Pratik Kumar, PhD

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EDUCATION & PROFESSIONAL APPOINTMENTS

Postdoc	HHMI Janelia Research Campus, VA, USA		Luke Lavis	2019–
PhD	Stony Brook University, NY, USA	Chemistry	Scott Laughlin	2019
MS/BS	IISER-Kolkata, India	Chemistry	Rituparna Roy	2013
Diploma	JNCASR, Bangalore, India	Chemistry	Jayanta Haldar	2019

HHMI Janelia Research Campus, VA	Scientists Teaching Science	2020
Marine Biological Laboratory, Woods Hole, MA	Microscopy (OMIBS)	2018
Alan Alda center for Communicating Sciences, NY	Science Communication	2015–18

HONORS & AWARDS

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 2019

The Histochemical Society Travel Award 2018

Marine Biological Laboratory Scholarship 2018

Distinguished Travel Award by Graduate Student Organization, Stony Brook University 2018

Nominated by the Dept. of chemistry and then selected from the pool of all departmental nominations

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

ACS Interdivisional Sci-Mix, ACS-San Francisco 2017

One of the 18 posters (out of ~200) selected from the ACS Biological Chemistry division

3MT-People's Choice Award (3-minute thesis), Stony Brook University 2017

Departmental Distinguished Research Award, Stony Brook University 2016

German Research Foundation Travel Award, Lindau Nobel Laureate Meetings, Germany 2013

Dept. of Science & Technology (India) Travel Award, Asian Science Camp, South Korea 2011

POCE Fellowship, JNCASR, India 2009–11

INSPIRE Fellowship, Department of Science & Technology, India 2008–13

PATENT

Scott T. Laughlin, **Pratik Kumar**, Ting Jiang, Wei Huang. Compositions and methods for modular control of bioorthogonal ligation. WO2020113077, 2020.

PUBLICATIONS (Google Scholar | ORCID)

In advanced preparation

1. **Pratik Kumar**, Made Budiarta, Markus Sauer, Luke D. Lavis & Gerti Beliu. Far-red emitting fluorogenic tetrazine dyes for click imaging in tissues.
2. **Pratik Kumar**, Jonathan Grimm, Katie Holland, Ariana Tkachuk & Luke D. Lavis. Photoactivation via cyclization of rhodamine fluorophores for single molecule imaging.

Published/Submitted

1. **Pratik Kumar**, Jason D. Vevea, Edwin R. Chapman & Luke D. Lavis. Multifunctional fluorophores for live-cell imaging and affinity capture of proteins. Bioarxiv, 2022, doi.org/10.1101/2022.07.02.498544. In review. Featured on preLights
2. Brittany M. White, **Pratik Kumar**, Amanda N. Conwell*, Kane Wu*, Luke D. Lavis & Jeremy M. Baskin. Lipid expansion microscopy. Resubmitted after revision, 2022.
3. **Pratik Kumar** & Luke D. Lavis. Melding synthetic molecules and genetically encoded proteins to forge new tools for neuroscience. Annual Review of Neuroscience, 2022, 45, 131–50.

4. 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, 2022, 2, 3, 307–12
5. **Pratik Kumar**, David Shukhman, & Scott T. Laughlin. Stable cyclopropene-containing analog of the amino acid neurotransmitter glutamate. Tetrahedron Letters**,** 2019, 60, 1476–1480.
6. **Pratik Kumar**, Omar Zainul, Frank Camarda, Ting Jiang, John Mannone, & Scott T. Laughlin. Second generation caged cyclopropenes with improved kinetics for controlling bioorthogonal reactivity. Organic Letters, 2019, 21, 3721–3725.
7. Ting Jiang, **Pratik Kumar**, Wei Huang, Wei-Siang Kao & Scott T. Laughlin. Modular enzyme- and light-based activation of the cyclopropene-tetrazine ligation. ChemBioChem, 2019, 20(17), 2222–2226.
8. **Pratik Kumar** & Scott T. Laughlin (Book chapter). Modular activatable bioorthogonal reagents. Methods in Enzymology, 2019, 622, 153–182.
9. **Pratik Kumar**, Ting Jiang, Omar Zainul, A. Preston, J. Farr, S. Li, Pavit Suri, & Scott T. Laughlin. Lipidated cyclopropenes via a stable 3-N spirocyclopropene scaffold. Tetrahedron Letters**,** 2018, 59, 3435–3438.
10. **Pratik Kumar***, Ting Jiang*, Sining Li, Omar Zainul, & Scott T. Laughlin. Caged cyclopropenes for spatiotemporal control of bioorthogonal reactivity. Organic & Biomolecular Chemistry, 2018, 16(22), 4081–4085. Featured on RSC
11. **Pratik Kumar**, Omar Zainul, & Scott T. Laughlin. Inexpensive multigram-scale synthesis of cyclic enamines and 3-N spirocyclopropyl systems. Organic & Biomolecular Chemistry, 2018, 16(4), 652–656.
12. **Pratik Kumar**, David Shukhman, & Scott T. Laughlin. A light-activatable, cyclopropene-containing analog of the amino acid neurotransmitter glutamate. Tetrahedron Letters**,** 2016, 57, 5750–5752.
13. 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, 2012, 116(32), 9718–9726.
14. Jiaul Hoque, Padma Akkapeddi, Venkateswarlu Y., Divakara SSM Uppu, **Pratik Kumar**, & Jayanta Haldar. Cleavable cationic antibacterial amphiphiles: synthesis, mechanism of action, and cytotoxicities. Langmuir, 2012, 28(33), 12225–12234. Featured in Indian news

SELECTED ORAL PRESENTATIONS

Invited

1. **Sabarmati Young Researcher Seminar Series**, Biological Engineering, IIT Gandhinagar (virtual) 2021
   Multifunctional fluorescent dyes as molecular tools beyond imaging
2. **Project SEED, American Chemical Society** (virtual) 2021
   Illuminating biology through fluorescent dyes
3. **SUNY-Suffolk Community College**, Department of Natural Sciences, NY, USA 2018
   Activatable bioorthogonal reactions for biology

Conference

1. **Gordon Research Conference**, Bioorganic Chemistry, Flash talk, NH, USA 2022
   Multifunctional fluorophores as molecular tools beyond imaging
2. **IndiaBioscience** YIM and PDF Meeting (virtual) 2022
   Chemical tools for imaging and manipulation of living systems
3. **Chemical Biology and Physiology**, Oregon Health & Science University, OR, USA 2022
   Multifunctional fluorophores as molecular tools beyond imaging
4. **Annual Janelia Symposium**, HHMI-Janelia Research Campus, VA, USA 2022
   Multifunctional fluorophores as molecular tools beyond imaging
5. **International Conference on Nanoscopy**, Leibniz Institute of Photonic Technology (virtual) 2021
   Multifunctional fluorophores as molecular tools beyond imaging
6. **Dana-Farber Cancer Institute,** Chemical Biology Symposium, Flash talk (virtual) 2021
   Multifunctional fluorophores as molecular tools beyond imaging
7. **IndiaBioscience** YIM and PDF Meeting (virtual) 2021
   Chemigenetic multifunctional fluorophores
8. **Probe Fest,** HHMI-Janelia Research Campus, Flash talk, VA, USA 2018
   Modular activatable cyclopropenes for spatiotemporal control of bioorthogonal reactivity

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

SELECTED POSTER PRESENTATIONS

1. **Gordon Research Seminars** & **Gordon Research Conference**, Bioorganic Chemistry, NH, USA 2022
   Multifunctional fluorophores as molecular tools beyond imaging
2. **EMBO/EMBL**, Seeing is Believing: Imaging the Molecular Processes of Life, VA, USA 2021
   Multifunctional fluorophores as molecular tools beyond imaging
3. **HHMI-Janelia Research Campus**, ProbeFest, VA, USA 2018
   Light- and enzyme-activatable cyclopropenes
4. **Rockefeller University**, Tri-Institutional Chemical Biology Symposium, NY, USA 2018
   Caged cyclopropenes for spatiotemporal control of bioorthogonal reactivity
5. **Gordon Research Seminars** & **Gordon Research Conference**, Bioorganic Chemistry, NH, USA 2018
   Caged cyclopropenes for spatiotemporal control of bioorthogonal reactivity
6. **NERCBI and Yale Chemical Biology Symposium**, CT, USA 2018
   Caged cyclopropenes for spatiotemporal control of bioorthogonal reactivity
7. **Icahn School of Medicine–Mount Sinai** & **ICB&DD–Stony Brook University** symposium on 2017
   Frontiers in Chemical Biology and Drug Discovery, NY, USA | **Best poster award**
   3*N*spirocyclopropenes provide spatiotemporal control of bioorthogonal reactivity
8. **New York Academy of Sciences**, Chemical Biology Symposium, NY, USA 2017
   Cyclopropene neurotransmitters for biorthogonal imaging of neural circuits
9. **Gordon Research Seminars** & **Gordon Research Conference**, High-Throughput Chemistry 2017
   and Chemical Biology, NH, USA
   Caged cyclopropenes for spatiotemporal control of bioorthogonal reactivity
10. **ACS National Meeting** & **ACS interdivisional Sci-Mixer presentation**, CA, USA 2017
    Cyclopropene neurotransmitters for biorthogonal imaging of neural circuits
11. **Stony Brook University**, Chemistry Research Day, NY, USA 2015
    Cyclopropene analogs of neurotransmitters for illuminating neural circuits
12. **Stony Brook University**, Chemistry Research Day, NY, USA 2014
    Fluorescent boronic acid probe as transsynaptic tracer of neural circuitry

PROFESSIONAL SERVICE

Reviewer| Journals: Organic & Bimolecular Chemistry, ChemBioChem, Journal of Materials Chemistry
Meetings: European Molecular Imaging Meeting (2021), Gordon Research Seminars-Bioorganic Chemistry (2022), 70th Lindau Nobel Laureate Meetings

COMPASS Associate, American Society for Cell Biology 2022–
Chair, Gordon Research Seminars-Bioorganic Chemistry 2022
President, Janelia Association of Research Scientists 2022–
Officer, Janelia Association of Research Scientists 2021–22
Moderator, 70th Lindau Nobel Laureate Meeting Open Exchange Sessions 2021
Discussion leader, Gordon Research Seminars-Bioorganic Chemistry 2019
Vice-Chair, Gordon Research Seminars-Bioorganic Chemistry 2019
President, Graduate Chemical Society, SBU Apr 2017–Apr 2019
President, Student Invited Speaker Committee, Stony Brook Chemistry Spring 2017
Moderator (& organizer), Grad. Chemical Society career panel on non-academic careers Spring 2016
Moderator (& organizer), Graduate Career Association career panel on entrepreneurship Fall 2015
Vice-President, Graduate Career Association, SBU Fall 2015–Spring 2016
Senator for Chemistry at Graduate Student Organization, SBU 2015–Spring 2018
Public Relations Officer, Graduate Chemical Society Spring 2015–Apr 2017

TEACHING EXPERIENCE

Graduate assistant, NMR facilities, SBU 2018, Spring 2019

Trained undergraduate, graduate, and postdoctoral trainees on setting up and analyzing ^{1}H, ^{13}C, COSY, and DEPT NMR on 400/500/700 MHz NMR instruments. Also, performed routine maintenance such liquid-nitrogen/helium refills.

Graduate assistant, Mass spectrometry facilities, SBU 2018, Spring 2019

Trained undergraduate-, graduate-, and postdoctoral-trainees on how to run and analyze liquid samples on ESI-mass spectrometer; run and obtain high-resolution mass-spectra of liquid samples; run solid samples on TLC-inject mass spectrometer; and properly maintain mass spectrometers.

Teaching assistant, Advanced organic chemistry lab, SBU Spring 2015

Led ~4 lectures on NMR and weekly laboratory course for ~30 chemistry-majors on how to set up multistep organic reactions; monitor the progress of reactions; purify reaction intermediates; analyze GC data; acquire and analyze IR data; analyze ^{1}H & ^{13}C NMR data; report spectroscopic and experimental data; and follow proper lab-safety techniques.

Teaching assistant, Undergraduate organic chemistry lab, SBU Fall 2013–Spring 2014

Led a weekly laboratory course for ~30 pre-med students on how to set up organic reactions; isolate and purify an reaction product; analyze GC data; analyze IR data; report experimental data; and follow proper lab-safety techniques.

MENTORING EXPERIENCE (TOTAL = 15)

2 Postdoc (1st year of their Postdoc):
- Guoqiang Yu 2022–23
- Jianping Zhu 2021–22

3 PhD (rotation and 1st year of their PhD):
- Wei Huang (Chemistry/Chemical Biology, co-authors on two manuscripts) Nov 2017–Dec 2018
- Wei-Siang Kao (Chemistry/Chemical Biology, co-authors on two manuscripts) Nov 2017– Dec 2018
- Ting Jiang (Chemistry/Chemical Biology, co-authors on four manuscripts) Nov 2016–Dec 2017

3 PhD rotation students: Lei Chen, Yilin Ma, Beilei Jiang 2016, 2017

1 MS student: Sining Li (Chemistry, co-authors on three manuscripts) Jan 2016–Apr 2017

5 Undergraduate students:
- Nayarit Tineo (Biology, worked with Omar Zainul through SBU-INSPIRE program) Spring 2018
- John Mannone (Chemistry, awarded URECA summer research fellowship) Nov 2017–Apr 2019
- Frank Camarda (Pharmacology, co-authors on two manuscript) Nov 2017–Apr 2019
- Omar Zainul (Pharmacology, and co-authors on four manuscripts) Sep 2016–Apr 2018
  Awarded URECA summer research fellowship and Sigma-Xi Undergraduate Research Award
- David Shukhman (Biochemistry, co-authors on one manuscript) Aug 2014–Apr 2016

1 High School student: Pavit Suri (W.T. Clarke high School, co-author on one manuscript) Summer 2017

OUTREACH

Moderator (& organizer), "How to approach new collaborations" American Society for Cell Biology 2022

Organizer, Adobe Illustrator Workshop for Scientists, Janelia Research Campus, VA, USA 2021

Project SEED Speaker, American Chemical Society 2021

Science Coach, American Chemical Society 2020

Developed chemistry demos/lectures focused on current research for high-school students

Judge, Annual Biomedical Research Conference for Minority Students (ABRCMS) 2020

Janelia RESET team, Volunteer 2020

Biology demos/labs (1/month) at nearby diverse and low-income elementary schools

"Life as a scientist and career in scientific research", Suffolk Community College, NY, USA 2018

Science Fair Judge for WAC Lighting Foundation Invitational science fair, NY 2017, 2018, 2021

Science Competition Judge for 5th Annual Nassau County science fair, NY 2017

3MT (3-minute thesis) **Judge**, SBU 2017

Research photo contest, Graduate Chemical Society, SBU (winner) 2016, 2017

Co-Founder, BrainChem (~500 subscribers) 2016

A page for non-scientists where we explain interesting tidbits about chemistry and ecology using simple graphics

High-School Chemistry, Volunteer, Patna, India Fall 2012, Summer 2013

Taught chemistry to underprivileged, primarily Hindi-speaking high schoolers preparing for an exam in English