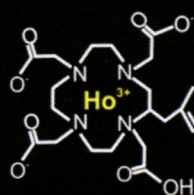


1711  
A53/2

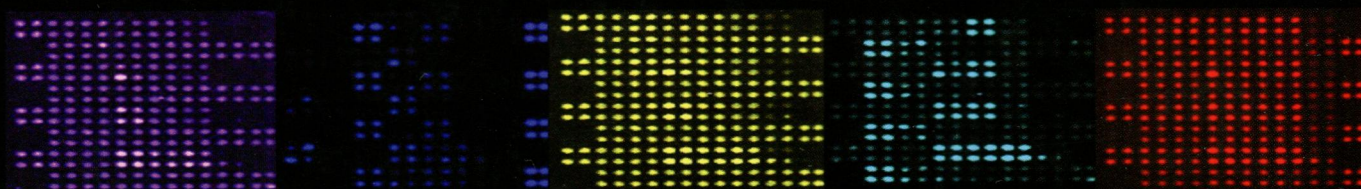
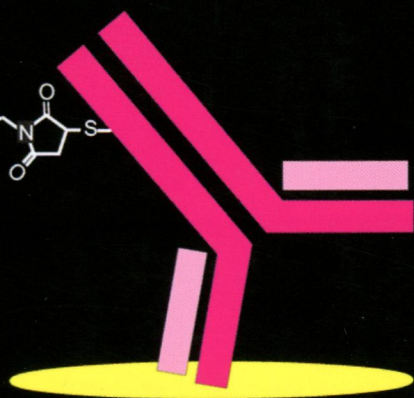
# Analyst

www.rsc.org/analyst

Volume 138 | Number 21 | 7 November 2013 | Pages 6199–6694



MeCAT



|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| H  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | He |
| Li | Be |    |    |    |    |    |    |    |    |    |    | B  | C  | N  | O  | F  | Ne |
| Na | Mg |    |    |    |    |    |    |    |    |    |    | Al | Si | P  | S  | Cl | Ar |
| K  | Ca | Sc | Ti | V  | Cr | Mn | Fe | Co | Ni | Cu | Zn | Ga | Ge | As | Se | Br | Kr |
| Rb | Sr | Y  | Zr | Nb | Mo | Tc | Ru | Rh | Pd | Ag | Cd | In | Sn | Sb | Te | I  | Xe |
| Cs | Ba | L  | Hf | Ta | W  | Re | Os | Ir | Pt | Au | Hg | Tl | Pb | Bi | Po | At | Rn |
| Fr | Ra | A  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|    | L  | La | Ce | Pr | Nd | Pm | Sm | Eu | Gd | Tb | Dy | Ho | Er | Tm | Yb | Lu |    |
|    | A  | Ac | Th | Pa | U  | Np | Pu | Am | Cm | Bk | Cf | Es | Fm | Md | No | Lr |    |

ISSN 0003-2654

RSC Publishing

**HOT ARTICLE**

Larissa Waentig *et al.*

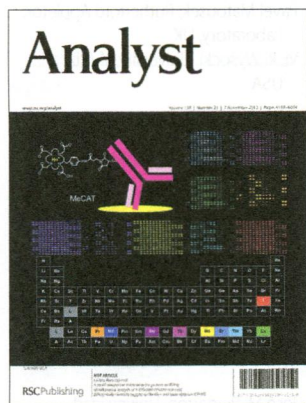
A multi-parametric microarray for protein profiling: simultaneous analysis of 8 different cytochromes *via* differentially element tagged antibodies and laser ablation ICP-MS



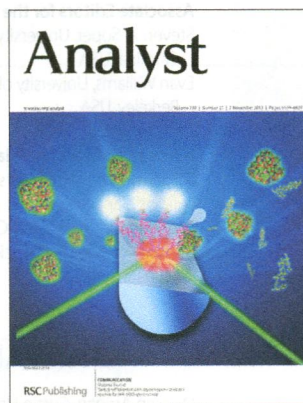
0003-2654 (2013) 138:21;1-X

## IN THIS ISSUE

ISSN 0003-2654 CODEN ANALAO 138(21) 6199–6694 (2013)



**Cover**  
See Larissa Waentig *et al.*,  
pp. 6309–6315.  
Image reproduced by permission  
of Larissa Müller (née Waentig)  
from *Analyst*, 2013, **138**, 6309.



**Inside cover**  
See Shuping Xu *et al.*,  
pp. 6282–6286.  
Image reproduced by permission  
of Shuping Xu from *Analyst*, 2013,  
**138**, 6282.

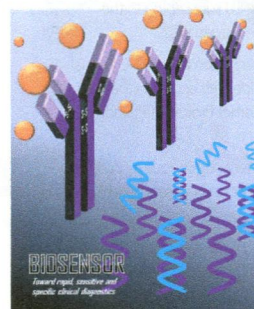
## MINIREVIEW

6219

### Novel biosensing methodologies for ultrasensitive detection of viruses

Ming Soon Cheng and Chee-Seng Toh\*

Biosensors function as rapid, sensitive and specific diagnostic tools for various viral infectious diseases.



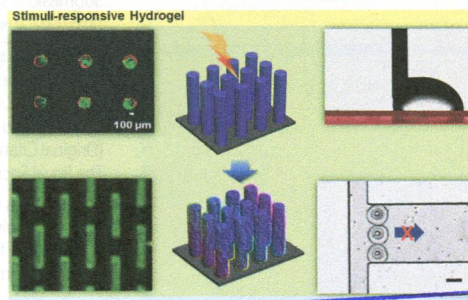
## TUTORIAL REVIEW

6230

### Stimuli-responsive hydrogel patterns for smart microfluidics and microarrays

Do Hyun Kang, Sang Moon Kim, Byungjun Lee, Hyunsik Yoon\* and Kahp-Yang Suh\*

In this review, we highlight the properties, functions and applications of stimuli-responsive hydrogel patterns in bioanalytical applications.



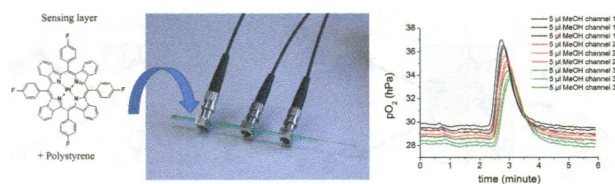
Федеральное государственное  
бюджетное учреждение науки  
Центральная научная библиотека  
Уральского отделения  
Российской академии наук (ЦНБ УРО РАН)

6243

### A new method to measure oxygen solubility in organic solvents through optical oxygen sensing

Michela Quaranta, Michael Murkovic and Ingo Klimant\*

A flow through capillary sensor was successfully used to measure oxygen content in different organic solvents and binary mixtures which were injected in an HPLC.

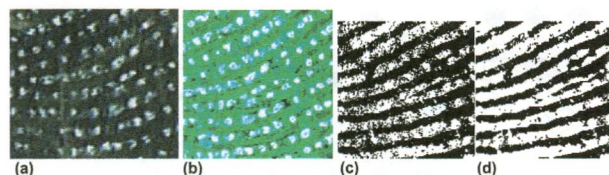


6246

### Enhanced imaging of developed fingerprints using mass spectrometry imaging

M. J. Bailey,\* M. Ismail, S. Bleay, N. Bright, M. Levin Elad, Y. Cohen, B. Geller, D. Everson, C. Costa, R. P. Webb, J. F. Watts and M. de Puit

Imaging mass spectrometry can be used to enhance the visualisation of latent fingerprints that cannot be satisfactorily developed by conventional methods.

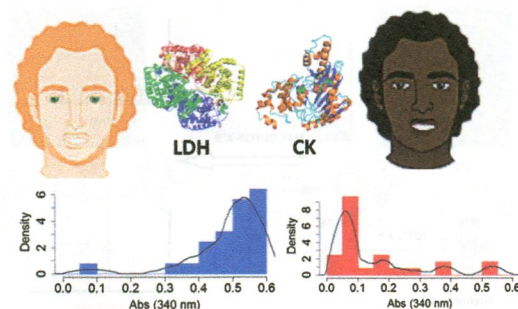


6251

### Biocatalytic analysis of biomarkers for forensic identification of ethnicity between Caucasian and African American groups

Friederike Kramer, Lenka Halámková, Arshak Poghosian, Michael J. Schöning, Evgeny Katz\* and Jan Halánek\*

A biocatalytic assay analyzing the simultaneous presence of creatine kinase and lactate dehydrogenase recognizes biofluids of different ethnic origins for forensic applications.

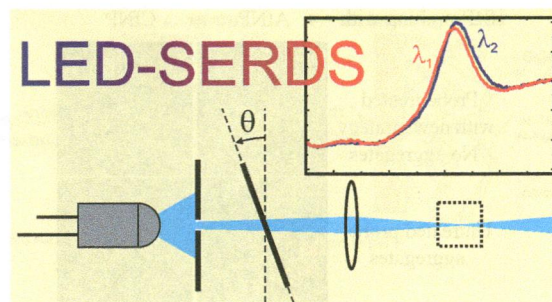


6258

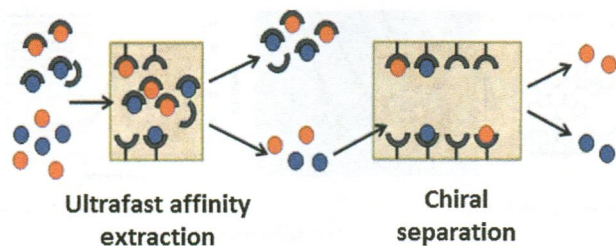
### Light-emitting diode based shifted-excitation Raman difference spectroscopy (LED-SERDS)

Renata Adami and Johannes Kiefer\*

The combination of a light-emitting diode and an angle-tunable bandpass filter allows shifted-excitation Raman difference spectra to be acquired.



6262

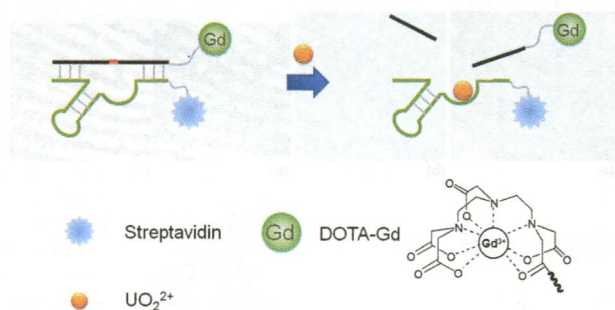


### Analysis of free fractions for chiral drugs using ultrafast extraction and multi-dimensional high-performance affinity chromatography

Xiwei Zheng, Michelle J. Yoo and David S. Hage\*

A multi-dimensional system based on ultrafast affinity extraction and a chiral separation was developed to measure the free fractions of drug enantiomers in biological samples and to study drug-protein interactions.

6266

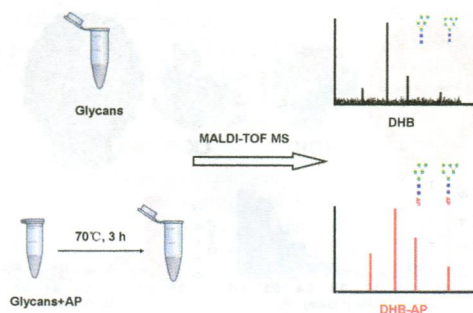


### A smart $T_1$ -weighted MRI contrast agent for uranyl cations based on a DNAzyme-gadolinium conjugate

Weichen Xu, Hang Xing and Yi Lu\*

We report a smart MRI contrast agent for the sensing of  $\text{UO}_2^{2+}$  based on a DNAzyme and Gd complex conjugate.

6270

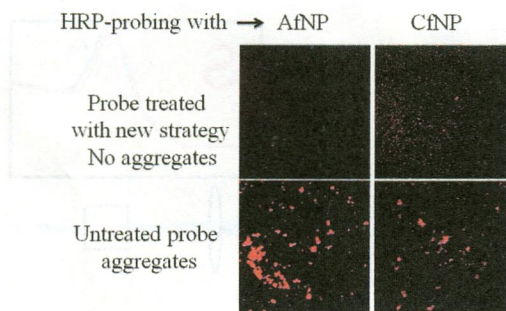


### Improved analysis of oligosaccharides for matrix-assisted laser desorption/ionization time-of-flight mass spectrometry using aminopyrazine as a derivatization reagent and a co-matrix

Yan Cai, Ying Zhang,\* Pengyuan Yang and Haojie Lu\*

A nonreductive amination derivatization using aminopyrazine (AP) as a derivatization agent and a co-matrix for improved analysis of oligosaccharides by MALDI-TOF MS is described.

6277



### A chemical quenching- and physical blocking-based method to minimize process-mediated aggregation of antibody-crosslinked nanoparticles for imaging application

Chandra K. Dixit,\* Shibsekhar Roy, Conor Byrne, Richard O'Kennedy and Colette McDonagh

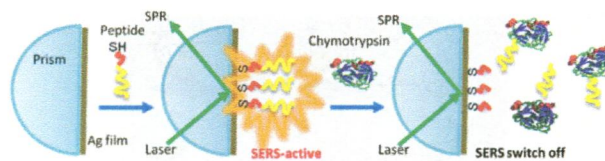
Critical limitation of nanoparticles (NP) is their aggregation after functionalisation and antibody cross-linking.

6282

### 'Switch-off' biosensing for chymotrypsin-catalyzed reaction by SPR-SERS spectroscopy

Cuicui Fu, Weiqing Xu, Gang Chen and Shuping Xu\*

A novel 'switch-off' biosensing strategy for the detection of chymotrypsin based on surface plasmon resonance (SPR) and surface-enhanced Raman scattering (SERS) spectroscopy.

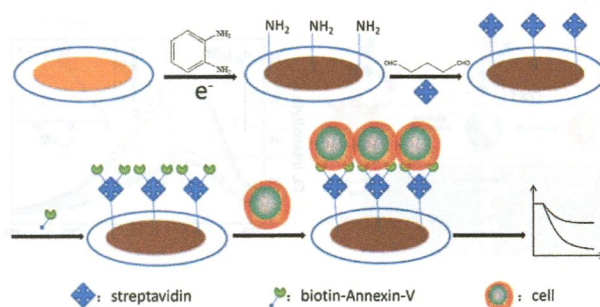


6287

### Annexin-V modified QCM sensor for the label-free and sensitive detection of early stage apoptosis

Yuliang Pan, Wenqian Shan, Heting Fang, Manli Guo,\* Zhou Nie, Yan Huang and Shouzhao Yao\*

A novel Annexin-V modified QCM sensor was constructed for the specific capture and sensitive detection of apoptotic cells without the need for cell labelling.

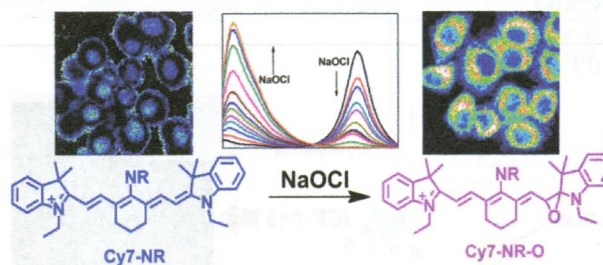


6291

### Ratiometric fluorescence imaging of cellular hypochlorous acid based on heptamethine cyanine dyes

Zhangrong Lou, Peng Li, Peng Song and Keli Han\*

A series of fluorescence probes for detecting hypochlorous acid selectively, sensitively and ratiometrically have been developed.

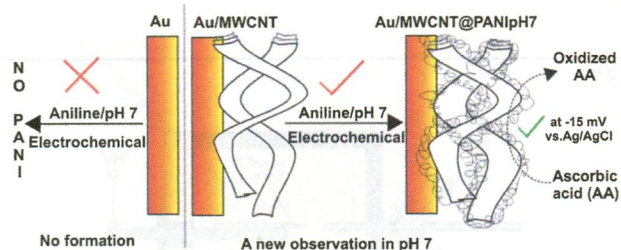


6296

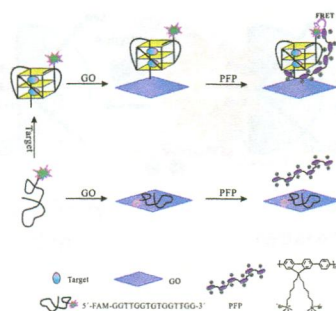
### Unusual neutral pH assisted electrochemical polymerization of aniline on a MWCNT modified electrode and its enhanced electro-analytical features

Nandimalla Vishnu, Annamalai Senthil Kumar\* and K. Chandrasekara Pillai

In this work, we have observed an unusually facile electrochemical formation of PANI in neutral pH (7) on a MWCNT modified electrode and it showed high selectivity for ascorbic acid at a very low potential.



6301

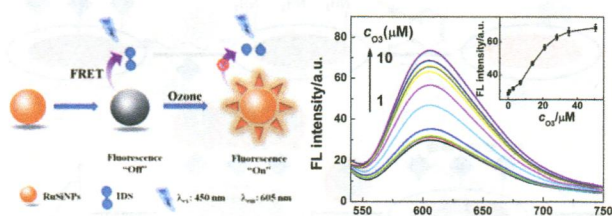


### Amplified fluorescent assay of potassium ions using graphene oxide and a conjugated cationic polymer

Xiao-Jing Xing, Ying Zhou, Xue-Guo Liu, Hong-Wu Tang\* and Dai-Wen Pang

We present a low background and amplified fluorescent sensor for potassium ions using graphene oxide (GO) and a cationic conjugated polymer (CCP). The strategy is based on the phenomenon that the addition of CCP cannot release the dye labeled guanine-rich DNA from the GO surface, and the conformational switch of the guanine-rich DNA induced by the target.

6305



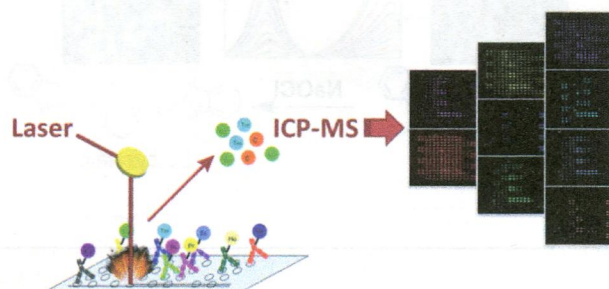
### Fluorescent silica nanoparticle-based probe for the detection of ozone via fluorescence resonance energy transfer

Wenjing Qi, Di Wu, Jianming Zhao, Zhongyuan Liu, Min Xu, Saima Anjum and Guobao Xu\*

A fluorescence resonance energy transfer platform for the detection of ozone was developed using  $Ru(bpy)_3^{2+}$ -doped silica nanoparticles and indigo carmine.

## PAPERS

6309

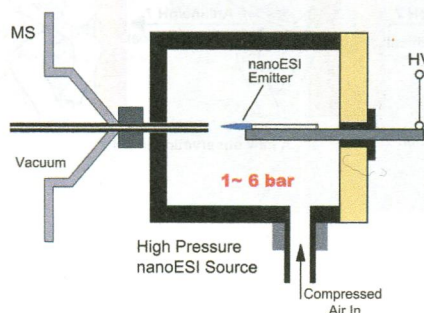


### A multi-parametric microarray for protein profiling: simultaneous analysis of 8 different cytochromes via differentially element tagged antibodies and laser ablation ICP-MS

Larissa Waentig\*, Sandra Techritz, Norbert Jakubowski and Peter H. Roos

High throughput reverse phase microarrays in combination with element tagged antibodies and the multi-analyte capabilities of LA-ICP-MS were used for detection and quantification many biomarkers in multiple samples simultaneously.

6316



### High pressure nanoelectrospray ionization mass spectrometry for analysis of aqueous solutions

Md. Matiur Rahman, Mridul Kanti Mandal, Kenzo Hiraoka and Lee Chuin Chen\*

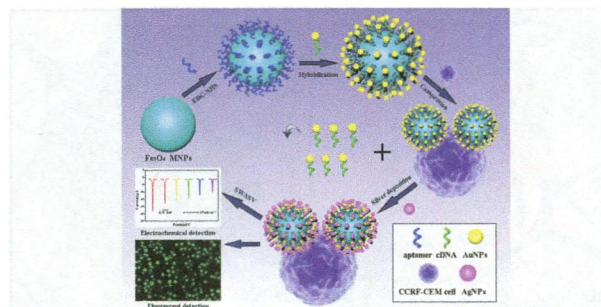
Comparison of nanoelectrospray under atmospheric pressure and super-atmospheric pressure for the analysis of samples in aqueous solution.

6323

### A novel aptamer-based competition strategy for ultrasensitive electrochemical detection of leukemia cells

Kui Zhang, Tingting Tan, Jia-Ju Fu, Tingting Zheng and Jun-Jie Zhu\*

The detection principle of the competitive electrochemical sensing system is illustrated schematically. It utilized the competitive binding of cell-specific aptamers to acute leukemia cells and subsequent voltammetric quantification of the metal signature.

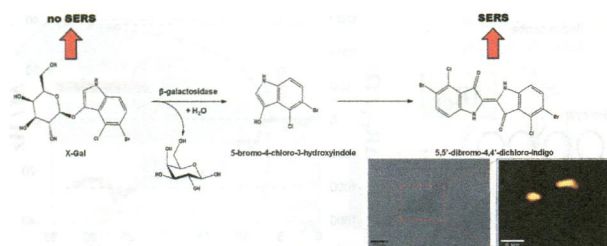


6331

### Analysis of intracellular enzyme activity by surface enhanced Raman scattering

Ross Stevenson, Sarah McAughtrie, Laura Senior, Robert J. Stokes, Helen McGachy, Laurence Tetley, Paola Nativo, James M. Brewer, James Alexander, Karen Faulds and Duncan Graham\*

The *in vitro* conversion of X-Gal to a SERS active product by native  $\beta$ -galactosidase enzymes allows localisation of intracellular activity pockets.

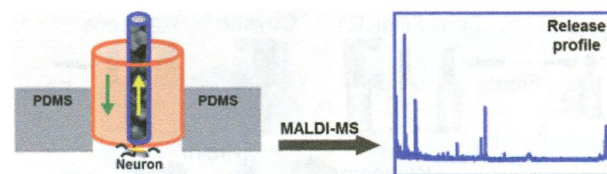


6337

### Stimulation and release from neurons via a dual capillary collection device interfaced to mass spectrometry

Yi Fan, Chang Young Lee, Stanislav S. Rubakhin and Jonathan V. Sweedler\*

A dual capillary device and associated protocols enable the chemical stimulation of cells and efficient collection of neuropeptide release, followed by sample concentration, removal of inorganic salts, and finally, mass spectrometry characterization of samples ranging from individual neurons to spatially defined locations from a brain region.

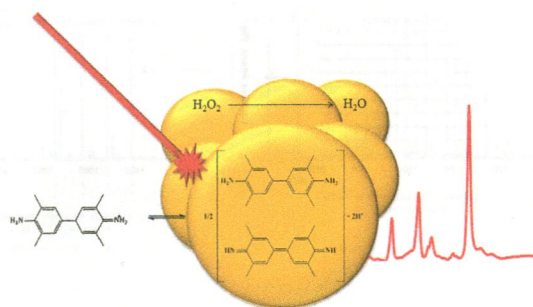


6347

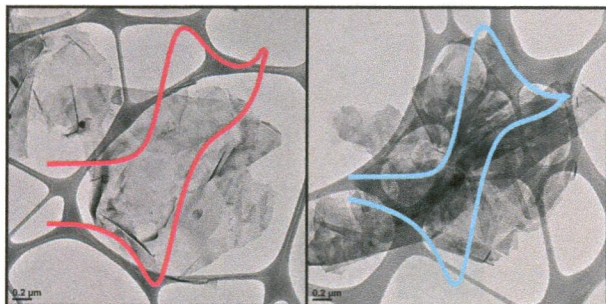
### An investigation into the simultaneous enzymatic and SERRS properties of silver nanoparticles

Kristy S. McKeating, Sian Sloan-Dennison, Duncan Graham and Karen Faulds\*

Silver nanoparticles were investigated for their dual catalytic activity and success as a SERRS substrate and subsequently used for the detection of  $H_2O_2$ .



6354

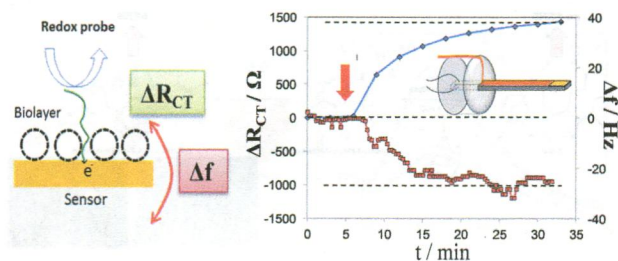


### Exploring the electrochemical performance of graphitic paste electrodes: graphene vs. graphite

Luiz C. S. Figueiredo-Filho, Dale A. C. Brownson, Maria Gómez-Mingot, Jesús Iniesta, Orlando Fatibello-Filho and Craig E. Banks\*

Spot the difference: a graphene paste electrode is compared to a graphite alternative, revealing no observable differences in the electrochemical performance.

6365

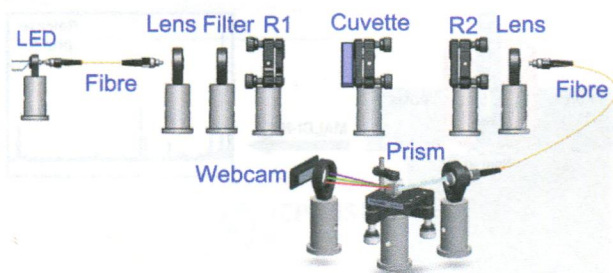


### Electrochemical piezoelectric-excited millimeter-sized cantilever (ePEMC) for simultaneous dual transduction biosensing

Blake N. Johnson and Raj Mutharasan\*

Surface binding causes charge transfer resistance increase and resonant frequency decrease in a single sensor with dual transduction.

6372

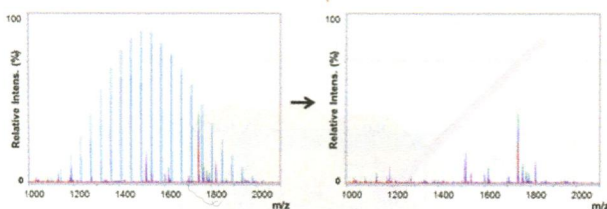


### High sensitivity liquid phase measurements using broadband cavity enhanced absorption spectroscopy (BBCEAS) featuring a low cost webcam based prism spectrometer

Zhechao Qu, Julia Engstrom, Donald Wong, Meez Islam and Clemens F. Kaminski\*

Broadband cavity enhanced absorption spectroscopy with a low cost webcam based prism spectrometer.

6380



### Comparative LC-MS/MS analysis of optimal cutting temperature (OCT) compound removal for the study of mammalian proteomes

Leigh A. Weston and Amanda B. Hummon\*

Primary tissue samples are valuable resources for investigators interested in understanding disease.

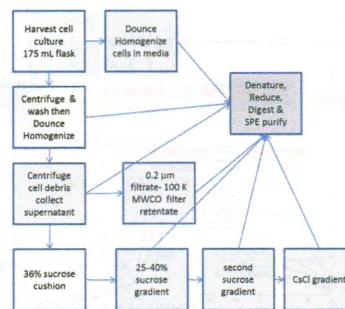


6385

### Forensic proteomics of poxvirus production

David Wunschel,\* Edan Tulman, Heather Engelmann, Brian H. Clowers, Steven Geary, Aaron Robinson and Xiaofen Liao

The field of microbial forensics has recently sought to develop methods to discern biological signatures to indicate production methods for biological agents.

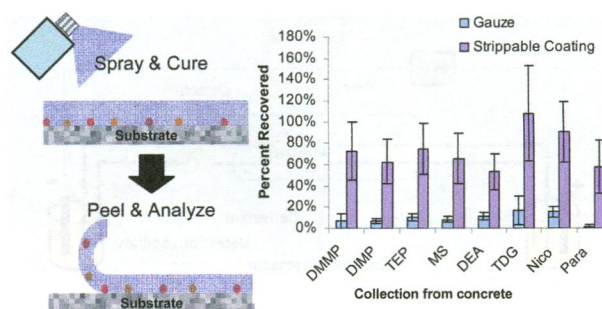


6398

### Forensic collection of trace chemicals from diverse surfaces with strippable coatings

Michael J. Jakubowski, Kevin J. Beltis, Paul M. Drennan and Bradford A. Pindzola\*

We present strippable coatings as effective sampling tools for collection of trace chemicals from a diverse array of common surfaces.

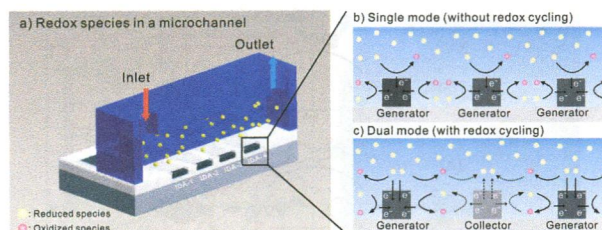


6404

### The effect of channel height and electrode aspect ratio on redox cycling at carbon interdigitated array nanoelectrodes confined in a microchannel

Jeong-Il Heo, Yeongjin Lim and Heungjoo Shin\*

1 : 1 aspect ratio interdigitated array nanoelectrodes integrated in a polydimethylsiloxane microchannel that enables current amplification by up to 1116 times using redox cycling effect were demonstrated.

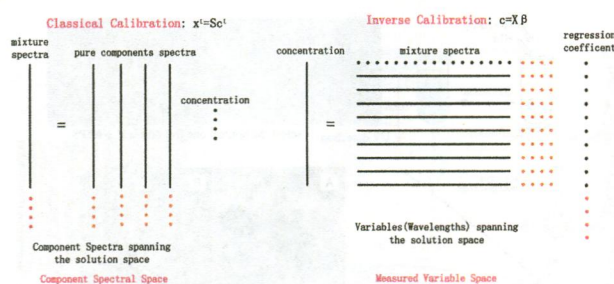


6412

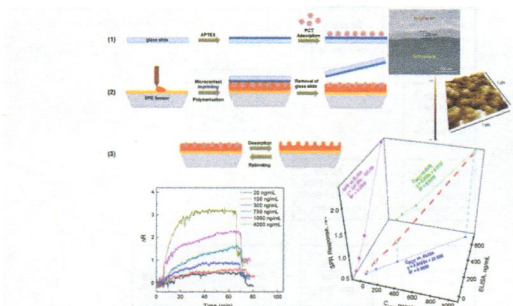
### A perspective demonstration on the importance of variable selection in inverse calibration for complex analytical systems

Yong-Huan Yun, Yi-Zeng Liang,\* Gui-Xiang Xie, Hong-Dong Li, Dong-Sheng Cao and Qing-Song Xu

Classical calibration and inverse calibration represent two scenarios of multivariate calibration in chemical modeling, and in this work we clarify the intrinsic difference between the two.



6422

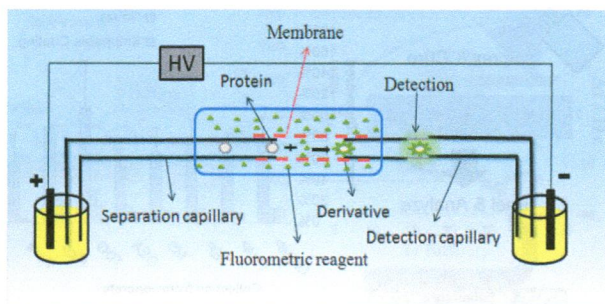


### Rapid real-time detection of procalcitonin using a microcontact imprinted surface plasmon resonance biosensor

Gulsu Sener, Erdogan Ozgur, Abbas Yousefi Rad, Lokman Uzun, Ridvan Say and Adil Denizli\*

Procalcitonin (PCT) is a promising biomarker for identification of the origin and severity of sepsis, which is a deadly body infection.

6429

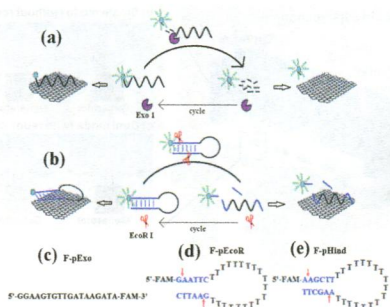


### A novel, post-column micro-membrane reactor for fluorescent analysis of protein in capillary electrophoresis

Fan Liu, Lingyi Zhang, Junhong Qian, Jun Ren, Fangyuan Gao and Weibing Zhang\*

This work reports a novel, post-column membrane reactor for protein analysis in capillary electrophoresis with laser induced fluorescence detection.

6437

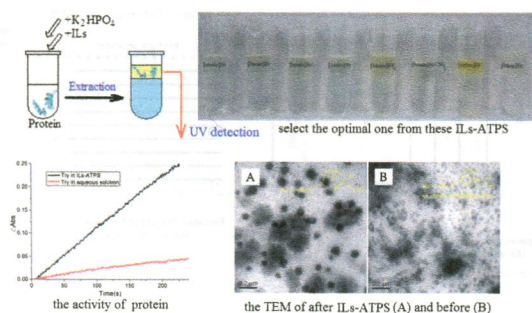


### A general fluorescent sensor design strategy for "turn-on" activity detection of exonucleases and restriction endonucleases based on graphene oxide

Qi Zhang and De-Ming Kong\*

A universal sensor design strategy was developed on the basis of significantly different binding affinities of graphene oxide to single-stranded DNAs with different lengths. The proposed sensors could be used for the activity detection of both exonucleases and restriction endonucleases.

6445



### Extraction and separation of proteins by ionic liquid aqueous two-phase system

Xiao Lin, Yuzhi Wang,\* Qun Zeng, Xueqin Ding and Jing Chen

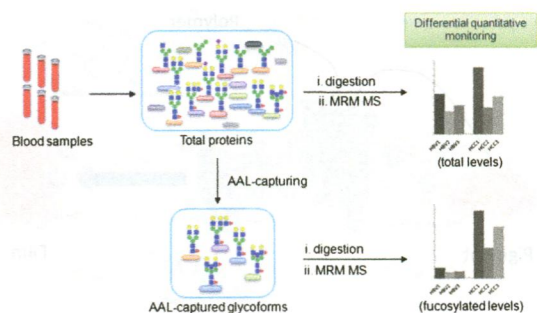
A satisfactory protocol of protein extraction and separation has been established based on the ionic liquid aqueous two-phase system (IL-ATPS) for the purification of bioactive substances.

6454

### Quantitative analysis of aberrant protein glycosylation in liver cancer plasma by AAL-enrichment and MRM mass spectrometry

Yeong Hee Ahn, Park Min Shin, Yong-Sam Kim, Na Ree Oh, Eun Sun Ji, Kwang Hoe Kim, Yeon Jung Lee, Sung Ho Kim and Jong Shin Yoo\*

The origins of increased abundance of fucosylated A1AT and FETUA in HCC plasmas were elucidated using AAL-capturing and MRM-based analysis.

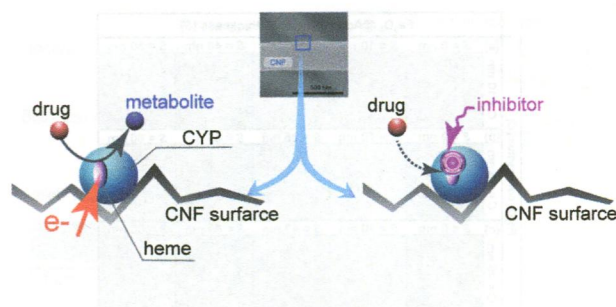


6463

### Human cytochrome P450 3A4 and a carbon nanofiber modified film electrode as a platform for the simple evaluation of drug metabolism and inhibition reactions

Qiang Xue, Dai Kato, Tomoyuki Kamata, Qiaohui Guo, Tianyan You and Osamu Niwa\*

We constructed a platform based on carbon nanofibers and a CYP3A4 modified film electrode for the simple evaluation of drug metabolism and its inhibition reactions.

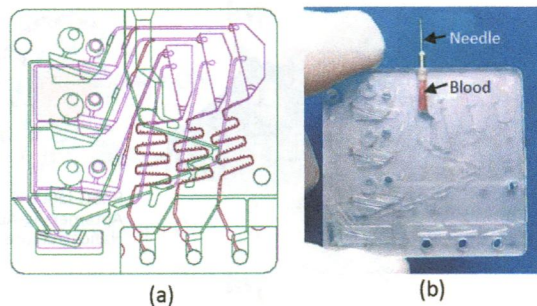


6469

### Colorimetric microchip assay using our own whole blood collected by a painless needle for home medical care

Madoka Takai,\* Masao Nagai, Yuji Morimoto, Kunihiro Sasao, Akio Oki, Jun Nakanishi, Hiromichi Inokuchi, Chia-Hsien Chang, Jun Kikuchi, Hiroki Ogawa and Yasuhiro Horiike\*

We have developed a colorimetric measurement chip that measures triglycerides, total cholesterol, and high-density lipoprotein in 6  $\mu$ L of whole blood collected with a painless needle.

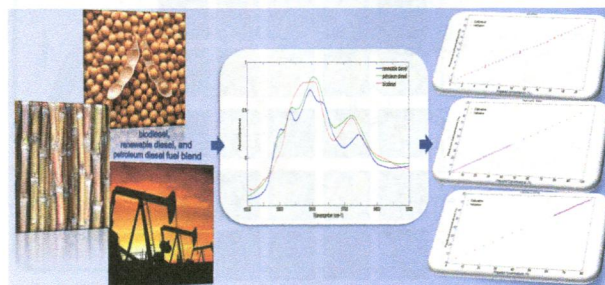


6477

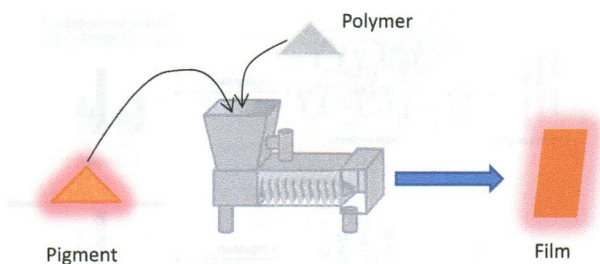
### Simultaneous determination of hydrocarbon renewable diesel, biodiesel and petroleum diesel contents in diesel fuel blends using near infrared (NIR) spectroscopy and chemometrics

Julio Cesar Laurentino Alves\* and Ronei Jesus Poppi

Quantitative determination of hydrocarbon renewable diesel (farnesane), biodiesel and petroleum diesel fuel blends using NIR spectroscopy and chemometrics.



6488

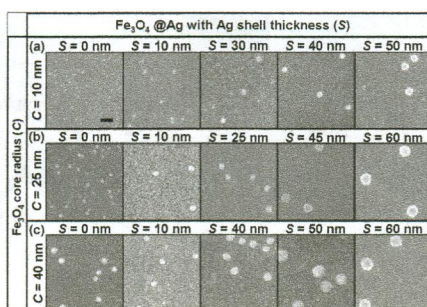


### Extruded polymer films pigmented with a heterogeneous ion-pair based lumophore for O<sub>2</sub> sensing

Andrew Mills\* and Ashleigh Graham

An ion-paired pigment is used to create an O<sub>2</sub>-sensitive extruded polymer film.

6494

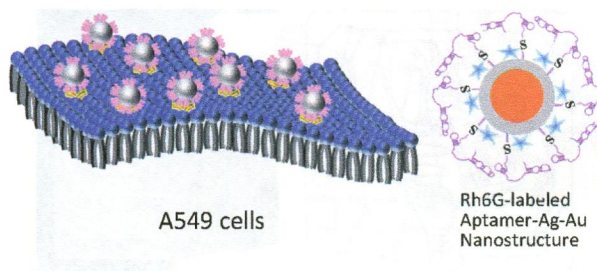


### Optimization of Fe<sub>3</sub>O<sub>4</sub>@Ag nanoshells in magnetic field-enriched surface-enhanced resonance Raman scattering for malaria diagnosis

Clement Yuen and Quan Liu\*

In this study, we present the optimization of nanoparticles used in the magnetic field enriched surface enhanced resonance Raman scattering by tuning the core size (C) and shell thickness (S) of nanoparticles with an iron oxide core and a silver shell (Fe<sub>3</sub>O<sub>4</sub>@Ag).

6501

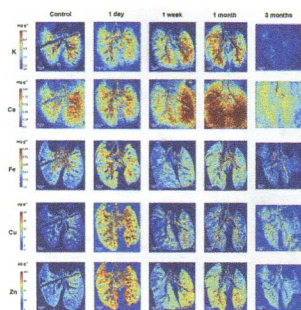


### High specific detection and near-infrared photothermal therapy of lung cancer cells with high SERS active aptamer–silver–gold shell–core nanostructures

Ping Wu, Yang Gao, Yimei Lu, Hui Zhang and Chenxin Cai\*

An aptamer–Ag–Au shell–core nanostructure-based SERS assay for specific detection and near-infrared photothermal therapy of lung adenocarcinoma cells was reported.

6511



### Synchrotron radiation X-ray fluorescence analysis of biodistribution and pulmonary toxicity of nanoscale titanium dioxide in mice

Jichao Zhang, Bo Li,\* Yi Zhang, Aiguo Li, Xiaohan Yu,\* Qing Huang, Chunhai Fan and Xiaoqing Cai\*

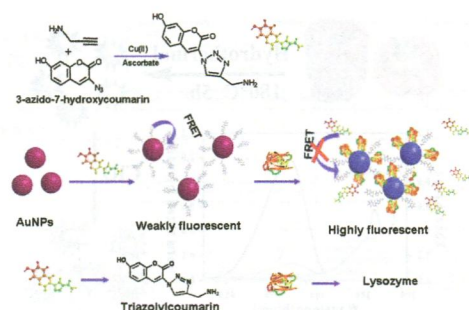
Quantitative metal elemental distributions of K, Ca, Fe, Cu and Zn in sections of lungs exposed to nanoTiO<sub>2</sub> using synchrotron radiation X-ray fluorescence (SRXRF).

6517

### Colorimetric and fluorometric dual-readout sensor for lysozyme

Hanye Zheng, Suyan Qiu, Kefeng Xu, Linguang Luo, Yibiao Song, Zhenyu Lin,\* Longhua Guo, Bin Qiu and Guonan Chen

A highly sensitive and selective dual-readout sensor (colorimetric and fluorometric) for the detection of lysozyme was proposed.

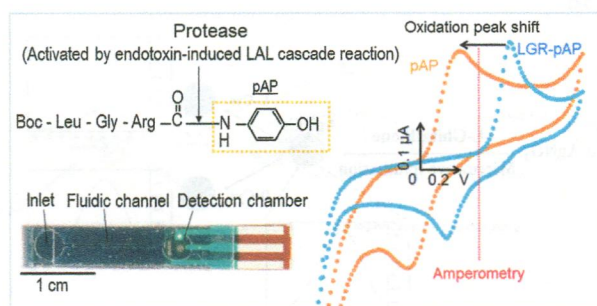


6523

### A screen-printed endotoxin sensor based on amperometry using a novel *p*-aminophenol conjugated substrate for a *Limulus* amoebocyte lysate protease reaction

Kumi Y. Inoue,\* Shinichiro Takano, Satoko Takahashi, Yosuke Ishida, Kosuke Ino, Hitoshi Shiku and Tomokazu Matsue\*

We successfully realized amperometric protease detection using a *p*-aminophenol conjugated substrate. This method was applied to a disposable endotoxin sensor.

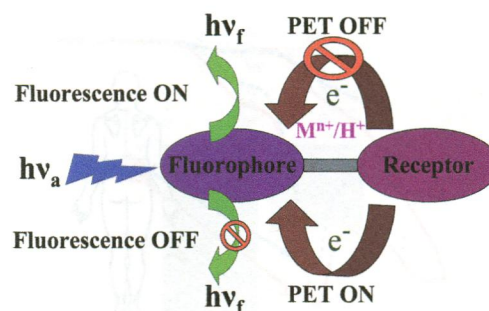


6532

### Selective fluorescence sensing of Cu(II) and Zn(II) using a new Schiff base-derived model compound: naked eye detection and spectral deciphering of the mechanism of sensory action

Aniruddha Ganguly, Bijan Kumar Paul, Soumen Ghosh, Samiran Kar and Nikhil Guchhait\*

Ratiometric chemosensor of fluorophore-spacer-receptor type: a new synthetic Schiff base selective for Cu<sup>2+</sup> and Zn<sup>2+</sup> ions with sufficiently low detection limit.

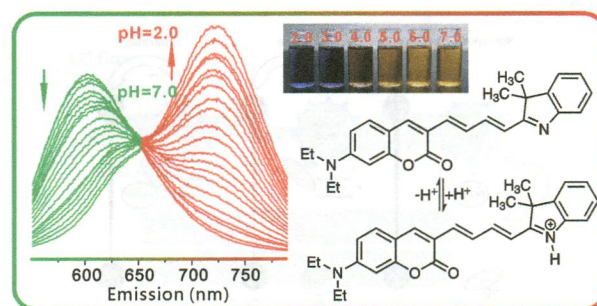


6542

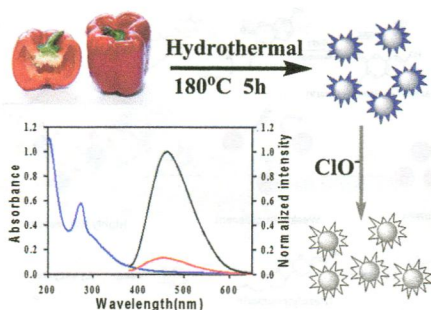
### A coumarin-indole-based near-infrared ratiometric pH probe for intracellular fluorescence imaging

Xiao-Dong Liu, Ying Xu, Ru Sun,\* Yu-Jie Xu, Jian-Mei Lu\* and Jian-Feng Ge\*

A coumarin-indole based probe for the quantitative detection of intracellular pH with large Stokes shifts, rapid response and other advantages.



6551

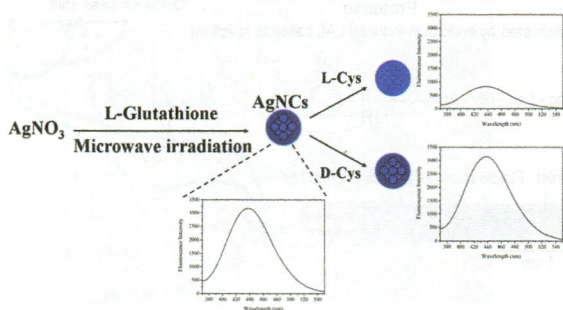


### Green synthesis of carbon dots with down- and up-conversion fluorescent properties for sensitive detection of hypochlorite with a dual-readout assay

Bangda Yin, Jianhui Deng, Xue Peng, Qian Long, Jiangna Zhao, Qiuju Lu, Qiong Chen, Haitao Li, Hao Tang, Youyu Zhang\* and Shouzhuo Yao

C-dots with down- and up-conversion fluorescence were synthesized by using cheap raw materials, and mild reaction conditions. Using the C-dots as fluorescent probes, a low-cost, simple, highly sensitive and dual-readout assay for hypochlorites has been developed.

6558

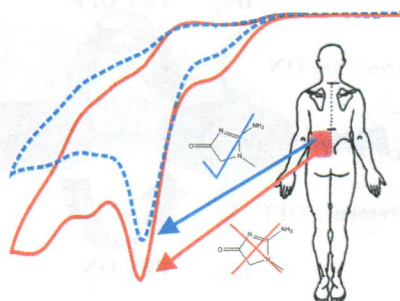


### Microwave-assisted green synthesis of ultrasmall fluorescent water-soluble silver nanoclusters and its application in chiral recognition of amino acids

Tao Liu, Yingying Su, Hongjie Song and Yi Lv\*

A novel fluorescent chiral recognition and detection method for cysteine based on L-GSH–AgNCs has been established.

6565

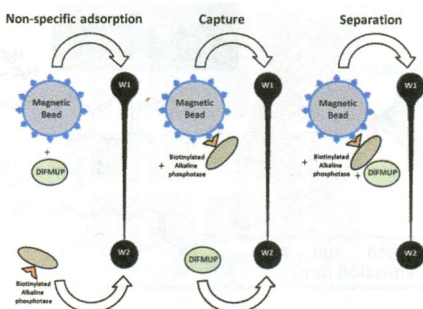


### An improved electrochemical creatinine detection method via a Jaffe-based procedure

Edward P. Randviir, Dimitrios K. Kampouris and Craig E. Banks\*

Electrochemical monitoring of the picrate anion is utilised as a potential method to monitor creatinine levels within urine with a view to engineering a screen-printed sensor for use in point-of-care diagnosis of deficient glomerular filtration.

6573



### Capture and separation of biomolecules using magnetic beads in a simple microfluidic channel without an external flow device

Jingjing Wang, Kenneth Morabito, Tom Erkers and Anubhav Tripathi\*

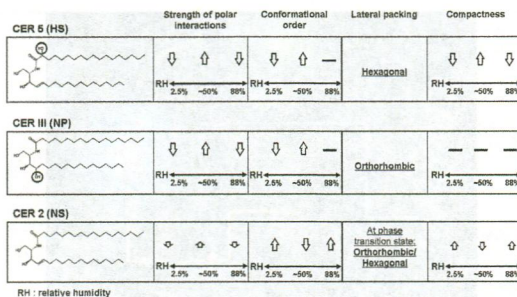
Three specific assays were performed using our microfluidic platform: non-specific adsorption of DiFMUP onto the streptavidin coated beads, capture of AP, and separation of AP from DiFMUP.

6582

## Hydration effects on the barrier function of stratum corneum lipids: Raman analysis of ceramides 2, III and 5

Ali Tfayli,\* Dima Jamal, Raoul Vyumvuhore, Michel Manfait and Arlette Baillet-Guffroy

The stratum corneum is the outermost layer of the skin; its barrier function is highly dependent on the composition and the structure as well as the organization of lipids in its extracellular matrix.

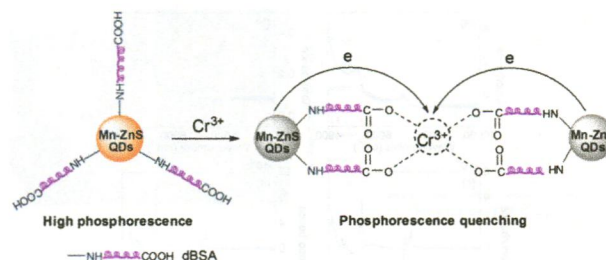


6589

## Phosphorescent sensing of Cr<sup>3+</sup> with protein-functionalized Mn-doped ZnS quantum dots

Ting Zhao, Xiandeng Hou, Ya-Ni Xie, Lan Wu\* and Peng Wu\*

A phosphorescent sensor for Cr<sup>3+</sup> was developed based on phosphorescence quenching of denatured-BSA-capped Mn-doped ZnS quantum dots.

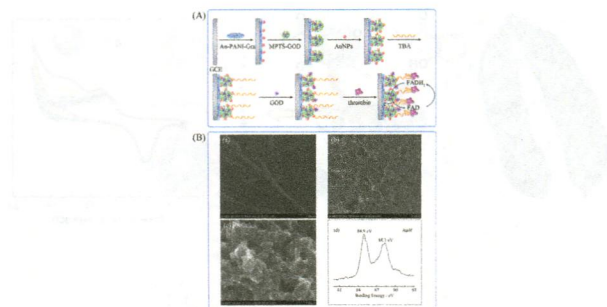


6595

## An electrochemical aptasensor for thrombin detection based on direct electrochemistry of glucose oxidase using a functionalized graphene hybrid for amplification

Lijuan Bai, Bin Yan, Yaqin Chai,\* Ruo Yuan,\* Yali Yuan, Shunbi Xie, Liping Jiang and Ying He

In this work, we reported a new label-free electrochemical aptasensor for sensitive detection of thrombin using direct electron transfer of glucose oxidase and a functionalized graphene hybrid for amplification.

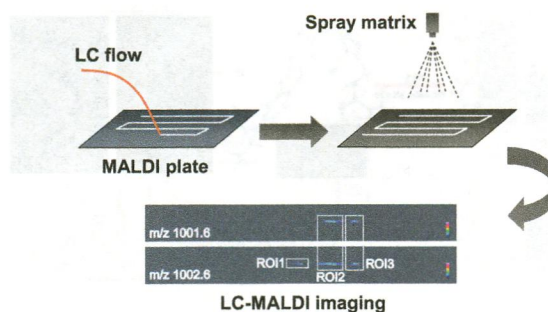


6600

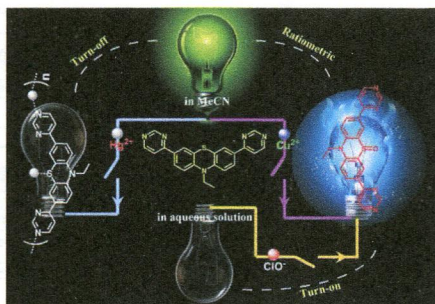
## Liquid chromatography-matrix-assisted laser desorption/ionization mass spectrometric imaging with sprayed matrix for improved sensitivity, reproducibility and quantitation

Zichuan Zhang, Jun Kuang and Lingjun Li\*

A new platform that couples LC and MALDI MS imaging is developed by spraying a MALDI matrix onto the dried LC trace, enabling enhanced MS signals, improved peptidome coverage, and absolute quantitation.



6607

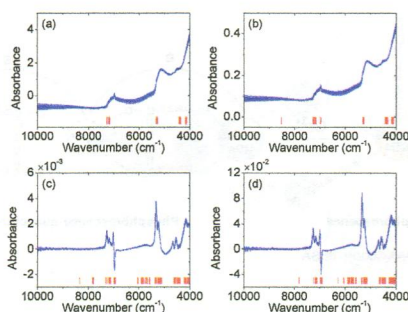


### Multi-functional fluorescent probe for $\text{Hg}^{2+}$ , $\text{Cu}^{2+}$ and $\text{ClO}^-$ based on a pyrimidin-4-yl phenothiazine derivative

Jiena Weng, Qunbo Mei,\* Bin Zhang, Yuanzhi Jiang, Bihai Tong, Quli Fan, Qidan Ling and Wei Huang\*

An interesting multi-functional fluorescent probe was developed for detecting  $\text{Hg}^{2+}$ ,  $\text{Cu}^{2+}$  and  $\text{ClO}^-$  with good sensitivity and selectivity, respectively.

6617

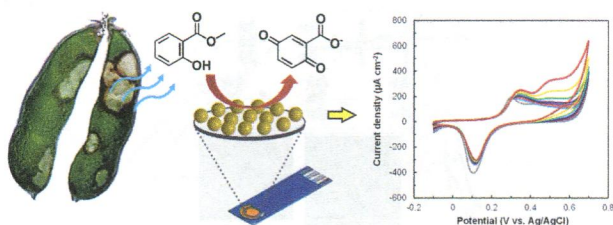


### Micro-analysis by near-infrared diffuse reflectance spectroscopy with chemometric methods

Yan Liu, Yu Ning, Wensheng Cai and Xueguang Shao\*

A very high sensitivity can be obtained for near-infrared diffuse reflectance spectroscopic analysis with the help of an enrichment operation and chemometric approaches to minimize the effects of noise and variant background.

6623

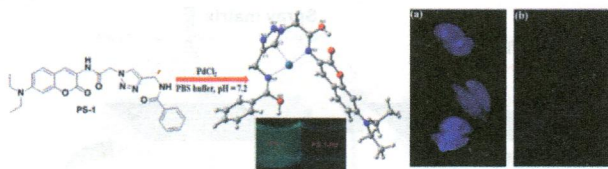


### Highly sensitive electrochemical detection of methyl salicylate using electroactive gold nanoparticles

Yogeswaran Umasankar and Ramaraja P. Ramasamy\*

Electrode retained >95% of its methyl salicylate response even with high concentrations of interfering compounds *cis*-3-hexenol, hexyl acetate and *cis*-hexenyl acetate.

6632



### Novel triazole-based fluorescent probes for $\text{Pd}^{2+}$ in aqueous solutions: design, theoretical calculations and imaging

Ji-Ting Hou, Kun Li,\* Kang-Kang Yu, Mei-Zhen Ao, Xin Wang and Xiao-Qi Yu\*

The first triazole-based fluorescent probe for palladium was presented, which could selectively respond to  $\text{Pd}^{2+}$  in aqueous solution and be used for fluorescence imaging of  $\text{Pd}^{2+}$  in cells.

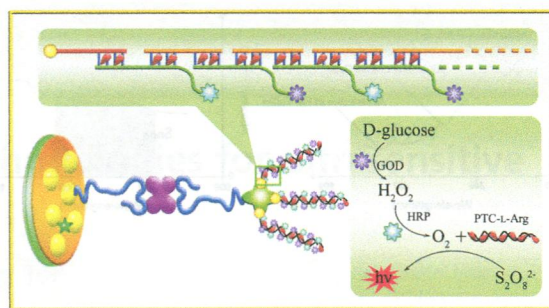


6639

### Dual signal amplification strategy for the fabrication of an ultrasensitive electrochemiluminescent aptasensor

Min Zhao, Ying Zhuo,\* Yaqin Chai, Yun Xiang, Ni Liao, Guofeng Gui and Ruo Yuan\*

Dual signal amplification strategy for construction of a cathodic peroxydisulfate-based electrochemiluminescence aptasensor for ultrasensitive detection of thrombin.

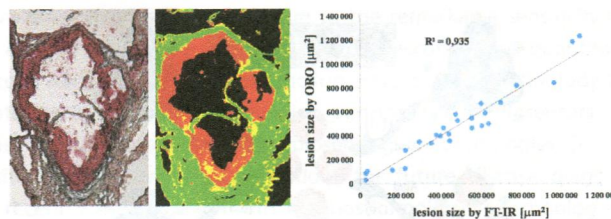


6645

### Quantification of plaque area and characterization of plaque biochemical composition with atherosclerosis progression in ApoE/LDLR<sup>-/-</sup> mice by FT-IR imaging

Tomasz P. Wrobel, Lukasz Mateuszuk, Renata B. Kostogrys, Stefan Chlopicki and Malgorzata Baranska\*

Quantitative determination of atherosclerotic plaque and disease progression analysis (3, 4 and 6 months old) was performed by FT-IR imaging.

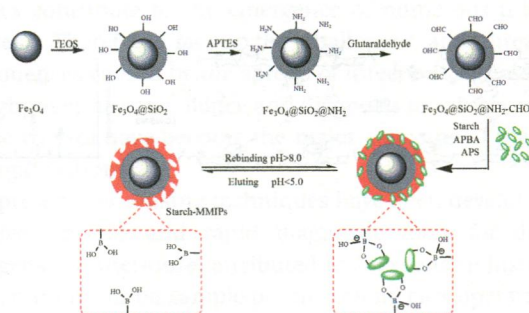


6653

### Fast and selective recognizes polysaccharide by surface molecularly imprinted film coated onto aldehyde-modified magnetic nanoparticles

Weiwei Huang, Xin Yang,\* Song Zhao, Min Zhang, Xinglong Hu, Jing Wang\* and Haitian Zhao

A starch imprinted magnetic nanoparticles composite material has been synthesized that is capable of successfully capturing polysaccharides for pharmacology applications.

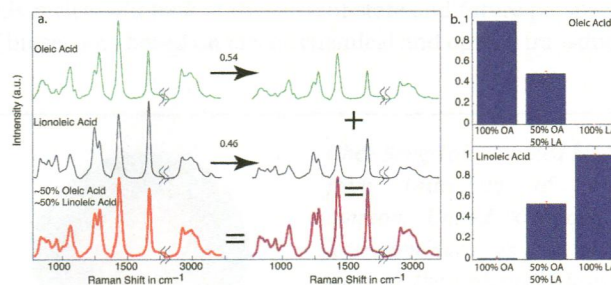


6662

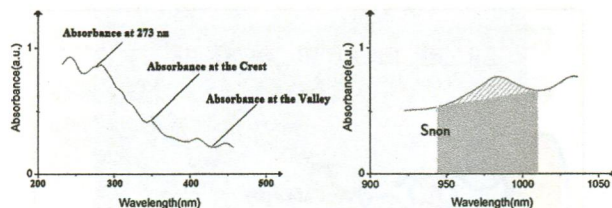
### Direct comparison of fatty acid ratios in single cellular lipid droplets as determined by comparative Raman spectroscopy and gas chromatography

Iwan W. Schie, Lena Nolte, Theresa L. Pedersen, Zach Smith, Jian Wu, Idir Yahiatène, John W. Newman and Thomas Huser\*

The composition of individual lipid droplets inside living cells is determined by Raman micro-spectroscopy and compared to gas chromatography data from millions of cells.



6671

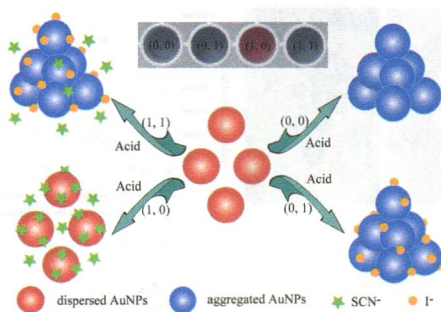


### The characterization of the concentration of the single-walled carbon nanotubes in aqueous dispersion by UV-Vis-NIR absorption spectroscopy

Bing Yang, Lingling Ren,<sup>\*</sup> Luming Li, Xingfu Tao, Yunhua Shi and Yudong Zheng<sup>\*</sup>

Wavelength range indicators were defined for the universal characterization of the concentration of single-wall carbon nanotubes (SWCNTs).

6677

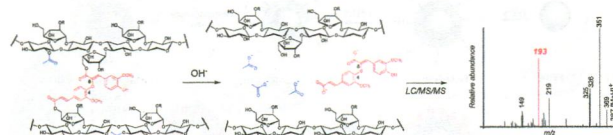


### An IMPLICATION logic gate based on citrate-capped gold nanoparticles with thiocyanate and iodide as inputs

Hao-Hua Deng, Guang-Wen Li, Xin-Hua Lin, Ai-Lin Liu,<sup>\*</sup> Wei Chen<sup>\*</sup> and Xing-Hua Xia

In the (0, 0) state, citrate-capped AuNPs aggregate because of the deprotonation of citrate ligands under acidic conditions, while in the (1, 0) state,  $\text{SCN}^-$  can protect AuNPs from acid-induced aggregation. However, in (1, 1) and (0, 1) states, when  $\text{I}^-$  is introduced, the aggregation of AuNPs can be observed.

6683



### Profiling of diferulates (plant cell wall cross-linkers) using ultrahigh-performance liquid chromatography-tandem mass spectrometry

Ramin Vismeh, Fachuang Lu, Shishir P. S. Chundawat, James F. Humpala, Ali Azarpira, Venkatesh Balan, Bruce E. Dale, John Ralph and A. Daniel Jones<sup>\*</sup>

Tandem mass spectrometry generates isomer-characteristic fragment ions of diferulates released from hemicelluloses by hydrolytic and ammonolytic pretreatment of lignocellulosic biomass.