

INDRAJIT SRIVASTAVA

Maddox Engineering Research Center, 1010 Boston Ave, Lubbock, TX 79409
(217)898-3010 ◊ indrajit.srivastava@ttu.edu ◊ Website www.thesrivastavalab.com

EDUCATION

- Doctor of Philosophy in Bioengineering (GPA: 4/4)** *May 2020*
University of Illinois at Urbana-Champaign, IL, USA
Advisor: Prof. Dipanjan Pan
Thesis: *Next Generation Multi-Color Carbon Dots: Comprehensive Understanding of their Photophysical Properties and Subsequent Use in Biomedical Applications*
Thesis Committee: Prof. Shuming Nie, Prof. Joseph Irudayaraj, Prof. Kai Zhang
- Master of Science in Bioengineering (GPA: 3.6/4)** *May 2017*
University of Illinois at Urbana-Champaign, IL, USA
Advisor: Prof. Dipanjan Pan
Thesis: *Surface Chemistry of Carbon Nanoparticles Functionally Select Their Uptake in Various Stages of Cancer Cells*
- Bachelor of Engineering in Metallurgical Engineering and Materials Science (GPA: 3.8/4)** *May 2015*
Indian Institute of Engineering Science & Technology (IIEST), Shibpur, India
Recipient of Prof. A. K. Seal Memorial Undergraduate Academic Fellowship

RESEARCH EXPERIENCES

- Assistant Professor** *Starting on August 2023*
Department of Mechanical Engineering, Edward E. Whitacre Jr. College of Engineering,
Texas Tech University, TX, USA
- My research program develops bioinspired biomaterials using a combination of microfluidic approaches, surface science strategies, and polymeric engineering approaches having potential applications in improving healthcare diagnostics and therapeutics.
- Postdoctoral Research Associate** *July 2020- June 2023*
University of Illinois at Urbana-Champaign, IL, USA
Research Mentors: Prof. Shuming Nie & Prof. Viktor Gruev
- Pioneered the design and development of a new class of biomimetic plasmonic nanoparticles with enhanced dispersion stability features (including resistance to freeze-thaw cycles, heating, physiological solutions, and easily lyophilizable) and superior surface-enhanced Raman scattering (SERS) signal profile.
 - Optimized these biomimetic plasmonic nanoparticles for rapid disease diagnosis (cardiovascular diseases, hypofibrinogenemia) and multi-modal image-guided surgical interventions having fluorescence, photoacoustic, and CT capabilities.
 - Integrated biomimetic features to polymer-lipid nanoparticles and using a hexachromatic near-infrared fluorescence camera sensor demonstrated receptor-specific image-guided surgery and multiplexed optical imaging of tumor biomarkers at single excitation wavelength.
- Graduate Research Assistant** *August 2015- May 2020*
University of Illinois at Urbana-Champaign, IL, USA
Research Advisor: Prof. Dipanjan Pan
- Designed, developed, and optimized the synthesis and optical properties of novel polymeric nanoparticle probes, Carbon Dots as well as characterizing them physiochemically and biologically for the purpose of biomedical imaging, cancer cell targeting, intracellular trafficking, drug delivery, diagnostic, and multi-scale imaging.
 - Culminated in 20+ publications (including 10 first-author/co-first authors in high-impact scientific journals including *Advanced Functional Materials*, *ACS Nano*, *PNAS*, *Nature Communications* and *Journal of American Chemical Society*).
- Visiting Undergraduate Summer Researcher** *May 2014 - July 2014*
University of Illinois at Urbana-Champaign, IL, USA
Research Mentor: Prof. Dipanjan Pan
- Developed and optimized a novel nanoparticle from hyperstar polymer for combinatorial therapy with a capacity to encompass drugs that selectively targeted triple negative breast cancer cells.
 - Demonstrated a 4-fold proficiency than individual drugs and 20 times more selective than parent drug. Published the findings in a paper as a co-author in *Chem. Commun.*, 2015, 51, 16710.

ACADEMIC AWARDS, HONORS & RECOGNITION

- Graduate Student & Postdoctoral Scholars Recognition Program Recipient: Leadership in Mentoring, *American Chemical Society* (2023)
- Selected Participant for ACS New Faculty Workshop (Full Scholarship), *American Chemical Society* (2023)
- CAS Future Leaders Top 100 Program, *Chemical Abstract Services by American Chemical Society* (2023)
- Baxter Young Investigator Award, *Baxter International Foundation* (2022)
- American Chemical Society Postdoc to Faculty (P2F) Scholar, *American Chemical Society* (2022)
- Younger Chemists Committee Leadership Development Award, *American Chemical Society* (2022)
- Baxter Young Investigator Award, *Baxter International Foundation* (2021)
- BMES UNITE Future Faculty Fellow, *Biomedical Engineering Society* (2021)
- Extended Editorial Advisory Board, *Carbon Journal - Elsevier* 2021
- Outstanding Thesis in Carbon Science & Technology, 2nd place, *Carbon Journal - Elsevier* (2021)
- American Chemical Society PMSE Future Faculty Scholar, *American Chemical Society* (2021)
- Alexander von Humboldt Research Fellowship, \$100k, 2-year support, *Humboldt Foundation, Germany* (2021) (Declined due to COVID-19)
- Selected Participant for NIH Clinical and Translational Research Program, *Virtual event* (2021)
- BMES Career Development Award, *Biomedical Engineering Society* (2020)
- BMES Midwest Graduate Speaker Exchange Award, *Biomedical Engineering Society* (2020)
- Outstanding Mentorship Award, *WYSE Researchers Program, UIUC* (2019)
- Bioengineering Teaching Excellence Award, \$2k, *Department of Bioengineering, UIUC* (2019)
- Featured Research in Chemistry in Pictures: "Aurora borealis", *C&EN Magazine* (2018)
- Graduate College Travel Fellowship Award, \$1k, *UIUC* (2018, 2020)
- Summer Research Undergraduate Fellowship, *UIUC* (2014)
- Prof. A. K. Seal Undergraduate Academic Fellowship, \$0.5k, *IEST Shibpur, India* (2013-14)
- Outstanding Poster Award, 3rd place, *Metallum, IEST Shibpur, India* (2013)
- National Standard Examination in Chemistry, Top 1% in State, *Indian Association of Physics Teachers, India* (2009)
- Regional Level National Science Exhibition, 3rd place, *Central Board of Secondary Education, India* (2009)
- National Mathematical Olympiad Contest, Silver medal, *All India Schools Mathematics Teachers Association* (2008)

PUBLICATIONS

+denotes co-first author, # denotes undergraduate/graduate mentee, * denotes corresponding author

From Postdoc. with Profs. Shuming Nie and Viktor Gruev

(4) I. Srivastava, R. Xue, K. Huang, J. Jones, # L. Lin, Z. Wang, S. Pandit, # S. Zhao, K. Flatt, V. Gruev, Y.-S. Chen, * S. Nie*. "Biomimetic Membrane Protected Plasmonic Nanostructures as Dual-Modality Contrast Agents for Correlated SERS and Photoacoustic Detection of Hidden Tumor Lesions". *Under Revision at ACS Applied Materials & Interfaces*.

(3) I. Srivastava, * B. Lew, Y. Wang, S. Blair, M. B. George, B. S. Hajek, S. Bangru, S. Pandit, # Z. Wang, J. Ludwig, K. Flatt, M. Gruebele, S. Nie, * V. Gruev*. "Cell-Membrane Coated Nanoparticles for Tumor Delineation and Qualitative Estimation of Cancer Biomarkers at Single Wavelength Excitation in Murine and Phantom Models". *ACS Nano*, DOI: 10.1021/acsnano.3c005787, (2023)
This work was highlighted by the Illinois News Bureau and Illinois Public Media.

(2) M. B. George, +, B. Lew, +, S. Blair, Z. Zhu, Z. Liang, I. Srivastava, A. Chang, H. Choi, K. Kim, S. Nie, S. Singhal, V. Gruev*. "Bioinspired Color-Near Infrared Endoscopic Imaging System for Molecular Guided Cancer Surgery". *Journal of Biomedical Optics*, 28 (5), 056002. (2023)
This work was highlighted on the Cancer Center at Illinois website.

(1) I. Srivastava, R. Xue, # J. Jones, # H. Rhee, # K. Flatt, V. Gruev, * S. Nie*. "Biomimetic Surface-Enhanced Raman

Scattering (SERS) Nanoparticles with Improved Dispersibility, Signal Brightness, and Tumor Targeting Functions”. *ACS Nano*, DOI:10.1021/acsnano.2c01062. (2022)

This work was highlighted on the Cancer Center at Illinois website.

From Ph.D. with Prof. Dipanjan Pan

(25) M. Alafeef, **I. Srivastava**, D. Pan.* “Carbon Dots: From Synthesis to Unraveling the Fluorescence Mechanisms”. *Under Review at Small, Invited Submission*

(24) P. Mukherjee, **I. Srivastava**+, A. Ghosh, H. Jang, J. Pfister, D. Pan*, R. Bhargava.* “Real-time Chemical Imaging of Carbon Dot Templated Tubulin-Polymerization”. *Submitted*

(23) **I. Srivastava**, K. Brent, # S. Pandit, # E. Altun, P. Moitra, D. Pan*. “Biodegradable and Switchable Near-Infrared Fluorescent Probes for Hypoxia Detection”. Accepted, *Nanomedicine UK*, doi: nmm-2023-0095.

(22) **I. Srivastava**, P. Moitra, M. Fayyaz, S. Pandit, # P. Fathi, H. Rezvani, K. Dighe, M. Alafeef, K. Vyoung, # M. Jabeen, D. Sar, S. Nie, J. Irudayaraj, D. Pan.* “Rational Design of Surface-State Controlled Multi-Color Crosslinked Carbon Dots with Distinct Photoluminescence and Cellular Uptake Properties”. *ACS Applied Materials & Interfaces* doi:am-2021-19995g. (2021)

(21) A. S. Schwartz-Duval, R. Wen, **I. Srivastava**, P. Moitra, D. Pan*。“A Simplistic Single-Step Method for Preparing Biomimetic Nanoparticles from Endogenous Biomaterials”. *ACS Applied Materials & Interfaces*, 13, 46464. (2021)

(20) H. A. Nguyen, **I. Srivastava**, D. Pan, M. Gruebele*。“Ultrafast Nanometric Imaging of Energy Flow Within and Between Single Carbon Dots”. *Proc. Natl. Acad. Sci. USA*, 118(1), e2023083118. (2021)
This work was highlighted on Materials Today, Phys. Org, Bioengineer.Org, Eurek Alert (AAAS).

(19) **I. Srivastava**, D. Sar, K. Wang, # M. Alafeef, P. Moitra, J. Scott, D. Pan*。“Luminescence Switching in Polymerically Confined Carbon Nanoparticles Triggered by UV Light”. *Nanoscale* 13, 16288. (2021)

(18) **I. Srivastava**+, S. K. Misra, +S. Bangru, K. Boateng, J. A. N. T. Soares, A. S. Schwartz-Duval, A. Kalsotra, D. Pan*。“Complementary Oligonucleotide Conjugated Multi-Color Carbon Dots for Intracellular Recognition of Biological Events”. *ACS Applied Materials & Interfaces*, 12, 14, 16137. (2020)

(17) A. S. Schwartz-Duval, C. J. Konopka, P. Moitra, E. A. Daza, **I. Srivastava**, E. V. Johnson, T. L. Kampert, S. Fayn, A. Haran, L. W. Dobrucki, D. Pan*。“Intratumoral Generation of Photothermal Gold Nanoparticles through a Vectorized Biomineralization of Ionic Gold”. *Nature Comm.*, 11, 4530. (2020)
This work was highlighted on the Genetic Engineering Biotechnology News, Phys.Org, Eurek Alert (AAAS) and UMBC News.

(16) M. Alafeef, **I. Srivastava**, D. Pan*。“Machine-learning for Precision Breast Cancer Diagnosis and Prediction of the Nanoparticles Cellular Internalization”. *ACS Sens.*, 5, 6, 1689-1698. (2020)

(15) H. A. Nguyen, + **I. Srivastava**+, D. Pan*, M. Gruebele*。“Unraveling the Photoluminescence Mechanism of Carbon Dots with Sub-Particle Resolution”. *ACS Nano*, doi: 10.1021/acsnano.0c01924.(2020)

(14) **I. Srivastava**, M. S. Khan, K. Dighe, Z. Wang, M. Alafeef, T. Banerjee, T. Ghonge, L. M. Grove, # R. Bashir, D. Pan*。“On-chip Electrical Monitoring of Real-time Soft and Hard Protein-Corona on Carbon Nanoparticles”. *Small Methods*, doi:10.1002/smt.202000099. (2020)
Selected as the front cover for the July 2020 issue. This work was highlighted on the Department of Bioengineering, UIUC website.

(13) S. Pandit, # T. Banerjee, **I. Srivastava**, S. Nie,* D. Pan*。“Machine Learning-Assisted Array-Based Biomolecular Sensing Using Surface-Functionalized Carbon Dots”. *ACS Sens.*, 4, 10, 2730-2737. (2019)

(12) **I. Srivastava**, J. Khamo, S. Pandit, # P. Fathi, X. Huang, A. Cao, # R. Haasch, S. Nie, K. Zhang,* D. Pan*。“Influence of Electron Acceptor and Electron Donor on the Photophysical Properties of Carbon Dots: A Comparative Investigation at the Bulk-State and Single-Particle Level”. *Adv. Funct. Mater.*, 29, 37, 1902466. (2019)

(11) P. Fathi, J. S. Khamo, X. Huang, **I. Srivastava**, M. B. Esch, K. Zhang*, D. Pan*。“Bulk-state and Single-particle Imaging are Central to Understanding Carbon Dot Photo-physics and Elucidating the Effects of Precursor Composition and Reaction Temperature”. *Carbon*, 145, 572. (2019)

(10) M. S. Khan, + K. Dighe, + Z. Wang, **I. Srivastava**, E. Daza, A. S. Schwartz-Duval, S. K. Misra, and D. Pan*。“Electrochemical-digital Immunosensor with Enhanced Sensitivity for Detecting Human Salivary Glucocorticoid Hormone”. *Analyst*, 144, 1448. (2019)

- (9) **I. Srivastava**+, D. Sar,+ P. Mukherjee, A. S. Schwartz-Duval, Z. Huang, C. Jaramillo, A. Civantos, I. Tripathi, J. P. Allain, R. Bhargava, D. Pan*. “Enzyme-Catalyzed Biodegradation of Carbon Dots follow Sequential Oxidation in a Time Dependent Manner”. *Nanoscale*, 11, 8226. (2019)
- (8) S. K. Misra+, **I. Srivastava**+, J. Khamo, V. V. Krishnamurthy, D. Sar, A. S. Schwartz-Duval, J. A. N. T. Soares, K. Zhang,* D. Pan*. “Carbon Dots with Induced Surface Oxidation Permits Imaging at Single-Particle Level for Intracellular Studies”. *Nanoscale*, 10, 18510. (2018)
This work was highlighted on the School of Molecular & Cellular Biology, UIUC website titled “Painting the cells with different colors”.
- (7) **I. Srivastava**, S. K. Misra, I. Tripathi, A. S. Schwartz-Duval, D. Pan*. “In Situ Time-Dependent and Progressive Oxidation of Reduced State Surface Functionalities at the Nanoscale of Carbon Nanoparticles for Polarity Driven Multiscale Near-Infrared Imaging”. *Adv. Biosys*, 2, 1800009. (2018)
- (6) D. Sar+, **I. Srivastava**+, S. K. Misra, F. Ostadhossein, P. Fathi, D. Pan*. “Copper-Catalyzed Syntheses of Pyrene-Pyrazole Pharmacophores and Structure-Activity Studies for Tubulin Polymerization”. *ACS Omega*, 3, 6378. (2018)
- (5) I. Tripathi, S. K. Misra, F. Ostadhossein, **I. Srivastava**, D. Pan*. “Synthesis of Chiral Carbo- Nanotweezers for Enantiospecific Recognition and DNA Duplex Winding in Cancer Cells”. *ACS. Appl. Mater. Interfaces*, 10, 37886. (2018)
- (4) M. S. Khan,+ K. Dighe,+ Z. Wang, **I. Srivastava**, E. Daza, A. S. Schwartz-Duval, J. Ghannam, S. K. Misra, D. Pan*. “Detection of Prostate Specific Antigen (PSA) in Human Saliva using an Ultra-Sensitive Nanocomposite of Graphene Nanoplatelets with Diblock-co-polymers and Au Electrodes”. *Analyst*, 14, 1094. (2018)
- (3) T. L. Kampert, S. K. Misra, **I. Srivastava**, I. Tripathi, and D. Pan*. “Phenotypically Screened Carbon Nanoparticles for Enhanced Combinatorial Therapy in Triple Negative Breast Cancer”. *Cellular and Molecular Bioengineering*, 10, 371. (2017)
This article was part of the 2017 CMBE Young Innovators special issue.
- (2) S. K. Misra,+ **I. Srivastava**+, I. Tripathi, E. Daza, F. Ostadhossein, D. Pan*. “Macromolecularly Caged Carbon Nanoparticles for Intracellular Trafficking via Switchable Photoluminescence”. *J. Am. Chem. Soc.*, 139, 1746. (2017)
This work was highlighted on the Grainger College of Engineering website, Phys.Org, SciTechDaily Eureka Alert (AAAS).
- (1) **I. Srivastava**+, S. K. Misra,+ F. Ostadhossein, E. A. Daza, J. Singh#, D. Pan*. “Surface Chemistry of Carbon Nanoparticles Functionally Select their Uptake in Cancer Cells of Different Stages”. *NanoResearch*, 10, 3269. (2017)
Selected as journal cover-art for October 2017.

From Undergraduate Research

- (2) S. K. Misra, X. Wang, **I. Srivastava**, M. K. Imgruet, R. W. Graff, A. Ohoka, T. L. Kampert, H. Gao*, D. Pan*. “Combinatorial Therapy for Triple Negative Breast Cancer Using Hyperstar Polymer-Based Nanoparticles”. *Chem. Comm.* 51, 16710. (2015)
- (1) B. Kartick, **I. Srivastava**, S. K. Srivastava*. “Green Synthesis of Graphene”. *Journal of Nanoscience and Nanotechnology*, 13, 4320. (2013)

ORAL TALKS

Invited Talks, Conference & Symposium Presentations

- “Engineering Tunable Biomimetic Nanosensors for Image-Guided Therapeutic Interventions Rapid Disease Diagnostics”, Department of Biological and Agricultural Engineering, Louisiana State University, Baton Rouge, LA (2023) **Invited talk**
- “Nature-Inspired Biomimetic Nanosensors for Image-Guided Therapeutic Interventions and Early Disease Diagnostics”, Department of Biomedical Engineering, New Jersey Institute of Technology, Newark, NJ (2023) **Invited talk**
- “Engineering Tunable Biomimetic Nanosensors for Rapid Disease Diagnostics and Image-Guided Interventions”, Department of Mechanical Engineering, Texas Tech University, Lubbock, TX (2023) **Invited talk**
- “Biomimetic Plasmonic Nanostars with Enhanced Surface-Enhanced Raman Scattering and Photoacoustic Imaging Features for Ultrasensitive Image-Guided Surgery”, Biomedical Engineering Society Annual Meeting, San Antonio (2022)
- “Rational Design & Precise Modulation of Nanoparticles for Multi-Scale Biological Applications”, PMSE Future Faculty Symposium, American Chemical Society, San Diego (2022) **Award talk**
- “Biomimetic SERS nanoparticles coated with red blood cell membranes with improved dispersibility for early disease detections”, American Chemical Society, San Diego (2022)

- “Rational Design & Precise Modulation of Nanoparticles for Multi-Scale Biological Applications”, American Chemical Society Future Faculty Rapid Fire Talks, Virtual (2021) *Invited talk*
- “Connecting the Dots in Carbon Dots: Rational Design & Precise Modulation of Nanoparticles for Multi-Scale Biological Applications”, Biomedical Engineering Society’s UNITE Future Faculty Webinar, Virtual (2021) *Invited talk*
- “Biodegradable, Photothermally Responsive, Near-Infrared Fluorescent Carbon Dot Probes For Hypoxia Detection”, American Chemical Society, Philadelphia, PA (2020) Cancelled due to COVID-19
- “Next-Generation Multi-Color Carbon Dots: Comprehensive Understanding of their Photophysics Subsequent Use in Biomedical Applications”, Department of Biomedical Engineering, Northwestern University, Evanston, IL (2020) *Invited talk*
- “Biodegradable, Photothermal-Responsive, Near-Infrared Fluorescent Carbon Dot Probes for Hypoxia Detection”, American Vacuum Society, Urbana, IL (2019)
- “On-Chip Electrical Monitoring of Real-time ”Soft” and ”Hard” Protein Corona Formation”, Bioengineering Graduate Student’s Symposium, Urbana, IL (2019)
- “Controlled Intra-particulate Surface Cross-linking Synthesis of Multi-Color Carbon Dots from a Single Source”, American Chemical Society, Orlando, FL (2019)
- “Intracellular Cytotoxic Peptide Release Triggered by In Situ Hybridization of Complementary DNA-Conjugated Multicolor Carbon Dots”, American Chemical Society, Orlando, FL (2019)
- “Lipase-Catalyzed Enzymatic Biodegradation of Carbon Dots Follow Sequential Oxidation Pathways”, American Chemical Society, Orlando, FL (2019)
- “Real-time Monitoring of ”Soft” and ”Hard” Protein Corona in Carbon Dots via a Microfluidic Setup”, American Chemical Society, Orlando, FL (2019)
- “Triggered Intracellular Cytotoxic Peptide Release by In Situ Hybridization of Complementary DNA Conjugated Multi-Color Carbon Dots”. Lightning talk at Bioengineering Graduate Student Seminar, Urbana IL (2018) *Invited talk*
- “Macromolecularly Caged Carbon Nanoparticles for Intracellular Tracking via Switchable Photoluminescence”, American Chemical Society, New Orleans, LA (2018)
- “In Situ Time-Dependent and Progressive Oxidation of Reduced State Surface Functionalities at the Nanoscale of Carbon Nanoparticles for Polarity Driven Multiscale Near-Infrared Imaging”, UIUC MRL Fall Biological Conference, Urbana, IL (2017) *Invited talk*
- “Feasibility of selecting carbon nanoparticles based on cancer stages as a function of surface properties”, Midwestern Universities Analytical Chemistry Conference, BMES Midwest Biomedical Engineering Regional Conference, Champaign, IL (2016)

MENTORSHIP

Mentoring Graduate, Undergraduate, and High School Students

August 2015 - Present

University of Illinois at Urbana-Champaign, IL, USA

- Mentored 15 undergraduate students and highschool students (through educational outreach programs such as NSF REU, SpHERES, and researchStart) on performing synthesis and optimization of nanoparticles as well as trained them on instruments to perform different physio-chemical characterizations pertaining to dynamic light scattering, zeta potential, UV-Vis and Fluorescence spectroscopy, pH measurements.
- Mentored 4 graduate students on their master’s and Ph.D. dissertation research projects. Designed experiments and trained them on experimental laboratory techniques relevant for their projects.
- Trained everyone to follow proper lab practices in a Biosafety Level 2 laboratory and encouraged them to work as a team.

Graduate Students Mentored

2016-2017 Rushi Patel, Bioengineering (D.O. medical student at Marian University, Indianapolis)

2017-2018 Hamza Ahmed, Bioengineering (now at Baxter International Inc.)

2017-2018 Dustin Park, Bioengineering (now at Dickson)

2018-2022 Subhendu Pandit, Chemistry (now at Lam Research)

2020-2022 Ruiyang Xue, Materials Science (now at Takeda Pharmaceuticals)

Undergraduate Students Mentored

2016-2017 Jasleena Singh, Bioengineering

2016-2020 Lauren Grove, Bioengineering (now at Medline Industries Inc.)

2017-2019 Anleen Cao, Materials Science & Engineering (now at Viscofan USA Inc.)

2017-2019 Kevin Wang, Materials Science & Engineering (joined MEng in Bio-instrumentation, UIUC.)

2018-2019 Katherine Vyoung, Materials Science & Engineering

2019-2020 Kyle Ritchie, Bioengineering

2019-2019 Hannah Laverty, Bioengineering

2020-2021 Hyunjoon Rhee, Industrial Engineering (currently postbac. at Tufts University)
2021-2022 Jamie Jones, Bioengineering (Ph.D. student at University of Wisconsin-Madison)
2023-2023 Ziyin 'Jane' Wang, Bioengineering

Summer Trainees Mentored *via* Campus Outreach Programs

2016 Sam Hotchkiss, ResearchStart @ Cancer Center at Illinois (joined undergrad. at Vanderbilt University)
2019 Kurtis Brent, NSF Frontier in Biomedical Imaging REU (Ph.D. student at UCB/UCSF Bioengineering Program)
2019 Banan Garada, SpHERES High School Research Program @ UIUC (joined undergrad. at UCLA Computer Science & Engineering)
2019 Makhai Smith, SpHERES High School Research Program @ UIUC
2019 Alhena Bello-Cordova, SpHERES High School Research Program @ UIUC

TEACHING EXPERIENCES

Graduate Teaching Assistant *August 2018 - December 2018;*
University of Illinois at Urbana-Champaign, IL, USA
Instructor: Prof. Shuming Nie, **Course:** BIOE 598: Surgical Technologies, **Class size:** 35 students

- Involved in developing the course curriculum, hands-on experiments for *Surgical Technologies* course (BIOE 598 SN).
- Responsible for organizing talks from several UIUC faculty members and helped in engaging interesting discussions between speakers and students to facilitate more interactive learning.
- Awarded *Bioengineering Teaching Excellence Fellowship* after being nominated by the instructor and students of the course.

Graduate Teaching Assistant *January 2020 - May 2020;*
University of Illinois at Urbana-Champaign, IL, USA
Instructor: Prof. Michael Insana, **Course:** BIOE 198: Biomedical Data Analysis, **Class size:** 14 students

- Involved in organizing laboratory lectures on Matlab and conduct discussion sessions to provide freshman Bioengineering students a hands-on experience on formatting, analyzing, and visualizing biomedical data.
- Involved in conducting office hours and helping the instructor in grading homework assignments.
- Developed an entire course module : "*Principal Component Analysis for dimensional and data reduction*".

Graduate Teaching Assistant *January 2020 - May 2020;*
University of Illinois at Urbana-Champaign, IL, USA
Instructor: Prof. Sergei Maslov, **Course:** BIOE 310: Computational Tools for Biological Data, **Class size:** 58 students

- Involved in assisting the instructor in formulating the course modules to introduce junior and senior students in Bioengineering students with different computational tools involved in processing statistical data.
- Involved in conducting office hours and will help the instructor in grading homework assignments, midterms and finals.

GRANT WRITING EXPERIENCES

- **National Science Foundation, NSF : Nanoscale Interaction Program CBET Grant No. 2153091**
Proposal Title: Real-time Chemical Imaging of Nanoparticle Templated Tubulin-Polymerization
Principal Investigators: Prof. Dipanjan Pan and Prof. Rohit Bhargava
Contributions: Concept design, preliminary results, proposal drafting, experimental investigations
Status: Awarded (\$357,473.00)
- **National Science Foundation, NSF : Nanoscale Interaction Program**
Proposal Title: Real-time Monitoring of Nanoparticle-Protein Corona under Dynamically Controllable Environment by Electrical Resistance Integrated with Microfluidics
Principal Investigators: Prof. Dipanjan Pan
Contributions: Concept design, preliminary results, proposal drafting, experimental investigations
Status: Under Consideration
- **Alexander von Humboldt Research Fellowship for Postdoctoral Researchers**
Proposal Title: Using *in vitro* 3D Models for Evaluating and Optimizing Lipid-based Nanotherapeutics for Personalised Cancer Therapy
Principal Investigator: Dr. Indrajit Srivastava
Contributions: Concept design, preliminary results, proposal drafting, experimental investigations.
Status: Awarded (\$100k, 2-year support), declined due to COVID-19

PROFESSIONAL SERVICES

- **Journal Reviewer (since April 2020):** Adhoc Reviewer for Chemistry of Materials, New Journal of Chemistry, RSC Advances, WIRE Nanomedicine, Transactions on Biomedical Engineering, Bioengineering and Translational Medicine, ACS Applied Nano Materials. Contributed Reviewer for Nature Biomedical Engineering, PNAS, Nano Letters.
- **Professional Memberships:** American Chemical Society Member (2017 - Present); Biomedical Engineering Society Student Member (2020 - Present); American Heart Association Member (2022 - 2023).
- **Poster and Oral Session Judge:** Undergraduate Research Symposium, UIUC (2017, 2018, 2019); Engineering Open House Judge, UIUC (2019, 2023); BIOE 498/598 : Surgical Technologies, UIUC (2019).

ACADEMIC REFERENCES

- Dr. Shuming Nie, Ph.D., Grainger Distinguished Chair in Engineering, Department of Bioengineering, University of Illinois at Urbana-Champaign. Email: nies@illinois.edu
- Dr. Dipanjan Pan, Ph.D., Dorothy Foehr Huck & J. Lloyd Huck Chair Professor in Nanomedicine (Nuclear Eng and Materials Science and Eng), Penn State University. (Previously UMBC-UMB and University of Illinois at Urbana-Champaign). Email: dipanjan@psu.edu
- Dr. Martin Gruebele, Ph.D., James R. Eiszner Chair in Chemistry, and Professor of Physics, Biophysics and Quantitative Biology, University of Illinois at Urbana-Champaign.
Prof. Martin Gruebele's personal assistant's Email: myerscou@illinois.edu
- Dr. Viktor Gruev, Ph.D., Professor of Electrical & Computer Engineering, University of Illinois at Urbana-Champaign. Email: vgruev@illinois.edu