

# Jie Shen

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## Education and Academic Experience

**2013.07-Present** Postdoc fellow

Wyss Institute for Biologically Inspired Engineering, Harvard University

Department of Systems Biology, Harvard Medical School

Supervisor: Prof. Peng Yin

**2010.12-2013.07** Postdoc fellow

Biochemistry and Molecular Pharmacology, University of Massachusetts Medical School

Supervisor: Prof. Gang Han

**2005.09-2010.07** Ph.D. in Inorganic Chemistry

College of Chemistry and Molecular Engineering, Peking University, China

**Dissertation:** Synthesis, modification and optical-probe application research of Rare Earth based luminescent nanoparticles

Supervisor: Prof. Ling-dong Sun, Prof. Chun-hua Yan

**2001.09-2005.07** Bachelor of Science in Chemistry

College of Chemistry & Molecular Engineering, Peking University, China

**Thesis:** Synthesis and bio-modification of water-soluble  $\text{YVO}_4:\text{Eu}$  nanocrystalline

Supervisor: Prof. Ling-dong Sun, Prof. Chun-hua Yan

## Research Interests

My research interests focus on advanced scalable manufacturing of functional nanomaterial. My current work is using molecular self-assemblies as programmable templates to fabricate prescribed inorganic nanostructure with single-nanometer precision, which could enable fundamental research for next-generation electronics and plasmonics.

## Academic Talks

1. 2014 MRS Fall Meeting & Exhibit, in Boston, USA, Nov 30- Dec 5, 2014  
“3D Nano-Lithography under DNA Bricks Crystal”.

2. 2015 MRS Fall Meeting & Exhibit, in Boston, USA, Nov 29- Dec 4, 2015  
“3D Nanolithography with DNA Brick Crystals”.
3. Molecular Programming Project 2016 Annual Workshop, in Seattle, USA, January 15-18, 2016  
“Nanolithography with DNA Brick Crystals”.

### Peer Reviewed Publications

1. Feng Zhou, Wei Sun, Karen B Ricardo, Dong Wang, **Jie Shen**, Peng Yin, Haitao Liu\*,  
“*Programmably-Shaped Carbon Nanostructure from Shape-Conserving Carbonization of DNA*”,  
*ACS Nano*, **2012**, 10.1021/acsnano.5b05159.
2. Xiang Wu, Guanying Chen, **Jie Shen**\*, Zhanjun Li, Yuanwei Zhang, Gang Han\*, “*Upconversion Nanoparticles: A Versatile Solution to Multiscale Biological Imaging*”, *Bioconjugate Chemistry*, **2015**, 26, 166-175. (co-corresponding authors\*)
3. **Jie Shen**†, Guanying Chen†, Anne-Marie Vu, Wei Fan, Osman S. Bilsel, Chun-Chih Chang, Gang Han\*, “*Engineering the Upconversion Nanoparticle Excitation Wavelength: Cascade Sensitization of Tri-doped Upconversion Colloidal Nanoparticles at 800 nm*”, *Advanced Optical Materials*, **2013**, 1, 644-650. (co-first authors†)
4. **Jie Shen**†, Guanying Chen†, Tymish Y. Ohulchanskyy, Samuel J. Kesseli, Steven Buchholz, Zhipeng Li, Paras N. Prasad, Gang Han\*, “*Tunable Near Infrared to Ultraviolet Upconversion Luminescence Enhancement in ( $\alpha$ -NaYF<sub>4</sub>:Yb,Tm)/CaF<sub>2</sub> Core/Shell Nanoparticles for In Situ Biocompatible Photoactivation*”, *Small*, **2013**, 9, 3213-3217. (co-first authors†)
5. **Jie Shen**, Liang. Zhao, Gang. Han\*, “*Lanthanide-doped upconverting luminescent nanoparticle platforms for optical imaging-guided drug delivery and therapy*”, *Advanced Drug Delivery*. **2013**, 65, 744-755.
6. Guanying Chen†, **Jie Shen**†, Tymish Y. Ohulchanskyy, Nayan Patel, Artem Kutikov, Zhipeng Li, Jie Song, Ravindra K. Pandey, Hans Ågren, Paras N. Prasad\*, Gang Han\*, “*Heterogeneous ( $\alpha$ -NaYbF<sub>4</sub>:Tm<sup>3+</sup>)/CaF<sub>2</sub> Core/Shell Nanoparticles with Efficient Near-Infrared to Near-Infrared Upconversion for High-Contrast Deep Tissue Bioimaging*”, *ACS Nano*, **2012**, 6, 8280-8287. (co-first authors†)
7. **Jie Shen**, Ling-Dong Sun\*, Ya-Wen Zhang, Chun-Hua Yan\*, “*Bifunctional Fe<sub>3</sub>O<sub>4</sub>/ $\beta$ -NaYF<sub>4</sub>:Yb,Er Hetero-Nanoparticles via a Crosslinker Anchoring Strategy*”, *Chemical Communications*, **2010**, 46, 5731-5733.

8. **Jie Shen**, Ling-Dong Sun\*, Jia-Dan Zhu, Liu-He Wei, Hong-Fang Sun, Chun-Hua Yan\*, “*Biocompatible Bright YVO<sub>4</sub>:Eu Nanoparticles as Versatile Optical Bioprobes*”, *Advanced Functional Materials*, **2010**, 20, 3708-3714.
9. **Jie Shen**, Ling-Dong Sun, Chun-Hua Yan\*, “*Luminescent Rare Earth Nanomaterials for Bioprobe Applications*”, *Dalton Transactions*, **2008**, 5687-5697.
10. Xiang Wu, Hyungseok Lee, Osman Bilsel, Yuanwei Zhang, Zhanjun Li, Teresa Chen, Yi Liu, Chunying Duan, **Jie Shen**, Amol Punjabi, Gang Han\*, “*Tailoring dye-sensitized upconversion nanoparticle excitation bands towards excitation wavelength selective imaging*”, *Nanoscale*, **2015**, 7, 18424-18428.
11. Liang Zhao, Artem Kutikov, **Jie Shen**, Chunying Duan, Jie Song\*, Gang Han\*, “*Stem Cell Labeling using Polyethylenimine Conjugated ( $\alpha$ -NaYbF<sub>4</sub>:Tm<sup>3+</sup>)/CaF<sub>2</sub> Upconversion Nanoparticles*”, *Theranostics*, **2013**, 3, 249-257.
12. Ye-Fu Wang, Ling-Dong Sun\*, Jia-Wen Xiao, Wei Feng, Jia-Cai Zhou, **Jie Shen**, Chun-Hua Yan\*, “*Rare-Earth Nanoparticles with Enhanced Upconversion Emission and Suppressed Rare-Earth-Ion Leakage*”, *Chemistry - A European Journal*, **2012**, 18, 5558-5564.
13. Jia-Cai Zhou, Ling-Dong Sun\*, **Jie Shen**, Jian-Qin Gu, Chun-Hua Yan\*, “*Fluorescent-magnetic Nanocrystals: Synthesis and Property of YP<sub>x</sub>V<sub>1-x</sub>O<sub>4</sub>:Eu @GdPO<sub>4</sub> Core/Shell Structure*”, *Nanoscale*, **2011**, 3, 1977-1983.
14. Huan-Ping Zhou, Hao-Shuai Wu, **Jie Shen**, An-Xiang Yin, Ling-Dong Sun, Chun-Hua Yan\*, “*Thermally Stable Pt/CeO<sub>2</sub> Hetero-nanocomposites with High Catalytic Activity*”, *Journal of the American Chemical Society*, **2010**, 132, 4998-4999.
15. Jian-Qin Gu, **Jie Shen**, Ling-Dong Sun\*, Chun-Hua Yan\*, “*Resonance Energy Transfer in Steady-State and Time-Decay Fluoro-Immunoassays for Lanthanide Nanoparticles Based on Biotin and Avidin Affinity*”, *The Journal of Physical Chemistry C*, **2008**, 112, 6589-6593.

## Patents and Patent Applications

1. Gang Han and **Jie Shen**, *Compositions and methods for upconverting luminescence with engineered excitation and applications thereof*. **US20150362432** and **WO 2014116631 A1**.
2. Gang Han and **Jie Shen**, *Coated up-conversion nanoparticles*. **US20150238638** and **WO 2013181076 A1**.

3. **Jie Shen**, Wei Sun, and Peng Yin, *High-resolution nucleic acid lithography*. **U.S. Provisional patent, filed May, 2014.**

## References

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Postdoctoral Advisor

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Molecular Engineering  
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