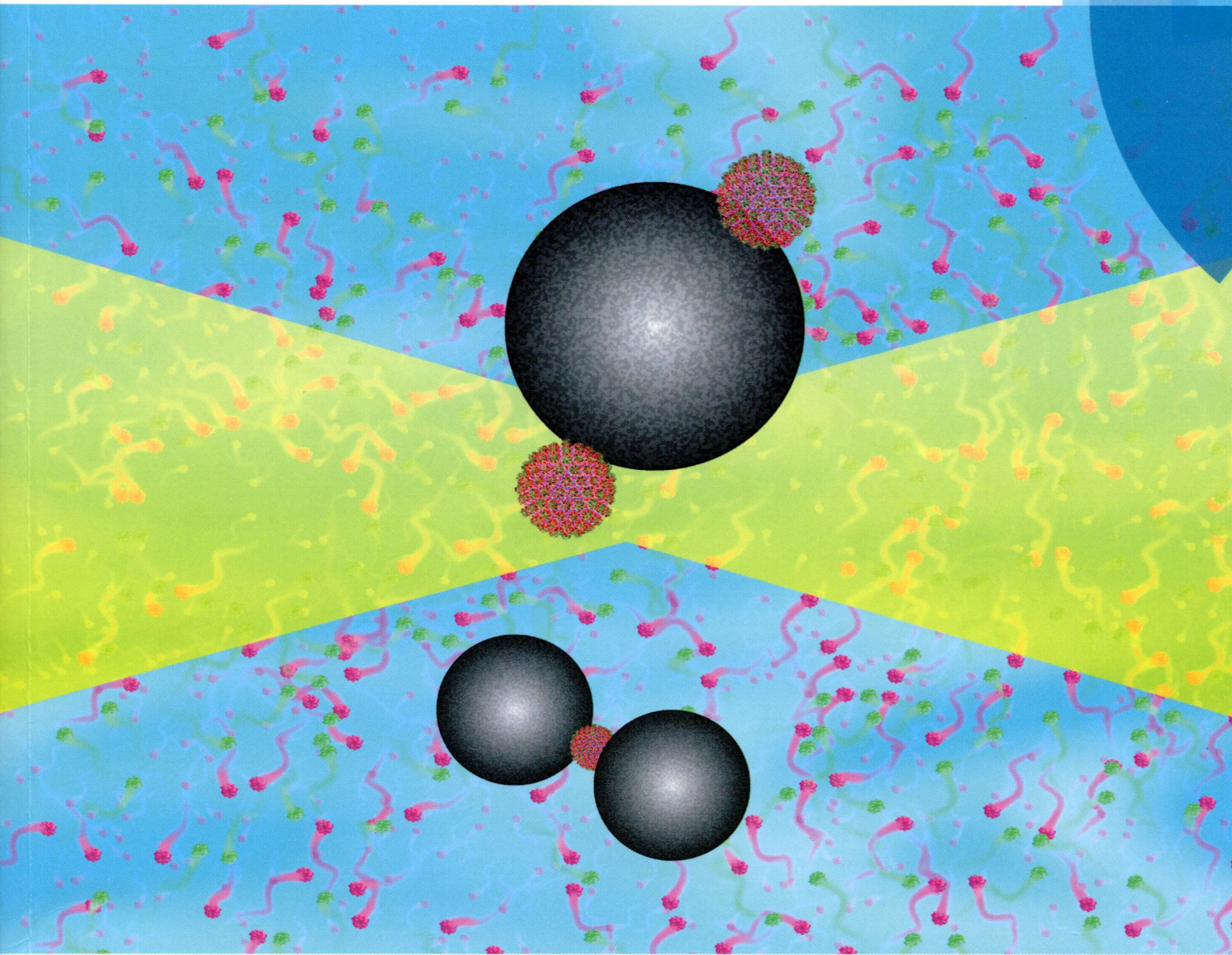


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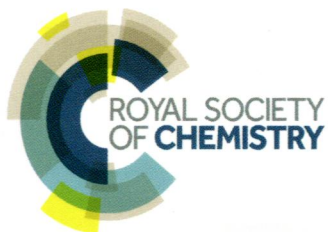
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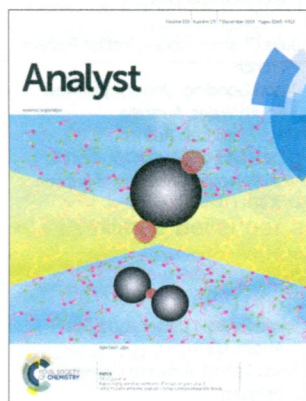
PAPER

Gil U. Lee *et al.*

Rapid, highly sensitive detection of herpes simplex virus-1 using multiple antigenic peptide-coated superparamagnetic beads

IN THIS ISSUE

ISSN 0003-2654 CODEN ANALAO 139(23) 6065–6312 (2014)



Cover

See Gil U. Lee *et al.*,
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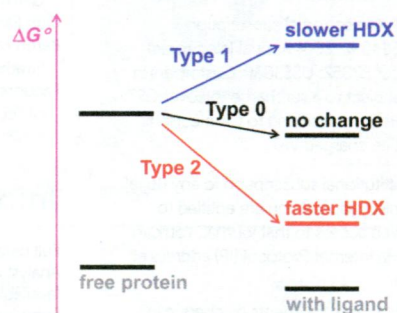
CRITICAL REVIEW

6078

Type 1 and Type 2 scenarios in hydrogen exchange mass spectrometry studies on protein–ligand complexes

Lars Konermann,* Antony D. Rodriguez
and Modupeola A. Sowole

Ligand binding to a protein can elicit a wide range of responses when studied by HDX mass spectrometry.



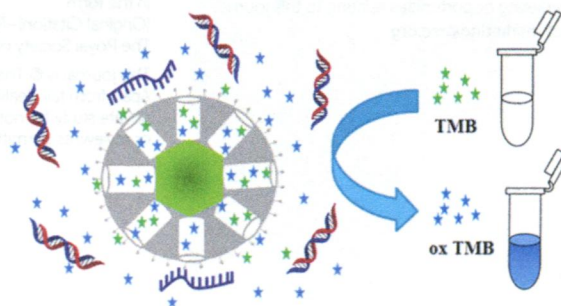
COMMUNICATIONS

6088

Label-free detection of DNA by combining gated mesoporous silica and catalytic signal amplification of platinum nanoparticles

Zhifei Wang,* Xia Yang, Jie Feng, Yongjun Tang,
Yanyun Jiang and Nongyue He*

A simple label-free detection of DNA by combining gated mesoporous SiO₂ and the TMB oxidation reaction catalyzed by Pt was presented.

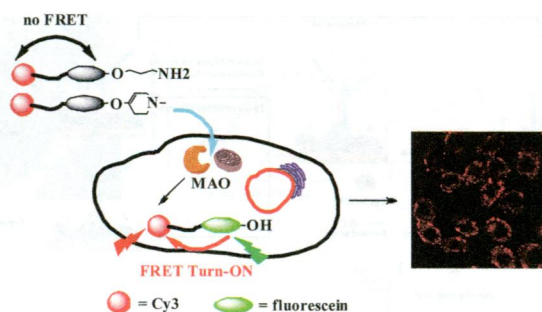


6092

Visualization of monoamine oxidases in living cells using "Turn-ON" fluorescence resonance energy transfer probes

Xuefeng Li, Jiajun Yu, Qing Zhu,* Linghui Qian, Lin Li, Yuguo Zheng* and Shao Q. Yao*

Novel FRET-based small molecule probes targeting monoamine oxidases (MAOs) were designed and synthesized. These "Turn-ON" fluorescent probes were proved to be capable of directly reporting MAO activities in live mammalian cells.

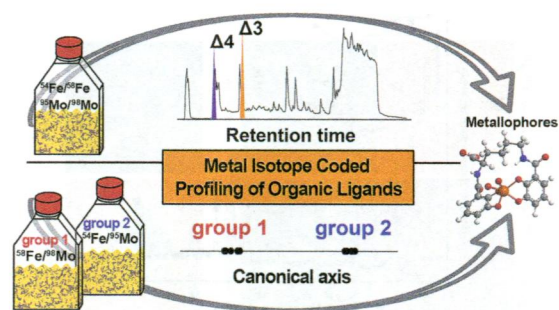


6096

Metallophore mapping in complex matrices by metal isotope coded profiling of organic ligands

Michael Deicke, Jan Frieder Mohr, Jean-Philippe Bellenger and Thomas Wichard*

Metal isotope coded profiling (MICP) utilizes stable metal isotope pairs creating unique isotopic signatures used for fast identification of metallophores, metal ion buffers or sequestering agents.

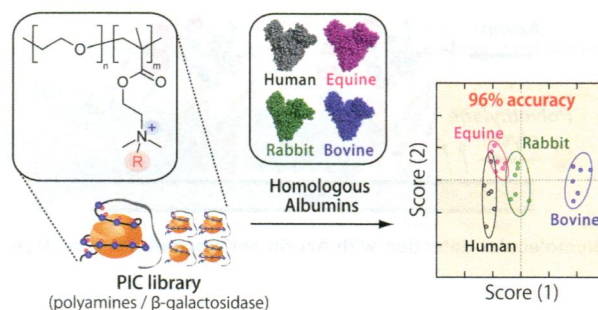


6100

Enzymatic fingerprinting of structurally similar homologous proteins using polyion complex library constructed by tuning PEGylated polyamine functionalities

Shunsuke Tomita,* Tomohiro Soejima, Kentaro Shiraki and Keitaro Yoshimoto*

Structurally similar homologous albumins were fingerprinted and discriminated by a sensor array consisting of a polyion complex library with artificial differentiation constructed by facile tuning of PEGylated polyamine functionalities.



6104

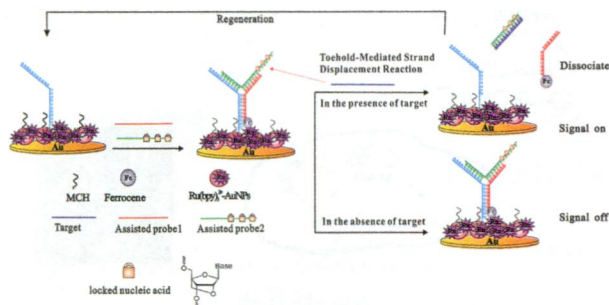
A simple, rapid and low-cost staining method for gel-electrophoresis separated phosphoproteins via the fluorescent purpurin dye

W. Cong, J. Shen, Y. Xuan, X. Zhu, M. Ni, Z. Zhu, G. Hong, X. Lu* and L. Jin*

A simple, rapid and low-cost fluorescent staining method for gel-separated phosphoproteins using purpurin in the presence of Al^{3+} is described. The specificity of the method is shown by 1-D and 2-D SDS-PAGE, dephosphorylation, western blot and LC-MS/MS.



6109

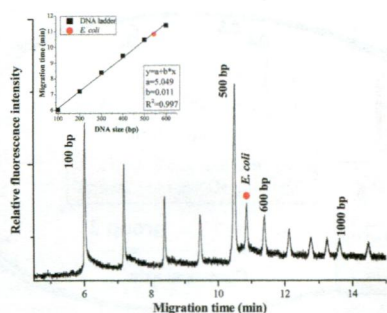


Ultrasensitive electrochemiluminescence biosensor based on locked nucleic acid modified toehold-mediated strand displacement reaction and junction-probe

Xi Zhang, Jing Zhang,* Dongzhi Wu, Zhijing Liu, Shuxian Cai, Mei Chen, Yanping Zhao, Chunyan Li, Huanghao Yang* and Jinghua Chen*

Locked nucleic acid is applied in toehold-mediated strand displacement reaction to develop a junction-probe biosensor for single-nucleotide polymorphism detection.

6113

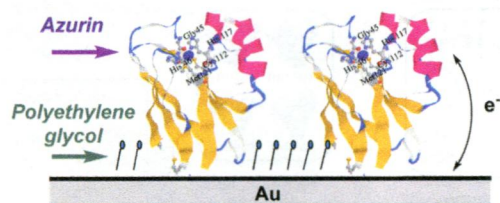


Determination and quantification of *Escherichia coli* by capillary electrophoresis

Zhenqing Li,* De Li, Dawei Zhang and Yoshinori Yamaguchi*

Capillary electrophoresis (CE) is widely employed for the separation of nucleic acids or protein, but it is rarely applied in the quantification of *Escherichia coli* (*E. coli*).

6118



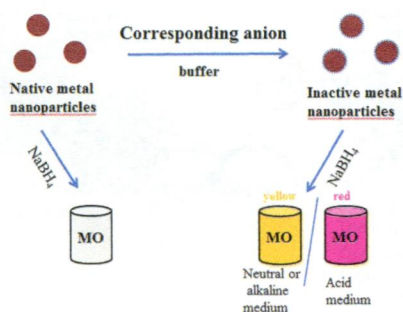
Biomolecular detection with Azurin self-assembled monolayer

Switching of electrochemical characteristics of redox protein upon specific biomolecular interactions

Man Yi Ho,* Sarah A. Goodchild, Pedro Estrela, Daping Chu and Piero Migliorato

Label-free protein sensing platform based on a simplified and standardized immobilization process with Azurin redox self-assembled monolayer is fabricated. A significant change in the electrochemical characteristics of the assay upon specific interaction with target molecules is observed.

6122



A "light-on" colorimetric assay for anion detection using the inhibitory effect of anions on the catalytic activity of metal nanoparticles for the degradation of methyl orange

Lixia Lu, Fan Yang and Xiorong Yang*

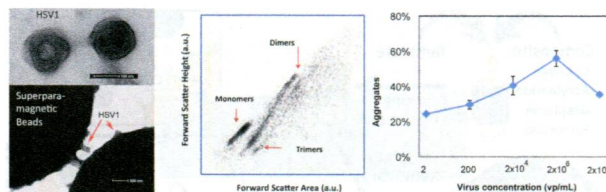
A "light-on" colorimetric method for anion detection using the catalytic ability of metal nanoparticles for methyl orange (MO) degradation was developed.

6126

Rapid, highly sensitive detection of herpes simplex virus-1 using multiple antigenic peptide-coated superparamagnetic beads

Ying-Fen Ran, Conor Fields, Julien Muzard, Viktoryia Liauchuk, Michael Carr, William Hall and Gil U. Lee*

We demonstrate a label free assay employing scattering to determine the aggregation state of peptide-functionalized superparamagnetic beads. HSV-1 virus at 200 virus particles per mL was detected in 30 min, demonstrating potential use in point of care testing.

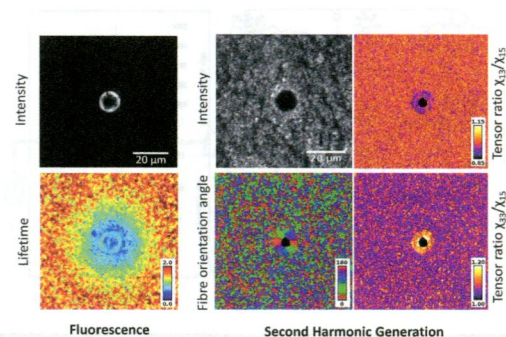


6135

Multimodal optical characterisation of collagen photodegradation by femtosecond infrared laser ablation

A. Manickavasagam, L. M. Hirvonen, L. N. Melita, E. Z. Chong, R. J. Cook, L. Bozec and F. Festy*

Well-defined circular cavities are prepared by controlled femtosecond laser ablation on dry collagen I matrix and analysed using a new multi-modal optical imaging methodology to quantitatively define four distinct zones around the laser ablated areas.

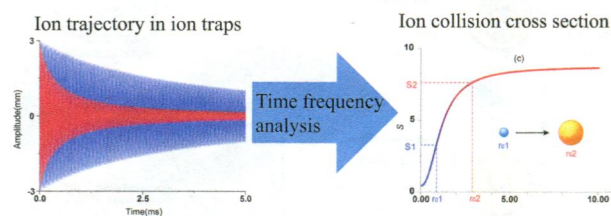


6144

Ion collision crosssection measurements in quadrupole ion traps using a time–frequency analysis method

Muyi He, Dan Guo, Yu Chen, Xingchuang Xiong, Xiang Fang and Wei Xu*

In this study, a method for measuring ion collision crosssections (CCSs) was proposed through time–frequency analysis of ion trajectories in quadrupole ion traps.

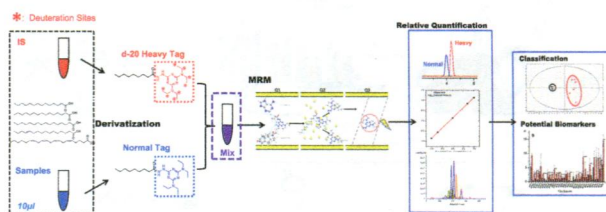


6154

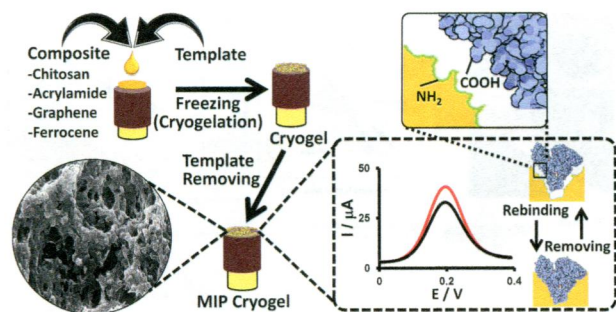
HPLC-MRM relative quantification analysis of fatty acids based on a novel derivatization strategy

Tie Cai,* Hu Ting, Zhang Xin-Xiang, Zhou Jiang and Zhang Jin-Lan*

Sensitive and convenience fatty acid HPLC-MRM quantification methods were developed based on a novel derivatization strategy.



6160

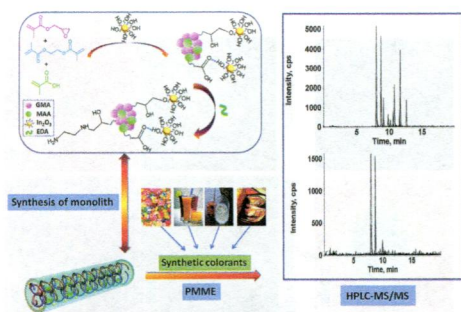


A novel molecularly imprinted chitosan–acrylamide, graphene, ferrocene composite cryogel biosensor used to detect microalbumin

Amin Fatoni, Apon Numnuam, Proespichaya Kanatharana, Warakorn Limbut and Panote Thavarungkul*

A novel highly sensitive and selective molecularly imprinted polymer (MIP) cryogel biosensor for determination of microalbumin in urine samples was prepared with chitosan–acrylamide, graphene, ferrocene composite. The detection of HSA was by differential pulse voltammetry (DPV).

6168

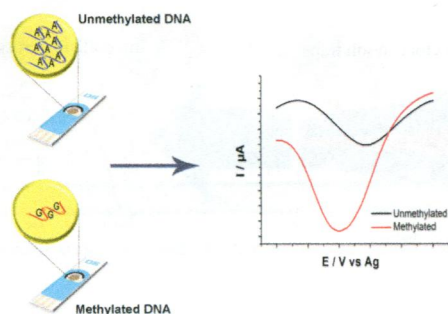


Rapid identification of synthetic colorants in food samples by using indium oxide nanoparticle-functionalized porous polymer monolith coupled with HPLC-MS/MS

Ruifang Qi, Xiao Zhou, Xiqian Li, Jiutong Ma, Chunmei Lu, Jun Mu, Xuguang Zhang and Qiong Jia*

An In_2O_3 nanoparticle-functionalized poly(methacrylic acid-glycidyl methacrylate-ethylene dimethacrylate-ethanediamine) monolithic column was prepared and used for microextraction of colorants coupled with HPLC-MS/MS.

6178

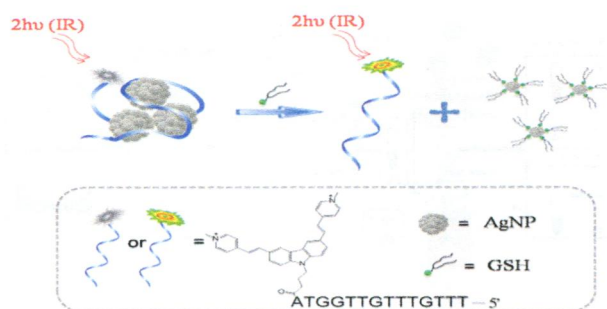


eMethylsorb: rapid quantification of DNA methylation in cancer cells on screen-printed gold electrodes

Kevin M. Koo, Abu Ali Ibn Sina, Laura G. Carrascosa,* Muhammad J. A. Shiddiky* and Matt Trau*

A simple, sensitive and inexpensive electrochemical method has been reported to detect regional DNA methylation by using differential adsorption affinity of DNA bases to gold.

6185



Two-photon AgNP/DNA-TP dye nanosensing conjugate for biothiol probing in live cells

Mingli Liu, Qiao Tang, Ting Deng, Huijuan Yan, Jishan Li,* Yinhui Li and Ronghua Yang

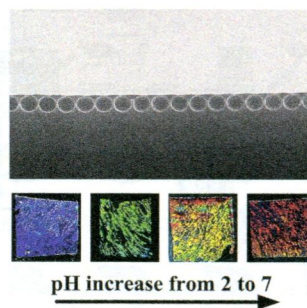
In this study, we fabricated a novel AgNP/DNA-two-photon dye (TP dye) conjugate as a two-photon nanoprobe for biothiol imaging in live cells.

6192

Two-dimensional inverse opal hydrogel for pH sensing

Fei Xue, Zihui Meng,* Fenglian Qi, Min Xue,*
Fengyan Wang, Wei Chen and Zequn Yan

Two-dimensional (2D) inverse opal hydrogels with well-ordered macroporous monolayer on the surface are prepared by polymerization of hydrogel monomers on 2D array templates and show a prompt response to pH stimuli by the change of diffraction color.

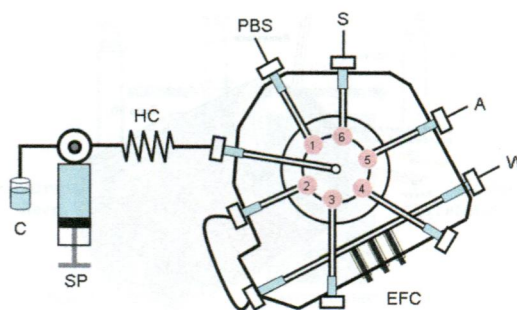


6197

Metal–organic frameworks and β -cyclodextrin-based composite electrode for simultaneous quantification of guanine and adenine in a lab-on-valve manifold

Yang Wang,* Huanhuan Chen, Yichun Wu, Huali Ge,
Guiqin Ye and Xiaoya Hu*

A highly sensitive and automated method for the simultaneous determination of two DNA bases was developed in lab-on-valve system using metal–organic frameworks based modified electrode.

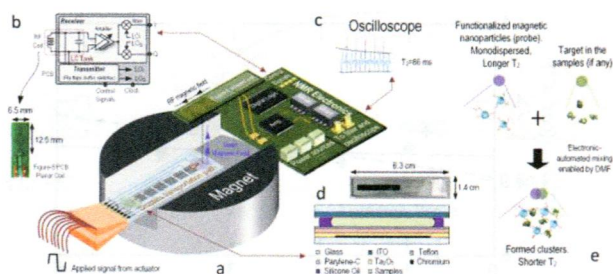


6204

NMR–DMF: a modular nuclear magnetic resonance–digital microfluidics system for biological assays

Ka-Meng Lei, Pui-In Mak,* Man-Kay Law
and Rui P. Martins

We present a modular nuclear magnetic resonance–digital microfluidics (NMR–DMF) system as a portable diagnostic platform for miniaturized biological assays.

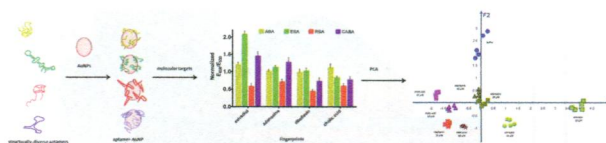


6214

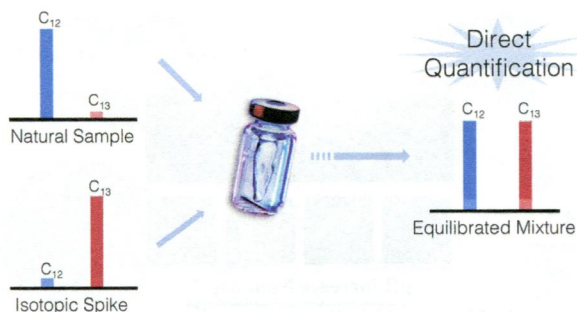
Plasmonic aptamer–gold nanoparticle sensors for small molecule fingerprint identification

Jorge L. Chávez, Juliann K. Leny, Suzanne Witt,
Grant M. Slusher, Joshua A. Hagen
and Nancy Kelley-Loughnane*

Apt–AuNPs were utilized as cross-reactive sensors for identification and quantification of small molecular targets through principal components analysis.



6223

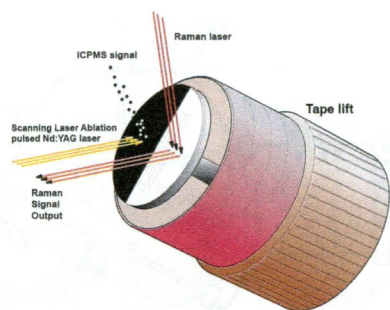


An accurate and transferable protocol for reproducible quantification of organic pollutants in human serum using direct isotope dilution mass spectrometry

Andrew J. Boggess, G. M. Mizanur Rahman, Matt Pamukcu, Scott Faber and H. M. Skip Kingston*

A novel and transferable method for the accurate and direct quantification of organic pollutants in human serum.

6232

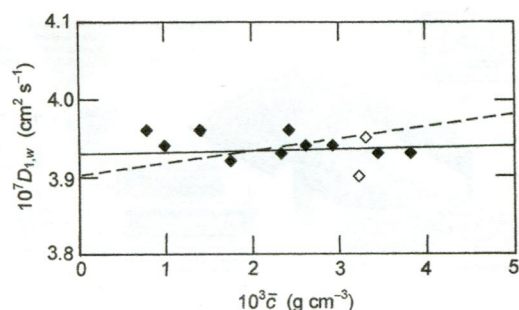


A novel method for the identification of inorganic and organic gunshot residue particles of lead-free ammunitions from the hands of shooters using scanning laser ablation-ICPMS and Raman micro-spectroscopy

Zuriñe Abrego, Nagore Grijalba, Nora Unceta, Maite Maguregui, Alicia Sanchez, Alberto Fernández-Isla, M. Aranzazu Goicolea and Ramón J. Barrio*

SLA-ICPMS and Raman micro-spectroscopy has been applied to the characterization of GSR using modified tape lifts.

6242

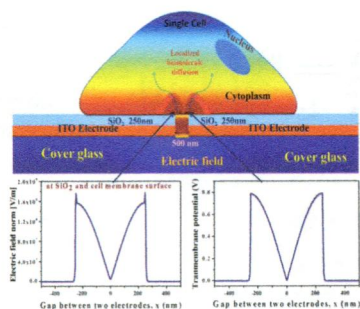


Concentration dependence of translational diffusion coefficients for globular proteins

David J. Scott,* Stephen E. Harding and Donald J. Winzor

This investigation examines published results of traditional diffusion experiments on ovalbumin and bovine serum albumin to determine the extent to which assumed concentration independence of the translational diffusion coefficient is a reasonable approximation in the analysis of boundary spreading in sedimentation velocity experiments on proteins.

6249



Impact of pulse duration on localized single-cell nano-electroporation

Tuhin Subhra Santra, Hwan-You Chang, Pen-Cheng Wang and Fan-Gang Tseng*

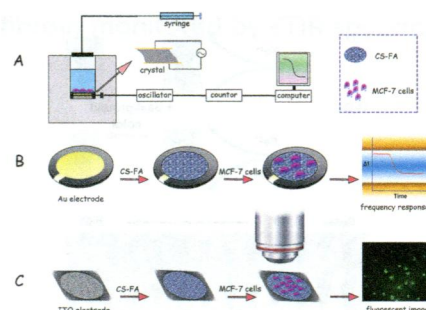
Localized single-cell nano-electroporation (LSCNEP), where the electrical field is considerably more intense at two specific membrane positions resulting in a very small membrane area creates several larger nano-pores to precisely deliver biomolecules with controllable pulse duration and number of pulses. Smaller the pulse higher the cell viability.

6259

A recyclable chitosan-based QCM biosensor for sensitive and selective detection of breast cancer cells in real time

Shaolian Zhang, Haihua Bai, Jinmei Luo, Peihui Yang* and Jiye Cai

A sensitive and recyclable QCM biosensor for the real-time measurement of MCF-7 breast cancer cells was developed for the first time using folic acid coupled to chitosan as an excellent biocompatible biosensor film.

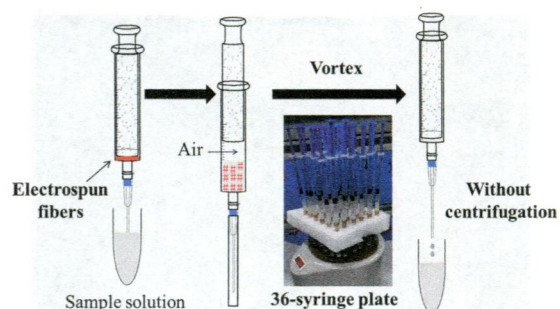


6266

In-syringe dispersive solid phase extraction: a novel format for electrospun fiber based microextraction

Gang-Tian Zhu, Xiao-Mei He, Bao-Dong Cai, Han Wang, Jun Ding, Bi-Feng Yuan and Yu-Qi Feng*

A rapid and high-throughput in-syringe dispersive solid phase extraction (dSPE) system using electrospun fibers as adsorbents is presented.

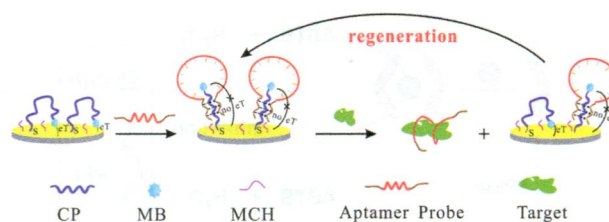


6272

A sensitive and versatile "signal-on" electrochemical aptasensor based on a triple-helix molecular switch

Xiuzhong Wang, Aiwen Jiang, Ting Hou and Feng Li*

A versatile "signal-on" electrochemical aptasensor has been developed based on a triple-helix molecular switch for sensitive detection of human α -thrombin.

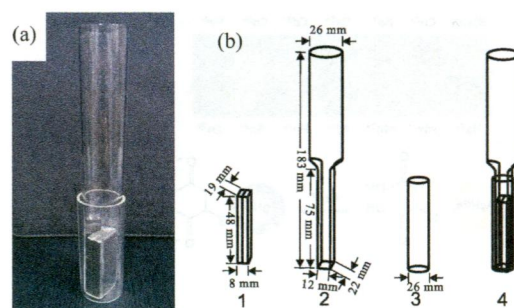


6279

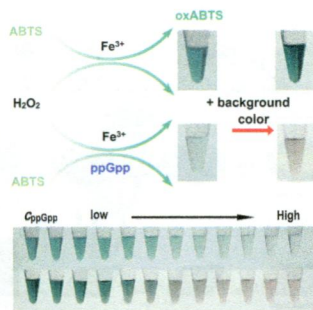
Development of a field sampling method based on magnetic nanoparticles for the enrichment of pesticides in aqueous samples

Lingyi Zhang, Xiaoling Sheng, Runsheng Zhang,* Zhichao Xiong, Zhongping Wu, Songmao Yan, Yurong Zhang and Weibing Zhang*

A field sampling method based on magnetic core-shell silica nanoparticles was developed for field sampling and the enrichment of low concentrations of pesticides in aqueous samples.



6284

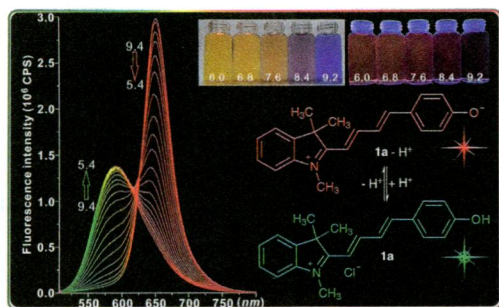


Selective and sensitive colorimetric detection of stringent alarmone ppGpp with Fenton-like reagent

Lin Ling Zheng and Cheng Zhi Huang*

A colorimetric detection of ppGpp based on its inhibition effect for the oxidation of 2,2'-azino-bis(3-ethylbenzthiazoline-6-sulfonic acid) by Fenton-like reagent was proposed.

6290

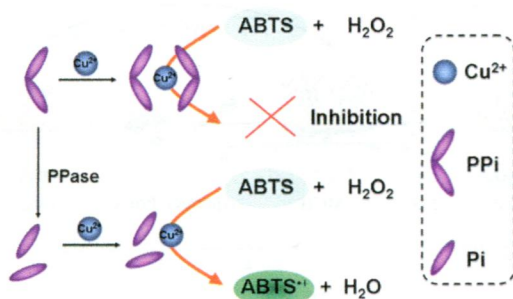


Colorimetric and ratiometric pH responses by the protonation of phenolate within hemicyanine

Jia-Tao Miao, Chen Fan, Xiao-Yu Shi, Ru Sun,* Yu-Jie Xu and Jian-Feng Ge*

The indolium-phenol based tetramethylene hemicyanine has colorimetric and ratiometric optical responses under acidic and basic conditions.

6298

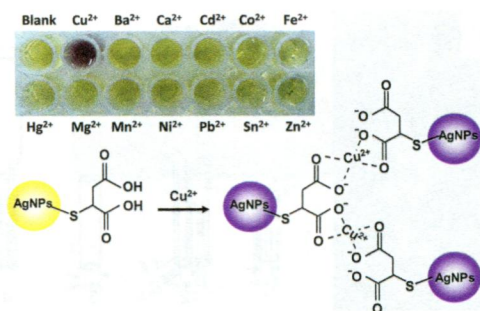


A convenient label free colorimetric assay for pyrophosphatase activity based on a pyrophosphate-inhibited Cu^{2+} -ABTS- H_2O_2 reaction

Liangliang Zhang,* Mei Li, Yingfeng Qin, Zhidan Chu and Shulin Zhao*

An inhibition effect of pyrophosphate on the Cu^{2+} -ABTS- H_2O_2 colorimetric reaction was demonstrated and applied to develop a convenient pyrophosphatase activity assay.

6304



Sensitive and selective colorimetric detection of Cu^{2+} in aqueous medium *via* aggregation of thiomalic acid functionalized Ag nanoparticles

Vairaperumal Tharmaraj and Jyisy Yang*

A highly selective and sensitive colorimetric sensor based on thiomalic acid functionalized AgNPs was prepared for the detection of Cu^{2+} .

6310

Retraction: Methanol-induced conformation transition of gland fibroin monitored by FTIR spectroscopy and terahertz spectroscopy

Chao Yan, Bin Yang* and Zhicheng Yu