

The Analyst

Interdisciplinary detection science

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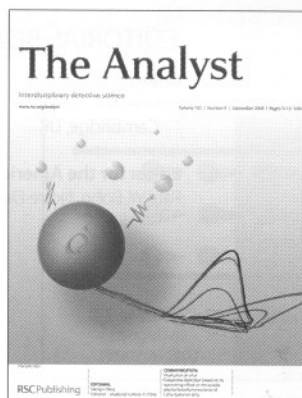


Cover

See P. Gao, C. Lu, F. Zhang, P. Sang, D. Yang, X. Li, H. Kong, P. Yin, J. Tian, X. Lu, A. Lu and G. Xu, pp. 1214–1220.

Integrated GC–MS and LC–MS coupled with univariate and multivariate analysis facilitate metabolomics to be a more promising tool in disease research.

Image reproduced by permission of Guowang Xu from *Analyst*, 2008, **133**, 1214.



Inside cover

See X. Liu, L. Cheng, J. Lei and H. Ju, pp. 1161–1163.

The electrochemiluminescence energy transfer from excited quantum dots to the quencher decreases the emission peak and produces the detection signal for the quencher.

Image reproduced by permission of Huangxian Ju from *Analyst*, 2008, **133**, 1161.

CHEMICAL TECHNOLOGY

T65

Drawing together research highlights and news from all RSC publications, *Chemical Technology* provides a 'snapshot' of the latest applications and technological aspects of research across the chemical sciences, showcasing newsworthy articles and significant scientific advances.

Chemical Technology

September 2008/Volume 5/Issue 9

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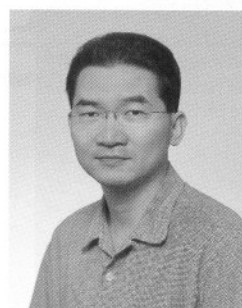
i-SECTION: EDITORIAL

1127

Editorial – analytical science in China

Mengsu Yang

Mengsu Yang, editorial board member for *The Analyst*, introduces this themed issue whose aim is to highlight the top-class analytical science research currently being carried out in China, to encourage more scientific exchange and collaboration between the Chinese analytical research community and those in other regions.

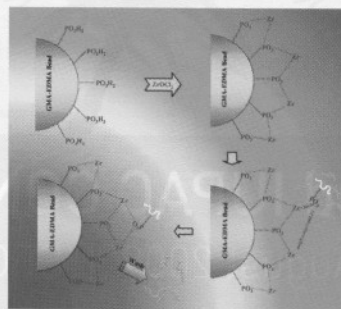


1128

Development of phosphopeptide enrichment techniques for phosphoproteome analysis

Guanghui Han, Mingliang Ye* and Hanfa Zou*

This review covers recent phosphopeptide enrichment techniques developed for phosphoproteome analysis with an emphasis on the new developments in this field in China.

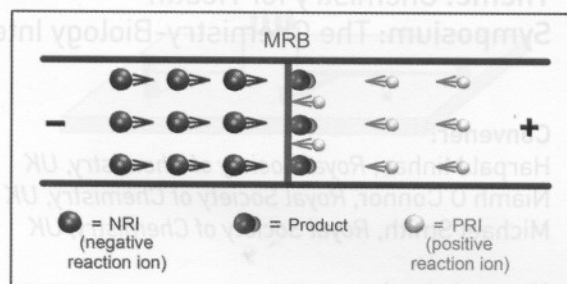


1139

Review on the theory of moving reaction boundary, electromigration reaction methods and applications in isoelectric focusing and sample pre-concentration

Cheng-Xi Cao,* Liu-Yin Fan and Wei Zhang

A review has been made on the moving reaction boundary (MRB), including moving precipitate boundary (MPB), moving neutralization boundary (MNB) and moving chelation boundary (MCB). Furthermore, the relevant methods and applications in isoelectric focusing and sample pre-concentration have been also reviewed.



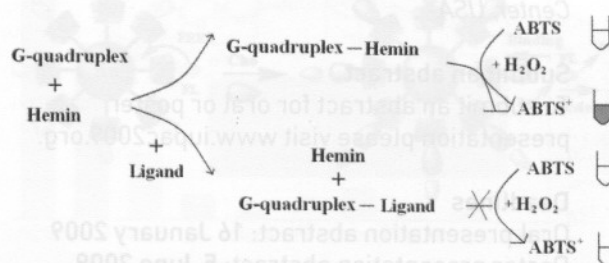
COMMUNICATIONS

1158

A new method for the study of G-quadruplex ligands

De-Ming Kong,* Jing Wu, Yong-E Ma and Han-Xi Shen

A new method for the study of G-quadruplex ligands was developed, in which the interaction of G-quadruplexes with ligands can be judged by the naked eye, eliminating the need for expensive machines.

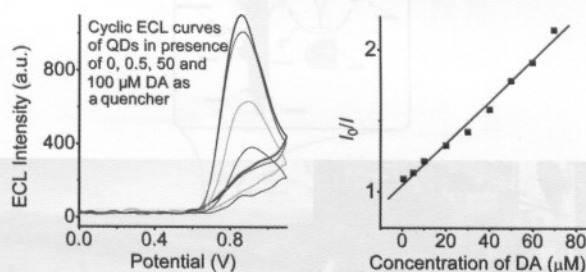


1161

Dopamine detection based on its quenching effect on the anodic electrochemiluminescence of CdSe quantum dots

Xuan Liu, Lingxiao Cheng, Jianping Lei and Huangxian Ju*

A sensitive detection method for electrochemiluminescence (ECL) quenchers using dopamine (DA) as a model molecule was developed based on the strong co-reactant-enhanced ECL of CdSe quantum dots (QDs) in a neutral system.

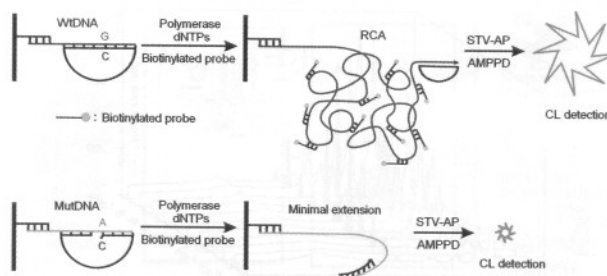


1164

Chemiluminescent detection of DNA hybridization and single-nucleotide polymorphisms on a solid surface using target-primed rolling circle amplification

Zhengping Li,* Wei Li, Yongqiang Cheng and Longteng Hao

A new chemiluminescent method has been developed for sensitive determination of DNA hybridization and specific detection of single-nucleotide polymorphisms with target-primed rolling circle amplification.

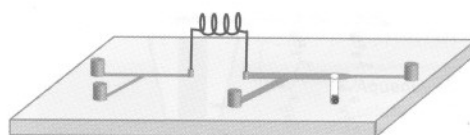


1169

Determination of arsenate by sorption pre-concentration on polystyrene beads packed in a microfluidic device with chemiluminescence detection

Waraporn Som-aum, Haifang Li, Jiangjiang Liu and Jin-Ming Lin*

The reaction system of luminol chemiluminescence with heteropoly acids was applied to the determination of As(v). Integration of the sorption pre-concentration and chemiluminescence reaction on the microchip contributes to the highly sensitive and specific detection.

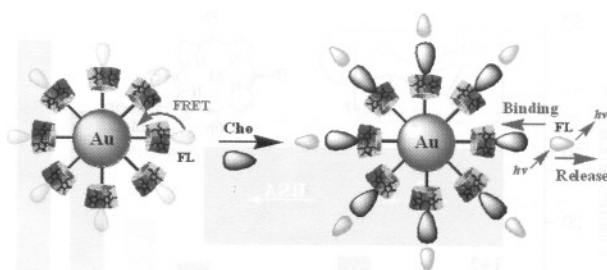


1176

A novel assembly of Au NPs- β -CDs-FL for the fluorescent probing of cholesterol and its application in blood serum

Ning Zhang, Yuanyuan Liu, Lili Tong, Kehua Xu, Linhai Zhuo and Bo Tang*

A novel assembly of Au NPs- β -CDs-FL for the fluorescent probing of cholesterol (Cho) is provided. Fluorescence resonance energy transfer (FRET) switches off because of the cholesterol-induced release of fluorescein (FL) from the β -CD cavity, which results in the fluorescence recovery of the quenched dye.

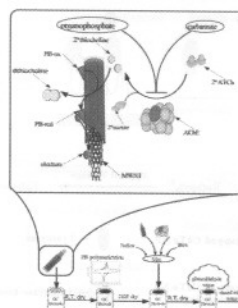


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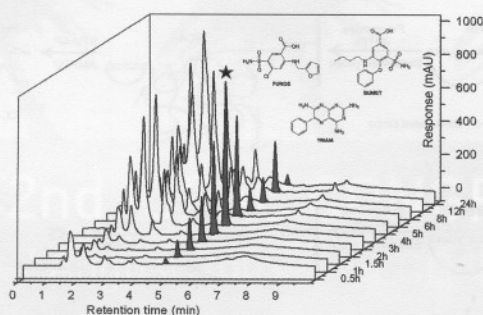
An electrochemical sensor for pesticide assays based on carbon nanotube-enhanced acetylcholinesterase activity

Haode Chen, Xiaolei Zuo, Shao Su, Zhuzhao Tang, Aibo Wu, Shiping Song, Dabing Zhang* and Chunhai Fan*

Carbon nanotubes significantly improved the performance of acetylcholinesterase-based electrochemical sensors including the response time, stability and sensitivity.



1187

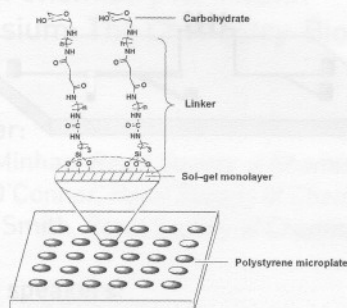


Determination of diuretics in human urine by hollow fiber-based liquid-liquid-liquid microextraction coupled to high performance liquid chromatography

Zhuomin Zhang, Dapeng Wang, Lan Zhang,* Min Du and Guonan Chen*

A sensitive, rapid and convenient analytical method for the determination of acidic [furosemide (FUROS), bumetanide (BUMET)] and basic [triamterene (TRIAM)] diuretics in human urine is reported.

1195

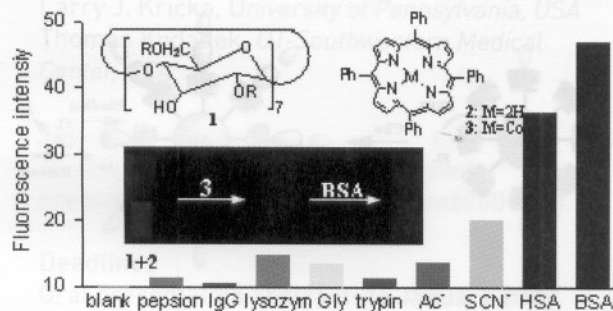


Covalent immobilization of carbohydrates on sol-gel-coated microplates

Lan Zou, Hei-Leung Pang, Pak-Ho Chan, Zhi-Shu Huang, Lian-Quan Gu* and Kwok-Yin Wong*

Carbohydrate arrays allow monitoring of biologically important protein-carbohydrate interactions in a high-throughput manner. An effective approach to immobilizing intact carbohydrates directly on polystyrene microtiter plates coated with amine-functionalized sol-gel monolayers is described.

1201

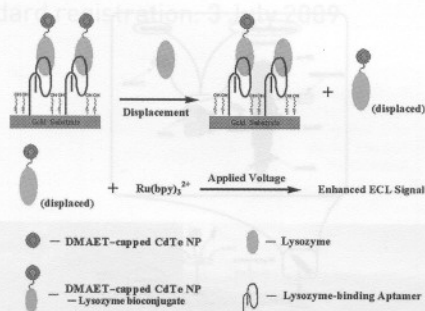


Interactions between protein and porphyrin-containing cyclodextrin supramolecular system: a fluorescent sensing approach for albumin

Liping Long, Jian Yu Jin, Ying Zhang, Ronghua Yang* and Keming Wang

An assembly of meso-tetraphenylporphyrin, meso-tetraphenylporphyrin cobalt(II), and a β -cyclodextrin derivative is applied in fluorescence recognition and quantification of albumin in aqueous solution based on fluorescence enhancement of the free-base porphyrin.

1209



Nanoscale-enhanced $\text{Ru}(\text{bpy})_3^{2+}$ electrochemiluminescence labels and related aptamer-based biosensing system

Weiwei Guo, Jipei Yuan, Bingling Li, Yan Du, Erbo Ying and Erkang Wang*

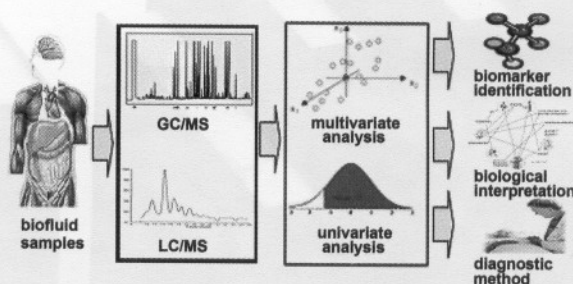
CdTe nanoparticles (NPs) functionalized with electrochemiluminescence (ECL) co-reactants of $\text{Ru}(\text{bpy})_3^{2+}$ proved to be highly sensitive ECL labels, and an aptamer/functionalized CdTe nanoparticle-based biosensing system was further constructed and applied in the ECL detection of proteins.

1214

Integrated GC–MS and LC–MS plasma metabolomics analysis of ankylosing spondylitis

Peng Gao, Chen Lu, Fengxia Zhang, Ping Sang, Dawei Yang, Xiang Li, Hongwei Kong, Peiyuan Yin, Jing Tian, Xin Lu, Aiping Lu* and Guowang Xu*

Integrated chromatography–mass spectrometry and integrated uni- and multi-variate statistical analysis facilitate metabolomics to be a more promising tool in disease research.

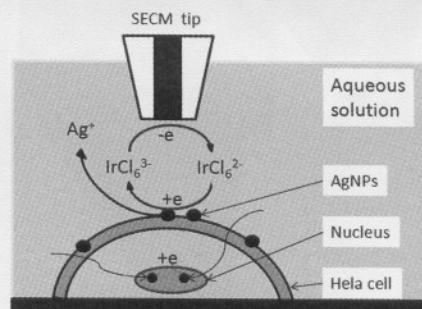


1221

Investigation of the interactions between silver nanoparticles and HeLa cells by scanning electrochemical microscopy

Zhong Chen, Shubao Xie, Li Shen, Yu Du, Shali He, Qing Li, Zhongwei Liang, Xin Meng, Bo Li, Xiaodong Xu, Hongwei Ma, Yanyi Huang and Yuanhua Shao*

The morphology, permeability, and amount of AgNPs adsorbed on the cell membrane have been investigated by SECM with both $K_3Fe(CN)_6$ and K_3IrCl_6 as mediators between AgNPs and patterned HeLa cells.

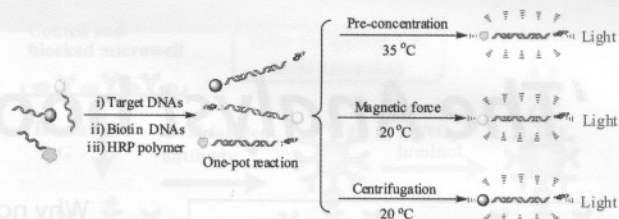


1229

Carrier-resolved technology for homogeneous and multiplexed DNA assays in a 'one-pot reaction'

Huan Li, Choiwan Lau* and Jianzhong Lu*

Every hybridization signal for the corresponding DNA target in our protocol is uniquely immobilized onto one carrier vehicle with a unique and intrinsic physico-chemical signature. Moreover, a simple chemiluminescence setup is employed to read the carrier code.

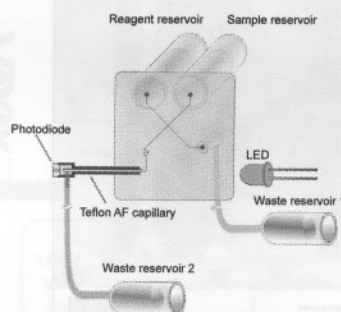


1237

Microfluidic chip-based valveless flow injection analysis system with gravity-driven flows

Yang-Zhen Huang, Wen-Bin Du, Jian-Zhang Pan and Qun Fang*

A microfluidic chip-based valveless flow injection analysis system with gravity-driven flows was developed. Automated sample injection in the nanolitre range was achieved by changing the vertical position of the waste reservoir, without the requirement of microvalves or electrokinetic manipulation.

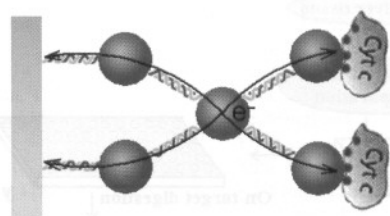


1242

Self-assembled multilayer of gold nanoparticles for amplified electrochemical detection of cytochrome *c*

Jing Zhao, Xiaoli Zhu, Ting Li and Genxi Li*

A self-assembly multilayer of gold nanoparticles has been fabricated on a gold electrode, upon which cyt *c* can be immobilized and show a significant electrochemical response; ultra-sensitive detection of cyt *c* can thus be achieved.

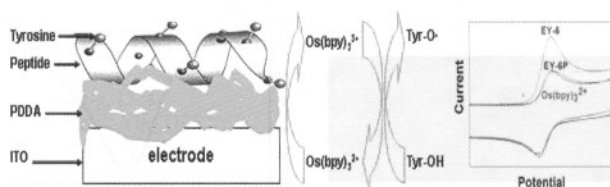


1246

Label-free electrochemical differentiation of phosphorylated and non-phosphorylated peptide by electro-catalyzed tyrosine oxidation

Na Qu, Bin Wan and Liang-Hong Guo*

A label-free electrochemical detection method was developed to differentiate phosphorylated (EY-6P) and non-phosphorylated (EY-6) peptides, using an osmium complex $[\text{Os}(\text{bpy})_3]^{2+}$ to electrochemically catalyze the oxidation of tyrosines in the peptide.

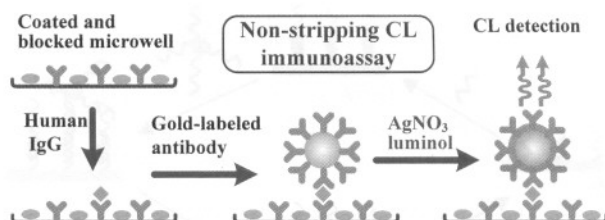


1250

Gold nanoparticle-based immunoassay by using non-stripping chemiluminescence detection

Chun-Feng Duan, Yu-Qi Yu and Hua Cui*

A simple, microplate-compatible, non-stripping immunoassay protocol was developed for the determination of human IgG based on a novel luminol- AgNO_3 -gold nanoparticles CL system.

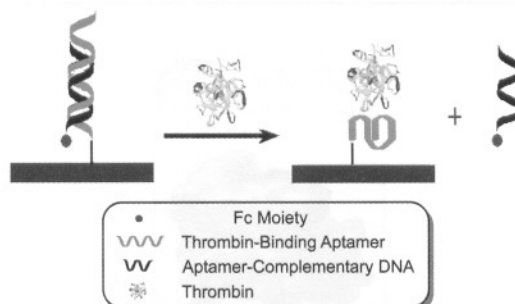


1256

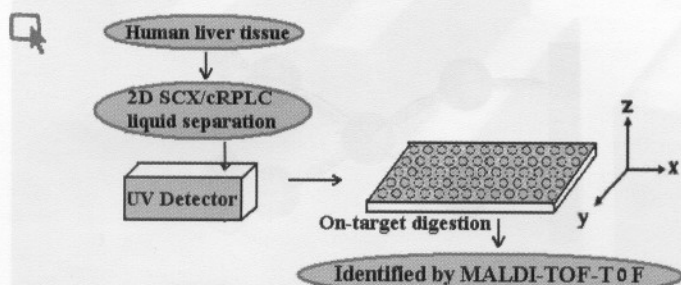
Aptamer-based electrochemical sensors that are not based on the target binding-induced conformational change of aptamers

Ying Lu, Ningning Zhu, Ping Yu and Lanqun Mao*

A new and general strategy for the development of aptamer-based electrochemical sensors that are not based on the target binding-induced conformational change of the aptamers is described by taking advantage of the stronger binding affinity of the aptamers toward their targets than the Fc-labeled short aptamer-complementary DNA.



1261

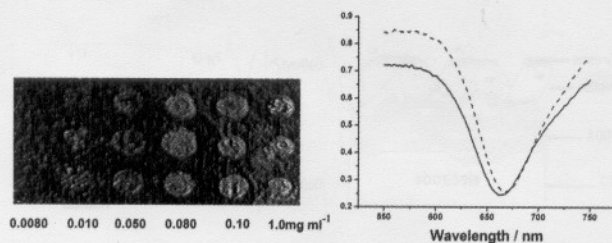


Integrated strong cation exchange/capillary reversed-phase liquid chromatography/on-target digestion coupled with mass spectrometry for identification of intact human liver tissue proteins

Mingxia Gao, Wenjia Yu, Yang Zhang, Guoquan Yan, Chunhui Deng, Pengyuan Yang and Xiangmin Zhang*

Multidimensional liquid chromatography coupled with a rapid on-target digestion technique and MALDI-TOF/TOF peptide analysis is presented and applied to the analysis of the soluble lysates of normal human liver.

1268

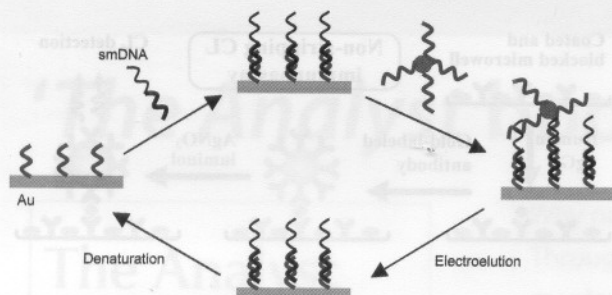


Surface plasmon resonance imaging of limited glycoprotein samples

Wei Liu, Yi Chen* and Mingdi Yan

A surface plasmon resonance imaging method has been developed for high throughput recognition and determination of low level glycoproteins with limited sample volume.

1274

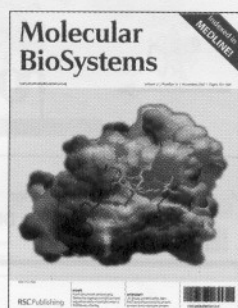


Recognition of single-base mismatch DNA by Au nanoparticle-assisted electroelution

Qing Wang, Xiaohai Yang, Kemin Wang,* Weihong Tan and Jun Gou

A simple, convenient and effective method based on surface plasmon resonance was introduced for recognition of single-base mismatch DNA (smDNA) by Au nanoparticle (AuNP)-assisted electroelution. Mismatched hybrids were denatured by the repulsion force acting on DNA-linked AuNPs.

MOLECULAR BIOSYSTEMS



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