Pratik Kumar, PhD

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Professional Appointments

2025– **Assistant Professor, Reader (F)**
NCBS–TIFR (National Centre for Biological Sciences–Tata Institute of Fundamental Research), Bangalore, India

2019–25 **Postdoctoral Associate, laboratory of Dr. Luke Lavis**
HHMI-Janelia Research Campus, Virginia, USA

Education and Workshops

2013–19 **PhD in Chemistry, laboratory of Dr. Scott Laughlin**
Stony Brook University, New York, USA
Cyclopropene-neurotransmitters and caged-cyclopropenes for bioorthogonal labeling

2008–13 **MS and BS in Chemistry, laboratory of Dr. Rituparna Roy (MS thesis)**
Indian Institute of Science Education and Research (IISER)-Kolkata, West Bengal, India
Conformational studies of gramicidin-inspired alternating LD peptides

2009–11 **Diploma in Chemistry, laboratory of Dr. Jayanta Haldar**
Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore, India
Biodegradable antibacterial gemini surfactants

2023 Junior Scientist Workshop on Imaging Techniques and Molecular Tools for Biology, Janelia
2020 Scientists Teaching Science, HHMI Janelia Research Campus, VA, USA
2018 Optical Microscopy and Imaging (OMIBS), Marine Biological Laboratory, Woods Hole, USA
2015–18 Science Communication, Alan Alda Center for Communicating Sciences, NY, USA

Publications (Google Scholar | ORCID)

1. Antonio Fiore, Guoqiang Yu, Jason J. Northey, Ronak Patel, Thomas A. Ravenscroft, Richard Ikegami, Wiert Kolkman, **Pratik Kumar**, Tanya L. Dilan, Virginia M.S. Ruetten, Misha B. Ahrens, Hari Shroff, Shaohe Wang, Valerie M. Weaver, & Kayvon Pedram. Imaging the extracellular matrix in live tissues and organisms with a glycan-binding fluorophore. **Nature Methods**, 2025. Janelia News | bioRxiv

2. **Pratik Kumar**, Jason D. Vevea, Ariana N. Tkachuk, Kirby Campbell, Emma T. Watson, Anthony X. Ayala Jonathan B. Grimm, Edwin R. Chapman, David J. Solecki, & Luke D. Lavis. Optimizing multifunctional fluorescent ligands for intracellular labeling. **In review**. preLights | Janelia News | bioRxiv

3. **Pratik Kumar***, Alina Gutu*, Amelia Waring, Timothy A. Brown, Luke D. Lavis, & Alison G. Tebo. Transforming chemigenetic bimolecular fluorescence complementation systems into chemical dimerizers using chemistry. bioRxiv

4. Motokazu Uchigashima, Risa Iguchi, Kazuma Fujii, **Pratik Kumar**, Manabu Abe, Motohiro Nozumi, Michihiro Igarashi, Kenji Sakimura, Ryoma Bise, Luke D Lavis, & Takayasu Mikuni. Single-cell synaptome mapping of endogenous protein subpopulations in mammalian brain. **In Revision**.

5. Brittany M. White, **Pratik Kumar**, Amanda N. Conwell, Kane Wu & Jeremy M. Baskin. Lipid expansion microscopy. **JACS**, 144, 40, 18212–217, 2022. Cornell Chronicle | ChemRxiv

6. **Pratik Kumar** & Luke D. Lavis. Melding synthetic molecules and genetically encoded proteins to forge new tools for neuroscience. **Annual Review of Neuroscience**, 45, 131–50, 2022.

7. Sambashiva Banala, Ariana Tkachuk, Ronak Patel, **Pratik Kumar**, Timothy Brown, & Luke D. Lavis. 2,7-Diaminobenzopyrylium dyes are live-cell mitochondrial stains. **ACS Bio Med Chem Au**, 2, 3, 307–12, 2022.
8. **Pratik Kumar**, David Shukhman, Frank M. Camarda, & Scott T. Laughlin. Stable cyclopropene-containing analog of the amino acid neurotransmitter glutamate. **Tetrahedron Letters**, 60, 1476–80, 2019.
9. **Pratik Kumar**, Omar Zainul, Frank M. Camarda, Ting Jiang, John Mannone, & Scott T. Laughlin. Caged cyclopropenes with improved tetrazine ligation kinetics. **Organic Letters**, 21, 3721–25, 2019.
10. Ting Jiang, **Pratik Kumar**, Wei Huang, Wei-Siang Kao, Adrian O. Thompson, Frank M. Camarda, & Scott T. Laughlin. Modular enzyme- and light-based activation of the cyclopropene-tetrazine ligation. **ChemBioChem**, 20(17), 2222–26, 2019.
11. **Pratik Kumar** & Scott T. Laughlin. Modular activatable bioorthogonal reagents. **Methods in Enzymology**, 622, 153–82, 2019.
12. **Pratik Kumar**, Ting Jiang, Omar Zainul, Alyssa N. Preston, Joshua D. Farr, Sining Li, Pavit Suri, & Scott T. Laughlin. Lipidated cyclopropenes via a stable 3-N spirocyclopropene scaffold. **Tetrahedron Letters**, 59, 3435–38, 2018.
13. **Pratik Kumar***, Ting Jiang*, Sining Li, Omar Zainul, & Scott T. Laughlin. Caged cyclopropenes for controlling bioorthogonal reactivity. **Organic & Biomolecular Chemistry**, 16(22), 4081–85, 2018. Royal Society of Chemistry Blog
14. **Pratik Kumar**, Omar Zainul, & Scott T. Laughlin. Inexpensive multigram-scale synthesis of cyclic enamines and 3-N spirocyclopropyl systems. **Organic & Biomolecular Chemistry**, 16(4), 652–56, 2018.
15. **Pratik Kumar**, David Shukhman, & Scott T. Laughlin. A photocaged, cyclopropene-containing analog of the amino acid neurotransmitter glutamate. **Tetrahedron Letters**, 57, 5750–52, 2016.
16. Jiaul Hoque, **Pratik Kumar**, Vinod K. Aswal, & Jayanta Haldar. Aggregation properties of amide bearing cleavable gemini surfactants by small angle neutron scattering and conductivity studies. **Journal of Physical Chemistry B**, 116(32), 9718–26, 2012.
17. Jiaul Hoque, Padma Akkapeddi, Venkateswarlu Yarlagadda, Divakara SSM Uppu, **Pratik Kumar**, & Jayanta Haldar. Cleavable cationic antibacterial amphiphiles: synthesis, mechanism of action, and cytotoxicities. **Langmuir**, 28(33), 12225–34, 2012. Indian News

PATENTS

1. Shu-Hsien Sheu, **Pratik Kumar**, and Luke D. Lavis. Biotin-free proximity labeling. Provisional patent application 63/590534. 2023.
2. Luke D. Lavis and **Pratik Kumar**. Compounds and compositions comprising fluorophores for use in both visualization and purification. Provisional patent application 63/476193. 2022.
3. Scott T. Laughlin, **Pratik Kumar**, Ting Jiang, and Wei Huang. Compositions and methods for modular control of bioorthogonal ligation. WO2020113077 (2020), US 2022021866 (2022).

HONORS / AWARDS

2019 **Outstanding Doctoral Student**, Maria Tzamarioudaki Memorial Award**,** Stony Brook University
2019 **Outstanding Service** award, Department of Chemistry, Stony Brook University
2019 **New York State Graduate Student Employee Union** Professional Development Award
2018 **The Histochemical Society** Travel Award
2018 **Marine Biological Laboratory** Scholarship

2018 **Distinguished Travel Award**, Graduate Student Organization, Stony Brook University
Nominated by the Dept. of Chemistry and then selected from university-wide nominations
2017 **ACS Biological Chemistry** Travel Award
2017 **Best poster Award**, Institute of Chemical Biology & Drug Discovery, Stony Brook University
2017 **SUNY Research Foundation** Professional Development Award
2017 **Sigma Xi Research Achievement**, Stony Brook University Chapter
2017 **ACS Interdivisional Sci-Mix**, ACS Biological Chemistry division, ACS-San Francisco
2017 **3MT-People's Choice** Award (3-minute thesis), Stony Brook University
2016 **Departmental Distinguished Research Award**, Stony Brook University
2015 **Research Access Project Award**, Graduate Student Organization, Stony Brook University
2013 **German Research Foundation Travel Award**, Lindau Nobel Laureate Meetings, Germany
2011 **Dept. of Science & Technology (India) Travel Award**, Asian Science Camp, South Korea
2009–11 **POCE Fellowship**, JNCASR, India
2008–13 **INSPIRE Fellowship**, Department of Science & Technology, India

PROFESSIONAL SERVICE

2022–24 **COMPASS** (Committee for Postdocs and Students) Associate**,** American Society for Cell Biology
2022 **Chair,** Gordon Research Seminars, Bioorganic Chemistry
2022-23 **President,** Janelia Association of Research Scientists
2021–22 **Officer,** Janelia Association of Research Scientists
2021 **Moderator,** 70th Lindau Nobel Laureate Meeting Open Exchange Sessions
2019 **Discussion leader,** Gordon Research Seminars, Bioorganic Chemistry
2017–19 **President**, Graduate Chemical Society, Stony Brook University
2017 **Coordinator**, Student Invited Speaker Committee, Stony Brook University
2016 **Moderator**/Organizer, Graduate Chemical Society career panel on non-academic careers
2017 **Moderator**, Graduate Career Association career panel on entrepreneurship
2015–16 **Vice-President**, Graduate Career Association, Stony Brook University
2015–17 **Senator** for Chemistry at Graduate Student Organization, Stony Brook University
2015–17 **Public Relations Officer**, Graduate Chemical Society, Stony Brook University

Reviewer | Journals: Angewandte Chemie (2023–), Chemistry (2023–), Nature Communications (2022–), Organic & Bimolecular Chemistry (2020–), ChemBioChem (2020–), Journal of Materials Chemistry (2022–).
Meetings: European Molecular Imaging Meeting (2021), Gordon Research Seminars-Bioorganic Chemistry (2022), 70th Lindau Nobel Laureate Meetings (2022), American Society of Cell Biology-Cell Bio (2022)

ORAL PRESENTATIONS

INVITED

2025 **University of New Hampshire**, Dover, USA
Genetically targeted organic dyes as molecular tools beyond imaging
2024 **IIT-Hyderabad**, Hyderabad, India
Genetically targeted fluorophores as molecular tools beyond imaging
2024 **TIFR** (Tata Institute of Fundamental Research), Hyderabad, India
Genetically targeted fluorophores as molecular tools beyond imaging
2024 **NCBS** (National Centre for Biological Sciences), Bangalore, India
Genetically targeted fluorophores as molecular tools beyond imaging

2024 **CCMB** (Centre for Cellular and Molecular Biology), Hyderabad, India
Genetically targeted fluorophores as molecular tools beyond imaging

2023 **inStem** (Institute for Stem Cell Science and Regenerative Medicine), Bangalore, India
Genetically targeted fluorophores as molecular tools beyond imaging

2023 **IISER-Bhopal** Chemistry-Biology-Medicine Symposium
Genetically targeted fluorescent dyes for imaging and manipulation

2021 **Sabarmati Young Researcher Seminar Series**, Biological Engineering, IIT Gandhinagar
Multifunctional fluorescent dyes as molecular tools beyond imaging

2021 **Project SEED, American Chemical Society** (virtual)
Illuminating biology through fluorescent dyes

2018 **SUNY-Suffolk Community College**, Department of Natural Sciences, NY, USA
Activatable bioorthogonal reactions for biology

CONFERENCES / WORKSHOPS

2023 **FASEB**, The Optical Probes Conference: Discovery to Application, CA, USA
Genetically targeted fluorescent dyes for imaging & manipulating intracellular biomolecules

2023 **Junior Scientist Workshop on Imaging Techniques and Molecular Tools for Biology**, VA, USA
Genetically targeted fluorescent dyes for imaging and manipulation

2023 **Young Investigators' Meeting/PDF**, Flash talk, Gandhinagar, India
Genetically targeted fluorophores for imaging and manipulation

2022 **Gordon Research Conference**, Bioorganic Chemistry, Flash talk, NH, USA
Multifunctional fluorophores as molecular tools beyond imaging

2022 **Chemical Biology and Physiology**, Oregon Health & Science University, OR, USA
Multifunctional fluorophores as molecular tools beyond imaging

2022 **Annual Janelia Symposium**, HHMI-Janelia Research Campus, VA, USA
Multifunctional fluorophores as molecular tools beyond imaging

2021 **International Conference on Nanoscopy**, Leibniz Institute of Photonic Technology (virtual)
Multifunctional fluorophores as molecular tools beyond imaging

2021 **Dana-Farber Cancer Institute,** Chemical Biology Symposium, Flash talk (virtual)
Multifunctional fluorophores as molecular tools beyond imaging

2018 **Probe Fest,** HHMI-Janelia Research Campus, Flash talk, VA, USA
Modular activatable cyclopropenes for spatiotemporal control of bioorthogonal reactivity

2018 **New York Academy of Sciences**, Chemical Biology Symposium, NY, USA
Activatable cyclopropenes for spatiotemporal control of bioorthogonal reactivity

POSTER PRESENTATIONS

2025 **HHMI Science Meeting**, Janelia Research Campus, VA, USA
Optimizing multifunctional fluorescent ligands for protein purification and manipulation

2021 **Gordon Research Seminars** & **Gordon Research Conference**, Bioorganic Chemistry, NH, USA
Multifunctional fluorophores as molecular tools beyond imaging

2021 **EMBO/EMBL**, Seeing is Believing: Imaging the Molecular Processes of Life, VA, USA
Multifunctional fluorophores as molecular tools beyond imaging

2018 **HHMI-Janelia Research Campus**, ProbeFest, VA, USA
Light- and enzyme-activatable cyclopropenes

2018 **Rockefeller University**, Tri-Institutional Chemical Biology Symposium, NY, USA

Caged cyclopropenes for spatiotemporal control of bioorthogonal reactivity

2018 **Gordon Research Seminars** & **Gordon Research Conference**, Bioorganic Chemistry, NH, USA
Caged cyclopropenes for spatiotemporal control of bioorthogonal reactivity

2018 **NERCBI and Yale Chemical Biology Symposium**, CT, USA
Caged cyclopropenes for spatiotemporal control of bioorthogonal reactivity

2017 **Icahn School of Medicine–Mount Sinai** & **Stony Brook University** symposium, NY, USA
3*N*-spirocyclopropenes provide spatiotemporal control of bioorthogonal reactivity

2017 **New York Academy of Sciences**, Chemical Biology Symposium, NY, USA
Cyclopropene neurotransmitters for biorthogonal imaging of neural circuits

2017 **Gordon Research Seminars/Conference**, High-Throughput Chemistry & Chemical Biology, USA
Caged cyclopropenes for spatiotemporal control of bioorthogonal reactivity

2017 **ACS National Meeting** & **ACS interdivisional Sci-Mixer presentation**, CA, USA
Cyclopropene neurotransmitters for biorthogonal imaging of neural circuits

2015 **Stony Brook University**, Chemistry Research Day, NY, USA
Cyclopropene analogs of neurotransmitters for illuminating neural circuits

2014 **Stony Brook University**, Chemistry Research Day, NY, USA
Fluorescent boronic acid probe as transsynaptic tracer of neural circuitry

TEACHING EXPERIENCE (TOTAL = 5 SEMESTERS)

2018–19 **Graduate assistant, NMR facilities,** Stony Brook University, NY, USA
Trained undergraduate and graduate students on setting up and analyzing ^{1}H, ^{13}C, COSY, and DEPT NMR. Helped with routine maintenance of NMR instruments.

2018–19 **Graduate assistant, Mass spectrometry facilities,** Stony Brook University, NY, USA
Trained undergraduate and graduate students on setting up and analyzing liquid samples on ESI-mass spectrometer, and solid samples on TLC-inject mass spectrometer. Performed high-resolution mass spectroscopy of liquid samples and helped maintain the mass spectrometers.

2015 **Teaching assistant, Advanced organic chemistry lab,** Stony Brook University, NY, USA
Led 4 lectures on NMR, and weekly laboratory course for 30 chemistry majors on how to set up multistep organic reactions; monitor the progress; purify reaction products; analyze GC, IR, ^{1}H, & ^{13}C NMR data; report spectroscopic and experimental data; and follow lab-safety techniques.

2013–14 **Teaching assistant, Undergraduate organic chemistry lab,** Stony Brook University, NY, USA
Led the weekly laboratory course for 30 premed students on how to set up organic reactions; purify reaction products; analyze GC and IR data; report experimental data; and follow lab-safety techniques.

MENTORING EXPERIENCE (TOTAL = 14)

2023 Nathan Brown | Chemistry **undergraduate** student, Janelia Open Chemistry summer student

2017–19 John Mannone | Chemistry **undergraduate** student, co-author on one manuscript
Awarded URECA summer research fellowship

2017–19 Frank Camarda | Pharmacology **undergraduate** student, co-author on two manuscripts

2016–18 Omar Zainul | Pharmacology **undergraduate** student, co-author on four manuscripts
Awarded URECA summer research fellowship and Sigma-Xi Undergraduate Research Award

2017–18 Wei Huang | Chemistry **PhD** student, co-author on two manuscripts

2017–18 Wei-Siang Kao | Chemistry **PhD** student, co-author on two manuscripts

2018 Nayarit Tineo | Biology **undergraduate** student, SBU-INSPIRE program

2017 Pavit Suri | **High School** student, co-author on one manuscript
2016–17 Ting Jiang | Chemistry **PhD** student, co-author on four manuscripts
2016–17 Lei Chen, Yilin Ma, Beilei Jiang | Chemistry **PhD rotation** students
2016–17 Sining Li | Chemistry **MS** student, co-author on two manuscripts
2014–16 David Shukhman | Biochemistry **undergraduate** student, co-author on two manuscripts

OUTREACH / MEDIA

2023 Featured in Janelia Postdoc Life, Janelia Research Campus
2022 Moderator/American Society for Cell Biology | How to approach new collaborations
2021 Project SEED Speaker, American Chemical Society
2020 Science Coach, American Chemical Society, Chemistry demos on dyes for high-school students
2020 Poster Judge, Annual Biomedical Research Conference for Minority Students
2020, 22 Janelia RESET team, Biology demos and labs for diverse and low-income elementary school
2018 "Life as a scientist and career in scientific research", Suffolk Community College, NY, USA
2017, 18, 21 Science Fair Judge for WAC Lighting Foundation Invitational science fair, NY, USA
2017 Science Competition Judge for 5th Annual Nassau County science fair, NY, USA
2017 3MT Judge (3-minute thesis), SBU
2016, 17 Research photo contest winner, Graduate Chemical Society, Stony Brook University, NY, USA
2016-18 Co-Founder, BrainChem, Graphics to explain chemistry and ecology tidbits to non-scientists
2013 DW, Interview at Lindau Nobel Laureates meeting
2011 Indian Young Scientist Network, Interview of Nobel Laureates