

Huan Zhang

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RESEARCH INTERESTS

My Research Interests focus on design and modification of nanomaterials (such as: DNA nanostructures, carbon nanotubes, graphene oxide) and probe the biological systems both in vitro and in vivo for therapeutic delivery (e.g. siRNA, Cas9 RNP) and sensing applications (e.g. cancer related microRNA).

EDUCATION

Shanghai Institute of Applied Physics, Chinese Academy of Sciences, Shanghai, China

Ph.D. Chemistry, 2014

Ph.D. Advisor: Chunhai Fan

Ludong University, Shandong, China

B.S. Material science, 2009

RESEARCH ACHIEVEMENT

Honors and rewards:

- 2017-2019 National Natural Science Foundation of China Youth Fund
- 2013-2014 Excellent Student Award, Chinese Academy of Science;
- 2009 Excellent Graduate Award of University;
- 2008 National Inspirational Scholarship;
- 2007 First Class Scholarship of University;
- 2006 First Class Scholarship of University.

Publications:

- 1) **Huan Zhang**, Honglu Zhang, Ali Aldalbahi, Xiaolei Zuo, Chunhai Fan, Xianqiang Mi. Fluorescent Biosensors Enabled by Graphene and Graphene Oxide. **Biosensors and Bioelectronics**, 2017, 89, 96-106
- 2) Chenguang Wang, **Huan Zhang**, Dongdong Zeng, Lili Sana, and Xianqiang Mi. DNA nanotechnology mediated Gold nanoparticle conjugates and their applications in biomedicine. **Chinese Journal of Chemistry**, 2016, 34, 299-307.
- 3) San Lili, Zeng Dongdong, Song Shiping, Zuo Xiaolei, **Zhang Huan**, Wang Chenguang, Wu Jiarui, Mi Xianqiang.

An electrochemical immunosensor for quantitative detection of ficolin-3, **Nanotechnology**, 2016, 27, 254003.

4) **Huan Zhang**, Yunsheng Wang, Daiwei Zhao, Dongdong Zeng, Jiaoyun Xia, Ali Aldalbahi, Chenguang Wang, Lili San, Chunhai Fan, Xiaolei Zuo, and Xianqiang Mi. Universal Fluorescence Biosensor Platform Based on Graphene Quantum Dots and Pyrene-Functionalized Molecular Beacons for Detection of MicroRNAs. **ACS Applied Materials & Interfaces**, 2015, 7, 16152-16156.

5) **Huan Zhang***, Chenguang Wang*, Dongdong Zeng, Wenliang Sun, Honglu Zhang, Ali Aldalbahi, Yunsheng Wang, Lili San, Chunhai Fan, Xiaolei Zuo, Xianqiang Mi. Elaborately Designed Diblock Nanoprobes for Simultaneous Multicolor Detection of MicroRNAs. **Nanoscale**, 2015, 7, 15822-15829. (**Hot Paper of 2015**)

6) **Huan Zhang***, Dongdong Zeng*, DanZhu, JiangLi, LiliSan, ZehuaWang, Chenguang Wang, YunshengWang, LihuaWang, XiaoleiZuo, Xianqiang Mi. A novel ultrasensitive electrochemical DNA sensor based on double tetrahedral nanostructures. **Biosensors and Bioelectronics**, 2015, 17, 434–438.

7) **Huan Zhang**, Sisi Jia, Min Lv, Jiye Shi, Xiaolei Zuo, Shao Su, Lianhui Wang, Wei Huang, Chunhai Fan, Qing Huang. Size-Dependent Programming of the Dynamic Range of Graphene Oxide–DNA Interaction-Based Ion Sensors. **Analytical Chemistry**, 2014, 86, 4047-4051.

8) Jinli Sun, Jie Chao, Jing Huang, Min Yin, **Huan Zhang**, Cheng Peng, Zengtao Zhong and Nan Chen. Uniform Small Graphene Oxide as an Efficient Cellular Nanocarrier for Immunostimulatory CpG Oligonucleotides. **ACS Applied Materials & Interfaces**, 2014, 6, 7926–7932.

9) **Huan Zhang**, Cheng Peng, Jianzhong Yang, Min Lv, Rui Liu, Dannong He, Chunhai Fan, Qing Huang. Uniform Ultrasmall Graphene Oxide Nanosheets with Low Cytotoxicity and High Cellular Uptake. **ACS Applied Materials & Interfaces**, 2013, 5, 1761-1767.

10) Lv Min, **Zhang Huan**, Zhu Ying, Huang Qing, Zhao Yun. Comparison of Method effect for Determination of the Antibacterial Activity of Graphene Oxide NanoSheets. *Nuclear Science and Techniques*. 2012, 35 (10), 785-788.

Upcoming publications:

11) Gozde S. Demirer, Roger Chang, **Huan Zhang**, Linda Chio, Markita P. Landry. Nanoparticle-Guided Biomolecule Delivery for Transgene Expression and Gene Silencing in Mature Plants. doi: <https://doi.org/10.1101/179549>, bioRxiv (2017)

12) **Huan Zhang**, Honglu Zhang, Antony Lee, Jie Chao, Huajie Liu, Jiang li, Lihua Wang, Lianhui Wang, Chunhai Fan. Chain-growth co-polymerization of DNA hairpin tiles for hierarchical living supramolecular organization. 2017, Submitted.

13) **Huan Zhang**, Honglu Zhang, Jiang Li, Lihua Wang, Chunhai Fan, Qiang Huang. Environment-dependent Cellular Internalization of One-dimensional DNA Nanostructures. In preparation.

*Denotes equal contribution

Patents:

- Zhang Yujie; **Zhang Huan**; Hu Wenbing; Fan Chunhai; Huang Qing. A Method for Preparation of One-layer Graphene. CN101973543A.
- Zhang Yujie; Geng Make; **Zhang Huan**; Li Jiang; Fan Chunhai; Huang Qing. A Method for Preparation of Gold - graphene oxide nanocomposite. CN101973518A.
- Geng Make; Zhang Yujie; **Zhang Huan**; Chen Nan; Fan Chunhai; Huang Qing. A Method for Preparation of Gold - fullerene nanocomposites. CN101961785A.
- Zhang Yujie; Zhang Xiaoyong; Peng Cheng; **Zhang Huan**; Hu Wenbing; Huang Qing. A Method for Preparation of Gold -Tannins - graphene oxide nanocomposite. CN201110045170.8.
- Mi xianqiang; Wang chenguang; **Zhang huan**; Zeng dongdong. A method for preparing of nano molecular beacon probes based on gold nanoparticles and their applications. CN104726605A.
- Mi xianqiang; Wang yunsheng; Zeng dongdong; **Zhang huan**. A method for preparing of nano molecular beacon probes based on graphene quantum dots and their applications. CN104726603B.

RESEARCH EXPERIENCE

2017/2-present: Department of Chemical and Biomolecular Engineering, University of California Berkeley.

Exploring of using DNA nanostructures with different size and shape as ideal carriers for delivery of biomolecule cargos to plant tissues and cells; Developing an efficient method for covalently linking functional CRISPR-Cas9 complex to single walled carbon nanotubes to further augment their functionality and broaden their applications for plant transgenic.

2014/9-2017/2: Laboratory of System Biology, Shanghai Advanced Research Institute, Chinese Academy of Sciences

Design of novel functional nanoprobe, including DNA nanostructure based nanoprobe, gold nanoparticle and graphene quantum dots based nanoprobe; Evaluate their detection ability and exploring their use for *in vitro* and *in vivo* sensing of cancer related biomarkers.

2009/9-2014/7: Laboratory of Physical Biology, Shanghai Institute of Applied Physics, Chinese Academy of Sciences

Size-controlled synthesis of two-dimensional graphene oxide (GO) nanosheets and study of their biocompatibility and cellular uptake behaviors; Design and preparation of 1-D, 2-D and 3-D DNA

nanostructures; Cellular internalization and mechanism study of one-dimensional DNA nanostructures with tunable sizes and exploring their applications in biosensing and drug delivery;

ACADEMIC ACTIVITIES

Innovative Genomics Institute (IGI) Open House, Berkeley, October 2017.

Plant Genome Engineering Symposium, University of California, Berkeley, June 2017.

Chan-Zuckerberg Biohub Interlab Confab, San Francisco, CA, August 2017.

Frontier seminar and Symposium on biological imaging, Hefei, Anhui province, China, November 2016.

ShanghaiTech Advanced in Research (STAR) Symposium, Shanghai, China, June 2015.

International Conference on Nanoscience and Technology, China NANO 2013, Beijing, China, September 2013.

DNA Nanotechnology Workshop and Celebration of Albert Einstein Professorship of the Chinese Academy of Sciences being awarded to Ned Seeman, Shanghai, China, February 2012.

SKILLS

- Experimental Skills: Nanomaterial synthesis; Adherent and suspension cell lines culture, Western Blotting, ELISA, Immunohistochemistry, Transfection, DNA/RNA/miRNA isolation from tissue and cell lines, RT-PCR, PCR.
- Equipment Skills: Flow cytometry (FACS), DIC/Fluorescence Microscopy, Confocal Laser Scanning Microscopy, Raman spectroscopy, Atomic Force Microscopy, Total Internal Reflection Fluorescence Microscopy.
- Computer Programs: Image J, Origin, MS Office, Endnote, SPSS, Adobe Photoshop and Corel DRAW.
- Languages: Mandarin Chinese, native speaker; English, fluent (oral/reading/written).