

BIOGRAPHICAL SKETCH

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NAME: Dutta, Shuchismita

eRA COMMONS USER NAME (credential, e.g., agency login): shuchidutta

POSITION TITLE: Scientific Training, Education, and Documentation Lead, RCSB PDB

EDUCATION/TRAINING (*Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.*)

INSTITUTION AND LOCATION	DEGREE (if applicable)	END DATE MM/YYYY	FIELD OF STUDY
All India Institute of Medical Sciences, New Delhi, Delhi	BS	1992	Human Biology (Hons in Biophysics)
All India Institute of Medical Sciences , New Delhi, Delhi	MS	1994	Biotechnology
Boston University School of Medicine, Boston, Massachusetts	PHD	2000	Biophysics
Harvard Medical School, Boston, Massachusetts	Postdoctoral Fellow	2002	Structural Biology

A. Personal Statement

I am a trained X-ray crystallographer and currently the Scientific Training, Education, and Documentation Lead for the Research Collaboratory for Structural Bioinformatics Protein Data Bank (RCSB PDB). I interact with a broad range of users and engage them in using data/ tools/ resources available from the RCSB PDB to explore a molecular view of biology and medicine. An undergraduate honors seminar course that I have been teaching for over 15 years, forms the foundation for development of various educational resources at RCSB PDB. The course is focused on understanding the molecular basis of specific global health concerns (including HIV/AIDS, Diabetes, antimicrobial resistance, and Cancer), where students learn to explore and analyze relevant molecular structures from the PDB, integrate information from various bioinformatics data resources, and discuss their functions in health and disease. Some students from these courses return as summer interns and contribute to expert reviewed articles for general and community education, which are published on the PDB-101 Global Health pages. By interacting with various audiences, understanding their needs and interests, I collaborate with them to develop relevant training and educational materials. In the past 8-10 years I have collaborated with educators, scientists, and health care professionals to develop online curricular modules and case studies for teaching with a molecular perspective of biology and medicine. The curricular materials designed for high school students and introductory courses in biology are available from RCSB PDB's educational portal (PDB-101). The case studies are currently being pilot tested in select undergraduate courses in colleges and universities nationwide. With over 20 years of experience in teaching a wide range of audiences (ranging from high school students to health care professionals, and expert scientists), I look forward to guiding users in integrating relevant information from the PDB and other bioinformatics resources to explore and learn about cancer.

1. Dutta S, Jiang J, Ghosh S, Patel S, Bhikadiya C, Lowe R, Voigt M, Goodsell D, Zardecki C, Burley SK. An idea to explore: How an interdisciplinary undergraduate course exploring a global health challenge in molecular detail enabled science communication and collaboration in diverse audiences. *Biochem Mol Biol Educ.* 2023 Mar;51(2):137-145. PubMed Central PMCID: PMC10050141.
2. Burley SK, Bhikadiya C, Bi C, Bittrich S, Chao H, Chen L, Craig PA, Crichlow GV, Dalenberg K,

Duarte JM, Dutta S, Fayazi M, Feng Z, Flatt JW, Ganesan S, Ghosh S, Goodsell DS, Green RK, Guranovic V, Henry J, Hudson BP, Khokhriakov I, Lawson CL, Liang Y, Lowe R, Peisach E, Persikova I, Piehl DW, Rose Y, Sali A, Segura J, Sekharan M, Shao C, Vallat B, Voigt M, Webb B, Westbrook JD, Whetstone S, Young JY, Zalevsky A, Zardecki C. RCSB Protein Data Bank (RCSB.org): delivery of experimentally-determined PDB structures alongside one million computed structure models of proteins from artificial intelligence/machine learning. *Nucleic Acids Res.* 2023 Jan 6;51(D1):D488-D508. PubMed Central PMCID: PMC9825554.

B. Positions, Scientific Appointments and Honors

Positions and Scientific Appointments

- 2023 - Scientific Training, Education, and Documentation Lead, RCSB PDB, Rutgers, The State University of New Jersey, Piscataway, NJ
- 2020 - Member, Cancer Pharmacology, Rutgers, The State University of New Jersey, Rutgers CINJ, New Brunswick, NJ
- 2020 - 2022 Documentation Lead, Rutgers, The State University of New Jersey, RCSB PDB, Piscataway, NJ
- 2019 - Associate Research Professor, Rutgers, The State University of New Jersey, Institute for Quantitative Biomedicine, Piscataway, NJ
- 2014 - 2022 Scientific Educational Development Lead, Rutgers, The State University of New Jersey, RCSB PDB, Piscataway, NJ
- 2006 - 2018 Assistant Research Professor, Rutgers, The State University of New Jersey, RCSB PDB, Piscataway, NJ
- 2002 - 2005 Research Associate, Rutgers, The State University of New Jersey, RCSB Protein Data Bank, Piscataway, NJ
- 1997 - 1997 Teaching Assistant, Boston University School of Medicine, Cell Biology course, Boston, MA

Honors

- 2022 AAAS Fellow, American Association for the Advancement of Science (AAAS)

C. Contribution to Science

1. a. Dutta S, Jiang J, Ghosh S, Patel S, Bhikadiya C, Lowe R, Voigt M, Goodsell D, Zardecki C, Burley SK. An idea to explore: How an interdisciplinary undergraduate course exploring a global health challenge in molecular detail enabled science communication and collaboration in diverse audiences. *Biochem Mol Biol Educ.* 2023 Mar;51(2):137-145. PubMed Central PMCID: PMC10050141.
- b. Burley SK, Bhikadiya C, Bi C, Bittrich S, Chao H, Chen L, Craig PA, Crichlow GV, Dalenberg K, Duarte JM, Dutta S, Fayazi M, Feng Z, Flatt JW, Ganesan S, Ghosh S, Goodsell DS, Green RK, Guranovic V, Henry J, Hudson BP, Khokhriakov I, Lawson CL, Liang Y, Lowe R, Peisach E, Persikova I, Piehl DW, Rose Y, Sali A, Segura J, Sekharan M, Shao C, Vallat B, Voigt M, Webb B, Westbrook JD, Whetstone S, Young JY, Zalevsky A, Zardecki C. RCSB Protein Data Bank (RCSB.org): delivery of experimentally-determined PDB structures alongside one million computed structure models of proteins from artificial intelligence/machine learning. *Nucleic Acids Res.* 2023 Jan 6;51(D1):D488-D508. PubMed Central PMCID: PMC9825554.
- c. Burley SK, Bhikadiya C, Bi C, Bittrich S, Chao H, Chen L, Craig PA, Crichlow GV, Dalenberg K, Duarte JM, Dutta S, Fayazi M, Feng Z, Flatt JW, Ganesan SJ, Ghosh S, Goodsell DS, Green RK, Guranovic V, Henry J, Hudson BP, Khokhriakov I, Lawson CL, Liang Y, Lowe R, Peisach E, Persikova I, Piehl DW, Rose Y, Sali A, Segura J, Sekharan M, Shao C, Vallat B, Voigt M, Webb B, Westbrook JD, Whetstone S, Young JY, Zalevsky A, Zardecki C. RCSB Protein Data bank: Tools

for visualizing and understanding biological macromolecules in 3D. *Protein Sci.* 2022 Dec;31(12):e4482. PubMed Central PMCID: PMC9667899.

- d. Zardecki C, Dutta S, Goodsell DS, Lowe R, Voigt M, Burley SK. PDB-101: Educational resources supporting molecular explorations through biology and medicine. *Protein Sci.* 2022 Jan;31(1):129-140. PubMed Central PMCID: PMC8740840.
2. a. Lubin JH, Zardecki C, Dolan EM, Lu C, Shen Z, Dutta S, Westbrook JD, Hudson BP, Goodsell DS, Williams JK, Voigt M, Sarma V, Xie L, Venkatachalam T, Arnold S, Alfaro Alvarado LH, Catalfano K, Khan A, McCarthy E, Staggars S, Tinsley B, Trudeau A, Singh J, Whitmore L, Zheng H, Benedek M, Currier J, Dresel M, Duvvuru A, Dyszel B, Fingar E, Hennen EM, Kirsch M, Khan AA, Labrie-Cleary C, Laporte S, Lenkeit E, Martin K, Orellana M, Ortiz-Alvarez de la Campa M, Paredes I, Wheeler B, Rupert A, Sam A, See K, Soto Zapata S, Craig PA, Hall BL, Jiang J, Koeppe JR, Mills SA, Pikaart MJ, Roberts R, Bromberg Y, Hoyer JS, Duffy S, Tischfield J, Ruiz FX, Arnold E, Baum J, Sandberg J, Brannigan G, Khare SD, Burley SK. Evolution of the SARS-CoV-2 proteome in three dimensions (3D) during the first 6 months of the COVID-19 pandemic. *Proteins.* 2022 May;90(5):1054-1080. PubMed Central PMCID: PMC8661935.
 - b. Riley KJ, Vardar-Ulu D, Pollock E, Dutta S. Students authoring molecular case studies as a partial course-based undergraduate research experience (CURE) for lab instruction. *Biochem Mol Biol Educ.* 2021 Nov;49(6):853-855. PubMed Central PMCID: PMC8773143.
 - c. Stebbing J, Sánchez Nievas G, Falcone M, Youhanna S, Richardson P, Ottaviani S, Shen JX, Sommerauer C, Tiseo G, Ghiadoni L, Viridis A, Monzani F, Rizos LR, Forfori F, Avendaño Céspedes A, De Marco S, Carrozzi L, Lena F, Sánchez-Jurado PM, Lacerenza LG, Cesira N, Caldevilla Bernardo D, Perrella A, Niccoli L, Méndez LS, Matarrese D, Goletti D, Tan YJ, Monteil V, Dranitsaris G, Cantini F, Farcomeni A, Dutta S, Burley SK, Zhang H, Pistello M, Li W, Romero MM, Andrés Pretel F, Simón-Talero RS, García-Molina R, Kutter C, Felce JH, Nizami ZF, Miklosi AG, Penninger JM, Menichetti F, Mirazimi A, Abizanda P, Lauschke VM. JAK inhibition reduces SARS-CoV-2 liver infectivity and modulates inflammatory responses to reduce morbidity and mortality. *Sci Adv.* 2021 Jan;7(1) PubMed Central PMCID: PMC7775747.
 - d. Kurnat-Thoma E, Baranova A, Baird P, Brodsky E, Butte AJ, Cheema AK, Cheng F, Dutta S, Grant C, Giordano J, Maitland-van der Zee AH, Fridsma DB, Jarrin R, Kann MG, Keeney J, Loscalzo J, Madhavan G, Maron BA, McBride DK, McKean M, Mun SK, Palmer JC, Patel B, Parakh K, Pariser AR, Pristipino C, Radstake TRDJ, Rajasimha HK, Rouse WB, Rozman D, Saleh A, Schmidt HHHW, Schultz N, Sethi T, Silverman EK, Skopac J, Svab I, Trujillo S, Valentine JE, Verma D, West BJ, Vasudevan S. Recent Advances in Systems and Network Medicine: Meeting Report from the First International Conference in Systems and Network Medicine. *Syst Med (New Rochelle).* 2020;3(1):22-35. PubMed Central PMCID: PMC7099876.