ANKIT JOGDAND

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EDUCATION

May 2024 - May 2025	**Master's thesis project**	UT Austin, USA.
Aug 2020 - May 2025	**BS-MS Dual Degree**	IISER Pune, India.
July 2020	**12th standard CBSE board**	JNV Nanded, India.
May 2018	**10th standard CBSE board**	JNV Nanded, India.

RESEARCH EXPERIENCE

Master Thesis May 2024 - present
Advisor **Prof. Manish Kumar** *(Professor, UT Austin)*
Co-advisor **Dr. Harekrushna Behera** *(Research associate, UT Austin)*

Project 1: Developing artificial ion channels to extract and purify critical minerals, and recover nutrients.
I am involved in this project to design synthesize and characterize artificial lithium ion selective channels using different synthetic and analytic techniques. We have designed and developed derivatives of pillar[5]arene based ion channels which are selective towards specific critical minerals like lithium ions. We are incorporating these channels into a scalable membrane platform for lithium separation from brines or ores for practical application. Currently, we are studying its lithium transport and selectivity over other competing ions using electrophysiological setups and ICP-MS. ***Manuscript under review**

Project 2: Voltage-gated lanthanide selective supramolecular membrane channels.
This project focused on the engineering of nanopore and nanopore incorporated membranes for lanthanide ion separation and purification. I worked on the synthesis and characterization of ion channels. I have synthesized Diphenyl phosphene derivatives for selectivity of middle lanthanides like Europium and Ytterbium. In addition I gained expertise in electro physiological studies instruments (patch clamp) and artificial tissue preparations to study ion separation activities. *Work published in ACS nano, 2025*

Project 3: Highly Breathable and Protective Carbon Fabrics.
This project focused on the engineering of CMS membranes for breathable protective fabrics. I conducted a controlled CEES vapor adsorption study using CMS membranes in a sealed 'jar-in-jar' setup to assess their sorptive capacity, followed by quantitative extraction and analysis using ^{1}H NMR spectroscopy. Utilized imidazole as an internal standard to accurately determine CEES uptake, contributing to the revision of a peer-reviewed manuscript. *Work published in ACS Appl. Mater. Interfaces, 2025*

Semester Project Intern Aug 2023 - April 2024
Advisor **Prof. Siddhesh Kamat** *(Asso. Prof., IISER Pune)*

Project: Understanding lipid metabolism and lipid-protein interaction in mammalian physiology.
I explored the lipid-protein interaction in mammalian cells. I worked on Screening for lysophosphatidylserine lipases in mice tissue. This project aims to validation of ABHD12 as a lipase in peripheral tissues of mouse. Towards that aim, experiments were performed using different biochemical techniques. In this project, my work was to increase number of ABHD12 knockout mice. I gained expertise in techniques like Polymerase chain reaction, DNA isolation, gel electrophoresis.

Summer Project Intern May 2023 - July 2023
Advisor **Prof. Kazushi Kinbara** *(Professor, TIT Tokyo)*

Project: To reveal the mechanism of suppression of protein aggregation by PEGylated amphiphilic molecules.
In this lab, I worked as a project intern and was involved in the project to propose a practical approach of protein stabilization by introducing longer PEG chains. I performed successful synthesis and characterization of a small fluorescent amphiphilic molecule in this short period of time. The synthesized molecule is working as an efficient suppressor of protein aggregation and can be used to study the mechanism of suppression of protein aggregation.

I have performed various assays using UV-vis spectrophotometer, fluorescence spectrophotometer, DLS instrument, MD simulation method etc. to show the activity of this molecule towards suppressing protein aggregation.

Summer and Semester Project Intern March 2022 - May 2023
Advisor **Prof. Pinaki Talukdar** *(Professor, IISER Pune)*

Project: Synthesis and characterisation of barrel rosette fluorescent proton channel.
In this lab, I became acquainted with various synthesis and purification techniques and instruments used for an ion transport studies. I became competent in data analysis of various spectroscopic techniques. During this time I worked on the development of a small molecule based barrel rosette fluorescent proton channel which can selectivity transport protons rejecting other competing ions. So developing artificial protons channels is the need of the hour to regulate pH level of a living system for better functioning. During this period I conducted total synthesis, characterization and performed various assays of the artificial proton channel.

SKILLS

Experimental skills	Proficiency in performing different kind of chemical reactions (coupling reactions, hydrogenation reaction, catalytic reaction, etc.); expertise in compound purification by column chromatography, RP-HPLC, crystallization and precipitation techniques; Familiar with Schleck techniques and glovebox for handling hygroscopic, pyrophoric and air sensitive reagents and reactions; Expertise in designing and executing multi-step synthesis of ion channels including pillar[n]arene based moities.
Instrument Skills	Inductively coupled plasma mass spectrometry (ICP-MS); UV-visible spectrophotometer; Fluorescence spectrophotometer; IR Spectrophotometer; Patch clamp (BLM); DLS; Automated flash chromatography; HPLC;
Analytical Skills	I-V plots; ICP-MS elemental composition analysis; NMR spectrum; HRMS data; IR spectrum; MALDI-TOF Mass Spectrum; TLC analysis; Absorption and emission spectrum; Chromatograms;
Software Skills	Origin; Chemdraw; MestreNova; MATLab; Microsoft office (word, excel, powerpoint); pymole; BioRender 3Dpaint; Adobe photoshop; Adobe illustrator
Ion transport studis	Expertise in vesicle preparation including dye entrapped vesicles using mini extruder and freeze and thaw method, artificial tissue preparation for potentiostat and patach clamp studies; painting standing lipid bilayer for patch clamp studies; proficiency in performing HPTS assay for ion transport activity, Proficiency in elemental composition analysis using ICP-MS technique.

RESEARCH INTERESTS

- Artificial ions, proton and water channels; Supramolecular chemistry; Synthetic organic chemistry;
- Permittivity in protein channels; Water as a probe in drug testing; Hydration at lipid interface;
- Membrane science; Lanthanide separation; Critical minerals extractions and purification;
- Chemical Biology; Lipid and protein biology; Anion-Cation recognition;
- PFAS detection and decontamination; Drug discovery and diagnostic.

PUBLICATIONS

- Behera, H.; Duncan, T.; Samineni, L.; Oh, H.; **Jogdand, A.**; Karnik, A; Dhiman, R; Fica, Aida; Hsieh, T.; Ganesan V.; Kumar, M.* Lanthanide-Selective Artificial Channels. *ACS Nano* **2025**, 19 (14), 13927–13940.
- Oh, H.; Lopez-Marques, H.; Wamble, N. P.; Vogler, R. J.; Dhiman, R.; Behera, H.; Smith, L. A.; Yu, C.; **Jogdand, A.**; Hsieh, T.; Hernandez, J.; Mullins, C. B.; Freeman, B. D.; Kumar, M.* Highly Breathable and Protective Carbon Fabrics. *ACS Appl. Mater. Interfaces* **2025**, 17 (12), 14120–14131.
- Behera, H.; Duncan, T.; Samineni, L.; **Jogdand, A.**; Oh, H.; Chenhao Yao, Venkat Ganesan, Manish Kumar* Bioinspired super selective Lithium membrane channels. **(Manuscript under review)**

LANGUAGES KNOWN

- English (academic and working proficiency); Marathi (Native); Hindi

FELLOWSHIPS

- **JPY 500,000** awarded to cover living expenses at Tokyo during an international collaborative summer project.
- **USD 31,200** awarded to cover my living expenses at Austin during Masters thesis project for one year.

SYNERGESTIC ACTIVITIES

- National cadet corps **(NCC)** ('A' certificate) from **Jawahar Navodaya Vidyalaya, Nanded** (2016)
- Conquered **Kedarkantha peak (3810 m)** of Himalayan ranges during winter break (2022)
- Conquered **Mt. Fuji (3776 m)** , the tallest mountain in Japan as a trek leader during summer break (2023)
- **Tandem-skydiving jump (4500 m)**, Exemplified courage and focus in a high-adrenaline environment (2025).

CONFERENCE ATTENDED

- Attended **'Chemsymphoria'** during 22-24 **December 2022** at IISER Pune
- Presented a poster on 'Screening lysophosphatidylserine lipases in a mouse tissue" in **April 2024** as part of my semester project at IISER Pune.