

ISSN 1001-8417

CN 11-2710/O6



# CCL

## Chinese Chemical Letters

| Volume 30 | Number 9 | SEPTEMBER 2019 | Special Issue: Nanomaterials for Analytical Chemistry

Provided by  
Hongdeng Qiu's group, LICP, CAS, China.

Nanomaterial-enhanced fluorescence  
polarization/anisotropy sensors



#### REVIEW

Zhiyuan Gu et al.  
Solid-state nanopores for ion and small  
molecule analysis

#### COMMUNICATION

Juewen Liu et al.  
Gold nanoparticles as dehydrogenase  
mimicking nanozymes for estradiol  
degradation

ISSN 1001-8417



9 771001 841138

Chinese Chemical Society  
Institute of Materia Medica, Chinese Academy of Medical Sciences

万方数据



Contents lists available at ScienceDirect

Chinese Chemical Letters

journal homepage: [www.elsevier.com/locate/cclet](http://www.elsevier.com/locate/cclet)

## Graphical Abstracts/Chin Chem Lett 30 (2019) iii–viii

## Special Issue: Nanomaterials for Analytical Chemistry

## Editorial

## Nanomaterials for analytical chemistry

Chinese Chemical Letters 30 (2019) 1545

Juewen Liu, Hongdeng Qiu

Department of Chemistry, University of Waterloo, Waterloo, Ontario, N2L 3G1, Canada  
 Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences, Lanzhou 730000, China

## Reviews

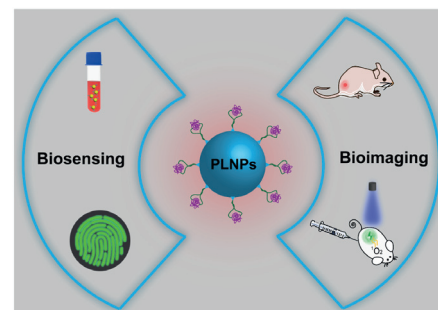
## Recent advances in autofluorescence-free biosensing and bioimaging based on persistent luminescence nanoparticles

Chinese Chemical Letters 30 (2019) 1547

Qiaosong Lin, Zhihao Li, Quan Yuan

Key Laboratory of Analytical Chemistry for Biology and Medicine (Ministry of Education), College of Chemistry and Molecular Sciences, Wuhan University, Wuhan 430072, China

Persistent luminescence nanoparticles (PLNPs) refer to a series of luminescent nanomaterials that can swiftly store the excitation energy and emit persistently after ceasing the excitation. Due to the characteristics of quickly storing the excitation energy and slowly emitting luminescence for a long time after ceasing excitation, they can effectively diminish background fluorescence, and are ideal for fluorescent analysis, especially in autofluorescence-free biosensing and bioimaging.



## One-dimensional and two-dimensional nanomaterials for the detection of multiple biomolecules

Chinese Chemical Letters 30 (2019) 1557

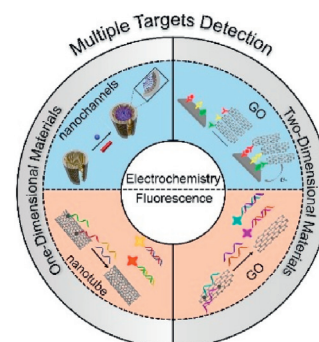
Quan Wang<sup>a</sup>, Xudong Wang<sup>c</sup>, Min Xu<sup>a</sup>, Xiaoding Lou<sup>a,b</sup>, Fan Xia<sup>a</sup>

<sup>a</sup> Engineering Research Center of Nano-Geomaterials of Ministry of Education, Faculty of Materials Science and Chemistry, China University of Geosciences, Wuhan 430074, China

<sup>b</sup> Zhejiang Institute, China University of Geosciences Wuhan, Hangzhou 311305, China

<sup>c</sup> Hubei Key Laboratory of Bioinorganic Chemistry & Materia Medica, School of Chemistry and Chemical Engineering, Huazhong University of Science and Technology, Wuhan 430074, China

By utilizing nanomaterials including one-dimensional materials (1DMs) and two-dimensional materials (2DMs), the recent development for the determination of multiple biomolecules has been focused.



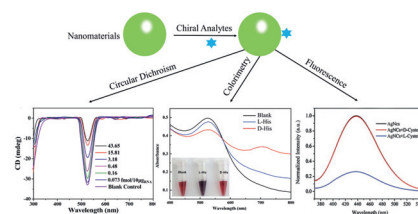
## Delving noble metal and semiconductor nanomaterials into enantioselective analysis

Yongting Wen, Zheng Li, Jianhui Jiang

State Key Laboratory of Chemo/Bio-Sensing and Chemometrics, College of Chemistry and Chemical Engineering, Hunan University, Changsha 410082, China

The chiroplasmonic and chiroexcitonic platform constructed from noble metal and semiconductor nanomaterials have significantly advanced enantioselective analysis. In this paper, we summarized the exciting progresses and contributions by the peers in the field.

Chinese Chemical Letters 30 (2019) 1565



## Recent progress in nanomaterial-enhanced fluorescence polarization/anisotropy sensors

Jia Chen<sup>a,b</sup>, Juewen Liu<sup>c</sup>, Xingguo Chen<sup>d</sup>, Hongdeng Qiu<sup>a</sup>

<sup>a</sup> CAS Key Laboratory of Chemistry of Northwestern Plant Resources and Key Laboratory for Natural Medicine of Gansu Province, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences, Lanzhou 730000, China

<sup>b</sup> University of Chinese Academy of Sciences, Chinese Academy of Sciences, Beijing 10039, China

<sup>c</sup> Department of Chemistry, Waterloo Institute for Nanotechnology, University of Waterloo, Waterloo, Ontario N2L 3G1, Canada

<sup>d</sup> State Key Laboratory of Applied Organic Chemistry, Lanzhou University, Lanzhou 730000, China

In this review, we summarize the number of scientific publications in the field of FP/FA sensor in recent five years, and introduce the recent progress of FP/FA sensor based on nanomaterial. The various analytical applications of FP/FA sensor based on nanomaterial are discussed. We also provide perspectives on the current challenges and future prospects in the promising field.

Chinese Chemical Letters 30 (2019) 1575



## Versatile metal graphitic nanocapsules for SERS bioanalysis

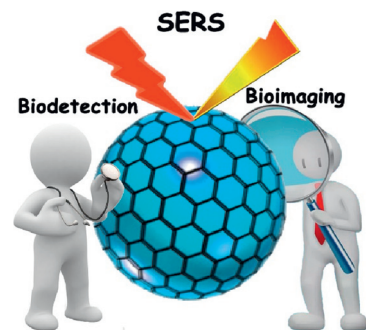
Shengkai Li<sup>a</sup>, Jiamei Xu<sup>a</sup>, Shen Wang<sup>a</sup>, Xin Xia<sup>a</sup>, Long Chen<sup>b</sup>, Zhuo Chen<sup>a</sup>

<sup>a</sup> Molecular Science and Biomedicine Laboratory (MBL), State Key Laboratory of Chemo/Bio-Sensing and Chemometrics, College of Chemistry and Chemical Engineering, Aptamer Engineering Center of Hunan Province, Hunan Provincial Key Laboratory of Biomacromolecular Chemical Biology, Hunan University, Changsha 410082, China

<sup>b</sup> Faculty of Science and Technology, University of Macau, Taipa 999078, Macau, China

A comprehensive summary toward the unique properties of the novel graphitic nanomaterial of metal graphitic nanocapsules (MGNs) and their applications in SERS biodetection and bioimaging were presented here.

Chinese Chemical Letters 30 (2019) 1581



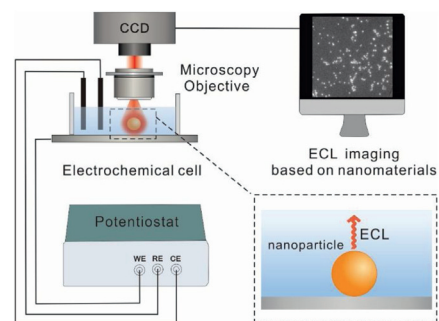
## Recent advances in electrochemiluminescence imaging analysis based on nanomaterials and micro-/nanostructures

Yanhuan Liu, Weiliang Guo, Bin Su

Institute of Analytical Chemistry, Department of Chemistry, Zhejiang University, Hangzhou 310058, China

In this review, the basic principles and apparatus of ECL imaging were briefly introduced at first. Then several latest and representative applications of ECL imaging based on nanomaterials and micro-/nanostructures were overviewed. Finally, the superiorities and challenges in ECL imaging for further development were discussed.

Chinese Chemical Letters 30 (2019) 1593



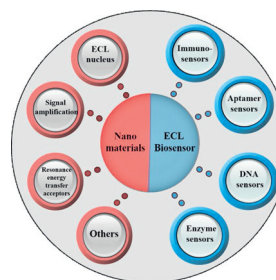
## Progress on the application of electrochemiluminescence biosensor based on nanomaterials

Zhaoxia Shi, Gongke Li, Yufei Hu

School of Chemistry, Sun Yat-sen University, Guangzhou 520175, China

In this review, we check out the number of published literature in the field of ECL biosensors trends during nearly a decade, and compare the research status of four different types of biosensors; summarize the application forms of nanomaterials in ECL biosensor. We have an overview of the building patterns and application example of the four main types of biosensors in the paper.

Chinese Chemical Letters 30 (2019) 1600



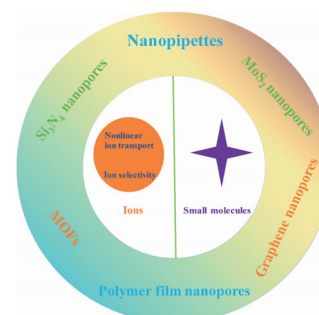
## Solid-state nanopores for ion and small molecule analysis

Qi Zhang, Yue Cheng, Peisheng Cao, Zhiyuan Gu

Jiangsu Key Laboratory of Biofunctional Materials, Jiangsu Collaborative Innovation Center of Biomedical Functional Materials, College of Chemistry and Materials Science, Nanjing Normal University, Nanjing 210023, China

Solid-state nanopore in analytical chemistry has developed rapidly in the 1990s and it is proved to be a versatile new tool for bioanalytical chemistry. This review focuses on the analysis of ions and small molecules with nanopores including nanopipettes, polymer film nanopores,  $\text{Si}_3\text{N}_4$  nanopores, graphene nanopores,  $\text{MoS}_2$  nanopores and MOFs.

Chinese Chemical Letters 30 (2019) 1607



## Analytical methods for locating modifications in nucleic acids

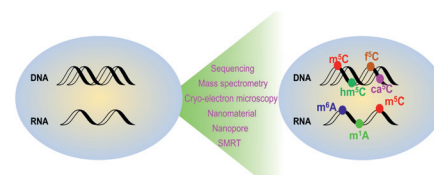
Chubo Qi<sup>a,b</sup>, Jianghui Ding<sup>a</sup>, Bifeng Yuan<sup>a</sup>, Yuqi Feng<sup>a</sup>

<sup>a</sup> Key Laboratory of Analytical Chemistry for Biology and Medicine (Ministry of Education), Department of Chemistry, Wuhan University, Wuhan 430072, China

<sup>b</sup> Hubei Cancer Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan 430079, China

We reviewed and summarized the established methods and the breakthrough of the techniques for locating modifications in nucleic acids. In addition, we discussed the principles, applications, advantages and drawbacks of these methods.

Chinese Chemical Letters 30 (2019) 1618



## Communications

### D-Proline capped gold nanoclusters for turn-on detection of serum Raltitrexed

Weifei Lan<sup>a,d</sup>, Qiqi Tan<sup>a,c</sup>, Juan Qiao<sup>a,b</sup>, Gangyi Shen<sup>d</sup>, Li Qi<sup>a,b</sup>

<sup>a</sup> Beijing National Laboratory of Molecular Sciences, Key Laboratory of Analytical Chemistry for Living Bio-systems, Institute of Chemistry, Chinese Academy of Sciences, Beijing 100190, China

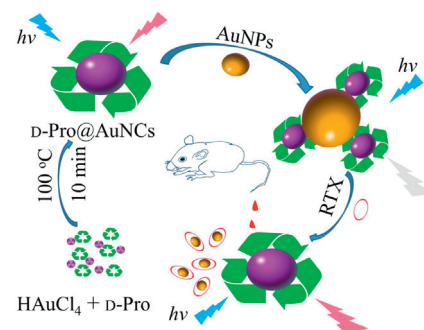
<sup>b</sup> School of Chemical Sciences, University of Chinese Academy of Sciences, Beijing 100049, China

<sup>c</sup> Department of Chemical Engineering, Beijing Institute of Petro-chemical Technology, Beijing 102617, China

<sup>d</sup> School of Pharmacy, Minzu University of China, Beijing 100081, China

Using D-proline (D-Pro) as the reducing agent and copper, D-Pro@AuNCs was rapidly constructed. Its fluorescence could be quenched by AuNPs. Due to the electrostatic interaction between anticancer drug Raltitrexed (RTX) and AuNPs induced fluorescence "turn-on" principle, the resultant fluorescent probe exhibited good selectivity and sensitivity for detecting RTX in rat serums.

Chinese Chemical Letters 30 (2019) 1627



## Enzyme-conjugated hybridization chain reaction for magneto-controlled immunoassay of squamous cell carcinoma antigen with pH meter

Jiancui Chen<sup>a</sup>, Huifeng Xue<sup>a</sup>, Qiaoyun Chen<sup>a</sup>, Yao Lin<sup>b</sup>, Dianping Tang<sup>c</sup>, Jinwen Zheng<sup>a</sup>

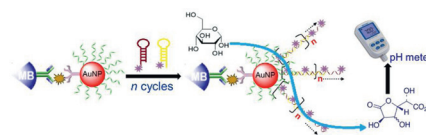
<sup>a</sup> Cervical Disease Diagnosis and Treatment Health Center, Fujian Provincial Maternity and Children's Hospital, Affiliated Hospital of Fujian Medical University, Fuzhou 350001, China

<sup>b</sup> College of Life Sciences, Fujian Normal University, Fuzhou 350117, China

<sup>c</sup> Key Laboratory for Analytical Science of Food Safety and Biology (MOE & Fujian Province), Department of Chemistry, Fuzhou University, Fuzhou 350116, China

A nanoparticle-based potentiometric immunoassay was designed for sensitive detection of squamous cell carcinoma antigen on a portable pH meter by coupling enzyme-labeled hybridization chain reaction with two alternating hairpin DNA probes for the signal amplification.

Chinese Chemical Letters 30 (2019) 1631



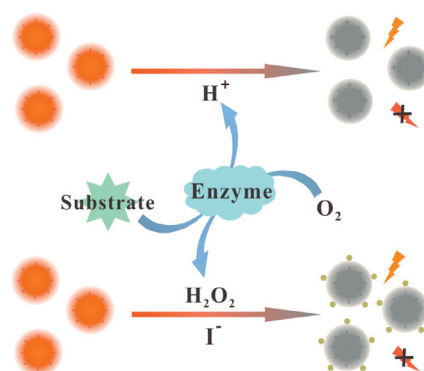
## pH and H<sub>2</sub>O<sub>2</sub> dual-responsive carbon dots for biocatalytic transformation monitoring

Wenxin Lv, Xin Wang, Jiahui Wu, Haiyin Li, Feng Li

College of Chemistry and Pharmaceutical Sciences, Qingdao Agricultural University, Qingdao 266109, China

Carbon dots with strong orange light emission, pH and H<sub>2</sub>O<sub>2</sub> dual-responsive characteristics, were prepared and applied for probing enzyme-mediated biocatalytic transformations via the fluorescence quenching.

Chinese Chemical Letters 30 (2019) 1635



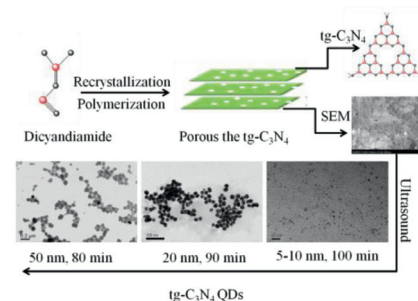
## Facile and efficient fabrication of g-C<sub>3</sub>N<sub>4</sub> quantum dots for fluorescent analysis of trace copper(II) in environmental samples

Qin Liu, Debin Zhu, Manli Guo, Ying Yu, Yujuan Cao

School of Chemistry and Environment, South China Normal University, Guangzhou 510006, China

A facile and efficient fabrication of g-C<sub>3</sub>N<sub>4</sub> quantum dots with highly fluorescent based on recrystallization and ultrasonic exfoliation was presented. The obtained g-C<sub>3</sub>N<sub>4</sub> QDs was successfully applied to the determination of trace Cu(II) in different environmental water samples.

Chinese Chemical Letters 30 (2019) 1639



## Highly selective electrochemical method for the detection of serotonin at carbon fiber microelectrode modified with gold nanoflowers and overoxidized polypyrrole

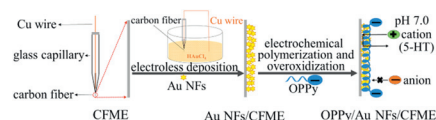
Jiajia Song<sup>a</sup>, Lifen Wang<sup>a</sup>, Hetong Qi<sup>b</sup>, Honglan Qi<sup>a</sup>, Chengxiao Zhang<sup>a</sup>

<sup>a</sup> Key Laboratory of Analytical Chemistry for Life Science of Shaanxi Province, School of Chemistry and Chemical Engineering, Shaanxi Normal University, Xi'an 710062, China

<sup>b</sup> Department of Applied Chemistry, School of Science, Xi'an Jiaotong University, Xi'an 710049, China

A gold nanoflowers and overoxidized polypyrrole modified carbon fiber microelectrode (OPPy/Au NFs/CFME) was fabricated using electroless deposition and electrochemical method for highly selective and sensitive detection of 5-HT.

Chinese Chemical Letters 30 (2019) 1643



## SciFinder-guided rational design of fluorescent carbon dots for ratiometric monitoring intracellular pH fluctuations under heat shock

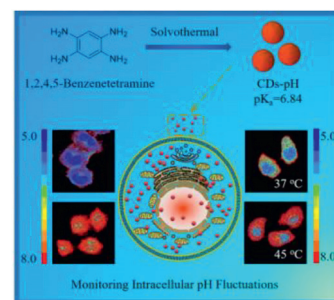
Haifang Liu<sup>a</sup>, Yuanqiang Sun<sup>a</sup>, Zhaohui Li<sup>a</sup>, Ran Yang<sup>a</sup>, Jie Yang<sup>a</sup>, Aaron Albert Aryee<sup>a</sup>, Xiaoge Zhang<sup>a</sup>, Jia Ge<sup>a</sup>, Lingbo Qu<sup>a</sup>, Yuehe Lin<sup>b</sup>

<sup>a</sup> Institute of Chemical Biology and Clinical Application at The First Affiliated Hospital, Henan Joint International Research Laboratory of Green Construction of Functional Molecules and Their Bioanalytical Applications, Zhengzhou University, Zhengzhou 450001, China

<sup>b</sup> School of Mechanical and Materials Engineering, Washington State University, Pullman, WA 99164, United States

A novel SciFinder-guided strategy for the preparation of pH responsive carbon dots (CDs-pH) for ratiometric intracellular imaging was developed.

Chinese Chemical Letters 30 (2019) 1647



## Cu-DNAzyme facilitates highly sensitive immunoassay

Zhi Shan<sup>a,b</sup>, Mingsheng Lyu<sup>a,c</sup>, Dennis Curry<sup>a</sup>, David Oakley<sup>a</sup>, Ken Oakes<sup>d</sup>, Xu Zhang<sup>a,e</sup>

<sup>a</sup> Verschuren Centre for Sustainability in Energy & the Environment, Cape Breton University, Sydney, Nova Scotia, B1P 6L2, Canada

<sup>b</sup> College of Life Science, Sichuan Agriculture University, Yaan 625014, China

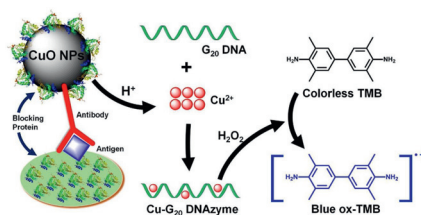
<sup>c</sup> Jiangsu Key Laboratory of Marine Bioresources and Environment, Huaihai Institute of Technology, Lianyungang 222005, China

<sup>d</sup> Department of Biology, Cape Breton University, Sydney, Nova Scotia, B1P 6L2, Canada

<sup>e</sup> Department of Chemistry, Cape Breton University, Sydney, Nova Scotia, B1P 6L2, Canada

A simple Cu-DNAzyme system is used for signal transduction of a CuO nanoparticle-labeled immunoassay, which makes the immunoassay fast, simple, cost-effective, and sensitive, thus promising for biomedical applications and point-of-care testing.

Chinese Chemical Letters 30 (2019) 1652



## Gold nanoparticles as dehydrogenase mimicking nanozymes for estradiol degradation

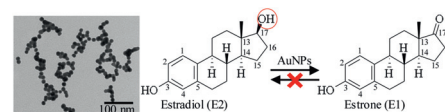
Zijie Zhang<sup>a</sup>, Leslie M. Bragg<sup>b</sup>, Mark R. Servos<sup>b</sup>, Juewen Liu<sup>a</sup>

<sup>a</sup> Department of Chemistry, Waterloo Institute for Nanotechnology, University of Waterloo, Waterloo, Ontario, N2L 3G1, Canada

<sup>b</sup> Department of Biology, University of Waterloo, Waterloo, Ontario, N2L 3G1, Canada

Small gold nanoparticles can mimic dehydrogenase activity to catalyze estradiol (E2) oxidation to estrone (E1), extending the range of nanozyme catalysis to environmentally and biologically important substrates.

Chinese Chemical Letters 30 (2019) 1655



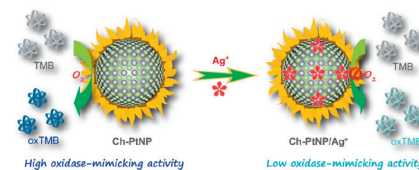
## Target-triggered inhibiting oxidase-mimicking activity of platinum nanoparticles for ultrasensitive colorimetric detection of silver ion

Haohua Deng, Shaobin He, Xiuling Lin, Lu Yang, Zhen Lin, Ruiting Chen, Huaping Peng, Wei Chen

Higher Educational Key Laboratory for Nano Biomedical Technology of Fujian Province, Department of Pharmaceutical Analysis, Fujian Medical University, Fuzhou 350004, China

A facile colorimetric method for sensitive and selective detection of Ag<sup>+</sup> is successfully developed based on the excellent oxidase-like activity of chitosan-stabilized platinum nanoparticles and the strong metallophilic Pt<sup>2+</sup>-Ag<sup>+</sup> interactions.

Chinese Chemical Letters 30 (2019) 1659



---

## Etching of gold nanorods: The effects of diameter on analytical performances

Bingjie Zhang, Yunsheng Xia

Key Laboratory of Functional Molecular Solids, Ministry of Education, College of Chemistry and Materials Science, Anhui Normal University, Wuhu 241000, China

The diameters of gold nanorods have profound effects on the analytical performances of the corresponding etching based sensing system.

Chinese Chemical Letters 30 (2019) 1663

