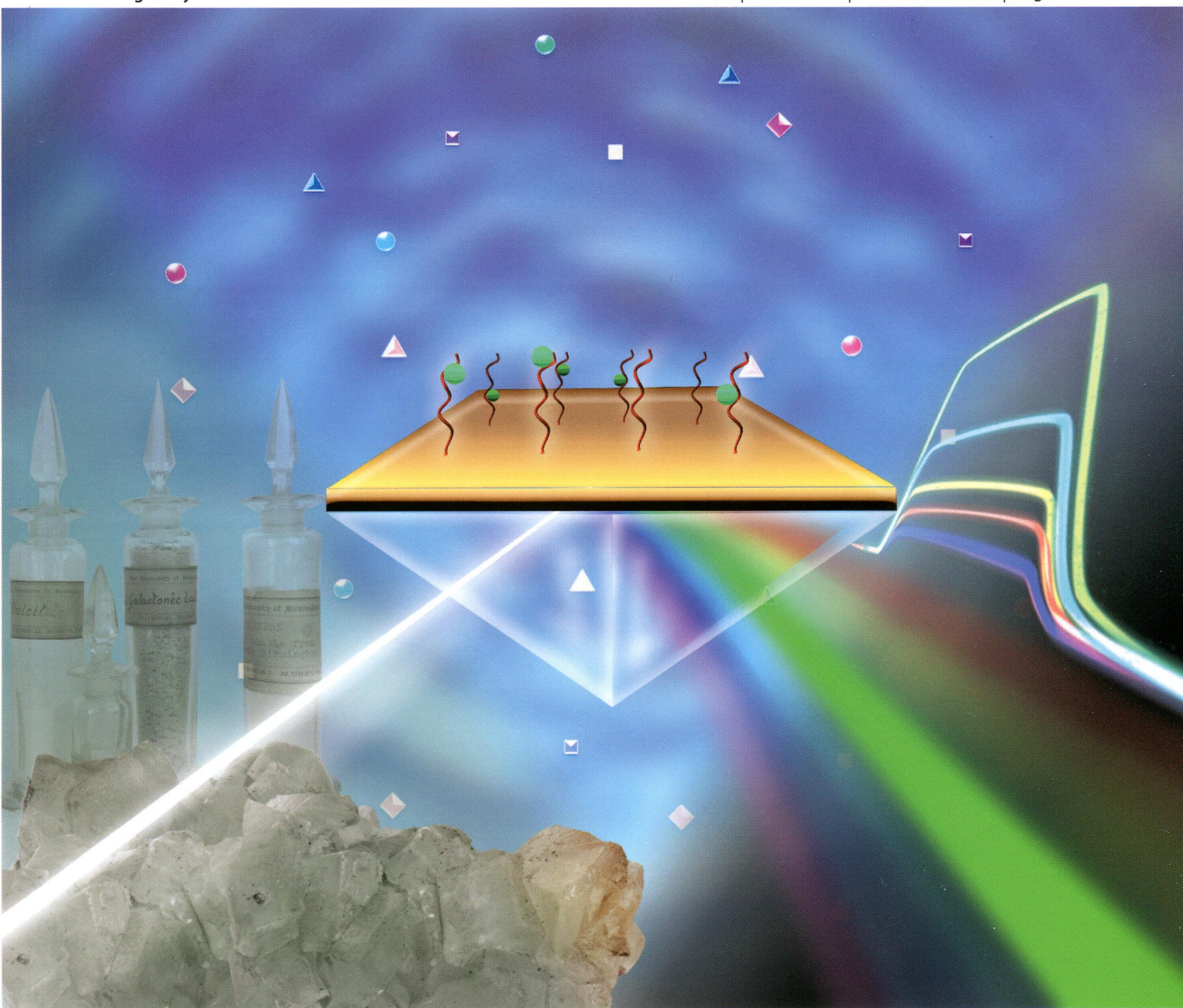


110
A53/2

Analyst

www.rsc.org/analyst

Volume 138 | Number 23 | 7 December 2013 | Pages 7041–7266



ISSN 0003-2654

RSC Publishing

PAPER

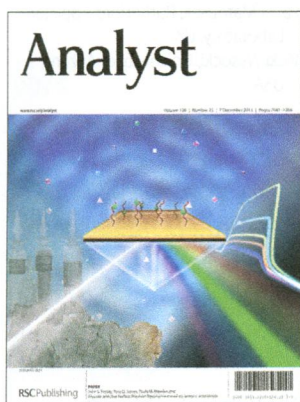
John S. Fossey, Tony D. James, Paula M. Mendes *et al.*
Glucose selective Surface Plasmon Resonance-based bis-boronic acid sensor



0003-2654 (2013) 138:23;1-V

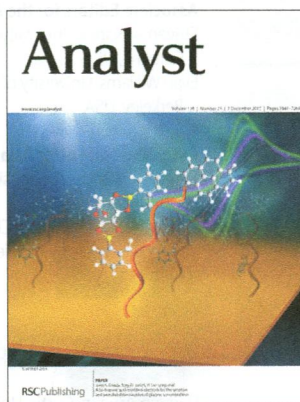
IN THIS ISSUE

ISSN 0003-2654 CODEN ANALAO 138(23) 7041–7266 (2013)



Cover

See John S. Fossey, Tony D. James, Paula M. Mendes *et al.*, pp. 7140–7145.
Image reproduced by permission of John S. Fossey from *Analyst*, 2013, **138**, 7140.



Inside cover

See John S. Fossey, Tony D. James, Yi-Tao Long *et al.*, pp. 7146–7151.
Image reproduced by permission of John S. Fossey from *Analyst*, 2013, **138**, 7146.

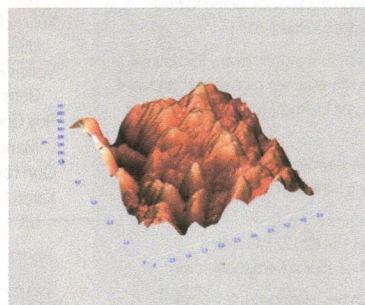
MINIREVIEW

7053

Nanostructured solid substrates for efficient laser desorption/ionization mass spectrometry (LDI-MS) of low molecular weight compounds

Yuliya E. Silina and Dietrich A. Volmer*

This mini-review presents promising recent developments in surface-assisted laser-desorption/ionization (SALDI) materials for mass spectrometric analysis of low molecular weight analytes.



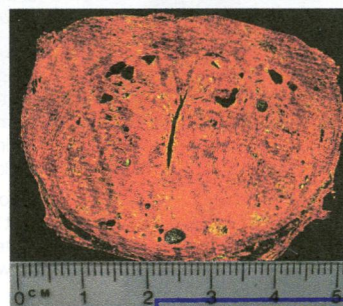
COMMUNICATIONS

7066

Whole organ cross-section chemical imaging using label-free mega-mosaic FTIR microscopy

Paul Bassan, Ashwin Sachdeva, Jonathan H. Shanks, Mick D. Brown, Noel W. Clarke and Peter Gardner*

Whole organ chemical imaging has been demonstrated using FTIR focal plane array technology. These imaging systems hold the potential to form automated cancer detection systems to complement current histopathology laboratories.



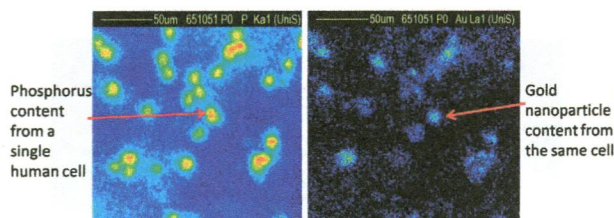
Федеральное государственное
бюджетное учреждение науки
Центральная научная библиотека
Уральского отделения
Российской академии наук (ЦНБ УрО РАН)

7070

Measuring and modelling cell-to-cell variation in uptake of gold nanoparticles

J. Charles. G. Jeynes,* Christopher Jeynes, Michael J. Merchant and Karen J. Kirkby

Microbeam proton beam analysis is used to measure the total carbon and gold content of individual cancer cells to determine cell-to-cell variability in gold nanoparticle uptake.

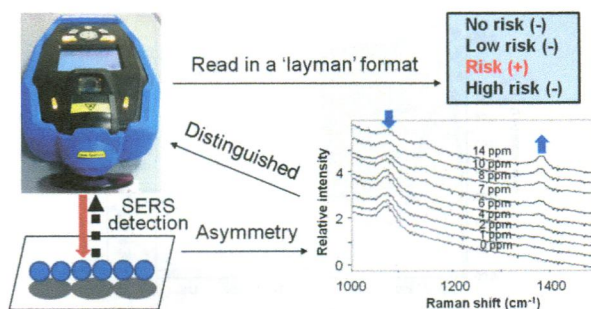


7075

Semi-quantification of surface-enhanced Raman scattering using a handheld Raman spectrometer: a feasibility study

Jinkai Zheng, Shintaro Pang, Theodore P. Labuza and Lili He*

The feasibility of utilizing a handheld Raman spectrometer for surface-enhanced Raman scattering detection was evaluated on the pesticide ferbam.

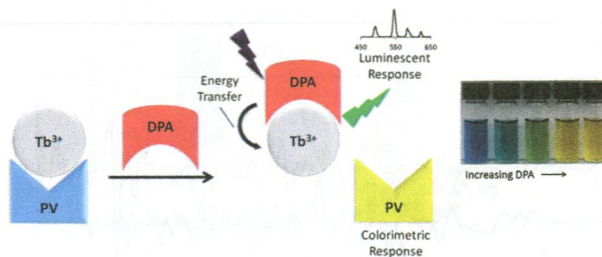


7079

Dual colorimetric and luminescent assay for dipicolinate, a biomarker of bacterial spores

Kasey J. Clear, Sarah Stroud and Bradley D. Smith*

A binary mixture of Tb^{3+} and pyrocatechol violet (PV) is used in a dye displacement assay to simultaneously produce a colorimetric and luminescent response to dipicolinate.

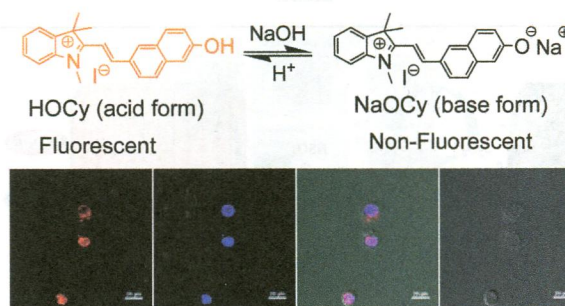


7083

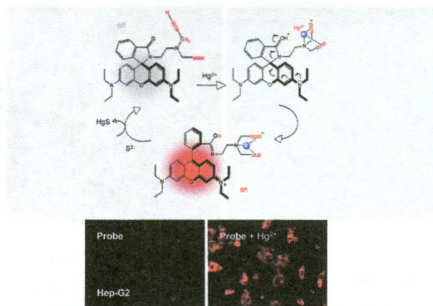
A novel and photostable pH probe for selectively staining nuclei in living cells

Lintao Zeng,* Ne Fan, Jiayu Zha, Xichao Hu, Boqiao Fu, Caiqin Qin and Liang Wang*

A novel pH probe displays large Stokes shift and good photostability and could selectively stain nuclei in living cells.



7087

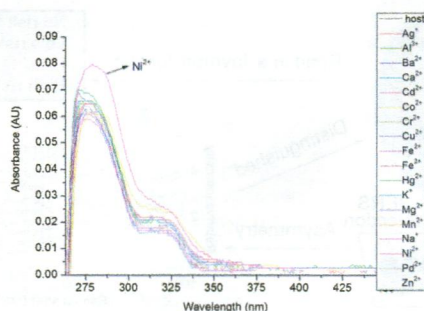


Revisit of a dipropargyl rhodamine probe reveals its alternative ion sensitivity in both a solution and live cells

Kai-Bin Li, Xiao-Li Wei, Yi Zang,* Xiao-Peng He,* Guo-Rong Chen, Jia Li* and Kaixian Chen

A dipropargyl rhodamine B derivative previously described as a reaction-based palladium probe is shown here to be, more sensitively, a reversible mercury probe in both an aqueous solution and live cells.

7090



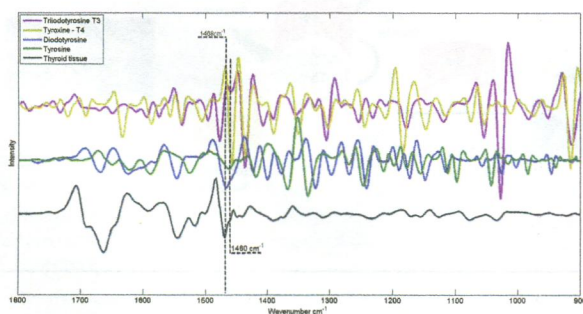
Highly sensitive and selective fluorescent chemosensor for Ni²⁺ based on a new poly(arylene ether) with terpyridine substituent groups

Hui Li, Shu-Jiang Zhang, Cheng-Liang Gong, Yan-Feng Li,* Yu Liang, Zhi-Gang Qi and Sheng Chen

A new poly(arylene ether) with terpyridine substituent groups has been synthesized which shows a turn-off fluorescent response in the presence of Ni²⁺ over other cations and allows discrimination of these cations from each other on the basis of the extent of quenching.

PAPERS

7094

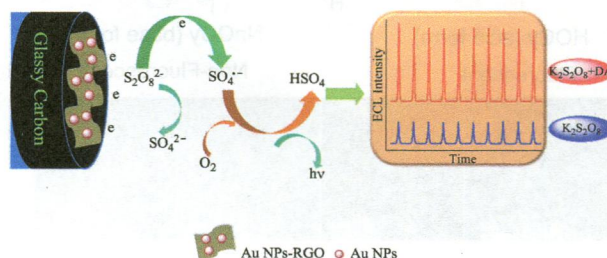


The characterization of normal thyroid tissue by micro-FTIR spectroscopy

Thiago M. Pereira, Denise M. Zzell,* Benjamin Bird, Milos Miljković and Max Diem

In this paper, we report the spectral patterns of normal human thyroid tissue and methodology to interpret hyperspectral imaging data and any protein conformational changes observed therein.

7101



Enhanced peroxydisulfate electrochemiluminescence for dopamine biosensing based on Au nanoparticle decorated reduced graphene oxide

Yuting Yan, Qian Liu, Kun Wang,* Ling Jiang, Xingwang Yang, Jing Qian, Xiaoya Dong and Baijing Qiu

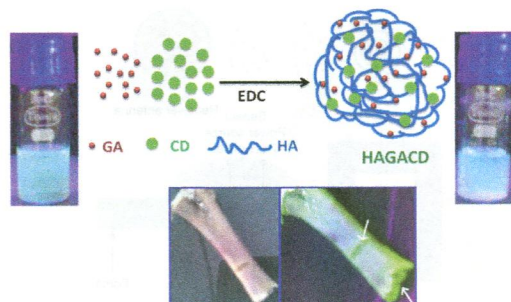
A novel strategy to amplify the ECL signal of peroxydisulfate solution based on the Au nanoparticle decorated reduced graphene oxide (Au NP-RGO) was constructed and an ECL biosensor for dopamine detection was developed.

7107

In vitro detection of calcium in bone by modified carbon dots

A. Shanti Krishna, C. Radhakumary and K. Sreenivasan*

Modified carbon dots enable the location of calcium deposits in bone.

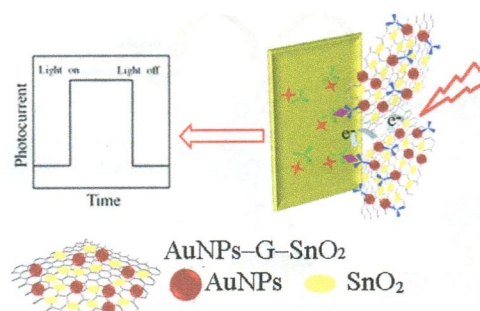


7112

A visible light photoelectrochemical sensor for tumor marker detection using tin dioxide quantum dot-graphene as labels

Yanhu Wang, Meng Li, Yuanna Zhu, Shenguang Ge, Jinghua Yu,* Mei Yan and Xianrang Song*

A simple and sensitive sandwich-type photoelectrochemical immunosensor for the measurement of biomarkers was developed for the first time using tin dioxide quantum dot modified graphene nanocomposites as an excellent label with amplification techniques.

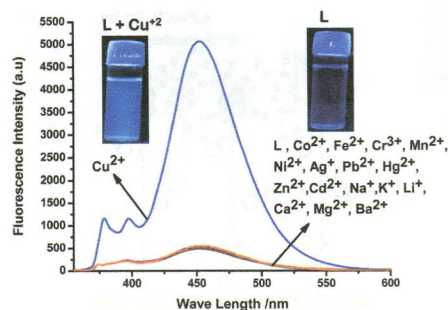


7119

A pyrene-based simple but highly selective fluorescence sensor for Cu²⁺ ions via a static excimer mechanism

Soma Sarkar, Swapnadip Roy, Anindita Sikdar, R. N. Saha and Sujit S. Panja*

A pyrene-based simple fluorosensor has been synthesized by a one step process. It exhibited high selectivity towards Cu²⁺ ion via fluorescence enhancement through *static* excimer emission. A mechanistic study has been made for pH effect on the monomer and excimer emission.

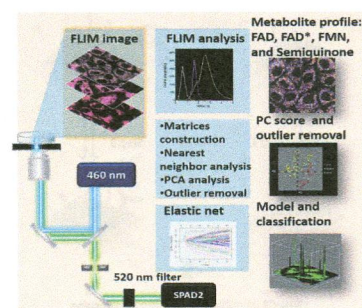


7127

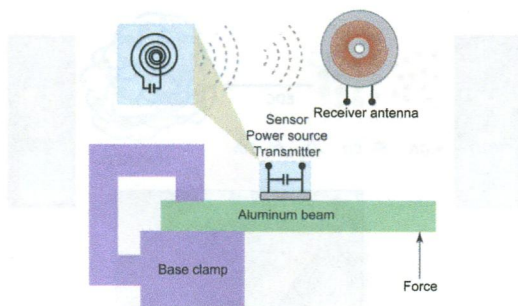
A hybrid FLIM-elastic net platform for label free profiling of breast cancer

Nur P. Damayanti, Ana Paula Craig and Joseph Irudayaraj*

Label-free metabolic profiling and classification of breast cancer cells by fluorescence lifetime imaging.



7135

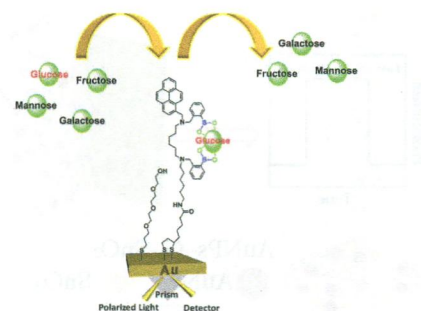


Uniaxially-aligned PVDF nanofibers as a sensor and transmitter for biotelemetry

Dennis Edmondson, Soumen Jana, David Wood, Chen Fang and Miqin Zhang*

We report a novel biotelemetry device consisting of a coiled bundle of uniaxially-aligned biocompatible polyvinylidene fluoride (PVDF) nanofibers that works simultaneously as a sensor, power source, and transmitter. The device has the potential to serve as a standalone biotelemeter for *in vivo* applications.

7140

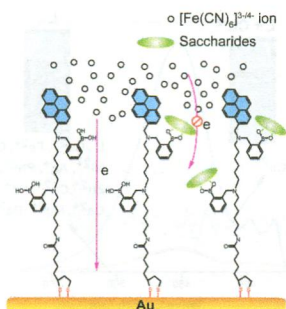


Glucose selective Surface Plasmon Resonance-based bis-boronic acid sensor

Alex Stephenson-Brown, Hui-Chen Wang, Parvez Iqbal, Jon A. Preece, Yitao Long, John S. Fossey,* Tony D. James* and Paula M. Mendes*

Surface plasmon resonance and self-assembled monolayers on gold generated from a *bis*-boronic acid can detect glucose with higher affinity than other saccharides, namely galactose, fructose and mannose.

7146

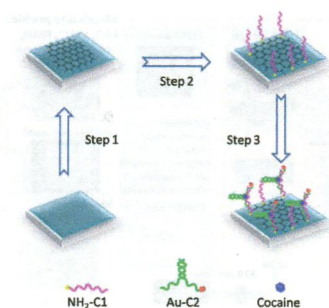


A *bis*-boronic acid modified electrode for the sensitive and selective determination of glucose concentrations

Hui-Chen Wang, Hao Zhou, Baoqin Chen, Paula M. Mendes, John S. Fossey,* Tony D. James* and Yi-Tao Long*

A *bis*-boronic acid modified electrode for the sensitive and selective determination of glucose concentrations has been developed.

7152



Fluorescent sensing of cocaine based on a structure switching aptamer, gold nanoparticles and graphene oxide

Yan Shi, Haichao Dai, Yujing Sun, Jingting Hu, Pengjuan Ni and Zhuang Li*

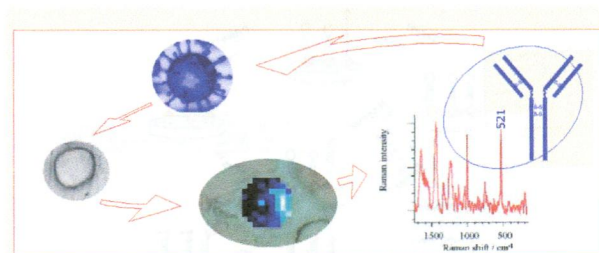
A fluorescence sensor employing graphene oxide, gold nanoparticles and a structure switching aptamer for the detection of cocaine.

7157

Raman micro-spectroscopy tracing human lymphocyte activation

A. Weselucha-Birczyńska,* M. Kozicki, J. Czepiel and M. Birczyńska

The aim of this work was to verify if Raman spectroscopy can be used to screen the activation of lymphocytes during viral infection.

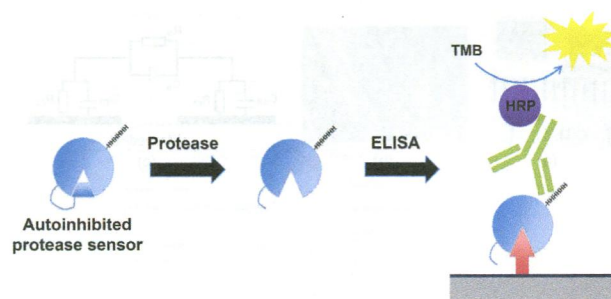


7164

A novel protease activity assay method based on an engineered autoinhibited protein using an enzyme-linked immunoassay

Hyun Kyung Yoon and Tae Hyeon Yoo*

In this report, we demonstrated a new strategy to assay protease activities by combining the concept of autoinhibition and the enzyme-linked immunoassay platform.

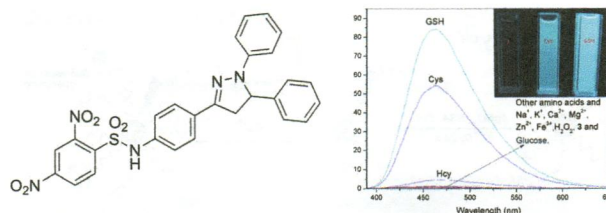


7169

A novel pyrazoline-based selective fluorescent probe for detecting reduced glutathione and its application in living cells and serum

Sheng-Qing Wang, Qing-Hua Wu, Hao-Yan Wang, Xiao-Xin Zheng, Shi-Li Shen, Yan-Ru Zhang, Jun-Ying Miao* and Bao-Xiang Zhao*

A pyrazoline-based selective and sensitive fluorescent probe for biothiols has been developed. The probe can be used for fluorescent imaging of cellular glutathione and for detecting glutathione in calf serum.

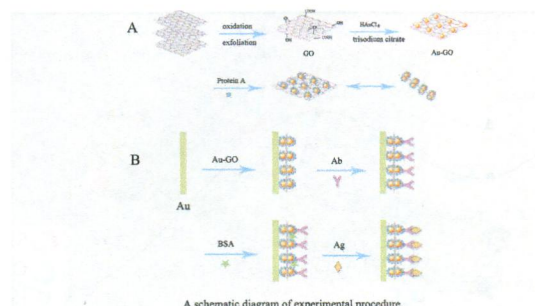


7175

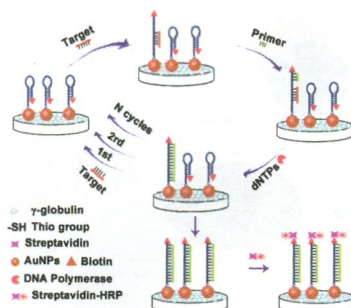
A protein A modified Au-graphene oxide composite as an enhanced sensing platform for SPR-based immunoassay

Jia Zhang, Ying Sun, Qiong Wu, Hua Zhang, Yu Bai and Daqian Song*

A sensitive and selective wavelength modulation surface plasmon resonance (SPR) biosensor is reported with Au nanoparticle decorated graphene oxide (GO) as an enhanced sensing platform.



7182

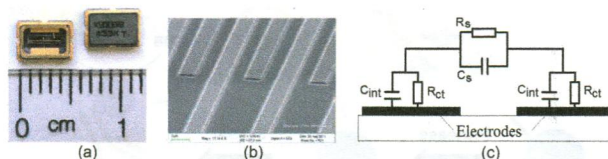


Spectrophotometric and ultrasensitive DNA bioassay by circular-strand displacement polymerization reaction

Luxin Yu, Wei Wu, Junhua Chen, Zhuo Xiao, Chenchu Ge, Puchang Lie, Zhiyuan Fang, Lingbo Chen, Ya Zhang and Lingwen Zeng*

We have demonstrated a new spectrophotometric DNA detection approach based on a circular strand-displacement polymerization reaction for the detection of sequence 3 specific DNA with a detection limit of 8 aM.

7188

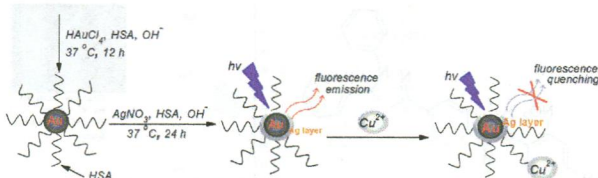


An AC electrokinetic impedance immunosensor for rapid detection of tuberculosis

Haochen Cui, Shanshan Li, Quan Yuan, Ashutosh Wadhwa, Shigetoshi Eda, Mark Chambers, Roland Ashford, Hongyuan Jiang and Jie Wu*

This work presents an AC electrokinetic impedance sensing method that is capable of detecting specific interactions between macromolecules such as antigen–antibody binding.

7197

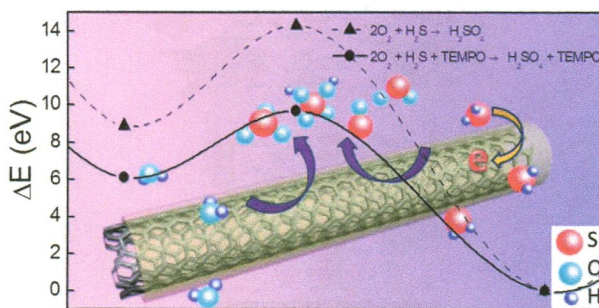


Aqueous synthesis of human serum albumin-stabilized fluorescent Au/Ag core/shell nanocrystals for highly sensitive and selective sensing of copper(II)

Rijun Gui* and Hui Jin

Using human serum albumin as a reductive plus stabilizing agent, fluorescent Au/Ag core/shell nanocrystals were prepared at pH 9.0 and 37 °C, and further developed as a highly sensitive and selective sensor of Cu²⁺.

7206



High-performance H₂S detection by redox reactions in semiconducting carbon nanotube-based devices

Hyun Young Jung,* Young Lae Kim, Sora Park, Aniket Datar, Hyung-June Lee, Jun Huang, Sivasubramanian Somu, Ahmed Busnaina, Yung Joon Jung and Young-Kyun Kwon*

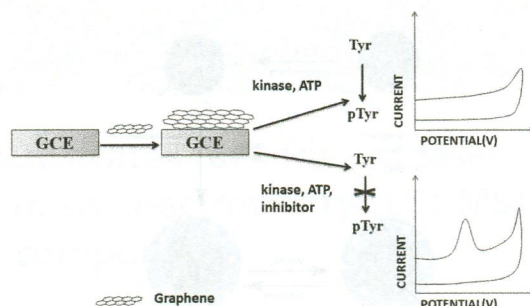
We report the highly effective detection of H₂S gas by redox reactions based on SWCNTs functionalized with TEMPO as a catalyst and discuss the important role of water vapor. The s-SWCNT device shows a very high sensitivity of 420% at 60% humidity.

7212

Graphene based electrochemical biosensor for label-free measurement of the activity and inhibition of protein tyrosine kinase

Bingyu Li, Xinhao Shi, Wei Gu, Kai Zhao, Ningning Chen and Yuezhong Xian*

Label-free evaluation of the activity of protein tyrosine kinase and inhibitor screening based on the electrochemical signal of tyrosine residues at a graphene modified glassy carbon electrode.

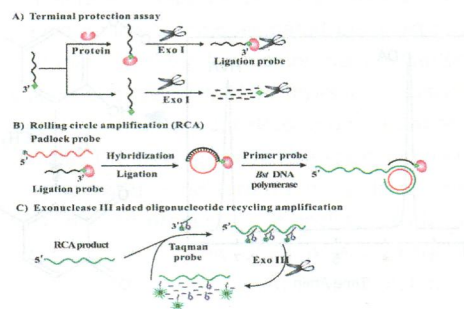


7218

Terminal protection of small-molecule-linked DNA for sensitive fluorescence detection of protein binding based on nucleic acid amplification

Li-Juan Ou, Hai-Bo Wang and Xia Chu*

A novel fluorescent strategy was developed for ultrasensitive small molecule–protein interactions detection based on terminal protection and nucleic acid amplification.

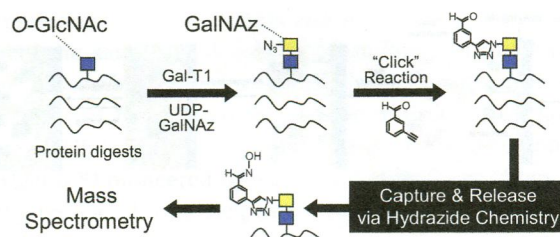


7224

Reversible hydrazone chemistry-based enrichment for O-GlcNAc-modified peptides and glycopeptides having non-reducing GlcNAc residues

Takashi Nishikaze,* Shin-ichirou Kawabata, Shinichi Iwamoto and Koichi Tanaka

A new enrichment method for O-GlcNAc-modified peptides by chemoenzymatic derivatization with an aromatic aldehyde followed by solid-phase extraction *via* reversible hydrazone chemistry.

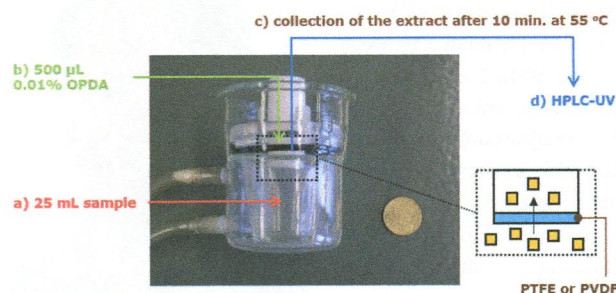


7233

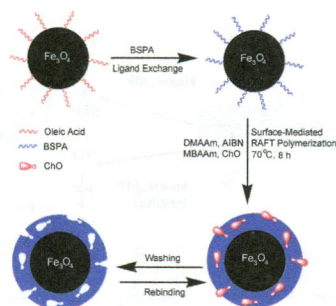
Chromatographic analysis of methylglyoxal and other α -dicarbonyls using gas-diffusion microextraction

Christiane M. Santos, Inês M. Valente,* Luís M. Gonçalves and José A. Rodrigues

Gas-diffusion microextraction applied to the HPLC-UV analysis of low volatile analytes like methylglyoxal.



7238

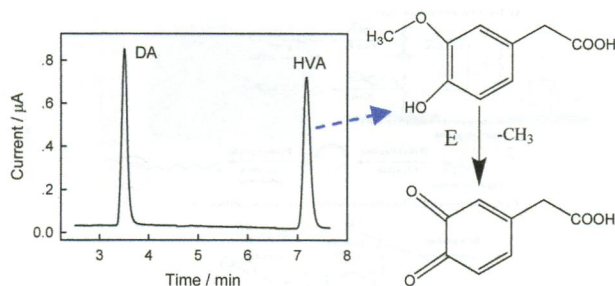


Molecularly imprinted superparamagnetic iron oxide nanoparticles for rapid enrichment and separation of cholesterol

Adem Zengin, Ertan Yildirim, Ugur Tamer and Tuncer Caykara*

We report a general protocol to prepare highly controllable core-shell Fe₃O₄@MIP SPNPs for rapid enrichment and separation of cholesterol.

7246

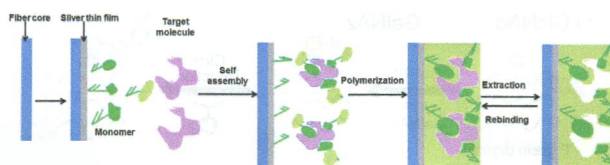


Simultaneous analysis of dopamine and homovanillic acid by high-performance liquid chromatography with wall-jet/thin-layer electrochemical detection

Yaping Zhou, Hongling Yan, Qingji Xie,* Siyu Huang, Jiali Liu, Zou Li, Ming Ma and Shouzhao Yao

Simultaneous analysis of dopamine and homovanillic acid by HPLC with wall-jet/thin-layer electrochemical detection.

7254



Optical fiber sensor for the detection of tetracycline using surface plasmon resonance and molecular imprinting

Roli Verma and Banshi D. Gupta*

We present a simple and highly selective optical fiber sensor for the detection of tetracycline in foodstuffs by using the combination of surface plasmon resonance (SPR) and a molecular imprinted polymer (MIP) matrix.