

Abhishek Dilip Deshpande

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Languages: Marathi (Native), Hindi (Native), English (Native), German (Basic)

EDUCATION

- 2023 - present** **Ph.D. student, Molecular Biology**
University of Colorado, Anschutz Medical Campus
- 2021** **M.S. Medical Biotechnology**
University of Illinois, College of Medicine at Rockford (UIC Rockford)
Thesis: Biochemical mechanisms of anti-cancer drugs targeting human Topoisomerase 2 α
- 2015** **B. Tech. Biotechnology**
Sinhgad College of Engineering, Pune, India
Thesis: Cross-species induction and enhancement of antimicrobial activity produced by marine microorganisms in co-cultivation systems

RESEARCH EXPERIENCE

- 2018-2019** **Biochemical mechanisms of anti-cancer drugs targeting human Topoisomerase 2 α | UIC Rockford**
Advisors: John L. Nitiss, Ph.D. & Karin C. Nitiss, Ph.D.
- Focused on understanding the role of the ATPase and C-terminal domains of the enzyme in regulating DNA cleavage.
 - Generated single amino acid mutations in different domains of the enzyme using site-directed mutagenesis and Gibson assembly and characterized these mutants by performing drug sensitivity assays.
 - Biochemically characterized mutants by expressing them in yeast systems, purifying them using affinity chromatography and performed assays to understand their activity, ATP requirements, and role in DNA cleavage.
- 2018-2019** **Understanding the role of Chromodomain Helicase DNA binding protein 2 (CHD2) in the repair of topoisomerase mediated DNA damage | UIC Rockford**
Advisors: John Nitiss, Ph.D. & Karin C. Nitiss, Ph.D.
- Studied the role of DNA damage by anti-cancer drugs in the context of chromatin by performing confocal microscopy to detect DNA damage foci in CHD2 knockout cells.
 - Generated CHD2 knockout cell lines using CRISPR/Cas9 technology and validated the knockout using DNA mismatch repair assays and western blotting.
- 2018-2019** **sciNote: Transition from Paper-based to Electronic Lab Notebook | UIC Rockford**
Class Collaborative Study
- A collaborative project conducted to compare paper lab-notebooks to electronic lab notebooks.
 - Used sciNote as a model software to assess the efficiency of a virtual method of scientific documentation and data sharing.
- 2014-2015** **Cross-species induction and enhancement of antimicrobial activity produced by marine microorganisms in co-cultivation systems | Sinhgad College of Engineering**
Advisor: Sarita Mahajani, Ph.D.
- Used the phenomenon of quorum sensing to discover new anti-microbial compounds from marine microbes.
 - Isolated bacteria and fungi from a marine water source and co-cultivated them to induce the production of novel antimicrobial compounds.
 - Extracted supernatants from coculture systems to test their anti-microbial activity against pathogenic microbes.

LABORATORY SKILLS

Affinity chromatography	ELISA	Gibson assembly	Protein expression and purification
Animal handling	Fluorescence microscopy	Mammalian cell culture	Reporter assays
CRISPR/Cas9 technology	Gene cloning	PCR/ qPCR	Reversed phase chromatography
DNA/RNA isolation	Gene editing	Plasmid manipulation and mutagenesis	Transcriptomics
Electronic lab notebooks	Gene knockout	Protein and DNA Gel electrophoresis	Western blotting

WORK EXPERIENCE

- 2021-2023** **Senior Research Associate I – Biology**
Empress Therapeutics (formerly Toran Therapeutics, Inc.) | Cambridge, MA
Manager: Shuai Wu, Ph.D.
- Independently developed and optimized cell-based reporter assays in monocytes, T-cells and B-cells to test the bioactivity of small molecule drug candidates generated through the Empress Therapeutics bio-platform.
 - Developed a high-throughput transcriptomics platform for molecule bioactivity screening, consisting of pre-assay cell work, RNA extraction, RNA library preparation and data interpretation post-sequencing.
 - Currently assisting with the development of a high throughput chemo-proteomics platform.
- 2019-2021** **Research Associate – Cellular and Molecular Biology**
Toran Therapeutics, Inc. | Cambridge, MA
Manager: Alba Luengo, Ph.D.
- Worked with the Discovery Biology team to study the role of Transporter proteins.
 - Became familiarized with mammalian cell culture techniques and generated stable cell lines using virus transduction.
 - Developed and optimized cell-based assays for target validation and drug discovery in collaboration with the chemistry team at Toran Therapeutics.
 - Extensively used molecular biology tools: Gateway cloning, restriction enzymes-based cloning, and CRISPR/Cas9 based techniques (gene overexpression, knockdown, knockout).
 - Discussed frequently with my manager and team to brainstorm innovative ideas, troubleshoot and enhance ongoing experiments, interpret data, and create presentations.
- 2018-2019** **Graduate Teaching Assistant: Molecular Biology & Recombinant DNA Tech | UIC Rockford**
- Assisted students with bioinformatics tools, cloning, transfections, cell culture techniques, western blotting, PCR and confocal microscopy. Worked with students as a team to create knockout cell lines using CRISPR/Cas9.
 - Assisted the professor with setting up lab materials and preparing reagents required for the class. Managed and coordinated the class during laboratory sessions.
- 2018-2019** **Lab Math Assistant | UIC Rockford**
- Taught laboratory essential math to a class of first-year graduate students, assisting in their understanding of basic calculations required to make buffers, cell cultures, antibody dilutions, etc.
- 2016-2017** **Quality Control Intern, Serum Institute of India Pvt. Ltd. | Pune, India**
- My role at this internship was to optimize ELISA and SDS-PAGE to assess the quality of their vaccine.
 - Trained in animal handling techniques like dosing, bleeding and spleen isolation to extract splenocytes.

2015-2016

Trainee

API R&D Cipla Ltd. | Mumbai, India

- Sponsored by Biotech Consortium India Ltd., Department of Biotechnology, India.
- Developed a process to purify anticancer drugs using high resolution chromatography techniques.
- Purified and analyzed small molecule anticancer drugs using preparative and analytical HPLC. Worked on optimizing tablet making by comparing wet and dry granulation techniques.

PUBLICATIONS

- **Deshpande, A., Panjwani, R., Gupta, S., Mahajani, S. and Joshi, K.** Co-cultivation systems of marine organisms for the discovery of novel drugs. *Journal of Microbial World*, vol. 17(no.1), pp: (9-14), Microbiologists Society, India (2015).
- Panjwani, R., **Deshpande, A., Mahajani, S., Joshi, K.** Production of bioactive compounds using marine isolates in co-culturing systems. *International Journal of Current Engineering and Scientific Research* 2, 64 (2015).

POSTER PRESENTATIONS

- **Rockford Research Day 2019 at UIC:** Identification of etoposide hypersensitive mutants of human Top2 α .
- **American Association for Cancer Research 2019, Atlanta:** Regulation of DNA cleavage by the amino and carboxyl domains of human Top2 α .
- **Rockford Research Day 2018 at UIC:** sciNote- Transition from paper-based to electronic lab notebook.
- **Rockford Research Day 2018 at UIC:** CRISPR/Cas9 as a tool for studying the action of drugs targeting topoisomerases.
- **International Conference on Biotechnology & Bioengineering (ICBB-2014):** Production of Bioactive Compounds in Co-Culturing Systems.

COMMUNITY ENGAGEMENT

2020

Alumni Speaker

Department of Biotechnology | Sinhgad College of Engineering, Pune, India

- Was invited by the department to speak to students about the scope and potential of Biotechnology as a current professional in the field.

2014-2015

General Secretary

KSHITIJ Social Service Club | Sinhgad College of Engineering, Pune, India

- Organized blood donation camps, conducted visits to *Snehalaya: Home of Love*, and carried out city clean-up initiatives.

2014-2015

Alumni Cell Coordinator

Department of Biotechnology | Sinhgad College of Engineering, Pune, India

- Conducted and managed quarterly alumni meetings for student-alumni engagement.