

Ashish A. Kulkarni, Ph.D.

University of Massachusetts, Amherst

N565 Life Sciences Laboratories

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CURRENT POSITION:

Assistant Professor

Department of Chemical Engineering

Adjunct Assistant Professor, Department of Chemistry

Adjunct Assistant Professor, Department of Biomedical Engineering

Faculty Member, Institute for Applied Life Sciences

Faculty Member, Molecular and Cellular Biology Graduate Program

University of Massachusetts, Amherst, MA

PREVIOUS POSITIONS:

Instructor in Medicine

2015 - 2017

Department of Medicine

Harvard Medical School, Boston, MA

Associate Bioengineer

2015 - 2017

Division of Engineering in Medicine

Brigham and Women's Hospital, Boston, MA

ACADEMIC TRAINING:

Postdoctoral Research Fellowship

2011 - 2014

Division of Engineering in Medicine

Department of Medicine

Harvard Medical School

Brigham and Women's Hospital

Harvard-MIT Division of Health Sciences and Technology

Research area: "Nanoscience in cancer biology"

Advisor: Prof. Shiladitya Sengupta

Ph.D. in Organic Chemistry

Department of Chemistry

University of Cincinnati

2006 - 2010

Dissertation title: "Tailored glycans as unique recognition motifs to probe carbohydrate-protein interactions"

Advisor: Prof. Suri Iyer

B. Tech., Chemical Technology

Institute of Chemical Technology

University of Mumbai

1999 - 2003

Thesis title: "Process design and development of 6-amino-2-(4-aminophenyl)-1H-benzimidazole"

Advisor: Prof. V. Kanetkar

RESEARCH INTERESTS:

Immuno-Therapeutics: Focal manipulation of the immune contexture with minimal systemic side effects is important for effective immune response. My goal is to develop novel nanomedicine platforms for therapeutically modulating immune response.

Immuno-Theranostics: Accurate monitoring of clinical efficacy of immunotherapy is challenging. My aim is to develop stimuli-responsive nanosystems for monitoring immunotherapy response.

Immuno-Engineering: My goal is to develop innovative platforms such as microfluidic systems, microscale and nanoscale systems, scaffolds etc. for probing immune cell interactions.

AWARDS AND ACHIEVEMENTS:

- **Research Scholar** 2019
American Cancer Society
- **Young Investigator Award, Finalist** 2019
Arnold and Mabel Beckman Foundation
- **Young Innovator Award** 2019
Cellular and Molecular Bioengineering
- **NextGen Star in Cancer Research** 2019
American Association for Cancer Research.
- **Best Oral Presentation Award** 2018
The Controlled Release Society Annual Meeting in New York
- **Technology Impact Award** 2018
Cancer Research Institute
- **C&EN's Talented 12** 2017
Chosen as one of the Top 12 Rising Stars in Chemistry by ACS Chemical & Engineering News
- **Young Investigator Award** 2017
Melanoma Research Alliance
- **Hearst Young Investigator Award** 2016
Department of Medicine, Brigham and Women's Hospital.
- **Dana-Farber/Harvard Cancer Center Career Development Award** 2016
Dana-Farber Cancer Institute, Harvard Medical School.
- **Center for Faculty Development and Diversity Pillar Award** 2016
Junior Faculty Mentor Award, Brigham and Women's Hospital.
- **AACR-Bristol-Myers-Squibb Scholar-In-Training Award** 2015
American Association for Cancer Research.
- **Young Scientist Travel Award** 2015
American Society for Pharmacology and Experimental Therapeutics.
- **Career Awards at the Scientific Interface, Semi-finalist** 2014
Burroughs Wellcome Fund.
- **Nominated for Postdoctoral Research Fellow Leadership Award** 2014
Brigham and Women's Hospital.
- **AACR-Millennium Scholar-In-Training Award** 2014
American Association for Cancer Research.
- **Young Scientist Travel Award** 2014
American Society for Pharmacology and Experimental Therapeutics.
- **Travel Study Grant** 2010

- The Cincinnati Branch of the English-Speaking Union.
- **University Research Council Fellowship** 2010
University of Cincinnati.
 - **Best Poster Award** 2010
Graduate Poster Forum, University of Cincinnati.
 - **Travel Award** 2009
The Society for Glycobiology Meeting in San Diego.
 - **Harry B. Mark, Jr. Advanced Standing Research Associate Award** 2009
Department of Chemistry, University of Cincinnati.
 - **Dover Publishing Award** for Outstanding Communication Skills in Organic Chemistry 2009
Department of Chemistry, University of Cincinnati.
 - **Best poster Award** 2008
4th Annual Midwest Carbohydrate and Glyco-biology Symposium.

RESEARCH EXPERIENCE:

Instructor, Harvard Medical School, USA 2015 –2017
Associate Bioengineer, Brigham and Women’s Hospital

Scientific Contributions:

- Developed the first ‘reporter’ nanoparticle that delivers a cytotoxic or an immunotherapy payload to the tumor and reports back on its efficacy in real-time. This is the first platform technology to enable an early read out of immunotherapy response in cancer.
- Developed the first computational algorithm, based on quantum mechanical-all atomistic simulations, for the design of supramolecular structures. We have demonstrated the utility of this platform to engineer supramolecular nanotherapeutics with anti-cancer agents including cytotoxic drugs, kinase inhibitors, epigenetic modulators and immunotherapy drugs.
- Developed a rational combination strategy for targeted therapies with immunotherapy. We have shown that combinations of kinase-inhibiting supramolecular therapeutics with immune checkpoint inhibitors (PD-L1 and PD-1 inhibitors) exerted enhanced antitumor outcome in melanoma and breast cancers.
- Developed a ‘2-in-1 hybrid nanoparticle’ strategy to overcome tumor-induced adaptive resistance. We have demonstrated that deterministic spatially constrained delivery of two drugs to target cells using 2-in-1 nanomedicine is more effective than combination of nanoparticles carrying individual drugs.

Mentoring/Teaching: Currently mentoring 2 visiting professors, 1 postdoctoral fellow, 2 research technicians and 6 undergraduate students. I have mentored 16 undergraduate students and 2 research technicians since 2015.

Research Fellow, Harvard Medical School, USA 2011 - 2014
Postdoctoral Research Fellow, Brigham and Women’s Hospital

Scientific Contributions:

- Elucidated the role of physical nanobridges in metastasis. We discovered a direct communication between metastatic cancer and endothelial cells mediated through physical nanoscale connections, which we termed nanobridges.

- Developed structure-activity relationship-inspired nanomedicine. We have worked on rationally modifying anticancer drugs based on structure activity relationships to facilitate self-assembly into supramolecular nanoparticles. We have used this strategy to develop mechanism-inspired multifunctional nanoparticles to overcome drug-induced adaptive resistance arising as a function of phenotypic cell state shift.
- Developed mathematical models for optimizing temporal sequence of administration of drugs. We have shown that mathematical model can predict optimal drugs dosing sequence and can significantly impact the anti-tumor outcome.

Mentoring/Teaching: I mentored 1 postdoctoral fellow, 1 research technician, 7 MS and PhD students and 13 undergraduate students from 2011- 2014.

Graduate Research Assistant, University of Cincinnati, USA

2006 – 2010

Scientific Contribution:

- Designed biologically-inspired glycans for diagnostic and therapeutic applications. I focused on the design and development of biologically-inspired and chemically-defined synthetic glycans for diagnostic and therapeutic applications.
- Developed synthetic methodologies for synthesis of complex glycans. I synthesized a library of tailored synthetic glycans (over 24 different types of glycans, most of which include over 20-25 steps synthesis with precise regiocontrol and stereocontrol) to develop structure activity relationship profiles with strains of toxins and pathogens.
- Identified and studied the factors that govern glycan-receptor recognition events at molecular level in toxins (Shiga toxin and Ricin toxin), viruses (Influenza) and bacteria (*E.coli*). Specifically, I studied the effect of valency and architecture of glycans to understand how these factors affect the discrimination between closely related toxins and pathogens. These comprehensive studies, for the first time, showed that biologically inspired synthetic glycans with small structural changes can be used as highly selective recognition elements for detection of structurally similar toxins and pathogens in real world samples.

Mentoring/Teaching: I mentored 4 graduate and 5 undergraduate students from 2006-2011. I also taught undergraduate level courses and part of graduate level courses.

CURRENT/COMPLETED SUPPORT:

- Research Scholar Grant, American Cancer Society 2019 - 2023
Principal Investigator
Title: “Nanoscale combination immunotherapy for bladder carcinoma”
- University of Massachusetts-Amherst Start-up Funds 2017 - 2021
Principal Investigator
- Cancer Research Institute, Technology Impact Award 2018 - 2020
Principal Investigator
Title: “Nanoscale Platform Technology for Monitoring Immunotherapeutic Responses”

- University of Massachusetts- IALS Seed Grant 2018 - 2019
Principal Investigator
Title: “A nanoscale platform technology for early monitoring of immunotherapy response”
- Melanoma Research Alliance Young Investigator Award 2017 - 2020
Principal Investigator
Title: A nanoscale technology for real-time tracking of immunotherapy response
- Dana-Faber/Harvard Cancer Center Research Grant 2016 - 2017
Principal Investigator
Title: “Supramolecular nanotherapeutics for preferential immune modulation of the tumor microenvironment”
- Hearst Young Investigator in Medicine Award 2016 - 2017
Principal Investigator
Title: “A self-reporting nanoscale technology for direct imaging of immunotherapy response”

JOURNAL PUBLICATIONS (PUBLISHED):

(* Corresponding author; # equal contribution)

1. Ramesh A., Natarajan S. K., Nandi D., **Kulkarni A. A.***, “Dual inhibitors-loaded nanotherapeutics that target kinase signaling pathways synergize with immune checkpoint inhibitor.” **Cellular and Molecular Bioengineering**, 2019; doi.org/10.1007/s12195-019-00576-1. (Part of 2019 CMBE Young Innovators special issue).
2. **Kulkarni A. A.***, Chandrasekar V., Natarajan S. K., Pandey P, Nirgud J., Bhatnagar H., Ashok D., Ajay A., Sengupta S.*, “A designer self-assembled supramolecule with signal-inhibition activity amplifies macrophage immune responses against aggressive cancer.”, **Nature Biomedical Engineering**, 2018; 2, 589-599.

(Featured in Nature, BBC News, Boston Globe, Boston Herald, Harvard News, UMass News, ScienceDaily, Medical News Today, EPM magazine, Xinhuanet, The Nation, Science News, Technology Networks etc)
3. Pandya H. J., Dhingra K., Prabhakar D.#, Chandrasekar V.#, Natarajan S. K.#, Vasani A. S., **Kulkarni A. A.***, Shafiq H.*, “A microfluidic platform for drug screening in a 3D cancer microenvironment.”, **Biosensors and Bioelectronics**, 2017; 94: 632-42.
4. **Kulkarni A. A.***, Rao P., Natarajan S., Goldman A., Sabbiseti V., Khater Y., Korimerla N., Chandrasekar V., Mashelkar R.*, Sengupta S.*, “Reporter nanoparticle that monitors its anticancer efficacy in real time.”, **Proc Natl Acad Sci U S A**, 2016; 1(15): E2104-13.

(Highlighted in over 140 news outlets including The Scientist, NanoWerk, Science News, Daily Mail, Yahoo News, The Telegraph and The Herald Sun.)
5. **Kulkarni A. A.**, Natarajan S. K., Chandrasekar V., Pandey P, Sengupta S., “Combining immune checkpoint inhibitors and kinase-inhibiting supramolecular therapeutics for enhanced anti-cancer efficacy”, **ACS Nano**, 2016; 10(10): 9227-42.

(Highlighted in 5 news outlets including Science Daily, Eureka Alert, Nanotechnology Now, Health Medicine Newtork, Phys.org and MedIndia.)

6. **Kulkarni A. A.**, Pandey P, Rao P. S., Mahmoud A., Goldman A., Sabbisetti V., Parcha S., Natarajan S. K., Chandrasekar V., Dinulescu D., Roy S., Sengupta S., “Algorithm for designing nanoscale supramolecular therapeutics with increased anticancer efficacy”, **ACS Nano**, 2016; 10(9): 8154-68.
(Highlighted in ACS Nano as a perspective and over 6 news outlets including Eureka Alert, NanoWerk, Health Medicine Newtork, Phys.org and MedIndia.)
7. **Kulkarni A. A.** #, Goldman A. #, Kohandel M., Pandey PR., Natarajan S., Ravi S., Sabbisetti S., Sengupta S, “Rationally designed 2-in-1 nanoparticles can overcome adaptive resistance in cancer”, **ACS Nano**, 2016; 10(6): 5823-5824.
(Highlighted in over 20 news outlets including NanoWerk, Science Daily, Health Medicine Newtork, News Medical, eCancer and Bioscience Technology.)
8. **Kulkarni A. A.***, Vijaykumar V. E., Natarajan S. K., Sengupta S., Sabbisetti V. S.*, “Sustained inhibition of cMET-VEGFR2 signaling using liposome-mediated delivery increases efficacy and reduces toxicity in kidney cancer”, **Nanomedicine: Nanotechnology, Biology and Medicine**, 2016; 12(7): 1853-1861.
9. Connor Y., Tekleab S., Husain A., Walls C., **Kulkarni A. A.**, Zetter B., Dvorak H., Sengupta S., “Physical nanoscale conduits-mediated communication between tumor cells and endothelium modulates endothelial phenotype”, **Nature Communications**, 2015; 16(6): 8671.
(Highlighted in over 20 news outlets including The Scientist, MIT News, Harvard News, NanoWerk, Health Medicinet, eCancer, The Telegraph and The Tech Times.)
10. Gaharwar A.K. , Mihaila S. M., **Kulkarni A. A.**, Patel A., Di Luca A., Reis R. L., Gomes M. E., van Blitterswijk C., Moroni L., Khademhosseini A., “Amphiphilic beads as depots for sustained drug release integrated into fibrillar scaffolds”, **J Control Release**, 2014; 187: 66-73.
11. **Kulkarni A. A.***, Roy B., Rao P. S., Wyant G. A., Mahmoud A., Sengupta S.*, “Supramolecular nanoparticles that target phosphoinositide-3-kinase overcome insulin resistance and exert pronounced antitumor efficacy” **Cancer Research**, 2013; 73(23): 6987-97.
12. Pandey A., **Kulkarni A. A.**, Roy B., Goldman A. J., Sarangi S., Sengupta P., Sengupta S., “Sequential application of a cytotoxic nanoparticle and a PI3K inhibitor enhances antitumor efficacy” **Cancer Research**, 2014; 74(3): 675-85.
13. Sengupta P., Basu S., Soni S., Pandey A., **Kulkarni A. A.** et.al. “A cholesterol-tethered platinum II-based supramolecular nanoparticle increases antitumor efficacy and reduces nephrotoxicity.” **Proc Natl Acad Sci U S A**, 2012; 109(28): 11294-11299.
14. Sengupta S., **Kulkarni A. A.**, “Design principles for clinical efficacy of cancer nanomedicine: a look into the basics.” **ACS Nano**, 2013; 7(4): 2878-82.
15. **Kulkarni A. A.**, Fuller C., Korman H., Weiss A. A., Iyer S. S., “Glycan encapsulated gold nanoparticles selectively inhibit Shiga toxins 1 and 2.” **Bioconjugate Chemistry**, 2010; 21(8): 1486-1493.
16. **Kulkarni A. A.**, Weiss A. A., Iyer S. S., “Detection of carbohydrate binding proteins using magnetic relaxation switches.” **Analytical Chemistry**, 2010; 82 (17): 7430-7435.

17. Guo X., **Kulkarni A. A.**, Doepke A. Halsall H. B., Iyer S. S., Heineman W. R., “Carbohydrate-based label-free detection of *Escherichia coli* ORN 178 using electrochemical impedance spectroscopy.” *Analytical Chemistry*, 2012; 84 (1): 241-246.
18. Flagler M. J., Mahajan S. S., **Kulkarni A. A.**, Weiss A. A., Iyer S. S., “Comparison of binding platform yields insights into receptor binding differences between Shiga toxins 1 and 2.” *Biochemistry*, 2010; 49(8): 1649-1657.
19. **Kulkarni A. A.**, Weiss A. A., Iyer S. S., “Glycan based high affinity ligands for toxins and pathogen receptors.” *Medicinal Research Reviews*, 2010; 30(2): 327-393.

BOOK CHAPTER:

- **Kulkarni A. A.***, Rao P. S., Synthesis of polymeric nanomaterials for biomedical applications. In: Gaharwar A. K., Sant S., Hancock M., Hacking A., editors. Nanomaterials in tissue engineering: characterization, fabrication and applications. *Elsevier Publishers (UK)*; 2013. p. 27-56.

PATENTS/ REPORTS OF INVENTION:

- **Kulkarni A. A.**, Rao P. S., Sengupta S. S., “Compositions for treating Cancer and methods for making the same”, US Patent Application, PCT/US2013/045893, filed June 14, 2013.
- Goldman A. J., **Kulkarni A. A.**, Sengupta S. S., “Methods and compositions relating to the treatment of Cancer”, US Patent Application, PCT/US14/15957, filed February 12, 2014.
- **Kulkarni A. A.**, Sengupta S. S., “A reporter platform for real time monitoring of drug efficacy”, US Patent Application, PCT/US2017/020440, filed March 2, 2017.
- **Kulkarni A. A.**, Sengupta S. S., “Cellular signaling inhibitors, their formulations and methods thereof”, US Patent Application, PCT/IB2017/050770, filed February 11, 2017.
- **Kulkarni A. A.**, Sengupta S. S., “A novel inhibitor that exerts sustained inhibition of IDO and inhibits tumor progression in combination with immunotherapy”, Drafting provisional patent application.

WORK EXPERIENCE:

Graduate Intern, UES Inc., Dayton, Ohio 2010

- Development of a spectroelectrochemical-based biosensor for detection of *E.coli*.

Technical Officer, NOCIL, Rubber Chemicals Division, India 2003 – 2006

- Participated in process development of hexamethylene-1, 6-bis (thiosulphate) disodium salt.
- Conducted an in-depth literature survey and a series of experiments in lab.
- Performed material balances, energy balances and costing of the projects.
- Performed HAZOP analysis to study the safety aspects of the process.
- Prepared piping and instrumentation diagrams and process flow diagrams.
- Prepared engineering drawing review of chemical equipment.
- Performed analysis of raw materials, intermediates and products by analytical techniques.
- Scaled up and commissioned the lab recipe to pilot plant scale and then to plant scale.

Undergraduate Intern, Metropolitan Eximchem Ltd., India 2002

- Learned Process Engineering and Production operations at industrial setting

TEACHING AND MENTORING EXPERIENCE:

Teaching Experience, University of Cincinnati

2006 - 2010

- Invited lecture in Chemical sensors course (Graduate Level): 'MRI in biosensing applications', Winter 2010.
- Introduction to Nanotechnology, University of Cincinnati, OH (Undergraduate Level Course)
- Invited lecture in Bio-organic chemistry course (Graduate Level): 'Protecting groups in carbohydrate chemistry', Spring 2008.
- Graduate Research Assistant: Mentored 5 undergraduate and 4 junior graduate students, Jun 2007 – 2011.
- Graduate Teaching Assistant: General Chemistry laboratory, Organic Chemistry laboratory. September 2006- June 2007

Mentoring Experience, University of Cincinnati

2006 – 2010

(Student name, Current Position, Year)

- Mentored 4 graduate students –
 - Sanjeeva Rodrigo, Postdoctoral Fellow, University of Kentucky, KY 2009
 - Hailemichael Yosief, Postdoctoral Fellow, University of Massachusetts, MA 2009 - 2010
 - Yun He, MS, Postdoctoral Fellow, Georgia State University, GA 2009 - 2010
 - Tevhide Ozakaya, Graduate Student, University of Cincinnati, OH 2010
- Mentored 5 undergraduate students –
 - Henry Korman, Graduate Student, University of California San Diego, CA. 2007 - 2009
 - David Siler, Graduate Student, Princeton University, Princeton, NJ. 2007 - 2009
 - Tuan Dinh, Working in Private Company, Cincinnati, OH 2007
 - Erin Hooper, The Sherwin Williams Company, Cleveland, OH 2008
 - Haley Monaco, Undergraduate Student, Ohio State University, Columbus, OH 2008 - 2009

Mentoring Experience, Harvard Medical School

2011 – 2017

(Student name, Year, Current Position)

- Mentored 10 graduate and postdoctoral students –
 - Poornima Rao, Scientist, Novartis, Cambridge, MA 2011 - 2013
 - Ayaat Mahmoud, Graduate Student, the American University in Cairo, Egypt 2011 - 2013
 - Shyam Srivatsa, Postdoctoral Fellow, University of California, San Francisco, CA 2011
 - Navya Korimerla, Graduate Student, Stony Brook University, Buffalo, NY 2013
 - Maral Llewellyn, Senior Scientist, Formex LLC, San Diego, CA 2013
 - Ishrat Bano, Scientist, Pakistan 2013
 - V.Jayashree, Biotechnology, SASTRA University 2015
 - B. Harishankar, Biological Engineering and Nanotechnology, SASTRA University 2015
 - Seema Sehrawat, Associate Professor, Shiv Nadar University, India 2015 - 2017
 - Rajani Madan, Visiting professor, Emanuel College, Boston 2016
 - Hardik Pandya, Postdoctoral Fellow, Brigham and Women's Hospital 2016
- Mentored 31 undergraduate students -
 - Zaid Zayyad, Biological Engineering, MIT, Cambridge, MA 2011 - 2013
 - Abin Biswas, Graduate Student, University of Heidelberg, Germany 2012

- Madhumitha Ramachandran, Graduate Student, University of Oklahoma, OK 2012
- Saranya Radhakrishnan, Graduate Student, Purdue University, IN 2012
- Pooja Vasudevan, Materials Engineering, Massachusetts Institute of Technology, MA 2012
- Yashika Khater, Research Assistant, Indian Institute of Science, Bangalore, India. 2013
- Prachi Desai, Research Assistant, Texas A & M University, College Station, TX 2013
- Suproteem Sarkar, Undergraduate Student, Harvard University, Cambridge, MA 2013
- Neeraja Setlur, Undergraduate Student, University of Texas at Austin, TX 2013
- Divya Murali, Graduate Student, University of California San Diego, CA 2014
- Niranjana Sudhakar, Graduate Student, University of Waterloo, Canada 2014
- Siva Natarajan, Graduate Student, University of Michigan, Ann Arbor, MI 2014 - 2016
- Sankaranarayanan R., Graduate Student, SASTRA University 2014
- Ashwin Iyer, Research Associate, Brigham and Women's Hospital, Boston, MA 2015
- Anand Murali, Biological Engineering, SASTRA University 2015
- Ramya R., Biotechnology, SASTRA University 2015
- Vishruti Vaikundan, Biotechnology, SRM University 2015
- Rupasree Srikumar, Bioengineering, SRM University 2015
- Aparna Chakravarty, Research Associate, University of Kansas, KS 2015
- Vineeth Chandrasekar, Invictus Oncology, India 2015 - 2016
- K. R. Sri Aishvarya, Biotechnology, SRM University 2016
- Christy Charles, Biotechnology, SRM University 2016
- Samyuktha Suresh, Biotechnology, SRM University 2016
- Harshangda Bhatnagar, Biotechnology, SRM University 2016
- Anuradha Subramanian, Bioengineering, SASTRA University 2016
- Sharada Swaminathan, University of Montreal, Canada 2016
- Sushmetha Ananthanarayanan, Bioengineering, SASTRA University 2016
- Somesh Mohapatra, Materials Engineering, IIT Roorkee 2016
- Aditya Chindhade, Chemical Engineering, BITS, Pilani 2016
- Shreya Kumar, Electrical Engineering, BITS, Pilani 2016
- Tanmaye N, Electrical Engineering, BITS, Pilani 2016
- Driti Ashok, Genetic Engineering, SRM University 2016
- Preethi Kesavan, Genetic Engineering, SRM University 2016
- Anvita S., Biomedical Engineering, SRM University 2016
- Lavanya Ranganathan, Biomedical Engineering, SRM University 2016
- Anujan Ramesh, Bioengineering, SASTRA University 2017
- Sheetal Sreeram, Bioengineering, SASTRA University 2017
- Ramya C., Biotechnology, SASTRA University 2017
- Srikar N., Biotechnology, SASTRA University 2017

Mentoring Experience, University of Massachusetts Amherst

2017 – present

(Student name, Year, Current Position)

- Postdoctoral Fellow
 - Nilesh Deshpande 2019- present
- Graduate students
 - Anh Nguyen, Chemical Engineering 2017- present
 - Anthony Brouillard, Chemical Engineering 2017- present

- Dipika Nandi, VASCI 2017- present
- Research Scholars
 - Anujan Ramesh 2017- present
 - Sahana Kumar 2018- present
- Undergraduate Students
 - Emily Iskak, Biochem. & Molecular Biol. 2017- 2019
 - William McInerney, Chemical Engineering 2017- 2019
 - Maximilian Marek, Chemical Engineering 2017- 2019
 - William Paing, Chemical Engineering
 - Harriet Smith, Chemical Engineering 2018- present
 - Daniel Ssozi, Biochem. & Molecular Biol. 2017- 2019
 - Nanlan Yang, Chemical Engineering 2018- present
 - Thomas Douglas, Chemical Engineering 2018
 - Mathangi Lakshmipathi, SRM University 2018
 - Mahak Samdaria, SRM University 2018
 - Seanu Meena Sangeetha, SASTRA University 2018
 - Hayat Anu Ranjani, SRM University 2019
 - Shankara Narayanan, SASTRA University 2019
 - Shruthi Polla Ravi, SASTRA University 2019
 - Hanna Scher, Chemical Engineering 2019- present
 - Dhiren Mistry, Chemical Engineering 2019- present
 - Syed Shahzad, Chemical Engineering 2019- present
 - Claire Kang, Chemical Engineering 2019- present
 - Hong Nguyen, Chemical Engineering 2019- present

ADMINISTRATIVE/LEADERSHIP POSITIONS:

- Undergraduate Student Secretary, University of Mumbai, Mumbai, India 2002
- Cultural show Organizing Committee Member, University of Mumbai, Mumbai, India 2002
- General Students Canteen Secretary, University of Mumbai, Mumbai, India 2002
- Sports Event Organizing Committee Member, University of Mumbai, Mumbai, India 2003
- Midwest Carbohydrate and Glycobiology Symposium, University of Cincinnati, OH 2009
- American Chemical Society Regional Meeting Session Organizer, Dayton, OH 2009
- 237th American Chemical Society National Meeting Session Organizer, Salt Lake City, UT 2009
- Member of Student Mentor Committee, University of Cincinnati, OH 2009
- Young Investigator Meeting Organizer, Massachusetts Institute of Technology, Cambridge, MA 2012
- Co-chair/Session Organizer, ASPET Conference, Chicago, IL 2017
- Co-chair/Session Organizer, BMES Annual Meeting, Phoenix, AZ 2017
- Co-leader, Cell-based Therapies Theme, Center for Bioactive Delivery, Institute for Applied Life Sciences, University of Massachusetts, Amherst 2018
- Co-chair/Session Organizer, Society for Biomaterials Annual Meeting, Seattle, WA 2019

PROFESSIONAL AFFILIATION AND SERVICE:

- American Association for Cancer Research 2011 – present

- American Institute of Chemical Engineers 2017 - present
- Biomedical Engineering Society 2017 – present
- Controlled Release Society 2017 - present
- Society for Biomaterials 2017 – present
- American Society for Pharmacology and Experimental Therapeutics 2013 – 2018
- Society for Glycobiology 2009 - 2011
- American Chemical Society 2009 - present
- Journal Reviewer: 2014- present
 - The International Journal of Biochemistry & Cell Biology
 - Nanomedicine: Nanotechnology, Biology, and Medicine
 - Journal of Healthcare Engineering
 - Scientific Reports
 - Pharmaceutical Research
 - ACS Applied Materials and Interfaces
 - ACS Biomaterials Science and Engineering
 - Recent patents on Drug Delivery and Formulation
 - Annals of Virology
 - International Journal of Nanomedicine
 - Lab on a chip
 - Nano Letters
 - Bioconjugate Chemistry
 - Theranostics

CONFERENCE PRESENTATIONS:

- Nguyen N., Ramesh A., **Kulkarni A. A.**, “Immunotheranostic Nanoprobes for Tracking Immunotherapy Response”, Cancer Nanotechnology Gordon Research Conference, Mt. Snow, VT, June 2019.
- Nguyen N., Ramesh A., **Kulkarni A. A.**, “Immunotheranostic Nanomaterials for Monitoring Immunotherapy Response”, Melanoma Research Alliance Annual Retreat, Washington DC, February 2019.
- **Kulkarni A. A.**, Sengupta S., “Computationally-Designed Nanotherapeutics for Immune Modulation of the Tumor Microenvironment”, Biomedical Engineering Society Annual Meeting, Phoenix, AZ, 2017.
- Chandrasekar V., Natarajan S. K., Sengupta S., **Kulkarni A. A.**, “Supramolecular fusion nanotherapeutic- mediated synergistic inhibition of PI3K and MEK pathways”, AACR Annual Meeting, New Orleans, LA, 2016 (**Best Poster Award to Chandrasekar V.**).
- Natarajan S., Sengupta S., **Kulkarni A. A.**, “2-in-1 ‘Sniper’ nanomedicines rescue dendritic cells by two-pronged inhibition of JAK2/STAT-3 and p38 MAPK pathways”, AACR Annual Meeting, New Orleans, LA, 2016.

- **Kulkarni A. A.**, Sabbiseti V., Sengupta S., “Supramolecular nanoparticles that target MAPK pathway synergizes with immune checkpoint inhibitor in melanoma”, AACR Annual Meeting, Philadelphia, PA, 2015. (**Scholar-in-Training Award**)
- **Kulkarni A. A.**, Pandey P., Rao P., Goldman A., Roy S., Sengupta S., “Engineering of supramolecular taxane nanoparticles by computationally modeling drug-lipid bilayer interactions”, Experimental Biology Meeting, Boston, MA, 2015. (**Young Scientist Travel Award**)
- **Kulkarni A. A.**, Pandey P., Goldman A., Roy S., Sengupta S., “Computationally- Inspired engineering of supramolecular taxane nanoparticles”, AACR Annual Meeting, San Diego, CA, 2014. (**Scholar-in-Training Award**)
- **Kulkarni A. A.**, Rao P. S., Pandey P., Goldman A., Dinulescu D., Ruoslahti E., Roy S., Sengupta S., “Targeting chemotherapy induced adaptive resistance using hybrid nanoparticles”, Experimental Biology Meeting, San Diego, CA, 2014. (**Young Scientist Travel Award**)
- **Kulkarni A. A.**, Rao P. S., Wyant G., Goldman A., Dinulescu D., Ruoslahti E., Sengupta S., “Enhancing anti-tumor efficacy via temporal inhibition of PI3K kinase using a supramolecular nanoparticle”, Gordon Research Conference, VT, 2013.
- Goldman A., Roy B., Ravi S., Rivera F., **Kulkarni A. A.**, Sengupta S., “CD44 mediates chemotherapy tolerance through Akt and Ezrin/Radixin/Moesin in an EGFR-dependent manner”, AACR Annual Meeting, Chicago, IL, 2012.
- **Kulkarni A. A.**, Rao P. S., Mahmoud A., Goldman A., Soh H., Sengupta S., Zayyad Z., Sengupta S., “Targeted multifunctional nanoparticles for breast cancer chemotherapy”, AACR Annual Meeting, Chicago, IL, 2012.
- **Kulkarni A. A.**, Weiss A. A., Iyer S. S., “Detection and differentiation of carbohydrate binding proteins using magnetic relaxation switches”, Graduate Poster Forum, University of Cincinnati, Cincinnati, OH, 2010. (**Best Poster Award**)
- **Kulkarni A. A.**, Iyer S. S., “Synthesis of tailored glycoconjugates for the precise detection of pathogens”, 240th ACS National Meeting and Exposition, Boston, MA, 2010. (**Travel Award**)
- **Kulkarni A. A.**, Fuller-Schaefer C., Korman H., Weiss A. A., Iyer S. S., “Glycan encapsulated gold nanoparticles for selective inhibition of Shiga toxins 1 and 2”, Society for Glycobiology Annual Meeting, San Diego, CA, 2009. (**Travel Award**)
- **Kulkarni A. A.**, Weiss A. A., Iyer S. S., “Carbohydrate based magnetic relaxation switches for selective and sensitive detection of carbohydrate binding proteins, BioOhio Annual Conference, Columbus”, OH, October 2009, **Invited**.
- **Kulkarni A. A.**, Fuller-Schaefer C., Korman H., Weiss A. A., Iyer S. S., “Glyconanoparticles for selective inhibition of Shiga toxins 1 and 2”, The Ohio Innovation Summit OIS 09, Dayton, OH, April 2009.
- **Kulkarni A. A.**, Fuller-Schaefer C., Korman H., Weiss A. A., Iyer S. S., “Synthesis of glycoconjugates for detection and capture of Shiga toxins, Midwest Carbohydrate and Glyco-biology Symposium”, Cleveland State University, Cleveland, OH, 2008. (**Best Poster Award**)

- **Kulkarni A. A.**, Fuller-Schaefer C., Korman H., Weiss A. A., Iyer S. S., “Synthetic glycans for the precise detection and differentiation of Shiga toxins”, BioOhio Annual Conference, Columbus, OH, October 2008, **Invited**.
- **Kulkarni A. A.**, Iyer S. S., “Synthesis of fluorescent tetrameric glycoconjugates”, 236th ACS National Meeting and Exposition, Philadelphia, PA, August 2008.
- **Kulkarni A. A.**, Iyer S. S., “Fluorescent tetrameric glycoconjugates for pathogen detection”, Midwest Carbohydrate and Glyco-biology Symposium, The Ohio State University, Columbus, OH, October 2007.

ORAL PRESENTATIONS:

- Ramesh A., Natarajan S., Nandi D., **Kulkarni A. A.**, “Chimeric Nanotherapeutics that Target Kinase Signaling Pathways Synergize with Immune Checkpoint Inhibitor”, Biomedical Engineering Society Annual Meeting, Philadelphia, PA, October 2019. **Invited. CMBE Young Innovator Award.**
- **Kulkarni A. A.**, “Computationally-designed Nanomaterials for Cancer Immunotherapy”, AIChE Annual Meeting, Orlando, FL, November 2019.
- **Kulkarni A. A.**, “Immunotheranostic probes for monitoring cancer immunotherapy response”, Society for Biomaterials Annual Meeting, Seattle, WA, April 2019.
- **Kulkarni A. A.**, “Immunotheranostic probes for monitoring cancer immunotherapy response”, American Association for Cancer Research Annual Meeting, Atlanta, GA, April 2019. **Invited. NextGen Star Award.**
- **Kulkarni A. A.**, “Computationally-designed Supramolecular Nanotherapeutics for Immune Modulation in Cancer”, Biomedical Engineering Society Annual Meeting, Atlanta, GA, October 2018.
- **Kulkarni A. A.**, “Computationally-designed Nanotherapeutics for Targeting Immunosuppressive Cells in the Tumor”, Controlled Release Society Annual Meeting, New York, NY, July 2018, **Best Oral Presentation Award.**
- **Kulkarni A. A.**, “Supramolecular Nanotherapeutic for Preferential Immune Modulation of the Tumor Microenvironment”, Society for Biomaterials Annual Meeting, Atlanta, GA, April 2018.
- **Kulkarni A. A.**, “Engineering Approaches for Modulating Immunity”, Soft Materials for Life Sciences National Research Traineeship at the University of Massachusetts, Amherst, November 2017, **Invited.**
- **Kulkarni A. A.**, “Nanoscale Approaches for Therapeutic Immune Modulation”, The Pioneer Valley Life Sciences institute, November 2017, **Invited.**
- **Kulkarni A. A.**, “Nanoscale Approaches for Therapeutic Immune Modulation”, School of Engineering and Applied Sciences, Harvard University, October 2017, **Invited.**
- **Kulkarni A. A.**, “Nanoscale Platform Technology for Monitoring Immunotherapeutic Responses”, Institute for Applied Life Sciences, University of Massachusetts, Amherst, October 2017, **Invited.**
- **Kulkarni A. A.**, “Nanoscale Approaches for Therapeutic Immune Modulation”, Department of Polymer Science and Engineering, University of Massachusetts, Amherst, October 2017, **Invited.**

- **Kulkarni A. A.**, “Immunotheranostics: Early Monitoring of Immunotherapy Response”, 247th ACS National Meeting and Exposition, Washington, DC, March 2016, August 2017, **Invited**.
- **Kulkarni A. A.**, “Imaging an Immunotherapy Response in Real-time”, ASPET Annual Meeting at EB2017, Chicago, IL, April 2017, **Invited**.
- **Kulkarni A. A.**, “Supramolecular nanotherapeutics for immune modulation of tumor microenvironment”, Dana-Farber Cancer Institute, Boston, MA, June 2016, **Invited**.
- **Kulkarni A. A.**, Sengupta S., “Nanoscale approaches for immune modulation of the tumor microenvironment”, Beth Israel Deaconess Medical Center, Kidney Cancer Program Seminar, Boston, MA, March 2016, **Invited**.
- **Kulkarni A. A.**, Sengupta S., “Hybrid nanotechnologies for detection and synergistic therapies”, Theranostics Session Talk, 247th ACS National Meeting and Exposition, Dallas, TX, March 2016, **Invited**.
- **Kulkarni A. A.**, “From small to big: Emerging concepts in nanochemistry for overcoming challenges in cancer therapy”, Renal Divisional Seminar, Brigham and Women’s Hospital, Boston, MA, December 2013, **Invited**.
- **Kulkarni A. A.**, Weiss A. A., Iyer S. S., “Rapid, one-step, no-wash carbohydrate-based detection of toxins and pathogens”, UES Inc., Dayton, OH, December 2009, **Invited**.
- **Kulkarni A. A.**, Fuller-Schaefer C., Korman H., Weiss A. A., Iyer S. S., “Glycan encapsulated gold nanoparticles inhibit Shiga toxins 1 and 2”, Central Regional Meeting of the American Chemical Society (CERMACS), Cleveland, OH, May 2009, **Invited**.
- **Kulkarni A. A.**, Fuller-Schaefer C., Korman H., Weiss A. A., Iyer S. S., “Synthesis of glycoconjugates for capturing Shiga toxins”, 236th ACS National Meeting and Exposition, Philadelphia, PA, August 2008.
- **Kulkarni A. A.**, Iyer S. S., “Fluorescent tetrameric glycoconjugates for pathogen detection”, 40th National Organic Chemistry Symposium, Duke University, NC, June 2007.
- **Kulkarni A. A.**, Fuller-Schaefer C., Weiss A. A., Iyer S. S., “Synthetic glycoconjugates for capture and detection of Shiga toxins”, 39th ACS Central Regional Meeting, Columbus, OH, May 2008.
- **Kulkarni A. A.**, Iyer S. S., “Synthesis of robust glycoconjugates for the detection of pathogens”, 39th ACS Central Regional Meeting, Cincinnati, OH, May 2007.