Pratik Kumar, PhD

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EDUCATION & RESEARCH EXPERIENCE

HHMI-Postdoctoral Associate, Janelia Research Campus — 2019–
Joint position with Luke D. Lavis and Martin J. Schnermann (NCI/NIH)

PhD, Chemistry (Chemical Biology Training Program) — 2013–19
Stony Brook University, NY (w/ Scott T. Laughlin)
Cyclopropene-neurotransmitters and caged-cyclopropenes for bioorthogonal labeling

Marine Biological Laboratory, Woods Hole, MA — Aug 2018
Optical Microscopy and Imaging in the Biomedical Sciences course

MS & BS, Chemistry — 2008–13
IISER-Kolkata, India (w/ Rituparna S. Roy)
Conformational studies of gramicidin inspired alternating LD peptides

Diploma, Chemistry — 2009–12
JNCASR, Bangalore, India (w/ Jayanta Haldar) — (summers)
Synthesis and aggregation properties of biodegradable, cationic gemini-surfactants

Scientists Teaching Science — Apr–Jun 2020
Online course on learning styles and effective instructional strategies for teaching STEM subjects

Science Communication courses/training at Alan Alda center for Communicating Sciences, SBU
Using digital media (2018), Improvisation for scientists (2016), Distilling your message (2015)

ACADEMIC AWARDS & FELLOWSHIPS

Maria Tzamarioudaki Memorial Award for Outstanding Doctoral Student, SBU — 2019
Outstanding Service award, Department of Chemistry, SBU — 2019
New York State Graduate Student Employee Union (GSEU) Professional Development Award — 2019
The Histochemical Society Travel Award — 2018
Marine Biological Laboratory Scholarship — 2018
Distinguished Travel Award by **Graduate Student Organization**, SBU — 2018
Nominated by the Dept. of chemistry and then selected from the pool of all departmental nominations
ACS Biological Chemistry Travel Award — 2017
ICB&DD-Best poster Award, Institute of Chemical Biology & Drug Discovery, SBU — 2017
SUNY Research Foundation Professional Development Award — 2017
ACS Interdivisional Sci-Mix, ACS-San Francisco — 2017
One of the 18 (out of ~200) posters selected from the ACS Biological Chemistry division
3MT-People's Choice Award (3-minute thesis), SBU — 2017
Departmental Distinguished Research Award, SBU — 2016
German Research Foundation Travel Award, Lindau Nobel Laureate Meeting, Germany — 2013
Dept. of Science & Technology (India) Travel Award, Asian Science Camp, South Korea — 2011
POCE Fellowship, JNCASR, India — 2009–11
Dept. of Science & Technology (India) INSPIRE Fellowship — 2008–13

PATENT

Scott T. Laughlin, **Pratik Kumar**, Ting Jiang, Wei Huang. Compositions and methods for modular control of bioorthogonal ligation. Patent application PCT/US2019/063714, Filed Nov 2019.

PUBLICATIONS (ORCID iD: 0000-0002-9516-0212)

1. **Pratik Kumar**, David Shukhman, & Scott T. Laughlin. Stable cyclopropene-containing analog of the amino acid neurotransmitter glutamate. Tetrahedron Letters, 2019, 60, 1476–1480.

2. **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.
3. 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.
4. **Pratik Kumar** & Scott T. Laughlin (Invited Book chapter). Modular activatable bioorthogonal reagents. Methods in Enzymology, 2019, 622, 153–182.
5. **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.
6. **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 blog** (rsc.li/2LAHrOW): "Reactivity Caging Strategy for Controlling Bioorthogonal Reactivity"
7. **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.
8. **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.
9. 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.
10. 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. **Indian news** (bit.ly/2t5yzJT): "Scientist Invents Biodegradable Detergent"

INVITED ORAL PRESENTATIONS

1. **New York Academy of Sciences—Chemical Biology Symposium**, NY, USA 2018
   Activatable cyclopropenes for spatiotemporal control of bioorthogonal reactivity
2. **HHMI-Janelia Research Campus** |1 min-1 slide talk 2018
   Modular activatable cyclopropenes for spatiotemporal control of bioorthogonal reactivity
3. **SUNY-Suffolk community college**, Department of Natural Sciences, NY, USA 2018
   Activatable bioorthogonal reactions for biology

POSTER PRESENTATIONS

1. **HHMI-Janelia Research Campus**, ProbeFest, VA, USA 2018
   Light- and enzyme-activatable cyclopropenes
2. **Rockefeller University**, Tri-Institutional Chemical Biology Symposium, NY, USA 2018
   Caged cyclopropenes for spatiotemporal control of bioorthogonal reactivity
3. **Gordon Research Seminars** & **Gordon Research Conference**, Bioorganic Chemistry, NH, USA 2018
   Caged cyclopropenes for spatiotemporal control of bioorthogonal reactivity
4. **NERCBI and Yale Chemical Biology Symposium**, CT, USA 2018
   Caged cyclopropenes for spatiotemporal control of bioorthogonal reactivity
5. **Icahn School of Medicine-Mount Sinai** & **ICB&DD-Stony Brook University**, Joint symposium on Frontiers in Chemical Biology and Drug Discovery, NY, USA | **Best poster award** 2017
   3*N* spirocyclopropenes provide spatiotemporal control of bioorthogonal reactivity
6. **New York Academy of Sciences**, Chemical Biology Symposium, NY, USA 2017
   Cyclopropene neurotransmitters for biorthogonal imaging of neural circuits
7. **Gordon Research Seminars** & **Gordon Research Conference**, High-Throughput Chemistry and Chemical Biology, NH, USA. 2017
   Caged cyclopropenes for spatiotemporal control of bioorthogonal reactivity
8. At both **ACS National Meeting** & **ACS interdivisional Sci-Mixer presentation**, CA, USA. 2017
   Cyclopropene neurotransmitters for biorthogonal imaging of neural circuits

9. **Stony Brook University**, Chemistry Research Day, NY, USA 2015
   Cyclopropene analogs of neurotransmitters for illuminating neural circuits
10. **Stony Brook University**, Chemistry Research Day, NY, USA 2014
    Fluorescent boronic acid probe as transsynaptic tracer of neural circuitry

MENTORING EXPERIENCE

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

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.

High-School Chemistry, India Fall 2012, Summer 2013
Taught chemistry to ~35 high schoolers from low-to-moderate income background for 8 h/week

PROFESSIONAL SERVICE

Reviewer for Organic & Bimolecular Chemistry, RSC
Co-Chair, Gordon Research Seminars-Bioorganic Chemistry 2021
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

OUTREACH

Volunteer, Janelia RESET team Spring 2020

Pratik Kumar, PhD

Teaching biology labs (~once/month) at nearby diverse and low-income elementary schools
"Life as a scientist and career in scientific research" 2018
Interaction with undergraduates at SUNY-Suffolk Community College, NY, USA

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

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

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

Graduate Chemical Society **research photo contest** winner, SBU 2016, 2017
Graduate Chemical Society competition in conjunction with the department of chemistry on research day

Founder, ***BrainChem*** (currently with ~500 subscribers) 2016
A page for non-scientists where we explain interesting tidbits about chemistry and ecology using simple graphics.