BIOGRAPHICAL SKETCH

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NAME: Kejriwal, Rishabh

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

POSITION TITLE: Graduate Research / Teaching Assistant

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
University of Mumbai (India)	B. Pharm	08/2013	Pharmaceutical Sciences
University of Edinburgh (UK)	MSc	07/2011	Drug Discovery and Translational Biology
University of Connecticut (USA)	PHD	05/2022	Molecular and Cell Biology

A. Personal Statement

I want to be a “killer” virologist, one who can design effective therapeutics to kill a virus or use a virus to stop cancer. To achieve this goal, I need to understand how the virus works, identify what I can target, and design and discover novel therapeutics. I believe my past experiences and my current PhD training are preparing me to achieve my goal.

One of my projects in Dr. Simon White’s lab involve structurally and functionally characterizing a highly conserved picornaviral protein called 2C. I can proudly say that my lab is one of the few labs in the world who have been able to purify the protein in its native state. In parallel, I am screening compounds against 2C using in vitro ATPase assay and ex vivo CPE assay using immortalized animal and human cell lines. I am developing in vitro helicase assay and ex vivo luciferase assay to be used in the screening process to better evaluate the efficacy of the compounds. My other projects involve understanding the assembly of the viral capsid with a focus on 2C and autophagy and designing antisense oligonucleotide therapeutics against a few of the Picornavirus family members.

I am a highly motivated and goal oriented student who is not afraid to take on new challenges to achieve my goal. I was accepted as a PhD student at UConn in Dr. Debra Kendall’s lab (Department of Medicinal Chemistry) back in 2014. I wanted to know more about GPCRs, after learning about them in 2012 due to the Nobel Prize awarded to Dr. Lefkowitz and Dr. Kobilka. I worked in her lab for three years on two projects; one involving screening compounds to discover novel positive allosteric modulators for CB1 receptor and the second was to use unnatural amino acid and click chemistry to understand its mechanism by finding downstream binding partners. However, fate had something else in mind and even though I spent three years in her lab, I decided to change my field to virology. The change was not sudden and after attending a few seminars involving finding new age-old viruses due to global warming and using viruses to deliver anti-cancer drugs, I decided to move to the Department of Molecular and Cell Biology (MCB) at UConn. Here, I rotated with two virologists and a cell biologist and ensured that virology was where I wanted to be and I was enthusiastic to start on this new adventure.

I can confidently state that I can work independently as well as be a team player. I have been in multiple leadership positions; the most recent one was where I was the Vice President of the American Association of Pharmaceutical Scientists (UConn Student Chapter). I was involved in organizing multiple events like the SAPA-CT UConn joint symposium, AAPS NorthEast Student Conference, a few academic seminars and webinars. I believe in collaborative science and Dr. White and I have effectively communicated and organized cross-functional collaborations with academia and industry. Moreover, being a teaching assistant, I have effectively taught four different courses over the past four years in the School of Pharmacy and in the Department of MCB.

Overall, I am extremely grateful to Dr. White and my previous advisors for helping me build a solid foundation for my long term goal and I believe by applying to various trainings like NCCAT cryoEM training, I will be able to become a “killer” structural virologist.

B. Positions and Honors

Positions and Employment

2011 - 2012	Jr. Manager (Formulations and Development), Finecure Pharmaceuticals Ltd., Ahmedabad
2013 - 2014	Research Trainee (Integrated Biophysics and Structural Biology lab), The Advanced Centre for Treatment, Research and Education in Cancer, Navi Mumbai
2014 -	Graduate Research / Teaching Assistant, University of Connecticut

Other Experience and Professional Memberships

2016 - 2017	Vice President, American Association of Pharmaceutical Scientists (AAPS) UConn student chapter

Honors

2013	Finalist - The Edinburgh BioQuarter Innovation Competition, Edinburgh BioQuarter
2008	Awarded Watumall Merit Award (2007-08) – Academic achievement award

C. Contribution to Science

A. Research I conducting in Dr. Simon White's Lab at the University of Connecticut (UCONN):

Currently, I am a PhD student in Dr. Simon White's lab in the Department of Molecular and Cell Biology at the University of Connecticut (UCONN). Dr. White's research focus is studying and understanding the assembly mechanisms in Picornaviruses and discovering and developing novel anti-viral compounds.
I am working on structurally characterizing the viral 2C protein which is a highly conserved protein in the Picornaviridae family and is known to be an ATPase and a helicase. I am using cryoEM to obtain the structure of 2C. Simultaneously, since 2C is an attractive target for novel anti-viral drugs, I have been screening compounds against it using in-vitro ATPase assay and ex-vivo (using cells) assays like CPE assay and luciferase assay.

B. Research I conducted in Dr. Debra Kendall's lab at UCONN:

I worked in Dr. Kendall's lab for three years along with fulfilling my duties as a graduate teaching assistant. I worked on two projects; one was to functionally characterize novel positive allosteric modulators for the Cannabinoid Receptor-2 (CB2) and the second one involved incorporating unnatural amino acids in the protein sequence in order to find its downstream binding partners.

The CB2 receptor, a G protein-coupled receptors (GPCRs), resides in peripheral tissue, including tissue associated with the immune system, and is involved in cannabinoid-mediated immune responses. Both CB1 and CB2 bind Δ9-tetrahydrocannabinol, the psychoactive component of Cannabis sativa L., and other cannabimimetic compounds.
Using different assays like radioligand binding assays, G protein coupling activity assay using GTP and cAMP assay, and internalization assays using confocal microscopy, I examined how new ligands bind to these receptors and elicit their activities at the molecular level. Unfortunately, the compounds I tested were not specific towards one receptor. However, these findings helped our collaborator and us to design more compounds. Further, the incorporation of the unnatural amino acid did not reach to the desired efficiency due to which it was difficult to continue the project.

C. Research I conducted at ACTREC:

I worked on the structural and functional characterization of the pro-apoptotic Serine Protease HtrA2 using in-silico studies, biophysical and biochemical techniques. My work majorly involved delineating the conformational changes arising during the activation of the protein and also during interaction with a substrate like β-casein.
The techniques used include Recombinant Protein Expression, Purification and fluorescence spectroscopic methods like FRET, Circular Dichroism and Enzyme Kinetic Studies.
HtrA2 has been implicated in neurodegenerative diseases and cancer. Understanding the conformational changes of this protein would aid in defining the mechanism of the protein. This would be helpful in controlling its activation/deactivation, the effect of which could be studied for its implications in the

aforementioned diseases. Also, once the structure and function of the protein would have been characterized, it would facilitate the development of specific ligands. These ligands could either be agonistic or antagonistic in nature depending on their intended role.

D. Research I carried out during my MSc at University of Edinburgh:
My MSc project involved identifying and validating potential hits acting as a Cyclophilin C (CypC) inhibitor. For this, the target protein, i.e. CypC, was purified, validated and used for ligand binding studies. The ligands were identified by means of virtual screening wherein three docking software, LIDAEUS, Autodock Vina and Autodock 4.2 were used. The ligand binding studies were carried out using thermal denaturation assay (TDA) and Fluorescence Polarization (FP). However, the ligands that we screened did not have a high enough binding affinity in order to characterize them further.
CypC has been implicated in a variety of cancers. Also, the cyclophilins are structurally conserved throughout the evolution indicating that if other CyPs have been implicated in a variety of diseases from viral infections to neuroprotection, it is evident that CypC, too, might play a role in some biochemical function which is yet to be characterised and CypC inhibitors might facilitate in unravelling this mystery. Also, once a specific CypC inhibitor is developed, it could be studied further to discover a novel drug therapy.

D. Additional Information: Research Support and/or Scholastic Performance

Scholastic Performance

My GPA at UConn is 3.96/4.00