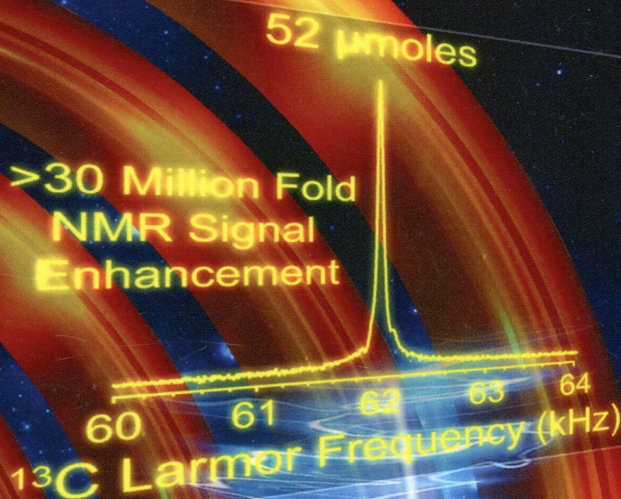


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# analytical chemistry

June 17, 2014 Volume 86 Number 12



**Parahydrogen Induced  
Polarization of 1- $^{13}\text{C}$ -Phospholactate- $d_2$   
for Biomedical Imaging with  
>30,000,000-fold NMR Signal  
Enhancement in Water**



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**ON THE COVER:**  $^{13}\text{C}$  nuclear spin polarization of  $1\text{-}^{13}\text{C}$ -phospholactate- $d_2$  was increased by >30,000,000 fold (5.75 mT) in water using Parahydrogen-Induced Polarization for potential use in molecular imaging. Image prepared by Dr. Panayiotis Nikolaou.

## Letters to Analytical Chemistry

5601  [dx.doi.org/10.1021/ac500952z](https://doi.org/10.1021/ac500952z)

**Parahydrogen Induced Polarization of  $1\text{-}^{13}\text{C}$ -Phospholactate- $d_2$  for Biomedical Imaging with >30,000,000-fold NMR Signal Enhancement in Water**

Roman V. Shchepin,\* Aaron M. Coffey, Kevin W. Waddell, and Eduard Y. Chekmenev\*

5606  [dx.doi.org/10.1021/ac501037e](https://doi.org/10.1021/ac501037e)

**One-Step, Ultrasensitive, and Electrochemical Assay of microRNAs Based on T7 Exonuclease Assisted Cyclic Enzymatic Amplification**

Mo Wang, Zhengliang Fu, Bingchen Li, Yunlei Zhou, Huanshun Yin,\* and Shiyun Ai\*

5611  [dx.doi.org/10.1021/ac501045h](https://doi.org/10.1021/ac501045h)

**Fluorescent Probe-Based Lateral Flow Assay for Multiplex Nucleic Acid Detection**

Ye Xu, Yinghua Liu, Yan Wu, Xiaohu Xia, Yiqun Liao, and Qingge Li\*

5615  [dx.doi.org/10.1021/ac501129h](https://doi.org/10.1021/ac501129h)

**Quantification of HIV-1 DNA Using Real-Time Recombinase Polymerase Amplification**

Zachary Austin Crannell,\* Brittany Rohrman, and Rebecca Richards-Kortum

5620  [dx.doi.org/10.1021/ac501173a](https://doi.org/10.1021/ac501173a)

**Dual-Peak Electrogenerated Chemiluminescence of Carbon Dots for Iron Ions Detection**

Pengjia Zhang, Zhenjie Xue, Dan Luo, Wei Yu, Zhihui Guo,\* and Tie Wang\*

5624  [dx.doi.org/10.1021/ac501261h](https://doi.org/10.1021/ac501261h)

**High Resolution Trapped Ion Mobility Spectrometry of Peptides**

Joshua A. Silveira, Mark E. Ridgeway, and Melvin A. Park\*

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[dx.doi.org/10.1021/ac501315p](https://doi.org/10.1021/ac501315p)

**Fluorescence Turn-On Detection of Gaseous Nitric Oxide Using Ferric Dithiocarbamate Complex Functionalized Quantum Dots**


Jian Sun, Yehan Yan, Mingtai Sun, Huan Yu, Kui Zhang, Dejian Huang,\* and Suhua Wang\*

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[dx.doi.org/10.1021/ac501451v](https://doi.org/10.1021/ac501451v)

**An Artifact in LC-MS/MS Measurement of Glutamine and Glutamic Acid: In-Source Cyclization to Pyroglutamic Acid**

Preeti Purwaha, Leslie P. Silva, David H. Hawke, John N. Weinstein, and Philip L. Lorenzi\*

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[dx.doi.org/10.1021/ac5014805](https://doi.org/10.1021/ac5014805)

**Red Emissive Two-Photon Probe for Real-Time Imaging of Mitochondria Trafficking**

Avik R. Sarkar, Cheol Ho Heo, Hyo Won Lee, Kyung Hee Park, Young Ho Suh, and Hwan Myung Kim\*

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**Rapid Enumeration of Phage in Monodisperse Emulsions**

Katrina F. Tjhung, Sean Burnham, Hany Anany, Mansel W. Griffiths, and Ratmir Derda\*

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[dx.doi.org/10.1021/ac501072g](https://doi.org/10.1021/ac501072g)

**High Throughput Identification and Quantification of Anabolic Steroid Esters by Atmospheric Solids Analysis Probe Mass Spectrometry for Efficient Screening of Drug Preparations**

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[dx.doi.org/10.1021/ac501081b](https://doi.org/10.1021/ac501081b)

**Reducing pH Gradients in Free-Flow Electrophoresis**

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[dx.doi.org/10.1021/ac501102t](https://doi.org/10.1021/ac501102t)

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Ting Song, Sureyya Ozcan, Alicia Becker, and Carlito B. Lebrilla\*

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Xiaolan Yang, Xiaolei Hu, Bangtian Xu, Xin Wang, Jialin Qin, Chenxiong He, Yanling Xie, Yuanli Li, Lin Liu, and Fei Liao\*

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[dx.doi.org/10.1021/ac501180n](https://doi.org/10.1021/ac501180n)

**Ultrasensitive Biotin Assay of a Noncompetitive Format in a Homogeneous Solution Based on Resonance Energy Transfer Induced by a Protein–Protein Interaction**

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[dx.doi.org/10.1021/ac501354y](https://doi.org/10.1021/ac501354y)

**Measuring the Formaldehyde Protein–DNA Cross-Link Reversal Rate**

Julia Kennedy-Darling and Lloyd M. Smith\*

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**Rapid Magnetic Bead Based Sample Preparation for Automated and High Throughput N-Glycan Analysis of Therapeutic Antibodies**

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**Improved Sphingolipidomic Approach Based on Ultra-High Performance Liquid Chromatography and Multiple Mass Spectrometries with Application to Cellular Neurotoxicity**

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[dx.doi.org/10.1021/ac404214a](https://doi.org/10.1021/ac404214a)

**Surface Oxidation under Ambient Air—Not Only a Fast and Economical Method to Identify Double Bond Positions in Unsaturated Lipids But Also a Reminder of Proper Lipid Processing**

Ying Zhou, Hyejung Park, Philseok Kim, Yan Jiang, and Catherine E. Costello\*

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**Aminophenylboronic-Acid-Conjugated Polyacrylic Acid–Mn-Doped ZnS Quantum Dot for Highly Sensitive Discrimination of Glycoproteins**

Li-Jia Sang and He-Fang Wang\*

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[dx.doi.org/10.1021/ac403998e](https://doi.org/10.1021/ac403998e)

**Fast Separation, Characterization, and Speciation of Gold and Silver Nanoparticles and Their Ionic Counterparts with Micellar Electrokinetic Chromatography Coupled to ICP-MS**

Bastian Franze and Carsten Engelhard\*

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[dx.doi.org/10.1021/ac404050t](https://doi.org/10.1021/ac404050t)

**High Temporal Resolution Measurements of Dopamine with Carbon Nanotube Yarn Microelectrodes**

Christopher B. Jacobs, Iliia N. Ivanov, Michael D. Nguyen, Alexander G. Zestos, and B. Jill Venton\*

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**Membrane-Assisted Isoelectric Focusing Device As a Micropreparative Fractionator for Two-Dimensional Shotgun Proteomics**

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[dx.doi.org/10.1021/ac404209a](https://doi.org/10.1021/ac404209a)

**Novel Linear Ion Trap Mass Analyzer Built with Triangular Electrodes**

Yu Xiao, Zhengzhi Ding, Chongsheng Xu, Xinhua Dai, Xiang Fang,\* and Chuan-Fan Ding\*

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[dx.doi.org/10.1021/ac500059a](https://doi.org/10.1021/ac500059a)

**Principal Component Analysis (PCA)-Assisted Time-of-Flight Secondary-Ion Mass Spectrometry (ToF-SIMS): A Versatile Method for the Investigation of Self-Assembled Monolayers and Multilayers as Precursors for the Bottom-Up Approach of Nanoscaled Devices**

Markus Holzweber,\* Thomas Heinrich, Valentin Kunz, Sebastian Richter, Christoph H.-H. Traulsen, Christoph A. Schalley, and Wolfgang E. S. Unger

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**Stretch–Stowage–Growth Strategy to Fabricate Tunable Triply-Amplified Electrochemiluminescence Immunosensor for Ultrasensitive Detection of Pseudorabies Virus Antibody**

Kang Shao, Jing Wang, Xiaochun Jiang, Feng Shao, Tingting Li, Shiyi Ye, Lu Chen, and Heyou Han\*

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Mara Serrapede, Giovanni Luca Pesce, Richard J. Ball, and Guy Denuault\*

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**Objective Set of Criteria for Optimization of Sample Preparation Procedures for Ultra-High Throughput Untargeted Blood Plasma Lipid Profiling by Ultra Performance Liquid Chromatography–Mass Spectrometry**

Magali H. Sarafian, Mathieu Gaudin, Matthew R. Lewis, Francois-Pierre Martin, Elaine Holmes, Jeremy K. Nicholson,\* and Marc-Emmanuel Dumas\*

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Karli R. Reiding, Dennis Blank, Dennis M. Kuijper, André M. Deelder, and Manfred Wuhrer\*

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Jacqueline W. H. Biesterbos,\* Gwendolyn Beckmann, Rob B. M. Anzion, Ad M. J. Ragas, Frans G. M. Russel, and Paul T. J. Scheepers

5800  [dx.doi.org/10.1021/ac500478g](https://doi.org/10.1021/ac500478g)  
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[dx.doi.org/10.1021/ac500656g](https://doi.org/10.1021/ac500656g)**Determination of Mustard Gas Hydrolysis Products Thiodiglycol and Thiodiglycol Sulfoxide by Gas Chromatography-Tandem Mass Spectrometry after Trifluoroacetylation**

Stanislaw Popiel,\* Jakub Nawala, Daniel Dziedzic, Martin Söderström, and Paula Vanninen

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[dx.doi.org/10.1021/ac500665b](https://doi.org/10.1021/ac500665b)**In Situ Generation of Self-Enhanced Luminophore by  $\beta$ -Lactamase Catalysis for Highly Sensitive Electrochemiluminescent Aptasensor**

Guo-Feng Gui, Ying Zhuo,\* Ya-Qin Chai, Yun Xiang, and Ruo Yuan\*

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[dx.doi.org/10.1021/ac501423g](https://doi.org/10.1021/ac501423g)**Monoclonal Surface Display SELEX for Simple, Rapid, Efficient, and Cost-Effective Aptamer Enrichment and Identification**

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[dx.doi.org/10.1021/ac500811j](https://doi.org/10.1021/ac500811j)**Pd-Ni Alloy Nanoparticle/Carbon Nanofiber Composites: Preparation, Structure, and Superior Electrocatalytic Properties for Sugar Analysis**

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[dx.doi.org/10.1021/ac500730s](https://doi.org/10.1021/ac500730s)**Measurement of ZnO Nanoparticles Using Diffusive Gradients in Thin Films: Binding and Diffusional Characteristics**

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[dx.doi.org/10.1021/ac5007365](https://doi.org/10.1021/ac5007365) **$\text{SnO}_2$  Quantum Dots-Reduced Graphene Oxide Composite for Enzyme-Free Ultrasensitive Electrochemical Detection of Urea**

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[dx.doi.org/10.1021/ac500790u](https://doi.org/10.1021/ac500790u)**Development of Triphenylamine Functional Dye for Selective Photoelectrochemical Sensing of Cysteine**

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**Sequential Strand Displacement Beacon for Detection of DNA Coverage on Functionalized Gold Nanoparticles**

Rebecca E. Paliwoda, Feng Li, Michael S. Reid, Yanwen Lin, and X. Chris Le\*

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[dx.doi.org/10.1021/ac501371r](https://doi.org/10.1021/ac501371r)

**Detection of *Yersinia pestis* in Environmental and Food Samples by Intact Cell Immunocapture and Liquid Chromatography–Tandem Mass Spectrometry**

Jérôme Chenau, François Fenaille, Stéphanie Simon, Sofia Filali, Hervé Volland, Christophe Junot, Elisabeth Carniel, and François Becher\*

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**DNA Assembled Gold Nanoparticles Polymeric Network Blocks Modular Highly Sensitive Electrochemical Biosensors for Protein Kinase Activity Analysis and Inhibition**

Zonghua Wang,\* Na Sun, Yao He, Yang Liu,\* and Jinghong Li\*

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[dx.doi.org/10.1021/ac501378x](https://doi.org/10.1021/ac501378x)

**Immiscible Oil–Water Interface: Dual Function of Electrokinetic Concentration of Charged Molecules and Optical Detection with Interfacially Trapped Gold Nanorods**

Hye Soo Han, Jihwan Song, Joohee Hong, Dongchoul Kim,\* and Taewook Kang\*

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Josephine C. Cunningham, Nicholas J. Brenes, and Richard M. Crooks\*

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