

Dr. Anirban Samanta

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#### Academic background:

- Doctor of Philosophy (Ph.D) from Department of Chemistry and Biochemistry, Arizona State University in 2014. Thesis title “DNA Conjugation and DNA Directed Self-Assembly of Quantum Dots for Nanophotonic Applications”
- Master of Science (Major in Chemistry, in 2009): IIT Kanpur.
- Bachelor of Science (Major in Chemistry, in 2007) University of Calcutta
- Higher Secondary from WBCHSE
- Madhyamik from WBBSE

#### Teaching experience:

- Teaching assistant at Arizona State University. Classes taught: CHM 237, CHM 238 (August 2009-December 2010)

#### Research interest:

- Bioconjugation of nanoparticles including semiconductor nanocrystal (Quantum Dots), gold nanoparticles, silver nanoparticles and their directed self-assembly onto DNA nanostructure.
- Photonic interaction between the plasmonic nanoparticles and fluorescence emitter.
- DNA scaffolded artificial light harvesting antenna.

#### Publication:

1. **Samanta, A.**; Deng, Z.; Liu, Y. Aqueous Synthesis of Glutathione-Capped CdTe/CdS/ZnS and CdTe/CdSe/ZnS Core/Shell/Shell Nanocrystal Heterostructures, *Langmuir*, 2012, 28, 8205.
2. Deng, Z<sup>†</sup>; **Samanta, A<sup>†</sup>**; Yan, H.; Liu, Y. Robust DNA Functionalized Core/Shell Quantum Dots with Fluorescent Emission Spanning from UV-Vis to Near IR and Compatible with DNA Directed Self-Assembly, *J. Am. Chem. Soc.*, 2012, 134, 17424. († equally contributed).
3. Han, D.; Jiang, S.; **Samanta, A.**; Liu, Y.; Yan, H. Unidirectional Scaffold-Strand Arrangement in DNA origami. *Angew. Chem. Int. Ed.*, 2013, 125, 1.
4. Deng, Z.; Pal, S.; **Samanta, A.**; Yan, H.; Liu, Y. DNA Functionalization of Colloidal II-VI Semiconductor Nanowires, *Chem. Sci.*, 2013, 4, 2234.
5. **Samanta, A.**; Deng, Z.; Yan, H.; Liu, Y. A Perspective on Functionalizing Colloidal Quantum Dots with DNA, *Nano Res.* 2013, 12, 853.
6. **Samanta, A.**; Deng, Z.; Liu, Y. IR emitting QDs: DNA conjugation and DNA origami directed self-assembly. *Nanoscale*, 2014, 6, 4486.

7. **Samanta, A.**; Zhou, Y.; Zou, S.; Yan, H.; Liu, Y. Fluorescence quenching of QDs by gold nanoparticles: a potential long range spectroscopic ruler. *Nano Lett.* , 2014, 14, 5052
8. **Samanta, A.**; Banerjee, S.; Liu, Y. DNA nanotechnology for nanophotonic applications. *Nanoscale*, 2015, 7, 2210.
9. **Samanta, A.**; Walper, S. A.; Susumu, K.; Dwyer, C. L.; Medintz, I. L. An enzymatically-sensitized sequential and concentric energy transfer relay self-assembled around semiconductor quantum dots, *Nanoscale*, 2015, 7, 7603. (Cover page)
10. Dwyer, C. L.; Diaz, S. A.; Walper, A. A.; **Samanta, A.**; Susumu, K.; Oh, E.; Buckhout-White, S.; Medintz, I. L. Chemoenzymatic Sensitization of DNA Photonic Wires Mediated through Quantum Dot Energy Transfer Relays. *Chem. Mater.* 2015, 27, 6490.
11. **Samanta, A.** Medintz, I. L. Nanoparticles and DNA – a powerful and growing functional combination in bionanotechnology *Nanoscale*, 2016, 8, 9037.
12. D'iaz, S. A. Buckhout-White, S. Brown, C. W. **Samanta, A.** Klein, W. P. Ancona, M. G. Dwyer, C. L. Goldman, E. R Melinger, J. S. Cunningham, P. D. *SPIE BioPhotonics Australasia*, 2016, p. 1001317.
13. Mathur, D.; Samanta, A; Oh, E.; Diaz, S. A.; Susumu, K.; Ancona, M. G.; Medintz, I. L.; Quantum Dot encapsulation using a peptide-modified tetrahedral DNA Cage. *Chem. Mater.* 2017, 29, 5762-5766.
14. Brown, C.; **Samanta, A.**; Diaz, S. A.; Buckhout-White, S.; Walper, S. A.; Goldman, E. R.; Medintz, I. L. Enzymatically-sensitized multi-step FRET relay in a DNA dendrimer. 2017, 5, 1700181. (Cover page)

#### Research Experience:

- **US Naval research Laboratory:** Postdoctoral research fellow (Joined in 2014, under the group leader Dr. Igor Medintz).

##### **Professional skill:**

- Expertise in constructing efficient artificial light harvesting antennae by integrating nanoparticles, organic fluorescent dyes and luminescent proteins onto DNA nanostructures.
  - Enzyme assay, especially on enzymes immobilized onto nanoparticles.
- **Arizona State University:** Graduate student (Joined in 2009, Advisor: Prof. Hao Yan, Co-advisor: Prof. Yan Liu) Research focused on DNA nanotechnology, self-assembly of nanoparticles and fluorescence spectroscopy.

##### **Professional skill:**

- DNA nanotechnology, including small wireframe DNA structures to M13 scaffolded DNA origami.
- DNA conjugation and DNA directed self-assembly of Quantum Dots, Gold and Silver nanoparticles.

- Atomic Force Microscopy, High and low resolution TEM, Fluorescence spectroscopy, Ultrafast lasers spectroscopy, Energy dispersive X-Ray spectroscopy, HPLC, Powder X-ray diffraction, Confocal Raman Microscopy.
- **Indian Institute of Technology (IIT), Kanpur:** Master's Thesis (Advisor: Prof. P. K. Bharadwaj) on Metal Organic Frameworks.
- **Indian Institute of Science (IISc), Bangalore:** Summer project (Advisor: Prof. G. Mugesh) on synthesis and characterization of biologically active organochalcogen compounds.

#### Patent:

1. Oligonucleotide functionalized Quantum Dots. Filed, March 2013. Application# 61771728

#### Conference Attended:

- DNA 19-An international conference on DNA based self-assembly and computation. Held at Arizona State University, Tempe Arizona in 2013.
- F-NANO 2012-An international conference on different interdisciplinary areas of Nanotechnology with special emphasis on DNA based nanomaterials. Held at Snowbird Utah in 2012.
- MED-CHEM 2009-A national conference on current trends in medicinal chemistry. Held at Indian Institute of Technology, Madras, India in 2009.

#### Awards and Recognitions:

- Outstanding graduate student award in 2014 from Dept. Of Chemistry and Biochemistry, Arizona State University.
- Kaushal Kishore summer research fellow in 2008 at Inorganic and Physical Chemistry Department, Indian Institute of Science, Bangalore.
- Recipient of MCM scholarship at Indian Institute of Technology, Kanpur.
- Special recognition from Ramakrishna Mission Vidyamandira for obtaining first class in B.Sc in Chemistry.
- Recipient of National Merit Scholarship from West Bengal Council of Higher Secondary Education.
- Recipient of Dr. Mani Bhowmick Educational Foundation Scholarship.

#### Personal Data:

Age/Place of Birth: 30 years / Hooghly, India.

Languages: English (proficient), Bengali (Native), Hindi (speaking)

Citizenship: India

References:

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