

DHIMAN S. PAL

Department of Biological Sciences, CUNY Hunter College
413 E 69th St, Belfer Research Building, BB-426, New York NY 10021
(667) 403-0259 • Dhiman.Pal@hunter.cuny.edu / dpal1@jhmi.edu / dhimanpal8@gmail.com
ORCID • [LinkedIn](#) • [Google Scholar](#) • [MyNCBI](#)

ACADEMIC BACKGROUND AND POSITIONS

Assistant Professor of Biological Sciences, Hunter College, City University of New York, USA	2025-present
Adjunct Assistant Professor of Cell Biology, School of Medicine, Johns Hopkins University, USA	2025-present
Postdoctoral Training, School of Medicine, Johns Hopkins University, USA	
Research Associate, Cell Biology	2024-2025
Postdoctoral Fellow, Cell Biology	2018-2024
Integrated MS-PhD, Indian Institute of Science Education and Research Kolkata, India	
PhD Fellow, Biological Sciences (Specialization: Molecular Parasitology)	2012-2017
MS Fellow, Biological Sciences	2010-2012
BSc Microbiology, Chemistry, Zoology, St Joseph's College of Arts and Science, Bangalore, India	2007-2010

RESEARCH EXPERIENCE

Postdoctoral Research, School of Medicine, Johns Hopkins University (JHU) – Baltimore, MD, USA (April 2018-August 2025)

Principal Investigator: Peter N Devreotes, PhD, Professor & Director Emeritus, Dept of Cell Biology

Project title: Ras Signaling as a Direct Regulator of Immune Cell Migration and Polarity

- Developed optogenetic Ras inhibitors to show that localized attenuation of Ras GTPase activity drives leukocyte polarization and directional migration by enhancing actomyosin contractility at the cell rear
- Engineered optogenetic systems to elucidate how localized Ras–mTORC2–Akt growth factor signaling regulates actin polymerization at the leading edge and directs migration in human leukocytes
- Discovered that the generic surface charge on the inner leaflet of the plasma membrane acts as a key organizer of signaling activities and cytoskeletal rearrangements driving macrophage migration

Graduate Research, Indian Institute of Science Education and Research (IISER) – Kolkata, WB, India (September 2012-December 2017)

Principal Investigator: Rupak Datta, PhD, Professor & Former Chair, Dept of Biological Sciences

Thesis title: Characterization of *Leishmania major* β -Carbonic Anhydrase as a Potential Drug Target against Leishmaniasis

- Uncovered a pyruvate carboxylase-independent pathway for gluconeogenesis in eukaryotes, where a malic enzyme–carbonic anhydrase partnership fulfills this essential metabolic function
- Demonstrated that cytosolic and cell surface carbonic anhydrases neutralize acid accumulation in *Leishmania*, revealing a novel intracellular pH buffering mechanism in microbes
- Identified metal dithiocarbamates as a new class of carbonic anhydrase inhibitors, demonstrating their potential as lead compounds for treating the parasitic disease, leishmaniasis

Summer Research, University of Calcutta – Kolkata, WB, India (May-July 2011 and June-September 2012)

Principal Investigator: Dhrubajyoti Chattopadhyay, PhD, Guha Professor, Dept of Biotechnology

Project title: Role of Chandipura Virus Inclusion Bodies in Viral RNA Synthesis and Propagation

- Showed that primary mRNA synthesis in negative-stranded RNA viruses shifts from the cytoplasm to viral inclusion bodies in later infection stages

Summer Training, LV Prasad Eye Institute – Hyderabad, TS, India (June-July 2010)

Lab Head: Suma Nalamada, MD, Jhaveri Microbiology Centre & Saroja A Rao Immunology Lab

- Gained hands-on experience in immunological and microscopic techniques using patient ocular samples

PRE-PRINTS AND PEER-REVIEWED PUBLICATIONS

Total publications in PhD: 4; Total publications/pre-prints in postdoctoral training: 12

FIRST-AUTHORED (*equal contribution, †corresponding authors, mentees/advisees)

1. Lin Y*, **Pal DS***†, Banerjee P, Banerjee T, Qin G, Deng Y, Borleis J, Iglesias PA, Devreotes PN†. 2024. [Ras suppression potentiates rear actomyosin contractility-driven cell polarization and migration](#). **Nature Cell Biology** 26, 1062–1076.
2. **Pal DS***†, Lin Y*, Zhan H, Banerjee T, Kuhn J, Providence S, Devreotes PN†. 2023. [Optogenetic modulation of guanine nucleotide exchange factors of Ras superfamily proteins directly controls cell shape and movement](#). **Frontiers in Cell and Developmental Biology** 11:1195806. (Note: Methods Article)
3. **Pal DS**†, Banerjee T, Lin Y, de Trogoff F, Borleis J, Iglesias PA, Devreotes PN†. 2023. [Actuation of single downstream nodes in growth factor network steers immune cell migration](#). **Developmental Cell** S1534-5807(23)00195-8. (**Press Release**)
4. Mondal DK*, **Pal DS***, Abbasi M, Datta R. 2021. [Functional partnership between carbonic anhydrase and malic enzyme in promoting gluconeogenesis in Leishmania major](#). **FEBS Journal** 288:4129-4152.
5. **Pal DS***, Li X*, Banerjee T, Miao Y, Devreotes PN. 2019. [The excitable signal transduction networks: movers and shapers of eukaryotic cell migration](#). **International Journal of Developmental Biology** 63:407–416. (Note: Review Article)
6. **Pal DS**, Abbasi M, Mondal DK, Varghese BA, Paul R, Singh S, Datta R. 2017. [Interplay between a cytosolic and a cell surface carbonic anhydrase in pH homeostasis and acid tolerance of Leishmania](#). **Journal of Cell Science** 130:754-766.
7. **Pal DS**, Mondal DK, Datta R. 2015. [Identification of metal dithiocarbamates as a novel class of antileishmanial agents](#). **Antimicrobial Agents and Chemotherapy** 59:2144-2152.

CO-AUTHORED (*equal contribution)

1. Deng Y, Banerjee T, **Pal DS**, Banerjee P, Zhan H, Borleis J, Iglesias PA, Devreotes PN. 2024. [PIP5K-Ras bistability initiates plasma membrane symmetry breaking to regulate cell polarity and migration](#). **BioRxiv**
2. Banerjee P, Kuhn J, **Pal DS**, Deng Y, Banerjee T, Devreotes PN, Iglesias PA. 2025. [Spatial distribution of cytoskeleton-mediated feedback controls cell polarization: a computational study](#). **PLoS Computational Biology** 21(10): e1013036.
3. Banerjee T, Deng Y, **Pal DS**, Zhan H, Iglesias PA, Devreotes PN. 2025. [Signaling and actin waves at a glance](#). **Journal of Cell Science** 138, jcs263634. (Note: Review Article)
4. Zhan H, **Pal DS**, Borleis J, Janetopoulos C, Huang C-H, Devreotes PN. 2025. [Self-organizing glycolytic waves tune cellular metabolic states and fuel cancer progression](#). **Nature Communications** 16, 5563. (**Press Release**)
5. Banerjee T, Matsuoka S, Biswas D, **Pal DS**, Ueda M, Devreotes PN, Iglesias PA. 2023. [A dynamic partitioning mechanism polarizes membrane protein distribution](#). **Nature Communications** 14, 7909. (**Press Release**)
6. Banerjee T, Biswas D*, **Pal DS***, Miao Y, Iglesias PA, Devreotes PN. 2022. [Spatiotemporal dynamics of membrane surface charge regulates cell polarity and migration](#). **Nature Cell Biology** 24, 1499–1515. (**Recommended by H1 Connect**)

7. Li X, **Pal DS**, Biswas D, Iglesias PA, Devreotes PN. 2021. [Reverse fountain flow of phosphatidylinositol-3,4-bisphosphate polarizes migrating cells](#). **EMBO Journal** 40:e105094. (**Cover Article**)
8. Li X, Miao Y, **Pal DS**, Devreotes PN. 2020. [Excitable networks controlling cell migration during development and disease](#). **Seminars in Cell and Developmental Biology** 100:133–142. (Note: Review Article)
9. Chattaraj S, Basu S, Ray K, **Pal DS**. 2019. [Vitamin D as an important constituent of epididymal luminal micro-environment for maturation of spermatozoa in large white Yorkshire boar](#). **Veterinarski Arhiv** 89:169-182.

HONORS AND AWARDS

1. **Cell Bio Travel Grant** – American Society for Cell Biology, September 2024
2. [Merton Bernfield Memorial Award](#) – American Society for Cell Biology, August 2024
3. [Albert Lehninger Research Award](#) – School of Medicine, JHU, April 2024 (**Interview**)
4. **Lewis Travel Award** – Dept of Cell Biology, School of Medicine, JHU, November 2022
5. **JHU Collaborative Teaching Fellowships** – Goucher College, Spring 2022 and BUGSS, Fall 2020
6. **SERB International Travel Award** – Dept of Science & Technology, Govt of India, April 2017
7. **IISER International Travel Grant** – Dean of Academics, IISER Kolkata, India, February 2017
8. **100 Students Initiative Travel Scholarship** – WHO and DNDi, Switzerland, February 2017
9. **Best Poster** – ‘Advances in Life Sciences’, IISER Kolkata, India, January 2017
10. **Best Talk** – ‘Frontiers in Modern Biology’, IISER Kolkata, India, December 2015
11. **Best Poster** – ‘Annual Meeting of Society of Biological Chemists’, Kolkata, India, December 2012
12. **IAS-INSA-NAS Summer Fellowships** – University of Calcutta, India, Summers 2011 and 2012
13. **IISER Kolkata Integrated MS-PhD Fellowship** – Govt of India, August 2010-July 2017
14. **Best Working Model** – National Collegiate Science Competition, Bangalore, India, May 2009

SELECTED INVITED TALKS AND CONFERENCE PRESENTATIONS

POST-DOCTORAL RESEARCH

- Ras-mediated homeostatic control of front-back signaling dictates polarity in migrating cells. **ASCB|EMBO Meeting, San Diego, USA, December 2024 (M. Bernfield Award Talk)**
- Actuation of single downstream nodes in growth factor network steers immune cell migration. **47th Young Investigators’ Day, JHU, Baltimore, USA, April 2024 (A. Lehninger Award Poster)**
- Actuation of single downstream nodes in growth factor network mediates neutrophil guidance. **Directed Cell Migration GRS/GRC, Galveston, USA, January 2023 (Poster & Talk)**
- Optical activation of Ras-Akt network tunes polarity and organizes protrusions in neutrophil migration. **ASCB|EMBO Meeting, Washington DC, USA, December 2022 (Subgroup Talk & Poster)**
- Spatiotemporally precise optogenetics reveal Ras-Akt regulate polarity in migrating human neutrophils. **Rising Stars in Cell Biology Symposium, JHU, Baltimore, USA, April 2022 (Poster)**
- Differential surface charge on the plasma membrane polarizes cells during migration. **ASCB|EMBO Virtual Meeting, December 2020 (Subgroup Talk & Poster)**

GRADUATE RESEARCH

- Carbonic anhydrases as emerging players in Leishmania physiology: their role in intracellular pH regulation and beyond. **MPIIB, Berlin, Germany, August 2017 (Department Symposium)**
- Role of carbonic anhydrases in acid acclimatization of Leishmania. **6th World Congress on Leishmaniasis, Toledo, Spain, May 2017 (Talk)**
- Role of a cytosolic and a membrane-bound carbonic anhydrase of Leishmania major in combating acid stress. **Advances in Life Sciences, IISER Kolkata, India, January 2017 (Best Poster)**
- Interplay between cytosolic and membrane-bound carbonic anhydrase for pH homeostasis of Leishmania. **Frontiers in Modern Biology, IISER Kolkata, India, December 2015 (Best Talk & Poster)**

SUMMER RESEARCH

- Role of Chandipura virus inclusion bodies in viral RNA synthesis and propagation. **81st Annual Meeting of Society of Biological Chemists, Kolkata, India, December 2012 (Best Poster)**

TEACHING TRAINING AND EXPERIENCE

- **Course Instructor, Goucher College** – Taught Biochemistry theory course (CHE341); designed curriculum, gave lectures (24 hours), and organized *Real-World Biochemistry* seminar series for 16 students (Spring 2022)
- **Course Instructor, BUGSS** – Taught *Build-a-Genome* Synthetic Biology course; designed and instructed 14-hour theory/lab hybrid course with experimental demos for 15 students (Fall 2020)
- **Teaching Academy Fellow, JHU** – Completed 1-year certified university pedagogy training through courses, workshops, and teaching practicums (2019-2020)
- **Graduate Teaching Assistant, IISER Kolkata** – Led biochemistry lab courses for 25-30 students; prepared experiments and graded exams for LS4204, LS3204, LS3104, and LS3205 (2013–2017)

MENTORING EXPERIENCE

- **Ingenuity Research Supervisor, Baltimore Polytechnic Institute/JHU** – Supervised high school senior with 1-year research project and helped co-author research article (2022-2023)
- **Poster Judge, ASCB|EMBO Annual Meetings** – Official judge providing scientific feedback to undergraduates, post-baccalaureate fellows, and graduate students (2019-2022)
- **Academic Mentor, JHU School of Medicine** – Mentored 1 research tech and 3 graduate students in technical skills, science communication, and career development (2018-2025)
- **Undergraduate Research Mentor, IISER Kolkata** – Mentored 7 MS/PhD students, 10 summer fellows, and 13 rotation students in research skills and science communication (2011-2017)

ACADEMIC LEADERSHIP AND SERVICE

- **Poster Abstract/Travel Grant Reviewer, ASCB|EMBO Meetings** – Led a sub-committee to review poster abstracts, create scientific sessions, and score travel grants (2024-present)
- **Ambassador, International Students at Hopkins, JHU** – Organized support services to postdoctoral fellows during COVID-19 pandemic with Hopkins OIS (2020-2021)
- **Editor/Ad hoc Reviewer** – Associate Guest Editor for *Frontiers*; reviewed 22 manuscripts for Nature Communications, PLoS Biology, MBoC, and others (2019-present)

- **Postdoctoral Representative, Cell Biology, JHU** – Provided support services to postdoctoral fellows with help from Office of Postdoctoral Affairs (2019-2021)
- **Symposia Organizer, Cell Biology, JHU** – Organized and hosted weekly hybrid Lewis Talks for trainees (Fall 2021 & Spring 2022); invited speakers for department seminars (Fall 2019)
- **Memberships** – American Society for Cell Biology, Biophysical Society (2019-present)
- **Secretary, Microbiology UG Student Association, St Joseph's College of Arts and Science** – Peer-elected to coordinate events promoting science on campus and in the community (2008-2010)

REFERENCES

Peter N Devreotes, PhD, Distinguished Service Professor & Director Emeritus, Department of Cell Biology, Johns Hopkins University School of Medicine, Baltimore, MD, USA (pnd@jhmi.edu) Tel: (410) 236-6245

Rupak Datta, PhD, Professor & Former Chair, Department of Biological Sciences, Indian Institute of Science Education and Research Kolkata, WB, India (rupakdatta@iiserkol.ac.in) Tel: (+91) 033-6136-1214

Pablo A Iglesias, PhD, Professor and Head, Department of Electrical and Computer Engineering, Whiting School of Engineering, Johns Hopkins University, MD, USA (pi@jhu.edu) Tel: (410) 516-6026

Douglas N Robinson, PhD, Professor and Allen Distinguished Investigator, Department of Cell Biology, Johns Hopkins University School of Medicine, Baltimore, MD, USA (dnr@jhmi.edu) Tel: (410) 502-2850