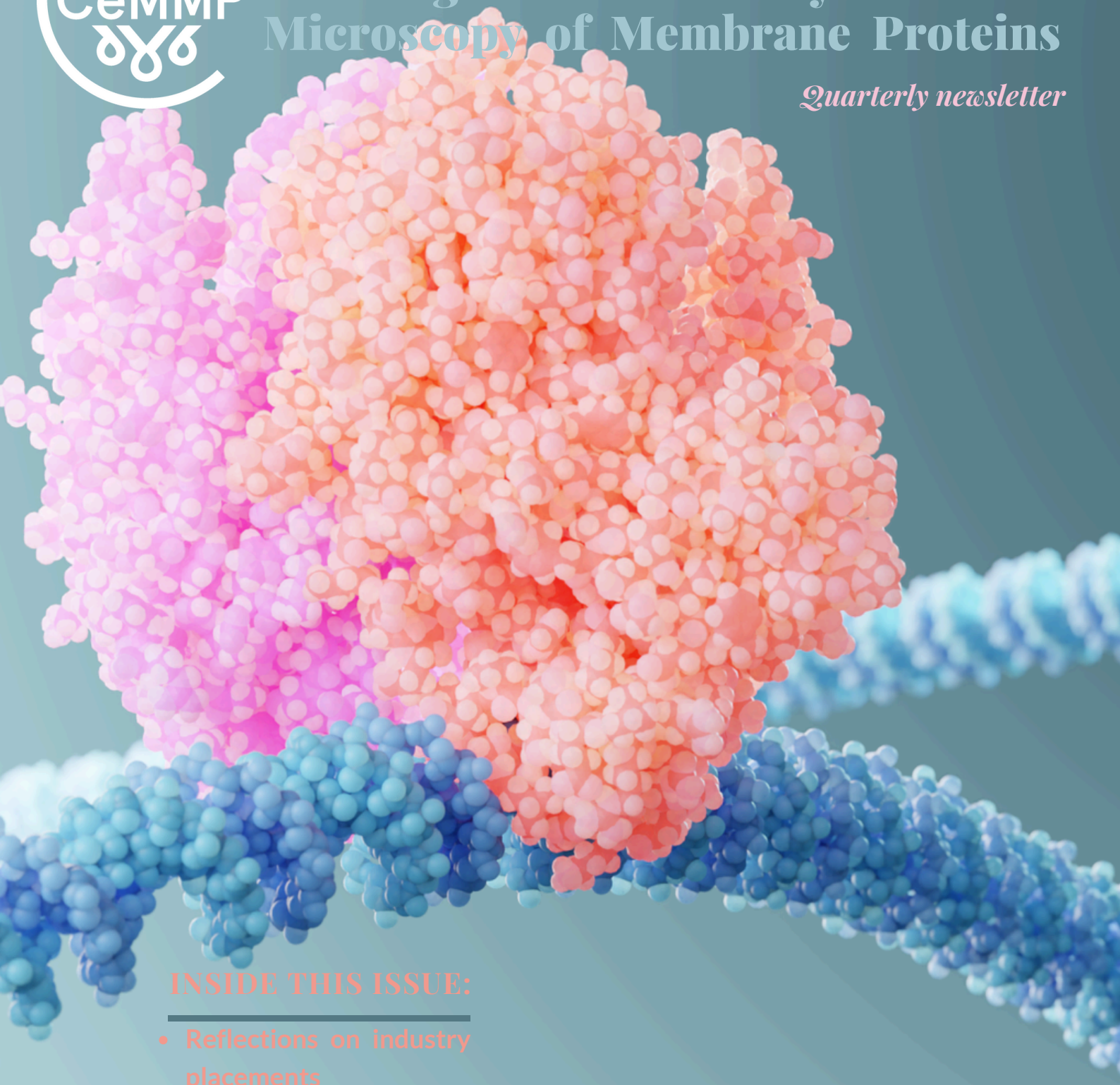
JULY 2025, ISSUE 17

ARC Industrial Transformation Training Centre for Cryo-electron Microscopy of Membrane Proteins

Quarterly newsletter



INSIDE THIS ISSUE:

Image credit - Tom van Hattem, www.lab76.org

Australian Government
Australian Research Council
MONASH University
THE UNIVERSITY OF MELBOURNE
bio21 institute
MOLECULAR HORIZONS
UNIVERSITY OF WOLLONGONG AUSTRALIA
WEHI brighter together

CCeMMP acknowledges the peoples of the Kulin, Dharawal, Yuin and Wadi Wadi Nations on whose land the Centre and its Nodes operate. We pay our respects to their Elders, past, present and emerging.

From the Director

Prof. Patrick Sexton

CCeMMP Director, Prof. Patrick Sexton

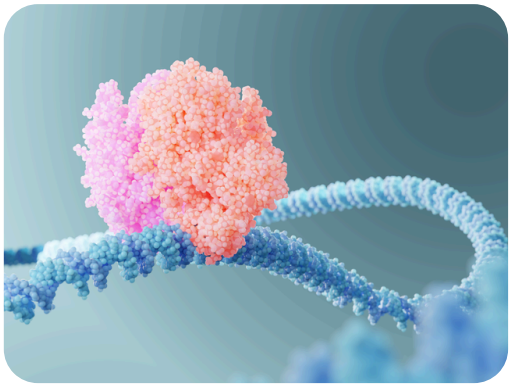
In this quarter we welcomed Dr. Chandan Kishor who was recently appointed as the new UoW node ICPD. It was also rewarding to read the reflections of 3 more ICHDRs who have recently returned from completion of the embedded component of their industry placements. It was also exciting to see many postdocs and students of the Centre receiving awards for their research. A special shout out to Prof. David Adams, one of the founding CIs for the Centre grant, who was inducted as a Fellow of the Australian Academy of Science, recognising his outstanding contributions to neuropharmacology and neurophysiology. Of course, more new research being published, including in Science, Sci Advances, Cell Reports, PNAS and EMBO J, with lots of new structures that are highlighted in our gallery.

As always, thanks to the members and affiliates of the Centre who are the foundation of everything we do.

Prof. Patrick Sexton
Director

Did you know?....

Have you noticed something different with PDB this year...? What is it with those extended PDB IDs sitting next to the regular IDs? Turns out PDB is just getting us ready for the transition when they run out of 4-character ID's. It is anticipated that the 4-character IDs will run out by 2028, after which only 12-character IDs will be issued.



On the cover: *From our WEHI node - PDB:9CDH, EMD-45476. Tan et al., (2025). MORC2 is a phosphorylation-dependent DNA compaction machine. Nat Commun 16: 5606. https://doi.org/10.1038/s41467-025-60751-z* ***Image credit: Tom van Hattem, www.lab76.org***

ICHDR Update

Industry Placements

Students continue to return from their 3 month embedded components of their industry placements. This last quarter we welcomed back Minakshi Baruah, Anna Beyger and Bhavika Rana from their industry partners Pfizer (Groton, CT, USA), Servier (Paris, France) and Sanofi (Paris, France), respectively. All have been kind enough to share their experiences below.

Current placements: Marialena Georgopoulou (Aculeus, Melbourne).

Preparations continue for other students planning to do their placements later this year.

Reflections on My Industry Placement at Pfizer

I've been fortunate to spend the last 3.5 months in the small town of Groton, Connecticut, working at Pfizer Inc.- a life-changing experience that was both professionally enriching and personally meaningful.

Moving to the US was completely new for me, but from the very beginning, I felt embraced by a community that was warm, supportive, and genuinely welcoming. I joined the Molecular Sciences team led by Dr. Seungil Han- an outstanding scientist and mentor- who, along with the entire group, made me feel like part of the team from day one.

Before starting, I had assumed that an industry role might be more compartmentalized—that I'd mainly focus on solving cryo-EM structures with limited involvement in the broader research pipeline. But that notion quickly changed. I found myself in a dynamic and collaborative environment, where team members contribute across diverse techniques and disciplines. In my very first week, I was reviewing protein expression strategies, optimizing purifications, preparing cryo-EM grids, screening samples, and even collecting full datasets on a 300 kV Titan Krios microscope- all for the first time on my own. I was absolutely mesmerized by the sophistication of that incredible instrument.

One of the most eye-opening aspects of this placement was experiencing how industry tackles scientific challenges. The same level of technical rigour found in academia is very much present, but it's applied with a different mindset- one shaped by tight timelines, strategic priorities, and a strong focus on therapeutic outcomes. Adjusting to this fast-paced environment was a learning curve, but it became an incredibly smooth and enjoyable journey thanks to the amazing people I had the privilege of working with: Dr. Seungil Han, Dr. Joshua Lees, Dr. Jinseo Park, Dr. Min Woo Sung, Dr. Kevin Huynh, Dr. Hirohide Takahashi, and the wonderful Alison Verghese.

The team at Pfizer

Alison was my go-to person- always ready to help, whether it was running FPLC, sourcing compounds, or troubleshooting cell culture issues. Whenever I hit even a small roadblock in data processing, Jinseo was right there to help- and also happened to be one of my regular lunch buddies along with Kevin. Although Seungil and Josh were technically my supervisors, it never felt that way; we were more like friends, discussing science and going for walks. Honestly, it amazed me how two incredibly talented scientists could be so down-to-earth, kind, and easy to talk to. I'm deeply grateful for the mentorship, encouragement, and

sense of belonging I received from the entire SBDD group. They turned what could have been an overwhelming new chapter into one of the most rewarding experiences of my PhD journey.

In addition to cryo-EM, I had the opportunity to perform surface plasmon resonance (SPR) experiments to study ligand binding kinetics- work that beautifully complemented the structural side. I'm thankful to Dr. John Warner for guiding me through the intricacies of SPR; the sensitivity of those sensors was fascinating to observe. My exposure extended beyond structural biology- I engaged with medicinal chemists, computational scientists, and other cross-functional teams, which gave me a holistic view of Pfizer's approach to drug discovery.

What truly made this experience unforgettable were the people. From spontaneous hallway conversations to after-work happy hours at local pubs, and the lively lunch breaks at the iconic 274 canteen, the camaraderie and kindness I encountered made Groton feel like home. I came to the US as a graduate student from Australia, carrying big hopes and, admittedly, a bit of nervousness. I was stepping into a world I didn't fully know- but all of that changed the very first day I met the incredible team. What I found wasn't just colleagues or mentors- I found a family. What began as a professional placement quickly grew into a chapter filled with genuine friendships, laughter, support, and memories I'll cherish for a lifetime.
Over these past few months, I've gained invaluable technical skills, a deeper appreciation for the drug discovery pipeline, and a profound respect for the collaborative spirit that drives innovation at Pfizer. I'll carry the lessons and relationships from this experience with me for the rest of my career. And I'll never forget the quote I saw so often at Pfizer: "Science will win." It's a belief that's now etched into my heart.
Thank you for everything.

-Minakshi

Reflections on My Industry Placement at Servier

Three months ago, I landed in Paris, and it's hard to believe how quickly the time has flown. After a week of adjusting to the end of the European winter (and enjoying far too many pain au chocolats), I began my internship at Institut de Recherche et Développement Servier.

Ania at Servier

I joined the Protein Science team as part of a long-standing collaboration with my lab at Monash University. From the very beginning, I felt welcomed and included, working alongside researchers with deep expertise in structural biology, biochemistry, biophysics, and computational chemistry. I was fortunate to be mentored by Dr Rosana Inacio dos Reis Thevenot, Dr Sonja Kuhn, and Dr Isabelle Thérét, who were incredibly generous with their time and knowledge.

Throughout the placement, I built on my prior experience in protein purification and was exposed to a more rigorous and streamlined industry approach to experimental design. I learned how various biophysical and quality control techniques are integrated into workflows to ensure sample quality, particularly important in the context of structure-based drug discovery. I also had the chance to get hands-on with techniques I hadn't used before, which really expanded my skill set.

What stood out was the level of collaboration and efficiency across teams, with a strong focus on scientific reproducibility, cross-functional input, and real-world application. It was exciting to be involved in live projects and to get a glimpse into the early stages of drug development, understanding how experiments fit into broader timelines, how decisions are made, and how confidentiality and strategic thinking shape the process.

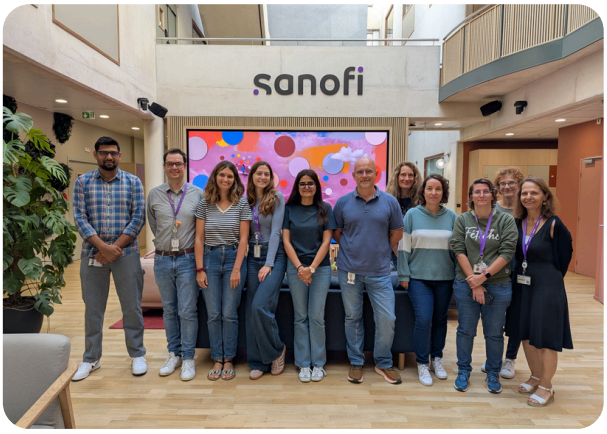
Working in industry felt different, but not in the way I expected. The pace was faster and more goal-oriented, but the scientific curiosity and drive were just as present as in academia. This experience gave me a new perspective on research, and helped me think more critically about my own work.
I've returned with new techniques, ideas, and ways of thinking that I'm already applying in the lab. The placement was incredibly valuable, and it's reassuring to see how much innovation happens in both academic and industry settings. I'm keeping all doors open for the future, and now I have a much clearer idea of what that future could look like.

The team at Servier

--Ania Beyger

SERVIER

Reflections on My Industry Placement at Sanofi



The team at Sanofi

"I still can't believe how quickly the three months at Sanofi flew by! It feels like I just got started, but in that short time, I had the chance to be part of some really exciting work (all under strict confidentiality, of course). While I can't go into details, it was genuinely rewarding to know I was contributing to something meaningful and potentially impactful. Working within that kind of confidentiality was new for me, it felt a bit intense at first, but it also gave the work a sense of real-world weight. It made me more thoughtful about how we communicate science, both inside and outside the lab.

Three months turned out to be just enough to get a solid feel for the pace and structure of the industry environment, but I definitely wouldn't have minded staying longer! The contrast with academia was clear: faster-moving projects, well-defined goals, structured timelines, and a strong sense of collaboration across different teams. It was energizing to see how coordinated and outcome-driven everything was, and how focused the work is on actual translation.
This experience definitely got me thinking more seriously about industry as a post-PhD path. It also sparked a few ideas for my own research, especially in terms of thinking more broadly about downstream applications. I've already started applying some of those insights to how I plan and talk about my project now.
All in all, it was a really eye-opening and valuable experience. I'd absolutely recommend it to other PhD students who are curious about exploring research outside of academia, even a short experience like this can really shift your perspective in all the right ways."

--Bhavika Rana

sanofi

ICHDR Update

Exit Seminars

Our next exit seminar is just around the corner; Qinghao Ou, will present “Structural understanding of GIPR and GLP-1R co-agonism.” August 14, 2025. The invitation to this was shared with our Members and Affiliates. Watch you in boxes, Dongju Lee will be next.

Unit 3: Process of Drug Discovery

Our final group of ICHDRs participated in the Process of Drug Discovery rotation. Six of our ICHDRs (Anastasia, Emily, Inamur, Thomas, Vignesh and Mayada), took part in this unit that was run through the Drug Discovery Biology Theme at the Monash Node (Parkville). Over three weeks, students took part in workshops and “post tasks” across eleven modules: The Process of Drug Discovery; Hit Discovery; Practical Applications of HTS; Hit Assessment; Hit to Lead & Lead Optimisation; Structural Biology & Molecular Modelling; Formulation & Delivery; Preclinical Development (Parts 1&2); Critical Path for Drug Discovery; Clinical Development; and Pharmacoepidemiology. With the completion of Unit 3, this concludes the rotational training for all our ICHDRs.

Centre Updates

In the Spotlight.....

IN THE *spotlight*

Isabelle Rouiller

linkedin.com/in/isabelle-rouiller-389244312

Background

I completed my undergraduate studies at INSA Lyon (France), where I trained as an engineer in Biochemistry. I carried out my PhD research at the Institute for Animal Health in Pirbright (UK) focusing on host–pathogen interactions and African Swine Fever Virus.

Current research

I am currently working on the structural and functional characterization of large macromolecular complexes involved in membrane remodelling, protein unfolding, and immune evasion, particularly in the context of mitochondrial biology, neurodegeneration, and viral pathogenesis.

Looking forward

One of the most exciting developments on the horizon is the ability to generate “molecular movies” from cryo-EM data. This advancement promises to revolutionise our approach to studying and treating various molecular-based disorders.

About me

As a kid, I was obsessed with microscopes. Once, I begged for a toy one; but my dad said those things were junk! Well, fast forward a few decades... I now use some of the best microscopes in the world for my research, and I even train brilliant students on how to use them. So yeah, good call, Dad!

If you're a CCeMMP member and would like to be featured, please reach out to the CCeMMP Outreach and Public Engagement Committee (sarah.piper@monash.edu).

IN THE *spotlight*

Assoc. Prof. Gökhan Tolun

@gokhan_tolun
@gokhan-tolun.bsky.social
linkedin.com/in/gokhantolun

Career breakthrough

It's surreal that my group determined Redβ's structure more than half a century after its discovery and I worked with it for >20 years.

Current expertise

My main expertise is studying single strand annealing homologous DNA recombination. Methods: single particle cryo-EM, shadow-casting EM (for imaging DNA and nucleoprotein complexes) and biochemistry.

Advice for cryo-EM ECRs

Read the literature broadly and talk to cryo-EM experts. Otherwise, you may miss specific methods and tips & tricks on both sample preparation and data processing you may benefit from.

Inspiration to pursue a career in research

My mom read children's encyclopedias to me (pre-school), and I watched lots of scientific documentaries as my dad loved them. Standout: the original Cosmos by Prof. Carl Sagan.

If you're a CCeMMP member and would like to be featured, please reach out to the CCeMMP Outreach and Public Engagement Committee (sarah.piper@monash.edu).

Node Updates

Monash Node

Prof. Denise Wootten, Node Leader, Monash University

Dr. Jason Cao receives Gordon Hammes Scholar Award 2025

The Gordon Hammes Scholar Award celebrates significant achievements in biological chemistry, recognizing young scholars for their outstanding published research. Jason was selected for this award due to his exciting doctoral work, where he determined cryo-EM structures of the Amylin 1 (AMY_1) receptor bound to calcitonin-gene related peptide (CGRP). CGRP is a critical mediator in migraine pathology and binds both the cognate CGRP receptor and AMY_1 receptor. His work unveiled the molecular interactions of CGRP with these two receptors and explains why some CGRP receptor antagonists used in migraine treatment have cross-reactivity at the AMY_1 receptor.

Dr. Jason Cao

The award is scheduled to be presented at ACS Fall 2025 conference in Washington, DC (Aug 17 - 21, 2025), where Jason will be presenting a lecture along with the Gordon Hammes Lectureship Award recipient and other prominent researchers in the field. The Gordon Hammes Scholar Award honours young scientists responsible for the very best papers published in Biochemistry.

Dr. Sarah Piper Wins Image Competition

Dr. Sarah Piper

Dr. Sarah Piper has one of her images gracing the cover of the Monash Institute of Pharmaceutical Sciences (MIPS) Annual Report, 2024. Sarah's image, ***"Abstract Atoms"*** is a cryoEM structure of the PAC1 receptor (PDB ID: 8E3X). PAC1 is an important receptor involved in neurological processes. The structure is displayed using atom spheres, with light rays that illuminate the PACAP agonist (green), which activates the receptor (blue). The image was created using the 3D graphics software Blender. She used a green colour for the agonist, symbolising "hope", and used a "Monash" blue colour for the receptor, symbolising the vital research done at Monash University.

"Abstract Atoms"

Grants Awarded

A/Prof Karen Gregory (GA441959): Medical Research Future Fund (MRFF) Stem Cell Therapies Mission "Lighting up human brain cells to help find safer and more effective medications for dementia", $953,751.

New members/affiliates

New affiliates: PostDocs Dr. Cara Press , Dr. Luis Valentin-Alvarado, Dr. Yongyi Peng and Dr. Christy Ying and student affiliates Jaiyin Zhang, Caitlin Owyong, Huan Koh, Vinayak Annapure, Warunika Karunasiri and Liam Rashleigh.

University of Melbourne (Bio21) Node

Prof. Isabelle Rouiller, Node Leader and Deputy Director, University of Melbourne

Daniel Fox Awarded ASBMB Fellowship

ASBMB awarded 4 Fellowships to early career biochemists or molecular biologists (at least in the 2nd year of their PhD and not more than 2 years post being awarded their PhD). The Fellowship is in recognition of outstanding work in the field of biochemistry or molecular biology and provides funds to assist the recipient to attend an overseas conference in a field associated with biochemistry or molecular biology or to visit research laboratories in Australia or overseas to learn new research techniques. Daniel was also selected to participate in the Young Scientist Program as a part of the 2025 meeting of the Federation of Asian and Oceanian Biochemists and Molecular Biologists (FAOBMB), see later in the Newsletter. For Daniel, the ASBMB Fellowship allowed travel to Busan, South Korea, to participate in the Young Scientist Program as a part of the 2025 meeting of the Federation of Asian and Oceanian Biochemists and Molecular Biologists (FAOBMB) and also attend the main FAOBMB Conference. Daniel's current research focuses on the structure and function of transporters responsible for iron piracy in Gram-negative pathogens, where he leverages state of the art advances in machine learning to design de novo protein binders that can potently inhibit bacterial growth.

Daniel Fox Awarded Tilley Prize, Melbourne Protein Group Student Symposium

Daniel Fox was also awarded the Tilley Prize for best oral presentation for presenting his work"AI-designed protein inhibitors can inhibit growth of pathogenic E. coli", at the Melbourne Protein Group Student Symposium , Bio21, Parkville, July 16th 2025. The prize not only acknowledged the best oral presentation of the symposium, it came with a cash prize of $500 and $500 worth of job-ready advice and interview coaching from mexec (a recruiting company).

Somavally Dalvi receives Iain Charles Medgett Postgraduate Award

The Iain Charles Medgett Postgraduate Award is awarded to postgraduate students in the Department of Pharmacology to assist postgraduate students to attend scientific meetings concerning pharmacology or to undertake short courses of study in pharmacology in Australia or overseas. The value of each award is determined by the Council on the recommendation of the committee having regard to the travel expenses of each recipient; Somavally received $2,500.

Marialena Georgopoulou featured in Neos Kosmos

In May, Marialena shared her journey from Greece to Australia through a series of Greek and Greek-Australian media features. It all began with an invitation to contribute an article about her life in Australia as well as what led to the decision to pursue a PhD in Melbourne. The article was published on the local Greek news website Mousiko Vagoni (https://mousikovagoni.gr).

The story quickly gained momentum, catching the attention of regional and diaspora media. With Marialena's permission, the interview was subsequently republished by the Greek newspaper Taxydromos (print and online at https://www.taxydromos.gr), and later by Neos Kosmos, a leading Greek-Australian news outlet (print and online) on May 27, 2025 "From Velestino… to Melbourne" https://neoskosmos.com/el/2025/05/27/life/apo-to-velestino-sti-melvourni/. While everything was in Greek, Neos Kosmos will translate their article to English at the click of a button.

Marialena was later invited to speak in a live national TV interview on Greece's ERT1 channel, where she shared insights about her research and life as a PhD student in Australia.

Daniel Fox and Dr. Naveen Vankadari Awarded FAOBMB Young Scientist Program 2025 Fellowship

Daniel Fox and Dr Naveen Vankadari were selected to participate in the Young Scientists Program 2025 (YSP2025) at the 31st FAOMB meeting, South Korea, May 2025. YSP2025 is a 2-day scientific and networking program, allowing outstanding early career researchers an opportunity to showcase their research to an international audience, promote their scientific career, attend career-focussed workshops and build on networking opportunities. The Fellowship included travel support to attend YSP2025 as well as the 31st FAOBMB Conference, Busan, South Korea. In addition to the YSP2025 presentation, they both presented a short talk at FAOBMB: Daniel presented "AI-designed protein inhibitors can block heme uptake and inhibit growth of pathogenic E. coli"; and Naveen presented "Structural landscape of SARS-COV-2 entry and activation of spike glycoprotein by engaging unique host factors & potential interventions".

Travel Grants

Somavally Dalvi: Iain Charles Medgett Postgraduate Award (2,500 AUD)
Daniel Fox: Monash University Travel Grant (400 AUD)
Daniel Fox: FAOBMB Young Scientist Program Fellowship (600 USD)
Daniel Fox: ASBMB Fellowship (4,000 AUD)

New Members and Affiliates

New affiliates: Student affiliates Srujan Shetty and Janik Clement, Mario Delgadillo, Javaid Jabbar
New members: Dr. Bryan Lim (PostDoc), Dr. Nadia Aleksandrova (PostDoc)

University of Wollongong Node

A/Prof. Gökhan Tolun, Node Leader, University of Wollongong

Prof. David Adams elected to the Australian Academy of Science (AAS)

Prof. David Adams

Congratulations to Prof. David Adams for being elected to the Australian Academy of Science, May 2025. Fellows of the Australian Academy of Science are among Australia's most distinguished scientists. They are elected by their peers based on their contributions to science – for ground-breaking research and scientific advancement that has had clear impact. For David, this was the discovery of analgesic conotoxins and their potential for the development of non-opioid analgesics.

From the AAS

Professor David Adams is internationally recognised as a leader in membrane physiology and neuroscience research, with a focus on the function and modulation of membrane receptors and ion channels, primarily through molecular biology and electrophysiological recording techniques. Over the past 25 years, Professor Adams has characterised numerous peptides, particularly conotoxins derived from the venom of cone snails, as tools for studying ion channel structure and function, as well as potential therapeutics for treating chronic neuropathic and visceral pain. Professor Adams's discovery of analgesic conotoxins that target G protein-coupled receptors, which in turn modulate the function of voltage-gated calcium and potassium channels, offers a promising approach for the development of non-opioid drugs for pain treatment.

Introducing Chandan Kishor as New ICPD at UoW

We're delighted to welcome Dr. Chandan Kishor as an ICPD Fellow at the University of Wollongong, starting in August 2025. Chandan completed his PhD at AcSIR/CSIR-IICT in India and has since held postdoctoral positions at Griffith University and UoW. He also brings over two years of industry experience from International Flavors & Fragrances, where he applied big data analytics and AI to support the bioethanol sector.

In his new role, Chandan will collaborate closely with our CCeMMP PhD students, contributing his expertise in expression systems, protein purification and characterisation, X-ray crystallography, molecular modelling, and more.

Dr. Chandan Kishor

Lucy Fitschen Awarded FAOBMB Young Scientist Program 2025 (YSP2025) Fellowship

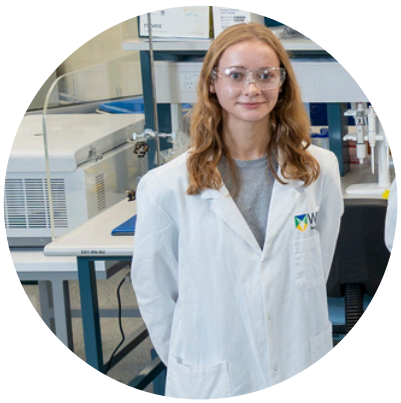
Lucy Fitschen was selected to participate in the Young Scientists Program 2025 at the 31st FAOMB meeting, South Korea, May 2025. YSP2025 is a 2-day scientific and networking program, allowing outstanding early career researchers an opportunity to showcase their research to an international audience, promote their scientific career, attend career-focussed workshops and build on networking opportunities. The Fellowship included travel support to attend YSP 2025 as well as the 31st FAOBMB Conference, Busan, South Korea. In addition to the YSP2025 presentation, Lucy also presented a short talk at FAOBMB, “Cryo-EM structures of the herpes simplex virus 1 annealase protein ICP8.”

Travel Grants

Lucy Fitschen - FAOBMB Young Scientist Program 2025 Fellowship, Busan, South Korea. $930, accommodation during the YSP and registration for FAOBMB 2025.
Lucy Fitschen - SMAH (Faculty of Science, Medicine and Health) HDR Travel Grant, University of Wollongong. $1,200 for travel to FAOBMB25.

WEHI Node

Prof. Isabelle Lucet, Node Leader, WEHI



Emily Park

ICHDR, Emily Park, Wins Poster Prize

ICHDR, Emily Park won a poster prize at the 23rd Melbourne Protein Group Student Symposium, July 16th 2025 at Bio21 Institute, Parkville for her poster "Understanding the molecular structure and signalling functions of Eph receptor pseudokinase EphA10".

Grants Awarded

Shabih Shakeel (co-investigator): US Department of Defence on Lung Cancer Research Program, with Prof. Marie-Liesse Labat (PI). "SBNO2: a new target to induce MHC-I expression in lung adenocarcinoma". $524,941 USD

New Members and Affiliates

Student affiliates: Haripriya Ramakrishnan and Shraddha Kameshwar

External Affiliates Update

The Centre continues to reach out to scientists, both within our existing Nodes and outside of the founding academic institutions, who are involved in cryo-EM and membrane protein research to provide opportunities for them to become members or affiliates of the Centre. If you are interested in becoming a member or affiliate, please reach out to us at ccemmp@monash.edu.

New Affiliate Members

We welcome Dr. Rosemary Cater and her students, Ariana Ivanic and Parteek Mandhan, from UQ as an affiliate and student affiliates, respectively. We also welcome Student Affiliate Bronte Carroll (University of Sydney).

Upcoming Events

Our seminar series continues on the second Tuesday of the month, 10:00 AM - 11:00 AM (AEST/AEDT). This coming quarter we will hear from:

- Dr. Bronte Johnstone (University of Melbourne Node) September 9, and
- Dr. Sarah Piper (Monash Node) October 14.

We also have two special seminars coming up this quarter:

- Prof. Dimitrios Fotiadis (University of Bern, Switzerland) 4:00 PM August 19 and
- Dr. Alexey Rak from industry partner Sanofi, 4:00 PM October 21.

Miss a seminar? Most are recorded so you can access them from our website (https://ccemmp.org/events/ccemmp-seminar-series/) or our youtube channel.

Next quarter we have our two final seminars for 2025; Dr. Rie Nygaard (Weill Cornell Medicine, New York, NY, USA) November 11 and Dr. Lisa Eshun-Wilson (The Scripps Research Institute, La Jolla, CA, USA), December 9.

The seminar committee is busily putting together the 2026 program.

EduWeek 2025

Look forward to a week of exciting workshops!!! Introduction to Python and Anaconda, a 2-day Masterclass in 3D variability, Clarivate workshops, business development workshop and an industry panel on rethinking your PhD experience to industry language; seeing how your academic skills can be applied to an industry setting. All EduWeek workshops are open to our members and affiliates, with some priority is given to ICHDRs before other members/affiliates.

Bench to Art Competition, 2025

The Bench to Art Competition returned for 2025! As last year, the competition will be aligned with National Science Week (August 9-17, 2025). Entries close August 7 but you can view the Gallery via our website (https://ccemmp.org/events/arc-ccemmp-bench-to-art-exhibition-2025/); check it out and vote for your favourite piece. Judges will award prizes and there will be a People's Choice Award.

Steptember 2025

The CCeMMP Outreach Committee warmly invites you to join us for ***Steptember 2025*** — a fun, engaging way to get moving while supporting babies with cerebral palsy! Please see the flyer on the next page and our mascot, MORC2 ATPase structure (PDB:9CDI), Winnie Tan (image credit, Lyn Deng).

Outreach

In the Media

- **May 7, 2025: ACS Journals media release** - **Jason Cao awarded Gordon Hammes Scholar award 2025** - https://axial.acs.org/biology-and-biological-chemistry/meet-karen-allen-and-jianjun-cao-winners-of-the-2025-gordon-hammes-awards
- **May 12, 2025:** Monash University Faculty of Pharmacy and Pharmaceutical Sciences media release announcing A/Prof Karen Gregory MRFF funding. : Monash scientists secure MRFF funding to find new medicines for dementia by "lighting up" human brain cells
- **May 27, 2025: Marialena Georopoulou** was featured in **Neos Kosmos** "From Velestino... to Melbourne" https://neoskosmos.com/el/2025/05/27/life/apo-to-velestino-sti-melvourni/
- **June 29, 2025**: **Prof. Patrick Sexton** quoted in –Obesity pill is on the way | **The Sunday Age** (Jun 29, 2025); full article Next-gen obesity drugs emerge using technology that's not hard to swallow | The Sunday Age (Jun 29, 2025); article appeared in: **The Brisbane Times** (https://www.brisbanetimes.com.au/national/ozempic-in-a-pill-the-next-generation-of-weight-loss-drugs-emerges-20250628-p5maz1.html); **The Age** (https://www.theage.com.au/national/ozempic-in-a-pill-the-next-generation-of-weight-loss-drugs-emerges-20250628-p5maz1.html) **WAtoday.com.au** (https://www.watoday.com.au/national/ozempic-in-a-pill-the-next-generation-of-weight-loss-drugs-emerges-20250628-p5maz1.html); **The Sydney Morning Herald** (https://www.smh.com.au/national/ozempic-in-a-pill-the-next-generation-of-weight-loss-drugs-emerges-20250628-p5maz1.html)

STEPTEMBER *with* CCEMMP

3K **5K** **10K**

TRACK YOUR STEPS FROM 1–30 SEPTEMBER

Join #CCeMMP to raise funds for early detection and therapy for babies with cerebral palsy

More info here

Join us!

CeMMP | Steptember | Cerebral Palsy ALLIANCE

- **July 9, 2025: The Microbiolgist:** AI used to create protein that kills E. coli. https://www.the-microbiologist.com/news/ai-used-to-create-protein-that-kills-e-coli/6225.article
- **July 9, 2025: Science News Today:** AI Designs a Superbug Killer in Seconds and Signals a New Era of Medicine. https://www.sciencenewstoday.org/ai-designs-a-superbug-killer-in-seconds-and-signals-a-new-era-of-medicine
- **July 9, 2025: Technology Networks:** AI-Generated Protein Shows Promise Against Antibiotic-Resistant E. Coli. https://www.technologynetworks.com/tn/news/ai-generated-protein-shows-promise-against-antibiotic-resistant-e-coli-402105
- **July 9, 2025: The Medical News:** Australian scientists use AI to create protein that kills superbugs. https://www.news-medical.net/news/20250709/Australian-scientists-use-AI-to-create-protein-that-kills-superbugs.aspx
- **July 9, 2025: Science Blog:** AI Designs Proteins That Kill Antibiotic-Resistant E. coli. https://scienceblog.com/ai-designs-proteins-that-kill-antibiotic-resistant-e-coli/
- **July 9, 2025: Pursuit, The University of Melbourne.** AI joins the fight against superbugs.https://pursuit.unimelb.edu.au/articles/ai-joins-the-fight-against-superbugs
- **July 9, 2025: MSN.** Australian scientists use AI to create protein that kills superbugs. https://www.msn.com/en-gb/health/other/australian-scientists-use-ai-to-create-protein-that-kills-superbugs/ar-AA1Ij6wk
- **July 10, 2025: Genetic Engineering and Biotechnology News:** AI-Designed Protein Disarms Membrane Transporter to Defeat Resistant Bacteria. https://www.genengnews.com/topics/infectious-diseases/ai-designed-protein-disarms-membrane-transporter-to-defeat-resistant-bacteria/
- **July 10, 2025: Pulse and IT News**. Australian scientists use AI to fight bacteria with synthetic proteins. https://www.pulseit.news/australian-digital-health/australian-scientists-use-ai-to-fight-bacteria-with-synthetic-proteins/
- **July 10, 2025: Monash University Media Release**- Media.net. Australians join elite group of scientists using AI to create man-made proteins. https://newshub.medianet.com.au/2025/07/australians-join-elite-group-of-scientists-using-ai-to-create-man-made-proteins/108962/
- **July 11, 2025: Science Daily:** In seconds, AI builds proteins to battle cancer and antibiotic resistance. https://www.sciencedaily.com/releases/2025/07/250710113152.htm
- **July 11, 2025: Complete AI Training.** Australian Scientists Use AI to Design Protein That Kills Antibiotic-Resistant Bacteria. https://completeaitraining.com/news/australian-scientists-use-ai-to-design-protein-that-kills/
- **July 14, 2025: Mindstream:** Real scientists are using open-source AI to kill superbugs. https://www.mindstream.news/p/real-scientists-are-using-open-source-ai-to-kill-superbugs-46d8

Outreach - Training

- Dr. Winnie Tan - visiting Monash University, Chen Davidovich lab, 2 days a week from July onwards to learn preparation of Streptavidin affinity grids, Arctica and Krios microscopy for cryoEM

Social Media

Bluesky – @ccemmp-outreach.bsky.social

Instagram - ccemmp_outreach

Structure Sunday

Have you seen/liked/reposted "Structure Sunday" yet? Structure Sunday is a new initiative of the Outreach and Public Engagement Committee. They post any structure from our library of renders, rotating the featured membrane protein through each of our nodes.

Industry Engagement

Members and student members continue to have their regular meetings with their respective industry partners (Boerhinger Ingelheim, Astex, Servier, Dimerix, Novo Nordisk and Pfizer). ICHDRs and their supervisors are engaged with industry partners regarding the embedded component of their 3 month placements. ICHDRs also continue to meet with their industry mentors.

Recent Centre Activities and Achievements

Beginner Blender Workshop, June 13

We held a Blender workshop on June 13 with a strong turn out. Nineteen registered to attend in person at MIPS, with a further 11 via zoom. Members of the outreach committee booked rooms so that zoom attendees within a Node could participate together (UoW and Monash Clayton). Dr. Sarah Piper presented an overview on the use of Blender with the add-on Molecular Nodes and provided all attendees with a comprehensive set of notes, so that they can recreate amazing renders on their own. Alongside Sarah, there was highly welcome assistance from our in-house Blender gurus, Dr. Brian Cary, Dr. Jason Cao, Lyn Deng and Dr. Jesse Mobbs for the in-person group, with Thomas Ficker and Yan Li supporting the online attendees.

Blender Workshop June, 2025

Conference Presentations

International Meetings

Prof. Megan Maher: Invited talk. Using structural biology to interrogate bacteria trace metal nutrition. 2nd Biochemistry and Molecular Biology International Joint Symposium (Joint KSBMB/ASBMB satellite meeting of the FAOBMB meeting), 18 - 20 May, 2025, Pohang, South Korea.

Prof. Denise Wootten: Invited symposium presentation. Digging into the GLP-1 Receptor to understand where and how small nonpeptide GLP-1RAs work- are they created equal? American Diabetes Association, 20-23 June, 2025, Chicago IL, USA.

Prof. Denise Wootten: Invited talk. Insights into GRK and arrestin interaction with family B GPCRs. FASEB Science Research Conferences: G Protein-coupled Receptor Kinases and Arrestins, 22-26 June, 2025, Niagra Falls, NY, USA.

Daniel Fox: Selected talk. AI-designed protein inhibitors can inhibit growth of pathogenic E. coli. FAOBMB Young Scientist Program 18 - 19 May 2025, Busan, South Korea.

Daniel Fox: Selected talk. AI-designed protein inhibitors can inhibit growth of pathogenic E. coli. Federation of National Societies of Biochemistry and Molecular Biology in the Asian and Oceanian Region (FAOBMB) 2025, 20 -23 May 2025, Busan, South Korea.

Lucy Fitschen: Selected Talk. Cryo-EM Structures of the Herpes Simplex Virus 1 Annealase Protein ICP. Federation of National Societies of Biochemistry and Molecular Biology in the Asian and Oceanian Region (FAOBMB) 2025, 20- 23 May 2025, Busan, South Korea.

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Lucy Fitschen: Selected Talk. Cryo-EM Structures of the Herpes Simplex Virus 1 Annealase Protein ICP8". FAOBMB2025 Young Scientist Program, May 18 - 19, 2025, Busan, South Korea.

A/Prof. Shabih Shakeel: Selected Talk. MORC2 is a DNA compaction machine. EMBL Chromatin and Epigenetics 2025 Conference,13 - 16 May, 2025,Heidelberg, Germany.

Dr. Naveen Vandkadari: Selected talk.Structural landscape of SARS-COV-2 entry and activation of spike glycoprotein by engaging unique host factors & potential interventions. FAOBMB2025 Young Scientist Program, May 18 - 20, 2025, Busan, South Korea.

Dr. Naveen Vandkadari: Selected talk. Structural landscape of SARS-COV-2 entry and activation of spike glycoprotein by engaging unique host factors & potential interventions. FAOBMB 2025, 20-23 May 2025, Busan, South Korea.

Prof Denise Wootten (**Yuliante E**, **Sexton PM**, **Wootten D**, Trinh PNH, **Bumbak F**, **Zhang X, Jiang Y**, **Ou Q**, Ebenhock, Weichert D, Nar H: Poster presentation. The molecuar basis os Survodutide (BI456906) Glucagon/G:LP-1 Receptor dual agonism. American Diabetes Association, 20-23 June, 2025, Chicago IL, USA. ***With industry partner Boehringer Ingelheim.***

Local Meetings

Daniel Fox: Oral Presentation*. AI-designed protein inhibitors can inhibit growth of pathogenic E. coli. Melbourne Protein Group Student Symposium,16 July 2025, Bio21, Parkville. ***Tilley Award for best oral presentation***

Marialena Georopoulo: Oral presentation. Decoding human phospholipase D3 (PLD3): Structural and functional discoveries with therapeutic potential for Alzheimer's Disease (AD). 23rd Melbourne Protein Group Student Symposium, 16 July 2025, Bio21, Parkville.

Sathya Muthusamy: Oral presentation*. Deciphering the role of Fusobacterium nucleatum in colorectal carcinogenesis using cryo-electron microscopy techniques. Department of Biochemistry & Pharmacology (Bio21 Institute-UoM) GR Conference, 21-22 July, 2025, Carlton.***Best Talk***

Dr. Winnie Tan: Oral presentation. MORC2 is a phosphorylation-dependent DNA compaction machine. 16th Annual Scientific Meeting, ASMR Victoria symposium, 31 July, 2025, Docklands, Victoria.

Yunzhi (Anastasia) Chen: Poster Presentation. A cryo-EM structure to unravel the unexpected promiscuity between IL-6 and IL-11Rα". 23rd Melbourne Protein Group Student Symposium, 16 July 2025, Bio21, Parkville.

Somavally Dalvi: Poster presentation. Crossing the barrier: Understanding the life cycle of membrane-containing phages at molecular resolution. 23rd Melbourne Protein Group Student Symposium, 16 July 2025, Bio21, Parkville.

Riya Joseph: Poster presentation*. Structural perspective on pore formation and regulation of B. fragilis CDCL toxins. 23rd Melbourne Protein Group Student Symposium, 16 July 2025, Bio21, Parkville. ***Poster Prize***

Vignesh Kamath: Poster Presentation. Understanding the assembly and structure of Leukemia Inhibitory factor and Oncostatin-M cytokine signaling complexes. 23rd Melbourne Protein Group Student Symposium, 16 July 2025, Bio21, Parkville.

Emily Park: Poster Presentation. Understanding the molecular structure and signalling functions of Eph receptor pseudokinase EphA10. 23rd Melbourne Protein Group Student Symposium, 16 July 2025, Bio21, Parkville.

Academic Presentations

International Academic Seminars

A/Prof. Alastair Stewart: "Understanding catalysis by ATP synthase", Department of Biochemistry, University of Oxford, UK, 2nd June, 2025.

A/Prof. Shabih Shakeel: "Phosphoryaltion-driven DNA compaction by MORC2", Department of Molecular Biology and Genetics (MBG Focus Talks), Aarhus University, Denmark, 26 May, 2025.

A/Prof. Shabih Shakel: "MORC2 is a DNA compaction machine", University of Helsinki, Finland, 27 May, 2025.

A/Prof Shabih Shakeel: "Structural Basis for Chromatin Remodelling and DNA Repair", Tsinghua University, China, 3rd June, 2025.

Publications

New Publications

Bythell-Douglas R, van Twest S, Abbouche L, Dunn E, Coulthard RJ, Briggs DC, Murphy V, Zhang X, **Tan W**, Henrikus SS, Qian D, Wu Y, Wolf J, Rigoreau L, **Shakeel S**, Chapman KL, McDonald NQ, Deans AJ (2025). Structural basis of Fanconi anemia pathway activation by FANCM. EMBO J. 2025 Jul;44(14):4013-4036. doi: 10.1038/s44318-025-00468-3

Dietrich MH, Chmielewski J, Chan LJ, Tan LL, Adair A, Lyons FMT, Gabriela M, Lopaticki S, Dite TA, Dagley LF, Pazzagli L, Gupta P, Kamil M, Vaughan AM, Rojrung R, Abraham A, Mazhari R, Longley RJ, Zeglinski K, Gouil Q, Mueller I, Fabb SA, Shandre-Mugan R, Pouton CW, **Glukhova A, Shakeel S**, **Tham WH** (2025). Cryo-EM structure of endogenous Plasmodium falciparum Pfs230 and Pfs48/45 fertilization complex. Science. 2025 Jul 31:eady0241. doi: 10.1126/science.ady0241

Fiyaksel OP, **Dalvi SP**,· Zhou B, Ravins M, Shraiteh B,· Bhattacharya S, · Kirillov S, · Kaur P, Rosenshine I,· **Ghosal D**, Ben-Yehuda S (2025). A bacterial host factor confines phage localization for excluding the infected compartment through cell division. Cell Reports, 44(7): 115994. DOI: 10.1016/j.celrep.2025.115994

Fox DR, Asadollahi, K, Samuels I, Spicer BA, **Kropp A**, Lupton CJ, Lim, K., Wang C, Venugopal H, Dramicanin M, Knott G, **Grinter R** (2025) Inhibiting heme-piracy by pathogenic Escherichia coli using de novo-designed proteins. Nature Communications, 16:6066. https://doi.org/10.1038/s41467-025-60612-9 (9DHE; 9DIV; 9DIR, EMD-46916; 9DIS, EMD-46917).

Mitra N, Mishra D, **Mudaliyar, M,** Yadav R, Zinjurte S, Puthethu IA, Gayathri P, **Ghosal D**, Srinivasan R (2025). Mutational analysis of the F plasmid partitioning protein ParA reveals residues required for oligomerization and plasmid maintenance, Nucleic Acids Research, 53 (12): gkaf537. https://doi.org/10.1093/nar/gkaf537

Munder F, Voutsinos M, Hantke K, Venugopal H, **Grinter R** (2025). High-affinity PQQ import is widespread in Gram-negative bacteria. Science Advances, 11(22), p.eadr2753. DOI: https://doi.org/10.1126/sciadv.adr2753 (9C4O, EMD-45192).

Nguyen ATN, Panel N, Vo DD, Thai BS, Chia LY, Lu CS, Hellyer SD, Langiu M, Jörg M, **Gregory KJ**, Kihlberg J, White PJ, Scammels PJ, **Christopoulos A,** Carlsson J, May LT (2025). Structure-based discovery of positive allosteric modulators of the A1 adenosine receptor. Proc Natl Acad Sci, 122 (28): e2421687122. https://doi.org/10.1073/pnas.2421687122

Razzak MA, Tran K, McCague R, Sengmany K, Kos J, Langiu M, Li B, Hellyer SD, **Gregory KJ** (2025). Pharmacological characterisation of allosteric modulators at human mGlu5. Biochem Pharmacol, 239:117030. doi: 10.1016/j.bcp.2025.117030. Epub 2025 Jun 6.

Preprints

Seneviratne JA, Crisp CL, Glancy E, Choy N, **Tan W**, Neve M, Stammers M, Wang T, Johnstone R, Kaur A, Fennell KA, Burr M, Parker BL, **Shakeel S**, Eckersley-Maslin MA. Embryonic stem cell factors DPPA2/4 facilitate a unique chromatin state in non-small cell lung cancer. bioRxiv April 27, 2025. https://doi.org/10.1101/2025.04.27.650876

Updated Publications

Tan W, Park J, Venugopal H, Lou J, Dias PS, Baldoni PL, Moon KW, Dite TA, Keenan CR, Gurzau AD, Lee J, Johanson TM, Leis A, Yousef J, Vaibhav V, Dagley LF, Ang CS, Corso LD, Davidovich C, Vervoort SJ, Smyth GK, Blewitt ME, Allan RS, Hinde E, D'Arcy S, Ryu JK, Shakeel S (2025). MORC2 is a phosphorylation-dependent DNA compaction machine. Nat Commun 16: 5606-5606. https://doi.org/10.1038/s41467-025-60751-z (9CDF, EMD-45474;9CDI, EMD-45477; 9CDH, EMD-45476; 9CDJ , EMD-45478; 9CDG, EMD-45475).

Released Structures

9BYO, EMD-45040: Cryo-EM structure of glucagon-like peptide-1 receptor (GLP-1R)-Gs complex with Exendin-asp3
9C0K, EMD-45087: Cryo-EM structure of glucagon-like peptide-1 receptor (GLP-1R)-Gs complex with Exendin-phe1

- Cindy Zhang, (Rachel Johnson), Matthew Belousoff, Patrick Sexton, Denise Wootten.
- To be published

9BYP, EMD-45041: Single subunit of Epstein-Barr virus annealase BALF2 ssDNA-annealing complex
9BYQ, EMD-45042: Two-subunit asymmetric unit of Epstein-Barr virus annealase BALF2 ssDNA-annealing complex
9BYR, EMD-45043: Filamentous Epstein-Barr virus annealase BALF2 ssDNA-annealing complex

- Jordan Nicholls, Gökhan Tolun, (Jodie Brewster)
- To be published

9DIR, EMD-46916: ChuA+G7
9DIS, EMD-46917: ChuA+H3

- 9DHE (X-ray), 9DIV (X-ray):
- Daniel Fox and Rhys Grinter
- Fox et al., (2025)Inhibiting heme-piracy by pathogenic Escherichia coli using de novo-designed proteins. Nature Communications, 16:6066. https://doi.org/10.1038/s41467-025-60612-9

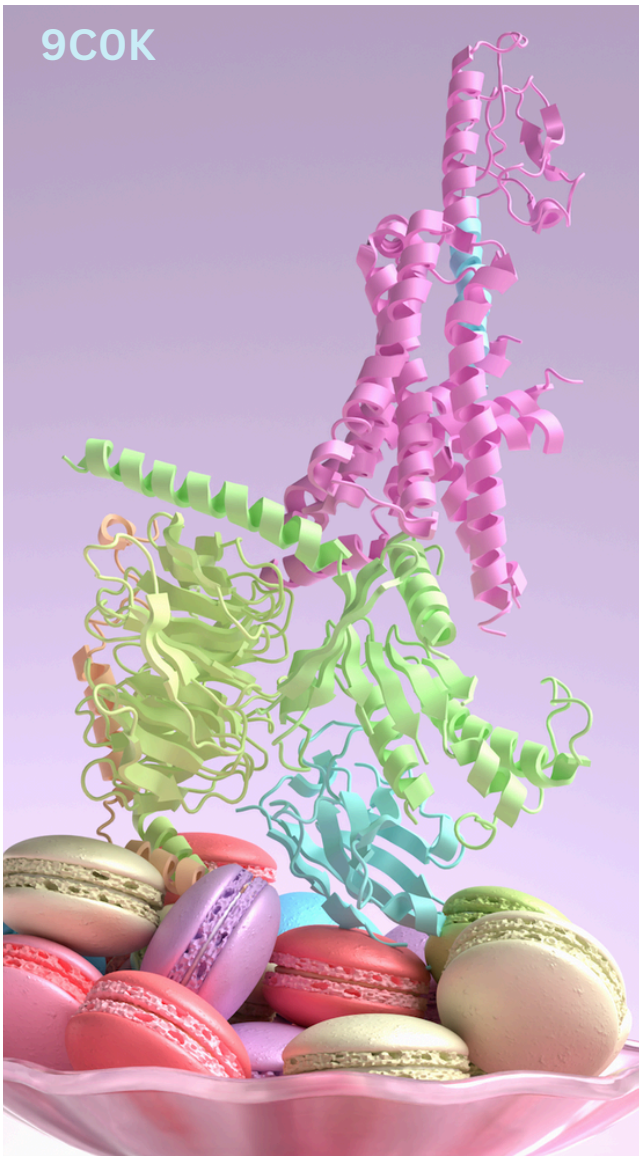
9C4O, EMD-45192: PqqU with ligand PQQ

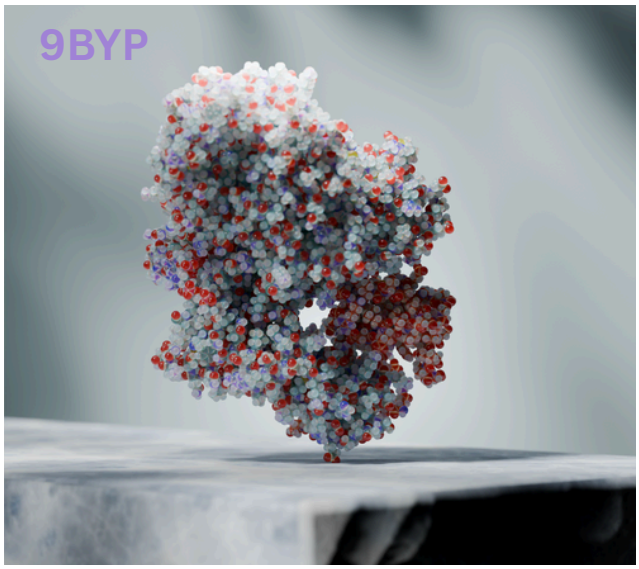
- Fabian Munder and Rhys Grinter.
- Munder et al., (2025). High-affinity PQQ import is widespread in Gram-negative bacteria. Science Advances, 11(22), p.eadr2753. **DOI:** https://doi.org/10.1126/sciadv.adr2753

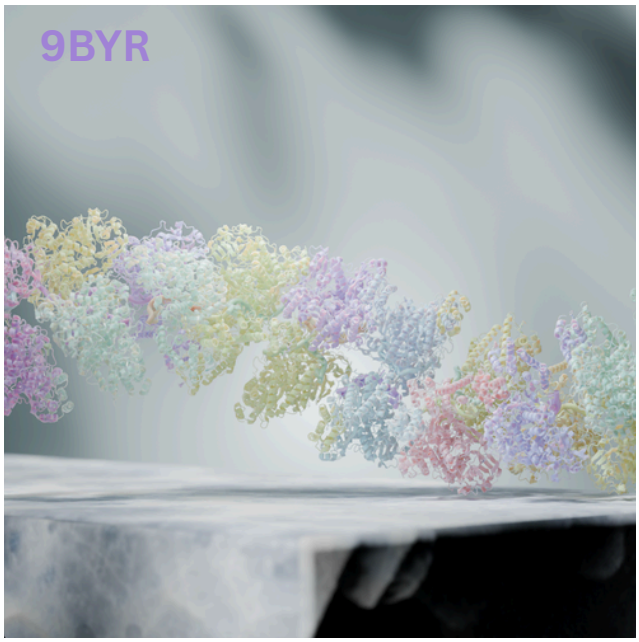
9CDF, EMD-45474: MORC2PD
9CDI, EMD-45477: MORC21-603
9CDH, EMD-45476: MORC2PD-DNA
9CDJ , EMD-45478: MORC21-603-DNA
9CDG, EMD-45475: MORC2S87A

- Winnie Tan and Shabih Shakeel
- Tan et al., (2025). MORC2 is a phosphorylation-dependent DNA compaction machine. Nat Commun 16: 5606. https://doi.org/10.1038/s41467-025-60751-z

CCeMMP Cryo-EM Structure Image Gallery

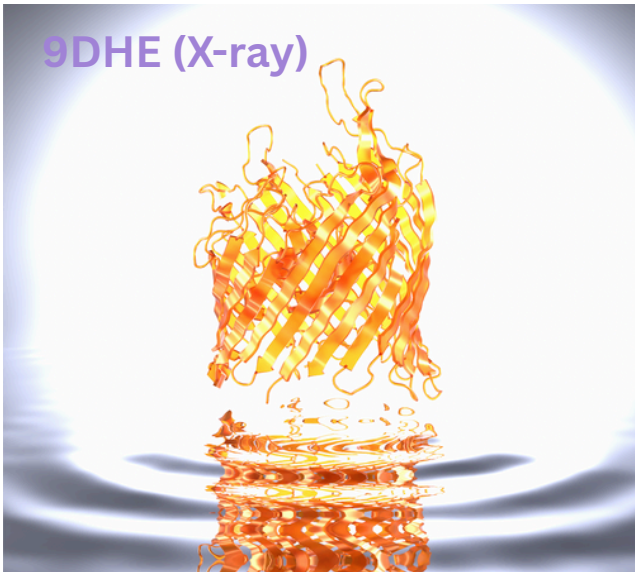




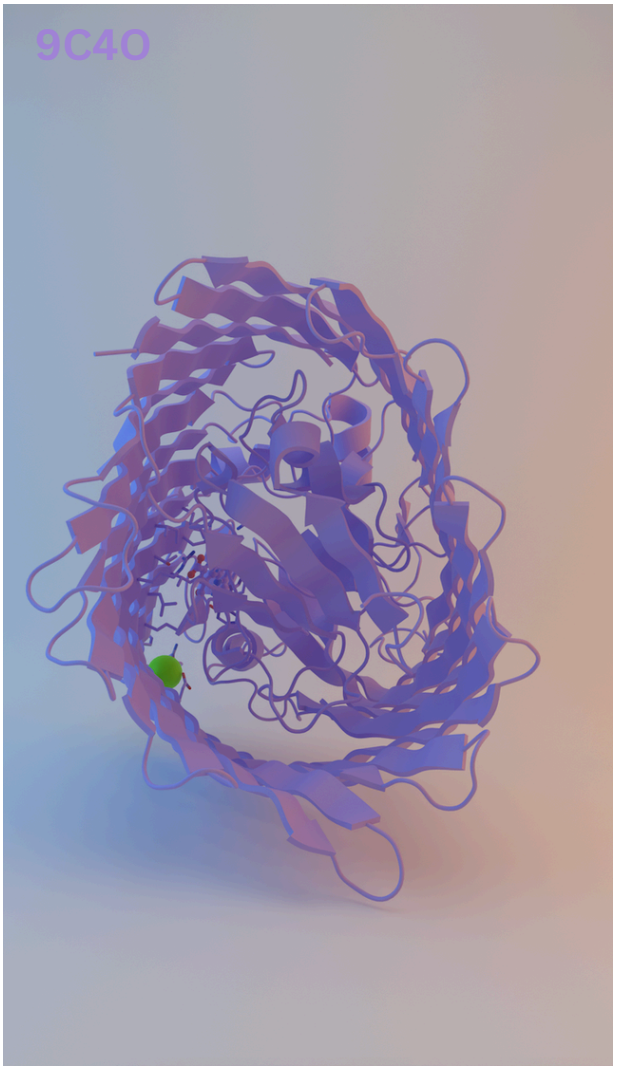



9DIR

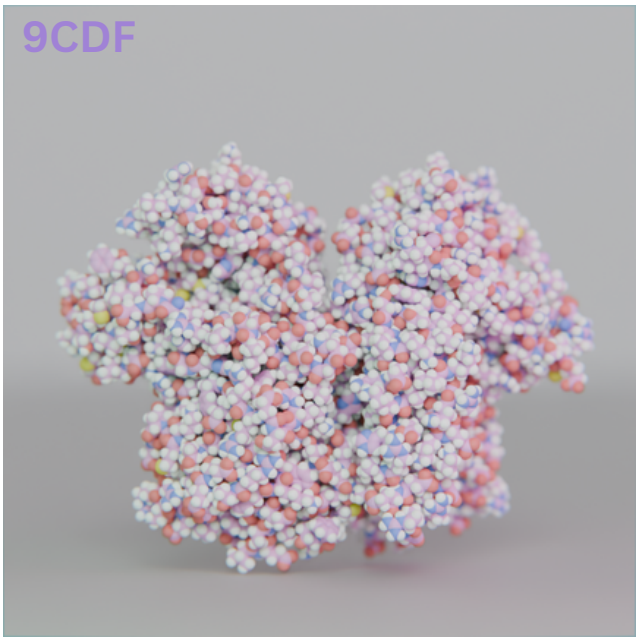

9DIS

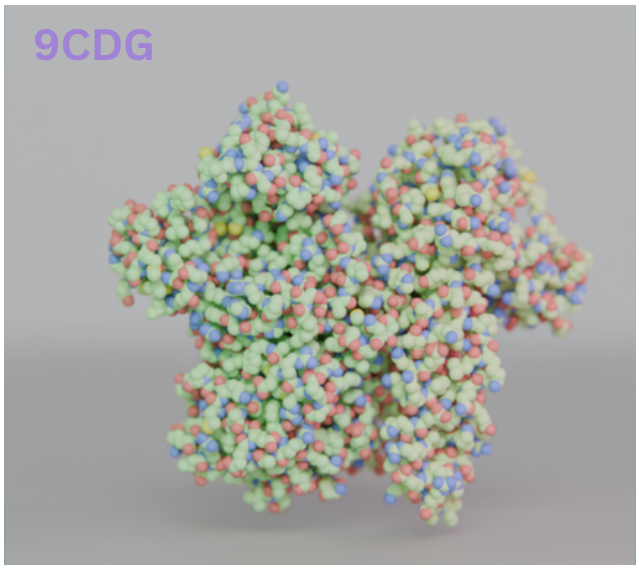

9DHE (X-ray)

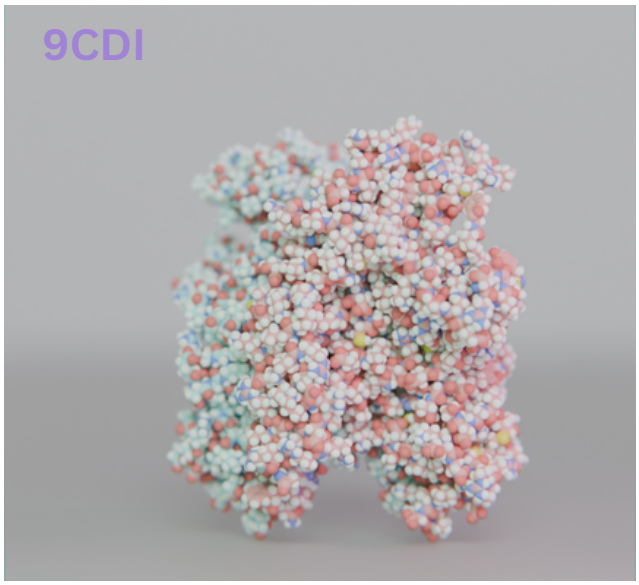

9DIV
(X-ray)

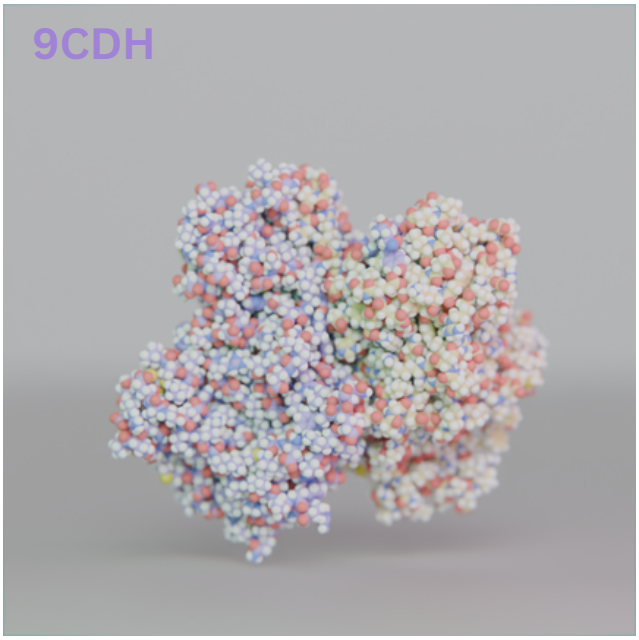

9C4O

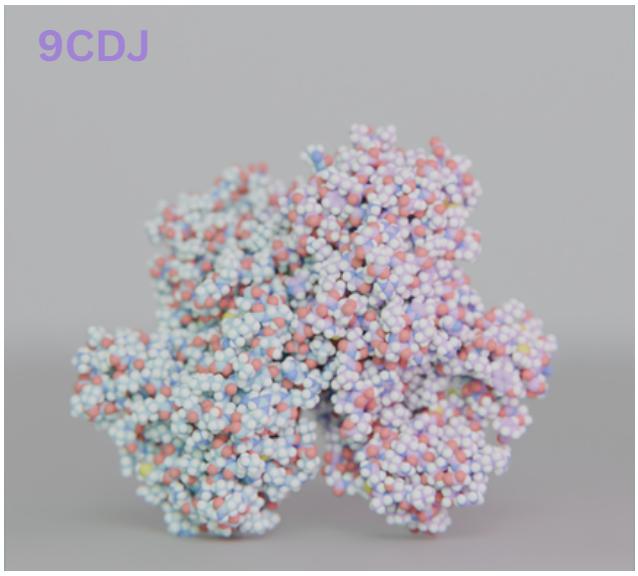
CCeMMP Cryo-EM Structure Image Gallery











Images credit: Dr. Sarah Piper (this page) and renders created by Lyn Deng (p22-23), using Molecular Nodes as well as assets from BlenderKit (Candy theme by Product Mockup; Blue glass by Dicaprio; Fire and ice studio by Danila Poljakov; Water by Srabon arafat).