

# Santimukul Santra, Ph.D.

## Assistant Professor

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## OBJECTIVE

Pursuing teaching and cutting-edge research in the area of organic synthesis / synthetic polymer chemistry / nanochemistry / nanotheranostics / nanobiotechnology / nanomedicine / drug delivery / cancer therapy / infectious diseases / bioimaging / MR Contrast agents / X-Ray Contrast agent / Activatable nanoprobe / systems biology.

## EXPERTISE

Blend of expertise in the design and synthesis of novel anti-cancer drugs, biodegradable and biocompatible dendritic polymers, designer branched monomers, characterizations and functionalization, polymeric nanomaterial synthesis, biomaterials and specialized in nanobiotechnology, nanomedicines, cancer and infectious disease targeting, drug delivery to address the critical medical problems associated with human health.

My extensive expertise can be categorized into the following broad interdisciplinary areas:

### ORGANIC / BIOPOLYMER SYNTHESIS:

More than 14 years of expertise in design and multi-step organic synthesis for biologically active small molecules / anti-cancer drugs / linear and dendritic biopolymers / hyperbranched polymers and dendrimers / Amino acid-based biopolymer / multi-step, air and moisture sensitive organic synthesis / nanochemistry / material science / column chromatography / NMR / MASS / FT-IR / UV-VIS / Fluoremeter / GPC / TGA / DSC.

### NANO-BIO TECHNOLOGY:

More than 8 years of expertise in synthesis of polymer coated nanomaterials for targeted drug delivery: Polymeric, Iron oxide, Cerium oxide, Gold nanoparticles / Bioconjugation, click chemistry / Activatable MRI probes for cancer imaging / Activatable theranostic prodrugs for cancer treatment / Nanomaterial-drug formulation / Fluorescence and Confocal microscopy / FACS / DLS / Magnetic relaxometer / STEM / TEM / Zetasizer / Tissue culture / In Vitro cell-based assays development.

### DETECTION AND TREATMENT OF MALIGNANT CARCINOMAS AND INFECTIOUS DISEASES:

More than 6 years of expertise in Nanotheranostics / Cancer targeting, imaging and treatment: Lung, Prostate, Breast, Ovarian, colon and Cervical / Infectious disease detection: Cholera, Anthrax, Pathogens, Bowel diseases and other infectious diseases / Medical devices / Nanomedicine / Nanosensing / Bioimaging / In Vivo imaging / IVIS / FMT / X-Ray CT / MR Imaging.

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## EMPLOYMENT PROFILE

**2013 - Present** **Assistant Professor.** Department of Chemistry, Pittsburg State University, Pittsburg, Kansas, USA.

**2015** **Visiting Assistant Professor.** Department of Chemistry and Chemical Biology, Rensselaer Polytechnic Institute, Troy, New York, USA.

**2010 - 2012** **Research Assistant Professor.** Nanoscience Technology Center, University of Central Florida, Orlando, Florida, USA.

**2007 - 2009** **Postdoctoral Research Associate.** Nanoscience Technology Center, University of Central Florida, Orlando, Florida, USA.

## EDUCATION

- 2000 - 2006 **Ph. D. in synthetic polymer chemistry and organic chemistry.** Department of Chemistry, Indian Institute of Technology-Bombay (IIT-Bombay), Mumbai, India. Advisor: Prof. Anil Kumar.  
Thesis Title: "Design and Syntheses of Functional Biopolymers Based on 2, 2'-Bis(hydroxymethyl) Propionic Acid, Malonic Acid and  $\beta$ - Alanine"
- 1998 - 2000 **M. Sc. in Organic Chemistry.** Department of Chemistry (2<sup>nd</sup> topper), Banaras Hindu University (BHU), Varanasi, India.
- 1995 - 1998 **B. Sc. in Chemistry.** Ramakrishna Mission College-Narendrapur. University of Calcutta, India.

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## PATENTS

9. J. M. Perez, **S. Santra**. "Gadolinium-Encapsulating Iron Oxide Nanoprobe as Activatable NMR/MRI Contrast Agent" **US Patent Appl. No. 61668622.**
8. J. M. Perez, **S. Santra** "Synthesis of hyperbranched amphiphilic polyester and theranostic nanoparticles thereof." **US Patent # 8,372,944 B1.**
7. J. M. Perez, **S. Santra** "Multimodal, Multifunctional Polymer Coated Nanoparticles" **US Patent # 8,236,284 B1.**
6. J. M. Perez, A. Asati, **S. Santra**, C. Kaittanis "Surface Charge Dependent Cell Localization and Cytotoxicity of Cerium Oxide Nanoparticles" **U.S. patent Appl. 61/366,697.**
5. J. M. Perez, A. Asati, **S. Santra**, C. Kaittanis, S. Nath "Oxidase activity of polymer coated cerium oxide nanoparticles" **U.S. patent Appl. 61/160,744.**
4. J. M. Perez, C. Kaittanis, A. Asati, **S. Santra** "A cerium-oxide-nanoparticle-based device for the detection of reactive oxygen species and monitoring of chronic inflammation" **U.S. patent Appl. 12/924,976.**
3. **Santra, S.** Kumar, A. et. al., "Malonic acid based monomers and polymers" **Indian Patent Appl. 664/ MUM/2006.**
2. **Santra, S.** Kumar, A. et al., "N-alkylation of amino acids and their application in polymer synthesis" **Indian Patent Appl. 775/MUM/2006.**
1. **Santra, S.** Kumar, A. et. al., "O-alkylation of  $\beta$ ,  $\beta$ -disubstituted hydroxy compounds and its applications in polymer syntheses" **Indian Patent Appl. 776/MUM/2006.**

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## PEER REVIEWED PUBLICATIONS

20. C. Kaittanis, T. M. Shaffer, A. Ogirala, **S. Santra**, J. M. Perez, G. Chiosis, Y. Li, L. Josephson, J. Grimm. "Environment-responsive nanophores for therapy and treatment monitoring via molecular MRI quenching" **Nature Communications 2014**, 5, 3384. DOI: 10.1038/ncomms4384 (online).
19. **Santra, S.** Jativa, D. J. Kaittanis, C. Normand, G. Grimm, J. Perez, J. M. "Gadolinium-Encapsulating Iron Oxide Nanoprobes as Activatable NMR/MRI Contrast Agent" **ACS Nano 2012**, 6, 7281. (I.F. 12.06)
18. Boohaker, R. Zhang, G. Lee, M. Nemecek, K. **Santra, S.** Perez, J. Manuel; Khaled, A. "Rational Development of a Cytotoxic Peptide to Trigger Cell Death" **Molecular Pharmaceutics 2012**, 9, 2080-2093. (I.F. 4.57)
17. C. Kaittanis, H. Boukhriss, **S. Santra**, J. F. Valentine, S. A. Naser, J. M. Perez. "Hybridizing magnetic relaxation nanosensors facilitate the rapid and sensitive detection of an intracellular pathogen in human peripheral leukocytes" **PLoS One, 2012**, 7, e35326. (I.F. 4.4)

\*Featured in Genetic Engineering and Biotechnology NewsMagazine. \*Featured in [www.nano.gov](http://www.nano.gov) website of National Nanotechnology Initiative group. \*Posted on National Institute of General Medical Science (NIH) website. \*Posted on Sciencedaily.com website. \*Posted on Europapress.com website. \*Posted on Eurekalert.com website. \*Posted on today.ucf.com website. \* **Interviewed on FOX 35 news channel.**

16. C. Kaittanis, **S. Santra**, A. Asati, J. M. Perez. "A Cerium Oxide Nanoparticle-based Device for the Detection of Chronic Inflammation via Optical and Magnetic Resonance Imaging" *Nanoscale* **2012**, 4, 2117-2123. (I.F. 6.23)
15. **S. Santra**, C. Kaittanis, O. J. Santiesteban, J. M. Perez "Cell-Specific, Activatable and Theranostic Prodrug for Dual Targeted Cancer Imaging and Therapy" *J. Am. Chem. Soc.* **2011**, 133, 16680-16688. (I.F. 10.67)
14. **S. Santra**, C. Kaittanis, O. J. Santiesteban, J. M. Perez "Trifunctional Targeting" *ACS Chem. Biol.* (Spotlight), **2011**, 6, 1143-1143. (I.F. 6.44)
13. **S. Santra**,\* J. M. Perez "Facile, One-Step, Selective N-Alkylation of Amino Acids: Novel Polyamino Acid-Based Theranostic Nanoagents for Targeted Cancer Therapy" *Biomacromolecules* **2011**, 12, 3917-3927. (I.F. 5.47.  
\* Corresponding Author)
12. C. Kaittanis, **S. Santra**, O. J. Santiesteban, T. Henderson, J. M. Perez "The Assembly State between Magnetic Nanosensors and their Targets Orchestrates their Magnetic Relaxation Response" *J. Am. Chem. Soc.* **2011**, 133, 3668-3676. (I.F. 10.67)
11. A. Asati, C. Kaittanis, **S. Santra**, J. M. Perez. "pH-Tunable Oxidase-Like Activity of Cerium Oxide Nanoparticles Achieving Sensitive Fluorogenic Detection of Cancer Biomarkers at Neutral pH" *Anal. Chem.* **2011**, 83, 2547-2553. (I.F. 5.69)
10. C. Kaittanis, T. Banerjee, **S. Santra**, O. J. Santiesteban, K. Teter, J. M. Perez. "Identification of Molecular-Mimicry-Based Ligands for Cholera Diagnostics using Magnetic Relaxation" *Bioconjugate Chemistry*, **2011**, 22, 307-314. (I.F. 5.37)
9. A. Asati, **S. Santra**, C. Kaittanis, J. M. Perez. "Surface chemistry-dependent cell localization and cytotoxicity of cerium oxide nanoparticles" *ACS Nano*, **2010**, 4, 5321-5331. (I.F. 12.06)
8. **S. Santra**, C. Kaittanis, J. M. Perez. "Cytochrome c Encapsulating Theranostic Nanoparticles: A Novel Bifunctional System for targeted delivery of therapeutic membrane-impermeable proteins to tumors and imaging of cancer therapy" *Molecular Pharmaceutics*, **2010**, 7, 1209-1222. (I.F. 4.57)
7. Kaittanis, C., **Santra, S.**, Perez, J. M. Emerging nanotechnology-based strategies for the identification of microbial pathogenesis. *Adv. Drug Deliv. Rev.* **2010**, 62, 408. (I.F. 12.88)
6. **Santra, S.**, Kaittanis, C., Perez, J. M. Aliphatic Hyperbranched Polyester: A New Building Block in the Construction of Multifunctional Nanoparticles and Nanocomposites. *Langmuir* **2010**, 26, 5364. (I.F. 4.18)
5. **Santra, S.**, Kaittanis C., Grimm J. and Perez J. M. Drug/Dye-Loaded, Multifunctional Iron Oxide Nanoparticles for Combined Targeted Cancer Therapy and Dual Optical/MR-Imaging, *Small* **2009**, 5, 1862. (I.F. 8.34)  
  
\*Posted on National Institute of General Medical Science (NIH) website \*Invited for an interview in TV media coverage. \*Posted on Sciencedaily.com website.
4. Asati, A., **Santra, S.**, Kaittanis, C., Nath, S., Perez, J. M. Oxidase-like activity of polymer-coated cerium oxide nanoparticles. *Angew. Chem. Int. Ed. Engl.* **2009**, 48, 2308. (I.F. 13.45)  
  
\* Featured as very important paper \*Selected for cover picture of the journal \*Featured in ACS Chemical & Engineering News Magazine \*Invited by ACS Communication office for Media coverage \*Posted on National Institute of General Medical Science (NIH) website.
3. Kaittanis, C., **Santra, S.**, Perez, J. M. Role of nanoparticle valency in the nondestructive magnetic-relaxation-mediated detection and magnetic isolation of cells in complex media. *J. Am. Chem. Soc.* **2009**, 131, 12780. (I.F. 10.67)
2. **S. Santra** and A. Kumar. "Facile synthesis of aliphatic hyperbranched polyesters based on diethylmalonate and their irreversible molecular encapsulation" *Chem. Comm.* **2004**, 2126. (I.F. 6.37)
1. A. Kumar, A. Q. Contractor, A. V. Ambade, T. Ranganathan, K. Krishnamoorthy, S. P. Mishra, U. P. Ojha, **S. Santra**, M. Kanungo "Novel approaches for novel materials" *Int. J. Plast. Tech.* **2003**, 6, 73.

## GRANTS

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### Current Funded Projects:

- 13) "Highly economic, one-step synthesis of soybean polyols for industrial applications", Kansas Soybean Commission, PI, \$100,000.00, 2015-2017.
- 12) "Development of New soybean-based anti-oxidant topical lotion for skin care applications", Kansas Soybean Commission, PI, \$100,000.00, 2015-2017.
- 11) "Polycarbonate from soybean oil-based epoxide and carbon dioxide", Kansas Soybean Commission, Co-PI, \$50,000.00, 2015-2016.
- 10) "Activatable MR Contrast Agent for the PARP-1 Inhibitor-Assisted Combination Therapy of Prostate Cancers" Star-Trainee Award, K-INBRE, PI, \$9,000, 2015-2016.
- 9) "Hsp90 Inhibitor-Induced Combination Therapy of Lung Cancer Using Novel Magnetic Nanotheranostics" Summer Scholar Award, K-INBRE, PI, \$4,000, 2015-2016.
- 8) "Rapid and sensitive detection of bacterial contaminations in SEK environmental water resources using novel magnetic relaxation nanosensors", Campus Award, K-INBRE, NIGMS P20 GM103418 (NIH), PI, \$2000, 2015-2016.

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### Previous Completed Projects:

- 7) "Development of novel sulfur-containing theranostic nanomedicines for the targeted X-ray/CT imaging and treatment of cancers", Kansas IDeA Network of Biomedical Research Excellence (K-INBRE), PI, \$31,000.00, 2014-2015.
- 6) Start-up fund, Polymer Chemistry Initiative, Pittsburg State University, PI, \$200,000.00, 2013-2015.
- 5) "Design and Synthesis of Novel Polymeric Nanotheranostics for the Targeted Optical / X-ray CT Imaging and Treatment of Lung Cancer". Star Trainee Award, K-INBRE, PI, \$9,000, 2014-2015.
- 6) "Assessment of Molecular Interactions for the Rapid and Sensitive Detection of Influenza using Novel Magnetic Relaxation Nanosensors" Summer Scholar Award, K-INBRE, PI, \$4,000, 2014-2015.
- 3) "Nucleolin Targeting Novel Polymeric Nanotheranostics for the MR Imaging and Treatment of Breast Cancer" Semester Scholar Award, K-INBRE, PI, \$4,000, 2014-2015.
- 2) "Independent Research Project Grant", Pittsburg State University, PI, \$2,000.00, 2014-2015.
- 1) "Faculty proposal submission incentive grant", Pittsburg State University, PI, \$1,000.00, 2014-2015.

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## TEACHING EXPERIENCES

CHEM 215: General Chemistry I

CHEM 216: General Chemistry I Laboratory

CHEM 360: Introduction to Polymer Science and Technology

CHEM 325: Organic Chemistry I

CHEM 326: Organic Chemistry I Laboratory

CHEM 625: Polymer Synthesis and Characterizations

CHEM 626: Polymer synthesis laboratory

CHEM 687: Polymers in Nanotechnology

CHEM 720: Advanced Polymers

CHEM 850: Inorganic and Architecturally Unusual Polymers

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## AWARDS AND HONORS

- 2015: Outstanding Undergraduate Research Faculty Mentor Award from the Pittsburg State University.
- 2015: Best Poster Presentation Award (1<sup>st</sup>), Graduate Symposium, Pittsburg State University
- 2015: Best Oral Presentation Award (1<sup>st</sup>), Graduate Symposium, Pittsburg State University
- 2015: Best Undergraduate Poster Presentation, Capitol Research Summit, Topeka, KS
- 2015: Best Poster Award, Bio-Kansas, Capitol Research Summit, Topeka, KS
- 2015: Best Graduate Poster Presentation, Capitol Research Summit, Topeka, KS
- 2015: Best Poster Presentation Award (2<sup>nd</sup>), K-INBRE symposium, KS.
- 2015: Best Poster Presentation Award (1<sup>st</sup>), K-INBRE symposium, KS.
- 2014: Best Poster Presentation Award, Graduate Symposium, Pittsburg State University
- 2014: Best Oral Presentation Award, Graduate Symposium, Pittsburg State University
- 2012 Best Oral Presentation Award, NanoFlorida Symposium 2012, USF, Tampa.
- 2011 Recognition from American Chemical Society for substantial contribution as author and reviewer.
- 2010 Best Poster Presentation Award, NanoFlorida Symposium 2010, UCF, Orlando.
- 2009 Recognition in ACS Chemical & Engineering News (C&EN) magazine.
- 2003 Senior Research Fellow (SRF) Award: National Eligibility Test- Council of Scientific and Industrial Research (NET-CSIR).
- 2001 Junior Research Fellowship (JRF) Award: National Eligibility Test- Council of Scientific and Industrial Research (NET-CSIR).
- 2000 Teaching Assistant Award, Indian Institute of Technology (IIT), Bombay, India.
- 2000 Graduate Aptitude Test in Engineering (GATE) award for national graduate fellowship.

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## UNIVERSITY SERVICES

1. Member for the 2013-2014 session of "Leadership PSU".
2. Member of Polymer Chemistry Curriculum committee.
3. Active member of the college of Arts and Science "Honors Committee".
4. Active member of the Master thesis committee
5. Teaching at the 2014 Summer Workshop, Cottey College, MO, USA.
6. Member of University "Host Family".
7. Member of University "Moving Crew".

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## STUDENT AWARDS AND ACHIEVEMENTS

22. 2015: K-INBRE Campus Scholar Award to Jessica Jewell
21. 2015: K-INBRE Semester Scholar Award to Deaven Thompson
20. 2015: K-INBRE Star-Trainee Award to Tyler Shelby
19. 2015: Best UG Poster Presentation Award (1<sup>st</sup>) to Blaze Heckert, Annual Symposium, Pittsburg State University
18. 2015: Best Graduate Oral Presentation Award (1<sup>st</sup>) to Jyothi Kallu, Annual Symposium, Pittsburg State University
17. 2015: Best UG Poster Presentation Award (2<sup>nd</sup>) to Deaven Thompson, Annual Symposium, Pittsburg State University
16. 2015: Best Graduate Poster Presentation Award (2<sup>nd</sup>) to Shoukath Sulthana, Annual Symposium, PSU.
15. 2015: PSU Best Undergraduate Poster Presentation Award to Kalee Woody, Capitol Research Summit, Topeka, KS
14. 2015: Best Poster Award to Jyothi Kallu, Bio-Kansas, Capitol Research Summit, Topeka, KS
13. 2015: PSU Best Graduate Poster Presentation Award to Jyothi Kallu, Capitol Research Summit, Topeka, KS
12. 2015: Best Poster Presentation Award (2<sup>nd</sup>) to Kalee Woody, K-INBRE symposium, KS.
11. 2015: Best Poster Presentation Award (1<sup>st</sup>) to Blaze Heckert, K-INBRE symposium, KS.
10. 2014: K-INBRE Star-Trainee Award to Blaze Heckert
9. 2014: PSU UG Best Oral Presentation (1<sup>st</sup> place) Award to Kalee Woody
8. 2014: William & Mary Fern Souder Scholarship to Dagen Worthington
7. 2014: PSU UG Best Poster Presentation (3<sup>rd</sup> place) Award to Blaze Heckert
6. 2014: K-INBRE Semester Scholar Award to Kalee Woody
5. 2014: PSU Chemistry Best UG Research Award to Blaze Heckert
4. 2014: PSU Chemistry Graduate Teaching Award to Nelson Elbers

3. 2014: PSU UG Best Poster Presentation (2<sup>nd</sup> place) Award to Kalee Woody
2. 2014: K-INBRE Semester Scholar Award to Deaven Thompson
1. 2013: K-INBRE Semester Scholar Award to Blaze Heckert

## PRESS AND MEDIA

2015: Students win top awards for research, Pittsburg State University webpage.

<http://www.pittstate.edu/press-media/detail.dot?id=de8074c6-0788-4ffc-a0b5-5cc6b33f7b8e>

2014: Polymer chemistry and cancer targeting research was highlighted in COVER page of University magazine:

<http://magazine.pittstate.edu/issue/fall-2014/>

[https://www.youtube.com/watch?v=LkymH\\_nmjzM](https://www.youtube.com/watch?v=LkymH_nmjzM)

2014: Collegio newspaper: <http://psucollegio.com/2014/09/fighting-cancer-one-nano-at-a-time/>

2014: Joplinglobe newspaper: [http://www.joplinglobe.com/news/article\\_b58ffdd4-3a1d-11e4-a02b-ff0a85e9562c.html](http://www.joplinglobe.com/news/article_b58ffdd4-3a1d-11e4-a02b-ff0a85e9562c.html)

2014: TV Channel CODE-12: <http://www.fourstateshomepage.com/story/d/story/polymer-chemistry-lab-cancer-research/42749/J4f-EjApuE6klcWmLA9y7Q>

2014: The Morning Sun Newspaper:

<http://www.morningsun.net/article/20140617/NEWS/140619808/0/SEARCH/?Start=1>

2012: FOX 35 News channel: <http://www.myfoxorlando.com/story/17586368/medical-tests-in-an-instant>

## PROFESSIONAL INTEREST

Design and synthesis of small molecule anti-cancer drugs, linear and dendritic polymers, polymer-based nanotechnology, nanobiotechnology-based theranostics for targeted cancer therapy, nanosensors for the detection and bioimaging.

- Biologically active small molecules /drugs design, synthesis and purification
- Biodegradable linear and dendritic biopolymer design, synthesis and characterizations
- Amino acid-based biocompatible linear and hyperbranched polymer synthesis
- Nanomaterials, peptide and biomolecules functionalizations: Click chemistry, EDC, CDI, DCC couplings
- Water-based bioconjugation chemistries: Click and carbodiimide
- Water-based nanoparticle formulation techniques: Solvent diffusion, evaporation and emulsion
- Receptor targeting theranostic nanomaterials synthesis: Polymeric and metallic (Fe, Ce & Au)
- Molecular encapsulations and functionalizations: drugs, dyes, peptides and oligos
- Cancer Nanotechnology: Targeted detection, non-invasive imaging and treatment of malignant carcinomas
- Combination therapy: Co-synergistic effects of cytotoxic drugs and peptides to trigger malignant tumor death
- Aptamer Nanobiotechnology: Receptor / Nucleolin targeting using small molecule / Aptamer linked nano-vehicles
- Cancer inhibitor therapy: Targeting Ras mutant tumors and neurodegenerative disorders
- Design and synthesis of activatable pro-theranostics: Prodrug, MRI/X-ray CT contrast agents for cancer treatment
- Magnetic nanosensors: The detection of circulating single cancer cells in complex media: blood and milk
- Nanosensors: Rapid and sensitive detection of Anthrax Lethal Factor and other infectious diseases
- Nanosensing of Bowel's diseases: Crohn's and John's diseases
- Nano-device: The detection of chronic inflammations and cancer biomarkers
- Magnetic relaxation technology for the detection of microbial pathogens and cholera diagnostics
- Nanomedicines, nanosensing, nanotoxicology, nanobioimaging

## SPECIFIC SKILLS AND PROFICIENCY

### • Designer biopolymer synthesis

- Multi-step air and moisture sensitive reactions, schlenk-line techniques, TLC and Column chromatography.
- Design and synthesis of biologically active small molecules.
- Linear, hyperbranched, dendritic polymer, polyacrylates, polyurethanes, hydrogels synthesis and purifications.
- Melt, solution, free radical, emulsion polymerizations, convergent and divergent growth approach.

### • Nanotechnologies for controlled drug delivery

- Nanoparticle and microparticle synthesis: solvent diffusion, evaporation, sol-gel, emulsion techniques.
- Physico-chemical modifications with antibodies, small molecules, bioconjugation chemistry, click chemistry.
- Molecular encapsulation of drugs, dyes, peptides and contrast agents.

### • Analysis and characterization

- Physico-chemical characterizations of nanoparticles (dynamic light scattering, zeta potential, magnetic relaxation)
- Analytical techniques (NMR, ES-MS, FT-IR, UV-Vis, Nano-drop, Fluoremeter, Micro-titer plate reader, GPC, TGA, HPLC, PD-10 column, sephadex column, Kros Flo purification)
- Microscopy (Optical, SEM, STEM, TEM)

### • *In vitro* cell culture and molecular biology

- Cell culture (human, murine and bacterial cell lines)
- In vitro* cell-based assays: cytotoxicity, lyso-tracking, inflammatory response, oxidative stress (MTT, MTS, XTT, ELISA, LDH, BCA and assay development)
- Assessment of cell - nanoparticle interactions (Fluorescence and confocal microscopy, flow cytometry)
- Molecular biology techniques: Genomic DNA isolation, purification, Agarose gel electrophoresis.

### • *In vivo* manipulation

- Mouse and rat manipulation (Special training from **Memorial Sloan-Kettering Cancer Center-MSKCC**, New York. tumor implantation, treatment, dissection and imaging).
- Biodistribution study in real-time of fluorescent nanoparticles, optical imaging of small animals: Odyssey Imaging system, Fluorescence Molecular Tomography (FMT), IVIS 50 Imaging System.

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## REVIEWER OF THE FOLLOWING JOURNALS

- ACS Applied Materials & Interfaces
  - Langmuir
  - Colloids and Surfaces B: Biointerfaces
  - Journal of Nanoparticle Research
  - Molecules
  - IEEE Transactions on Information Theory
  - International Journal of Nanomedicine
  - Current Nanoscience
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## REVIEWER OF THE FOLLOWING RESEARCH GRANTS

- Swiss National Science Foundation (*Invited*).
  - Davidson Institute for Talent Development (*Invited*)
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## EDITORIAL BOARD MEMBER

- Journal of Nanomedicine Research
  - Journal of Nanomaterials (Guest editor)
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## JUDGE / CHAIR OF THE FOLLOWING CONFERENCES

- 2013: Judge for the Research Colloquium at the Pittsburg State University for Graduate and Continuing Studies
  - 2013: Chair of the technical session "Trends in Polymer Science" at the ACS MWRM conference, Springfield, MO
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## PROFESSIONAL AFFILIATIONS

2009-Present     Member, American Chemical Society (ACS)

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## SELECTED CONFERENCE PROCEEDINGS AND PRESENTATIONS

41. "Inhibitor-Induced Combination Therapy of K-RAS Driven NSCLC". **Blaze Heckert**, Deaven Thompson, Kalee Woody and Santimukul Santra. 250<sup>th</sup> ACS National Meeting & Exposition, Boston, MA. August 16-20<sup>th</sup>, 2015 (Poster presentation).
40. "Innovative Anti-Oxidant Nanoceria for the Early Diagnosis and Treatment of Lung Cancer". **Shoukath Sulthana**, Blaze Heckert, Jyothi Kallu and Santimukul Santra. 250<sup>th</sup> ACS National Meeting & Exposition, Boston, MA. August 16-20<sup>th</sup>, 2015 (Poster presentation).
39. "Non-Small-Cell-Lung-Cancer Treatment Using Hsp90 Inhibitor Carrying Magnetic Nanotheranostics". **Jyothi Kallu**, Blaze Heckert, Shoukath Sulthana and Santimukul Santra. 250<sup>th</sup> ACS National Meeting & Exposition, Boston, MA. August 16-20<sup>th</sup>, 2015 (Poster presentation).
38. "Functional Magnetic Nanoprobes: Novel Nanotheranostics for the Treatment of Prostate Carcinomas". **Deaven Thompson**, Blaze Heckert, Shoukath Sulthana and Santimukul Santra. 250<sup>th</sup> ACS National Meeting & Exposition, Boston, MA. August 16-20<sup>th</sup>, 2015 (Poster presentation).
37. "Non-Small-Cell-Lung-Cancer Treatment Using Hsp90 Inhibitor Carrying Magnetic Nanotheranostics". **Jyothi Kallu**, Blaze Heckert, Shoukath Sulthana and Santimukul Santra. Research symposium, Pittsburg State University, KS, 2015 (Best Oral presentation award, 1<sup>st</sup> position).
36. "Inhibitor-Induced Combination Therapy of K-RAS Driven NSCLC". **Blaze Heckert**, Deaven Thompson, Kalee Woody and Santimukul Santra. Research symposium, Pittsburg State University, KS, 2015 (Best poster presentation award, 1<sup>st</sup> position).
35. "Functional Magnetic Nanoprobes: Novel Nanotheranostics for the Treatment of Prostate Carcinomas". **Deaven Thompson**, Blaze Heckert, Shoukath Sulthana and Santimukul Santra. Research symposium, Pittsburg State University, KS, 2015 (Best poster presentation award, 2<sup>nd</sup> position).
34. "Innovative Anti-Oxidant Nanoceria for the Early Diagnosis and Treatment of Lung Cancer". **Shoukath Sulthana**, Blaze Heckert, Jyothi Kallu, Santimukul Santra. Research symposium, Pittsburg State University, KS, 2015 (Best poster presentation award, 1<sup>st</sup> position).
33. "PSMA-Receptor targeting magnetic nanoprobes: Novel nanotheranostics for the treatment of prostate carcinomas". **Kalee Woody**, Shoukath Sulthana, Jyothi Kallu and Santimukul Santra. Annual Capitol Research Summit, Feb 11-12<sup>th</sup>, 2015, Topeka, **PSU undergraduate poster award winner**.

32. "Non-Small-Cell Lung Cancer treatment using Hsp90 inhibitor carrying magnetic nanotheranostics". Jyothi Kallu, Kalee Woody, Tuhina Banerjee and Santimukul Santra. Annual Capitol Research Summit, Feb 11-12<sup>th</sup>, 2015, Topeka, **Best poster BIO-KANSAS award and best PSU graduate poster award winner**
31. "PSMA-Receptor targeting magnetic nanoprobes: Noven nanotheranostics for the treatment of prostate carcinomas". **Kalee Woody**, Shoukath Sulthana, Jyothi Kallu and Santimukul Santra. K-INBRE, Jan 17-18<sup>th</sup>, 2015, **Best poster award winner**.
30. "Inhibitor-induced combination therapy of K-RAS driven NSCLC". **Blaze Heckert**, Deaven Thompson, Kalee Woody and Santimukul Santra. K-INBRE, Jan 17-18<sup>th</sup>, 2015, **Best poster award winner**.
29. "Gadolinium-Encapsulating Iron Oxide Nanoprobe as Activatable NMR/MRI Contrast Agent". **Santimukul Santra**, Shoukath Sulthana, Deaven Thompson, J. Manuel Perez. ACS Midwest Regional Meeting, University of Missouri, Columbia, Nov 12-15<sup>th</sup>, 2014. (Oral presentation).
28. "Highly economic, one-step synthesis of soybean polyols for industrial applications". **Santimukul Santra**. Kansas Soybean Commission (KSC), KS, Dec 4<sup>th</sup>, 2014 (**Invited talk, \$100K grant winner**).
27. "Development of new soybean-based anti-oxidant topical lotion for skin care applications". **Santimukul Santra**. Kansas Soybean Commission (KSC), KS, Dec 4<sup>th</sup>, 2014 (**Invited talk, \$100K grant winner**).
26. "Targeting PSMA-Receptors with Glutamated Magnetic Nanoparticles: Novel Nanotheranostics for the Treatment of Prostate Carcinomas". **Kalee Woody**, Blaze Heckert, Jyothi Kallu and Santimukul Santra. ACS Midwest Regional Meeting, University of Missouri, Columbia, Nov 12-15<sup>th</sup>, 2014. (Poster presentation).
25. "Designer Polymeric Nanotheranostics for the Detection and Treatment of Cancer". **Blaze Heckert**, Kalee Woody, Deaven Thompson and Santimukul Santra. K-INBRE conference at Kansas City, MO, Jan 17-18, 2014 (Poster presentation).
24. "Activatable nanoprobes for cancer targeting". **Santimukul Santra**, Blaze Heckert, Kalee Woody and Deaven Thompson. K-INBRE conference at Kansas City, MO, Jan 17-18, 2014 (Poster presentation).
23. "Design and Synthesis of Novel Polymeric Nanotheranostics for the Targeted Imaging and Treatment of Cervical Cancer". **Matthew Reddick**, Blaze Heckert and Santimukul Santra. Topeka, Feb 12, 2014 (Poster presentation).
22. "Targeting PSMA-Receptors with Glutamate-Conjugated Magnetic Nanoparticles: Novel Nanotheranostics for the Treatment of Prostate Carcinomas". **Kalee Woody**, Santimukul Santra. Graduate Research symposium, Pittsburg State University, KS, April 16, 2014 (Best oral presentation award, 1<sup>st</sup> position).
21. "Polymeric Nanotheranostics for the Detection and Treatment of Cancer". **Blaze Heckert**, Santimukul Santra. Annual Research symposium, Pittsburg State University, KS, April 16, 2014 (Best poster presentation award, 3<sup>rd</sup> position).
20. "Targeting PSMA-Receptors with Glutamate-Conjugated Magnetic Nanoparticles: Novel Nanotheranostics for the Treatment of Prostate Carcinomas". **Kalee Woody**, Santimukul Santra. Annual Research symposium, Pittsburg State University, KS, April 16, 2014 (Best poster presentation award, 2<sup>nd</sup> position).
19. "Polymeric Nanotheranostics for the Detection and Treatment of Cancer" Graduate symposium, Pittsburg State University, KS, 2014 (**Poster**).
18. "Introducing Soybean-Based Therapeutic Nanogels for the Treatment of Cancers and Soybean Diseases" Kansas Soybean Commission (KSC), KS, USA, 2013 (**Invited talk**)
17. "Introducing Soybean-Based Anti-oxidant and Theranostic Nanogels for Human Health" Missouri Soybean Merchandising Council (MSMC), MO, USA, 2013 (**Invited talk**)
16. "Designer Polymeric Nanotheranostics for the Detection and Treatment of Cancer" **K-INBRE conference** at Kansas city, MO, Jan 17-18, 2014 (**Poster**).
15. "In the Age of Polymer Science: Polymeric "Nano-Bio" Theranostics to Solve the Environmental and Human Health Problems" **ACS MWRM conference** at Springfield, MO, Oct 16-19, 2013 (**Invited speaker**).
14. "Gadolinium-Encapsulating Iron Oxide Nanoprobes as Activatable NMR/MRI Contrast Agent" **NanoFlorida Symposium 2012 (Best Oral Presentation Award winner)**.
13. "Nanoparticles in Imaging Technologies" **NSTI Nanotech**, Boston, MA, June 2011 (**Oral presentation**).
12. "Biodegradable hyperbranched polyester: A new building block in the construction of multifunctional nanoparticles and nanocomposites for targeted cancer therapy and imaging" **The 239<sup>th</sup> American Chemical Society National Meeting and Exposition** at San Francisco, California, March 2010 (**Oral presentation**).
11. "Aliphatic Hyperbranched Polyester: A New Building Block in the Construction of Multifunctional Nanoparticles and

Nanocomposites" **NanoFlorida Symposium 2010 (Best Poster Presentation Award winner).**

10. "Single reagent based immunoassay for the detection of cancer biomarkers and cancer cell" **The 238<sup>th</sup> American Chemical Society National Meeting and Exposition** at Washington DC, August 2009 (**Oral presentation**).
9. "Polymer coated cerium oxide nanoparticles as antioxidant and its oxidase like activity" **7<sup>th</sup> AAPS National Biotechnology Conference 2009 (Invited talk and Poster).**
8. "pH modulated enzymatic behavior of cerium oxide nanoparticles and its potential application in cellular ELISA" **NanoFlorida Symposium 2009 (Poster).**
7. "Intrinsic oxidase activity of cerium oxide nanoparticles facilitate the detection of cancer biomarkers and cancer cells" **NSTI-Nanotech 2009, ISBN 978-1-4398-1783-4 Vol. 2 (Oral presentation).**
6. "Unique pH-dependent free radical scavenging activity of dextran coated cerium oxide nanoparticle" **The 236<sup>th</sup> American Chemical Society National Meeting and Exposition** at Philadelphia, August 2008 (**Poster**).
5. "Diversity oriented polymer syntheses: Design and Syntheses of functional biopolymers" **International Conference MACRO 2006** at Pune, India, December 2006 (**Oral presentation**).
4. "Synthesis of Bis-MPA based aliphatic polyurethane homodendrimers" **International Conference MACRO 2004** at Trivandrum, India, December 2004 (**Poster**).
3. "Synthesis and characterization of hyperbranched polymers and dendrimers for biomedical applications" **6<sup>th</sup> National Symposium of Chemical Research Society of India** at IIT Kanpur, India, February 2004 (**Poster**).
2. "Synthesis and characterization of aliphatic hyperbranched polyester based on diethyl malonate and Bis-MPA" **RSC-West India Section's 1<sup>st</sup> Students Symposium** at NCL-Pune, India, September 2003 (**Invited Talk**).
1. "Synthesis and characterization of aliphatic hyperbranched polyester based on diethyl malonate" **International Conference MACRO 2002** at IIT Kharagpur, India, December 2002 (**Poster**).