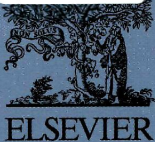


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ANALYTICA CHIMICA ACTA

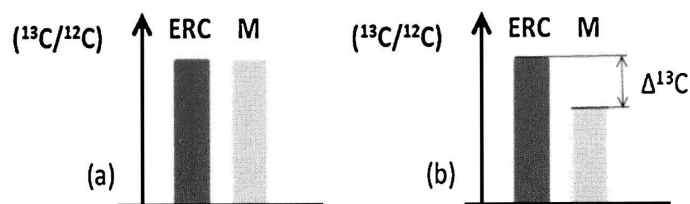
AN INTERNATIONAL JOURNAL DEVOTED TO ALL BRANCHES OF ANALYTICAL CHEMISTRY

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Review Article

Use of isotope ratio mass spectrometry to differentiate between endogenous steroids and synthetic homologues in cattle: A review

Geert Janssens, Dirk Courtheyn, Sven Mangelinckx,
Stéphanie Prévost, Emmanuelle Bichon, Fabrice Monteau,
Geert De Poorter, Norbert De Kimpe and Bruno Le Bizec

(Published on pp. 1–15 of this issue)

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Volume 772, Pages 1-98 (15 April 2013)

Editorial Board

Page iii

Review article

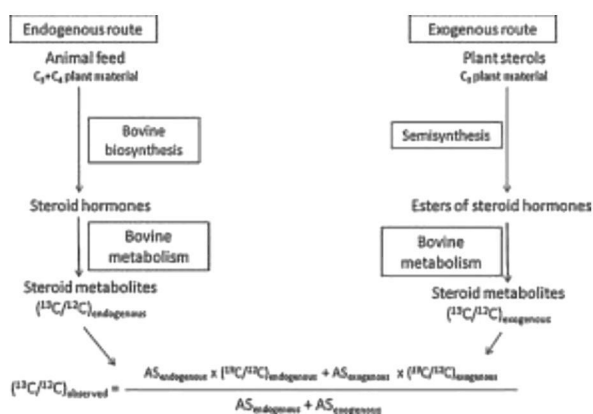
Use of isotope ratio mass spectrometry to differentiate between endogenous steroids and synthetic homologues in cattle: A review

Review Article

Pages 1-15

Geert Janssens, Dirk Courtheyn, Sven Mangelinckx, Stéphanie Prévost, Emmanuelle Bichon, Fabrice Monteau, Geert De Poorter, Norbert De Kimpe, Bruno Le Bizec

Graphical abstract



Highlights

► The difference between endogenous and exogenous steroids is thoroughly laid out. ► Factors influencing the carbon ratio and the use of $\Delta^{13}\text{C}$ -values are explained. ► Implementation of GC/C/IRMS to detect steroid abuse in cattle is reviewed. ► Alternative methods and upcoming techniques are discussed. ► The differences and similarities with sports doping control are highlighted.

Chemometrics

Multivariate curve resolution-particle swarm optimization: A high-throughput approach to exploit pure information from multi-component

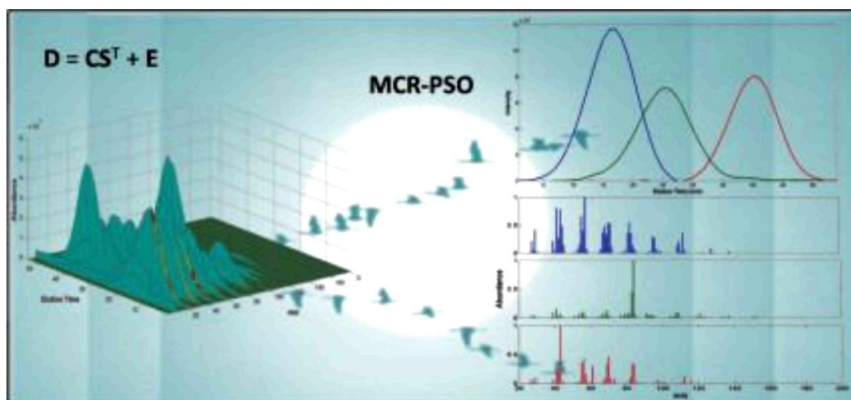
hyphenated chromatographic signals

Original Research Article

Pages 16-25

Hadi Parastar, Heshmatollah Ebrahimi-Najafabadi, Mehdi Jalali-Heravi

Graphical abstract



Electrochemistry

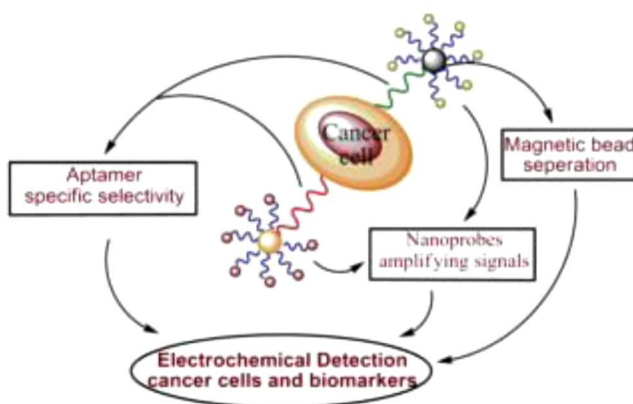
Aptamer based strategy for cytosensing and evaluation of HER-3 on the surface of MCF-7 cells by using the signal amplification of nucleic acid-functionalized nanocrystals

Original Research Article

Pages 26-32

Shaoping Lv, Yong Guan, Dong Wang, Yifeng Du

Graphical abstract



Highlights

► Nanoparticles were used for the amplification of electrochemical detection. ► Magnetic beads (MBs) were used for the separation tool. ► High-affinity DNA aptamers were used for signal recognition.

Extraction and Sample Handling

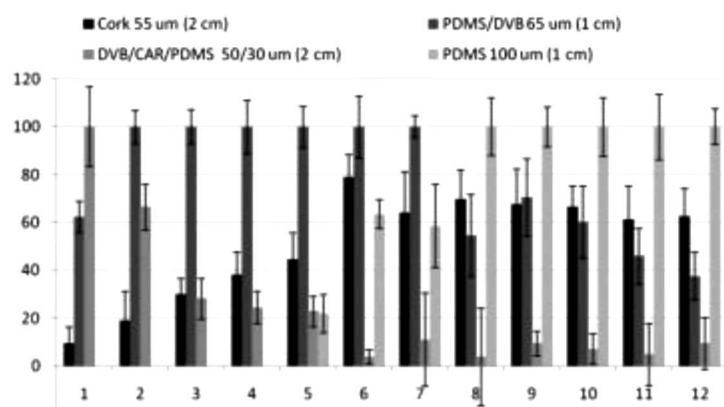
Cork as a new (green) coating for solid-phase microextraction: Determination of polycyclic aromatic hydrocarbons in water samples by gas chromatography–mass spectrometry

Original Research Article

Pages 33-39

Adriana Neves Dias, Vanessa Simão, Josias Merib, Eduardo Carasek

Graphical abstract



Highlights

► Cork as a new coating for solid-phase microextraction was proposed. ► Good results were achieved, demonstrating the applicability of the cork as coating for SPME. ► The efficiency of cork fiber was very similar to commercially available fibers.

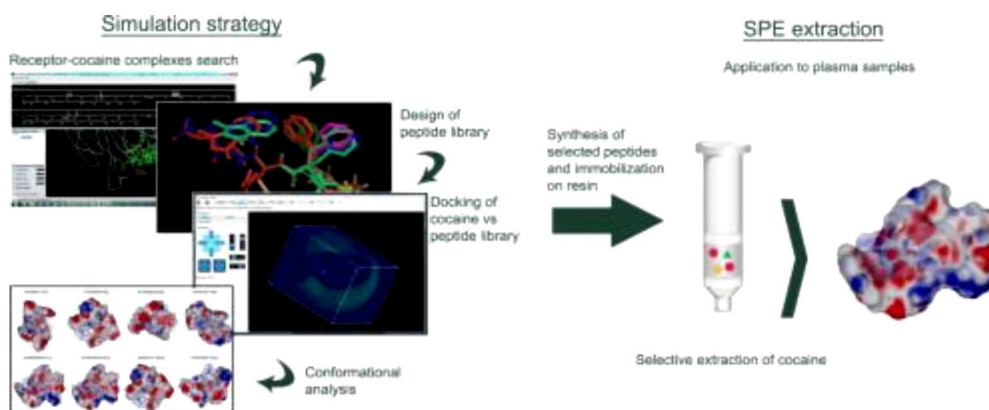
Peptides trapping cocaine: docking simulation and experimental screening by solid phase extraction followed by liquid chromatography mass spectrometry in plasma samples

Original Research Article

Pages 40-46

Marcello Mascini, Camilla Montesano, Manuel Sergi, German Perez, Maristella De Cicco, Roberta Curini, Dario Compagnone

Graphical abstract



Highlights

► Two peptides were computationally designed as selective SPE sorbent for cocaine. ► The hexapeptide–cocaine complex was docked with different scoring functions. ► The extraction procedure for SPE was optimized for human plasma. ► QHWWDW was found to have good recovery in agreement with docking simulation.

Mass Spectrometry

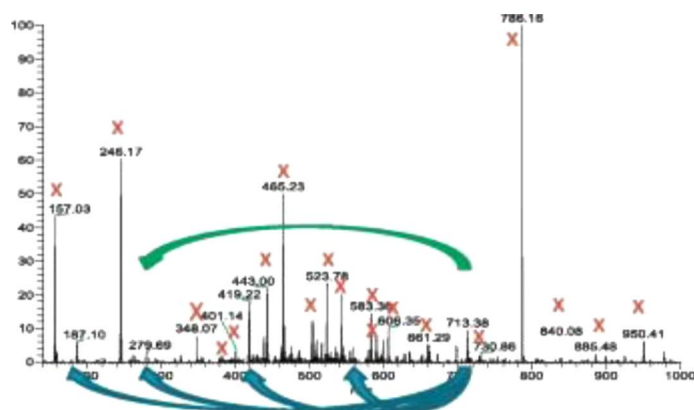
Correlation of precursor and product ions in single-stage high resolution mass spectrometry. A tool for detecting diagnostic ions and improving the precursor elemental composition elucidation

Original Research Article

Pages 47-58

S. Borràs, A. Kaufmann, R. Companyó

Graphical abstract



Highlights

► We are describing a technique to spot ions which are derived from each other. ► Single stage high resolution data is used. ► This “in silicon” technique is compared to conventional precursor scan. ► Some applications for this technique are presented.

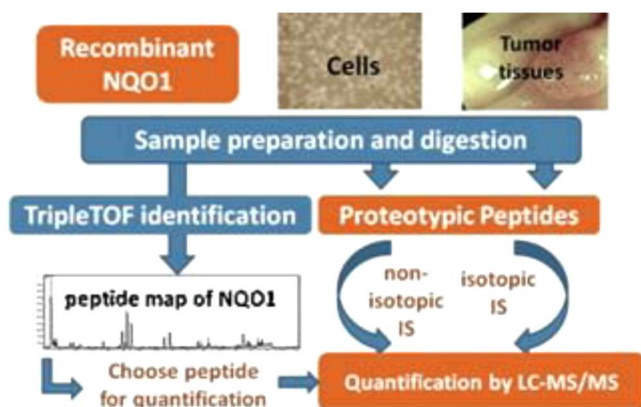
Absolute quantification of NAD(P)H:quinone oxidoreductase 1 in human tumor cell lines and tissues by liquid chromatography–mass spectrometry/mass spectrometry using both isotopic and non-isotopic internal standards

Original Research Article

Pages 59-67

Zhiyuan Tang, Mengqiu Wu, Yingchun Li, Xiao Zheng, Huiying Liu, Xuefang Cheng, Lin Xu, Guangji Wang, Haiping Hao

Graphical abstract



Highlights

► The peptide fingerprint map of NQO1 has been defined by using TripleTOF. ► Signature peptide of NQO1 can be quickly quantified within 10 min. ► Analysis is performed with non-isotopic analog and compared with isotopic method. ► This method is adequate for NQO1 quantitation from human cancer cells and tissues.

Sensors and Bioselective Reagents

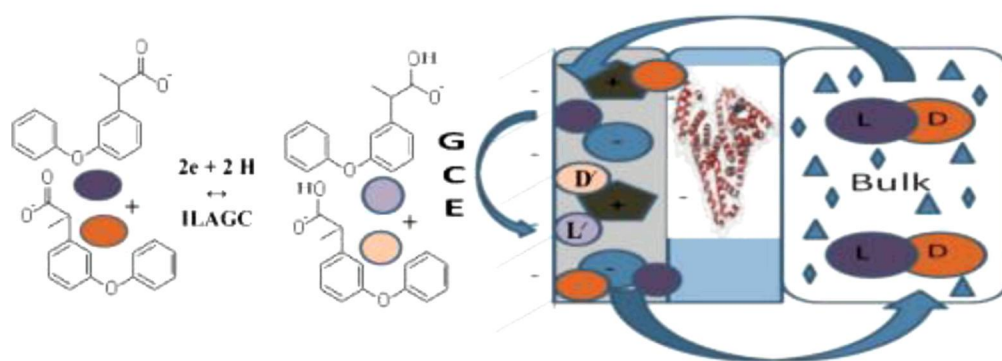
Hyphenation of ionic liquid albumin glassy carbon biosensor or protein label-free sensor with differential pulse stripping voltammetry for interaction studies of human serum albumin with fenoprofen enantiomers

Original Research Article

Pages 68-74

Deia Abd El-Hady, Ahmed K. Youssef

Graphical abstract



Highlights

- ▶ New wearable ionic liquid (IL) biosensor for chiral discrimination of fenoprofen.
- ▶ Proving the ability of IL as a mediator and promoter of activity of protein on GCE.
- ▶ Simple voltammetric estimation of binding constants of HSA–fenoprofen enantiomers.
- ▶ Performing the displacement and reciprocal competitive binding studies on the biosensor.

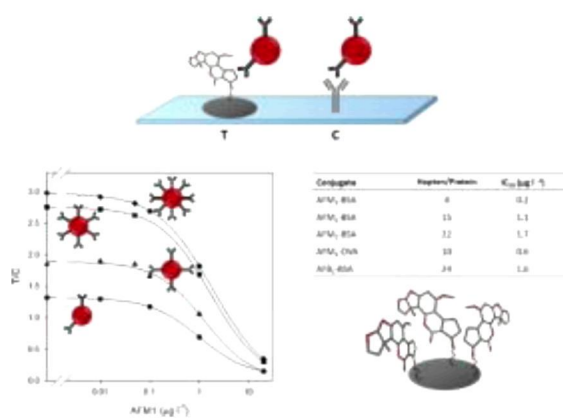
Optimization of a lateral flow immunoassay for the ultrasensitive detection of aflatoxin M₁ in milk

Original Research Article

Pages 75-80

Laura Anfossi, Claudio Baggiani, Cristina Giovannoli, Flavia Biagioli, Gilda D'Arco, Gianfranco Giraudi

Graphical abstract



Highlights

► The development of a high sensitive lateral flow immunoassay is described. ► The developed assay allowed aflatoxin M₁ detection in milk at level required by EU regulations. ► Article describes advances in lateral flow technology towards high sensitivity. ► A simple and rapid sample pre-treatment was proposed to overthrow matrix interference.

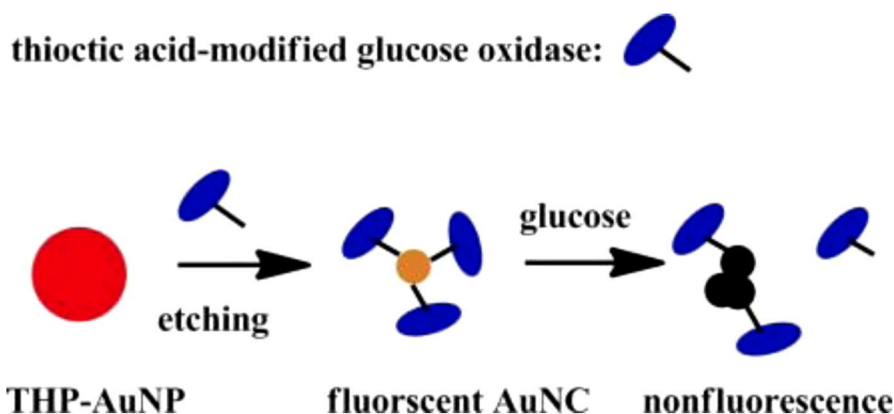
Glucose oxidase-functionalized fluorescent gold nanoclusters as probes for glucose

Original Research Article

Pages 81-86

Xiaodong Xia, Yunfei Long, Jianxiu Wang

Graphical abstract



Highlights

► A glucose oxidase/gold nanocluster conjugates formed by etching chemistry. ► Integration of the bioactivities and fluorescence properties within a single unit. ► These conjugates serve as novel fluorescent probe for glucose.

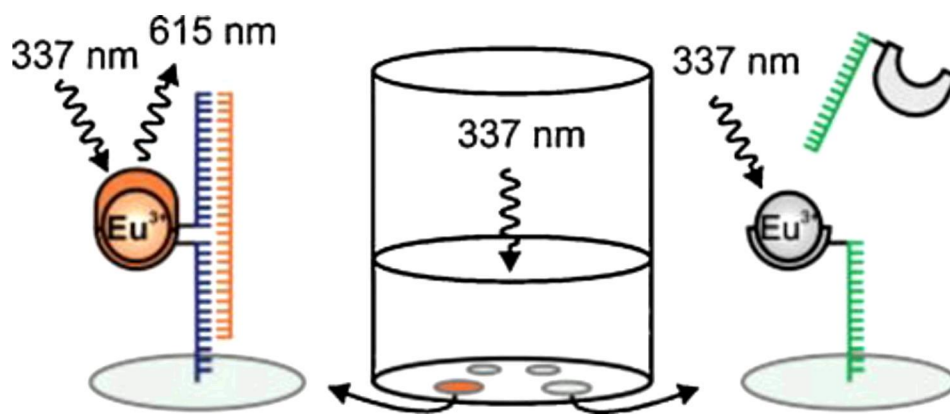
Quantitative detection of well-based DNA array using switchable lanthanide luminescence

Original Research Article

Pages 87-92

Ulla Karhunen, Minna Soikkeli, Susanne Lahdenperä, Tero Soukka

Graphical abstract



Highlights

- ▶ Oligonucleotide hybridization switches on lanthanide luminescence.
- ▶ The binary probe technology enables wash-free nucleic acid array.
- ▶ Detection of both synthetic targets and PCR-amplified *E. coli* DNA is demonstrated.

Separation Methods

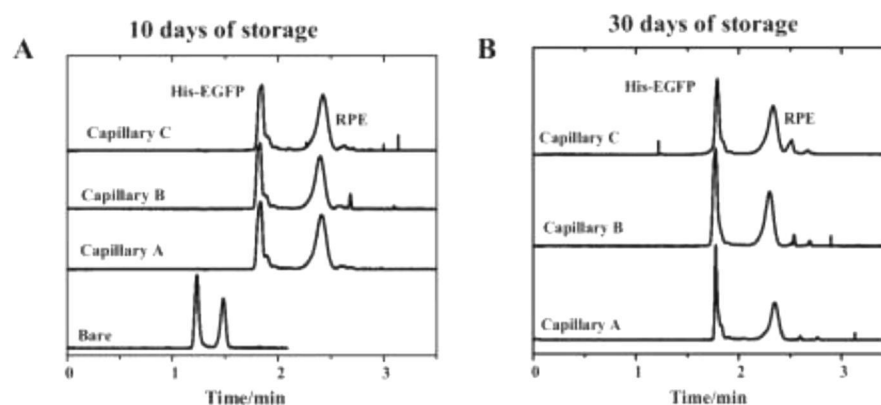
Practical considerations for preparing polymerized phospholipid bilayer capillary coatings for protein separations

Original Research Article

Pages 93-98

Seid M. Adem, Elisabeth Mansfield, John P. Keogh, Henry K. Hall Jr., Craig A. Aspinwall

Graphical abstract



Highlights

- ▶ We investigated the stability of polymerized lipid bilayer capillary coatings.
- ▶ Effects of pH and capillary inner diameter on stability of coating were studied.
- ▶ Smaller inner diameter

capillaries provide a very stable coating. ► The polymerized lipid bilayer coatings are stable across a wide range of pH values. ► The polymerized lipid bilayer coatings are stable for an extended period of time.