Lianzhe Hu

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Personal

- Born on June 03, 1986 in Xinxiang, Henan, China.
  Gender: Male.

Education

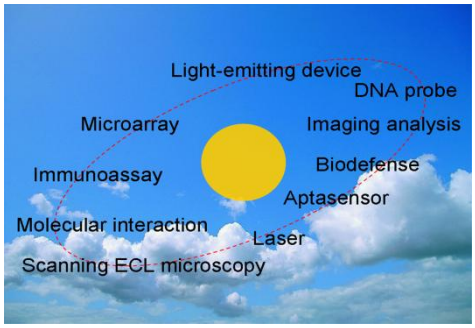
- Postdoctoral Fellow, King Abdullah University of Science and Technology
  Research Advisor: Dr. Niveen M. Khashab 2013-Present
- Ph.D. in Analytical Chemistry, Chinese Academy of Sciences
  Research Advisor: Dr. Guobao Xu 2007-2012
- B.S. in Chemistry, Jilin University, China 2003-2007

Research Interests

- Electrochemiluminescence (ECL)
- Using electrochemical, fluorescent, colorimetric, or chemiluminescent methods for analytical and biorelated applications
- Applications of nanomaterials in bioanalytical chemistry and catalysis
- Design of functional molecular probe for bioimaging in living cells

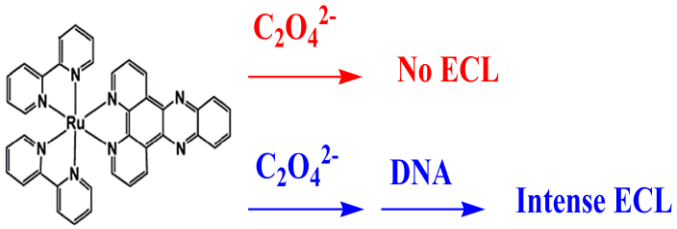
Research Experience

- Invited by *Chemical Society Reviews* to write a critical review, focusing on the applications and trends in electrochemiluminescence. This paper is recognized as "The top ten accessed articles from the online version of ChemSocRev during the month of July 2010".

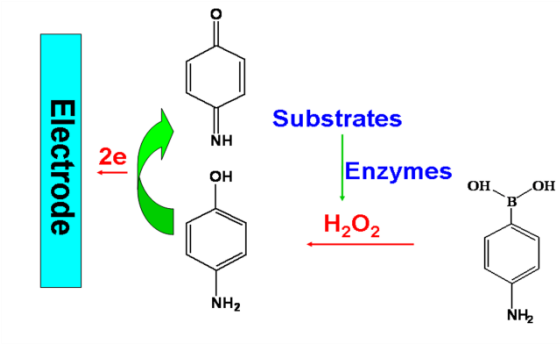


- Studied the ECL switch properties of $[Ru(bpy)_2dppz]^{2+}$, found that the ECL intensity of $[Ru(bpy)_2dppz]^{2+}$ increased about 1000 times when $[Ru(bpy)_2dppz]^{2+}$ intercalated into the nucleic acid structure, this provided a new way to investigate DNA

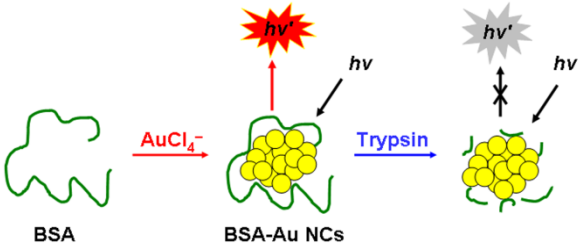
interactions and design label-free aptamer based biosensors. (Most Read Articles in *Analytical Chemistry*)



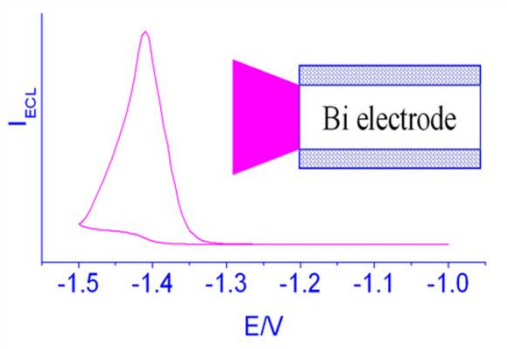
- Developed a new strategy for H_2O_2 determination by combing the advantages of H_2O_2-mediated selective boronate deprotection and a classic electrochemical probe *p*-aminophenol, and extend this method to design oxidase-based biosensors and monitor oxidase activities. (Featured by *Advances in Engineering*)



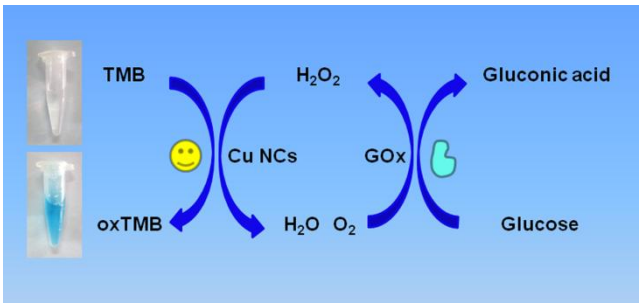
- Synthesized water soluble fluorescent gold nanoclusters, and developed a highly sensitive fluorescent method for protease detection based the digestion of the protein template of the as-prepared protein-stabilized fluorescent nanoclusters.



- Observed strong ECL emission from $Ru(bpy)_3^{2+}/S_2O_8^{2-}$ system in aqueous solution at bismuth electrodes, demonstrated that bismuth electrodes are powerful electrodes for cathodic ECL studies in aqueous solutions because their high hydrogen evolution overpotential.



- Investigated the intrinsic peroxidase-like activity of Cu nanoclusters, and used Cu nanoclusters for colorimetric determination of H_2O_2 and glucose based on the TMB reaction.



- Studied the electrochemical and ECL behaviours of $Ru(bpy)_3^{2+}$ in the presence of formaldehyde and formic acid, investigated the luminescence mechanisms, and found a new method for formaldehyde and formic acid determination.
- Investigated the electrochemical and ECL behaviours of $Ru(bpy)_3^{2+}$ in the presence of hydrazine and its derivatives, discussed the possible ECL mechanisms, and extended this method for hydrazine and isoniazid determination.

Honors and Awards

- 2012: Distinguished Graduate in the Graduate School of Chinese Academy of Sciences (Less than 5% of the total students in Chinese Academy of Sciences)
- 2012: Merit Student in the Graduate School of Chinese Academy of Sciences (Less than 15% of the total students in Chinese Academy of Sciences)
- 2011: Graduate School of Chinese Academy of Sciences–Australia BHP Billiton Scholarship (the only student that win this award in 2011 in our institute)
- 2010: Merit Student in the Graduate School of Chinese Academy of Sciences (Less than 15% of the total students in Chinese Academy of Sciences)

Publications

1. **Lianzhe Hu,** Guobao Xu, Applications and trends in electrochemiluminescence. *Chem. Soc. Rev.* **2010**, 39, 3275-3304. (The top ten accessed articles from the online version of ChemSocRev during the month of July 2010) (Invited Review)

2. **Lianzhe Hu**, Zheng Bian, Haijuan Li, Shuang Han, Yali Yuan, Lianxun Gao, Guobao Xu, $[Ru(bpy)_2dppz]^{2+}$ electrochemiluminescence switch and its applications for DNA interaction study and label-free ATP aptasensor. *Anal. Chem.* **2009**, 81, 9807-9811. (Most read articles)
3. **Lianzhe Hu**, Haijuan Li, Shuyun Zhu, Lishuang Fan, Lihong Shi, Xiaoqing Liu, Guobao Xu, Cathodic electrochemiluminescence in aqueous solutions at bismuth electrodes. *Chem. Commun.* **2007**, 4146-4148.
4. **Lianzhe Hu**, Shuang Han, Saima Parveen, Yali Yuan, Ling Zhang, Guobao Xu, Highly sensitive fluorescent detection of trypsin based on BSA-stabilized gold nanoclusters. *Biosens. Bioelectron.* **2012**, 32, 297-299.
5. **Lianzhe Hu**, Shuang Han, Zhongyuan Liu, Saima Parveen, Yali Yuan, Guobao Xu, A versatile strategy for electrochemical detection of hydrogen peroxide as well as related enzymes and substrates based on selective hydrogen peroxide-mediated boronate deprotection. *Electrochem. Commun.* **2011**, 13, 1536-1538. (Featured by *Advances in Engineering*)
6. **Lianzhe Hu**, Yali Yuan, Ling Zhang, Jianming Zhao, Saadat Majeed, Guobao Xu, Copper nanoclusters as peroxidase mimetics and their applications to H_2O_2 and glucose detection. *Anal. Chim. Acta* **2013,** 762, 83-86.
7. **Lianzhe Hu**, Haijuan Li, Shuang Han, Guobao Xu, $Ru(bpy)_3^{2+}$ electrochemiluminescence in the presence of formaldehyde or formic acid. *J. Electroanal. Chem.* **2011**, 656, 289-292.
8. **Lianzhe Hu**, Jie Gao, Yi Wang, Guobao Xu, Electrochemiluminescence of tris(2,2′-bipyridyl)ruthenium(II) in the presence of hydrazine and its derivatives. *Anal. Methods*, **2011**, 3, 1786-1789.
9. Tao Yuan, Zhongyuan Liu, **Lianzhe Hu**, Ling Zhang, Guobao Xu, Label-free supersandwich electrochemiluminescence assay for detection of sub-nanomolar Hg^{2+}. *Chem. Commun.* **2011**, 47, 11951-11953.
10. Zhongyuan Liu, Wei Zhang, **Lianzhe Hu**, Haijuan Li, Shuyun Zhu, Guobao Xu, Label-free and signal-on electrochemiluminescence aptasensor for ATP based on target-induced conjunction of split aptamer fragments using $Ru(phen)_3^{2+}$ intercalated into double-strand DNA as probe, *Chem. Eur. J.* **2010**, 16, 13356-13359.
11. Shuang Han, Yali Yuan, **Lianzhe Hu**, Guobao Xu, Electrochemical derivatization of carbon surface by reduction of diazonium salts in situ generated from nitro precursors in aqueous solutions and electrocatalytic ability of the modified electrode toward hydrogen peroxide, *Electrochem. Commun.* **2010**, 12, 1746-1748.
12. Shuang Han, Haijuan Li, **Lianzhe Hu**, Yali Yuan, Guobao Xu, Electrochemiluminescence of tris(2,2′-bipyridyl)ruthenium(II)/pyruvate system in the absence of cerium(III), *Anal. Methods*, 2010, 2, 479-483.
13. Tao Yuan, Zhongyuan Liu, **Lianzhe Hu**, Guobao Xu, Electrochemical and electrochemiluminescent Aptasensors, *Chin. J. Anal. Chem*. 2011, 39, 972-977. (Invited Review)
14. Haijuan Li, Shuang Han, **Lianzhe Hu**, Guobao Xu, Progress in $Ru(bpy)_3^{2+}$ electrogenerated chemiluminescence, *Chin. J. Anal. Chem*. **2009**, 37, 1557-1565.
15. Yali Yuan, Haijuan Li, Shuang Han, **Lianzhe Hu**, Saima Parveen, Guobao Xu,

Vitamin C derivatives as new coreactants for tris(2,2′-bipyridine)ruthenium(II) electrochemiluminescence, *Anal. Chim. Acta* **2011**, 701, 169-173.

16. Yali Yuan, Haijuan Li, Shuang Han, **Lianzhe Hu**, Saima Parveen, Haoran Cai, Guobao Xu. Immobilization of tris(1,10-phenanthroline)ruthenium with graphene oxide for electrochemiluminescent analysis. *Anal. Chim. Acta* **2012**, 720, 38-42.
17. Shuang Han, Wenxin Niu, Haijuan Li, **Lianzhe Hu**, Yali Yuan, Guobao Xu, Effect of hydroxyl and amino groups on electrochemiluminescence activity of tertiary amines at low tris(2,2′-bipyridyl)ruthenium(II) concentrations, *Talanta* **2010**, 81, 44-47.
18. Yali Yuan, Haijuan Li, Shuang Han, **Lianzhe Hu**, Guobao Xu, Application of cement as new electrode material and solid-phase microextraction material demonstrated by electrochemiluminescent detection of perphenazine. *Talanta* **2011**, 84, 49-52.
19. Shuyun Zhu, Zhongyuan Liu, Wei Zhang, Shuang Han, **Lianzhe Hu**, Guobao Xu, Nucleic acid detection using single-walled carbon nanohorns as a fluorescent sensing platform, *Chem. Commun.* **2011**, 47, 6099-6101.
20. Zhongyuan Liu, Wei Zhang, Shuyun Zhu, Ling Zhang, **Lianzhe Hu**, Saima Parveen, Guobao Xu, Ultrasensitive signal-on DNA biosensor based on nicking endonuclease assisted electrochemistry signal amplification, *Biosens. Bioelectron.* **2011**, 29, 215-218.
21. Xiaoqing Liu, Wenxin Niu, Haijuan Li, Shuang Han, **Lianzhe Hu**, Guobao Xu, Glucose biosensor based on gold nanoparticle-catalyzed luminol electrochemiluminescence on a three-dimensional sol-gel network. *Electrochem. Commun.* **2008**, 10, 1250-1253.

Conference Presentation

1. **Oral Presentation**: New strategies for improving the sensitivity for electrochemiluminescent detection using ruthenium complex, The 7th Sino-French Workshop on "Surface Electrochemistry of Molecules of Biological Interest & Biosensor Applications", 2011, Nanjing, China.
2. **Poster:** A versatile strategy for electrochemical detection of hydrogen peroxide as well as related enzymes and substrates based on selective hydrogen peroxide-mediated boronate deprotection, The 13th International Symposium on Electroanalytical Chemistry, 2011, Changchun, China.
3. **Poster:** Cathodic electrochemiluminescence in aqueous solutions at bismuth electrodes, The 12th International Symposium on Electroanalytical Chemistry, 2009, Changchun, China.