

# Joy Karmakar, PhD

karmakarjoy@pm.me

---

## Professional Summary

Innovative and results-driven chemist with over 7 years of experience in designing, synthesizing, and optimizing novel chemical compounds for various applications. Proven expertise in small molecule drug development, fluorescent sensor design, and synthetic pathway optimization. Adept at leveraging advanced analytical techniques and problem-solving to drive product development from concept to preclinical stages.

## Key Skills

- **Drug Discovery & Development:** Synthesis of inhibitors (e.g., SLC26A6, SLC26A4, SLC26A3) for intestinal disorders, edema, and lung diseases.
- **Chemical Synthesis:** Design of luminescent Bimane derivatives and PEG-conjugated compounds.
- **Analytical Techniques:** NMR, HPLC, LCMS, HRMS, Flash Chromatography, IR/UV-Vis/Fluorescence Spectroscopy.
- **Project Leadership:** Managed research projects, optimized synthetic routes, and delivered publishable results under tight deadlines.
- **Molecular Docking & Computational Tools:** AutoDock 4, AutoDock Vina, Maestro (Schrödinger Suite); completed the 7-day workshop on ‘Molecular Docking Series: From Fundamentals to Automation and Visualizations’.
- Completed certified hands-on training in computational **ADMET profiling** using SwissADME, ADMETlab 2.0, PreADMET, DruLiTo, and OSIRIS Property Explorer to evaluate drug-likeness, pharmacokinetics, and toxicity parameters of small molecules for early-stage drug discovery.

## Education

**Ph.D. in Chemistry** | Ari’el University, Israel | 2018 – 2022

- Dissertation: *Novel Bimane Derivatives: Synthesis and Metal Complexes*

**M.Sc. in Chemistry (First Class)** | University of Hyderabad, India | 2013 – 2016

- Dissertation: *Studies on Propargyl Claisen Rearrangement via in situ Formed Acetal*

**B.Sc. in Chemistry (First Class with Honors)** | Presidency College, University of Calcutta, India | 2010 – 2013

## Professional Experience ([Google Scholar Link](#))

**Postdoctoral Scholar, University of California, San Francisco**

*Department of Pediatrics, Cil Lab (Formerly Verkman Lab), 2023 – 2025*

- Designed and synthesized novel PAT1 (SLC26A6) inhibitors, advancing a potential first-in-class treatment for cystic fibrosis-associated intestinal disorders.

- Developed Pendrin (SLC26A4) inhibitors as drug candidates for edema, hypertension, and lung diseases, improving potency and selectivity.
- Led synthesis of PEG-conjugated DRA (SLC26A3) inhibitors, enhancing targeted delivery for intestinal therapies.
- Optimized synthetic pathways for CaSR antagonists (e.g., ronacaleret, NPS-2143), reducing steps and increasing yield.

#### **Graduate Student, Ariel University, Israel**

Advisors: *Prof. Flavio Grynszpan and Prof. Alex Szpilman, 2018 – 2022*

- Developed novel Bimane derivatives as fluorescent sensors for detecting water, acids, hydrogen peroxide, and iodine, with applications in environmental monitoring and diagnostics.
- Synthesized *syn*-Bimanes with diverse functional groups (amines, boronic esters, triazoles), enhancing their versatility as sensors.
- Collaborated with Prof. Mindy Levine to validate sensor applications, resulting in 5 peer-reviewed publications and international presentations.

#### **Research Fellow, Indian Institute of Science Education and Research (IISER-Pune), India**

*Department of Chemistry, 2017 – 2018*

- Developed chlorogermylumylidene complexes within bisimine frameworks, showcasing expertise in organometallic synthesis.

#### **Research Fellow, CSIR-Indian Institute of Chemical Technology (CSIR-IICT), India**

*Centre for Semiochemicals, 2016 – 2017*

- Synthesized hexadecenoic acid ester derivatives using Yamaguchi reagent, creating eco-friendly pest control solutions for stored grain protection.

#### **Selected Achievements**

- *Postdoctoral Independent Research Grant Award* from **Sandler Program for Breakthrough Biomedical Research (PBBR)** by **Sandler Foundation**, USA, 2024.
- *Postdoctoral Fellowship* awarded from 2023 to 2025 by University of California, San Francisco, USA.
- *Special Sponsor Award (NCCR Bioinspired)* of the **European Young Chemists Meeting** and **Swiss Academy of Sciences**, Fribourg, Switzerland, 2022.
- **Excellence in Doctoral Research** (₪ 5000) awarded by Scholarship & Award Committee, School of Graduate Studies, Ari'el University, Israel. 2022.
- *A Grant of ₪ 30,000 (~\$8000)* was awarded by the School of Graduate Studies, Ari'el University, Israel, 2022.

#### **Affiliations**

- Member, American Chemical Society (ACS) & Israel Chemical Society
- Invited Member, Youth Editorial Board, *Carbon Energy*, Wiley (2024)