✓ **عنوان پژوهش:**

Recent progress in surface-enhanced Raman spectroscopy for biological and biomedical applications: From cells to clinics

✓ **نویسندگان:**

Cialla-May D., Zheng X.-S., Weber K., Popp J.

✓ **خلاصه پژوهش:**

The application of surface-enhanced Raman spectroscopy (SERS) in biological and biomedical detection schemes is feasible due to its excellent molecular specificity and high sensitivity as well as the capability of SERS to be performed in complex biological compositions. SERS-based investigation of cells, which are the basic structure and functional unit of organisms, represents the starting point of this review. It is demonstrated that SERS provides a deep understanding of living cells as well as their microenvironment which is needed to assess the development of diseases. The clinical relevance of SERS is proved by its application for the detection of cancer cells and tumour margins under in vivo conditions and examples for theranostic approaches are discussed. This review article provides a comprehensive overview of the recent progress within the last 3 years. © 2017 The Royal Society of Chemistry.

✓ **لینک** DOI **(استفاده برای دانلود مقاله)**

10.1039/c7cs00172j

✓ **نام ژورنال:**

Chemical Society Reviews

✓ **سال انتشار:**

2017

✓ **کلیدواژه‌ها:**

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

SERS as a foundation for nanoscale, optically detected biological labels

✓ **نویسندگان:**

Doering W.E., Piotti M.E., Natan M.J., Freeman R.G.

✓ **خلاصه پژوهش:**

Au and Ag nanoparticles have optical properties that have made them useful as tags in a wide variety of measurement schemes. This Progress Report discusses several different schemes in which Au and Ag nanoparticles have been used as surface-enhanced Raman scattering (SERS) tags for the measurement of biomolecules. As an example application, results using glass-coated nanotags (Nanoplex Biotags) in a lateral flow immunoassay kit are presented. © 2007 WILEY-VCH Verlag GmbH & Co. KGaA,.

✓ **لینک** DOI (**استفاده برای دانلود مقاله**)

10.1002/adma.200701984

✓ **نام ژورنال:**

Advanced Materials

✓ **سال انتشار:**

2007

✓ **کلیدواژه‌ها:**

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Practical understanding and use of surface enhanced Raman scattering/surface enhanced resonance Raman scattering in chemical and biological analysis

✓ **نویسندگان:**

Smith W.E.

✓ **خلاصه پژوهش:**

The unique ability to obtain molecular recognition of an analyte at very low concentrations in situ in aqueous environments using surface enhanced Raman scattering (SERS) and surface enhanced resonance Raman scattering (SERRS) detection makes these spectroscopies of considerable interest. Improved understanding of the effect coupled to improvements in practical techniques make the use of SERS/SERRS much simpler than has been the case in the past. This article is designed as a tutorial review targeted at aiding in the development of practical applications. © 2008 The Royal Society of Chemistry.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1039/b708841h

✓ **نام ژورنال:**

Chemical Society Reviews

✓ **سال انتشار:**

2008

✓ **کلیدواژه‌ها:**

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Biological imaging of HEK293 cells expressing PLCγ1 using surface-enhanced raman microscopy

✓ **نویسندگان:**

Lee S., Kim S., Choo J., Soon Y.S., Lee Y.H., Ha Y.C., Ha S., Kang K., Chil H.O.

✓ **خلاصه پژوهش:**

Surface-enhanced Raman scattering (SERS) imaging has been used for the targeting and imaging of specific cancer markers in live cells. For this purpose, Au/Ag core-shell nanoparticles, conjugated with monoclonal antibodies, were prepared. The procedures to label live cells with those bimetallic nanoprobes have been developed and used for highly sensitive SERS imaging of live cells. In the present study, live HEK293 cells expressing PLCγ1 have been used as the optical imaging target. Our results demonstrate the potential feasibility of SERS imaging technology for the highly sensitive imaging of cancer biomarkers in live cells. © 2007 American Chemical Society.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1021/ac061246a

✓ **نام ژورنال:**

Analytical Chemistry

✓ **سال انتشار:**

2007

✓ **کلیدواژه‌ها:**

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Optical probes for biological applications based on surface-enhanced Raman scattering from indocyanine green on gold nanoparticles

✓ **نویسندگان:**

Kneipp J., Kneipp H., Rice W.L., Kneipp K.

✓ **خلاصه پژوهش:**

We report surface-enhanced Raman scattering (SERS) studies on indocyanine green (ICG) on colloidal silver and gold and demonstrate a novel optical probe for applications in living cells. In addition to its own detection by the characteristic ICG SERS signatures, the ICG gold nanoprobe delivers spatially localized chemical information from its biological environment by employing SERS in the local optical fields of the gold nanoparticles. The probe offers the potential to increase the spectral specificity and selectivity of current chemical characterization approaches of living cells and biomaterials based on vibrational information. © 2005 American Chemical Society.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1021/ac050109v

✓ **نام ژورنال:**

Analytical Chemistry

✓ **سال انتشار:**

2005

✓ **کلیدواژه‌ها:**

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Surface-enhanced Raman scattering for medical diagnostics and biological imaging

✓ **نویسندگان:**

Vo-Dinh T., Yan F., Wabuyele M.B.

✓ **خلاصه پژوهش:**

We present recent development and applications of a surface-enhanced Raman scattering (SERS) technology for use in medical diagnostics and biological imaging. For medical diagnostics, we use Raman-active dye-labeled DNA gene probes and nanostructured metallic substrates as SERS-active platforms. The surface-enhanced Raman gene probes can be used to detect DNA biotargets (e.g. gene sequences, bacteria and viral DNA) via hybridization to DNA sequences complementary to these probes. The SERS gene probes eliminate the need for radioactive labels and have great potential to provide both sensitivity, selectivity and label multiplexing for DNA sequencing and clinical assays. We also describe a hyperspectral surface-enhanced Raman imaging (HSERI) system that combines imaging capabilities with SERS detection to identify cellular components with high spatial and temporal resolution. The HSERI system's application to biological imaging is demonstrated using Raman dye-labeled silver nanoparticles in cellular systems. Copyright © 2005 John Wiley & Sons, Ltd.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1002/jrs.1348

✓ **نام ژورنال:**

Journal of Raman Spectroscopy

✓ **سال انتشار:**

2005

✓ **کلیدواژه‌ها:**

Cellular imaging; Gene detection; Nanostructured materials; Surface-enhanced Raman scattering

✓ **عنوان پژوهش:**

Application of surface-enhanced Raman spectroscopy to biological systems

✓ **نویسندگان:**

Cotton T.M., Kim J.-H., Chumanov G.D.

✓ **خلاصه پژوهش:**

This review summarizes the literature relating to the application of surface-enhanced Raman scattering (SERS) and surface-enhanced resonance Raman scattering (SERRS) techniques to the study of biological molecules. The emphasis is on publications that have appeared during the period from 1985 to 1991. The review is divided into six major parts. First, a brief overview of the current understanding of the mechanistic aspects of SERS/SERRS is given, with an emphasis on the relationship between theoretical predictions and experimental results. The most common experimental systems (colloids, metal island films, and electrodes) are described. Studies of biological systems are described in the second (small molecules), third (DNA and proteins) and fourth (membranes proteins and membrane preparations) sections. In the fifth or conclusion section, the potential use of SERS or SERRS as a method for obtaining spectra of native biological molecules is evaluated. Finally, the sixth section describes advances in Raman instrumentation in terms of their possible impact on future applications of SERS/SERRS techniques to biological molecules. Copyright © 1991 John Wiley & Sons, Ltd.

✓ **لینک** DOI (**استفاده برای دانلود مقاله**)

10.1002/jrs.1250221203

✓ **نام ژورنال:**

Journal of Raman Spectroscopy

✓ **سال انتشار:**

1991

✓ **کلیدواژه‌ها:**

TEKSAN
Detect Precisely

✓ عنوان پژوهش:

Surface-enhanced Raman scattering detection of chemical and biological agents using a portable Raman integrated tunable sensor

✓ نویسندگان:

Yan F., Vo-Dinh T.

✓ خلاصه پژوهش:

This paper describes a compact and rugged Raman integrated tunable sensor coupled with surface-enhanced Raman scattering substrates for the screening of a wide variety of chemical and biological agents for homeland defense applications. The field-deployable instrument, consisting of an 830-nm diode laser for excitation and an avalanche photodiode (APD) for detection, is a fully integrated, tunable, "point-and-shoot" Raman device based on solid-state acousto-optic tunable filter (AOTF) technology. It can provide direct identification of chemical and biological samples in a few seconds under field conditions. This paper illustrates some applications of this portable device for the detection of various compounds of particular interest for homeland defense applications. These include methyl parathion (a nerve agent simulant) and dipicolinic acid (a biomarker for bacillus endospore), and other chemical warfare simulants such as dimethyl methylphosphonate, pinacolyl methylphosphonate, diethyl phosphoramidate, and 2-chloroethyl ethylsulfide, which are simulants for sarin (GB), soman (GD), tabun (GA), and sulfur mustard (HD), respectively, and intact bacteria such as Bacillus globigii, Erwinia herbicola, and Bacillus thuringiensis, which are simulants for biological warfare agents. © 2006 Elsevier B.V. All rights reserved.

✓ لینک DOI (استفاده برای دانلود مقاله)

10.1016/j.snb.2006.09.032

✓ نام ژورنال:

Sensors and Actuators, B: Chemical

✓ سال انتشار:

2007

✓ کلیدواژه‌ها:

Acousto-optic tunable filter (AOTF); Biological warfare agent; Chemical warfare agent; Sensors; Surface-enhanced Raman scattering

✓ **عنوان پژوهش:**

SERS chemical sensors and biosensors: new tools for environmental and biological analysis

✓ **نویسندگان:**

Vo-Dinh T.

✓ **خلاصه پژوهش:**

This paper describes recent advances in chemical sensors and biosensors based on surface-enhanced Raman scattering (SERS) detection. The SERS-active probes involve silver-coated microstructured substrates designed to amplify the Raman signals of adsorbed molecules and to detect trace chemicals in liquid as well as vapor samples. The development and application of several SERS devices such as a fiber-optic remote sensor and a vapor dosimeter are described. The results illustrate the different uses of the SERS method for the identification and quantification of important environmental and biological compounds. © 1995.

✓ **لینک** DOI (**استفاده برای دانلود مقاله**)

10.1016/0925-4005(95)01681-3

✓ **نام ژورنال:**

Sensors and Actuators: B. Chemical

✓ **سال انتشار:**

1995

✓ **کلیدواژه‌ها:**

Biological analysis; Environmental analysis; SERS sensors; Spectroscopy

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Surface-enhanced Raman scattering hybrid nanoprobe multiplexing and imaging in biological systems

✓ **نویسندگان:**

Matschulat A., Drescher D., Kneipp J.

✓ **خلاصه پژوهش:**

Surface-enhanced Raman scattering (SERS) labels and probes consisting of gold and silver nanoaggregates and attached reporter molecules can be identified by the Raman signature of the reporter molecule. At the same time, SERS hybrid probes deliver sensitive molecular structural information on their nanoenvironment. Here we demonstrate full exploitation of the multifunctional and multiplexing capabilities inherent to such nanoprobes by applying cluster methods and principal components approaches for discrimination beyond the visual inspection of individual spectra that has been practiced so far. The reported results indicate that fast, multivariate evaluation of whole sets of multiple probes is feasible. Spectra of five different reporters were shown to be separable by hierarchical clustering and by principal components analysis (PCA). In a duplex imaging approach in live cells, hierarchical cluster analysis, K-means clustering, and PCA were used for imaging the positions of different types of SERS probes along with the spectral information from cellular constituents. Parallel to cellular imaging experiments, cytotoxicity of the SERS hybrid probes containing aromatic thiols as reporters is assessed. The reported results suggest multiplexing applications of the nontoxic SERS nanoprobes in high density sensing and imaging in complex biological structures. © 2010 American Chemical Society.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1021/nn100280z

✓ **نام ژورنال:**

ACS Nano

✓ **سال انتشار:**

2010

✓ **کلیدواژه‌ها:**

2-Naphthalenethiol; 3T3 cells; Cytotoxicity; Hierarchical cluster analysis; Imaging; Nanosensor; Para-aminobenzenethiol; Principal component analysis; Surface-enhanced Raman scattering

✓ **عنوان پژوهش:**

Label-free SERS in biological and biomedical applications: Recent progress, current challenges and opportunities

✓ **نویسندگان:**

Zheng X.-S., Jahn I.J., Weber K., Cialla-May D., Popp J.

✓ **خلاصه پژوهش:**

To achieve an insightful look within biomolecular processes on the cellular level, the development of diseases as well as the reliable detection of metabolites and pathogens, a modern analytical tool is needed that is highly sensitive, molecular-specific and exhibits fast detection. Surface-enhanced Raman spectroscopy (SERS) is known to meet these requirements and, within this review article, the recent progress of label-free SERS in biological and biomedical applications is summarized and discussed. This includes the detection of biomolecules such as metabolites, nucleic acids and proteins. Further, the characterization and identification of microorganisms has been achieved by label-free SERS-based approaches. Eukaryotic cells can be characterized by SERS in order to gain information about the outer cell wall or to detect intracellular molecules and metabolites. The potential of SERS for medically relevant detection schemes is emphasized by the label-free detection of tissue, the investigation of body fluids as well as applications for therapeutic and illicit drug monitoring. The review article is concluded with an evaluation of the recent progress and current challenges in order to highlight the direction of label-free SERS in the future. © 2018

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1016/j.saa.2018.01.063

✓ **نام ژورنال:**

Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy

✓ **سال انتشار:**

2018

✓ **کلیدواژه‌ها:**

Biological application; Biomedical application; Label-free detection; Nanotechnology; Raman spectroscopy; Surface-enhanced Raman scattering

TEKSAN
Detect Precisely

✓ عنوان پژوهش:

Surface-enhanced Raman scattering of biological molecules on metal colloid II: Effects of aggregation of gold colloid and comparison of effects of pH of glycine solutions between gold and silver colloids

✓ نویسندگان:

Dou X., Jung Y.M., Cao Z.-Q., Ozaki Y.

✓ خلاصه پژوهش:

As the second paper of a series of our studies on surface-enhanced Raman scattering (SERS) of biological molecules on metal colloid, this paper reports effects of aggregation of gold colloid on the SERS intensity of glycine (Gly) in aqueous solutions and comparison of effects of pH of the Gly solutions between gold and silver colloids. In order to investigate the relation between the SERS effect and colloidal aggregation, we have developed a spectroscopic system by which we can measure simultaneously time-resolved SERS spectra and a time-dependent intensity change in a surface plasmon absorption of a metal colloid system. By use of this instrument we monitored time-dependent intensity changes in the SERS signals and in an absorption band at 802 nm of Gly on gold colloid at pH 3.9 and 6.0. For both pH values, the intensities of the SERS and the absorption band change in concert with each other at the emergence of the SERS effect. The intensity changes in the SERS signals are rather slow for the solution of pH 6.0 while rapid for that of pH 3.9. The coagulation proceeds slowly near the isoelectric point of Gly, whereas the rapid coagulation happens in the acidic region. SERS spectra of Gly adsorbed on silver colloid were measured at various pH values, and it was found that, in sharp contrast to the gold colloid system, which we reported in our previous paper, the SERS intensity of Gly on the silver colloid decreases markedly at pH 2.0 where most of Gly in the solution has a COOH group instead of a COO- group. It seems that the coagulation of the silver colloid particles does not occur very much below pK1 (2.35) because the COOH groups do not interact strongly with the positively charged silver particles.

✓ لینک DOI (استفاده برای دانلود مقاله)

10.1366/0003702991945803

✓ نام ژورنال:

Applied Spectroscopy

✓ سال انتشار:

1999

✓ کلیدواژه‌ها:

✓ **عنوان پژوهش:**

Covalent dimerization of vascular permeability factor/vascular endothelial growth factor is essential for its biological activity. Evidence from Cys to Ser mutations

✓ **نویسندگان:**

Potgens A.J.G., Lubsen N.H., Van Altena M.C., Vermeulen R., Bakker A., Schoenmakers J.G.G., Ruiter D.J., De Waal R.M.W.

✓ **خلاصه پژوهش:**

Vascular permeability factor, or vascular endothelial growth factor (VPF/VEGF) is an important factor in the regulation of vascular growth and vascular permeability, VPF is a secreted, dimeric protein and has 8 cysteine residues conserved with platelet-derived growth factor (PDGF). To study the role of some of these cysteine residues in maintaining the structure and function of VPF, we replaced the codons for the second, third, fourth, and fifth cysteine by serine codons, and expressed the mutant proteins in a mammalian expression system. Cysteine residues 2 and 4 in VPF were found to be directly involved in anti-parallel interchain disulfide bonds, as in PDGF, VPF mutants lacking one of these cysteines were severely impaired in their S- linked dimerization, while upon coexpression of both mutants the ability to form dimers was restored. The VPF mutants lacking cysteine residue 2 or 4 also competed poorly for receptor binding of labeled VPF and had low biological activity, but these defects were also complemented by coexpressing the two mutants, indicating that for efficient receptor binding and activation VPF needs to be a covalent dimer, unlike PDGF-BB. Furthermore, cysteine residue 5 was found to be essential for VPF dimerization and activity, while the mutant lacking cysteine residue 3 was only mildly affected in its ability to dimerize and had partial biological activity.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

✓ **نام ژورنال:**

Journal of Biological Chemistry

✓ **سال انتشار:**

1994

✓ **کلیدواژه‌ها:**

✓ **عنوان پژوهش:**

Surface enhanced Raman scattering for narcotic detection and applications to chemical biology

✓ **نویسندگان:**

Ryder A.G.

✓ **خلاصه پژوهش:**

Raman spectroscopy is rapidly finding favour for applications in the life science because of the ease with which it can be used to extract significant data from tissue and cells. However, the Raman effect is an inherently weak effect, which hinders the analysis of low concentration analytes. Raman sensitivity can be improved via the surface enhanced Raman scattering (SERS) effect. In SERS, Raman spectra are dramatically amplified when a molecule is adsorbed onto nano-roughened noble metal surfaces such as silver and gold. The degree of enhancement enables single-molecule detection, which offers the potential for the unambiguous identification of analytes at concentrations that are useful in both a forensic and a chemical biology context. Here we discuss some of the practical applications of SERS to both low-level narcotic detection, and how this can be applied to chemical biology. © 2005 Elsevier Ltd. All rights reserved.

✓ **لینک** DOI (**استفاده برای دانلود مقاله**)

10.1016/j.cbpa.2005.07.001

✓ **نام ژورنال:**

Current Opinion in Chemical Biology

✓ **سال انتشار:**

2005

✓ **کلیدواژه‌ها:**

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Label-free detection in biological applications of surface-enhanced Raman scattering

✓ **نویسندگان:**

Han X.X., Ozaki Y., Zhao B.

✓ **خلاصه پژوهش:**

Surface-enhanced Raman scattering (SERS) is currently undergoing rapid development as an ultra-sensitive analytical technique in the biological field. Label-free and extrinsic SERS labeling are two independent approaches that are commonly used to detect biomolecules directly and indirectly. The label-free detection method is a direct, convenient method for the detection of biomolecules and is more reliable than extrinsic SERS labeling, but its major limitations are poor selectivity in some complex mixtures and poor sensitivity at relatively low sample concentrations.However, label-free, highly sensitive, selective detection of biomolecules based on SERS is possible. With the development of novel SERS-active substrates, Raman instruments, and methods for sample pretreatment, the label-free protocol is becoming increasingly powerful and promising.This review highlights recent developments in label-free SERS-based techniques for bimolecular detection, including direct biomolecule identification, biomolecule-ligand recognition via spectral differences among molecular bridges, and indirect phenolic molecule detection based on azo couplings. © 2012 Elsevier Ltd.

✓ **لینک** DOI (**استفاده برای دانلود مقاله**)

10.1016/j.trac.2012.05.006

✓ **نام ژورنال:**

TrAC - Trends in Analytical Chemistry

✓ **سال انتشار:**

2012

✓ **کلیدواژه‌ها:**

Bacteria; Biorecognition; Cell; DNA; Estrogen; Label free; Metal nanoparticle; Protein; RNA; Surface-enhanced Raman scattering (SERS)

✓ **عنوان پژوهش:**

The application of a SERS fiber probe for the investigation of sensitive biological samples

✓ **نویسندگان:**

Geßner R., Rösch P., Petry R., Schmitt M., Strehle M.A., Kiefer W., Popp J.

✓ **خلاصه پژوهش:**

The applicability of an etched and silver or gold coated SERS fiber probe in combination with a commercially available laboratory micro-Raman setup or a home built mobile micro-Raman setup to perform on-site field measurements was evaluated and successfully tested on different biological samples. The SERS fiber probe allows one to perform measurements with high spatial resolution. Simultaneously, the laser power used for Raman spectroscopy on biological samples as compared with conventional Raman experiments can be reduced by more than two orders of magnitude. This experimental arrangement was tested to investigate sensitive biological samples like mint plants (Bergamot mint, spear mint) and citrus fruits (kumquat). Furthermore, traces of fungicides on wine leaves were detected by means of such a SERS fiber probe setup.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1039/b411690a

✓ **نام ژورنال:**

Analyst

✓ **سال انتشار:**

2004

✓ **کلیدواژه‌ها:**

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Understanding tip-enhanced Raman spectra of biological molecules: A combined Raman, SERS and TERS study

✓ **نویسندگان:**

Blum C., Schmid T., Opilik L., Weidmann S., Fagerer S.R., Zenobi R.

✓ **خلاصه پژوهش:**

Although conventional Raman, surface-enhanced Raman (SERS) and tip-enhanced Raman spectroscopy (TERS) have been known for a long time, a direct, thorough comparison of these three methods has never been carried out. In this paper, spectra that were obtained by conventional Raman, SERS (on gold and silver substrates) and TERS (in ˜gap mode' with silver tips and gold substrates) are compared to learn from their differences and similarities. Because the investigation of biological samples by TERS has recently become a hot topic, this work focuses on biologically relevant substances. Starting from the TER spectra of bovine serum albumin as an example for a protein, the dipeptides Phe-Phe and Tyr-Tyr and the tripeptide Tyr-Tyr-Tyr were investigated. The major findings were as follows. (1) We show that the widely used assumption that spectral bands do not shift when comparing SER, TER and conventional Raman spectra (except due to binding to the metal surface in SERS or TERS) is valid. However, band intensity ratios can differ significantly between these three methods. (2) Marker bands can be assigned, which should allow one to identify and localize proteins in complex biological environments in future investigations. From our results, general guidelines for the interpretation of TER spectra are proposed. Copyright © 2012 John Wiley & Sons, Ltd.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1002/jrs.4099

✓ **نام ژورنال:**

Journal of Raman Spectroscopy

✓ **سال انتشار:**

2012

✓ **کلیدواژه‌ها:**

biological molecules; interpretation of spectra; peptides; surface-enhanced Raman spectroscopy (SERS); tip-enhanced Raman spectroscopy (TERS)

✓ **عنوان پژوهش:**

Biological pH sensing based on surface enhanced Raman scattering through a 2-aminothiophenol-silver probe

✓ **نویسندگان:**

Wang Z., Bonoiu A., Samoc M., Cui Y., Prasad P.N.

✓ **خلاصه پژوهش:**

We report pH sensing for biological applications based on surface enhanced Raman scattering (SERS) from silver nanoparticles functionalized with 2-aminothiophenol (2-aminobenzenethiol, 2-ABT). pH-dependent SERS spectra of the attached 2-ABT molecules enable one to sense the pH over the range of 3.0-8.0. We have performed the first demonstration of SERS detection in living cells kept in different pH buffer solutions and show that the pH sensitivity is retained in that case. Thus, the nanoparticles can be used as probes delivering spatially localized chemical information from biological environments and provide a new way to monitor chemical changes at cellular level. © 2007.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1016/j.bios.2007.09.017

✓ **نام ژورنال:**

Biosensors and Bioelectronics

✓ **سال انتشار:**

2008

✓ **کلیدواژه‌ها:**

Cellular imaging; pH sensor; SERS probe; Surface enhanced Raman scattering

TEKSAN Detect Precisely

✓ **عنوان پژوهش:**

Classification of chemical and biological warfare agent simulants by surface-enhanced Raman spectroscopy and multivariate statistical techniques

✓ **نویسندگان:**

Pearman W.F., Fountain III A.W.

✓ **خلاصه پژوهش:**

Initial results demonstrating the ability to classify surface-enhanced Raman (SERS) spectra of chemical and biological warfare agent simulants are presented. The spectra of two endospores (B. subtilis and B. atrophaeus), two chemical agent simulants (dimethyl methylphosphonate (DMMP) and diethyl methylphosphonate (DEMP)), and two toxin simulants (ovalbumin and horseradish peroxidase) were studied on multiple substrates fabricated from colloidal gold adsorbed onto a silanized quartz surface. The use of principal component analysis (PCA) and hierarchical clustering were used to evaluate the efficacy of identifying potential threat agents from their spectra collected on a single substrate. The use of partial least squares-discriminate analysis (PLS-DA) and soft independent modeling of class analogies (SIMCA) on a compilation of data from separate substrates, fabricated under identical conditions, demonstrates both the feasibility and the limitations of this technique for the identification of known but previously unclassified spectra. © 2006 Society for Applied Spectroscopy.

✓ **لینک** DOI **(استفاده برای دانلود مقاله)**

10.1366/000370206776593744

✓ **نام ژورنال:**

Applied Spectroscopy

✓ **سال انتشار:**

2006

✓ **کلیدواژه‌ها:**

Biological warfare agents; Chemical warfare agents; Partial least squares-discriminant analysis; PLS-DA; SIMCA; Soft independent modeling of class analogies; Surface-enhanced Raman spectroscopy

TEKSAN Detect Precisely

✓ **عنوان پژوهش:**

Fabrication and characterization of a multiwell array SERS chip with biological applications

✓ **نویسندگان:**

Abell J.L., Driskell J.D., Dluhy R.A., Tripp R.A., Zhao Y.-P.

✓ **خلاصه پژوهش:**

Uniform, large surface area substrates for surface-enhanced Raman spectroscopy (SERS) are fabricated by oblique angle deposition. The SERS-active substrates are patterned by a polymer-molding technique to provide a uniform array for high throughput biosensing and multiplexing. Using a conventional SERS-active molecule, 1,2-di(4-pyridyl)ethylene (BPE) ≥98%, we show that this device provides a uniform Raman signal enhancement from well to well with a detection limit of at least 10-8 M of the BPE solution or 10-18 mol of BPE. The SERS intensity is also demonstrated to vary logarithmically with the log of BPE concentration and the apparent sensitivity of the patterned substrate is compared to previous reports from our group on non-patterned substrates. Avian influenza is analyzed to demonstrate the utility of SERS multiwell patterned substrates for biosensing. The spectra acquired from patterned substrates show better reproducibility and less variation compared to the unpatterned substrates according to multivariate analysis. Our results highlight potential advantages of the patterned substrate. © 2009 Elsevier B.V. All rights reserved.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1016/j.bios.2009.05.039

✓ **نام ژورنال:**

Biosensors and Bioelectronics

✓ **سال انتشار:**

2009

✓ **کلیدواژه‌ها:**

Microtiter; Multiwell array; Patterned substrate; SERS; Silver nanorod array; Viral detection

✓ **عنوان پژوهش:**

Optofluidic SERS: Synergizing photonics and microfluidics for chemical and biological analysis

✓ **نویسندگان:**

White I.M., Yazdi S.H., Yu W.W.

✓ **خلاصه پژوهش:**

Surface enhanced Raman spectroscopy (SERS) leverages the specificity of Raman scattering and the sensitivity provided by localized plasmonic effects for applications in chemical and biomolecular detection. However, nearly four decades after the first report of SERS, practical uses of the technique remain limited. Optofluidic SERS-the synergistic use of microfluidics to improve the performance of SERS-may finally lead to practical devices for chemical and biomolecular detection. In this review, we describe recent advances in optofluidic SERS microsystems that have been developed to improve the performance and applicability of SERS. These techniques include designs that improve the light-analyte interaction, that perform active or passive concentration of metal nanoparticles and/or analyte molecules, and that utilize microfluidic techniques to improve functionality. In addition, we present optofluidic SERS techniques that enable new applications that have not been possible before the advent of optofluidics. Finally, we project future advances in optofluidic SERS and present a vision for the disruptive technologies that will enable the translation of SERS from the research lab to practical uses. © Springer-Verlag 2012.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1007/s10404-012-0962-2

✓ **نام ژورنال:**

Microfluidics and Nanofluidics

✓ **سال انتشار:**

2012

✓ **کلیدواژه‌ها:**

Biosensors; Chemical sensors; Optofluidics; Surface enhanced Raman spectroscopy

TEKSAN Detect Precisely

✓ **عنوان پژوهش:**

Effects and anomalies that can occur in SERS spectra of biological molecules when using a wide range of aggregating agents for hydroxylamine-reduced and citrate-reduced silver colloids

✓ **نویسندگان:**

Yaffe N.R., Blanch E.W.

✓ **خلاصه پژوهش:**

SERS spectra of cysteine and proline were measured for citrate-reduced and hydroxylamine-reduced silver colloids using aggregating agents K2SO4, NaNO3, NaCl, Ca(NO3)2, CaCl2, Na2SO4, KNO3 and KCl, to compare the effects of aggregation on two different colloid environments. High intensity anomalous bands were found for both colloids on the addition of the aggregating agents. On the addition of cysteine these anomalous bands disappeared. However, when proline was analysed, the anomalous bands remained, indicating the importance of characterising the colloidal sol to differentiate between band patterns from the analyte and those from the colloid in the presence of an aggregating agent. K2SO4 gave the greatest enhancement (~103) of any aggregating agent for cysteine with the hydroxylamine-reduced colloid, in contrast to the citrate-reduced colloids where similar enhancement factors (~102) were found with several different aggregating agents. Through the analysis of different SERS spectra for amino acids with different aggregating agents and colloids, a better understanding of the SERS technique may be achieved and its application in biology may be expanded. © 2007 Elsevier B.V. All rights reserved.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1016/j.vibspec.2007.12.002

✓ **نام ژورنال:**

Vibrational Spectroscopy

✓ **سال انتشار:**

2008

✓ **کلیدواژه‌ها:**

Aggregating agents; Amino acids; Cysteine; Proline; SERS; Silver colloids

✓ **عنوان پژوهش:**

Surface-enhanced raman scattering and its application to the study of biological molecules

✓ **نویسندگان:**

Nabiev I.R., Efremov R.G., Chumanov G.D.

✓ **خلاصه پژوهش:**

Work on surface-enhanced Raman scattering (RS) of light by molecules near a metal surface is reviewed. The experimental conditions for obtaining surface-enhanced Raman scattering spectra in different molecule-metal systems are examined. The basic characteristics and mechanisms of the effect are discussed. Special attention is devoted to applications of the method of surface-enhanced Raman scattering spectroscopy for structural-functional study of biological molecules: DNA, proteins, supramolecular complexes. It is pointed out that the large enhancement of the RS cross section makes it possible to reduce the concentration of the substances under study by three orders of magnitude—;down to 10-8–10-9M. The short range of the enhancement mechanism in some systems makes it possible to obtain Raman scattering spectra for groups of atoms located directly adjacent to the surface of the metal and thereby to study the topography of biological macromolecules and the kinetics of their behavior at an interface. The prospects for applications of enhanced Raman scattering as a new method of vibrational spectroscopy of biopolymers are discussed. © 1988 American Institute of Physics.

✓ **لینک** DOI **(استفاده برای دانلود مقاله)**

10.1070/PU1988v031n03ABEH005720

✓ **نام ژورنال:**

Soviet Physics - Uspekhi

✓ **سال انتشار:**

1988

✓ **کلیدواژه‌ها:**

TEKSAN Detect Precisely

✓ **عنوان پژوهش:**

Highly Sensitive and Reproducible SERS Sensor for Biological pH Detection Based on a Uniform Gold Nanorod Array Platform

✓ **نویسندگان:**

Bi L., Wang Y., Yang Y., Li Y., Mo S., Zheng Q., Chen L.

✓ **خلاصه پژوهش:**

Conventional research on surface-enhanced Raman scattering (SERS)-based pH sensors often depends on nanoparticle aggregation, whereas the variability in nanoparticle aggregation gives rise to poor repeatability in the SERS signal. Herein, we fabricated a gold nanorod array platform via an efficient evaporative self-assembly method. The platform exhibits great SERS sensitivity with an enhancement factor of 5.6 × 107 and maintains excellent recyclability and reproducibility with relative standard deviation (RSD) values of less than 8%. On the basis of the platform, we developed a highly sensitive bovine serum albumin (BSA)-coated 4-mercaptopyridine (4-MPy)-linked (BMP) SERS-based pH sensor to report pH ranging from pH 3.0 to pH 8.0. The intensity ratio variation of 1004 and 1096 cm-1 in 4-MPy showed excellent pH sensitivity, which decreased as the surrounding pH increased. Furthermore, this BMP SERS-based pH sensor was employed to measure the pH value in C57BL/6 mouse blood. We have demonstrated that the pH sensor has great advantages such as good stability, reliability, and accuracy, which could be extended for the design of point-of-care devices. © 2018 American Chemical Society.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1021/acsami.7b19347

✓ **نام ژورنال:**

ACS Applied Materials and Interfaces

✓ **سال انتشار:**

2018

✓ **کلیدواژه‌ها:**

4-MPy; C57BL/6 mouse blood; gold nanorod array; pH sensor; RSD; SERS

✓ **عنوان پژوهش:**

Sensitive SERS glucose sensing in biological media using alkyne functionalized boronic acid on planar substrates

✓ **نویسندگان:**

Kong K.V., Ho C.J.H., Gong T., Lau W.K.O., Olivo M.

✓ **خلاصه پژوهش:**

In this work, we propose a novel glucose binding mechanism on a highly sensitive SERS substrate, in order to overcome challenges in specific glucose detection in bio-fluids. We make use of phenylboronic acid as a receptor for saccharide capture onto the substrate and the ability of the captured glucose molecule to undergo secondary binding with an alkyne-functionalized boronic acid to form a glucose-alkyne-boronic acid complex. The formation of this complex shows high selectivity for glucose, over other saccharides. In addition, the alkyne group of the alkyne-functionalized boronic acid exhibits a distinct Raman peak at 1996cm-1 in a biological silent region (1800-2800cm-1) where most endogenous molecules, including glucose, show no Raman scattering, thus offering a high sensitivity over other SERS glucose sensing. The substrate offers long-term stability, as well as high SERS enhancement to the glucose-alkyne boronic acid complex on substrate. In addition, the reversibility of SERS signals at various incubation stages also shows reusability capabilities, whereas positive results in clinical urine samples demonstrate clinical feasibility. All these strongly suggest that this newly developed SERS-based assay offers great potential in glucose sensing. © 2014 Elsevier B.V.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1016/j.bios.2013.12.062

✓ **نام ژورنال:**

Biosensors and Bioelectronics

✓ **سال انتشار:**

2014

✓ **کلیدواژه‌ها:**

Alkyne; Biosensing; Boronic acid; Glucose; Surface-enhanced Raman spectroscopy

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Fundamental studies on enhancement and blinking mechanism of surface-enhanced Raman scattering (SERS) and basic applications of SERS biological sensing

✓ **نویسندگان:**

Yamamoto Y.S., Ishikawa M., Ozaki Y., Itoh T.

✓ **خلاصه پژوهش:**

We review recent our results in the fundamental study of surface-enhanced Raman scattering (SERS) with emphasis on experiments that attempted to identify the enhancement and blinking mechanism using single Ag nanoparticle dimers attached to dye molecules. These results are quantitatively discussed in the framework of electromagnetic mechanism. We also review recent our results in basic SERS applications for biological sensing regarding detections of cell surface molecules and distinction of disease marker molecules under single cell and single molecule level. © 2014 Higher Education Press and Springer-Verlag Berlin Heidelberg.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1007/s11467-013-0347-3

✓ **نام ژورنال:**

Frontiers of Physics

✓ **سال انتشار:**

2014

✓ **کلیدواژه‌ها:**

Ag nanoparticle; plasmonics; surface-enhanced fluorescence; surface-enhanced Raman scattering (SERS)

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Surface-enhanced Raman spectroscopy at single-molecule scale and its implications in biology

✓ **نویسندگان:**

Wang Y., Irudayaraj J.

✓ **خلاصه پژوهش:**

Single-molecule (SM) spectroscopy has been an exciting area of research offering significant promise and hope in the field of sensor development to detect targets at ultra-low levels down to SM resolution. To the experts and developers in the field of surface-enhanced Raman spectroscopy (SERS), this has often been a challenge and a significant opportunity for exploration. Needless to say, the opportunities and excitement of this multidisciplinary area impacts span the fields of physics, chemistry and engineering, along with a significant thrust in applications constituting areas in medicine, biology, environment and agriculture among others. In this review, we will attempt to provide a quick snapshot of the basics of SM-SERS, nanostructures and devices that can enable SM Raman measurement. We will conclude with a discussion on SERS implications in biomedical sciences. © 2012 The Author(s) Published by the Royal Society.

✓ **لینک** DOI (**استفاده برای دانلود مقاله**)

10.1098/rstb.2012.0026

✓ **نام ژورنال:**

Philosophical Transactions of the Royal Society B: Biological Sciences

✓ **سال انتشار:**

2013

✓ **کلیدواژه‌ها:**

Biological sciences; Hot spot; Nanotechnology; Single molecule; Surface-enhanced Raman spectroscopy

✓ **عنوان پژوهش:**

Gold nanostars for cancer cell-targeted SERS-imaging and NIR light-triggered plasmonic photothermal therapy (PPTT) in the first and second biological windows

✓ **نویسندگان:**

Song C., Li F., Guo X., Chen W., Dong C., Zhang J., Zhang J., Wang L.

✓ **خلاصه پژوهش:**

Cancer cell-targeted imaging and efficient therapy are vital for tumor diagnosis and treatments. However, the development of multifunctional plasmonic nanoparticles with high-performance SERS-imaging and NIR light-triggered plasmonic photothermal therapy (PPTT) of cancer cells in both the first (NIR-I) and second (NIR-II) biological windows is still a big challenge. In the present work, gold nanostars which possess a broad NIR absorption band covering the NIR-I and NIR-II windows with good NIR SERS activity and photothermal effects were synthesized by a seed-mediated growth method, using gold chloride (HAuCl4), ascorbic acid (AA) and (1-hexadecyl) trimethylammonium chloride (CTAC) as growth solutions. The gold nanostars were further designed to be multifunctional nanoagents by labeling Raman molecules and then conjugating arginine-glycine-aspartic acid (RGD), which can serve as cancer cell-targeted SERS-imaging tags and photothermal nanoagents in both the NIR-I and NIR-II windows. The investigation of in vitro SERS-mapping and PPTT of the A549 human lung adenocarcinoma cells indicates that the proposed multifunctional gold nanostars have great potential for a wide spectrum of light-mediated applications, such as optical imaging and image-guided phototherapy in both the NIR-I and NIR-II biological windows. © 2019 The Royal Society of Chemistry.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1039/c9tb00061e

✓ **نام ژورنال:**

Journal of Materials Chemistry B

✓ **سال انتشار:**

2019

✓ **کلیدواژه‌ها:**

TEKSAN
Detect Precisely

✓ عنوان پژوهش:

Consensus statement of the spanish society of rheumatology on risk management of biologic therapy in rheumatic patients [Consenso SER sobre la gestión de riesgo del tratamiento con terapias biológicas en pacientes con enfermedades reumáticas]

✓ نویسندگان:

Reino J.G., Loza E., Andreu J.L., Balsa A., Batlle E., Cañete J.D., Collantes Estévez E., Fernández Carballido C., Fernández Sueiro J.L., García de Vicuña R., González-Álvaro I., González Fernández C., Juanola X., Linares L.F., Marenco J.L., Martín Mola E., Moreno Ramos M., Mulero Mendoza J., Muñoz Fernández S., Queiro R., Richi Alberti P., Sanz J., Tornero Molina J., Zarco Montejo P., Carmona L.

✓ خلاصه پژوهش:

Objective: Due to the increasing use of biologic therapy in rheumatic diseases and the importance of its risk management, the Spanish Society of Rheumatology (SER) has promoted the development of recommendations based on the best evidence available. These recommendations should be a reference to rheumatologists and those involved in the treatment of patients who are using, or about to use biologic therapy irrespectively of the rheumatic disease. Methods: Recommendations were developed following a nominal group methodology and based on systematic reviews. The level of evidence and degree of recommendation were classified according to the model proposed by the Center for Evidence Based Medicine at Oxford. The level of agreement was established through a Delphi technique. Evidence from previous consensus and clinical guidelines was used. Results: We have produced recommendations on risk management of biologic therapy in rheumatic patients. These recommendations include indication risk management, risk management before the use of biologic therapy, risk management during follow-up, attitude to adverse events, and attitude to special situations. Conclusions: We present the SER recommendations related to biologic therapy risk management. © 2011 Elsevier España, S.L.

✓ لینک DOI (استفاده برای دانلود مقاله)

10.1016/j.reuma.2011.05.002

✓ نام ژورنال:

Reumatologia Clinica

✓ سال انتشار:

2011

✓ کلیدواژه‌ها:

Biologic therapy; Consensus; Guidelines; Recommendations; Rheumatic diseases; Risk management; Systemic autoimmune diseases

✓ **عنوان پژوهش:**

Label-free nanometer-resolution imaging of biological architectures through surface enhanced raman scattering

✓ **نویسندگان:**

Ayas S., Cinar G., Ozkan A.D., Soran Z., Ekiz O., Kocaay D., Tomak A., Toren P., Kaya Y., Tunc I., Zareie H., Tekinay T., Tekinay A.B., Guler M.O., Dana A.

✓ **خلاصه پژوهش:**

Label free imaging of the chemical environment of biological specimens would readily bridge the supramolecular and the cellular scales, if a chemical fingerprint technique such as Raman scattering can be coupled with super resolution imaging. We demonstrate the possibility of label-free super-resolution Raman imaging, by applying stochastic reconstruction to temporal fluctuations of the surface enhanced Raman scattering (SERS) signal which originate from biomolecular layers on large-area plasmonic surfaces with a high and uniform hot-spot density (>1011/cm2, 20 to 35 nm spacing). A resolution of 20 nm is demonstrated in reconstructed images of self-assembled peptide network and fibrilated lamellipodia of cardiomyocytes. Blink rate density is observed to be proportional to the excitation intensity and at high excitation densities (>10 kW/cm2) blinking is accompanied by molecular breakdown. However, at low powers, simultaneous Raman measurements show that SERS can provide sufficient blink rates required for image reconstruction without completely damaging the chemical structure.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1038/srep02624

✓ **نام ژورنال:**

Scientific Reports

✓ **سال انتشار:**

2013

✓ **کلیدواژه‌ها:**

TEKSAN Detect Precisely

✓ **عنوان پژوهش:**

Gold nanomaterials for the selective capturing and SERS diagnosis of toxins in aqueous and biological fluids

✓ **نویسندگان:**

Hassanain W.A., Izake E.L., Schmidt M.S., Ayoko G.A.

✓ **خلاصه پژوهش:**

A highly sensitive nanosensing method for the combined selective capture and SERS detection of Microcystin-LR (MC-LR) in blood plasma has been developed. The new method utilizes gold coated magnetic nanoparticles that are functionalized with anti MC-LR antibody Fab' fragments for the selective capture of MC-LR from aqueous media and blood plasma. Using an oriented immobilization approach, the Fab' fragments are covalently attached to gold surface to form a monolayer with high capture efficiency towards the toxin. After the selective capture, the purified MC-LR molecules were released from the extractor nanoparticles within 5 min by manipulating the pH environment of the nanoparticles. The regenerated extractor nanoparticles maintained their capture efficiency and, therefore, were re-used to capture of MC-LR from successive samples. The released purified toxin was screened within 10 min on gold coated silicon nanopillars and a new paper-based SERS substrate by handheld Raman spectrometer. The SERS enhancement factors of the nanopillars and the new paper-based substrate were 2.5×106 and 3×105 respectively. The lower limit of quantification (LOQ) of MC-LR by SERS on the nanopillar substrate was 10 fM (R2=0.9975) which is well below the clinically required detection limit of the toxin. The SERS determination of MC-LR was cross validated against ELISA. By using antibody fragments that are specific to the target biomolecule, the new methodology can be extended to the rapid extraction and detection of other toxins and proteins. © 2017 Elsevier B.V.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1016/j.bios.2017.01.032

✓ **نام ژورنال:**

Biosensors and Bioelectronics

✓ **سال انتشار:**

2017

✓ **کلیدواژه‌ها:**

Antibody fragments; Biological fluids; Functionalized nanoparticles; Microcystin-LR; Molecular diagnosis; Paper SERS substrate

✓ **عنوان پژوهش:**

Combinatorial synthesis and biological evaluation of library of small-molecule Ser/Thr-protein phosphatase inhibitors

✓ **نویسندگان:**

Wipf P., Cunningham A., Rice R.L., Lazo J.S.

✓ **خلاصه پژوهش:**

In eukaryotes, phosphorylation of serine, threonine, and tyrosine residues on proteins is a fundamental posttranslational regulatory process for such functions as signal transduction, gene transcription, RNA splicing, cellular adhesion, apoptosis, and cell cycle control. Based on functional groups present in natural product serine/threonine protein phosphatase (PSTPase) inhibitors, we have designed pharmacophore model 1 and demonstrated the feasibility of a combinatorial chemistry approach for the preparation of functional analogues of 1. Preliminary biological testing of 18 structural variants of 1 has identified two compounds with growth inhibitory activity against cultured human breast cancer cells. In vitro inhibition of the PSTPase PP2A was demonstrated with compound Id. Using flow cytometry we observed that compound If caused prominent inhibition in the G1 phase of the cell cycle. Thus, the combinatorial modifications of the minimal pharmacophore 1 can generate biologically interesting antiproliferative agents.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1016/S0968-0896(96)00199-X

✓ **نام ژورنال:**

Bioorganic and Medicinal Chemistry

✓ **سال انتشار:**

1997

✓ **کلیدواژه‌ها:**

TEKSAN Detect Precisely

✓ **عنوان پژوهش:**

Near-Infrared Excited Surface-Enhanced Raman Scattering of Biological Molecules on Gold Colloid I: Effects of pH of the Solutions of Amino Acids and of Their Polymerization

✓ **نویسندگان:**

Dou X., Jung Y.M., Yamamoto H., Doi S., Ozaki Y.

✓ **خلاصه پژوهش:**

Near-infrared (NIR) excited surface-enhanced Raman scattering (SERS) has been measured for lysine (Lys) on gold colloid at pH 10.8 and 12.0 where its c-amino group is ionized and both the α -and ε-amino groups are neutralized, respectively. The intensities of SERS signals from Lys are much stronger at pH 10.8 than at pH 12.0. This result suggests that the electrostatic interaction between the positive charge of the ε-NH3+ group and the negative charge of the gold surface is one of the most important factors which determine the intensities of the SERS signals. A similar SERS study has been carried out for glycine (Gly) on gold colloid at various pH. The SERS spectra of Gly on gold colloid are quite different in terms of both the frequencies and the band intensities from those of Gly on silver colloid, previously reported; the zwitter ion is dominant on the surface of the gold colloid, while the anion form is major on the silver colloid surface. The chemical interactions are much less important for the emergence of SERS of Gly on the gold colloid. NIR SERS has also been performed for oligomers and polymers of Lys and Gly. The intensities of the SERS signals decrease markedly with their polymerization. The effects of the steric hindrance due to the polymerization and of the distance between the gold surface and amino acid unit probably determine the SERS intensities.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1366/0003702991946406

✓ **نام ژورنال:**

Applied Spectroscopy

✓ **سال انتشار:**

1999

✓ **کلیدواژه‌ها:**

Gold colloid; Near-infrared, Amino acid; Raman spectroscopy; Surface-enhanced Raman scattering SERS

✓ **عنوان پژوهش:**

Synthesis and biological evaluation of N-arylbenzo[b]thieno[3,2-d] pyrimidin-4-amines and their pyrido and pyrazino analogues as Ser/Thr kinase inhibitors

✓ **نویسندگان:**

Loidreau Y., Marchand P., Dubouilh-Benard C., Nourrisson M.-R., Duflos M., Lozach O., Loaëc N., Meijer L., Besson T.

✓ **خلاصه پژوهش:**

A useful and rapid access to libraries of N-arylbenzo[b]thieno[3,2-d] pyrimidin-4-amines and their pyrido and pyrazino analogues was designed and optimized for the first time via microwave-accelerated condensation and Dimroth rearrangement of the starting anilines with N′-(2-cyanoaryl)-N,N- dimethylformimidamides obtained by reaction of thiophene precursors with dimethylformamide dimethylacetal. The inhibitory potency of the final products against five protein kinases (CDK5/p25, CK1δ/ε, GSK3α/β, DYRK1A and CLK1) was estimated. N-arylpyrido[3′,2′:4,5]thieno[3,2-d] pyrimidin-4-amine series of compounds (4a-j) turned out to be particularly promising for the development of new pharmacological inhibitors of CK1 and CLK1 kinases. © 2012 Elsevier Masson SAS. All rights reserved.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1016/j.ejmech.2012.10.006

✓ **نام ژورنال:**

European Journal of Medicinal Chemistry

✓ **سال انتشار:**

2012

✓ **کلیدواژه‌ها:**

Alzheimer's disease; Dimethylformamide dimethylacetal; Dimroth rearrangement; Kinase inhibitor; Microwave-assisted chemistry; Thieno[3,2-d]pyrimidine

✓ **عنوان پژوهش:**

Specific chemical effects on surface-enhanced Raman spectroscopy for ultra-sensitive detection of biological molecules

✓ **نویسندگان:**

Koo T.-W., Chan S., Sun L., Xing S.U., Zhang J., Berlin A.A.

✓ **خلاصه پژوهش:**

Achieving high signal amplification in surface-enhanced Raman scattering (SERS) is important for reaching single molecule level sensitivity and has been the focus of intense research efforts. We introduce a novel chemical enhancer, lithium chloride, that provides an additional order of magnitude increase in SERS relative to previously reported enhancement results. We have duplicated single molecule detection of the DNA base adenine that has previously been reported, thereby providing independent validation of this important result. Building upon this work, we show that the chemical enhancer LiCl produces strong SERS signal under a wide range of experimental conditions, including multiple laser excitation wavelengths and target molecule concentrations, for nucleotides, nucleosides, bases, and dye molecules. This is significant because while selection of anions used in chemical enhancement is well known to affect the degree of amplification attained, cation selection has previously been reported to have no major effect on the magnitude of SERS enhancement. Our findings indicate that cation selection is quite important in ultra-sensitive SERS detection, opening the door to further discussion and theory development involving the role of cations in SERS.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1366/0003702042641227

✓ **نام ژورنال:**

Applied Spectroscopy

✓ **سال انتشار:**

2004

✓ **کلیدواژه‌ها:**

Chemical enhancement; LiCl; Lithium chloride; SERS; Single molecule; Surface-enhanced Raman scattering

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

SERS of whole cell bacteria and trace levels of biological molecules

✓ **نویسندگان:**

Guzelian A.A., Sylvia J.M., Janni J.A., Clauson S.L., Spencer K.M.

✓ **خلاصه پژوهش:**

Through its several orders of magnitude signal enhancement over normal Raman, surface-enhanced Raman spectroscopy (SERS) provides an opportunity to extend the benefits of vibrational spectroscopy to trace level detection. SERS in particular holds great potential for biological sensing due to the weak Raman bands of water and the reduction in fluorescence backgrounds from interactions of the analyte with the metal SERS substrate. This work examines the trace level detection (<100 ppm) of biological molecules and oligomers such as amino acids, peptides, and oligonucleotides as well as the detection of whole cell bacteria. The SERS substrates employed are electrochemically roughened gold. The biological molecules show well-resolved and intense bands that are an effective spectral signature; these bands also persist in corresponding oligomeric compounds. Spectra from whole cell bacteria have been obtained for several species, including gram-positive and gram-negative strains. Viable and nonviable cells have also been examined and significant spectral differences are observed. The results show the potential for using SERS as an analytical tool for the identification of biological molecules and microorganisms with applications in biological agent detection, food and water monitoring, and the search for signs of extraterrestrial life.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1117/12.455736

✓ **نام ژورنال:**

Proceedings of SPIE - The International Society for Optical Engineering

✓ **سال انتشار:**

2001

✓ **کلیدواژه‌ها:**

Amino acids; Bacteria; Nucleic acids; Raman; SERS; Trace detection

✓ **عنوان پژوهش:**

Surface-enhanced Raman scattering detection of chemical and biological agent simulants

✓ **نویسندگان:**

Yan F., Wabuyele M.B., Griffin G.D., Vass A.A., Vo-Dinh T.

✓ **خلاصه پژوهش:**

Surface-enhanced Raman scattering spectra of chemical and biological agent simulants, such as dimethyl methylphonate, pinacolyl methylphosphonate, diethyl phosphoramidate, 2-chloroethyl ethylsulfide, bacillus globigii, erwinia herbicola, and bacillus thuringiensis were obtained from silver-oxide film-deposited substrates. Thin AgO films ranging in thickness from 50 to 250 nm were produced by chemical bath deposition onto glass slides. Further Raman intensity enhancements were noticed in UV irradiated surfaces due to photo-induced Ag nanocluster formation, which may provide a possible route to producing highly useful plasmonic sensors for the detection of chemical and biological agents upon visible-light illumination.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1109/JSEN.2005.850993

✓ **نام ژورنال:**

IEEE Sensors Journal

✓ **سال انتشار:**

2005

✓ **کلیدواژه‌ها:**

Biological agent simulates; Chemical agent simulants; Plasmonic sensors; Silver nanoclusters; Surface-enhanced Raman scattering (SERS)

✓ عنوان پژوهش:

Surface-enhanced Raman spectroscopy for chemical and biological sensing using nanoplasmonics: The relevance of interparticle spacing and surface morphology

✓ نویسندگان:

Shvalya V., Filipič G., Zavašnik J., Abdulhalim I., Cvelbar U.

✓ خلاصه پژوهش:

In this review, the weightiest decadal developments of surface-enhanced Raman scattering (SERS) and nanoplasmonic materials in sensing applications are discussed. Today, there are several well-established research directions where plasmonic detection is employed extensively, namely, food and water quality monitoring, viruses, pathogenic bacteria and hazardous toxin investigations for theranostic applications, and explosive substance detection for military and civil protection purposes. A combination of vibrational spectroscopy and surface nanoengineering has gained a reputation as a powerful weapon for rapid and accurate determination of submolecular quantities of nanoanalytes. Signal enhancement achieved by employing various metallic nanoparticles and nanostructures can be amplified significantly due to the electromagnetic field confinement effect. Localized surface plasmon waves, which are responsible for the phenomenon, promote light absorption at nanovolume, generating 'hot spots' with an incredibly intense and confined electromagnetic field close to the nanosculptured metallic surface. However, the formation of the hot spot network is heavily dependent on morphology, size, and spatial arrangement of plasmonic nanomaterials. Under optimal excitation conditions, the interaction between the optically induced electromagnetic field in the hot spot region and a probing analyte attached to the nanosculptured metallic substrate enlarges photon scattering cross section, increasing signal intensity by 106-1010. As a result, fast single-molecule vibrational fingerprint recording is possible. This focused review collects recent state-of-the-art developments in nanoplasmonic SERS sensing, highlighting the most efficient surface morphology designs that hold the most promise for future developments. © 2020 Author(s).

✓ لینک DOI (استفاده برای دانلود مقاله)

10.1063/5.0015246

✓ نام ژورنال:

Applied Physics Reviews

✓ سال انتشار:

2020

✓ کلیدواژه‌ها:

✓ **عنوان پژوهش**:

Functional evidence that the Ser-195 residue of staphylococcal exfoliative toxin A is essential for biological activity

✓ **نویسندگان**:

Prevost G., Rifai S., Chaix M.L., Piemont Y.

✓ **خلاصه پژوهش**:

The substitution of the serine 195 residue of staphylococcal exfoliative toxin A by a cysteine residue led to a biologically inactive protein. This result is consistent with the hypothesis that exfoliative toxin A could be a protease or a lipase. However, no protease or lipase activity was detected with the native toxin.

✓ **لینک** DOI (**استفاده برای دانلود مقاله**)

✓ **نام ژورنال**:

Infection and Immunity

✓ **سال انتشار**:

1991

✓ **کلیدواژه‌ها**:

TEKSAN
Detect Precisely

✓ **عنوان پژوهش**:

Surface-enhanced Raman scattering of biological molecules on metal colloids: Basic studies and applications to quantitative assay

✓ **نویسندگان**:

Dou X.-M., Ozaki Y.

✓ **خلاصه پژوهش**:

[No abstract available]

✓ **لینک** DOI (**استفاده برای دانلود مقاله**)

✓ **نام ژورنال**:

Reviews in Analytical Chemistry

✓ **سال انتشار**:

1999

✓ **کلیدواژه‌ها**:

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Consensus statement of the Spanish Society of Rheumatology on the management of biologic therapies in psoriatic arthritis [Documento SER de consenso sobre el uso de terapias biológicas en la artritis psoriásica]

✓ **نویسندگان:**

Fernández Sueiro J.L., Juanola Roura X., Cañete Crespillo J.D.D., Torre Alonso J.C., García de Vicuña R., Queiro Silva R., Ariza Ariza R., Batlle Gualda E., Loza Santamaría E.

✓ **خلاصه پژوهش:**

Objective: Due to the amount and quality variability regarding the use of biologic therapy (BT) in psoriatic arthritis (PsA) patients, the Spanish Society of Rheumatology (SER) has promoted the generation of recommendations based on the best evidence available. These recommendations should serve as reference to rheumatologists and those involved in the treatment of patients with PsA, who are using, or about to use BT. Methods: Recommendations were developed following a nominal group methodology and based on systematic reviews. The level of evidence and degree of recommendation was classified according to the model proposed by the Center for Evidence Based Medicine at Oxford. The level of agreement was established through Delphi technique. Results: We have produced recommendations for the use of TB currently available for PsA in our country. These recommendations include disease assessment, treatment objectives, therapeutic scheme and switching. Conclusions: We present an update on the SER recommendations for the use of BT in patients with PsA. © 2010 Elsevier España, S.L.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1016/j.reuma.2011.02.001

✓ **نام ژورنال:**

Reumatologia Clinica

✓ **سال انتشار:**

2011

✓ **کلیدواژه‌ها:**

Biologic therapy; Consensus; Guide; Psoriatic arthritis; Recommendations

✓ عنوان پژوهش:

Surface-enhanced Raman scattering detection of silver nanoparticles in environmental and biological samples

✓ نویسندگان:

Guo H., Xing B., Hamlet L.C., Chica A., He L.

✓ خلاصه پژوهش:

Growing concerns over the potential release and threat of silver nanoparticles (AgNPs) to environmental and biological systems urge researchers to investigate their fate and behavior. However, current analytical techniques cannot meet the requirements for rapidly, sensitively and reliably probing AgNPs in complex matrices. Surface-enhanced Raman spectroscopy (SERS) has shown great capability for rapid detection of AgNPs based on an indicator molecule that can bind on the AgNP surface. The objective of this study was to exploit SERS to detect AgNPs in environmental and biological samples through optimizing the Raman indicator for SERS. Seven indicator molecules were selected and determined to obtain their SERS signals at optimal concentrations. Among them, 1,2-di(4-pyridyl)ethylene (BPE), crystal violet and ferric dimethyl-dithiocarbamate (ferbam) produced the highest SERS intensities. Further experiments on binding competition between each two of the three candidates showed that ferbam had the highest AgNPs-binding ability. The underlying mechanism lies in the strong binding affinity of ferbam with AgNPs via multiple sulfur atoms. We further validated ferbam to be an effective indicator for SERS detection of as low as 0.1 mg/L AgNPs in genuine surface water and 0.57 mg/L in spinach juice. Moreover, limited interference on SERS detection of AgNPs was found from environmentally relevant inorganic ions, organic matter, inorganic particles, as well as biologically relevant components, demonstrating the ferbam-assisted SERS is an effective and sensitive method to detect AgNPs in complex environmental and biological samples. © 2016 Elsevier B.V..

✓ لینک DOI (استفاده برای دانلود مقاله)

10.1016/j.scitotenv.2016.02.084

✓ نام ژورنال:

Science of the Total Environment

✓ سال انتشار:

2016

✓ کلیدواژه‌ها:

AgNPs; Biological samples; Environmental water; Matrix components; SERS

✓ **عنوان پژوهش:**

Total chemical synthesis and biological activities of glycosylated and Non-glycosylated forms of the chemokines CCL1 and Ser-CCL1

✓ **نویسندگان:**

Okamoto R., Mandal K., Ling M., Luster A.D., Kajihara Y., Kent S.B.H.

✓ **خلاصه پژوهش:**

CCL1 is a naturally glycosylated chemokine protein that is secreted by activated T-cells and acts as a chemoattractant for monocytes.1 Originally, CCL1 was identified as a 73 amino acid protein having one N-glycosylation site,1 and a variant 74 residue non-glycosylated form, Ser-CCL1, has also been described.2 There are no systematic studies of the effect of glycosylation on the biological activities of either CCL1 or Ser-CCL1. Here we report the total chemical syntheses of both N-glycosylated and non-glycosylated forms of (Ser-)CCL1, by convergent native chemical ligation. We used an N-glycan isolated from hen egg yolk together with the Nbz linker for Fmoc chemistry solid phase synthesis of the glycopeptide-αthioester building block.3 Chemotaxis assays of these glycoproteins and the corresponding non-glycosylated proteins were carried out. The results were correlated with the chemical structures of the (glyco)protein molecules. To the best of our knowledge, these are the first investigations of the effect of glycosylation on the chemotactic activity of the chemokine (Ser-)CCL1 using homogeneous N-glycosylated protein molecules of defined covalent structure. Man-made: Total chemical synthesis was used to prepare glycosylated and non-glycosylated forms of the chemokines CCL1 and Ser-CCL1. In a chemotaxis assay using a CCR8-transfected cell line, non-glycosylated CCL1 was more active than glycosylated CCL1; both non-glycosylated and glycosylated Ser-CCL1 had only minimal activity in the same assay. © 2014 WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1002/anie.201310574

✓ **نام ژورنال:**

Angewandte Chemie - International Edition

✓ **سال انتشار:**

2014

✓ **کلیدواژه‌ها:**

chemical protein synthesis; chemokines; glycoproteins; native chemical ligation

✓ **عنوان پژوهش:**

Biological Photonic Crystal-Enhanced Plasmonic Mesocapsules: Approaching Single-Molecule Optofluidic-SERS Sensing

✓ **نویسندگان:**

Sivashanmugan K., Squire K., Kraai J.A., Tan A., Zhao Y., Rorrer G.L., Wang A.X.

✓ **خلاصه پژوهش:**

Surface-enhanced Raman scattering (SERS) sensing in microfluidic devices, namely optofluidic-SERS, suffers an intrinsic tradeoff between mass transport and hot spot density, both of which are required for ultrasensitive detection. To overcome this compromise, photonic crystal-enhanced plasmonic mesocapsules are synthesized, utilizing diatom biosilica decorated with in-situ growth silver nanoparticles (Ag NPs). In the optofluidic-SERS testing of this study, 100× higher enhancement factors and more than 1,000× better detection limit are achieved compared with traditional colloidal Ag NPs, the improvement of which is attributed to unique properties of the mesocapsules. First, the porous diatom biosilica frustules serve as carrier capsules for high density Ag NPs that form high density plasmonic hot-spots. Second, the submicron-pores embedded in the frustule walls not only create a large surface-to-volume ratio allowing for effective analyte capture, but also enhance the local optical field through the photonic crystal effect. Last, the mesocapsules provide effective mixing with analytes as they are flowing inside the microfluidic channel. The reported mesocapsules achieve single molecule detection of Rhodamine 6G in microfluidic devices and are further utilized to detect 1 × 10−9 m of benzene and chlorobenzene compounds in tap water with near real-time response, which successfully overcomes the constraint of traditional optofluidic sensing. © 2019 WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1002/adom.201900415

✓ **نام ژورنال:**

Advanced Optical Materials

✓ **سال انتشار:**

2019

✓ **کلیدواژه‌ها:**

optofluidic devices; photonic crystals; plasmonic mesocapsules; surface-enhanced Raman scattering

✓ **عنوان پژوهش:**

Determination of resonance Raman cross-sections for use in biological SERS sensing with femtosecond stimulated Raman spectroscopy

✓ **نویسندگان:**

Silva W.R., Keller E.L., Frontiera R.R.

✓ **خلاصه پژوهش:**

Surface-enhanced Raman spectroscopy (SERS) is a promising technique for in vivo bioanalyte detection, but accurate characterization of SERS biosensors can be challenging due to difficulties in differentiating resonance and surface enhancement contributions to the Raman signal. Here, we quantitate the resonance Raman cross-sections for a commonly used near-infrared SERS dye, 3,3′-diethylthiatricarbocyanine (DTTC). It is typically challenging to measure resonance Raman cross-sections for fluorescent dye molecules due to the overwhelming isoenergetic fluorescence signal. To overcome this issue, we used etalon-based femtosecond stimulated Raman spectroscopy, which is intrinsically designed to acquire a stimulated Raman signal without strong fluorescence or interference from signals resulting from other four-wave mixing pathways. Using this technique, we found that the cross-sections for most of the resonantly enhanced modes in DTTC exceed 10-25 cm2/molecule. These cross-sections lead to high signal magnitude SERS signals from even weakly enhancing SERS substrates, as much of what appears to be a SERS signal is actually coming from the intrinsically strong resonance Raman signal. Our work will lead to a more accurate determination of SERS enhancement factors and SERS substrate characterization in the biologically relevant near-infrared region, ultimately leading to a more widespread use of SERS for biosensing and bioimaging applications. © 2014 American Chemical Society.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1021/ac501701h

✓ **نام ژورنال:**

Analytical Chemistry

✓ **سال انتشار:**

2014

✓ **کلیدواژه‌ها:**

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Sensitive SERS-pH sensing in biological media using metal carbonyl functionalized planar substrates

✓ **نویسندگان:**

Kong K.V., Dinish U.S., Lau W.K.O., Olivo M.

✓ **خلاصه پژوهش:**

Conventional nanoparticle based Surface enhanced Raman scattering (SERS) technique for pH sensing often fails due to the aggregation of particles when detecting in acidic medium or biosamples having high ionic strength. Here, We develop SERS based pH sensing using a novel Raman reporter, arene chromium tricarbonyl linked aminothiophenol (Cr(CO)3-ATP), functionalized onto a nano-roughened planar substrates coated with gold. Unlike the SERS spectrum of the ATP molecule that dominates in the 400-1700cm-1 region, which is highly interfered by bio-molecules signals, metal carbonyl-ATP (Cr(CO)3)-ATP) offers the advantage of monitoring the pH dependent strong CO stretching vibrations in the mid-IR (1800-2200cm-1) range. Raman signal of the CO stretching vibrations at ~1820cm-1 has strong dependency on the pH value of the environment, where its peak undergo noticeable shift as the pH of the medium is varied from 3.0 to 9.0. The sensor showed better sensitivity in the acidic range of the pH. We also demonstrate the pH sensing in a urine sample, which has high ionic strength and our data closely correlate to the value obtained from conventional sensor. In future, this study may lead to a sensitive chip based pH sensing platform in bio-fluids for the early diagnosis of diseases.© 2013 Elsevier B.V.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1016/j.bios.2013.10.052

✓ **نام ژورنال:**

Biosensors and Bioelectronics

✓ **سال انتشار:**

2014

✓ **کلیدواژه‌ها:**

Metal carbonyl reporter molecule; PH Sensing; SERS substrates; Surface enhanced Raman scattering; Urine sample

✓ عنوان پژوهش:

Evidence for Retention of Biological Activity of a Non-Heme Iron Enzyme Adsorbed on a Silver Colloid: A Surface-Enhanced Resonance Raman Scattering Study

✓ نویسندگان:

Broderick J.B., Natan M.J., O'Halloran T.V., Van Duyne R.P.

✓ خلاصه پژوهش:

The structure and catalytic properties of the enzyme (E) chlorocatechol dioxygenase (CCD) adsorbed on a citrate-reduced silver colloid are analyzed by surface-enhanced resonance Raman spectroscopy (SERRS). This is the first SERRS study of a non-heme metalloenzyme. It is demonstrated that the native conformation of CCD is retained in the adsorbed state by comparison of resonance Raman scattering (RRS) from CCD in solution with SERRS from CCD adsorbed on the silver colloid. Both spectra show clear evidence of vibrational bands typical of iron-tyrosinate proteins. Furthermore, it is demonstrated that adsorbed CCD retains 60–85% of its enzymatic activity in the reaction of catechol substrate (S) with O2 to give the dioxygenated product (P) cis,cis-muconate. This is accomplished by enzyme assays of Ag-adsorbed CCD and comparison of the SERRS of Ag-adsorbed enzyme-substrate (ES) complex under anaerobic conditions with that of Ag-adsorbed ES in the presence of dioxygen. The SERRS difference spectrum, ES(aerobic) — ES(anaerobic), shows clear evidence for the appearance of the vibrational modes of adsorbed product. The analogous SERR difference spectroscopy experiment is also carried out for the enzyme-inhibitor (EI) complex of CCD with tetrachlorocatechol (TCC). Slow turnover of CCD-TCC is observed by SERRS on exposure to dioxygen which is consistent with the slow rate of turnover of TCC by CCD in solution. © 1993, American Chemical Society. All rights reserved.

✓ لینک DOI (استفاده برای دانلود مقاله)

10.1021/bi00213a003

✓ نام ژورنال:

Biochemistry

✓ سال انتشار:

1993

✓ کلیدواژه‌ها:

TEKSAN Detect Precisely

✓ **عنوان پژوهش:**

Refractive index sensitive, plasmon resonant scattering, and surface enhanced Raman scattering nanoparticles and arrays as biological sensing platforms

✓ **نویسندگان:**

Stuart D.A., Haes A., McFarland A.D., Nie S., Van Duyne R.P.

✓ **خلاصه پژوهش:**

The intense color of noble metal nanoparticles has inspired artists and fascinated scientists for hundreds of years. These rich hues are due to the interaction of light with the nanostructure's localized surface plasmon (LSPR). Here, we describe three optical sensing modalities that are dependant on the effects of the LSPR. Specifically, we will demonstrate the use of LSPR supporting particles as analogues to fluorescent probes and labels for multiplex detection, sensing based on observation of changes in the LSPR spectrum caused by alteration of the local refractive index upon analyte binding, and the spectroscopic labeling of cells and tissues with Surface Enhanced Raman Scatting (SERS) active nanoparticles probes.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1117/12.554416

✓ **نام ژورنال:**

Proceedings of SPIE - The International Society for Optical Engineering

✓ **سال انتشار:**

2004

✓ **کلیدواژه‌ها:**

Biosensor; Nanoparticle; SERS; Surface enhanced raman; Surface plasmon

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Towards interference free HPLC-SERS for the trace analysis of drug metabolites in biological fluids

✓ **نویسندگان:**

Hassanain W.A., Izake E.L., Sivanesan A., Ayoko G.A.

✓ **خلاصه پژوهش:**

Sofosbuvir metabolite, 2′-deoxy-2′-fluoro-2′-C-methyluridine (PSI-6206) was studied for the first time by surface enhanced Raman spectroscopy (SERS) using the paper-based SERS substrate. The quantification limit of PSI-6206 by SERS was found to be 13 ng L−1 (R2 value = 0.959, RSD = 5.23%). For the structural and quantitative analysis of PSI-6206 in blood plasma, an interference-free HPLC-SERS method was developed and compared to HPLC-DAD and HPLC–MS methods. The SERS quantification of the drug by the paper substrate was 4 orders of magnitude more sensitive than that by the diode array detector. In addition, the SERS detection provided unique structural identification of the drug in blood plasma, similar to Mass spectroscopy detector. Due to the disposable nature of the SERS substrate, the new method does not suffer from the known “memory effect” which is known to lead to false positive identification in traditional HPLC-SERS methods. Therefore, the presented HPLC-paper SERS platform holds great potential for the sensitive and cost effective determination of drugs and their metabolites in biological fluids. © 2016 Elsevier B.V.

✓ **لینک** DOI (**استفاده برای دانلود مقاله**)

10.1016/j.jpba.2016.12.019

✓ **نام ژورنال:**

Journal of Pharmaceutical and Biomedical Analysis

✓ **سال انتشار:**

2017

✓ **کلیدواژه‌ها:**

Biological fluids; HPLC-SERS; Infectious diseases; Paper SERS substrate; PSI-6206 nucleoside

TEKSAN Detect Precisely

✓ **عنوان پژوهش:**

Methodologies for developing surface-enhanced raman scattering (SERS) substrates for detection of chemical and biological molecules

✓ **نویسندگان:**

Dhawan A., Du Y., Yan F., Gerhold M.D., Misra V., Vo-Dinh T.

✓ **خلاصه پژوهش:**

This paper describes methodologies for developing efficient surface-enhanced Raman scattering (SERS) substrates such as annealing thin gold films for developing gold nanoislands, fabrication of nanopillars arrays and roughened films by employing focused ion beam (FIB) milling of gold films, as well as overcoating deep-UV-fabricated silicon nanowires with a layer of gold film. Excitation of surface plasmons in these gold nanostructures leads to substantial enhancement in the Raman scattering signal obtained from molecules lying in the vicinity of the nanostructure surface. In this paper, we perform comparative studies of SERS signals from molecules such as p-mercaptobenzoic acid and cresyl fast violet attached to or adsorbed on various gold SERS substrates. It was observed that gold-coated silicon nanowire substrates and annealed gold island substrates provided considerably higher SERS signals as compared to those from the FIB patterned substrates and planar gold films. The SERS substrates developed by the different processes were employed for detection of biological molecules such as dipicolinic acid, an excellent marker for spores of bacteria such as Anthrax. © 2010 IEEE.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1109/JSEN.2009.2038634

✓ **نام ژورنال:**

IEEE Sensors Journal

✓ **سال انتشار:**

2010

✓ **کلیدواژه‌ها:**

Annealing; Focused ion beam; Nanoislands; Nanopillars; Nanowires; Surface plasmons; Surface-enhanced Raman scattering (SERS)

TEKSAN Detect Precisely

✓ **عنوان پژوهش:**

Surface enhanced Raman scattering (SERS)-based next generation commercially available substrate: Physical characterization and biological application

✓ **نویسندگان:**

Hankus M.E., Stratis-Cullum D.N., Pellegrino P.M.

✓ **خلاصه پژوهش:**

The development of a sensing platform capable of detecting and identifying hazards including biological, chemical, and energetic in nature is a long sought after goal of the Army and many other first responders. Surface enhanced Raman scatting (SERS) is one spectroscopic technique gaining popularity as a solution to many sensing needs due to its many advantages such as high sensitivity, little to no sample preparation required, and use in numerous environmental settings). Despite all the advantages of SERS, it still remains a marginalized sensing technique primarily due to the challenges in fabricating a reliable, highly sensitive and reproducible nanoscale surface. In this work, we show that many of these challenges have been overcome with a newly developed commercially available Klarite SERS substrate. These substrates are fabricated in a fashion similar to standard Klarite substrates, but due to changes in size and spacing of the inverted pyramidal structurethere is an overall increase of SERS sensing capabilities of up to 4 orders of magnitude. In this proceeding paper, the next generation Klarite (308 and 309) substrates are characterized, analyte sensitivity demonstrated at 633 nm and 785 nm, and a brief discussion of their biological sensing capabilities is presented. © 2011 SPIE.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1117/12.893842

✓ **نام ژورنال:**

Proceedings of SPIE - The International Society for Optical Engineering

✓ **سال انتشار:**

2011

✓ **کلیدواژه‌ها:**

Biological; Energetic; Hazard; Klarite; Raman; SERS; Substrate; Surface enhanced Raman scattering

✓ عنوان پژوهش:

Biological synthesis of gold nanoparticles by the diatom Stephanopyxis turris and in vivo SERS analyses

✓ نویسندگان:

Pytlik N., Kaden J., Finger M., Naumann J., Wanke S., Machill S., Brunner E.

✓ خلاصه پژوهش:

Cultivation of the sea water diatom Stephanopyxis turris (S. turris) in a gold salt containing medium leads to the formation of gold nanoparticles. These biosynthesized nanoparticles were characterized using scanning electron microscopy (SEM), energy dispersive X-ray spectroscopy (EDX), transmission electron microscopy (TEM), and selected area electron diffraction (SAED). According to their diameter, they are classified into two groups with average diameters of around 30 and 10 nm. It is demonstrated that both types of nanoparticles consist exclusively of gold. The location of the gold nanoparticles with respect to the diatom cell was revealed using surface enhanced Raman scattering (SERS). To ensure a reliable observation of SERS spectra in each measured cell, the concentration of the gold solution as well as the incubation time of S. turris in this solution were optimized. 3D Raman imaging of entire S. turris cells was performed to localize SERS spectra of compounds resulting from closely neighbored nanoparticles. Interestingly, intracellular SERS spectra were observed indicating the presence of gold nanoparticles inside S. turris cells. Further investigation shows that the SERS spectra generated by biosynthesized nanoparticles differ significantly from the conventional Raman spectrum of diatoms. While pigments are dominating the resonance enhanced Raman spectrum, SERS spectra exhibit a completely different appearance. Their bands coincide with bands in SERS spectra of various biologically relevant compounds, e.g., hydroxyurea and retinol. The biosynthesized gold nanoparticles therefore have a high potential for prospective in vivo research of algal metabolism and its regulation. © 2017 Elsevier B.V.

✓ لینک DOI (استفاده برای دانلود مقاله)

10.1016/j.algal.2017.10.004

✓ نام ژورنال:

Algal Research

✓ سال انتشار:

2017

✓ کلیدواژه‌ها:

3D Raman imaging; Diatom; Gold nanoparticles; Intracellular nanoparticles; Stephanopyxis turris; Surface enhanced Raman scattering (SERS)

TEKSAN Detect Precisely

✓ **عنوان پژوهش:**

Inkjet-printed fluidic paper devices for chemical and biological analytics using surface enhanced Raman spectroscopy

✓ **نویسندگان:**

Hoppmann E.P., Yu W.W., White I.M.

✓ **خلاصه پژوهش:**

The fabrication of substrates for surface enhanced Raman spectroscopy (SERS) by printing plasmonic structures on paper has emerged as a potential low-cost replacement for conventional nanofabricated SERS devices. Not only are the paper devices low in cost to produce, the inherent flexibility and fluidic transport capabilities of paper provide advantages in sample collection and processing, as well as analyte concentration. In this study, we review the recent progress in paper or membrane SERS devices fabricated through inkjet printing and other deposition methods. We then report a new potential diagnostics application for paper SERS devices that leverages the fluidic transport and chromatographic capabilities of paper to enable SERS-based detection following PCR. The use of paper SERS creates the potential for a simple yet densely multiplexed PCR assay that is not possible with conventional fluorescence-based transduction. © 2013 IEEE.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1109/JSTQE.2013.2286076

✓ **نام ژورنال:**

IEEE Journal on Selected Topics in Quantum Electronics

✓ **سال انتشار:**

2014

✓ **کلیدواژه‌ها:**

Biosensing; Chemical sensing; Paper; Polymerase chain reaction (PCR); Surface enhanced Raman spectroscopy (SERS); TaqMan

✓ عنوان پژوهش:

Consensus Statement of the Spanish Society of Rheumatology on the management of biologic therapies in Spondyloarthritis except for Psoriatic Arthritis [Documento SER de consenso sobre el uso de terapias biológicas en la espondilitis anquilosante y otras espondiloartritis, excepto la artritis psoriásica]

✓ نویسندگان:

Juanola Roura X., Zarco Montejo P., Sanz Sanz J., Muñoz Fernández S., Mulero Mendoza J., Linares Ferrando L.F., Gratacós Masmitja J., García de Vicuña R., Fernandez Carballido C., Collantes Estevez E., Batlle Gualda E., Ariza Ariza R., Loza Santamaría E.

✓ خلاصه پژوهش:

Objective: Due to the amount and variability in quality regarding the use of biologic therapy (BT) in patients with spondyloarthritis (SpA), except for psoriatic arthritis (PsA) patients, the Spanish Society of Rheumatology has promoted the generation of recommendations based on the best evidence available. These recommendations should be a reference for rheumatologists and those involved in the treatment of patients with spondyloarthritis (SpA), except for psoriatic arthritis (PsA), who are using, or about to use BT. Methods: Recommendations were developed following a nominal group methodology and based on systematic reviews. The level of evidence and grade of recommendation were classified according to the model proposed by the Center for Evidence Based Medicine at Oxford. The level of agreement was established through Delphi technique. Results: We have produced recommendations on the use of BT currently available for SpA (but not PsA) in our country. These recommendations include disease assessment, treatment objectives, therapeutic scheme and switching. Conclusions: We present an update on the SER recommendations for the use of BT in patients with SpA, except for PsA. © 2010 Elsevier España, S.L.

✓ لینک DOI (استفاده برای دانلود مقاله)

10.1016/j.reuma.2010.12.002

✓ نام ژورنال:

Reumatologia Clinica

✓ سال انتشار:

2011

✓ کلیدواژه‌ها:

Biologic therapy; Consensus; Guide; Recommendations; Spondyloarthritis

✓ **عنوان پژوهش:**

Coupling surface-enhanced resonance raman scattering and electronic tongue as characterization tools to investigate biological membrane mimetic systems

✓ **نویسندگان:**

Aoki P.H.B., Alessio P., Riul A., De Saja Saez J.A., Constantino C.J.L.

✓ **خلاصه پژوهش:**

The surface-enhanced Raman scattering (SERS) effect and sensor and biosensor analyses are widely applied to investigate drug-biomolecule interactions or to detect trace amount of analytes. In this work, surface-enhanced resonance Raman scattering (SERRS) and an electronic tongue system using impedance spectroscopy were brought together, combining sensitivity and structural level information. Taking advantage of the use of layer-by-layer (LbL) films of phospholipids as biological membrane mimetic systems, cardiolipin (CLP) and dipalmitoyl phosphatidyl glycerol (DPPG) were applied as transducers onto Pt interdigitated electrodes forming an array of sensing units. This e-tongue system was able to detect the phenothiazine methylene blue (MB) below nanomolar concentrations. SERRS was applied to investigate the MB molecular arrangement (monomers or aggregates) when in contact with the phospholipids at trace levels of concentration. The key point was the adsorption of Ag nanoparticles (AgNPs) within the phospholipid LbL films. This approach did not compromise the e-tongue performance and allowed the recording of in situ SERRS spectra for the LbL films after immersion into MB aqueous solutions. The detection of MB through SERRS gave similar results to those reported in the literature but now with an unprecedented sensitivity. © 2010 American Chemical Society.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1021/ac902585a

✓ **نام ژورنال:**

Analytical Chemistry

✓ **سال انتشار:**

2010

✓ **کلیدواژه‌ها:**

TEKSAN Detect Precisely

✓ عنوان پژوهش:

A direct comparison of biological response modulation and clinical side effects by interferon-beta(ser), interferon-gamma, or the combination of interferons beta(ser) and gamma in humans

✓ نویسندگان:

Schiller J.H., Storer B., Paulnock D.M., Brown R.R., Datta S.P., Witt P.L., Borden E.C.

✓ خلاصه پژوهش:

To directly compare clinical side effects and biological response modification, IFN-β(ser), IFN-γ, or the combination of IFN-β(ser) plus IFN-γ was administered to 21 cancer patients. Each IFN or the combination was given intravenously on days 1, 8, and 15 in varied order. Each IFN and the combination resulted in significant (P < 0.05) modulation of IFN-induced proteins. IFN-β(ser) was more effective than IFN-γ in enhancing 2-5A synthetase activity (P = 0.001). IFN-γ was more effective than IFN-β(ser) in enhancing serum β2 microglobulin expression (P = 0.05) and indoleamine dioxygenase activity, as assessed by decreased serum tryptophan (P = 0.03). The combination enhanced tryptophan catabolism more effectively than IFN-β(ser) in a dose-dependent manner (P < 0.03). IFN-β(ser)/IFN-γ did not potentiate natural killer cells or antibody-dependent cellular toxicity (ADCC). IFN-β(ser)/IFN-γ enhanced monocyte guanylate cyclase activity, as assessed by serum neopterin, more effectively than IFN-γ alone (P = 0.005). Both IFNs and the combination resulted in increases in HLA class II expression on monocytes. However, no significant difference in the level of induction of HLA DQ and HLA DR expression between IFN-β(ser)/IFN-γ IFN-γ and either IFN-β(ser) or IFN-γ was noted. Although frequency and servity of side effects of IFN-β(ser), IFN-γ, or the combination were dose related, induction of induced proteins (with exception of influences on tryptophan catabolism) were not a function of dose administered over the 10-fold range. Continued treatment with the combination intravenously three times a week for 4 wk sustained but did not further potentiate, most of the changes in interferon-induced proteins. Thus, IFN-β(ser) and IFN-γ each resulted in effective and essentially equivalent patterns of induction of induced proteins. When combined, however, these IFNs did not result in potentiation of biological response modification in vivo.

✓ لینک DOI (استفاده برای دانلود مقاله)

10.1172/JCI114827

✓ نام ژورنال:

Journal of Clinical Investigation

✓ سال انتشار:

1990

✓ کلیدواژه‌ها:

biological response modification; clinical cancer trial; interferon

✓ **عنوان پژوهش:**

SERS-Active-Charged Microgels for Size- and Charge-Selective Molecular Analysis of Complex Biological Samples

✓ **نویسندگان:**

Kim D.J., Park S.-G., Kim D.-H., Kim S.-H.

✓ **خلاصه پژوهش:**

Surface-enhanced Raman scattering (SERS) provides a dramatic increase of Raman intensity for molecules adsorbed on nanogap-rich metal nanostructures, serving as a promising tool for molecular analysis. However, surface contamination caused by protein adsorption and low surface concentration of small target molecules reduce the sensitivity, which severely restricts the use of SERS in many applications. Here, charged microgels containing agglomerates of gold nanoparticles (Au NPs) are designed using droplet-based microfluidics to provide a reliable SERS substrate with molecular selectivity and high sensitivity. The limiting mesh size of hydrogel enables the autonomous exclusion of large proteins and the charged matrix concentrates oppositely charged small molecules through electrostatic attraction. As nanogaps among Au NPs in the agglomerates enhance Raman intensity, Raman spectrum of the adsorbed molecules is selectively measured with high sensitivity in the absence of interruption from adhesive proteins. Therefore, the SERS-active-charged microgels can be used for direct analysis of pristine biological samples without the pretreatment steps of separation and concentration, which are commonly a prerequisite for Raman analysis. For the purpose of demonstration, a direct detection of fipronil sulfone with partial negative charges, a metabolite of toxic insecticide, dissolved in eggs using the positively charged microgels without any pretreatment of the samples, is shown. © 2018 WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1002/smll.201802520

✓ **نام ژورنال:**

Small

✓ **سال انتشار:**

2018

✓ **کلیدواژه‌ها:**

charge; electrostatic interaction; microfluidics; microgels; surface-enhanced Raman scattering

✓ **عنوان پژوهش:**

SER Consensus statement on the use of biologic therapy for systemic lupus erythematosus [Consenso de la Sociedad Española de Reumatología sobre el uso de terapias biológicas en el lupus eritematoso sistémico]

✓ **نویسندگان:**

Calvo-Alén J., Silva-Fernández L., Úcar-Angulo E., Pego-Reigosa J.M., Olivé A., Martínez-Fernández C., Martínez-Taboada V., Luis Marenco J., Loza E., López-Longo J., Gómez-Reino J.J., Galindo-Izquierdo M., Fernández-Nebro A., Cuadrado M.J., Aguirre-Zamorano M.T., Zea-Mendoza A., Rúa-Figueroa T.

✓ **خلاصه پژوهش:**

Objective: To provide a reference to rheumatologists and other physicians involved in the treatment of systemic lupus erythematosus (SLE) who are using, or about to use biologic therapies. Methods: Recommendations were developed following a nominal group methodology and based on systematic reviews. The level of evidence and degree of recommendation were classified according to a model proposed by the Center for Evidence Based Medicine at Oxford. The level of agreement was established through a Delphi technique. Results: We have produced recommendations on the use of belimumab, the only biological agent with approved indications for SLE, and other biological agents without an indication for SLE. The objective of treatment is to achieve a complete clinical response, taken as the absence of perceived or evident disease activity. Nuances regarding the use of biologic therapies in SLE were reviewed as well, such as the evaluation that should be performed prior to administration and the follow up of patients undergoing these therapies. Conclusions: We present the SER recommendations for the use of biological therapies in patients with SLE. © 2013 Elsevier España, S.L.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1016/j.reuma.2013.04.001

✓ **نام ژورنال:**

Reumatologia Clinica

✓ **سال انتشار:**

2013

✓ **کلیدواژه‌ها:**

Biological therapy; Consensus; Guides; Recommendations; Systemic lupus erythematosus

✓ **عنوان پژوهش:**

The effects of electrostatic interaction between biological molecules and nano-metal colloid on near-infrared surface-enhanced Raman scattering

✓ **نویسندگان:**

Zhao H., Yuan B., Dou X.

✓ **خلاصه پژوهش:**

This paper reports effects of electrostatic interaction between amino acid and gold colloid on the intensity of surface-enhanced Raman scattering (SERS). Near-infrared (NIR) excited SERS has been measured for lysine (Lys) on gold colloid at pH 10.8 and 12.0 where its ε-amino group is ionized and both the α- and ε-amino groups are neutralized, respectively. Note that the SERS intensity changes dramatically with pH. This result suggests that the electrostatic interaction between the positive charge of the ε-NH 3+ group and the negative charge of the gold surface is one of the most important factors that determine the intensities of the SERS signals. A similar SERS study has been carried out for glycine (Gly) on gold colloid at various pH values. It also suggests that the positively charged amino groups interact with the negatively charged gold surface, yielding a SERS effect. The chemical interactions are much less important for the emergence of SERS of Gly on the gold colloid.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1088/1464-4258/6/9/013

✓ **نام ژورنال:**

Journal of Optics A: Pure and Applied Optics

✓ **سال انتشار:**

2004

✓ **کلیدواژه‌ها:**

Glycine; Lysine; Metal colloid; Near infrared; Raman spectroscopy; SERS; Surface-enhanced Raman scattering

✓ **عنوان پژوهش:**

Optoplasmonic Hybrid Materials for Trace Detection of Methamphetamine in Biological Fluids through SERS

✓ **نویسندگان:**

Hong Y., Zhou X., Xu B., Huang Y., Huang Y., He W., Wang S., Wang C., Zhou G., Chen Y., Gong T.

✓ **خلاصه پژوهش:**

Optoplasmonic materials comprising both photonic and plasmonic elements are of particular interest for the development of substrates for surface-enhanced Raman spectroscopy (SERS). In this work, a layer of analyte-carrying dielectric nano/microspheres is placed on top of a monolayer of gold nanoparticles to enhance the intensity of the electric (E-) field localization and to enrich the analyte close to the electromagnetic hot spots. Numerical simulations of the hybrid structure confirm an increased and spatially expanded E-field enhancement at the interface. Due to a decreasing filling fraction with increasing size of the dielectric spheres, simulations predict a saturated SERS enhancement for dielectric microspheres with a diameter larger than 4 μm, which is confirmed by experimental SERS measurements. The dielectric microsphere can be functionalized with surface ligands that facilitate the binding of target molecules in solution. The deposition of the analyte-loaded microspheres on the self-assembled gold nanoparticle ensures a high local concentration of analytes in the electromagnetic "hot"surface. The performance of the optoplasmonic SERS approach for detecting methamphetamine in saliva and urine is tested, and the detection of analytes at nanomolar (nM) concentrations is demonstrated. © 2020 American Chemical Society.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1021/acsami.0c00853

✓ **نام ژورنال:**

ACS Applied Materials and Interfaces

✓ **سال انتشار:**

2020

✓ **کلیدواژه‌ها:**

methamphetamine; nanoparticles; optoplasmonic material; self-assembly; SERS

✓ عنوان پژوهش:

Surface-enhanced resonance Raman scattering of hemoproteins and those in complicated biological systems

✓ نویسندگان:

Kitahama Y., Ozaki Y.

✓ خلاصه پژوهش:

In this review article, we discuss surface-enhanced resonance Raman scattering (SERRS) studies of hemeproteins such as myoglobin, hemoglobin, and cytochrome on various metal substrates; for example, colloidal silver nanoparticles coated with and without self-assembled monolayers (SAM), a roughened silver electrode protected with and without SAM, a sharp silver tip, and colloidal gold nanoparticles coated with and without SAM. Moreover, we classify the studies in terms of an excitation wavelength; namely, excitation at the B- (Soret) band, Q- (α and β) band, and in the near infrared (NIR) range. In the SERRS studies with B band excitation, it has been shown that the hemeprotein on a silver surface takes a non-native form through detachment from the heme pocket in the protein. With Q band excitation, on the other hand, the change in SERRS has been explained by the orientation of the hemeprotein on the surface. Even by excitation in the NIR range, the peak positions are consistent with the assignment of the major vibrational modes of heme despite there being no resonance Raman effect. Thus, the SERRS of hemeproteins is influenced by a resonance Raman effect, LSPR, and interactions with the metal surface such as structural changes, orientation, and selective adsorption. Moreover, we discuss how SERRS has been applied to complicated biological systems such as living cells containing hemeprotein. For mitochondria, a change of the oxidation-state was observed by the electron transport chain in the cell and at different positions. As an example of a biomedical application of SERRS, the sensitive detection of malaria is presented. © 2016 The Royal Society of Chemistry.

✓ لینک DOI (استفاده برای دانلود مقاله)

10.1039/c6an01009a

✓ نام ژورنال:

Analyst

✓ سال انتشار:

2016

✓ کلیدواژه‌ها:

✓ **عنوان پژوهش:**

A microfluidic dialysis device for complex biological mixture SERS analysis

✓ **نویسندگان:**

Perozziello G., Candeloro P., Gentile F., Coluccio M.L., Tallerico M., De Grazia A., Nicastri A., Perri A.M., Parrotta E., Pardeo F., Catalano R., Cuda G., Di Fabrizio E.

✓ **خلاصه پژوهش:**

In this paper, we present a microfluidic device fabricated with a simple and inexpensive process allowing rapid filtering of peptides from a complex mixture. The polymer microfluidic device can be used for sample preparation in biological applications. The device is fabricated by micromilling and solvent assisted bonding, in which a microdialysis membrane (cut-off of 12-14 kDa) is sandwiched in between an upper and a bottom microfluidic chamber. An external frame connects the microfluidic device to external tubes, microvalves and syringe pumps. Bonding strength and interface sealing are pneumatically tested. Microfluidic protocols are also described by using the presented device to filter a sample composed of specific peptides (MW 1553.73 Da, at a concentration of 1.0 ng/μl) derived from the BRCA1 protein, a tumor-suppressor molecule which plays a pivotal role in the development of breast cancer, and albumin (MW 66.5 kDa, at a concentration of 35 μg/μl), the most represented protein in human plasma. The filtered samples coming out from the microfluidic device were subsequently deposited on a SERS (surface enhanced Raman scattering) substrate for further analysis by Raman spectroscopy. By using this approach, we were able to sort the small peptides from the bigger and highly concentrated protein albumin and to detect them by using a label-free technique at a resolution down to 1.0 ng/μl. © 2015 Elsevier B.V.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1016/j.mee.2015.02.015

✓ **نام ژورنال:**

Microelectronic Engineering

✓ **سال انتشار:**

2015

✓ **کلیدواژه‌ها:**

Complex mixture analysis; Microfluidic filtering; SERS analysis

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Online SERS detection and characterization of eight biologically-active peptides separated by capillary zone electrophoresis

✓ **نویسندگان:**

Negri P., Sarver S.A., Schiavone N.M., Dovichi N.J., Schultz Z.D.

✓ **خلاصه پژوهش:**

There is a need for low cost, sensitive and chemical specific detectors for routine characterization of biomolecules. In this study, we utilize sheath-flow surface-enhanced Raman scattering (SERS) to analyze a mixture of eight biologically-active peptides separated by capillary zone electrophoresis (CZE). Analysis of the SERS electropherogram resulting from online detection resolves the characteristic Raman bands attributed to the amino acid constituents of each peptide, which enables identification. The detection limit by SERS was found to be 10-8 M. Our results suggest that the structural information obtained from the detected vibrational modes provides complementary characterization to other chemically specific detectors like mass spectrometry and improved chemical identification over other commonly used optical-based post-chromatographic detection methods. In addition, the sheath-flow SERS detection results in band narrowing in the observed electropherogram that enables distinction of closely migrating species. The results presented here indicate that this platform can provide fast, robust, reproducible, and chemical specific detection to facilitate the characterization of peptides. This journal is © The Royal Society of Chemistry.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1039/c4an01980f

✓ **نام ژورنال:**

Analyst

✓ **سال انتشار:**

2015

✓ **کلیدواژه‌ها:**

TEKSAN Detect Precisely

✓ **عنوان پژوهش:**

Near-infrared FT-SERS microspectroscopy on silver and gold surfaces: Technical development, mass sensitivity, and biological applications

✓ **نویسندگان:**

Beljebbar A., Sockalingum G.D., Angiboust J.F., Manfait M.

✓ **خلاصه پژوهش:**

An FT-Raman and FT-SERS microprobe with the spatial resolution on the micrometer scale has been developed. The main interfacing components are discussed and the whole setup is validated with the use of different SERS-active substrates: silver and gold colloids and gold island films. Micro-FT-SERS spectra of crocetin, mitoxantrone, and mitoxantrone/DNA complexes have been obtained, and the mass detection limits are found to be on the order of 5 × 102 molecules. Adsorption on the SERS-active substrates does not induce any detectable changes in the all-trans configuration of the crocetin. Adsorption of the mitoxantrone/DNA complex does not induce detectable perturbations of the molecular interactions within the complex. Moreover, interactions between the drug and DNA induces very similar effects in both the resonance Raman and FT-SERS spectra of the drugs. These effects were found to be consistent with the model of mitoxantrone DN A intercalation proposed from nuclear magnetic resonance and resonance Raman data. The signal-to-noise ratios found indicate that submonolayer amounts of intracellularly localized drugs totaling less than 10-18 mole can be detected by means of the FT-SERS microprobe. Hence, both the extralow mass detection limit of the technique and its sensitivity to interactions within the supramolecular complexes will in the future allow the drug to be followed within the living cell.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1366/0003702963906438

✓ **نام ژورنال:**

Applied Spectroscopy

✓ **سال انتشار:**

1996

✓ **کلیدواژه‌ها:**

Carotenoid; Colloids; DNA; FT-Raman; FT-SERS; Island films; Microspectroscopy; Mitoxantrone; NIR

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Carbon nanowalls as a platform for biological SERS studies

✓ **نویسندگان:**

Dyakonov P., Mironovich K., Svyakhovskiy S., Voloshina O., Dagesyan S., Panchishin A., Suetin N., Bagratashvili V., Timashev P., Shirshin E., Evlashin S.

✓ **خلاصه پژوهش:**

Herein we report about developing new type of Surface Enhanced Raman Scattering (SERS) substrates based on Au-decorated carbon nanowalls. The designed substrates possess high specific surface area and high sensitivity. Chemical stability of Au perfectly blends with electrical properties and high value of specific surface area of carbon nanowalls. Created structures were applied to detect signals of a typical molecule used for SERS substrates testing, rhodamine 6G, which exhibits electronic absorption in the visible area of spectrum, and biomacromolecules such as tryptophan, guanine, bovine serum albumin and keratin hydrolysates, whose electronic absorption is in the ultraviolet region of spectrum and lies far from the Au plasmonic resonance. The obtained signals for these compounds suggest that the developed substrate is a prominent platform for the detection of biological macromolecules. The properties of the substrate, including its morphology and Au film thickness, as well as the analyte deposition method, were optimized to achieve the optimum Raman signal enhancement. Electric field distribution in the designed structures was calculated to describe the observed dependence of SERS activity on the substrate morphology. © 2017 The Author(s).

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1038/s41598-017-13087-8

✓ **نام ژورنال:**

Scientific Reports

✓ **سال انتشار:**

2017

✓ **کلیدواژه‌ها:**

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Series of quinone-containing nanosensors for biologically relevant redox potential determination by surface-enhanced Raman spectroscopy

✓ **نویسندگان:**

Thomson P.I.T., Camus V.L., Hu Y., Campbell C.J.

✓ **خلاصه پژوهش:**

Redox potential is of key importance in the control and regulation of cellular function and lifecycle, and previous approaches to measuring the biological redox potential noninvasively in real time are limited to areas of hypoxia or normoxia. In this paper, we extend our previous work on nanoparticle-based intracellular nanosensors to cover a much wider redox potential range of -470 to +130 mV vs NHE, which includes the redox potential range occupied by cells in a state of oxidative stress. The nanosensors are rationally designed to target different areas of this redox potential range and are monitored by surface-enhanced Raman spectroscopy, which will permit noninvasive real-time imaging of cells undergoing oxidative stress. © 2015 American Chemical Society.

✓ **لینک** DOI **(استفاده برای دانلود مقاله)**

10.1021/ac504795s

✓ **نام ژورنال:**

Analytical Chemistry

✓ **سال انتشار:**

2015

✓ **کلیدواژه‌ها:**

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Surface-enhanced Raman scattering (SERS) -nanoimaging probes for biological analysis

✓ **نویسندگان:**

Hankus M.E., Gibson G., Chandrasekharan N., Cullum B.M.

✓ **خلاصه پژوهش:**

We have developed a surface enhanced Raman scattering (SERS) based nanoimaging probe capable of chemical imaging with nanometer scale spatial resolution. Using this SERS-nanoimaging probe it is possible to image individual chemical components within sub-cellular environments. The probe consists of a tapered coherent fiber optic imaging bundle that has been coated with a roughened layer of metal, providing a SERS active substrate. The fiber optic bundle is tapered using a specially programmed micropipette puller, allowing precise control over the probe tip's diameter, and thus the resolution of images. Tapered bundles having individual fiber elements ranging from 100-800 nanometers on the tapered end and 4 micrometers in diameter on the proximal end have been investigated. Through modification of the fibers' tapered tips, generation of nanoscale imaging with inherent image magnification and short pass filtering effects is possible. Following tapering of the fiber optic bundles, the fiber probes are spin-coated with alumina particles and coated with silver to provide a reproducible SERS active surface. Characterization of the response of these SERS nanoimaging probes has been evaluated using common SERS active chemical species (e.g., benzoic acid, brilliant cresyl blue, etc.) and application of these nanoimaging sensors to biological systems is discussed.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1117/12.569299

✓ **نام ژورنال:**

Progress in Biomedical Optics and Imaging - Proceedings of SPIE

✓ **سال انتشار:**

2004

✓ **کلیدواژه‌ها:**

Chemical imaging; Nanotechnology; Optical imaging; Sensor; SERS; Surface-enhanced Raman scattering

✓ **عنوان پژوهش:**

Non-invasive chemically specific measurement of subsurface temperature in biological tissues using surface-enhanced spatially offset Raman spectroscopy

✓ **نویسندگان:**

Gardner B., Stone N., Matousek P.

✓ **خلاصه پژوهش:**

Here we demonstrate for the first time the viability of characterising non-invasively the subsurface temperature of SERS nanoparticles embedded within biological tissues using spatially offset Raman spectroscopy (SORS). The proposed analytical method (T-SESORS) is applicable in general to diffusely scattering (turbid) media and features high sensitivity and high chemical selectivity. The method relies on monitoring the Stokes and anti-Stokes bands of SERS nanoparticles in depth using SORS. The approach has been conceptually demonstrated using a SORS variant, transmission Raman spectroscopy (TRS), by measuring subsurface temperatures within a slab of porcine tissue (5 mm thick). Root-mean-square errors (RMSEs) of 0.20 °C were achieved when measuring temperatures over ranges between 25 and 44 °C. This unique capability complements the array of existing, predominantly surface-based, temperature monitoring techniques. It expands on a previously demonstrated SORS temperature monitoring capability by adding extra sensitivity stemming from SERS to low concentration analytes. The technique paves the way for a wide range of applications including subsurface, chemical-specific, non-invasive temperature analysis within turbid translucent media including: the human body, subsurface monitoring of chemical (e.g. catalytic) processes in manufacture quality and process control and research. Additionally, the method opens prospects for control of thermal treatment of cancer in vivo with direct non-invasive feedback on the temperature of mediating plasmonic nanoparticles. © 2016 The Royal Society of Chemistry.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1039/c5fd00154d

✓ **نام ژورنال:**

Faraday Discussions

✓ **سال انتشار:**

2016

✓ **کلیدواژه‌ها:**

✓ **عنوان پژوهش:**

Monitoring prion protein expression in complex biological samples by SERS for diagnostic applications

✓ **نویسندگان:**

Manno D., Filippo E., Fiore R., Serra A., Urso E., Rizzello A., Maffia M.

✓ **خلاصه پژوهش:**

Surface-enhanced Raman spectroscopy (SERS) allows a new insight into the analysis of cell physiology. In this work, the difficulty of producing suitable substrates that, besides permitting the amplification of the Raman signal, do not interact with the biological material causing alteration, has been overcome by a combined method of hydrothermal green synthesis and thermal annealing. The SERS analysis of the cell membrane has been performed with special attention to the cellular prion protein PrPC. In addition, SERS has also been used to reveal the prion protein-Cu(II) interaction in four different cell models (B104, SH-SY5Y, GN11, HeLa), expressing PrPC at different levels. A significant implication of the current work consists of the intriguing possibility of revealing and quantifying prion protein expression in complex biological samples by a cheap SERS-based method, replacing the expensive and time-consuming immuno-assay systems commonly employed. © 2010 IOP Publishing Ltd.

✓ **لینک** DOI **(استفاده برای دانلود مقاله)**

10.1088/0957-4484/21/16/165502

✓ **نام ژورنال:**

Nanotechnology

✓ **سال انتشار:**

2010

✓ **کلیدواژه‌ها:**

TEKSAN
Detect Precisely

✓ عنوان پژوهش:

Production and characterization of biologically active Ala-Ser-(His)6-Ile-Glu-Gly-Arg-human prolactin (tag-hPRL) secreted in the periplasmic space of Escherichia coli

✓ نویسندگان:

Morganti L., Huyer M., Gout P.W., Bartolini P.

✓ خلاصه پژوهش:

Human prolactin (hPRL) cDNA was obtained by screening of a pituitary cDNA library with a synthetic 21-mer oligonucleotide and with rat PRL cDNA. For its expression, use was made of a vector, p3SN8, containing tac-promoter-controlled sequences for a bacterial cellulase leader joined to sequences coding for Ala-Ser, a Chromatographic affinity site consisting of six histidines and a Factor Xa cleavage site. The hPRL cDNA was inserted at the 3' end of the cleavage-site sequences. Expression in Escherichia coli led to secretion in the periplasmic space of a fully bioactive hPRL variant constituting authentic hPRL with a peptide tag, i.e. Ala-Ser-(His)6-Ile-Glu-Gly-Arg, at its N-terminal. This tag-hPRL could be rapidly and efficiently purified by metal-chelate affinity chromatography. The correct processing and quality of tag-hPRL was monitored by SDS/PAGE, Western-blot analysis, immunoassay and Nb2-lymphoma-cell bioassay. Treatment with Factor Xa for tag removal was only partially successful. Periplasmic secretion of taghPRL of the order of 0.7 μg/ml per A600 unit and one-step purification indicate feasibility for tag-hPRL production for in vitro diagnostic and research applications. This is the first report describing periplasmic secretion of a bioactive form of hPRL.

✓ لینک DOI (استفاده برای دانلود مقاله)

✓ نام ژورنال:

Biotechnology and Applied Biochemistry

✓ سال انتشار:

1996

✓ کلیدواژه‌ها:

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Design and biological activity of synthetic oligopeptides with Pro-His-Ser-Arg-Asn (PHSRN) and Arg-Gly-Asp (RGD) motifs for human osteoblast-like cell (MG-63) adhesion

✓ **نویسندگان:**

Kim T.-I., Jang J.-H., Lee Y.-M., Ryu I.-C., Chung C.-P., Han S.-B., Choi S.-M., Ku Y.

✓ **خلاصه پژوهش:**

A synthetic oligopeptide, composed of Arg-Gly-Asp (RGD) and its synergistic Pro-His-Ser-Arg-Asn (PHSRN) motifs and a six glycines (G6) linker, promoted human osteoblast-like cell (MG-63) adhesion, spreading and mitogen-activated protein kinase (MAPK) activity in a similar manner to a positive fibronectin control. This synthetic oligopeptide may therefore be a useful osteo-inductive material.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1023/A:1021368519336

✓ **نام ژورنال:**

Biotechnology Letters

✓ **سال انتشار:**

2002

✓ **کلیدواژه‌ها:**

Fibronectin; Mitogen-activated protein kinase; Oligopeptides; Osteoblast-like cell

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Highly selective determination of acid phosphatase in biological samples using a biomimetic recognition-based SERS sensor

✓ **نویسندگان:**

Li X., Li B., Hong J., Zhou X.

✓ **خلاصه پژوهش:**

In this paper, we introduce a synthetic biomimetic receptors-based surface enhanced Raman scattering (SERS) sensor for highly specific recognition and detection of acid phosphatase in complex biological samples. It depends on the establishment of molecular imprinted polymers (MIPs) which capture the target glycoprotein via biomimetic recognition, and SERS probes which bind to glycoproteins by boronate affinity. The MIPs layer was synthesized through self-polymerization of dopamine on the surface of glycoprotein-immobilized polymeric skeletons, which was prepared by choosing 4-vinylphenylboronic acid (VPBA) as functional monomers, pentaerythritol triacrylate (PETA) as crosslinker, ethyleneglycol (EG) and cyclohexanol as porogens. The accessible and stable recognition sites allowed the rebinding of the template and offered good reproducibility. The proposed biomimetic recognition-based SERS sensor showed superb performances for acid phosphatase detection with high sensitivity (LOD of 0.1 ng mL−1) and excellent selectivity. © 2018 Elsevier B.V.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1016/j.snb.2018.08.076

✓ **نام ژورنال:**

Sensors and Actuators, B: Chemical

✓ **سال انتشار:**

2018

✓ **کلیدواژه‌ها:**

Acid phosphatase; Biomimetic recognition; Boronate affinity; Glycoprotein; Surface-enhanced Raman scattering

✓ عنوان پژوهش:

Recommendations for infectious disease screening in migrants to Western Europe with inflammatory arthropathies before starting biologic agents. Results from a multidisciplinary task force of four European societies (SIR, SER, SIMET, SEMTSI) facing the largest impact of the flow of migrants today

✓ نویسندگان:

Bartalesi F., Scirè C.A., Requena-Méndez A., Abad M.A., Buonfrate D., Caporali R., Conti F., Diaz-Gonzalez F., Fernández-Espartero C., Martinez-Fernandez C., Mascarello M., Generali E., Minisola G., Morrone A., Muñoz J., Richi P., Sakellariou G., Coronas J.S., Spinicci M., Castelli F., Bartoloni A., Bisoffi Z., Gimenez-Sanchez F., Muñoz-Fernández S., Matucci-Cerinic M.

✓ خلاصه پژوهش:

Objective Inflammatory arthritis needs infectious disease screening before starting a biologic agent, however, few data are known about migrant patients, who represent a peculiar population which requires a multidisciplinary approach among international health specialists and should also be considered by health authorities. For this reason, the Italian and Spanish Societies of Rheumatology (SIR and SER) and Tropical Medicine (SIMET and SEMTSI) promoted a multidisciplinary task force in order to produce specific recommendations about screening and advices to be considered in migrant patients with inflammatory arthritis candidate to receive biological therapy, according to their geographical origin. Methods The experts provided a prioritised list of research questions and the eligible spectrum of inflammatory arthritis, biologic drugs and infectious disease were defined in order to perform a systematic literature review. A search was made in Medline, Embase and Cochrane library, updated to March 2015. Ubiquitous infections and HBV, HCV, HIV and tuberculosis that are already considered in national and international recommendations, were not included. The strength of each recommendation was determined. Results The task force members agreed on 7 overarching principles. The risk of reactivation of selected potentially latent infectious disease was addressed in migrants with inflammatory arthritis candidates for biologics was considered and 15 potentially relevant infections were identified. Conclusion Fifteen disease-specific recommendations were formulated on the basis of high level of agreement among the experts panel. © Clinical and Experimental Rheumatology 2017.

✓ لینک DOI (استفاده برای دانلود مقاله)

Detect Precisely

✓ نام ژورنال:

Clinical and Experimental Rheumatology

✓ سال انتشار:

2017

✓ کلیدواژه‌ها:

Ankylosing spondylitis; Anti-TNF; Infections; Psoriatic arthritis; Rheumatoid arthritis; Systematic review

✓ **عنوان پژوهش:**

Feature-based recognition of Surface-enhanced Raman spectra for biological targets

✓ **نویسندگان:**

Pavillon N., Bando K., Fujita K., Smith N.I.

✓ **خلاصه پژوهش:**

We propose and compare multiple approaches to automatically process data measured through surface-enhanced Raman scattering (SERS), in the context of intracellular molecule probing. It relies on locally detecting the most relevant spectra to retrieve all data independently through indexing, thus avoiding any pre-filtering which occurs with standard processing methods. We first assess our approach on simulated data of the spectrum of Rhodamine 6G, and then validate high-performing methods on experimental measurements of this compound. The optimized method is then utilized to extract and classify the complex SERS response behavior of gold nanoparticles taken in live cells. © 2013 WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1002/jbio.201200181

✓ **نام ژورنال:**

Journal of Biophotonics

✓ **سال انتشار:**

2013

✓ **کلیدواژه‌ها:**

Cell biology; Metal nanoparticles; Microscopy; Raman; Surface-enhanced Raman scattering

✓ عنوان پژوهش:

Spectroscopic characterization of biological agents using FTIR, Normal Raman and surface enhanced Raman scattering

✓ نویسندگان:

Luna-Pineda T., Soto-Feliciano K., De La Cruz-Montoya E., Londoño L.C.P., Ríos-Velázquez C., Hernández-Rivera S.P.

✓ خلاصه پژوهش:

FTIR, Raman spectroscopy and Surface Enhanced Raman Scattering (SERS) requires a minimum of sample allows fast identification of microorganisms. The use of this technique for characterizing the spectroscopic signatures of these agents and their stimulants has recently gained considerable attention due to the fact that these techniques can be easily adapted for standoff detection from considerable distances. The techniques also show high sensitivity and selectivity and offer near real time detection duty cycles. This research focuses in laying the grounds for the spectroscopic differentiation of Staphylococcus spp., Pseudomonas spp., Bacillus spp., Salmonella spp., Enterobacter aerogenes, Proteus mirabilis, Klebsiella pneumoniae, and E. coli, together with identification of their subspecies. In order to achieve the proponed objective, protocols to handle, cultivate and analyze the strains have been developed. Spectroscopic similarities and marked differences have been found for Spontaneous or Normal Raman spectra and for SERS using silver nanoparticles have been found. The use of principal component analysis (PCA), discriminate factor analysis (DFA) and a cluster analysis were used to evaluate the efficacy of identifying potential threat bacterial from their spectra collected on single bacteria. The DFA from the bacteria Raman spectra show a little discrimination between the diverse bacterial species however the results obtained from the SERS demonstrate to be high discrimination technique. The spectroscopic study will be extended to examine the spores produced by selected strains since these are more prone to be used as Biological Warfare Agents due to their increased mobility and possibility of airborne transport. Micro infrared spectroscopy as well as fiber coupled FTIR will also be used as possible sensors of target compounds.

✓ لینک DOI (استفاده برای دانلود مقاله)

10.1117/12.720338

✓ نام ژورنال:

Proceedings of SPIE - The International Society for Optical Engineering

✓ سال انتشار:

2007

✓ کلیدواژه‌ها:

Biological agents; Raman; SERS

✓ **عنوان پژوهش**:

Isolierung eines Des-Thr-Ser-Pro-Gln-Arg-Trypsininhibitors vom Schwein mit voller biologischer Aktivität

✓ **نویسندگان**:

Tschesche H., Wächter E., Kallup G.

✓ **خلاصه پژوهش**:

Aus modifiziertem Trypsininhi-bitor vom Schwein wurde durch Ionenaustausch-chromatographie an DEAE- und SE-Sephadex ein Des-Thr-Ser-Pro-Gln-Arg-Trypsininhibitor als einheitliches Polypeptid isoliert. Durch Aminosäureanalyse, Gelfiltration des oxydierten Inhibitors und EDMAN-Abbau mit massenspektrometrischer Identifizierung der abgespaltenen p-Brom-phenylthiohy-dantoine sowie durch ein tryptisches Fingerprint konnte gezeigt werden, daß es sich um ein Fragment von Inhibitor I (56 Aminosäuren1′6) handelt, das durch tryptische Abspaltung des TV-terminalen Pentapeptids entsteht. Die restliche Polypeptidkette (Position 6-56, 51 Aminosäuren) ist nicht modifiziert und all ihre Peptidbindungen sind intakt. Aus Inhibitor II (52 Aminosäuren)1′6 wird dieses Inhibitorfragment nicht gebildet. Das isolierte Fragment besitzt volle biologische Aktivität und zeigt das gleiche Hemmverhalten wie der native Inhibitor I. Damit sind weder die fünf Aminosäuren des N-terminalen Pentapeptids von Inhibitor I noch die positive Ladung des Arginin-Restes für die volle Aktivität von Bedeutung. © 1969, Walter de Gruyter. Alle Rechte vorbehalten.

✓ **لینک** DOI (**استفاده برای دانلود مقاله**)

10.1515/bchm2.1969.350.2.1662

✓ **نام ژورنال**:

Hoppe-Seyler's Zeitschrift fur Physiologische Chemie

✓ **سال انتشار**:

1969

✓ **کلیدواژه‌ها**:

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

SERS Nanoprobes in Biologically Raman Silent Region for Tumor Cell Imaging and In Vivo Tumor Spectral Detection in Mice

✓ **نویسندگان:**

Liang D., Jin Q., Yan N., Feng J., Wang J., Tang X.

✓ **خلاصه پژوهش:**

Surface enhanced Raman scattering (SERS) is widely used in biological applications due to its high sensitivity and deep tissue penetration. Most SERS nanoprobes with fluorophore attachments have Raman signals between 1400 and 1700 cm−1. Here, a series of SERS nanoprobes anchored with alkyne moieties in the biologically Raman-silent region through C≡Au bond formation is prepared. To achieve target-specific recognition, two nucleic acid aptamers (AS1411 and MUC1) and two control oligonucleotides (C-con and T-con) with the same alkyne moiety are also attached on the Au surface, respectively. Both aptamer-charged SERS nanoprobes successfully target MCF-7 cells, which could possibly achieve cross-check of target cells and overcome the possible false positive results. And the limit of detection reaches up to five cancer cells, which has great potential in circulating tumor cells detection. Further in vivo studies indicate that both SERS nanoprobes are successfully employed to target tumors in living mice with an obvious signal (≈2205 cm−1) at the Raman silent region after tail intravenous injection for the first time. © 2018 WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1002/adbi.201800100

✓ **نام ژورنال:**

Advanced Biosystems

✓ **سال انتشار:**

2018

✓ **کلیدواژه‌ها:**

AS1411; MUC1; nanoprobes; Raman spectroscopy; tumor detection

✓ عنوان پژوهش:

The onset of psoriasis during the treatment of inflammatory bowel diseases with infliximab: Should biological therapy be suspended? [Aparecimento de psoríase durante o tratamento das doenças inflamatórias intestinais com infliximabe: A terapia biológica deve ser suspensa?]

✓ نویسندگان:

Denadai R., Teixeira F.V., Saad-Hossne R.

✓ خلاصه پژوهش:

Context - Several paradoxical cases of infliximab-induced or-exacerbated psoriatic lesions have been described in the recent years. There is disagreement regarding the need to discontinue infliximab in order to achieve the resolution of these adverse cutaneous reactions specifically in inflammatory bowel disease (IBD) patients. Objective - To systematically review the literature to collect information on IBD patients that showed this adverse cutaneous reaction, focusing mainly on the therapeutic approach. Methods - A systematic literature review was performed utilizing Medline, Embase, SciELO and Lilacs databases. Published studies were identified, reviewed and the data were extracted. Results - Thirty-four studies (69 IBD patients) met inclusion criteria for review. There was inconsistency in reporting of some clinical and therapeutic aspects. Most patients included had Crohn's disease (89.86%), was female (47.83%), had an average age of 27.11 years, and no reported history of psoriasis (84.05%). The patients developed primarily plaque-type psoriasis (40.58%). There was complete remission of psoriatic lesions in 86.96% of IBD patients, existing differences in the therapeutic approaches; cessation of infliximab therapy led to resolution in 47.83% of cases and 43.48% of patients were able to continue infliximab therapy. Conclusion - As increasing numbers of IBD patients with psoriasis induced or exacerbated by infliximab, physicians should be aware of its clinical manifestations so that appropriate diagnosis and treatment are properly established. The decision whether to continue or discontinue infliximab should be individualized.

✓ لینک DOI (استفاده برای دانلود مقاله)

10.1590/S0004-28032012000200014

✓ نام ژورنال:

Arquivos de Gastroenterologia

✓ سال انتشار:

2012

✓ کلیدواژه‌ها:

Biological therapy; Inflammatory bowel disease; Infliximab; Psoriasis

✓ عنوان پژوهش:

[Ser2]- and [Ser(P)2]incretin analogs. Comparison of dipeptidyl peptidase IV resistance and biological activities in vitro and in vivo

✓ نویسندگان:

Hinke S.A., Manhart S., Kühn-Wache K., Nian C., Demuth H.-U., Pederson R.A., McIntosh C.H.S.

✓ خلاصه پژوهش:

Glucagon-like peptide-1 (GLP-1) and glucose-dependent insulinotropic polypeptide (GIP; also known as gastric inhibitory polypeptide) are incretin hormones that reduce postprandial glycemic excursions via enhancing insulin release but are rapidly inactivated by enzymatic N-terminal truncation. As such, efforts have been made to improve their plasma stability by synthetic modification or by inhibition of the responsible protease, dipeptidyl peptidase (DP) IV. Here we report a parallel comparison of synthetic GIP and GLP-1 with their Ser2- and Ser(P)2-substituted analogs, examining receptor binding and activation, metabolic stability, and biological effects in vivo. Both incretins and their Ser2-substituted analogs showed similar EC50s (0.16-0.52 nM) and IC50s (4.3-8.1 nM) at their respective cloned receptors. Although both phosphoserine 2-modified (Ser(PO3H2); Ser(P)) peptides were able to stimulate maximal cAMP production and fully displace receptor-bound tracer, they showed significantly right-shifted concentration-response curves and binding affinities. Ser2-substituted analogs were moderately resistant to DP IV cleavage, whereas [Ser(P)2]GIP and Ser(P)2] GLP-1 showed complete resistance to purified DP IV. It was shown that the Ser(P) forms were dephosphorylated in serum and thus in vivo act as precursor forms of Ser2-substituted analogs. When injected subcutaneously into conscious Wistar rats, all peptides reduced glycemic excursions (rank potency: Ser(P)2]incretins ≥ [Ser2] incretins > native hormones). Insulin determinations indicated that the reductions in postprandial glycemia were at least in part insulin-mediated. Thus it has been shown that despite having low in vitro bioactivity using receptor-transfected cells, in vivo potency of [Ser(P)2] incretins was comparable with or greater than that of native or [Ser2]peptides. Hence, Ser(P) 2-modified incretins present as novel glucose-lowering agents.

✓ لینک DOI (استفاده برای دانلود مقاله)

10.1074/jbc.M311304200

✓ نام ژورنال:

Journal of Biological Chemistry

✓ سال انتشار:

2004

✓ کلیدواژه‌ها:

Detect Precisely

✓ **عنوان پژوهش:**

Detection of biologically important compounds in flowing aqueous streams by surface-enhanced Raman spectroscopy at a silver electrode

✓ **نویسندگان:**

Pothier Neil J., Force R.Ken

✓ **خلاصه پژوهش:**

Flow-injection analysis has been utilized to generate surface-enhanced Raman spectra of pyridine, adenosine, and adenosine 3′ monophosphate. These biologically important compounds have been recorded in a 10-μL spectroelectrochemical flow cell while under flowing conditions. Charge-coupled-device detection and low-power Ar′ laser excitation allowed an 1800-cm-1 region to be observed with 10-s integration times. A computer-controlled potential waveform which efficiently adsorbs and desorbs the analytes at the electrode surface is described. The effects of the quantity of anodic charge passed during the ex situ and in situ roughening of the silver electrode on the SERS intensity are discussed. The limit of detection for 50-μL injections of adenosine under true dynamic conditions is less than 800 pmol. The technique yields both quantitative data and structural fingerprinting information for analytes eluting through the cell.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1366/0003702947752690O9

✓ **نام ژورنال:**

Applied Spectroscopy

✓ **سال انتشار:**

1994

✓ **کلیدواژه‌ها:**

TEKSAN Detect Precisely

✓ **عنوان پژوهش:**

Rapid biological agent identification by surface-enhanced Raman spectroscopy

✓ **نویسندگان:**

Farquharson Stuart, Smith Wayne W., Elliott Susan, Sperry Jay F.

✓ **خلاصه پژوهش:**

The Chemical Weapons Convention prohibits the development, production, stockpiling, and use of warfare agents (chemical and biological), and requires their destruction. Yet their use persists and has been included in the terrorist's arsenal. Currently, a number of analytical methods are being developed to perform rapid measurements of trace agents to ensure treaty compliance, as well as safe environments for military personal and the public at large. We have been investigating the ability of surface-enhanced Raman spectroscopy to detect bacterial nucleic acid-base pairs with sufficient sensitivity and selectivity to eliminate the need for enumeration used in polymerase chain reactions and culture growth, required by other measurement techniques. The design of a small volume, fiber optic coupled, electrolytic sample cell is presented along with analysis of DNA and RNA separated from non-toxic bacteria.

✓ **لینک** DOI (**استفاده برای دانلود مقاله**)

10.1117/12.371269

✓ **نام ژورنال:**

Proceedings of SPIE - The International Society for Optical Engineering

✓ **سال انتشار:**

1999

✓ **کلیدواژه‌ها:**

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Elucidating fentanyls differentiation from morphines in chemical and biological samples with surface-enhanced Raman spectroscopy

✓ **نویسندگان:**

Wang K., Xu B., Wu J., Zhu Y., Guo L., Xie J.

✓ **خلاصه پژوهش:**

Fentanyl and morphine are opioid drugs as well as new psychoactive substances. Even originally introduced as efficient anesthetic drugs to relieve moderate-to-severe pain in clinic, the overdose of new synthetic opioids is currently a serious public health problem in numerous countries worldwide. The entire category of fentanyls has been included in the regulatory list in several countries. There is a great and urgent demand to rapidly recognize fentanyls and morphines in various samples. Here, we report an on-site surface-enhanced Raman spectroscopic method to classify fentanyls from morphines by the Raman spectroscopic signature of the molecular scaffold structure, with an assistance of principle component analysis algorithm. Moreover, by simple but fine-tuning approach of inorganic salt-induced aggregation of gold nanoparticles substrate, we achieved a selective detection of 10 ng/mL fentanyl from 2000-fold of heroin, the most common coexisting substance in chemical samples. Good differentiation of 50 ng/mL fentanyl from 10 000-fold morphine as a main metabolite of heroin in urine samples was also possible after a feasible pretreatment by StageTip procedures. Depending on different structures, the detection sensitivity of five fentanyls ranged from 50 to 2000 ng/mL. © 2019 WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1002/elps.201900004

✓ **نام ژورنال:**

Electrophoresis

✓ **سال انتشار:**

2019

✓ **کلیدواژه‌ها:**

Differentiation; Fentanyls; Morphines; SERS; Urine

✓ **عنوان پژوهش:**

Preparation and biological evaluation of 99mTc-HYNIC-(Ser)3-D4 peptide for targeting and imaging of non-small-cell lung cancer

✓ **نویسندگان:**

Haddad Zahmatkesh M., Abedi S.M., Hosseinimehr S.J.

✓ **خلاصه پژوهش:**

Aim: In this study, radiolabeled D4 peptide conjugate was studied as a radiotracer for imaging of non-small-cell lung cancer with overexpression of EGFR. Methods: HYNIC-(Ser)3-D4 peptide was labeled with 99mTc using tricine as a co-ligand. Cellular specific binding and internalization as well as in vivo tumor targeting were assessed. Results: The in vitro experiments showed good cellular specific binding. Tumor uptake values as %ID/g were 7.55 and 6.82% at 1 and 4 h after injection, respectively. The presaturation of EGFR in xenografted nude mice reduced 36% tumor uptake of radioactivity at 1 h after injection that confirmed in vivo specificity. Conclusion: Findings showed this radiolabeled peptide is a promising candidate for tumor targeting and molecular imaging of non-small-cell lung cancer. © 2017 Future Medicine Ltd.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.2217/fon-2016-0426

✓ **نام ژورنال:**

Future Oncology

✓ **سال انتشار:**

2017

✓ **کلیدواژه‌ها:**

99mTc; EGFR; non-small-cell lung cancer; peptide; tumor targeting

✓ **عنوان پژوهش:**

SERS in biology/biomedical SERS: General discussion

✓ **نویسندگان:**

Baumberg J., Bell S., Bonifacio A., Chikkaraddy R., Chisanga M., Corsetti S., Delfino I., Eremina O., Fasolato C., Faulds K., Fleming H., Goodacre R., Graham D., Hardy M., Jamieson L., Keyes T., Królikowska A., Kuttner C., Langer J., Lightner C., Mahajan S., Masson J.-F., Muhamadali H., Natan M., Nicolson F., Nikelshparg E., Plakas K., Popp J., Porter M., Prezgot D., Pytlik N., Schlücker S., Silvestri A., Stone N., Tian Z.-Q., Tripathi A., Willner M., Wuytens P.

✓ **خلاصه پژوهش:**

[No abstract available]

✓ **لینک** DOI **(استفاده برای دانلود مقاله)**

10.1039/c7fd90089a

✓ **نام ژورنال:**

Faraday Discussions

✓ **سال انتشار:**

2017

✓ **کلیدواژه‌ها:**

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Quantification of dopamine in biological samples by surface-enhanced Raman spectroscopy: Comparison of different calibration models

✓ **نویسندگان:**

Shi C.-X., Chen Z.-P., Chen Y., Liu Q., Yu R.-Q.

✓ **خلاصه پژوهش:**

In this contribution, an attempt was made to quantify dopamine (DA) in complex biological samples (i.e., plasma and urine) using surface-enhanced Raman spectroscopy. Silver nanoparticles modified with iron-nitrilotriacetic acid (DA-selective probe) and 4-mercaptobenzoic acid (internal standard) were used as enhancing substrate. The performance of different calibration models for the quantification of DA in plasma and urine samples spiked with DA was evaluated and compared. The calibration models investigated were univariate ratiometric model based on the intensity ratio between the characteristic SERS peaks of DA and 4-mercaptobenzoic acid, PLS models built on the raw, standardized or pre-processed SERS measurements, and multiplicative effects model for surface-enhanced Raman spectroscopy (MEMSERS). Experimental results showed that among the models considered in this contribution, only MEMSERS achieved quite accurate and precise concentration predictions for DA in the spiked plasma and urine samples with recovery rates varying within the range of 91.9–112%, surprisingly better than the corresponding values of the quantitative results obtained by LC-MS/MS. This work provided further evidence of the effectiveness of MEMSERS in solving the problem of poor accuracy of quantitative SERS assays. © 2017 Elsevier B.V.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1016/j.chemolab.2017.09.006

✓ **نام ژورنال:**

Chemometrics and Intelligent Laboratory Systems

✓ **سال انتشار:**

2017

✓ **کلیدواژه‌ها:**

Calibration models; Dopamine; Multiplicative effects model; Quantitative analysis; Surface-enhanced Raman spectroscopy

✓ عنوان پژوهش:

Decreased biologic activity and degradation of human [Ser(B24)]-insulin, a second mutant insulin

✓ نویسندگان:

Haneda M., Kobayashi M., Maegawa H., Watanabe N., Takata Y., Ishibashi O., Shigeta Y., Inouye K.

✓ خلاصه پژوهش:

A second mutant insulin, identified as [Ser(B24)]-insulin, has a highly hydrophilic character. To determine the biologic activity and the degradation of this mutant insulin, human [Ser(B24)]- and [Ser(B25)]-insulin analogues were semisynthesized from porcine insulin by an enzyme-assisted coupling method. All of the following studies on isolated rat adipocytes were performed at 37°C to directly correlate the binding potency and the biologic activity. The ability of these insulins to displace 125I-porcine insulin bound to adipocytes was 0.5-2% and 1-4%, respectively, of porcine insulin. When the ability of these insulins to stimulate glucose transport and glucose oxidation was measured, both analogues had full activity at high concentrations (250 ng/ml). However, ED50 of the porcine, [Ser(B24)]-, and [Ser(B25)]-insulins to stimulate glucose transport was 0.37 ± 0.05, 46.3 ± 5.4, and 23.3 ± 5.5 ng/ml, respectively. Similarly, for glucose oxidation, ED50 was 0.38 ± 0.06, 33.8 ± 3.6, and 16.6 ± 3.4 ng/ml, respectively. Thus, the biologic activity of [Ser(B24)]- and [Ser(B25)]-insulins was reduced to 0.5-2% and 1-4% of that of porcine insulin, which was compatible with our previous studies under different conditions. No antagonistic effects were observed for either analogue. Degradation of 125I-labeled [Ser(B24)]- and [Ser(B25)]-insulins was also decreased to 62.8% and 55.8%, respectively, of 125I-porcine insulin. These results confirm the importance of the hydrophobic residues at B24 and B25 in the biologic activity of insulin; the patient having this hydrophilic insulin was considered to be in an insulinopenic state despite the hyperinsulinemia due to decreased degradation of the mutant insulin.

✓ لینک DOI (استفاده برای دانلود مقاله)

10.2337/diab.34.6.568

✓ نام ژورنال:

Diabetes

✓ سال انتشار:

1985

✓ کلیدواژه‌ها:

TEKSAN Detect Precisely

✓ **عنوان پژوهش:**

Synthesis of Bradykinyl-Val-Ala-Pro-Ala-Ser-OH and Its Biological Properties

✓ **نویسندگان:**

Sakagami M., Nakayama T.

✓ **خلاصه پژوهش:**

Synthesis is described of bradykinyl-Val-Ala-Pro-Ala-Ser-OH. All the fragment condensations were carried out by Rudinger's azide method in order to minimize the racemization during the coupling steps involving peptide fragments. The ensuing tetradecapeptide with a high degree of homogeneity was found to be identical with bradykinyl-Val-Ala-Pro-Ala-Ser-OH of natural origin with respect to chemical and biological properties. © 1973, The Pharmaceutical Society of Japan. All rights reserved.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1248/cpb.21.616

✓ **نام ژورنال:**

Chemical and Pharmaceutical Bulletin

✓ **سال انتشار:**

1973

✓ **کلیدواژه‌ها:**

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Ergothioneine, a dietary amino acid with a high relevance for the interpretation of label-free surface enhanced Raman scattering (SERS) spectra of many biological samples

✓ **نویسندگان:**

Fornasaro S., Gurian E., Pagarin S., Genova E., Stocco G., Decorti G., Sergo V., Bonifacio A.

✓ **خلاصه پژوهش:**

Intense SERS spectra of the natural amino acid ergothioneine (ERG) are obtained on different substrates upon 785 nm excitation. A characteristic spectral pattern with a distinctive intense band at 480–486 cm−1 is conserved when substrates of different type and characteristics are used. On the basis of available literature, we propose ERG is adsorbed on the metal surface in its thiolate form via the sulphur and heterocyclic nitrogen. The same spectral pattern is obtained in SERS spectra of filtered erythrocytes lysates, confirming the presence of ERG in those cells. The occurrence of ERG bands in label-free SERS spectra of serum and plasma reported in literature by different authors is discussed, highlighting the importance of this amino acid for the interpretation of SERS spectra of these biofluids. © 2020 Elsevier B.V.

✓ **لینک** DOI **(استفاده برای دانلود مقاله)**

10.1016/j.saa.2020.119024

✓ **نام ژورنال:**

Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy

✓ **سال انتشار:**

2021

✓ **کلیدواژه‌ها:**

Antioxidant; Biofluids; Ergothioneine; Erythrocytes; Plasma; Raman; SERS; Serum

✓ **عنوان پژوهش:**

Subsurface Chemically Specific Measurement of pH Levels in Biological Tissues Using Combined Surface-Enhanced and Deep Raman

✓ **نویسندگان:**

Gardner B., Matousek P., Stone N.

✓ **خلاصه پژوهش:**

There is much interest in using nanosensors to monitor biologically relevant species such as glucose, or cellular pH, as these often become dysregulated in diseases such as cancer. This information is often inaccessible at depth in biological tissue, due to the highly scattering nature of tissue. Here we show that gold nanoparticles labeled with pH-sensitive reporter molecules can monitor pH at depth in biological tissues. This was achieved using deep Raman spectroscopy (spatially offset Raman and transmission Raman) in combination with surface-enhanced Raman spectroscopy, allowing chemical information to be retrieved significantly deeper than conventional Raman spectroscopy permits. Combining these approaches with chemometrics enabled pH changes to be monitored with an error of ±~0.1 pH units noninvasively through 22 mm of soft tissue. This development opens the opportunity for the next generation of light-based medical diagnostic methods, such as monitoring of cancers, known to significantly alter pH levels. Copyright © 2019 American Chemical Society.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1021/acs.analchem.9b01015

✓ **نام ژورنال:**

Analytical Chemistry

✓ **سال انتشار:**

2019

✓ **کلیدواژه‌ها:**

Detect Precisely

✓ **عنوان پژوهش:**

SERS-enhanced piezoplasmonic graphene composite for biological and structural strain mapping

✓ **نویسندگان:**

Marin B.C., Liu J., Aklile E., Urbina A.D., Chiang A.S.-C., Lawrence N., Chen S., Lipomi D.J.

✓ **خلاصه پژوهش:**

Thin-film optical strain sensors have the ability to map small deformations with spatial and temporal resolution and do not require electrical interrogation. This paper describes the use of graphene decorated with metallic nanoislands for sensing of tensile deformations of less than 0.04% with a resolution of less than 0.002%. The nanoisland-graphene composite films contain gaps between the nanoislands, which when functionalized with benzenethiolate behave as hot spots for surface-enhanced Raman scattering (SERS). Mechanical strain increases the sizes of the gaps; this increase attenuates the electric field, and thus attenuates the SERS signal. This compounded, SERS-enhanced "piezoplasmonic" effect can be quantified using a plasmonic gauge factor, and is among the most sensitive mechanical sensors of any type. Since the graphene-nanoisland films are both conductive and optically active, they permit simultaneous electrical stimulation of myoblast cells and optical detection of the strains produced by the cellular contractions. © 2017 The Royal Society of Chemistry.

✓ **لینک** DOI **(استفاده برای دانلود مقاله)**

10.1039/c6nr09005b

✓ **نام ژورنال:**

Nanoscale

✓ **سال انتشار:**

2017

✓ **کلیدواژه‌ها:**

TEKSAN Detect Precisely

✓ عنوان پژوهش:

Synthesis and biological evaluation of analogues of the tetrapeptide N-Acetyl-Ser-Asp-Lys-Pro (AcSDKP), an inhibitor of primitive haematopoietic cell proliferation

✓ نویسندگان:

Thierry J., Grillon C., Gaudron S., Potier P., Riches A., Wdzieczak-Bakala J.

✓ خلاصه پژوهش:

The tetrapeptide N-Acetyl-Ser-Asp-Lys-Pro (AcSDKP), an inhibitor of haematopoietic stem cell proliferation, reduces in vivo and in vitro the damage to the stem cell compartment resulting from treatment with chemotherapeutic agents or ionizing radiations. In order to provide new molecules likely to improve the myeloprotection displayed by this tetrapeptide, we have prepared a set of analogues of AcSDKP. These compounds are derived from the parent peptide by substitution or modification of the N- or of the C-terminus, or substitution of side chains. We report here that almost all investigated analogues retain the antiproliferative activity reducing in vitro the proportion of murine Colony-Forming Units Granulocyte/Macrophage (CFU-GM) in S-phase and inhibiting the entry into cycle of High Proliferative Potential Colony-Forming Cells (HPP-CFC). This shows that the polar groups of Ser, Asp or Lys are critical for the expression of biological activity, but that the modification of the N- or C-terminus mostly yielded compounds still retaining antiproliferative activity and devoid of toxicity. The efficacy of AcSDKP analogues in preventing in vitro the primitive haematopoietic cells from entering into cycle makes these molecules new candidates for further in vivo investigations. Copyright © 2001 European Peptide Society and John Wiley & Sons, Ltd.

✓ لینک DOI (استفاده برای دانلود مقاله)

10.1002/psc.322

✓ نام ژورنال:

Journal of Peptide Science

✓ سال انتشار:

2001

✓ کلیدواژه‌ها:

AcSDKP; AcSDKP analogues; CFU-GM; HPP-CFC; Proliferation inhibitor; Pseudopeptides

TEKSAN Detect Precisely

✓ **عنوان پژوهش:**

Optimization of cell culture conditions for the evaluation of the biological activities of the tetrapeptide n-acetyl-ser-asp-lys-pro, a natural hernoregulatory factor

✓ **نویسندگان:**

Grillon C., Lenfant M., Wdzieczak-Bakala J.

✓ **خلاصه پژوهش:**

The present study attempts to define the difficulties in evaluating the properties of the hemoregulatory peptide AcSDKP using in vitro assays. In fact, in the presence of sera, which are generally added to basic culture media, AcSDKP is catabolized by proteases present in the serum. The kinetics of AcSDKP degradation depends on the nature and on the concentration of the added serum. In in vitro conditions, the half life of this peptide can be increased by the addition of 1 M captopril, a metalloprotease inhibitor. Thus, these points need to be considered in designing experiments to study the effects of AcSDKP. © 1993 Informa UK Ltd All rights reserved: reproduction in whole or part not permitted.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.3109/08977199309010828

✓ **نام ژورنال:**

Growth Factors

✓ **سال انتشار:**

1993

✓ **کلیدواژه‌ها:**

AcSDKP; Catabolism; Cell culture; Hematopoiesis regulation

TEKSAN
Detect Precisely

✓ عنوان پژوهش:

SERS activity and spectroscopic properties of Zn and ZnO nanostructures obtained by electrochemical and green chemistry methods for applications in biology and medicine

✓ نویسندگان:

Proniewicz E., Tąta A., Wójcik A., Starowicz M., Pacek J., Molenda M.

✓ خلاصه پژوهش:

This work for the first time evaluates the ability of homogeneous, stable, and pure zinc oxide nanoparticles (ZnONPs-GS) synthesized by "green chemistry"-an environmentally friendly, cheap, and easy method that allows efficient use of plant waste, such as banana peels, for the selective detection of four neurotransmitters present in body fluids and promotion of the SERS effect. Selective adsorption on ZnONPs-GS was compared with adsorption on the surface of (1) ZnONPs, which were obtained by electrochemical dissolution of zinc in a solution free of surfactants and (2) mechanically polished surface of bare Zn. The study showed that SERS spectroscopy using unique marker bands allows distinguishing whether the adsorbate is deposited on the surface of zinc or zinc oxide. Thus, the combination of the SERS technique with an optical probe can allow an in vivo determination of the condition of galvanized implants. The use of SERS has been extended to monitor the photocatalytic properties of surface-functionalized ZnO nanoparticles. It has been shown that despite the same structure, purity, and adsorption properties, ZnONPs-GS obtained using "green chemistry"are more bio-friendly for biological material than those obtained by the electrochemical method. This is because the surface of ZnONPs-GS is free of hydroxyl groups, which can easily form reactive oxygen species when the surface is exposed to visible radiation. Thus, surface-functionalized ZnONPS-GS can protect the biological material from the damage caused by the production and attack of an excess of ROS. Also, for an exemplary neurotransmitter, structural changes when it is not-covalently bound to Zn/ZnO were compared with the structural changes of this neurotransmitter deposited on the surface of various metals (Cu, α-Ti, and α-Fe) and metal oxides (leaf-like CuO, rutile-TiO2, and γ-Fe2O3). It has been shown that adsorption only slightly depends on the type of metallic surface and the development of this surface for roughness up to 1 micron. Metal substrates were characterized before and after the neurotransmitters' adsorption. UV-Vis, Raman, and ATR-FTIR confirmed the formation of ZnO nanoparticles. XRD showed a high crystalline structure of wurtzite. TEM and DLS showed that nanoparticles are spherical, well dispersed, and have a uniform size. © 2020 the Owner Societies.

✓ لینک DOI (استفاده برای دانلود مقاله)

10.1039/d0cp03517c

✓ نام ژورنال:

Physical Chemistry Chemical Physics

✓ سال انتشار:

2020

✓ کلیدواژه‌ها:

✓ عنوان پژوهش:

A high-resolution study of in situ surface-enhanced Raman scattering nanotag behavior in biological systems

✓ نویسندگان:

Wang J., Anderson W., Li J., Lin L.L., Wang Y., Trau M.

✓ خلاصه پژوهش:

The colloidal stability of surface-enhanced Raman scattering (SERS) nanotags (Raman reporter-conjugated plasmonic nanoparticles) significantly affects the accuracy and reproducibility of SERS measurements, particularly in biological systems. Limited understanding of SERS nanotag stability may partly hamper the translation of SERS nanotags from the laboratory to their use in the clinic. In this contribution, we utilized differential centrifugal sedimentation (DCS), a reliable and straightforward technique to comprehensively analyze the colloidal stability of SERS nanotags in biological systems. Compared with other particle characterization techniques, DCS has been shown to have a unique advantage for high-resolution and high-throughput polydisperse particle characterization. DCS data revealed that the universal aggregation prevention practice of coating SERS nanotags with silica or bovine serum albumin layers did not sufficiently stabilize them in common measurement environments (e.g., 1 × PBS). Combined DCS and SERS measurements established a strong correlation between the degrees of nanotag aggregation and signal intensities, further reinforcing the necessity of characterizing SERS nanotag stability for every condition in which they are used. We also found that increasing the protein thickness by the inclusion of extra protein components in the detection environments and antibody functionalization can improve the stability of SERS nanotags. We believe that this study can provide guidelines on appropriate measurement techniques and particle design considerations to assess and improve SERS nanotag stability in complex biological systems.
© 2018 Elsevier Inc.

✓ لینک DOI (استفاده برای دانلود مقاله)

10.1016/j.jcis.2018.11.035

✓ نام ژورنال:

Journal of Colloid and Interface Science

✓ سال انتشار:

2019

✓ کلیدواژه‌ها:

Colloidal stability; Differential centrifugal sedimentation (DCS); Plasmonic nanoparticles; SERS nanotags; Surface-enhanced Raman scattering (SERS)

✓ **عنوان پژوهش:**

Micron surface-enhanced Raman spectroscopy of intact biological organisms and model systems

✓ **نویسندگان:**

Todd Elizabeth A., Morris Michael D.

✓ **خلاصه پژوهش:**

Surface-enhanced Raman spectra have been obtained within intact zebrafish embryos and inside the 500-fL pores of a Nucleopore filter membrane with the use of coated microelectrodes with 1-3 μm active silver tip diameters. The spectra obtained demonstrate the microelectrode's ability to penetrate biological membranes as well as restricted volumes.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1366/0003702944924790

✓ **نام ژورنال:**

Applied Spectroscopy

✓ **سال انتشار:**

1994

✓ **کلیدواژه‌ها:**

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Tailoring lab-on-fiber SERS optrodes towards biological targets of different sizes

✓ **نویسندگان:**

Managò S., Quero G., Zito G., Tullii G., Galeotti F., Pisco M., De Luca A.C., Cusano A.

✓ **خلاصه پژوهش:**

In this paper, we studied the influence of the geometrical configuration of surface-enhanced Raman scattering (SERS)-active self-assembling gold nanostructures on the interaction with biological targets of different sizes, aiming at large-scope SERS lab-on-fiber optrodes composed of highly efficient SERS substrates integrated onto optical fibre tips. By using nanosphere lithography, we fabricated three types of highly ordered and reproducible SERS-active substrates. To correlate the SERS response to the steric hindrance of the biological target, we experimentally analysed and compared the SERS spectra of three representative biological probes, i.e., ultralow-molecular-weight molecules of biphenyl-4-thiol (BPT, small molecule, 186.27 Da), bovine serum albumin (BSA, medium molecule, 66.5 kDa) and red blood cells (RBCs, diameter <10 μm, complex target). All SERS-active substrates provided the Raman fingerprint of the biological targets, but the SERS intensity was dependent on the substrate geometry and its specific steric interfacing with biological targets. A full three-dimensional numerical analysis was carried out by means of the finite element method to gain insight into the electric field distribution and hot spot distribution of the fabricated structures. By correlating the electric field distribution with the SERS response, we conclude that the most efficient target-based architectures feature not only “intense” but also “accessible” hot spots. Finally, we optimized a Raman readout system for SERS optrode operation with efficient illumination and collection via an optical fibre. © 2020 Elsevier B.V.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1016/j.snb.2020.129321

✓ **نام ژورنال:**

Sensors and Actuators, B: Chemical

✓ **سال انتشار:**

2021

✓ **کلیدواژه‌ها:**

Biosensors; Lab-on- fiber optrode; Optical fibre sensor; Optical sensors; Self-assembly nanosphere lithography; Surface-enhanced Raman spectroscopy

✓ عنوان پژوهش:

Towards advanced biological detection using surface enhanced Raman scattering (SERS)-based sensors

✓ نویسندگان:

Hankus M.E., Stratis-Cullum D.N., Pellegrino P.M.

✓ خلاصه پژوهش:

The Army has a need for an accurate, fast, reliable and robust means to identify and quantify defense related materials. Raman spectroscopy is a form of vibrational spectroscopy that is rapidly becoming a valuable tool for homeland defense applications, as it is well suited for the molecular identification of a variety of compounds, including explosives and chemical and biological hazards. To measure trace levels of these types of materials, surface enhanced Raman scattering (SERS), a specialized form of Raman scattering, can be employed. The SERS enhancements are produced on, or in close proximity to, a nanoscale roughened metal surface and are typically associated with increased local electromagnetic field strengths. However, before application of SERS in the field and in particular to biological and other hazard sensing applications, significant improvements in substrate performance are needed. In this work, we will report the use of several SERS substrate architectures (colloids, film-over-nanospheres (FONs) and commercially available substrates) for detecting and differentiating numerous endospore samples. The variance in spectra as obtained using different sensing architectures will also be discussed. Additionally, the feasibility of using a modified substrate architecture that is tailored with molecular recognition probe system for detecting biological samples will be explored. We will discuss the progress towards an advanced, hybrid molecular recognition with a SERS/Fluorescence nanoprobe system including the optimization, fabrication, and spectroscopic analysis of samples on a commercially available substrate. Additionally, the feasibility of using this single-step switching architecture for hazard material detection will also be explored. © 2010 SPIE.

✓ لینک DOI (استفاده برای دانلود مقاله)

10.1117/12.859267

✓ نام ژورنال:

Proceedings of SPIE - The International Society for Optical Engineering

✓ سال انتشار:

2010

✓ کلیدواژه‌ها:

Biologicals; Fluorescence; Molecular probe; Raman; Sensor; SERS; Surface enhanced Raman scattering

✓ **عنوان پژوهش**:

Regeneration of native structure and biological activity by air oxidation of reduced pancreatic secretory trypsin inhibitor and Des-Thr-Ser-Pro-Gln-Arg-inhibitor

✓ **نویسندگان**:

Tschesche H., Haenisch G.

✓ **خلاصه پژوهش**:

[No abstract available]

✓ **لینک** DOI (**استفاده برای دانلود مقاله**)

10.1016/0014-5793(70)80530-0

✓ **نام ژورنال**:

FEBS Letters

✓ **سال انتشار**:

1970

✓ **کلیدواژه‌ها**:

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Optical penetration of surface-enhanced micro-scale spatial offset Raman spectroscopy in turbid gel and biological tissue

✓ **نویسندگان:**

Zhang Y., Lin L., He J., Ye J.

✓ **خلاصه پژوهش:**

The limited penetration of photons in biological tissue restricts the deep-tissue detection and imaging application. The micro-scale spatially offset Raman spectroscopy (micro-SORS) with an optical fiber probe, colleting photons from deeper regions by offsetting the position of laser excitation from the collection optics in a range of hundreds of microns, shows great potential to be integrated with endoscopy for inside-body noninvasive detection by circumventing this restriction, particularly with the combination of surface-enhanced Raman spectroscopy (SERS). However, a detailed tissue penetration study of micro-SORS in combination with SERS is still lacking. Herein, we compared the signal decay of enhanced Raman nanotags through the tissue phantom of agarose gel and the biological tissue of porcine muscle in the near-infrared (NIR) region using a portable Raman spectrometer with a micro-SORS probe (2.1mm in diameter) and a conventional hand-held probe (9.7mm in diameter). Two kinds of Raman nanotags were prepared from gold nanorods decorated with the nonresonant (4-nitrobenzenethiol) or resonant Raman reporter molecules (IR-780 iodide). The SERS measurements show that the penetration depths of two Raman nanotags are both over 2cm in agarose gel and 3mm in porcine muscle. The depth could be improved to over 4cm in agarose gel and 5mm in porcine tissue when using the micro-SORS system. This demonstrates the superiority of optical-fiber micro-SORS system over the conventional Raman detection for the detection of nanotags in deeper layers in the turbid medium and biological tissue, offering the possibility of combining the micro-SORS technique with SERS for noninvasive in vivo endoscopy-integrated clinical application. © 2021 The Author(s).

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1142/S1793545821410017

✓ **نام ژورنال:**

Journal of Innovative Optical Health Sciences

✓ **سال انتشار:**

2021

✓ **کلیدواژه‌ها:**

endoscopy; fiber-bundle probe; noninvasive; Spatial offset Raman spectroscopy; surface-enhanced Raman spectroscopy

✓ عنوان پژوهش:

The phosphorylation of CCR6 on distinct Ser/Thr residues in the carboxyl terminus differentially regulates biological function

✓ نویسندگان:

Lu M.-Y., Lu S.-S., Chang S.-L., Liao F.

✓ خلاصه پژوهش:

CCR6 is a G protein-coupled receptor (GPCR) that recognizes a single chemokine ligand, CCL20 and is primarily expressed by leukocytes. Upon ligand binding, CCR6 activates Gai heterotrimeric G proteins to induce various potential cellular outcomes through context-specific cell signaling. It is well known that differential phosphorylation of Ser and Thr residues in the C-terminal domains or intracellular loops of GPCRs can generate barcodes that regulate GPCR function by regulating the recruitment of β-arrestins. In this study, we demonstrate that ligand binding to CCR6 induces receptor phosphorylation at Ser/Thr residues in the C-terminal tail, rather than intracellular loops. Using mutagenesis experiments, we determined that distinct clusters of Ser/Thr residues in the C-terminal domain differentially regulate CCL20-induced signaling and cellular response. Substituting the Thr360/Ser361/Thr363 cluster or the Ser370/Ser371 cluster with Ala residues modulated cellular response upon CCL20 stimulation. Notably, receptor internalization, chemotaxis, F-actin distribution, transient ERK1/2 activation, and β-arrestin 2 recruitment were oppositely affected by mutating the two clusters, suggesting that phosphorylation of CCR6 C-terminal Ser/Thr residues directs the cell signaling response upon receptor activation. Moreover, activated CCR6 weakly recruited β-arrestin 1 in comparison with β-arrestin 2, and the two arrestin proteins seemed to play overlapping but distinct roles in mediating CCL20/CCR6-induced cellular responses. Taken together, the effects of site-specific Ser/Thr phosphorylation on CCR6 demonstrate the existence of barcodes on the protein that dictate the activation of different cell signaling profiles and lead to distinct biological outcomes. © 2018 Lu, Lu, Chang and Liao.

✓ لینک DOI (استفاده برای دانلود مقاله)

10.3389/fimmu.2018.00415

✓ نام ژورنال:

Frontiers in Immunology

✓ سال انتشار:

2018

✓ کلیدواژه‌ها:

CCR6; G protein-coupled receptor; Mutagenesis; Receptor phosphorylation; β-arrestins

✓ **عنوان پژوهش:**

Gold film over very small (107 nm) spheres as efficient substrate for sensitive and reproducible surface-enhanced Raman scattering (SERS) detection of biologically important molecules

✓ **نویسندگان:**

Štolcová L., Peksa V., Proška J., Procházka M.

✓ **خلاصه پژوهش:**

Gold plasmonic nanostructures with high sensitivity and spectral reproducibility are key components of molecular sensors based on surface-enhanced Raman scattering (SERS). In this paper, we report a “bottom-up” fabrication of gold “film over nanosphere” (FON) substrates for SERS sensing on the basis of very small (107 nm in diameter) polystyrene spheres coated with 20 nm of gold. To obtain close-packed spheres in a large scale area, the self-assembly at the water–air interface was found to be very efficient. Sensitivity and reproducibility of the AuFON substrates were tested using various molecular probes: 5,10,15,20-tetrakis(1-methyl-4-pyridyl)porphyrin, p-aminothiophenol, and benzocaine. Relative standard deviation of SERS signal was found to be less than 20% confirming good spectral reproducibility especially using a 100× objective. Then, we demonstrated sensitive SERS detection of other biologically important molecules adsorbed on our AuFON substrates: thiolated-polyA, protoporphyrin IX, and two alkaloids (nicotine and strychnine). Estimated limits of detection were 8.2 × 10−7 and 4.5 × 10−7 M (in order of 100 ng.ml−1) incubation concentration for strychnine and nicotine, respectively. Therefore, we conclude that the 20-nm gold film deposited on polystyrene spheres of 107 nm in diameter provided both good spectral reproducibility and sensitivity. Their implementation into the SERS-active system will enable to bring about new quantitative and analytical SERS applications. Copyright © 2017 John Wiley & Sons, Ltd.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1002/jrs.5317

✓ **نام ژورنال:**

Journal of Raman Spectroscopy

✓ **سال انتشار:**

2018

✓ **کلیدواژه‌ها:**

alkaloids; AuFON; biomolecules; reproducibility; SERS

✓ **عنوان پژوهش:**

Mapping of Pesticide Transmission on Biological Tissues by Surface Enhanced Raman Microscopy with a Gold Nanoparticle Mirror

✓ **نویسندگان:**

Yang T., Qu Y., Hickey M., Wang W., Zhao B., Bi S., Zhang G., He L.

✓ **خلاصه پژوهش:**

We presented an improved surface-enhanced Raman scattering (SERS) mapping technique for the imaging of pesticides on biological samples including tomato leaves, fruits, and mouse skin using a gold nanoparticle mirror as the SERS substrate. The gold nanoparticle mirror was fabricated using 50 nm commercial citrate-capped gold nanoparticles upon the interface of water and a mediating solvent that was prepared using acetonitrile and hexane. The properties of the gold nanoparticle mirror were compared with gold nanoparticles, and the mirror displayed higher sensitivity with a limit of detection of 0.07 μg/cm2 and better reproducibility with a relative standard deviation of 5.48% for the SERS mapping of pesticide (ferbam) on biological samples. The gold mirror-based SERS mapping technique was also used to investigate pesticide transmission from tomato fruit surfaces to mouse skin after 1 mg/cm2 of pesticides was administered upon the fruit, and the results showed that about 23% of the pesticide was transmitted from the fruit to the mouse skin. We also found that pesticides on the contaminated hand could not be completely removed by routine rinsing with tap water for 2 min. This study provides an effective approach for the imaging of pesticides on biological tissues that would facilitate research on pesticide behaviors both on and in biological systems. © 2019 American Chemical Society.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1021/acsami.9b16084

✓ **نام ژورنال:**

ACS Applied Materials and Interfaces

✓ **سال انتشار:**

2019

✓ **کلیدواژه‌ها:**

biological tissue; gold nanoparticle mirror; mapping; pesticide transmission; self-assembly; surface-enhanced Raman microscopy

✓ **عنوان پژوهش:**

Investigation of biological activities of wild bitter melon (Momordica charantia linn. var. abbreviata ser.)

✓ **نویسندگان:**

Ngo D.-H., Hanh Pham T.M., Ngo D.-N., Sang Vo T.

✓ **خلاصه پژوهش:**

Wild bitter melon (Momordica charantia L. var. Abbreviata Ser.) is a wild edible variety of M. charantia, often used in folk medicine. In this study, the biological activities of its extract and fractions were investigated in vitro. It was found that ethyl acetate (EA) fraction exhibited high 1,1-diphenyl-2-picryl-hydrazyl (DPPH) scavenging activity with a half maximal inhibitory concentration (IC50) value of 0.43 ± 0.04 mg/mL, while the chloroform (CF), EA, and n-butanol (Bu) fractions had strong 2,2-azinobis-3-ethyl benzothiazoline-6-sulfonic acid (ABTS)+ scavenging ability with IC50 values of 0.36 ± 0.04 mg/mL, 0.35 ± 0.02 mg/mL, and 0.35 ± 0.05 mg/mL, respectively. Moreover, the EA and Bu fractions exhibited the highest protective effect against H2O2-induced DNA damage in a concentration-dependent manner. Furthermore, the EA fraction was effective in the inhibition of enzyme α-amylase activity with an IC50 value of 0.27 ± 0.029 mg/mL. Finally, it was observed that the production of nitric oxide (NO), a pro-inflammatory mediator, was significantly reduced from LPS-stimulated murine macrophage RAW 264.7 cells by the ethanol extract (ET) and the EA fraction. Therefore, wild bitter melon could be considered as a promising biomaterial for the development of pharmaceutical products. © 2019, by the authors.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.3390/biom9060211

✓ **نام ژورنال:**

Biomolecules

✓ **سال انتشار:**

2019

✓ **کلیدواژه‌ها:**

DPPH; Momordica charantia; Nitric oxide; Wild bitter melon; α-amylase

✓ **عنوان پژوهش:**

Biological evaluation of 99mTC-HYNIC-EDDA/tricine-(Ser)3-D4 peptide for tumor targeting

✓ **نویسندگان:**

Kazemi Z., Zahmatkesh M.H., Abedi S.M., Hosseinimehr S.J.

✓ **خلاصه پژوهش:**

Background: D4 small peptide (Leu-Ala-Arg-Leu-Leu-Thr) was selected as an appropriate agent for specific targeting of epidermal growth factor receptor (EGFR). Objective: The aim of study was to investigate the 99mTc-labeled D4 peptide for non-small cell lung tumor targeting. Method: HYNIC-(Ser)3-D4 peptide was labeled with 99mTc using mixture of tricine and ethylenediamine diacetic acid (EDDA) as co-ligands. The in vitro cellular uptake of radiolabeled peptide was evaluated by blocking test on human non-small cell lung cancer (A-549) cell line and its biodistribution was evaluated in A-549 xenografted nude mice. Results: This conjugated peptide was labeled with 99mTc in high radiochemical purity and it was highly stable in buffer and serum. The un-blocked to blocked cellular radioactivity ratio was 4- fold that showed a specific binding of this radiolabeled peptide on A-549 cell. Animal biodistribution in A-549 xenografted nude mice showed rapid clearance from blood and other non-target organs. Tumor uptake values as %ID/g (percentage of injection dose per gram of tissue) were 2.47% and 1.30% at 1 and 4 h after injection. Conclusion: This study showed the 99mTc-EDDA/tricine-HYNIC-(Ser)3-D4 peptide had tumor targeting on the non-small cell lung tumor. © 2017 Bentham Science Publishers.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.2174/1874471010666170519165430

✓ **نام ژورنال:**

Current Radiopharmaceuticals

✓ **سال انتشار:**

2017

✓ **کلیدواژه‌ها:**

99mTC; EDDA/tricine; EGFR; Lung cancer; Peptide; Tumor targeting

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Biological applications of SERS using functional nanoparticles

✓ **نویسندگان:**

Kitahama Y., Itoh T., Pienpinijtham P., Ekgasit S., Han X.X., Ozaki Y.

✓ **خلاصه پژوهش:**

The purpose of this review is to outline the state-of-the art of biological applications of SERS using functional nanoparticles. The review consists of two parts. In the former part, mechanism of SERS is discussed in considerable detail with the particular emphasis on "twofold" EM enhancement mechanism. Quantitative evaluation of twofold EM enhancement is demonstrated. In the latter part, some examples of biological applications of SERS will be reported. First, highly sensitive detections of biologically important small molecules, e.g., iodide, thiacyanate, and estrogen are by SERS will be discussed. Second, we introduce the strategy for protein detections by SERS. Label-free detection and Raman dye labeled detection methods for them are compared. Finally, SERS detection of living cells, Escherichia coli and yeast, are described in detail.
Copyright © 2012 American Chemical Society.

✓ **لینک** DOI (**استفاده برای دانلود مقاله**)

10.1021/bk-2012-1113.ch009

✓ **نام ژورنال:**

ACS Symposium Series

✓ **سال انتشار:**

2012

✓ **کلیدواژه‌ها:**

TEKSAN
Detect Precisely

✓ عنوان پژوهش:

Manipulation of silver nanoparticles in a droplet for label-free detection of biological molecules using surface-enhanced Raman scattering

✓ نویسندگان:

Çulha M., Altunbek M., Keskin S., Saatçi D.

✓ خلاصه پژوهش:

Detection and identification of biomacromolecules is of critical importance in many fields ranging from biotechnology to medicine. Surface-enhanced Raman scattering (SERS) is an emerging technique for the label-free detection and identification of biological molecules and structures with its fingerprinting properties and high sensitivity. However, there are a number of obstacles for its applications for biological macromolecules due to their complexity. In this report, manipulation of microscopic processes in play during the drying of a sessile droplet as a tool to influence the nanoparticle-macromolecule packing, which has dramatic effect on SERS performance, before the SERS acquisition is demonstrated. A process known as the coffee ring phenomenon jams all particles and molecular species to the edges of the droplet during drying. This uncontrolled process has dramatic effects on a SERS experiment, using colloidal metal nanoparticles as substrates, by sweeping everything to the edges and influencing the packing of nanoparticles in the droplet area. A plastic tip was dipped into a drying sample droplet to influence the uncontrolled piling up. A negatively-charged protein, BSA, a positively-charged protein, cytochrom c, and a 20-base long oligonucleotide, were used as model biomacromolecules in this study. While a minimum of one order of magnitude lower concentration improvement in detection limit was observed with negatively-charged biomacromolecules, no significant improvement was observed with positively-charged ones compared to a sample droplet left on the surface without any interference. With the demonstrated approach, picomolar-level biomolecular detection using SERS is possible. © 2011 SPIE.

✓ لینک DOI (استفاده برای دانلود مقاله)

10.1117/12.871219

✓ نام ژورنال:

Progress in Biomedical Optics and Imaging - Proceedings of SPIE

✓ سال انتشار:

2011

✓ کلیدواژه‌ها:

Biomacromolecules; Contact line pinning; Detection; Proteins; SERS

✓ **عنوان پژوهش:**

Raman and surface enhanced Raman spectroscopy on molecules of pharmaceutical and biological interest

✓ **نویسندگان:**

Iliescu T., Baia M., Maniu D.

✓ **خلاصه پژوهش:**

The molecules with antibacterial properties like, acridine derivatives, rivanol, furan derivatives, potassium benzylpenicillin, tranquilizers like, phenothiazine derivatives, anti-inflamatorry drugs like, diclofenac sodium and its complex with beta-cyclodextrin and some non natural β-amino acids were studied by theoretical (DFT) and experimental (Raman and Surface Enhanced Raman Spectroscopy (SERS)) point of view in order to have information about vibrational frequencies their assignment and the structure of the adsorbed molecular species and orientation of the molecules on metallic surface. These studies lead to a better understanding of their biological activity on different physico-chemical conditions.

✓ **لینک** DOI (**استفاده برای دانلود مقاله**)

✓ **نام ژورنال:**

Romanian Reports in Physics

✓ **سال انتشار:**

2008

✓ **کلیدواژه‌ها:**

Pharmaceutical products; Raman; SERS

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Structural Analysis of Biological Aliphatic Compounds Using Surface-Enhanced Fourier Transform Raman Spectroscopy

✓ **نویسندگان:**

Hasegawa T.

✓ **خلاصه پژوهش:**

The surface-enhanced Raman scattering (SERS) technique for Fourier transform Raman spectrometry is employed to reveal the chemical structure of biological aliphatic compounds consisting of folded, long aliphatic chains. The structural analysis is performed via the measurements of the accordion-vibration modes generated in the ordered, long aliphatic chain. The SERS spectra after subtraction of a background spectrum give segment lengths that are almost perfectly consistent with the chemical structures studied by mass spectrometry. The agreement of the SERS results with those of mass spectrometry suggests the positions of kinks in the long hydrocarbon chain. The combination technique of SERS and mass spectrometry is useful to discuss the structure of folded, long biological lipids. © 2004 Wiley Periodicals, Inc.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1002/bip.10556

✓ **نام ژورنال:**

Biopolymers

✓ **سال انتشار:**

2004

✓ **کلیدواژه‌ها:**

Biological aliphatic compounds; Structural analysis; Surface-enhanced Fourier transform Raman spectroscopy

TEKSAN Detect Precisely

✓ **عنوان پژوهش:**

Development of bioorthogonal SERS imaging probe in biological and biomedical applications

✓ **نویسندگان:**

Qiu C., Cheng Z., Lv C., Wang R., Yu F.

✓ **خلاصه پژوهش:**

Living-cell imaging demands high specificity, sensitivity, and minimal background interference to the targets of interest. However, developing a desirable imaging probe that can possess all the above features is still challenging. The bioorthogonal surface-enhanced Raman scattering (SERS) imaging has been recently emerged through utilizing Raman reporters with characteristic peaks in Raman-silent region of cells (1800–2800 cm−1), which opens a revolutionary avenue for living-cell imaging with multiplexing capability. In this review, we focus on the recent advances in the technology development and the biological and biomedical applications of the living-cell bioorthogonal SERS imaging technique. After introduction of fundamental principles for bioorthogonal tag or label, we present applications for visualization of various intracellular components and environment including proteins, nucleic acids, lipids, pH and hypoxia, even for cancer diagnosis in tissue samples. Then, various bioorthogonal SERS imaging-guided therapy strategies have been discussed such as phototherapy and surgery. In conclusion, this strategy has great potential to be a flexible and robust tool for visualization detection and diseases diagnosis. © 2021

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1016/j.cclet.2021.03.016

✓ **نام ژورنال:**

Chinese Chemical Letters

✓ **سال انتشار:**

2021

✓ **کلیدواژه‌ها:**

Bioorthogonal molecule; Disease diagnosis; Surface-enhanced Raman scattering (SERS); Therapy; Visualization

TEKSAN Detect Precisely

✓ **عنوان پژوهش:**

Waveguiding and SERS simplified Raman spectroscopy on biological samples

✓ **نویسندگان:**

Valpapuram I., Candeloro P., Coluccio M.L., Parrotta E.I., Giugni A., Das G., Cuda G., Di Fabrizio E., Perozziello G.

✓ **خلاصه پژوهش:**

Biomarkers detection at an ultra-low concentration in biofluids (blood, serum, saliva, etc.) is a key point for the early diagnosis success and the development of personalized therapies. However, it remains a challenge due to limiting factors like (i) the complexity of analyzed media, and (ii) the aspecificity detection and the poor sensitivity of the conventional methods. In addition, several applications require the integration of the primary sensors with other devices (microfluidic devices, capillaries, flasks, vials, etc.) where transducing the signal might be difficult, reducing performances and applicability. In the present work, we demonstrate a new class of optical biosensor we have developed integrating an optical waveguide (OWG) with specific plasmonic surfaces. Exploiting the plasmonic resonance, the devices give consistent results in surface enhanced Raman spectroscopy (SERS) for continuous and label-free detection of biological compounds. The OWG allows driving optical signals in the proximity of SERS surfaces (detection area) overcoming spatial constraints, in order to reach places previously optically inaccessible. A rutile prism couples the remote laser source to the OWG, while a Raman spectrometer collects the SERS far field scattering. The present biosensors were implemented by a simple fabrication process, which includes photolithography and nanofabrication. By using such devices, it was possible to detect cell metabolites like Phenylalanine (Phe), Adenosine 5-triphosphate sodium hydrate (ATP), Sodium Lactate, Human Interleukin 6 (IL6), and relate them to possible metabolic pathway variation. © 2019 by the authors.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.3390/bios9010037

✓ **نام ژورنال:**

Biosensors

✓ **سال انتشار:**

2019

✓ **کلیدواژه‌ها:**

Optical biosensors; Optical waveguide; Prism coupling; Raman micro-spectroscopy

TEKSAN Detect Precisely

✓ عنوان پژوهش:

Biological application of water-based electrochemically synthesized CuO leaf-like arrays: SERS response modulated by the positional isomerism and interface type

✓ نویسندگان:

Proniewicz E., Vantasin S., Olszewski T.K., Boduszek B., Ozaki Y.

✓ خلاصه پژوهش:

Cupric oxide leaf-like nanostructures (CuONSs) (average dimensions: 80-180 nm in width and 400-750 nm in length) were synthesized via anodic electrochemical dissolution of copper in an ethanol solution containing LiCl electrolyte and water. Ultraviolet-visible (UV-Vis), Fourier-transform infrared (FT-IR), and Raman spectroscopies as well as scanning electron microscope (SEM), high-resolution transmission electron microscopy with energy dispersive X-ray (HD-TEM-EDS), X-ray photoelectron spectroscopy (XPS), and X-ray powder diffraction (XRD) were used to explore the metal surface plasmon, size, rheology, and structure of CuONSs. Then, pyridine α-aminophosphinic acid isomers (α-, β-, and γ-NHPy) were synthesized and assembled on the CuONS/air and CuONS/aqueous solution interfaces at the pH level of solution = 7. Differences in adsorption and thus in the spectral response resulting from positional isomerism were examined by surface-enhanced Raman scattering (SERS) with an excitation wavelength of 785 nm. The manner of interaction of the investigated isomers with CuONSs in an aqueous solution was discussed in detail and compared with that at the CuONS/air interface. For γ-NHPy, at the CuONS/water interface, the time-dependent changes in the spectral profile were observed and analyzed. For β-NHPy at the CuONS/air interface, tip-enhanced Raman scattering (TERS) measurements were performed. These measurements allowed observing single molecule behavior and avoiding interference from the molecule's surrounding environment. © 2017 the Owner Societies.

✓ لینک DOI (استفاده برای دانلود مقاله)

10.1039/c7cp06001g

✓ نام ژورنال:

Physical Chemistry Chemical Physics

✓ سال انتشار:

2017

✓ کلیدواژه‌ها:

✓ **عنوان پژوهش:**

Surface-enhanced raman spectroscopy-active substrates: Adapting the shape of plasmonic nanoparticles for different biological applications

✓ **نویسندگان:**

Vitol E.A., Friedman G., Gogotsi Y.

✓ **خلاصه پژوهش:**

We discuss the relationship between the shape of plasmonic nanoparticles and the biological surface-enhanced Raman spectroscopy (SERS) applications which they can enable. As a step forward in developing SERS-active substrates adapted to a particular application, we demonstrate that a modification of the widely used protocol for the sodium citrate mediated reduction of chloroauric acid, which is typically employed only for obtaining spherical gold nanoparticles, can yield flat polygonal nanoparticles at room temperature and a decreased amount of the reducing agent. The significant advantage of the described approach is that it allows for synthesis of nanoparticles with different geometries using a well-established synthesis protocol without the need for any additional chemicals or special synthesis apparatus. By contrasting spherical and anisotropically shaped nanoparticles, we demonstrate that multifaceted nanoparticles with sharp edges are better suitable for SERS analysis of low concentration analytes requiring strong SERS enhancement. On the other hand, gold nanoparticles with isotropic shapes, while giving a smaller enhancement, can provide a more reproducible SERS signal. This is important for analytical applications of complex biological systems where large SERS enhancement may not always be required, whereas data reproducibility and minimal false positive rate are imperative. Using a SERS-active substrate comprising isotropically shaped gold nanoparticles, we demonstrate the differences between Gram-negative (E. coli) and Gram-positive (S. aureus) bacteria, attributable to the outer membrane and peptidoglycan layer, with the level of detail which has not been previously reported with optical spectroscopic techniques. Copyright © 2014 American Scientific Publishers.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1166/jnn.2014.8610

✓ **نام ژورنال:**

Journal of Nanoscience and Nanotechnology

✓ **سال انتشار:**

2014

✓ **کلیدواژه‌ها:**

Bacteria; Cells; Gold Nanoparticles; Sensors; Sers; Synthesis

✓ **عنوان پژوهش:**

Time-resolved methods in Biophysics. 1. A novel pump and probe surface-enhanced resonance Raman approach for studying biological photoreceptors

✓ **نویسندگان:**

Naumann H., Klare J.P., Engelhard M., Hildebrandt P., Murgida D.H.

✓ **خلاصه پژوهش:**

This article describes a method, based on surface-enhanced resonance Raman (SERR) spectroscopy, for studying the reaction dynamics of photoreceptors immobilized on metal electrodes. Time resolution and fresh sample conditions are achieved by synchronizing the rotational and translational motion of a novel kinematic electrode with the duration and time delay between the pump and probe events. The power and sensitivity of the method is illustrated by studying the photocycle of the sensory photoreceptor NpSRII and its sensitivity to the applied electric field. The results are compared with time-resolved resonance Raman measurements in solution. © 2006 The Royal Society of Chemistry and Owner Societies.

✓ **لینک** DOI **(استفاده برای دانلود مقاله)**

10.1039/b607807a

✓ **نام ژورنال:**

Photochemical and Photobiological Sciences

✓ **سال انتشار:**

2006

✓ **کلیدواژه‌ها:**

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Establishment of a reliable scheme for obtaining highly stable SERS signal of biological serum

✓ **نویسندگان:**

Li H., Wang Q., Tang J., Gao N., Yue X., Zhong F., Lv X., Fu J., Wang T., Ma C.

✓ **خلاصه پژوهش:**

As a rapid and non-destructive biological serum detection method, SERS technology was widely used in the screening and medical diagnosis of various diseases by combining the analysis of serum SERS spectrum and multivariate statistical algorithm. Because of the high complexity of serum components and the variability of SERS spectra, which often resulted in the phenomenon that the SERS spectrum of the same biological serum was significantly different due to the different test conditions. In this experiment, through the dilution treatment of the serum and the systematic test of the serum of all concentration gradients with lasers of wavelength of 785, 633 and 532 nm, the most suitable conditions for detecting the serum were investigated. The experimental results showed that only when the serum is diluted to low concentration (10 ppm), the SERS spectrum with high reproducibility and stability could be obtained, furthermore, the low concentration serum had weak tolerance to laser, and 532 nm laser was not suitable for serum detection. In this paper, a set of test scheme for obtaining highly stable serum SERS spectra was established by using high-performance gold nanoparticles (Au NPs) as the active substrate of SERS. Through comparative analysis of SERS spectrum of serum of normal people and cervical cancer, the reliability of the established low-concentration serum test program was verified, as well as its great potential advantages in disease screening and diagnosis. © 2021 Elsevier B.V.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1016/j.bios.2021.113315

✓ **نام ژورنال:**

Biosensors and Bioelectronics

✓ **سال انتشار:**

2021

✓ **کلیدواژه‌ها:**

Cervical cancer; Human serum; Optical standards and testing; SERS

✓ عنوان پژوهش:

SERS-based inverse molecular sentinel (iMS) nanoprobes for multiplexed detection of microRNA cancer biomarkers in biological samples

✓ نویسندگان:

Crawford B.M., Wang H.-N., Fales A.M., Bowie M.L., Seewaldt V.L., Vo-Dinh T.

✓ خلاصه پژوهش:

The development of sensitive and selective biosensing techniques is of great interest for clinical diagnostics. Here, we describe the development and application of a surface enhanced Raman scattering (SERS) sensing technology, referred to as "inverse Molecular Sentinel (iMS)" nanoprobes, for the detection of nucleic acid biomarkers in biological samples. This iMS nanoprobe involves the use of plasmonic-active nanostars as the sensing platform for a homogenous assay for multiplexed detection of nucleic acid biomarkers, including DNA, RNA and microRNA (miRNA). The "OFF-to-ON" signal switch is based on a non-enzymatic strand-displacement process and the conformational change of stem-loop (hairpin) oligonucleotide probes upon target binding. Here, we demonstrate the development of iMS nanoprobes for the detection of DNA sequences as well as a modified design of the nanoprobe for the detection of short (22-nt) microRNA sequences. The application of iMS nanoprobes to detect miRNAs in real biological samples was performed with total small RNA extracted from breast cancer cell lines. The multiplex capability of the iMS technique was demonstrated using a mixture of the two differently labeled nanoprobes to detect miR-21 and miR-34a miRNA biomarkers for breast cancer. The results of this study demonstrate the feasibility of applying the iMS technique for multiplexed detection of nucleic acid biomarkers, including short miRNAs molecules. © 2017 SPIE.

✓ لینک DOI (استفاده برای دانلود مقاله)

10.1117/12.2258272

✓ نام ژورنال:

Progress in Biomedical Optics and Imaging - Proceedings of SPIE

✓ سال انتشار:

2017

✓ کلیدواژه‌ها:

Cancer diagnostics; MicroRNA; Plasmonics; Surface enhanced Raman scattering

✓ **عنوان پژوهش:**

Surface-enhanced Raman spectroscopy substrate fabricated via nanomasking technique for biological sensor applications

✓ **نویسندگان:**

Bauman S.J., Darweesh A.A., Herzog J.B.

✓ **خلاصه پژوهش:**

The nanomasking fabrication technique has been shown to be capable of producing many sub-10 nm gaps between metallic structures over a wafer-scale area. This provides the opportunity to utilize the technique in spectroscopy signal enhancement applications. Here we describe a device designed via nanomasking that holds potential as a surface enhanced Raman spectroscopy (SERS) substrate for biosensing or other applications. The high density of plasmonic hotspot nanogaps improves the feasibility of these types of patterns for signal enhancement, as it provides ease of use and increased speed of sample deposition for taking spectrum. The ability to fabricate these patterns with high repeatability at mass production scale is another benefit of nanomasking-fabricated spectroscopy substrates. This work demonstrates tests of fabricated devices for use in a custom Raman spectroscopy system as a potential source of signal enhancement. Also, theoretical enhancement results are calculated for comparison via computational electromagnetic studies. © 2016 SPIE.

✓ **لینک** DOI (**استفاده برای دانلود مقاله**)

10.1117/12.2213086

✓ **نام ژورنال:**

Proceedings of SPIE - The International Society for Optical Engineering

✓ **سال انتشار:**

2016

✓ **کلیدواژه‌ها:**

nanofabrication; nanogap; Plasmon; plasmonic enhancement; Raman; scalable nano; SERS; sub-10nm

TEKSAN Detect Precisely

✓ **عنوان پژوهش:**

Targeting biological sensing with commercial SERS substrates

✓ **نویسندگان:**

Farrell M.E., Singamaneni S., Pellegrino P.M.

✓ **خلاصه پژوهش:**

There is an increasing need for rapid and accurate detection, identification, and quantification of chemical, biological, and energetic hazards in many fields of interest. To meet these challenges, researchers are combining spectroscopy with nanoscale platforms to create technologies that offer viable and novel solutions for today's sensing needs. One technology that has gained increasing popularity to meet these needs is surface enhanced Raman scattering (SERS). For ideal SERS sensing, commercially available uniform and reproducible nanoscale surface demonstrating high sensitivity are desirable. If these surfaces can be modified for the selective sensing of hazard materials, an ideal sensor platform for dynamic in field measurements can be imagined. In this proceedings paper, preliminary efforts towards the characterization and application of commercially available next generation Klarite substrates will be demonstrated and efforts towards selective sensing will be discussed. © 2012 SPIE.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1117/12.917312

✓ **نام ژورنال:**

Proceedings of SPIE - The International Society for Optical Engineering

✓ **سال انتشار:**

2012

✓ **کلیدواژه‌ها:**

biological; biomimetic; chemical; detection; peptide; Raman; sensor; SERS

✓ **عنوان پژوهش:**

The "Forbidden Zone for Sleep" might be caused by the evening thyrotropin surge and its biological purpose is to enhance survival: A hypothesis [A "Zona Proibida para o Sono" pode ser causada pela elevação ao anoitecer dos níveis de tireoptropina e sua finalidade biológica é aumentar a sobrevivência: Uma hipótese]

✓ **نویسندگان:**

Pereira Jr. J.C., Alves R.C.

✓ **خلاصه پژوهش:**

It is possible for normal subjects to fall asleep during daytime wakefulness, and the propensity for daytime sleep varies being high in the mid-afternoon and lower in the early evening 2 or 3 hours before overnight sleep onset. This lowering of propensity for sleep in the few hours that precede overnight sleep is a paradoxical phenomenon termed the "Forbidden Zone for Sleep" or "Wake Maintenance Zone". During the day, thyrotropin levels, which reflect the activity of the hypothalamus- pituitary-thyroid axis, oscillate in a predictable rhythm: lower levels during afternoon and higher levels during the early evening Forbidden Zone for Sleep. The steep increase in thyrotropin levels in the early evening is called the "thyrotropin-evening-surge", with the higher levels just before overnight sleep onset. Thereafter thyrotropin levels decrease over the rest of the night reaching their low daytime levels. Considering the well-known role of the thyroid in vigilance and alertness, we propose that the negative correlation between thyrotropin levels and propensity to sleep is not a coincidence. Assuming that the circadian rhythms of any species are turned to facilitate survival, we propose that the Forbidden Zone for Sleep is an inherent part of the human circadian rhythm increases biological fitness. In this article, a medical hypothesis, we present evidence that in human's circadian rhythms the Forbidden Zone for Sleep is secondary to the thyrotropin evening surge.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

✓ **نام ژورنال:**

Sleep Science

✓ **سال انتشار:**

2011

✓ **کلیدواژه‌ها:**

Circadian rhythm; Receptors; Sleep disorders; Sleep-wake transition disorders; Thyroid hormones; Thyrotropin

✓ **عنوان پژوهش:**

SER recommendations on the use of biological drugs in primary Sjögren's syndrome [Recomendaciones SER sobre la utilización de fármacos biológicos en el síndrome de Sjögren primario]

✓ **نویسندگان:**

Andréu Sánchez J.L., Fernández Castro M., del Campo Fontecha P.D., Corominas H., Narváez García F.J., Gómez de Salazar J.R., Rua-Figueroa Í., Abad Hernández M.Á., Álvarez Rivas M.N., Montes J.D.P., Francisco Hernández F.M., Gantes Pedraza M.Á., Greco Merino M.G., Hernández M.V., Navarro Compán M.V., Solarte J.A.P., Romero Bueno F.I., Park H.S., Sivera Mascaró F.

✓ **خلاصه پژوهش:**

Objective: To formulate SER recommendations for the use of biological agents in primary Sjögren's syndrome (pSS). Methods: Relevant clinical research questions were identified on the use of biological agents in pSS. The clinical questions were reformulated into 4 PICO questions. A search strategy was designed and a review of the scientific evidence of studies published until May 2017 was carried out. The scientific evidence available was systematically reviewed. The overall level of scientific evidence was assessed using the SIGN evidence levels. After that, specific recommendations were made. Results: Rituximab is recommended as the biological agent of choice for extraglandular manifestations refractory to conventional treatment. The use of anti-TNF agents is discouraged. The scientific evidence with belimumab and abatacept is scarce, so they should be considered only in cases refractory to rituximab. Conclusions: Rituximab is the biological agent of choice in severe extraglandular manifestations of pSS. Belimumab or abatacept may be useful in selected cases. © 2018 Elsevier España, S.L.U. and Sociedad Española de Reumatología y Colegio Mexicano de Reumatología

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1016/j.reuma.2018.10.014

✓ **نام ژورنال:**

Reumatologia Clinica

✓ **سال انتشار:**

2019

✓ **کلیدواژه‌ها:**

Abatacept; Belimumab; Biological therapy; Etanercept; Infliximab; Recommendations; Rituximab; Sjögren's syndrome; Spanish Society of Rheumatology; Tocilizumab

✓ **عنوان پژوهش:**

Fabrication of novel biological substrate based on photolithographic process for surface enhanced Raman spectroscopy

✓ **نویسندگان:**

Zou Q., Mo S., Pei X., Wang Y., Xue T., Mayilamu M., Qin G.

✓ **خلاصه پژوهش:**

In this paper, a novel surface-enhanced Raman scattering (SERS) substrate based on Integrated Circuit (IC) process was designed, using photolithography, etching and other processes on the silicon wafer processing. Its surface morphology and Raman activity were characterized and tested. The relationship between the substrate's photolithographic pattern and its Raman activity, stability and reproducibility has been analyzed and verified, and some suggestions for improvement of processing steps were given. This substrate can be used for the detection of biological proteins and provides a powerful research tool for life science and analytical chemistry research. © 2018 Author(s).

✓ **لینک** DOI (**استفاده برای دانلود مقاله**)

10.1063/1.5039600

✓ **نام ژورنال:**

AIP Advances

✓ **سال انتشار:**

2018

✓ **کلیدواژه‌ها:**

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Fabrication of Silver Chevron Arrays as an Efficient and Stable SERS Substrate: Implications in Biological Sensing

✓ **نویسندگان:**

Yarbakht M., Nikkhah M., Moshaii A., Abbasian S., Dellith A.

✓ **خلاصه پژوهش:**

Although glancing angle deposited silver substrates offer an excellent figures for surface enhanced Raman scattering (SERS) sensing, the chemical instability issues of silver substrates upon exposure to the aqueous solutions is still challenging and limits their application in SERS-based biosensors. In this context, we applied and compared two different strategies including sodium citrate as a self-assembled monolayer (SAM), and thermal deposition of gold at different thicknesses to stabilize the silver chevron arrays deposited by the glancing angle deposition method. Although optical characterization confirms good stabilization in both strategies, intact morphological features can only be detected after gold coating compared to sodium citrate coating which makes a homogenous monolayer on the surface. Furthermore, the SERS intensity of Rhodamine B increases after these coating processes, which might be due to the less oxidation and deformation of the nanostructures on the substrate or improved attachment of the analyte to the substrates. This research can extend our knowledge for the development of stable and reproducible SERS substrates in the field of biological sensing. © 2017, Springer Science+Business Media New York.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1007/s11468-017-0564-7

✓ **نام ژورنال:**

Plasmonics

✓ **سال انتشار:**

2018

✓ **کلیدواژه‌ها:**

Glancing angle deposition; Plasmonic; SERS substrates; Surface enhanced Raman spectroscopy

TEKSAN Detect Precisely

✓ **عنوان پژوهش:**

Robust SERS spectral analysis for quantitative detection of pycocyanin in biological fluids

✓ **نویسندگان:**

Nguyen C., Thrift W., Bhattacharjee A., Whiteson K., Hochbaum A., Ragan R.

✓ **خلاصه پژوهش:**

We demonstrate the advantage of using machine learning for surface enhanced Raman scattering (SERS) spectral analysis for quantitative detection of pyocyanin in Luria-Bertani media. Planar Au nanoparticle clusters were selfassembled on PS-b-PMMA diblock copolymer template using EDC crosslinking chemistry and electrohydrodynamic flow to fabricate SERS substrates. Resulting substrates produce uniform SERS response over large area with signal relative standard deviation of 10.8 % over 50 μm × 50 μm region. Taking advantage of the uniformity, 400 SERS spectra were collected at each pyocyanin concentration as training dataset. Tracking the intensity of pyocyanin 1350 cm-1 vibrational band shows linear regime beginning at 10 ppb. PLS analysis was also performed on the same training dataset. Without being explicitly "told" which spectrum to look for, PLS analysis recognizes the SERS spectrum of pyocyanin as its first loading vector even in the presence of other molecules in LB media. PLS regression enables quantitative detection at 1 ppb, 1 order of magnitude earlier than univariate regression. We hope this work will fuel a push toward wider adoption of more sophisticated machine learning algorithms for quantitative analysis of SERS spectra. © 2107 SPIE.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1117/12.2267958

✓ **نام ژورنال:**

Proceedings of SPIE - The International Society for Optical Engineering

✓ **سال انتشار:**

2017

✓ **کلیدواژه‌ها:**

biosensing; colloidal assembly; machine learning; metabolomics; plasmonics; self-assembly; surface enhanced Raman scattering

TEKSAN Detect Precisely

✓ **عنوان پژوهش:**

Biological sensing with surface-enhanced Raman spectroscopy (SERS) using a facile and rapid silver colloid-based synthesis technique

✓ **نویسندگان:**

Smyth C., Mehigan S., Rakovich Y.P., Bell S.E.J., McCabe E.M.

✓ **خلاصه پژوهش:**

Optical techniques towards the realisation of sensitive and selective biosensing platforms have received a considerable amount of attention in recent times. Techniques based on interferometry, surface plasmon resonance, field-effect transistors and waveguides have all proved popular, and in particular, spectroscopy offers a large range of options. Raman spectroscopy has always been viewed as an information rich technique in which the vibrational frequencies reveal a lot about the structure of a compound. The issue with Raman spectroscopy has traditionally been that its rather low cross section leads to poor limits-of-detection. In response to this problem, Surface-enhanced Raman Scattering (SERS), which increases sensitivity by bringing the sample in contact with many types of enhanceing substrates, has been developed. Here we discuss a facile and rapid technique for the detection of pterins using colloidal silver suspensions. Pteridine compounds are a family of biochemicals, heterocyclic in structure, and employed in nature as components of colour pigmentation and also as facilitators for many metabolic pathways, particularly those relating to the amino acid hydroxylases. In this work, xanthopterin, isoxanthopterin and 7,8-dihydrobiopterin have been examined whilst absorbed to SERS-active silver colloids. SERS, while far more sensitive than regular Raman spectroscopy, has its own issues relating to the reproducibility of substrates. In order to obtain quantitative data for the pteridine compounds mentioned above, exploratory studies of methods for introducing an internal standard for normalisation of the signals have been carried out.
© 2011 SPIE.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1117/12.876123

✓ **نام ژورنال:**

Progress in Biomedical Optics and Imaging - Proceedings of SPIE

✓ **سال انتشار:**

2011

✓ **کلیدواژه‌ها:**

✓ **عنوان پژوهش:**

Metallized ultrathin porous silicon membranes for biological sensing using SERS

✓ **نویسندگان:**

Shome K., Kavalenka M., Fang D.Z., Fauchet P.M.

✓ **خلاصه پژوهش:**

Ultrathin porous silicon membranes provide a novel platform for label free detection and identification of biological samples using SERS. A 15 nm thin gold metal film was deposited on top of a 30 nm thick porous silicon membrane to form a thin porous metallic film. 3D FDTD simulations show EM field enhancement inside the holes together with increased scattering and extinction cross sections, making this structure a novel SERS substrate. © 2010 Copyright SPIE - The International Society for Optical Engineering.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1117/12.848231

✓ **نام ژورنال:**

Progress in Biomedical Optics and Imaging - Proceedings of SPIE

✓ **سال انتشار:**

2010

✓ **کلیدواژه‌ها:**

Label free; Membranes; SERS

TEKSAN
Detect Precisely

✓ **عنوان پژوهش**:

Substitution of Ser-17 of pp60(c-src): Biological and biochemical characterization in chicken embryo fibroblasts

✓ **نویسندگان**:

Hirota Y., Kato J.-Y., Takeya T.

✓ **خلاصه پژوهش**:

[No abstract available]

✓ **لینک** DOI (**استفاده برای دانلود مقاله**)

10.1128/MCB.8.4.1826

✓ **نام ژورنال**:

Molecular and Cellular Biology

✓ **سال انتشار**:

1988

✓ **کلیدواژه‌ها**:

TEKSAN
Detect Precisely

✓ عنوان پژوهش:

Conjugates of gold nanoparticles and antitumor gold(III) complexes as a tool for their AFM and SERS detection in biological tissue

✓ نویسندگان:

Bondžić A.M., Leskovac A.R., Petrović S.Ž., Anićijević D.D.V., Luce M., Massai L., Generosi A., Paci B., Cricenti A., Messori L., Vasić V.M.

✓ خلاصه پژوهش:

Citrate-capped gold nanoparticles (AuNPs) were functionalized with three distinct antitumor gold(III) complexes, e.g., [Au(N,N)(OH)2][PF6], where (N,N)=2,2′-bipyridine; [Au(C,N)(AcO)2], where (C,N)=deprotonated 6-(1,1-dimethylbenzyl)-pyridine; [Au(C,N,N)(OH)][PF6], where (C,N,N)=deprotonated 6-(1,1-dimethylbenzyl)-2,2′-bipyridine, to assess the chance of tracking their subcellular distribution by atomic force microscopy (AFM), and surface enhanced Raman spectroscopy (SERS) techniques. An extensive physicochemical characterization of the formed conjugates was, thus, carried out by applying a variety of methods (density functional theory—DFT, UV/Vis spectrophotometry, AFM, Raman spectroscopy, and SERS). The resulting gold(III) complexes/AuNPs conjugates turned out to be pretty stable. Interestingly, they exhibited a dramatically increased resonance intensity in the Raman spectra induced by AuNPs. For testing the use of the functionalized AuNPs for biosensing, their distribution in the nuclear, cytosolic, and membrane cell fractions obtained from human lymphocytes was investigated by AFM and SERS. The conjugates were detected in the membrane and nuclear cell fractions but not in the cytosol. The AFM method confirmed that conjugates induced changes in the morphology and nanostructure of the membrane and nuclear fractions. The obtained results point out that the conjugates formed between AuNPs and gold(III) complexes may be used as a tool for tracking metallodrug distribution in the different cell fractions. © 2019 by the authors. Licensee MDPI, Basel, Switzerland.

✓ لینک DOI (استفاده برای دانلود مقاله)

10.3390/ijms20246306

✓ نام ژورنال:

International Journal of Molecular Sciences

✓ سال انتشار:

2019

✓ کلیدواژه‌ها:

AFM; AuNPs; Cell fractions; Conjugation; Gold(III) antitumor complexes; SERS

✓ **عنوان پژوهش:**

Probing lipids in biological membranes using SERS

✓ **نویسندگان:**

Nikelshparg E.I., Grivennikova V.G., Baizhumanov A.A., Semenova A.A., Sosnovtseva V., Goodilin E.A., Maksimov G.V., Brazhe N.A.

✓ **خلاصه پژوهش:**

A selective and sensitive experimental approach to the examination of lipids as well as lipid–protein interactions in biological membranes using surface-enhanced Raman spectroscopy has been proposed. This approach has been used for probing the intact mitochondria, membranes of erythrocyte ghosts and liposomes. © 2019

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1016/j.mencom.2019.11.009

✓ **نام ژورنال:**

Mendeleev Communications

✓ **سال انتشار:**

2019

✓ **کلیدواژه‌ها:**

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Detection of Saturated Fatty Acids Associated with a Self-Healing Synthetic Biological Membrane Using Fiber-Enhanced Surface Enhanced Raman Scattering

✓ **نویسندگان:**

Allen A.C., Romero-Mangado J., Adams S., Flynn M., Chen B., Zhang J.Z.

✓ **خلاصه پژوهش:**

The Synthetic Biological Membrane (SBM) project at NASA Ames developed a portable, self-repairing wastewater purification system. The self-repair process relies upon secreted fatty acids from a genetically engineered organism. However, solubilized fatty acids are difficult to detect using conventional methods. Surface-enhanced Raman scattering (SERS) was used to successfully detect solubilized fatty acids with the following limits of detection: 10-9, 10-8, 10-9, and 10-6 M for decanoic acid, myristic acid, palmitic acid, and stearic acid, respectively. Additionally, hollow core photonic crystal fiber (HCPCF) was applied as the sampling device together with SERS to develop in situ surveillance of the production of fatty acids. Using SERS + HCPCF yielded an 18-fold enhancement in SERS signal for the CH2 twist peak at 1295 cm-1 as compared to SERS alone. The results will help the SBM project to integrate a self-healing wastewater purification membrane into future water recycling systems. © 2018 American Chemical Society.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1021/acs.jpcb.8b06994

✓ **نام ژورنال:**

Journal of Physical Chemistry B

✓ **سال انتشار:**

2018

✓ **کلیدواژه‌ها:**

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Potential application of SERS for arsenic speciation in biological matrices

✓ **نویسندگان:**

Yang M., Matulis S., Boise L.H., McGoron A.J., Cai Y.

✓ **خلاصه پژوهش:**

Speciation of arsenic is usually carried out using chromatography-based methods coupled with spectroscopic determination; however, the inevitable procedures involving sample preparation and separation could potentially alter the integrity of the arsenic metabolites present in biological samples. Surface-enhanced Raman spectroscopy (SERS) could be a promising alternative for providing a reliable arsenic analysis under the influence of a cellular matrix. A method for arsenic speciation using SERS in cellular matrix was developed in this study and four arsenicals were selected, including arsenite (AsIII), arsenate (AsV), monomethylarsonic acid (MMAV) and dimethylarsinic acid (DMAV). Silver nanoparticles in the form of colliodal suspension with different surface charges, i.e., coated with citrate (AgNPs-Citrate) and spermine (AgNPs-Spermine) were employed as SERS substrates. Adsorption of arsenicals on nanoparticles in colloidal suspensions and the cellular matrix and the pH, size, and zeta potential of the colloidal suspensions were investigated for a better understanding of the SERS signal response of arsenicals in the colloidal suspensions or under the influence of cellular matrix. Arsenicals showed substantially different SERS responses in the two colloidal suspensions, mainly because of the distinct difference in the interaction between the arsenicals and the nanoparticles. Arsenic speciation in cell lysate could be successfully carried out in AgNPs-Spermine suspension, while AgNPs-Citrate could not yield significant SERS signals under the experimental conditions. This study proved that AgNPs-Spermine colloidal suspension could be a promising SERS substrate for studying arsenic metabolism in a biological matrix, reducing the bias caused by traditional techniques that involve sample extraction and pretreatment. © 2017, Springer-Verlag Berlin Heidelberg.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1007/s00216-017-0434-3

✓ **نام ژورنال:**

Analytical and Bioanalytical Chemistry

✓ **سال انتشار:**

2017

✓ **کلیدواژه‌ها:**

Arsenic; Cell lysate; Nanoparticles; SERS; Speciation

✓ **عنوان پژوهش:**

Nanoimprinted SERS Sensors for Chemical and Biological Detection

✓ **نویسندگان:**

Strack G., Fitzgerald M., Su J., Pelletier M.G.H., Gaines P., Sun H., Kurup P., Mosurkal R.

✓ **خلاصه پژوهش:**

Herein, we demonstrate a facile, rapid, and scalable method to fabricate polymer-based gratings for surface-enhanced Raman spectroscopy (SERS) sensors. To accomplish this, epoxy nanostripe arrays on silicon substrates were prepared using thermal annealing and UV-cross-linking. After preparation of the nanostripe arrays, the surface was briefly treated with oxygen plasma, which decreased the surface energy and enabled the growth of AgNPs on the polymer surface using a simple, low-cost, aqueous-based synthesis procedure. The SERS substrates exhibited a detection limit of ~1 pM using rhodamine 6G (R6G). In addition, preliminary work with E. coli DH5 showed that the nanoimprinted substrates can be used to obtain Raman spectra of washed bacteria cells. © Copyright 2017 Materials Research Society.

✓ **لینک** DOI **(استفاده برای دانلود مقاله)**

10.1557/adv.2017.44

✓ **نام ژورنال:**

MRS Advances

✓ **سال انتشار:**

2017

✓ **کلیدواژه‌ها:**

biological; Raman spectroscopy; sensor

TEKSAN Detect Precisely

✓ عنوان پژوهش:

Rapid detection of Pseudomonas aeruginosa biomarkers in biological fluids using surface-enhanced Raman scattering

✓ نویسندگان:

Wu X., Chen J., Zhao Y., Zughaier S.M.

✓ خلاصه پژوهش:

Pseudomonas aeruginosa (PA) is an opportunistic pathogen that causes major infection not only in Cystic Fibrosis patients but also in chronic obstructive pulmonary disease and in critically ill patients in intensive care units. Successful antibiotic treatment of the infection relies on accurate and rapid identification of the infectious agents. Conventional microbiological detection methods usually take more than 3 days to obtain accurate results. We have developed a rapid diagnostic technique based on surface-enhanced Raman scattering to directly identify PA from biological fluids. P. aeruginosa strains, PAO1 and PA14, are cultured in lysogeny broth, and the SERS spectra of the broth show the signature Raman peaks from pyocyanin and pyoverdine, two major biomarkers that P. aeruginosa secretes during its growth, as well as lipopolysaccharides. This provides the evidence that the presence of these biomarkers can be used to indicate P. aeruginosa infection. A total of 22 clinical exhaled breath condensates (EBC) samples were obtained from subjects with CF disease and from non-CF healthy donors. SERS spectra of these EBC samples were obtained and further analyzed by both principle component analysis and partial least square-discriminant analysis (PLS-DA). PLS-DA can discriminate the samples with P. aeruginosa infection and the ones without P. aeruginosa infection at 99.3% sensitivity and 99.6% specificity. In addition, this technique can also discriminate samples from subject with CF disease and healthy donor with 97.5% sensitivity and 100% specificity. These results demonstrate the potential of using SERS of EBC samples as a rapid diagnostic tool to detect PA infection. © 2014 SPIE.

✓ لینک DOI (استفاده برای دانلود مقاله)

10.1117/12.2053156

✓ نام ژورنال:

Proceedings of SPIE - The International Society for Optical Engineering

✓ سال انتشار:

2014

✓ کلیدواژه‌ها:

Biomarker; Pseudomonas aeruginosa; Pyocyanin; Rapid detection; Silver nanorod arrays; Surface-enhanced Raman scattering

✓ **عنوان پژوهش:**

Army relevant biological hazards detection with commercial SERS substrates

✓ **نویسندگان:**

Farrell M.E., Pellegrino P.M.

✓ **خلاصه پژوهش:**

There is an increasing need and challenge for early rapid and accurate detection, identification, and quantification of chemical, biological, and energetic hazards in many fields of interest (e.g., medical, environmental, industrial, and defense applications). Increasingly to meet these challenges, researchers are turning to interdisciplinary approaches combining spectroscopy with nanoscale platforms to create technologies that offer viable and novel solutions for today's sensing needs. One technology that has gained increasing popularity to meet these needs is surface enhanced Raman scattering (SERS). SERS is particularly advantageous as it does not suffer from interferences from water, requires little to no sample preparation, is robust and can be used in numerous environments, is relatively insensitive to the wavelength of excitation employed and produces a narrow-band spectral signature unique to the molecular vibrations of the analyte. SERS enhancements (chemical and electromagnetic) are typically observed on metalized nanoscale roughened surfaces. For ideal SERS sensing, a commercially available uniform and reproducible nanoscale surface demonstrating high sensitivity are desirable. Additionally, if these surfaces can be modified for the selective sensing of hazard materials, an ideal sensor platform for dynamic in field measurements can be imagined. In this proceedings paper, preliminary efforts towards the characterization and application of commercially available next generation Klarite substrates will be demonstrated. Additionally, efforts toward chemical modification of these substrates, through peptide recognition elements, can be used for the targeted sensing of hazardous materials. © 2012 SPIE.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1117/12.929873

✓ **نام ژورنال:**

Proceedings of SPIE - The International Society for Optical Engineering

✓ **سال انتشار:**

2012

✓ **کلیدواژه‌ها:**

Anthrax; Biological; Biomimetic; Chemical; Detection; Peptide; Protective antigen; Raman; Sensor; SERS

✓ **عنوان پژوهش:**

Current progress on surface-enhanced raman scattering chemical/biological sensing

✓ **نویسندگان:**

Abell J.L., Driskell J.D., Tripp R.A., Zhaod Y.

✓ **خلاصه پژوهش:**

For several decades, surface-enhanced Raman scattering (SERS) has proven to be an extremely sensitivity detection technique with superior chemical specificity. Continuing advancements in nanostructure fabrication have dramatically advanced SERS capabilities as a powerful chemical and biological sensing platform. Despite this potential, to date SERS has yet to become a mainstream, commercially viable detection technology. This chapter highlights advancements in SERS-based biosensing techniques using silver nanorod (AgNR) substrates fabricated by oblique-angle deposition (OAD). Specifically, the superior features of highly sensitive and reproducible OAD-AgNR substrates for SERS sensing are discussed with an emphasis on biodetection applications. The chapter also covers the progress made towards realizing OAD as a versatile technique capable of future SERS-device development. In addition, the potential for OAD integration with traditional nanofabrication techniques and manufacturing processes to ultimately fulfill the need for a mainstream SERS technology is also discussed. Copyright © 2012 American Chemical Society.

✓ **لینک** DOI (**استفاده برای دانلود مقاله**)

10.1021/bk-2012-1113.ch010

✓ **نام ژورنال:**

ACS Symposium Series

✓ **سال انتشار:**

2012

✓ **کلیدواژه‌ها:**

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Surface-enhanced Raman scattering (SERS) detection for chemical and biological agents

✓ **نویسندگان:**

Yan F., Stokes D.L., Wabuyele M.B., Griffin G.D., Vass A.A., Vo-Dinh T.

✓ **خلاصه پژوهش:**

Surface-enhanced Raman scattering (SERS) spectra of chemical agent simulants such as dimethyl methylphonate (DMMP), pinacolyl methylphosphonate (PMP), diethyl phosphoramidate (DEPA), and 2-chloroethyl ethylsulfide (CEES), and biological agent simulants such as bacillus globigii (BG), erwinia herbicola (EH), and bacillus thuringiensis (BT) were obtained from silver oxide film-deposited substrates. Thin AgO films ranging in thickness from 50 nm to 250 nm were produced by chemical bath deposition onto glass slides. Further Raman intensity enhancements were noticed in UV irradiated surfaces due to photo-induced Ag nanocluster formation, which may provide a possible route to producing highly useful plasmonic sensors for the detection of chemical and biological agents upon visible light illumination.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1117/12.558478

✓ **نام ژورنال:**

Proceedings of SPIE - The International Society for Optical Engineering

✓ **سال انتشار:**

2004

✓ **کلیدواژه‌ها:**

Biological agent simulates; Chemical agent simulants; Metallic nanostructures; Plasmonic sensors; Silver nanoclusters; Surface-enhanced Raman scattering

✓ **عنوان پژوهش:**

Biological agent identification by nucleic acid base-pair analysis using surface-enhanced Raman spectroscopy

✓ **نویسندگان:**

Farquharson Stuart, Smith Wayne W., Elliott Susan, Sperry Jay F.

✓ **خلاصه پژوهش:**

Recently, a number of analytical methods have been successfully developed which use nucleic acid sequencing to identify biological warfare agents. However, the effectiveness of these methods, towards the safety and protection of US Armed Forces and their allies are limited by the period (6 to 24 hours) required to enumerate the nucleic acid through polymerase chain reactions or culture growth to produce sufficient quantities for analysis. To overcome this limitation, we have been investigating the ability of surface-enhanced Raman spectroscopy to detect nucleic acids with sufficient sensitivity and selectivity to eliminate the need for enumeration. The design of a small volume electrolytic sample cell will be presented along with analysis of the nucleic acid bases and preliminary analysis of model bacteria.

✓ **لینک** DOI **(استفاده برای دانلود مقاله)**

✓ **نام ژورنال:**

Proceedings of SPIE - The International Society for Optical Engineering

✓ **سال انتشار:**

1999

✓ **کلیدواژه‌ها:**

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Comparative biological activities of ANF (Arg 101 - Tyr 126) and the synthetic form of circulating ANF (Ser 99 - Tyr 126)

✓ **نویسندگان:**

Garcia R., Cantin M., Léan A., Genest J., Godin J., Gutkowska J., Schiffrin E.L., Thibault G.

✓ **خلاصه پژوهش:**

The biological activities of ANF (Arg 101 - Tyr 126) and of the circulating form, ANF (Ser 99 - Tyr 126), were compared in the following assays: precontracted rabbit aortic strip and chick rectum, rat natriuresis, inhibition of aldosterone secretion and receptor affinity in bovine and rat adrenal zona glomerulosa cells, and receptor affinity in rabbit aorta and rat mesenteric artery cells. The results demonstrate that both peptides share the same biological activities. It is concluded that the addition of two amino acids to the N-terminal of ANF (Arg 101 - Tyr 126) does not modify its biological characteristics, validating thus previous research employing this peptide. © 1986.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1016/0006-291X(86)91025-9

✓ **نام ژورنال:**

Biochemical and Biophysical Research Communications

✓ **سال انتشار:**

1986

✓ **کلیدواژه‌ها:**

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

A novel SERS biosensor for ultrasensitive detection of mercury(II) in complex biological samples

✓ **نویسندگان:**

Liu Q., Wu F., Di H., Bi Y., Meng M., Liu D., Yin Y., Xi R.

✓ **خلاصه پژوهش:**

Developing highly sensitive and specific method is essential for trace Hg2+ quantifying. Herein, we established a background-free surface-enhanced Raman scattering (SERS) platform which allows not only the detection of Hg2+ in homogeneous samples, but also high-precision profiling of Hg2+ distribution in zebrafish. Its superior anti-interference capability is due to the introduction of a high signal-to-noise-ratio (SNR) Raman reporter with an acetylenyl group, which present single nonoverlapping peak at 2125 cm−1, avoiding interference from other substances. Additionally, the specific recognition of Hg2+-bis-thymine complexes and the signal amplified hybridization chain reaction (HCR) were effectively utilized in this design. Benefited from the above strategies, a detection range for Hg2+ from 1.0 fM to 100 pM was achieved with a detection limit of 0.2 fM. Additionally, Raman imaging was first performed in zebrafish sections to study Hg2+ distribution which provided a reference for the detection of Hg2+ pollution in fish. This approach could be extended to target other interested analytes both in simple and biological samples for various purposes. © 2021

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1016/j.snb.2021.130934

✓ **نام ژورنال:**

Sensors and Actuators B: Chemical

✓ **سال انتشار:**

2022

✓ **کلیدواژه‌ها:**

Hybridization chain reaction (HCR); SERS; T-Hg2+-T structures; Zebrafish

✓ عنوان پژوهش:

Fabrication of low cost highly structured silver capped aluminium nanorods as SERS substrate for the detection of biological pathogens

✓ نویسندگان:

Das S., Goswami L.P., Gayathri J., Tiwari S., Saxena K., Mehta D.S.

✓ خلاصه پژوهش:

We report the fabrication of low cost highly structured silver (Ag) capped aluminium (Al) nanorods (NRs) as surface enhanced Raman spectroscopy (SERS) substrate utilising the glancing angle deposition technique. The nano-capping of silver onto the Al NRs can concentrate the local electric field within the minimal volume that can serve as hotspots. The average size of the Ag nanocaps was 50 nm. The newly proposed nanoporous Ag capped Al NRs as SERS substrate could detect the Raman signal of rhodamine 6G (R6G) up to 10-15 molar concentration. The significant enhancement in the Raman signal of 107 was achieved for Ag capped Al NRs considering R6G as a probe molecule. Using the developed SERS substrate, we recorded Raman spectra for Escherichia coli bacteria with its concentration varying from 108 colony forming units per ml (CFU ml-1) up to 102 CFU ml-1. All the reported Raman spectra were acquired by a portable handheld Raman spectrometer. Hence, this newly proposed low cost, effective SERS substrate can be used commercially for the onsite detection of clinical pathogens. The 3D finite difference time domain simulation model was performed for Ag capped Al nanostructure to understand the generation of hotspots. The simulated results show excellent agreement with the experimental results. We fabricated uncapped Ag nanorods of similar dimensions and performed the experimental measurements and simulations for comparison. We found a significant enhancement in Ag capped Al NRs compared to the long Ag NRs. The description of the Raman signal enhancement has been elaborated. © 2021 IOP Publishing Ltd.

✓ لینک DOI (استفاده برای دانلود مقاله)

10.1088/1361-6528/ac2097

✓ نام ژورنال:

Nanotechnology

✓ سال انتشار:

2021

✓ کلیدواژه‌ها:

detection of E. coli; glancing angle deposition (GLAD); plasmonic enhancement; SERS substrate; silver capped Al nano-rods; surface enhanced Raman scattering

✓ عنوان پژوهش:

Development of a prototype device for near real-time surface-enhanced Raman scattering monitoring of biological samples

✓ نویسندگان:

Dumont E., De Bleye C., Rademaker G., Coïc L., Horne J., Sacré P.-Y., Peulen O., Hubert P., Ziemons E.

✓ خلاصه پژوهش:

With the fast growth of bioanalytical surface-enhanced Raman scattering (SERS), analytical methods have had to adapt to the complex nature of biological samples. In particular, interfering species and protein adsorption onto the SERS substrates have been addressed by sample preparation steps, such as precipitation or extraction, and by smart SERS substrate functionalisation. These additional handling steps however result in irreversible sample alteration, which in turn prevents sample monitoring over time. A new methodology, that enables near real-time, non-invasive and non-destructive SERS monitoring of biological samples, is therefore proposed. It combines solid SERS substrates, benefitting from liquid immersion resistance for extended periods of time, with an original protein filtering device and an on-field detection by means of a handheld Raman analyser. The protein removal device aims at avoiding protein surface fouling on the SERS substrate. It consists of an ultracentrifugation membrane fixed under a cell culture insert for multi-well plates. The inside of the insert is dedicated to containing biological samples. The solid SERS substrate and a simple medium, without any protein, are placed under the insert. By carefully selecting the membrane molecular weight cutoff, selective diffusion of small analytes through the device could be achieved whereas larger proteins were retained inside the insert. Non-invasive SERS spectral acquisition was then carried out through the bottom of the multi-well plate. The diffusion of a SERS probe, 2-mercaptopyridine, and of a neurotransmitter having a less intense SERS signal, serotonin, were first successfully monitored with the device. Then, the latter was applied to distinguish between subclones of cancerous cells through differences in metabolite production. This promising methodology showed a high level of versatility, together with the capability to reduce cellular stress and contamination hazards. © 2020 Elsevier B.V.

✓ لینک DOI (استفاده برای دانلود مقاله)

10.1016/j.talanta.2020.121866

✓ نام ژورنال:

Talanta

✓ سال انتشار:

2021

✓ کلیدواژه‌ها:

Biological samples; Handheld Raman spectrophotometer; Near real-time monitoring; Protein corona; Solid SERS substrates; Surface-enhanced Raman scattering (SERS)

✓ عنوان پژوهش:

Review of the application and mechanism of surface enhanced raman spectroscopy (sers) as biosensor for the study of biological and chemical analyzes

✓ نویسندگان:

Eskandari V., Hadi A.

✓ خلاصه پژوهش:

Raman spectroscopy is an important method for the identification of molecules that is widely used to determine the chemical and structural properties of various materials. Many materials have special Raman spectra so that this phenomenon can it has become an effective tool for studying the structural and chemical properties of molecules. Since Raman spectroscopy can provide accurate information on the chemical and structural properties of biological compounds, this method is used in the field of science. Vital and especially in biological and medical studies is rapidly expanding. Raman is inherently weak and sometimes masked by noise and fluorescence. As a result, the study of low-concentration molecules is not feasible and the need to amplify the Raman scattering signal is clearly felt. . One of the efficient methods for studying low and even single molecular concentrations is the Surface Enhanced Raman Scattering (SERS) method. It uses gold, silver, copper and noble metal nanoparticles to enhance the Raman scattering signal. . SERS has been rapidly expanding over the past four decades, as applications for recognition in the fields of chemistry, materials sciences, biochemistry and biosciences are rapidly expanding. Advances in the manufacture of SERS-based biosensors are a major breakthrough in the detection of biological materials in which the electromagnetic field (effect) molecule is affected by the external field, this larger substitute field due to electromagnetic resonance near the metal surface is formed. Mechanisms of electromagnetic field (field effect) amplifiers mainly contribute to the development of SERS, which includes the study of detection performance, direct and indirect fabrication methods for the identification of biological and chemical analytes, Applications of biosensors, amplifiers, and SERS-based biosensor structures to detect biomolecules are briefly described. © 2020 University of Tehran. All rights reserved.

✓ لینک DOI (استفاده برای دانلود مقاله)

10.22059/JCAMECH.2020.307294.540

✓ نام ژورنال:

Journal of Computational Applied Mechanics

✓ سال انتشار:

2020

✓ کلیدواژه‌ها:

Biological analytes; Biological Nano-Sensor; Chemicals; Metal Nanoparticles; Surface Enhanced Raman Spectroscopy (SERS)

✓ **عنوان پژوهش:**

Effective SERS method for identification of dexmedetomidine hydrochloride in biological samples

✓ **نویسندگان:**

Han S., Zhang C., Sha X., Li N., Hasi W., Zhang Y.

✓ **خلاصه پژوهش:**

In recent years, the abuse of dexmedetomidine hydrochloride (DH) in various criminal cases has increased demand for the rapid and effective supervision and determination of DH. In this paper, based on the SERS method, DH in aqueous solution, urine and serum was effectively and sensitively detected. On the basis of density functional theory (DFT), the Raman peaks of DH were identified by systematic calculation. The SERS performance for the measurement of DH was compared between Ag colloid and paper-based substrate. It was found that Ag colloid together with KI as an aggregator was equipped with better SERS behavior and could thus be applied in the analysis of DH in biological samples. Furthermore, with simple pre-treatment, DH in urine and serum were successfully determined with detection limits down to 10 μg mL-1 and 12 μg mL-1, respectively. The linear relationships between the characteristic peak intensity and the concentration of DH in urine and serum were established and the recovery rates were calculated with low relative standard deviation (RSD). This fast, accurate and non-destructive SERS method lays a reliable foundation for rapid on-site detection of DH. © 2020 The Royal Society of Chemistry.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1039/d0ay00019a

✓ **نام ژورنال:**

Analytical Methods

✓ **سال انتشار:**

2020

✓ **کلیدواژه‌ها:**

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Nanoengineered capsules for selective SERS analysis of biological samples

✓ **نویسندگان:**

You Y.-H., Schechinger M., Locke A., Coté G., McShane M.

✓ **خلاصه پژوهش:**

Metal nanoparticles conjugated with DNA oligomers have been intensively studied for a variety of applications, including optical diagnostics. Assays based on aggregation of DNA-coated particles in proportion to the concentration of target analyte have not been widely adopted for clinical analysis, however, largely due to the nonspecific responses observed in complex biofluids. While sample pre-preparation such as dialysis is helpful to enable selective sensing, here we sought to prove that assay encapsulation in hollow microcapsules could remove this requirement and thereby facilitate more rapid analysis on complex samples. Gold nanoparticle-based assays were incorporated into capsules comprising polyelectrolyte multilayer (PEMs), and the response to small molecule targets and larger proteins were compared. Gold nanoparticles were able to selectively sense small Raman dyes (Rhodamine 6G) in the presence of large protein molecules (BSA) when encapsulated. A ratiometric based microRNA-17 sensing assay exhibited drastic reduction in response after encapsulation, with statistically-significant relative Raman intensity changes only at a microRNA-17 concentration of 10 nM compared to a range of 0-500 nM for the corresponding solution-phase response. © COPYRIGHT SPIE. Downloading of the abstract is permitted for personal use only.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1117/12.2290572

✓ **نام ژورنال:**

Progress in Biomedical Optics and Imaging - Proceedings of SPIE

✓ **سال انتشار:**

2018

✓ **کلیدواژه‌ها:**

And microRNA-17; DNA oligomers; Metal nanoparticles; microcapsules; Point of Care (POC); Polyelectrolyte Multilayers (PEMs); Surface Enhanced Raman Spectroscopy (SERS)

TEKSAN Detect Precisely

✓ **عنوان پژوهش:**

Controlled surface enhanced resonance raman scattering (SERRS) in biological environment

✓ **نویسندگان:**

Lai Y., Li F., Sun S.

✓ **خلاصه پژوهش:**

We report here the use of gold nanoparticle (AuNP) and gold nanostar (AuNS) assemblies modified with oligonucleotides for the detection of target DNA molecules through SERRS. SERS activities of assmblies consisted of 16 nmAuNPs, 30nm AuNSs and 100nm AuNSs were compared. Interaction of localized surface plasmon resonance (LSPR) of AuNP and AuNS assemblies were controlled through adjusting the distance between AuNPs/AuNSs which were realized by varying the length of oligonucleotide with various base sequence. Raman spectroscopies were measured with excitation wavelength of 633 nm. It was found that stronger Raman signal was recorded when AuNSs were used while weaker signals were obtained with AuNPs. This may attribute to AuNSs has tip-enhancement effect while AuNPs has no tips on surface, and AuNSs DNA probes can easily detect 10 nM target DNA. We also found that the Raman signal being stronger when the distance between nanoparticles is ~3 nm than that of ~6 nm and ~12 nm. We envisage this study will achieve further insight into the mechanism of SERRS and provide a general approach for the ultrasensitive detection of biomolecules based on SERRS.
Copyright © Taylor & Francis Group, LLC.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1080/10584587.2013.789736

✓ **نام ژورنال:**

Integrated Ferroelectrics

✓ **سال انتشار:**

2013

✓ **کلیدواژه‌ها:**

Au Nanoparticle; Au nanostar; Oligonucleotide; SERRS

✓ **عنوان پژوهش:**

Difficulties in the process of negotiation of the Convention for the Protection of Human Rights and Dignity the Human Being with regard to the application of Biology and Medicine (and a call to accession) [Dificultades del proceso de negociación de la Convención para la Protección de los Derechos Humanos y la Dignidad del Ser Humano con respecto a las aplicaciones de la Biología y la Medicina (y un llamado a su adhesión)]

✓ **نویسندگان:**

Ulloa J.A.

✓ **خلاصه پژوهش:**

Making an attempt to frame the controversial topic of bioethics within international law and with the aim of watching over the society, the Council of Europe elaborated the Convention for the Protection of Human Rights and Dignity of the Human Being with regard to the application of biology and medicine. The instrument, which came into force 12 years ago, is opened to all countries but only 29 states have ratified it. This legal document represents the base of a universal legislation on the subject. The present article examines the origin of the Convention, its process and evolution. It analyses the intense debates with regard to the human dignity, the freedom of science, the beginning of life, among others; equally it explores the interests at stake within the convention, whether political, moral, scientific, and economic, at the moment of its draft and in the present. Finally, the article analyses the possibility of the adoption of the Convention by the Mexican government. It concludes on the effectiveness of the international law of bioethics, and calls for the need that the Convention be used as a base for universal legislation.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

✓ **نام ژورنال:**

Gaceta Medica de Mexico

✓ **سال انتشار:**

2012

✓ **کلیدواژه‌ها:**

Bioethics. Law; Interests at stake; International convention; Values negotiation

✓ **عنوان پژوهش:**

Development of plasmonics-active SERS substrates on a wafer scale for chemical and biological sensing applications

✓ **نویسندگان:**

Dhawan A., Du Y., Wang H., Leonard D., Misra V., Ozturk M., Gerhold M., Vo-Dinh T.

✓ **خلاصه پژوهش:**

This paper describes the fabrication of highly efficient plasmonics-active SERS substrates - having metallic nanowire structures with pointed geometries and sub-5 nm gap between the metallic nanowires enabling concentration of high EM fields in these regions - on a wafer-scale by a reproducible process that is compatible with large-scale development of these substrates. These SERS substrates were employed for detecting chemical and biological molecules of interest.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1109/IEDM.2008.4796732

✓ **نام ژورنال:**

Technical Digest - International Electron Devices Meeting, IEDM

✓ **سال انتشار:**

2008

✓ **کلیدواژه‌ها:**

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Can the biologic pattern of cervicogenic headache change after overuse or withdrawal of the ergotamine derivatives? [O padrao biologico da cefaleia cervicogenica pode ser alterado pelo uso excessivo de ergotaminicos ou pela sua retirada?]

✓ **نویسندگان:**

Piovesan E.J., Kowacs P.A., Lange M.C., Tatsui C.E., Werneck L.C.

✓ **خلاصه پژوهش:**

The transformation of a primary headache into a chronic daily headache (CDH) may or may not be related to the overuse of painkillers, as their influence on the pathophysiological mechanisms remain inconclusive. We describe three patients (female, aged 65 and 39 years, and male, 46) affected by cervicogenic headache (CH) and CDH linked to the overuse of painkillers (ergotamine derivatives) that were submitted to the infiltration of the greater occipital nerve (GON). At the end of three days of treatment, a total improvement of the pain symptoms was recorded, which allowed for the withdrawal of the ergotamine derivatives. The CH cannot be ranked with the CDHs, since it presents an organic etiology; however, if the pain is daily and the diagnosis is belated, the indiscriminate and excessive use painkillers may occur. In the cases described, the overuse of painkillers did not affect the natural evolution of this headache after treatment with the infiltration of the GON, as all the patients who underwent infiltration showed a total improvement of their painful symptoms, without headache resulting from the withdrawal of painkillers, nor did they show any pharmacological dependence. This is an evidence that the CH presents and organic etiology, not being influenced in its pathophysiology by the overuse of ergotamine derivatives.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1590/s0004-282x2000000200022

✓ **نام ژورنال:**

Arquivos de Neuro-Psiquiatria

✓ **سال انتشار:**

2000

✓ **کلیدواژه‌ها:**

Cervicogenic headache; Overuse; Painkillers; Treatment

✓ **عنوان پژوهش:**

Biological Activities of Analogues of Ser-Val-Gly-Glu (AS-I), a Toxin Pathogenic to Sunflower

✓ **نویسندگان:**

Liakopoulou-Kyriakides M., Metaxas A., Sarigiannis Y., Magafa V., Stavropoulos G., Laidou I., Thanassoulopoulos C.C.

✓ **خلاصه پژوهش:**

The tetrapeptides Ser-Val-Glu-Gly, Hse-Val-Gly-Glu, Thr-Val-Gly-Glu, Val-Ser-Gly-Glu and Ser-Val-Glu-Gly, analogues of the AS-I toxin which is pathogenic to sunflower, were examined for biological activity on sunflower and eight other plant species. These peptides were synthesized in solution or on a solid phase. Of the species studied by leaf inoculation, sunflower and zucchini were the most susceptible and cotton the most resistant to all of the toxins tested. The effect of Ser-Val-Glu-Gly was similar to that reported for AS-I, whereas the tetrapeptide Thr-Val-Gly-Glu was the most toxic.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1111/j.1439-0434.1998.tb04691.x

✓ **نام ژورنال:**

Journal of Phytopathology

✓ **سال انتشار:**

1998

✓ **کلیدواژه‌ها:**

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Recent advances in plasmonic Prussian blue-based SERS nanotags for biological application

✓ **نویسندگان:**

Liu Y.-Q., Zhu W., Hu J.-M., Shen A.-G.

✓ **خلاصه پژوهش:**

The reliability and reproducibility of surface-enhanced Raman scattering (SERS) technology is still a great challenge in bio-related analysis. Prussian blue (PB)-based SERS tags have attracted increasing interest for improving these deficiencies due to its unique Raman band (near 2156 cm−1) in the Raman-silent region, providing zero-background bio-Raman labels without interference from endogenous biomolecules. Moreover, the stable PB shell consisting of multiple layers of CN−reporters ensure a stable and strong Raman signal output, avoiding the desorption of the Raman reporter from the plasmonic region by the competitive adsorption of the analyte. More importantly, they possess outstanding multiplexing potential in biological analysis owing to the adjustable Raman shift with unique narrow spectral widths. Despite more attention having been attracted to the structure and preparation of PB-based SERS tags for their better biological applications over the past five years, there is still a great challenge for SERS suitable for applications in the actual environment. The biological applications of PB-based SERS tags are comprehensively recounted in this minireview, mainly focusing on quantification analysis, multiple-spectral analysis and cell-imaging joint phototherapy. The prospects of PB-based SERS tags in clinical diagnosis and treatment are also discussed. This review aims to draw attention to the importance of SERS tags and provide a reference for the design and application of PB-based SERS tags in future bio-applications. © The Royal Society of Chemistry 2021.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1039/d1na00464f

✓ **نام ژورنال:**

Nanoscale Advances

✓ **سال انتشار:**

2021

✓ **کلیدواژه‌ها:**

✓ **عنوان پژوهش:**

Recent progress of sers nanoprobe for ph detecting and its application in biological imaging

✓ **نویسندگان:**

Zhang L., Zhao Q., Jiang Z., Shen J., Wu W., Liu X., Fan Q., Huang W.

✓ **خلاصه پژوهش:**

As pH value almost affects the function of cells and organisms in all aspects, in biology, biochemical and many other research fields, it is necessary to apply simple, intuitive, sensitive, stable detection of pH and base characteristics inside and outside the cell. Therefore, many research groups have explored the design and application of pH probes based on surface enhanced Raman scattering (SERS). In this review article, we discussed the basic theoretical background of explaining the working mechanism of pH SERS sensors, and also briefly described the significance of cell pH measurement, and simply classified and summarized the factors that affected the performance of pH SERS probes. Some applications of pH probes based on surface enhanced Raman scattering in intracellular and extracellular pH imaging and the combination of other analytical detection techniques are described. Finally, the development prospect of this field is presented. © 2021 by the authors. Licensee MDPI, Basel, Switzerland.

✓ **لینک** DOI (**استفاده برای دانلود مقاله**)

10.3390/bios11080282

✓ **نام ژورنال:**

Biosensors

✓ **سال انتشار:**

2021

✓ **کلیدواژه‌ها:**

Detection; Imaging; PH; Probe; SERS

TEKSAN Detect Precisely

✓ عنوان پژوهش:

Silver nanoparticle aggregates: Wavelength dependence of their SERS properties in the first transparency window of biological tissues

✓ نویسندگان:

Pilot R., Massari M.

✓ خلاصه پژوهش:

Silver nanoparticle aggregates are very common substrates for surface enhanced Raman scattering (SERS) due to their simplicity of preparation and good optical enhancement. In this paper, their SERS properties are investigated from 680 to 920 nm, region that spans most of the first transparency window of biological tissues. Our experiments show that the SERS enhancement extends as far as 920 nm, without a significant wavelength dependence: the observed very broad optical response has been interpreted with the formation of large sized aggregates, possibly possessing a partial fractal character. On the other hand, the SERS signal, normalized by the laser power and by the integration time, quickly diminishes from 680 to 920 nm. This happens because the SERS signal depends on the enhancement but also on the instrument sensitivity and on the molecular cross section: for dispersive Raman instruments equipped with silicon CCD detectors and for non resonant molecules, these two parameters tend to diminish towards longer excitation wavelengths. The relevance of these results is twofold. a) Simple silver nanoparticle aggregates are good plasmonic substrates in most of the spectral region in which biological tissues present low absorption. b) The enhancement of the substrate and the normalized SERS signal (that is related to the limit of detection) are not necessarily correlated: they carry complementary pieces of information, both needed for properly designing a SERS experiment. © 2021 The Authors

✓ لینک DOI (استفاده برای دانلود مقاله)

10.1016/j.chphi.2021.100014

✓ نام ژورنال:

Chemical Physics Impact

✓ سال انتشار:

2021

✓ کلیدواژه‌ها:

Aggregates; Raman; SERS; Silver nanoparticles; Surface enhanced

✓ **عنوان پژوهش:**

Is the electrochemical or the “green chemistry” method the optimal method for the synthesis of ZnO nanoparticles for applications to biological material? Characterization and SERS on ZnO

✓ **نویسندگان:**

Proniewicza E., Tąta A., Starowicz M., Wójcik A., Pacek J., Molenda M.

✓ **خلاصه پژوهش:**

This work developed ecological procedures for the synthesis of stable, uniform, and pure ZnO nanoparticles for biological and medical applications. Nanoparticles were synthesized on two synthesis pathways: (i.) electrochemical zinc dissolution in a solution free of surfactants (ZnONPs) and (ii.) from banana skin (ZnONPs-GS) by a green synthesis – a cheap method that allows efficient use of waste from plant products. ATR-FTIR, Raman, and UV-Vis confirmed the formation of ZnO nanoparticles. XRD showed a high crystalline hexagonal structure, whereas TEM and DLS confirmed that nanoparticles are pure, well dispersed, and have a rather uniform size and spherical shape. ZnO nanoparticles were evaluated for their ability to adsorb selected amino acids and to promote the SERS effect. SERS spectra on the surface of ZnO nanoparticles were compared with SERS spectra on the surface of Zn. The obtained data show that (i.) with the use of specific marker bands SERS allows us to distinguish between amino acids and to determine the state of zinc surfaces (distinguish between Zn and ZnONPS and ZnONPs-GS), (ii.) ZnONPs-GS obtained from “green chemistry” are more friendly to biological material than those obtained using the electrochemical method because their surface is free from hydroxyl groups, which easily form reactive oxygen species, and (iii.) considering the view in the literature that metal surface type and metal roughness/nanoparticle size influence adsorption, the obtained results supplement the current understanding of amino acid adsorption on various metal surfaces. © 2020 The Author(s)

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1016/j.colsurfa.2020.125771

✓ **نام ژورنال:**

Colloids and Surfaces A: Physicochemical and Engineering Aspects

✓ **سال انتشار:**

2021

✓ **کلیدواژه‌ها:**

adsorption at solid/liquid interface; amino acids; electrochemical dissolution of zinc; green synthesis; surface-enhanced Raman scattering, SERS; zinc oxide nanoparticles, ZnONPs

✓ **عنوان پژوهش:**

Ultrasensitive surface-enhanced Raman scattering detection of biological pollutants by controlled evaporation on omniphobic substrates

✓ **نویسندگان:**

Mehta M., Waterland M.

✓ **خلاصه پژوهش:**

A simple and highly sensitive method, combining slippery liquid-infused porous substrates and surface-enhanced Raman spectroscopy (SLIPSERS) was used to detect biological pollutants at very low concentrations. Two commonly used rodenticides (brodifacoum and sodium monofluoroacetate) with long biological half-lives were selected as analytes. The SLIPSERS platform gives reproducible SERS enhancement and this allows “label-free” SERS detection of these environmental pollutants. Analyte ions were detected down to a concentration of 10−14 M for brodifacoum and 10−9 M for sodium monofluoroacetate. The limit of detection, limit of quantification and limit of linearity for brodifacoum are 10−12 M, 10−10 M and 10−6 M respectively. The SLIPSERS method uses a physical process to significantly increase analyte concentration, and SERS enhancement and therefore can be generally applied to a range of environmental pollutants. The method can be successfully used for ultra-sensitive detection of several chemical and biological contaminants and meet the emerging needs of environmental monitoring and food safety analysis. © 2020Analytical chemistry, Surface-enhanced Raman scattering; Biological pollutants; Brodifacoum; Sodium monofluoroacetate; Omniphobic surface. © 2020

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1016/j.heliyon.2020.e04317

✓ **نام ژورنال:**

Heliyon

✓ **سال انتشار:**

2020

✓ **کلیدواژه‌ها:**

Analytical chemistry; Biological pollutants; Brodifacoum; Omniphobic surface; Sodium monofluoroacetate; Surface-enhanced Raman scattering

✓ **عنوان پژوهش:**

Application of label-free SERS and EC-SERS for detection of traces of drugs in biological fluids.

✓ **نویسندگان:**

Velicka M., Adomaviciute S., Zacharovas E., Sablinskas V.

✓ **خلاصه پژوهش:**

Nowadays, with various available choices of non-prescription medication it is quite easy when under illness instead advising with the specialist to self-medicate and try different types of pharmaceuticals at once in order to save time or money. Such unguided or incorrect self-diagnosis of one's health often results in overdose and other serious health risks. In these cases when such life threatening events occur it is of the most importance to apply early medical treatment. However, specific treatment can be only chosen when the species of pharmaceutical is known. Thus, in order to prevent serious outcomes it is necessary to have a tool which would allow to diagnose the type of drug that was used as soon as possible. The fastest way to gather the required information is to analyze chemically biofluids like blood, saliva or etc. since the pharmaceuticals or their metabolites are contained and transported via biofluids. But the concentration of the molecules to detect is often very low thus the technique not only should be fast but also very sensitive. Of course, there are several clinically available drug screening methods which have already been used for decades and can identify chemical constituents with high sensitivity. Even though such conventional clinically used drug screening methods like liquid chromatography and mass spectroscopy, are sensitive enough, the sample preparation procedure and analysis is not easy and take time. Faster methods would be beneficial and could help avoid serious complications of unguided selfmedication. Vibrational spectroscopy is known to be a reliable tool for chemical composition and structure analysis. Be that as it may, the sensitivity of the conventional vibrational spectroscopy techniques is not sufficient for the detection of trace amounts of molecules. Surface enhanced Raman scattering (SERS) spectroscopy - one of the unconventional methods of vibrational spectroscopy is known to be very sensitive and chemically specific thus suitable for detection of low concentration substances in bodily fluids. This work presents the possible approach of label-free SERS and EC-SERS spectroscopies for application as a faster method for drug screening from biological fluids. © 2020 SPIE.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1117/12.2542306

✓ **نام ژورنال:**

Progress in Biomedical Optics and Imaging - Proceedings of SPIE

✓ **سال انتشار:**

2020

✓ **کلیدواژه‌ها:**

Aspirin; Blood; Caffeine; EC-SERS; Saliva; SERS

✓ **عنوان پژوهش:**

The development of Army relevant peptide-based surface enhanced Raman scattering (SERS) sensors for biological threat detection

✓ **نویسندگان:**

Farrell M.E., Strobbia P., Sarkes D.A., Stratis-Cullum D.N., Cullum B.M., Pellegrino P.M.

✓ **خلاصه پژوهش:**

The utility of peptide-based molecular sensing for the development of novel biosensors has resulted in a significant increase in their development and usage for sensing targets like chemical, biological, energetic and toxic materials. Using peptides as a molecular recognition element is particularly advantageous because there are several mature peptide synthesis protocols that already exist, peptide structures can be tailored, selected and manipulated to be highly discerning towards desired targets, peptides can be modified to be very stable in a host of environments and stable under many different conditions, and through the development of bifunctionalized peptides can be synthesized to also bind onto desired sensing platforms (various metal materials, glass, etc.). Two examples of the several Army relevant biological targets for peptide-based sensing platforms include Ricin and Abrin. Ricin and Abrin are alarming threats because both can be weaponized and there is no antidote for exposure. Combining the sensitivity of SERS with the selectivity of a bifunctional peptide allows for the emergence of dynamic hazard sensor for Army application. © 2016 SPIE.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1117/12.2224102

✓ **نام ژورنال:**

Proceedings of SPIE - The International Society for Optical Engineering

✓ **سال انتشار:**

2016

✓ **کلیدواژه‌ها:**

Biological sensing; Chemical sensing; Hazard; Klarite; Peptides; Raman; Regenerated surface; SERS

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Detection of cancerous biological tissue areas by means of infrared absorption and SERS spectroscopy of intercellular fluid

✓ **نویسندگان:**

Velicka M., Urboniene V., Ceponkus J., Pucetaite M., Jankevicius F., Sablinskas V.

✓ **خلاصه پژوهش:**

We present a novel approach to the detection of cancerous kidney tissue areas by measuring vibrational spectra (IR absorption or SERS) of intercellular fluid taken from the tissue. The method is based on spectral analysis of cancerous and normal tissue areas in order to find specific spectral markers. The samples were prepared by sliding the kidney tissue over a substrate - surface of diamond ATR crystal in case of IR absorption or calcium fluoride optical window in case of SERS. For producing the SERS signal the dried fluid film was covered by silver nanoparticle colloidal solution. In order to suppress fluorescence background the measurements were performed in the NIR spectral region with the excitation wavelength of 1064 nm. The most significant spectral differences - spectral markers - were found in the region between 400 and 1800 cm-1, where spectral bands related to various vibrations of fatty acids, glycolipids and carbohydrates are located. Spectral markers in the IR and SERS spectra are different and the methods can complement each other. Both of them have potential to be used directly during surgery. Additionally, IR absorption spectroscopy in ATR mode can be combined with waveguide probe what makes this method usable in vivo. © 2015 SPIE.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1117/12.2186395

✓ **نام ژورنال:**

Proceedings of SPIE - The International Society for Optical Engineering

✓ **سال انتشار:**

2015

✓ **کلیدواژه‌ها:**

ATR; FT-IR spectroscopy; Intercellular fluid; Kidney tumor; SERS spectroscopy

TEKSAN Detect Precisely

✓ **عنوان پژوهش**:

Application of silver nanoparticles prepared by "green" chemistry approach to diagnostics of biological objects by surface enhanced Raman spectroscopy

✓ **نویسندگان**:

Semenova A.A., Khabatova V.V., Brazhe N.A., Brazhe A.R., Maksimov G.V., Goodilin E.A., Tretyakov Yu.D.

✓ **خلاصه پژوهش**:

[No abstract available]

✓ **لینک** DOI (**استفاده برای دانلود مقاله**)

10.1134/S0012500811100119

✓ **نام ژورنال**:

Doklady Chemistry

✓ **سال انتشار**:

2011

✓ **کلیدواژه‌ها**:

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Nitrocellulose-based SERS immunosensor for detection of biological molecules

✓ **نویسندگان:**

Dykes A.C., Kamemoto L., Misra A.K., Sharma S.K.

✓ **خلاصه پژوهش:**

We have developed a simple and potentially a low-cost method for the sensitive detection of target proteins via surface-enhanced Raman scattering (SERS). The immunosensor constructed by the conjugation of monoclonal antibodies to 20 nm diameter gold nanoparticles via the bifunctional Raman reporter molecule, 5, 5'dithiobis (succinimidyl-2-nitrobenzoate) (DSNB) is the basis of a membrane-bound detection system. Traditionally, a common laboratory technique called a dot blot, which is a colorimetric method where detection of proteins is accomplished through the application of assorted dyes followed by their measurement via a densitometer. Dot blotting is a convenient and time saving method that involves the spotting of a protein onto an immobilizing matrix, such as nitrocellulose (NC) or polyvinylidene fluoride (PVDF) membrane. We found that for detection via SERS spectroscopy NC is the matrix of choice because it offers low background, minimal preparation prior to protein application, and optimal position of Raman bands. Furthermore, SERS detection of protein on NC requires only minimal sample preparation and demonstrates increased sensitivity when compared to other dot blot detection methods. Depending on the dye used for visualization, dot blots analyzed by commonly used optical methods have limits of detection in the nanogram range, some as low as 20 pg/ml. Here we demonstrate the use of the dot blot method for detecting target proteins (e.g., protein A and prostate specific protein (PSA)) by SERS spectroscopy down to a concentration of 100 fg/ml. © 2011 Copyright Society of Photo-Optical Instrumentation Engineers (SPIE).

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1117/12.884369

✓ **نام ژورنال:**

Progress in Biomedical Optics and Imaging - Proceedings of SPIE

✓ **سال انتشار:**

2011

✓ **کلیدواژه‌ها:**

nitrocellulose; prostate-specific antigen (PSA); protein A; Raman reporter-labeled immunogold colloids; SERS-immunosensor; surface-enhanced Raman scattering (SERS)

✓ **عنوان پژوهش:**

Identification of biologcal agents using Surface Enhanced Raman Scattering

✓ **نویسندگان:**

Paxon T.L., Duthie R.S., Renko C., Burns A.A., Lesaicherre M.L., Mondello F.J.

✓ **خلاصه پژوهش:**

GE Global Research Center, in collaboration with Morpho Detection, Inc. has developed an assay scheme for the identification of biological agents using Surface Enhanced Raman Scattering (SERS). Specifically, unique spectroscopic signatures are generated using SERS tags consisting of individual glass-encapsulated gold nanoparticles and surfacebound reporter molecules. These SERS tags are modified with a capture moiety specific to the antigen of interest, and serve as a spectroscopic label in a bead-based sandwich assay. Assays are being developed for a variety of pathogens and this paper will focus on aspects of assay development, optimization, stabilization and validation. Results on the development of an assay to detect Ricin toxin will be presented, and preliminary feasibility studies for the detection of additional pathogens will be discussed. © 2011 SPIE.

✓ **لینک** DOI **(استفاده برای دانلود مقاله)**

10.1117/12.884259

✓ **نام ژورنال:**

Proceedings of SPIE - The International Society for Optical Engineering

✓ **سال انتشار:**

2011

✓ **کلیدواژه‌ها:**

Assay; Biodetection; Biothreat; Nanoparticles; Raman; SERS; Spectroscopy

✓ **عنوان پژوهش:**

Tracking SERS-active nanoprobe intracellular uptake for chemical and biological sensing

✓ **نویسندگان:**

Gregas M.K., Yan F., Scaffidi J., Wang H.-N., Khoury C., Zhang Y., Vo-Dinh T.

✓ **خلاصه پژوهش:**

A critical aspect of the use of nanoprobes for intracellular studies in chemical and biological sensing involves a fundamental understanding of their uptake and trajectory in cells. In this study, we describe experiments using surfaceenhanced Raman scattering (SERS) spectroscopy and mapping to track cellular uptake of plasmonics-active labeled nanoparticles. Three different Raman-active labels with positive, negative, and neutral charges were conjugated to silver colloidal nanoparticles with the aim of spatially and temporally profiling intracellular delivery and tracking of nanoprobes during uptake in single mammalian cells. 1-D Raman spectra and 2-D Raman mapping are used to identify and locate the probes via their SERS signal intensities. Because Raman spectroscopy is very specific for identification of chemical and molecular signatures, the development of functionalized plasmonics-active nanoprobes capable of exploring intracellular spaces and processes has the ability to provide specific information on the effects of biological and chemical pollutants in the intracellular environment. The results indicate that this technique will allow study of when, where, and how these substances affect cells and living organisms.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1117/12.758287

✓ **نام ژورنال:**

Proceedings of SPIE - The International Society for Optical Engineering

✓ **سال انتشار:**

2007

✓ **کلیدواژه‌ها:**

Cellular uptake; Nanoparticles; Nanoprobes; Plasmonics; Raman imaging; Raman spectroscopy; Surface enhanced Raman scattering

TEKSAN Detect Precisely

✓ **عنوان پژوهش**:

The search for the biological function of novel yeast Ser/Thr phosphatases.

✓ **نویسندگان**:

Ariño J., Posas F., Clotet J.

✓ **خلاصه پژوهش**:

[No abstract available]

✓ **لینک** DOI (**استفاده برای دانلود مقاله**)

10.1385/0-89603-468-2:305

✓ **نام ژورنال**:

Methods in molecular biology (Clifton, N.J.)

✓ **سال انتشار**:

1998

✓ **کلیدواژه‌ها**:

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Synthesis of the tripeptide L-Trp-L-Ser-L-Glu. Comparison of its biological activity with that of the delta-sleep-inducing-peptide (DSIP).

✓ **نویسندگان:**

Monnier V.M.

✓ **خلاصه پژوهش:**

In order to test the specificity of the natural Delta-Sleep-Inducing-Peptide (DSIP), a tripeptide with the same N-terminal amino acid was synthesized. The synthesis of the new tripeptide L-Trp-L-Ser-L-Glu was carried out by the method of the mixed anhydride. Protecting groups were all oxygen-bound benzyl groups. The physical-chemical data of the newly synthesized peptides are reported. The biological activity of the tripeptide was assayed by intraventricular infusion in the rabbit under the same conditions as for the DSIP. The effects of the tripeptide on the EEG could not duplicate those of DSIP which induced a marked increase of delta activity, typical for orthodox 'Slow Wave Sleep' (SWS).

✓ **لینک** DOI **(استفاده برای دانلود مقاله)**

✓ **نام ژورنال:**

Experientia. Supplementum

✓ **سال انتشار:**

1977

✓ **کلیدواژه‌ها:**

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Observations on the Biology and Control of Stem Eelworm (Ditylenchus dipsaci (Kühn) Filipjev) on Hydrangea (Hydrangea macrophylla Ser.)

✓ **نویسندگان:**

French N., John M.E., Williams J.J.W.

✓ **خلاصه پژوهش:**

The life cycle of Ditylenchus dipsaci in hydrangea is similar to that in other plants: eggs hatched in about eight days and adults developed in 12 days at 19°C. The eelworms infesting hydrangea were shown to be of an oat-onion race. Hot-water treatment killed the plants before achieving complete control. Thionazin soil drenches at 0.02 per cent and 0.03 per cent gave good control of eelworm but 0.005 per cent and 0.01 per cent failed to give satisfactory control in some experiments. The higher rates caused some phytotoxicity particularly to rooted cuttings and forced plants. Thionazin 10 per cent granules at 2 oz per bushel (56.7 g per 36.4 1.) of compost caused very severe phytotoxicity. Copyright © 1971, Wiley Blackwell. All rights reserved

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1111/j.1365-3059.1971.tb00541.x

✓ **نام ژورنال:**

Plant Pathology

✓ **سال انتشار:**

1971

✓ **کلیدواژه‌ها:**

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Using a Biosensor Based on Surface-Enhanced Raman Scattering to Identify Influenza Viruses in Biological Fluids

✓ **نویسندگان:**

Zhdanov G.A., Gribanyov D.A., Gambaryan A.S., Kukushkin V.I., Zavyalova E.G.

✓ **خلاصه پژوهش:**

Abstract: Biosensors based on the effect of surface-enhanced Raman scattering obtained on silver nanoclusters modified with DNA aptamers allow viruses to be detected with high sensitivity. However, measurements in biological media are complicated by the nonspecific sorption of biomolecules on silver. Conditions for preparing samples of biological fluids that allow the nonspecific sorption of biomolecules to be nullified are studied. © 2022, Allerton Press, Inc.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.3103/S1062873822040293

✓ **نام ژورنال:**

Bulletin of the Russian Academy of Sciences: Physics

✓ **سال انتشار:**

2022

✓ **کلیدواژه‌ها:**

TEKSAN
Detect Precisely

✓ عنوان پژوهش:

NIR surface enhanced Raman spectra of biological hemes: Solvation and plasmonic metal effects

✓ نویسندگان:

Ingraham H.M., Premasiri W.R., Ziegler L.D.

✓ خلاصه پژوهش:

Surface enhanced Raman spectra (SERS) excited at 785 nm are reported for hemoglobin, myoglobin, two heme B proteins, and cytochrome c, a heme C protein, solubilized in a variety of solvent systems and then placed on Au and Ag substrates. These solvent environments include H2O pH 7.4, HCl/water pH 2, HCl/50% ethanol pH 2, 50% acetic acid and the organic layer of a pH 2 HCl/butanone mixture. To obtain the most intense SERS spectra of heme B proteins (Mb and Hb) it is not sufficient to be in a low pH (pH ~ 2) denaturing environment. A hydrophobic solvent component is additionally required in order to efficiently solubilize the cleaved heme moiety and consequently observe intense SERS spectra indicative of these heme B proteins. Although both heme B proteins exhibit virtually identical, metal (Au, Ag) specific SERS spectra, Cyt c is much weaker in the low pH environments and only displays a Ag-like SERS spectrum on both metals indicating that this heme C protein is not cleaved in any of these solvation environments. The strong SERS signals of hemoglobin and myoglobin are due to hemin and ferric acetate heme formed in pH 2 HCl/ethanol and pH 2/50% acetic acid solutions respectively. SERS vibrational features confirm oxidation state, coordination number and ligands. SERS signals due to globin protein aggregation effects are reduced in low pH solvent systems with polarities lower than pure water. These results confirm the mechanism of a successful acetic acid protocol previously developed for the highly sensitive SERS detection of dried blood for forensic applications and indicate how it may be further improved to achieve even higher SERS sensitivity for heme protein detection. © 2021 John Wiley & Sons, Ltd.

✓ لینک DOI (استفاده برای دانلود مقاله)

10.1002/jrs.6209

✓ نام ژورنال:

Journal of Raman Spectroscopy

✓ سال انتشار:

2021

✓ کلیدواژه‌ها:

cytochrome c; forensics; hemoglobin; myoglobin; SERS

✓ **عنوان پژوهش:**

Towards automation in biologics production via Raman micro-spectroscopy, laser-induced forward cell transfer and surface-enhanced Raman spectroscopy

✓ **نویسندگان:**

Jaeckle E., Brauchle E., Nottrodt N., Wehner M., Lensing R., Gillner A., Schenke-Layland K., Bach M., Burger-Kentischer A.

✓ **خلاصه پژوهش:**

Mammalian cells have become the predominant expression system for the production of biopharmaceuticals due to their capabilities in posttranslational modifications. In recent years, the efficacy of these production processes has increased significantly through technical improvements. However, the state of the art in the development of producer cell lines includes many manual steps and is as such very time and cost consuming. In this study we developed a process combination of Raman micro-spectroscopy, laser-induced forward transfer (LIFT) and surface-enhanced Raman spectroscopy (SERS) as an automated machine system for the identification, separation and characterization of single cell-clones for biopharmaceutical production. Raman spectra showed clear differences between individual antibody-producing and non-producing chinese hamster ovary (CHO) cells after their stable transfection with a plasmid coding for an immunoglobulin G (IgG) antibody. Spectra of producing CHO cells exhibited Raman signals characteristic for human IgG. Individual producing CHO cells were successfully separated and transferred into a multiwell plate via LIFT. Besides, changes in concentration of human IgG in solution were detected via SERS. SERS spectra showed the same peak patterns but differed in their peak intensity. Overall, our results show that identification of individual antibody-producing CHO cells via Raman micro-spectroscopy, cell separation via LIFT and determination of changes in concentrations of overexpressed protein via SERS are suitable and versatile tools for assembling a fully automated system for biopharmaceuticals manufacturing. © 2020 Elsevier B.V.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1016/j.jbiotec.2020.09.001

✓ **نام ژورنال:**

Journal of Biotechnology

✓ **سال انتشار:**

2020

✓ **کلیدواژه‌ها:**

automated single cell cloning; cell screening; laser-induced forward transfer; Raman micro-spectroscopy; surface-enhanced Raman spectroscopy

✓ **عنوان پژوهش:**

Ernst Cassirer: A biological foundation for the definition of human being as "symbolic animal" [Ernst Cassirer: una fundamentación biológica de la definición del ser humano como "animal simbólico"]

✓ **نویسندگان:**

Urzúa G.A.E.

✓ **خلاصه پژوهش:**

This paper analyses the biological foundation of a new definition of human nature, as proposed by Ernst Cassirer. Based on the state of the art, Cassirer's Philosophy relies, for the most part, on the biological research in order to develop a definition of the human being's symbolic nature. It will be shown that Cassirer's analysis considers three key elements: 1) Uexküll theoretical biology; 2) aphasia and apraxia studies; 3) and a detailed philosophical consideration of both former and latter elements. The ensemble of all three elements offers a new perspective on the biological fundamentals in which the Neokatian philosopher supports his definition of human being a symbolic animal. © 2019 Centro de Investigacion Social Avanzada. All rights reserved.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.23924/oi.v10n18a2019.pp125-144.289

✓ **نام ژورنال:**

Open Insight

✓ **سال انتشار:**

2019

✓ **کلیدواژه‌ها:**

Ernst cassirer; Johann von uexküll; Pathology of symbolic behavior; Symbolic animal; Theoretical biology

✓ **عنوان پژوهش:**

Erratum: Biological control for grapevine crown gall using nonpathogenic Rhizobium vitis strain ARK-1 [Proc. Jpn. Acad., Ser. B, 93, 8, (2017) (547-560)] DOI: 10.2183/pjab.93.035

✓ **نویسندگان:**

Kawaguchi A., Inoue K., Tanina K., Nita M.

✓ **خلاصه پژوهش:**

Crown gall of grapevine, which is caused by tumorigenic Rhizobium vitis, is the most important bacterial disease of grapevine throughout the world. Screening tests of biological control agents resulted in the discovery of a nonpathogenic R. vitis strain ARK-1. By soaking grapevine roots with a cell suspension of strain ARK-1 prior to planting in the field, ARK-1 treatment significantly reduced the number of plants with crown gall symptoms. Several field trials result indicated that ARK-1 was very useful in the field, not only for grapevine but also for various other plant species. In experiments where a mixture of ARK-1 and a tumorigenic strain at a 1: 1 cell ratio was examined in vitro and in planta, expression levels of the virulence genes virD2 and virE2 of the tumorigenic strain were significantly lower. The suppression of virulence genes, which can result in a reduction of gall formation and the pathogen population, seems to be a unique mechanism of ARK-1. These results indicated that ARK-1 is a promising new agent to control grapevine crown gall. © 2017 The Japan Academy.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.2183/pjab.93.047

✓ **نام ژورنال:**

Proceedings of the Japan Academy Series B: Physical and Biological Sciences

✓ **سال انتشار:**

2017

✓ **کلیدواژه‌ها:**

Biological control; Grapevine crown gall; Rhizobium vitis; Suppression of virulence genes

✓ **عنوان پژوهش:**

Surface enhanced Raman scattering detection of water-soluble derivatives of fullerene C60 and their covalent conjugates with dyes in biological model systems

✓ **نویسندگان:**

Poletaeva D.A., Rybkin A.Y., Kukushkin V.I., Belik A.Y., Goryachev N.S., Khakina E.A., Troshin P.A., Kotel'nikova R.A., Kotel'nikov A.I.

✓ **خلاصه پژوهش:**

The potential of surface enhanced Raman spectroscopy (SERS) for the detection of water-soluble fullerene derivatives and their covalent conjugates with xanthene dyes was investigated in model biological liposome membranes and in the albumin protein structure. It was shown that in liposomes and in albumin, fullerene derivatives and their covalent conjugates with dyes show characteristic SERS spectra, which allows detection of water-soluble fullerene derivatives in phosphatidylcholine liposomes at the lipid/fullerene derivative ratio of 100 as well as fullerene–dye conjugates in liposomes and albumin. © 2016, Pleiades Publishing, Ltd.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1134/S0012501616010073

✓ **نام ژورنال:**

Doklady Physical Chemistry

✓ **سال انتشار:**

2016

✓ **کلیدواژه‌ها:**

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Plasmonics-Active gold nanostars for chemical and biological sensing using SERS detection

✓ **نویسندگان:**

Liu Y., Yuan H., Fales A.M., Vo-Dinh T.

✓ **خلاصه پژوهش:**

Surface-enhanced Raman scattering (SERS) provides a non-destructive sensing method with high sensitivity and multiplex detection capability since SERS takes advantage of high enhancement from surface plasmon resonance and unique â€fingerprintâ€ spectral signature using Raman spectroscopy. Our group has developed a unique plasmonics-Active nanoparticle, gold nanostars, with tunable plasmonics in near-infrared (NIR) â€tissue optical windowâ€ without using toxic surfactant. We present their applications for chemical and biological sensing with SERS method as well as theoretical studies to investigate and confirm experimentally measured SERS results. © 2015 SPIE.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1117/12.2182123

✓ **نام ژورنال:**

Proceedings of SPIE - The International Society for Optical Engineering

✓ **سال انتشار:**

2015

✓ **کلیدواژه‌ها:**

Gold nanostar; PH sensing and DFT calculation; Surface-enhanced Raman scattering

Detect Precisely

✓ عنوان پژوهش:

Characterization of bacilli spores by surface-enhanced Raman spectroscopy, a fast and reliable technique for early warning of biological threats

✓ نویسندگان:

Almaviva S., Lai A., Spizzichino V., Addari L., Lecci S., Rufoloni A., Palucci A.

✓ خلاصه پژوهش:

It is demonstrated that Raman Spectroscopy is a fast and sensitive tool for the detection and classification of molecular species. The vibrational spectrum inherently serves as fingerprint of the chemical composition of each sample a thus makes identification and early warning of threats possible. Also microorganisms in areas susceptible to bacterial contamination can be sensed. However, to increase the sensitivity and selectivity of the technique various solutions have been studied such as Resonant Raman Spectroscopy or Surface-Enhanced Raman Spectroscopy (SERS). In this work we present our results on the application of the SERS technique for the characterization of Bacillus atrophaeus spores, a biological and genetic simulant of the deadly bacterium Bacillus anthracis, already used in terroristic attacks in 2001 against U.S. media and government offices causing the death of five people and the infection of other 22. This work is part of the RAMBO project (Rapid Air particle Monitoring against Biological threats) whose ultimate goal is the development of an advanced sensor with high performances, capable of detecting few spores or bacilli of dangerous species with good selectivity and reliability so as to be used as an early warning sensor. In this context, the SERS technique allows to recognize the characteristics vibrational bands of the spores with a scan duration of only few seconds, on amounts of few tenths of spores or less, demonstrating how it can be considered an effective and fast technique for early warning of biological threats as it has been considered in the RAMBO project. © Springer International Publishing Switzerland 2015.

✓ لینک DOI (استفاده برای دانلود مقاله)

10.1007/978-3-319-09617-9_4

✓ نام ژورنال:

Lecture Notes in Electrical Engineering

✓ سال انتشار:

2015

✓ کلیدواژه‌ها:

✓ **عنوان پژوهش**:

How to be prudent with synthetic biology. Synthetic Biology and the precautionary principle [Cómo ser prudentes con la biología sintética. Biología sintética y principio de precaución]

✓ **نویسندگان**:

Rodríguez López B.

✓ **خلاصه پژوهش**:

[No abstract available]

✓ **لینک** DOI (**استفاده برای دانلود مقاله**)

✓ **نام ژورنال**:

Revista de derecho y genoma humano = Law and the human genome review / Cátedra de Derecho y Genoma Humano/Fundación BBV-Diputación Foral de Bizkaia

✓ **سال انتشار**:

2014

✓ **کلیدواژه‌ها**:

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Hollow fiber based SERS probe for analysis of biological molecules

✓ **نویسندگان:**

Nagaoka M., Katagiri T., Matsuura Y.

✓ **خلاصه پژوهش:**

A flexible fiber probe for surface-enhanced Raman scattering (SERS) was fabricated by forming gold nanostructures on a ball lens mounted at the distal end of a hollow optical fiber. Two different methods were used to form the gold nanoparticles. In the photochemical deposition, easily fabricated probe indicated good sensitivity, but low reproducibility. On the other hand, in the sputtering method, higher intensity was achieved constantly because an optimal forming condition can be strictly controlled. The measurement of biological molecules using fabricated SERS active probe is also demonstrated. © 2014 SPIE.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1117/12.2039185

✓ **نام ژورنال:**

Progress in Biomedical Optics and Imaging - Proceedings of SPIE

✓ **سال انتشار:**

2014

✓ **کلیدواژه‌ها:**

Hollow optical fiber; Raman spectroscopy; Surface-enhanced Raman scattering (SERS)

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Rationally designed SERS substrates for the ultrasensitive detection of biologically important compounds

✓ **نویسندگان:**

Štolcová L., Proška J., Procházka M.

✓ **خلاصه پژوهش:**

The spectroscopy based on surface-enhanced Raman scattering (SERS) is a highly sensitive analytical technique, benefiting from the uniqueness of molecular vibrational spectra. Despite its great potential in sensing, it is only rarely used in commercial detection systems due to difficulties with SERS signal reproducibility and homogeneity in the samples. To deal with this matter, the rational design of SERS substrates is being employed still more frequently. We report on the preparation of rationally designed SERS substrates comprised of periodically modulated thin gold layers (i.e. microspheres coated with gold and gold semishells) and their use for the detection of biologically important compounds at trace concentrations. Reproducible SERS spectra of nicotine, strychnine and metronidazole were obtained. The possibility to detect large biomolecules or molecules with low chemical affinity to noble metals is discussed.

✓ **لینک** DOI (**استفاده برای دانلود مقاله**)

✓ **نام ژورنال:**

NANOCON 2013 - Conference Proceedings, 5th International Conference

✓ **سال انتشار:**

2013

✓ **کلیدواژه‌ها:**

Metronidazole; Nicotine; Rationally designed SERS substrates; Strychnine; Surface-enhanced Raman scattering (SERS)

✓ **عنوان پژوهش:**

Detection of biological species by surface enhanced Raman scattering

✓ **نویسندگان:**

Sengupta A., Volny M., Wilson C.B., Turecek F., Davis E.J.

✓ **خلاصه پژوهش:**

In recent years there has been a strong interest in the development of rapid detection techniques of biological species, especially pathogens that are involved in food poisoning, water contamination, and air-borne diseases. Conventional detection methods are time consuming and usually involve overnight culture of bacteria in a suitable growth medium. In this study we used surface-enhanced Raman scattering (SERS) to develop a rapid method of identifying bacteria. Molecules in close contact to the nanometallic surfaces show a huge enhancement in their Raman signature. The enhancement can be as great as 108-1014. We also explored the application of dry nanostructured surfaces to characterize biomolecules by softly landing them on plasma-etched silver surfaces. By such landings, biomolecular gas phase ions were allowed to chemically bind to the surface so that the Raman effect was significantly enhanced and fluorescence was suppressed.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

✓ **نام ژورنال:**

2006 NSTI Nanotechnology Conference and Trade Show - NSTI Nanotech 2006 Technical Proceedings

✓ **سال انتشار:**

2006

✓ **کلیدواژه‌ها:**

Bioaerosol; Biomolecules; Electrospray; Raman spectroscopy; Reactive landing

Detect Precisely

✓ **عنوان پژوهش:**

Detection of biological molecules with SERS nanotags

✓ **نویسندگان:**

Corish P.

✓ **خلاصه پژوهش:**

SERS provides the transformational detection system necessary to deliver the sensitivity and multiplex requirements to the POC and Clinical Lab diagnostics sectors in a robust, quantitative format from a variety of biological matrices. © Oxonica Plc.

✓ **لینک** DOI **(استفاده برای دانلود مقاله)**

10.1049/ic:20060428

✓ **نام ژورنال:**

IET Seminar Digest

✓ **سال انتشار:**

2006

✓ **کلیدواژه‌ها:**

TEKSAN
Detect Precisely

✓ **عنوان پژوهش:**

Multivariate statistical classification of surface enhanced raman spectra of chemical and biological warfare agent simulants

✓ **نویسندگان:**

Fountain III A.W., Pearman W.F.

✓ **خلاصه پژوهش:**

Initial results which demonstrate the ability to classify surface enhanced Raman (SERS) spectra of chemical and biological warfare agent simulants are presented. The spectra of 2 endospores (B. subtilis, B. atrophaeus); 2 chemical agent simulants (Dimethyl methylphosphonate (DMMP), Diethyl methylphosphonate (DEMP)); and 2 toxin simulants (Ovalbumin, Horseradish peroxidase) were collected on multiple substrates fabricated from colloidal gold adsorbed onto a silanized quartz surface. The use of principle component analysis (PCA) and Hierarchical Clustering was used as a method of determining the reproducibility of the individual spectra collected from a single substrate. Additionally, the use of partial least squares - discriminate analysis (PLS-DA) and soft independent modeling of class analogies (SIMCA) on a compilation of data from separate substrates, fabricated under identical conditions, demonstrates the feasibility of this technique for the identification of known but previously unclassified spectra.

✓ **لینک** DOI **(استفاده برای دانلود مقاله)**

10.1117/12.629742

✓ **نام ژورنال:**

Proceedings of SPIE - The International Society for Optical Engineering

✓ **سال انتشار:**

2005

✓ **کلیدواژه‌ها:**

Biological Warfare Agents; Chemical Warfare Agents; PLS-DA; SIMCA; Surface Enhanced Raman Spectroscopy

✓ عنوان پژوهش:

Highly sensitive multiplex detection of foodborne pathogens using a SERS immunosensor combined with novel covalent organic frameworks based biologic interference-free Raman tags

✓ نویسندگان:

Yang Y., Li G., Wang P., Fan L., Shi Y.

✓ خلاصه پژوهش:

Rapid and reliable multiplex detection of foodborne pathogens is in great demand for ensuring food safety and preventing foodborne diseases. In this study, we developed a highly sensitive SERS immunosensor for the simultaneous detection of multiple foodborne pathogens. Novel biologic interference-free Raman tags synthesized by using the covalent organic frameworks (COF) TBDP as nanocontainer to load biologic interference-free Raman reporters and specific antibodies for interested targets were used to convert and amplify signals of foodborne pathogens. In addition, lectin functionalized magnetic nanoparticles (MNPs@Con A) which could efficiently bind to the carbohydrate constituents on the surface of pathogens were prepared to capture and isolate multiple pathogens simultaneously. The recognition of the target foodborne pathogen impels the generation of sandwich-like composites of MNPs@Con A/pathogen/TBDP@Raman tags, and these composites could be quickly separated from the sample matrix with the assistance of an external magnet. Besides, a mass of Raman reporters was released by eluting the collected MNPs@Con A/pathogen/TBDP@Raman tags composites. Combined with a portable Raman system, characteristic Raman signals (2271 and 2113 cm−1) of the occupied reporters located at the biologic interference-free region were observed and used for the simultaneous detection of two different foodborne pathogenic strains. And an equal limit of detection of 101 CFU/mL was achieved for each strain. This strategy provides new insight into the application of SERS in the detection of pathogenic bacteria. © 2022

✓ لینک DOI (استفاده برای دانلود مقاله)

10.1016/j.talanta.2022.123369

✓ نام ژورنال:

Talanta

✓ سال انتشار:

2022

✓ کلیدواژه‌ها:

Biologic interference-free; COF; Food safety; Foodborne pathogen; Multiplex detection; SERS immunosensor

✓ عنوان پژوهش:

Dual-Approach Electrochemical Surface-Enhanced Raman Scattering Detection of Mycobacterium tuberculosis in Patient-Derived Biological Specimens: Proof of Concept for a Generalizable Method to Detect and Identify Bacterial Pathogens

✓ نویسندگان:

Hendricks-Leukes N.R., Jonas M.R., Mlamla Z.C., Smith M., Blackburn J.M.

✓ خلاصه پژوهش:

The recent surge in infectious disease-causing pathogens, resulting in global catastrophe, has merited a pivotal quest toward point-of-care (POC) diagnostics. Mycobacterium tuberculosis (MTB) is still the top bacterium-based infectious disease-causing pathogen worldwide. In a concerted effort toward simplifying and decentralizing the discriminatory screening of MTB causing pathogens, electrochemical surface-enhanced Raman scattering (EC-SERS) was adopted to create a customized screening tool. The development strategy combined five key factors, including (i) a simplified Tollens'-based chemical synthesis method for bulk supply of silver nanoparticles, (ii) the deliberate surface modification of nanoparticles with carefully selected polyelectrolytes to resemble the conditioning layer usually found on a natural substratum, (iii) uniform SERS-active films formed through simple unprogrammed assembly, (iv) the controlled manipulation of the local electric field through applied voltage using a technique that does not conform to the limitations of classical EC-SERS, and (v) the inherent specificity of the target-specific SERS vibrational signature. The EC-SERS platform was able to discriminatively detect and identify TB-derived mycobacteria, including three clinically relevant MTB strains, TB-H37Rv, TB-HN878, and TB-CDC1551. Moreover, a customized voltage stepping protocol, compatible with either the inclusion of a short preincubation step or with in situ EC-SERS is illustrated. From the obtained SERS vibrational signatures, a band indicating a mode unique to TB-derived/TB-affiliated mycobacteria and thus not observed for other bacterial types used in this study was illustrated. Furthermore, provisional investigation, done as prelude for assessing the potential for translational adaptability of the EC-SERS technique toward POC clinical settings for sputum and urine specimens, was carried out. © 2022 American Chemical Society.

✓ لینک DOI (استفاده برای دانلود مقاله)

10.1021/acssensors.2c00121

✓ نام ژورنال:

ACS Sensors

✓ سال انتشار:

2022

✓ کلیدواژه‌ها:

EC-SERS; label-free SERS detection; Mycobacterium tuberculosis; polyelectrolyte-wrapped silver nanoparticles; sequence-based voltage stepping; sputum; urine

✓ **عنوان پژوهش:**

Enzyme-triggered click chemistry combined with surface-enhanced Raman spectroscopy for the simple and sensitive detection of alkaline phosphatase activity from complex biological samples

✓ **نویسندگان:**

Cao F., Wang M., Yi X., Sun D.

✓ **خلاصه پژوهش:**

Alkaline phosphatase (ALP) is a widely used indicator in the diagnosis of various diseases. Thus, it is also urgent to develop simple and efficient methods, which can meet the accurate determination of ALP activity in physiological environments. In this study, enzyme-triggered click chemistry combined with the surface-enhanced Raman spectroscopy (SERS) technique was developed for the highly sensitive detection of the ALP activity in complex biological samples. ALP was able to catalyze the ascorbic acid-phosphate (AAP) to generate ascorbic acid (AA). Then, AA could reduce Cu(ii) to produce Cu(i), which plays the role of a catalyst to promote the click reaction of azide terephthalic acid (ATA) and 4-acetylene biphenyl (4-AB), resulting in the SERS signal intensity of free 4-AB in the solution was clearly reduced along with the click reaction carried on, and showed a quantitative relationship with the concentration of ALP. The proposed method has the advantages of high sensitivity, selectivity and excellent repeatability. As a proof of concept, the new developed SERS-click strategy was applied to the specific determination of the ALP activity in clinical serum samples, cellular lysate samples and the ALP inhibitor assessment successfully, indicating that the proposed ALP-triggered click chemistry assay has a significant potential application in medical diagnosis. © 2022 The Royal Society of Chemistry.

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1039/d1an02159a

✓ **نام ژورنال:**

Analyst

✓ **سال انتشار:**

2022

✓ **کلیدواژه‌ها:**

✓ **عنوان پژوهش:**

RICHARD OWEN'S VERTEBRATE ARCHETYPE: RAISON D'ÊTRE and DESTINY OF ONE OF THE MOST INFLUENTIAL MODELS IN THE HISTORY OF BIOLOGY [EL ARQUETIPO VERTEBRADO DE RICHARD OWEN: RAZÓN DE SER Y DESTINO DE UNOS DE LOS MODELOS MÁS INFLUYENTES EN LA HISTORIA DE LA BIOLOGÍA]

✓ **نویسندگان:**

Caponi G.

✓ **خلاصه پژوهش:**

The vertebrate archetype outlined by Richard Owen in the mid-19th century was a model conceived to guide the morphological analysis of living beings within the guidelines defined by the idea of a unit of composition when applied to the specific case of vertebrates. But here, in addition to analyzing the original raison d'être of this archetype and its mode of operation within the epistemic context in which it effectively emerged, we will also allude to the way in which this model could come to be considered, not as an idealization, or a methodologically operative abstraction, but as an approximation to a real entity that had to be individualized and duly described. © 2022 The author(s).

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.5007/1808-1711.2022.E84581

✓ **نام ژورنال:**

Principia

✓ **سال انتشار:**

2022

✓ **کلیدواژه‌ها:**

ancestor; archetype; compared anatomy; Richard Owen; unity of type

TEKSAN Detect Precisely

✓ **عنوان پژوهش:**

Using SERS and SEF Spectroscopy to Detect Fullerene-Dye Dyads in Water and Biological Structures

✓ **نویسندگان:**

Goryachev N.S., Kukushkin V.I., Belik A.Y., Rybkin A.Y., Kraevaya O.A., Troshin P.A., Kotelnikov A.I.

✓ **خلاصه پژوهش:**

Abstract: The effect of surface enhanced fluorescence (SEF), which is not observed for individual dyes, is detected when registering surface-enhanced Raman scattering (SERS) signals from fullerene-dye dyads PFD-Fl and PFD-Ce6. This is consistent with the theory predicting an inverse dependence of SEF fluorescence on the quantum yield of the stationary fluorescence of compounds in solution. The observed effect allows such hybrid molecular structures to be registered by recording SERS or SEF spectra in the 10−7–10−5 M range of concentrations and opens up the possibility of widely using SERS and SEF to study interaction between these fullerene derivatives and biological structures of different organization levels. © 2022, Allerton Press, Inc.

✓ **لینک** DOI **(استفاده برای دانلود مقاله)**

10.3103/S1062873822040116

✓ **نام ژورنال:**

Bulletin of the Russian Academy of Sciences: Physics

✓ **سال انتشار:**

2022

✓ **کلیدواژه‌ها:**

Detect Precisely

✓ **عنوان پژوهش:**

Biological SERS-active sensor platform based on flexible silk fibroin film and gold nanoislands

✓ **نویسندگان:**

Choi J.H., Choi M., Ho T.S., Kim S., Choi S., Choi S.H., Byun K.M.

✓ **خلاصه پژوهش:**

In contrast to conventional surface-enhanced Raman scattering (SERS) platforms implemented on non-biological substrates, silk fibroin has the unique advantages of long-term biosafety and controllable biodegradability for in vitro and in vivo biomedical applications, as well as flexibility and process-compatibility. In this study, a silk fibroin film was developed to fabricate a flexible SERS sensor template with nanogap-rich gold nanoislands. The proposed biological SERS platform presents fairly good enhancements in detection performance such as detection limit, sensitivity, and signal-to-noise ratio. In particular, the sensitivity improvement was by more than 10 times compared to that of the counterpart sample, and an excellent spatial reproducibility of 2.8% was achieved. In addition, the near-field calculation results were consistent with the experimental results, and the effect of surface roughness of the silk substrate was investigated in a quantitative way. It is believed that biological SERS-active sensors could provide the potential for highly sensitive, cost-effective, and easily customizable nanophotonic platforms that include new capabilities for future healthcare devices. © 2022 Optica Publishing Group

✓ **لینک DOI (استفاده برای دانلود مقاله)**

10.1364/OE.452665

✓ **نام ژورنال:**

Optics Express

✓ **سال انتشار:**

2022

✓ **کلیدواژه‌ها:**

TEKSAN Detect Precisely

✓ عنوان پژوهش:

A novel and rapid method to detect chlorpromazine hydrochloride in biological sample based on SERS

✓ نویسندگان:

Hao X., Liu W., Zhang Y., Kang W., Niu L., Ai L.

✓ خلاصه پژوهش:

Chlorpromazine hydrochloride (CPZ) is a phenothiazine antipsychotic drug, which can effectively relieve the symptoms of chronic or severe mental disorders and reduce the manic phase of manic depression. However, excessive CPZ (more than 2 g per day) can cause serious harm to the health of the body, such as cholestatic jaundice, leukopenia, orthostatic hypotension, extrapyramidal effects and contact dermatitis. Therefore, a simple, fast, and accurate method to detect and identify CPZ is very important, especially for the detection of biological samples. In this study, based on the principle of inorganic salt inducing nanoparticle agglomeration, we synthesized silver colloids (AgNPs) with plasmon resonance effect. And we introduced inorganic salt MgBr2 to induce self-limiting aggregation of AgNPs, resulting in a large number of “hot spots” in the nanoparticle gap. Thereby significantly enhancing the SERS intensity. The surface-enhanced Raman spectroscopy (SERS) method proposed in this paper can achieve real-time rapid detection of chlorpromazine hydrochloride in the field, with a linear range of 0.1–100 ppm (R2 = 0.992). The calculated detection limit was 0.048 ppm. This strategy enables high stability and good repeatability of the SERS spectra. The application of established method can achieve the rapid and accurate determination of CPZ in pig urine. The recovery of standard addition was 87.50–107.70% and the RSD was between 2.87% and 7.42%. Therefore, the SERS detection technology in this study provides a new insight for the rapid, effective and accurate determination and identification of CPZ in pig urine. © 2021

✓ لینک DOI (استفاده برای دانلود مقاله)

10.1016/j.cplett.2021.139066

✓ نام ژورنال:

Chemical Physics Letters

✓ سال انتشار:

2021

✓ کلیدواژه‌ها:

AgNPs; Chlorpromazine hydrochloride; Detection; MgBr2; SERS