APRIL 2025, ISSUE 16

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

Quarterly newsletter

INSIDE THIS ISSUE:

Image credit - Dr. Brian Cary

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

Welcome to the 16th instalment of the ARC CCeMMP quarterly newsletter. In this quarter the Centre was again very active with numerous members presenting at National and International meetings, with many members receiving awards at these meetings. It was exciting to see our ICHDRs completing their embedded placements and to see their positive feedback on the valued learnings from the experience. We also saw our first ICHDR completion. Congratulations to Isabella Russell, who has also accepted a position with Partner Organisation, Astra Zeneca. Centre members were also very successful in the recently announced NHMRC Investigator grant outcomes with 3 members awarded Leadership Fellowships and 3 members awarded Emerging Leader Fellowships. We were also delighted to see the award of a prestigious Snow Fellowship to Alisa Glukhova from our WEHI node. The quarter also delivered exciting new research publications authored by Centre members, including in Science, Nat Commun, Sci Advances, and PNAS. Not surprisingly, we also saw lots of exciting new structures released in the PDB and EMDB data bases. There was much more, but you will have to read the full Newsletter for the details.

Congratulations to everyone, and again thanks to everyone involved in organisation of the CCeMMP activities, it is only through the commitment and dedication of those individuals that we are able support to the Centre's mission and the broader membrane protein community.

Prof. Patrick Sexton
Director

Did you know?....

Catchy, clear concise: tripartite phrases boost research paper citations. In fact, memorable phrases make a paper more likely to be read, either just the abstract or the entire paper, as well as being cited (Nature, March 18, 2025 doi: https://doi.org/10.1038/d41586-025-00771-3). A recent study looked at 93,000 medical and life sciences papers that contained three-part phrases in their titles. This format was correlated with, on average, 32 extra citations relative to papers that did not contain three-part phrases. The next question is, if your paper is studying a tripartite (heterotrimeric G protein complex, tripartite receptor, tripartite signalling, tripartite transporter), will that boost it even further.....?

On the cover: *From our Monash node and ARC DECRA Fellow, Dr. Brain Cary PDB:9EBO. Peptide 2 (GLP-1 (ACPC18)) bound to GLP-1R/Gs complex. Cary et al., (2025) Proc Natl Acad Sci U S A, 122: e2407574122-e2407574122. DOI: https://doi.org/10.1073/pnas.2407574122* ***Image credit: Dr. Brian Cary***

ICHDR Update

Industry Placements

Alok Pradhan has completed his industry placement. Alok's industry partner was a local biotechnology company, Dimerix, headquartered in Fitzroy, enabling him to spend time there regularly over 12 months. Alok shares his experience with us; please see below.

Current placements: Minakshi Baruah, Pfizer (Groton, Connecticut, USA). Minakshi returns early May; we will be able to read about her experience in the next Newsletter.

Two students have just flown out to Paris for their placements at Sanofi and Servier, and one student is about to take up a placement at Aculeus Therapeutics (Melbourne).

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

Reflections of my experience at Dimerix – Alok Pradhan

My 12-month internship at Dimerix has been a significant step forward in understanding how scientific innovation is translated into commercial strategy within the biotech sector. Coming from an academic background, this experience gave me first-hand exposure to the operational, strategic, and cross-functional dynamics of a clinical-stage biotechnology company.

I had the opportunity to work on two business development cases focused on alternative indications and label expansion. These projects involved pipeline analysis, competitive landscape assessment, and target prioritization. I used tools like scoring matrices to evaluate assets based on scientific rationale, clinical feasibility, and strategic alignment with the company's long-term objectives. It was a valuable exercise in structured decision-making and aligning scientific potential with business goals.

A major part of my learning involved the development and refinement of Target Product Profiles (TPPs). I received training on how to build a TPP that integrates key regulatory, clinical, and commercial considerations. Using the TPP as a foundational tool helped guide product strategy and made me think more critically about how to define value early in the drug development lifecycle.

The internship also gave me the chance to work closely with various internal teams — including clinical development, research, contracts, and project management. This cross-functional collaboration helped me understand the interconnected nature of roles within a biotech company and how alignment between departments is essential to progressing assets through the pipeline.
Additionally, I gained exposure to financial evaluation frameworks commonly used in biotech. I worked with valuation models and commercial forecasting tools that informed asset strategy and business case development. These skills have broadened my perspective on how financial and scientific insights come together to drive investment decisions in the life sciences industry.

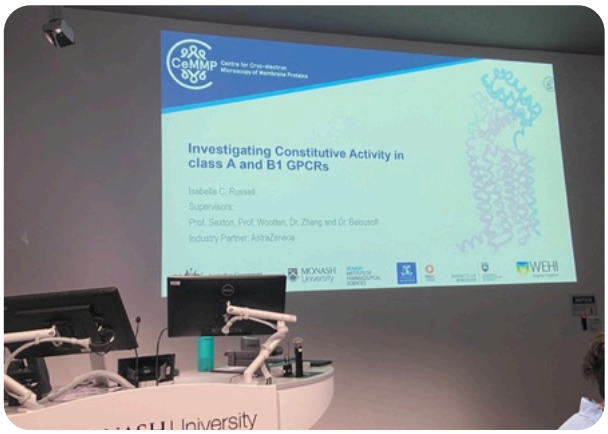
The team at Dimerix was also extremely welcoming and I was able to very quickly settle in. I was fortunate to be included in both internal and external stakeholder engagements, including team meetings and the company's Annual General Meeting. Observing how the executive team communicates with shareholders and external partners gave me valuable insight into corporate governance, investor relations, and the broader strategic narrative of a biotech company.

Transitioning from academia to a commercially focused environment required a significant adjustment; the learning curve was steep, and the work environment was highly dynamic. But it also pushed me to develop a more agile, outcome-oriented mindset. I'm particularly thankful to Dr. Carl White, who provided consistent mentorship, thoughtful feedback, and helped me connect my academic strengths to real-world biotech challenges. I also want to thank Dr. Robert Shepherd for his strategic guidance and for helping me step back and understand the "big picture" decision-making that shapes company direction.

The team at Dimerix

I'm grateful to everyone at Dimerix for making this internship so impactful and to the CCeMMP program for the opportunity. I've come away with a stronger grasp of how science, strategy, and execution converge in biotech — and I'm excited to continue building on this foundation in the future.

Exit Seminars



Isabella Russell presented her exit seminar March 26, 2025, "Investigating Constitutive Activity in Class A and B1 GPCRs". Isabella is off to industry partner AstraZeneca, this time as an employee, as Senior Scientist, Cambridge, UK. All the very best Isabella, we hope your PhD experience has provided a firm base to grow your scientific career and that your industry placement prepared you for the transition to industry.

Qinghao Ou and Dongju Lee are now primarily in the writing up phase of their candidatures; watch your inboxes for details on their final seminars. These seminars are additional to our regular seminar series.

Centre Updates

International Women's Day March 8th, 2025

To celebrate and recognise IWD this year, the Outreach and Public Engagement Committee invited members and affiliates to nominate Centre members to be recognised for their contributions to science. It was heart-warming to read the reasons for the nominations, particularly for our PhD students, as they are our future leaders. We hope the recipients felt honoured and appreciated for being recognised in this way; they may feel like they are just doing their job, but it is good to know that "just doing your job" can have such a positive impact on those around you.

You would have seen the posts on our social media channels, here's a reminder of those nominated: Minakshi Baruauh, Dr. Natalie Diepenhorst, Lucy Fitschen, Dr. Emily Furlong, Dr. Brooke Hayes, Ashleigh Kropp, Mariakatarina Lambourne, Prof. Megan Maher, Dr. Manasi Mudaliyar, Prof. Lezanne Ooi, Dr. Tracie Pierce, Dr. Sarah Piper and Isabella Russell.

Centre Updates

National Competitive Grants Success

Centre members were very successful in the latest funding round for NHMRC Investigator Grants, released February 2025 (for 2026 commencement). Congratulations to all.

- Dr. Wessel Burger (The Walter and Eliza Hall Institute), Emerging Leadership 1
- Dr. Jianjun Cao (Monash University), Emerging Leadership 1
- Prof. Arthur Christopoulos (Monash University), Leadership 3
- Prof. Peter Czabotar (The Walter and Eliza Hall Institute), Leadership 3
- A/Prof. Alisa Glukhova (The Walter and Eliza Hall Institute), Emerging Leadership 2
- A/Prof. David Thal (Monash University), Leadership 1

Projects details can be found in the respective Node updates.

In the Spotlight.....

IN THE *spotlight*

Alok Pradhan

@alokcpradhan
@alokcpradhan.bsky.social
linkedin.com/in/alokcpradhan

Background

I started my academic journey with an Engineering degree in Biotechnology and was introduced to cryo-EM during my Master of Research (Biological Sciences). I was able to continue my cryo-EM journey with the CCeMMP PhD program in Pharmaceutical Sciences.

Current research

I am using pharmacology and cryo-EM to investigate GPCR heteromerization and its implication in different disease conditions, which will aid in developing targeted therapies to help unmet need. Feel free to reach out if you're into any form of oligomers.

Looking forward

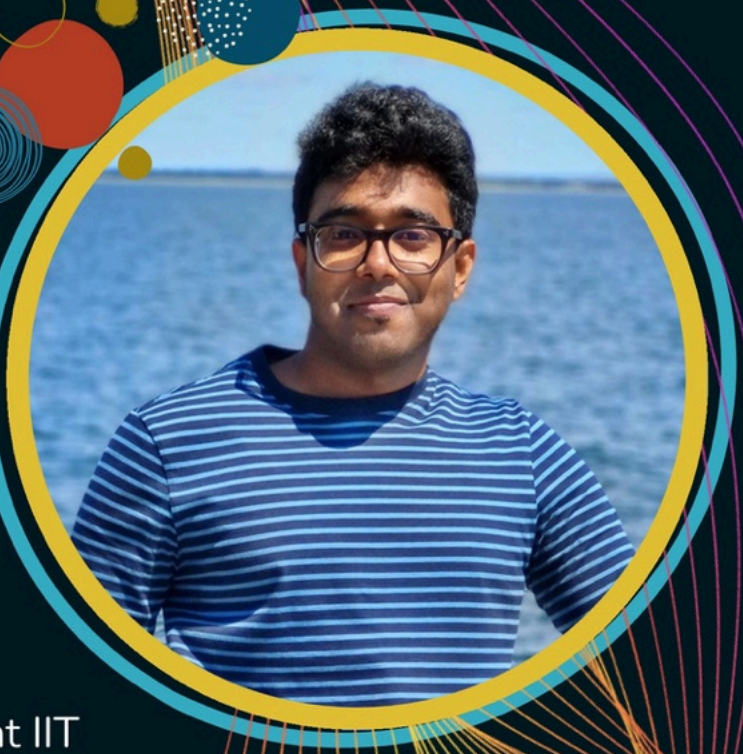
I look forward to a future where we fully understand network of receptors and other biomolecules enough to build biological transistors, which will go head-to-head with the best semi-conductor chips while only demanding a fraction of the energy.

About me

I do macro, wildlife and nature photography. I also love going on very long hikes and getting inspiration from nature to help me with unlocking the mysteries of the universe.

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*



Susovan Das

@dsusovan774
linkedin.com/in/susovan-das-a09087148

Background

I completed master's in biotechnology at IIT Kharagpur, India, and am currently a final-year PhD at WEHI/University of Melbourne, using Cryo-EM to study receptor proteins (Frizzled) involved in cancer progression and develop novel therapies.

Current research

In my PhD, we uncovered a novel process through which Frizzled receptors transduce signals by studying their atomic structure and developed potent therapeutic antibodies to block these receptors, helping improve cancer treatment.

Looking forward

In general, I'm excited about the recent Cryo-ET advancements, as Cryo-ET can reveal protein structures directly inside cells, capturing their native environment and offering insights into biologically relevant molecular interactions.

About me

Outside of research, I enjoy cooking, exploring photography, and taking relaxed bicycle rides around the city. These hobbies help me maintain work-life balance and stay refreshed.

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. Brooke Hayes awarded Anders award at Lorne Proteins

Dr. Brooke Hayes

Dr. Brooke Hayes was awarded an Anders Early Career Awards, at the 50th Lorne Conference on Protein Structure and Function, presenting her work "Structural basis of toxin delivery by the Type VI Secretion System" in a dedicated session. The Anders award is given to up to 5 scientists at the annual Lorne Proteins meetings. Awardees have impressive track records for their stage of career (within 5 years of obtaining their PhD). 2024 saw two CCeMMP members as recipients of this award, in 2025, there were THREE!

Dr. Sarah Piper awarded the JG Russell Award

Dr. Sarah Piper

Dr. Sarah Piper was awarded the JG Russell Award from the Australian Academy of Science. Sarah was one of 5 researchers to receive the award. The JG Russell award recognises the costs involved in experimental research and can be used towards equipment, maintenance and travel, giving top up grants of up to $7,000 to projects funded through the ARC DECRA scheme.

Sarah says "The award will allow an extended visit with an expert computational lab to apply molecular dynamics simulations to better understand the function of the PAC1 receptor."

A/Prof. Karen Gregory appointed ADGR

A/Prof. Karen Gregory

Associate Professor Karen Gregory was appointed Associate Dean Graduate Research at the Faculty of Pharmacy and Pharmaceutical Sciences, Monash University.

Grants Awarded

Dr. Jason Cao - NHMRC Investigator Grant (2042010): Emerging Leadership 1 (EL1) Structural approaches to assist the development of selective antagonists of adrenomedullin receptors, $688,405 (2026-2030).

Prof. Arthur Christopoulos - NHMRC Investigator Grant (2042847): Leadership 3 (L3) Allosteric modulation of muscarinic receptors for the treatment of neurocognitive deficits, $ 2,000,000.

A/Prof. David Thal - NHMRC Investigator Grant (2043281): Leadership 1 (L1) Harnessing protein allostery to accelerate drug discovery, $ 2,818,905.

New members/affiliates

New affiliate A/Prof. Vivek Naranbhai from Laboratory of Translation Immunology, Paula Fox Melanoma and Cancer Centre, Melbourne.

University of Melbourne (Bio21) Node

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

Student Poster Award - Lorne Proteins Milad Reyhani

PhD student Milad Reyhani, from the Ghosal lab, was awarded one of the student poster prizes at Lorne Proteins, Feb 2025 for the poster "Characterization of cell-cell interaction mechanisms in novel archaea. "

Somavally Dalvi wins two oral presentation prizes

Somavallly Dalvi, also of the Ghosal lab, recently won two awards for presenting her work. The first at The Australian Society for Microbiology, Phage Bites Symposium, April 1st 2025, an online meeting showcasing the work of post graduate students and early career researchers, where she won best talk.The second at The Australian Society for Microbiology, Mobile Genetic Element Meeting Feb 17-18, 2025, LaTrobe University, Melbourne City Campus, where she was first runner up for the oral presentation prize. The talk presented at both meetings was "Crossing the barrier: Understanding the life cycle of membrane-containing phages at molecular resolution."

Grants Awarded

A/Prof. Debnath Ghosal was one of the investigators awarded grant funding from the Indian Ministry of Education. The Faculty of Medicine, Dentistry and Health Sciences and the Indian Institute of Technology Kanpur were awarded $600,000 in funding for a collaborative project. The grant, Scheme for Promotion of Academic and Research Collaboration (SPARC), is funded by the Indian Ministry of Education and supports research into technology with the aim to improve the research ecosystem of Indian Universities. The funding will support up to 30 students to visit Melbourne for short research and development sessions, and to learn from academics in areas such as disease biology and biomedical engineering.

Associate Professor Ghosal explained that "along with bringing together research teams with complementary expertise, this project will enable student mobility, which is a vital mechanism for knowledge transfer and innovation, creating a globally competent workforce."
(Quote from https://biomedicalsciences.unimelb.edu.au/news-and-events/funding-sparks-innovation-and-collaboration-between-researchers-from-melbourne-and-india)

University of Wollongong Node

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

Student Affiliate Jordan Nicholls submits PhD thesis

Jordan Nicholls

Student affiliate Jordan Nicholls has submitted his PhD thesis for examination. During the course of his PhD, Jordan's work has been awarded prizes in the form of poster and oral presentation awards at the annual meetings of CryOz and Australian Society of Biophysics, respectively.

WEHI Node

Prof. Isabelle Lucet, *Node Leader, WEHI*

Dr Alisa Glukhaova awarded prestigious Snow Fellowship

A/Prof. Alisa Glukhova

A/Prof. Alisa Glukhova was awarded the prestigious Snow Fellowship, the only one for 2025. Alisa will receive $5M (AUD), to advance her cancer research on the project, "Exploiting the Wnt Pathway for Novel Cancer Therapies". Snow Fellowships target emerging global research leaders that show the potential to drive, manage and influence the next generation of health and medical innovation giving them the ability to develop a bold and ambitious research program, build a high-performing team, and establish their leadership experience.

"The Snow family believes in backing exceptional minds who take risks and challenge the limits of scientific discovery. Alisa's research is exactly the kind of high-impact, world-changing work that needs long-term support to thrive. She has consciously chosen to apply her outstanding structural biology skills in an area often avoided by others due to its complexity and degree of challenge. Alisa is aware of the risks, however, with this Fellowship, she will have the independence and stability to push the boundaries of biomedical science and deliver real outcomes for patients," Mr Snow said. (Quote from the Snow Medical, Media Release March 25, 2025 https://www.snowmedical.org.au/news/media-release-snow-fellowship-recipient-2025)

Dr. Wessel Burger ***and*** Dr. Winnie Tan awarded Anders awards at Lorne Proteins

Dr. Wessel Burger

Dr. Wessel Burger ***and*** Dr. Winnie Tan were the other members awarded an Anders Early Career Award, at the 50th Lorne Conference on Protein Structure and Function. Wessel presented his work in a dedicated Anders session, "Dissecting GPCR function through nanodiscs; structural and pharmacological approaches", while Winnie presented her award winning research "DNA compaction function of the MORC2 GHKL-type ATPase" in the CRISPR + DNA Regulation, (Joint Session with CRISPR2025) session. As mentioned earlier, the Anders award is given to up to 5 scientists at the annual Lorne Proteins meetings where the awardees have impressive track records for their stage of career (within 5 years of obtaining their PhD).

Dr. Winnie Tan

Grants Awarded

Prof. Peter Czabotar - NHMRC Investigator Grant (2042090): Leadership 3 (L3) Exploring Cell Death Signaling for Drug Target Discovery, $3,014,025.

A/Prof. Alisa Glukhova - NHMRC Investigator Grant (20434072): Emerging Leadership 2 (EL2) Decoding the Mechanisms of Signal Propagation through the Wnt Signaling Pathway, $1,623,700.

Dr. Wessel Burger - NHMRC Investigator Grant (2042668): Emerging Leadership 1 (EL1) Dissecting divergent pathway activation at Frizzled receptors, $688,405.

External Affiliates Update

Conferred PhD

Student affiliate Michael Newton-Vestry from the University of Canterbury, NZ has been awarded a PhD. Thesis title: "Understanding selective bacterial nutrient uptake through structural and functional analysis". Congratulations Dr. Newton-Vestry.

New Affiliates

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

Helen McGuinness UQ, PhD student

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 Prof. Juan Du (Northwestern Univ) May 13, Prof. Yifan Cheng (UCSF) June 10, Assistant Prof. Mohammad Kaplan (Univ Chicago) July 8.We also have two special seminars coming up this quarter; Mazdak Radjainia (CryoDuck) 4:00 PM May 20 and a speaker from industry partner Boehringer Ingelheim 4:00 PM July 15.

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 will hear from Prof. Lezanne Ooi (UoW node), August 12, Dr. Bronte Johnstone (UoM node), September 9 and Dr. Sarah Piper (Monash Node), October 14. We also have two additional special seminars: Prof. Dimitrios Fotiadis (University of Bern), 4:00 PM August 19 and Dr. Alexey Rak from industry partner Sanofi (Paris), 4:00 PM October 21.

Save the Date(s)

EduWeek 2025

Mark your calendars, the dates are set…..Monday 29 September to Friday 3 October. 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.

Bench to Art Competition, 2025

Brush up those Blender skills, dust off your artistic licence, the Bench to Art Competition returns for 2025! Similar to last year, the competition will be aligned with National Science Week (August 9-17, 2025). CCeMMP will run a Blender Workshop prior to the competition. Watch your in boxes for a call for applications and to view the "gallery" to vote for your favourite images.

Outreach

In the Media

- **Feb 7, 2025,** University of Melbourne, Faculty Medicine Dentistry and Health Sciences web page - https://mdhs.unimelb.edu.au/news-and-events/funding-sparks-innovation-and-collaboration-between-researchers-from-melbourne-and-india
- **March 25, 2025,** Snow Medical media release (Alisa Glukhova Snow Fellowship). https://www.snowmedical.org.au/news/media-release-snow-fellowship-recipient-2025
- **March 25, 2025,** Mirage News media release - Alisa Glukhova Snow Fellowship - https://www.miragenews.com/new-snow-fellow-targets-cancer-at-its-roots-1431603/
- **March 31, 2025,** St Vincent's Medical Research media release- Johnstone et al., Structural basis for the pore-forming activity of a complement-like toxin. Sci Adv. 2025;11(13):eadt2127. doi: 10.1126/sciadv.adt2127. https://www.svi.edu.au/news-events/bacterial-toxins-holes-in-cells/
- **April 4, 2025,** Philanthropy News media release Alisa Glukhova Snow Fellowship - https://www.philanthropy.org.au/news-and-stories/sector-news-wrap-up-2/
- **April 14, 2025.** Australian Academy of Science media release– Dr Sarah Piper JG Russell award. https://www.science.org.au/news-and-events/news-and-media-releases/five-emerging-scientists-receive-2025-j-g-russell-award
- **April 16, 2025.** Monash University, Faculty of Pharmacy and Pharmaceutical Science media release – Dr Sarah Piper JG Russell award. https://www.monash.edu/pharm/about/news/news-listing/latest/mips-scientist-receives-australian-academy-of-science-award

Social Media

The Outreach & Public Engagement Committee have opened two additional social media channels: Bluesky and Instagram. We will continue to post on X but with many scientists leaving for BlueSky, we are now active there as well. If you are on these platforms, remember to follow us!!

Bluesky – @ccemmp-outreach.bsky.social

Instagram - ccemmp_outreach

- WEHI LInkedIn Post - NHMRC awardees - https://www.linkedin.com/posts/wehi_research_an-excellent-effort-by-14-of-our-remarkable-activity-7299625264198627328-ZAia/?utm_source=social_share_send&utm_medium=member_desktop_web&rcm=ACoAABuSDrQBS7U9xIc4IxqAyw-UtR2tO16vQ5A
- Bluesky and Twitter posts for Sci Adv paper (Johnstone et al.)
- Bluesky : https://bsky.app/profile/bjohnstone.bsky.social/post/3lllocutfgs27
- Twitter: https://x.com/bronteaj/status/1906300679708410247

Outreach - Training

Centre members continue to present training within CCeMMP and externally, on more than just Cryo EM.

- Blender Workshop for Outreach and Public Engagement Committee Members - Facilitated by Dr. Sarah Piper
- Dr. Winnie Tan - facilitated Mass Photometry training (WEHI)

Industry Engagement

Members and student members continue to have their regular meetings with their respective industry partners (Boerhinger Ingelheim, Astex, Servier, AstraZeneca, Dimerix and Pfizer). ICHDRs and their supervisors are also talking with industry partners regarding their 3 month placements. ICHDRs are beginning to meet with their industry mentors.

- Anna Beyger commenced placement Servier

Visits to Industry

- Prof. Denise Wootten. Septerna Founders symposium. Targeting the GLP-1R from receptor structure to animal models of disease. Septerna Inc., San Francisco, CA, USA, February 24th-25th, 2025.
- Prof. Patrick Sexton. Septerna Founders symposium. Understanding the structural basis for selective and non-selective amylin and calcitonin receptor agonists. Septerna Inc., San Francisco, CA, USA, February 24th-25th, 2025.
- Prof. Arthur Christopoulos. Septerna Founders symposium. Septerna Inc., San Francisco, CA, USA, February 24th-25th, 2025.
- Prof. Patrick Sexton. Understanding the structural basis for selective and non-selective amylin and calcitonin receptor agonists. Novo Nordisk, Boston USA, February 27th, 2025.
- Profs. Wootten, Sexton and Christopoulos. Roundtable discussions. Septerna Inc., San Francisco, CA, USA, February 24th-25th, 2025.
- Profs. Wootten and Sexton. Roundtable discussions. Novo Nordisk, Boston USA, February 27th, 2025.

Recent Centre Activities and Achievements

Lorne Protein Conference 2025, 9-13 February, 2025

The Lorne Protein Conference 2025 successfully concluded, bringing together experts from around the world. This year's event celebrated the 50th anniversary of the Lorne Protein Conference and was held at the Mantra Hotel in Lorne, Australia, providing a crucial platform for cutting-edge discussions and knowledge exchange in protein science.

CCeMMP's Strong Presence at Lorne Protein Conference 2025

The CCeMMP had a significant presence at this year's event, with multiple members showcasing their pioneering research. Our researchers actively participated in oral presentations, panel discussions, and poster sessions, reinforcing our commitment to advancing protein science. CCeMMP members were well-represented, with nine oral presentations and 24 poster presentations at the conference.

CCeMMP at Lorne Proteins 2025

The conference also provided attendees with the opportunity to explore the beautiful surroundings of Lorne, including Erskine Falls, Lorne Pier, and Lorne Beach. Many of our Centre members took advantage of this scenic environment to network, exchange ideas, and discuss future collaborative opportunities.

CCeMMP Award Winners

Anders Award winners, Lorne Proteins 2025

Three of the five Anders Award Winners were CCeMMP members/affiliates. Congratulations to Dr. Wessel Burger, Dr. Brooke Hayes and Dr. Winnie Tan for being recognized for their ground breaking research.

Student Poster Prizes were awarded to Milad Reyhni from the Ghosal Lab, showcasing innovation and academic impact with the poster titled: Characterization of cell-cell interaction mechanisms in novel archaea and ICHDR Riya

Joseph with the poster titled: A structural perspective on pore formation and regulation of Bacteroides fragilis toxins.

We look forward to the next Lorne Protein Conference as we continue to promote academic innovation and global collaboration.

Student Poster Prize, Lorne Proteins 2025, Riya Joseph

Student Poster Prize, Lorne Proteins 2025, Milad Reyhni

Conference Presentations

International Meetings

Dr. Hamish Brown: Invited oral presentation. Montage electron cryo-tomography with square and rectangular beams. 13th Asia Pacific Microscopy Congress 2025, 2-7 February Brisbane, QLD, Australia.

A/Prof. Debnath Ghosal: Invited oral presentation. Exploring the microbial dark matter using electron cryotomography. 13th Asia Pacific Microscopy Congress 2025, 2-7 February Brisbane, QLD, Australia.

Dr. Joshua Hardy: Selected oral presentation Determining the Architecture of the Baculovirus Nucleocapsid Using Sub-Tomogram Averaging and Helical Reconstruction. 13th Asia Pacific Microscopy Congress 2025, 2-7 February Brisbane, QLD, Australia.

Dr. Yan Jiang: Invited talk. Structures of borate transporter AtBor1 of the SLC4 family reveal the mechanisms of auto-inhibition and transport. 13th Asia Pacific Microscopy Congress 2025, 2-7 February, Brisbane QLD, Australia

Prof. Isabelle Rouiller: Invited oral presentation. Characterizing the conformational landscape of protein from 2D cryo-EM images and tomography data using Molecular Dynamics. 13th Asia Pacific Microscopy Congress 2025, 2-7 February, Brisbane QLD, Australia.

Prof. Patrick Sexton: Invited symposium presentation. Structural and pharmacological insights in targeting class B1 GPCRs for metabolic diseases. Molecular Pharmacology, Gordon Research Conference, 16-21 February 2025, Ventura Beach, CA, USA.

National Meetings

Dr. Wessel Burger*: Invited talk. Dissecting GPCR function through nanodiscs; structural and pharmacological approaches. 50th Lorne Conference on Protein Structure and Function, Lorne Proteins 2025, 9-13 February, 2025, Lorne, Victoria. ***Anders Award***

Dr. Brooke Hayes*: Invited talk Structural basis of toxin delivery by the Type VI Secretion System.50th Lorne Conference on Protein Structure and Function, Lorne Proteins 2025, 9-13February, 2025, Lorne, Victoria. ***Anders Award***

Dr. Winnie Tan*: Invited talk. Multi-scale insights into the functions of a chromatin remodeller. 50th Lorne Conference on Protein Structure and Function, Lorne Proteins 2025, 9-13 February, 2025, Lorne, Victoria. ***Anders Award***

A/Prof. Alisa Glukhova, Lorne Proteins 2025

A/Prof. Alisa Glukhova: Selected oral presentation (Sparrow session). Using cryo-electron microscopy to understand the biology and drug binding of the wnt signalling pathway. 50th Lorne Conference on Protein Structure and Function, Lorne Proteins 2025, 9-13 February, 2025, Lorne, Victoria.

Dr. Benjamin Gully: Selected oral presentation. Uncovering the molecular basis of γδ T cell activation . 50th Lorne Conference on Protein Structure and Function, Lorne Proteins 2025, 9-13 February, 2025, Lorne, Victoria.

Dr. Kelsi Hall: Selected oral presentation (ANSTO Light-ning Talks). A conserved second-sphere residue in lytic polysaccharide monooxygenases controls copper-site reactivity. 50th Lorne Conference on Protein Structure and Function, Lorne Proteins 2025, 9-13 February, 2025, Lorne, Victoria.

Dr. Yan Jiang: Selected Oral Presentation. Structural Insights into SLC4 Transporters: Mechanisms of Activity Regulation and Substrate Transport. 50th Lorne Conference on Protein Structure and Function, Lorne Proteins 2025, 9-13 February, 2025, Lorne, Victoria.

Dr. Alice Shin, Lorne Proteins 2025

Prof. Megan Maher: Selected oral presentation (Sparrow session). Insecticidal proteins from ferns resemble Bacillus thuringiensis toxins. 50th Lorne Conference on Protein Structure and Function, Lorne Proteins 2025, 9-13 February, 2025, Lorne, Victoria.

A/Prof Gökhan Tolun, Lorne Proteins 2025

Dr. Alice Shin: Selected oral presentation (ANSTO Light-ning Talks). Structure, dynamics and evolution of the Candida albicans multi-drug resistance ABC transporter CDR1. 50th Lorne Conference on Protein Structure and Function, Lorne Proteins 2025, 9-13 February, 2025, Lorne, Victoria.

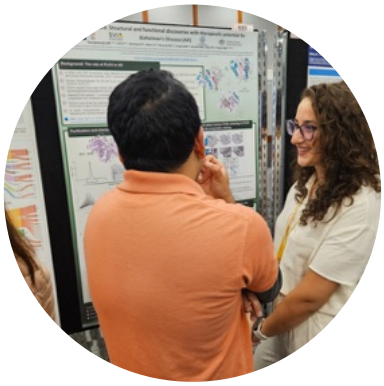
A/Prof Gökhan Tolun: Selected oral presentation (ANSTO Light-ning Talks). How Cryo-EM Structures Reveal Molecular Mechanisms of Biomolecular Complexes. 50th Lorne Conference on Protein Structure and Function, Lorne Proteins 2025, 9-13 February, 2025, Lorne, Victoria.

Dr. Brian Cary: Poster presentation. “Prolonged Signaling of Backbone-Modified Glucagon-like Peptide-1 Analogues with Diverse Receptor Trafficking.” 50th Lorne Conference on Protein Structure and Function, Lorne Proteins 2025, 9-13 February, 2025, Lorne, Victoria.

Dr. Brian Cary, Lorne Proteins 2025

Lyn Deng: Poster presentation. Uncovering the differential function and expression of DCLK1 isoforms in aggressive cancers . 50th Lorne Conference on Protein Structure and Function, Lorne Proteins 2025, 9-13 February, 2025, Lorne, Victoria.

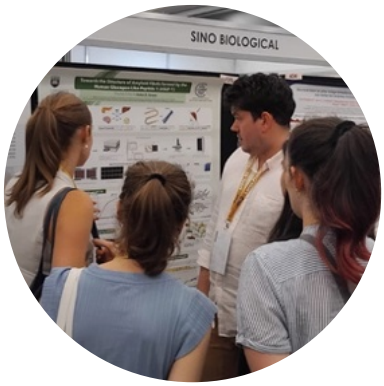
Sneha Desa: Poster presentation. Investigating the structure of TolC-like proteins in Gram positive bacteria. 50th Lorne Conference on Protein Structure and Function, Lorne Proteins 2025, 9-13 February, 2025, Lorne, Victoria.



Marialena Georgopoulou, Lorne Proteins 2025

Daniel Fox: Poster presentation. AI-designed protein inhibitors can block heme uptake and inhibit growth of pathogenic E. coli . 50th Lorne Conference on Protein Structure and Function, Lorne Proteins 2025, 9-13 February, 2025, Lorne, Victoria.

Marialena Georgopoulou: Poster presentation. Decoding PLD3: Structural and functional discoveries with therapeutic potential for Alzheimer’s Disease. 50th Lorne Conference on Protein Structure and Function, Lorne Proteins 2025, 9-13 February, 2025, Lorne, Victoria



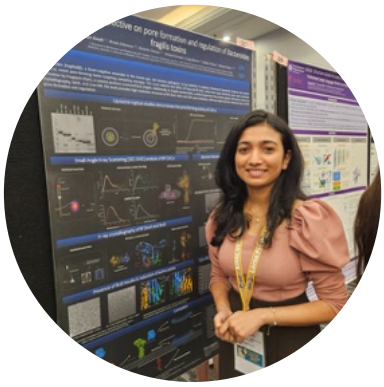
Dr. Aidan Grosas, Lorne Proteins 2025

Dr. Aidan Grosas: Poster presentation. Towards the Structure of Amyloid Fibrils formed by the Human Glucagon-Like-Peptide 1 (hGLP-1) . 50th Lorne Conference on Protein Structure and Function, Lorne Proteins 2025, 9-13 February, 2025, Lorne, Victoria.

Dr. Joshua Hardy: Poster presentation. TEMPO: Training in Electron Microscopy Processing and Optics. 50th Lorne Conference on Protein Structure and Function, Lorne Proteins 2025, 9-13 February, 2025, Lorne, Victoria.

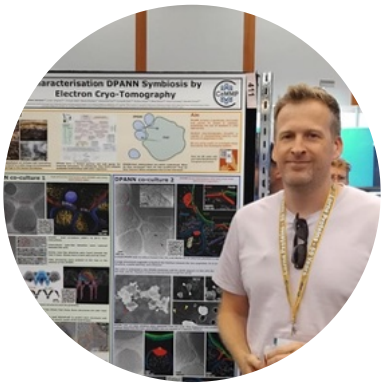
Dr. Matthew Johnson: Poster presentation. Characterisation DPANN symbiosis by electron cryo-tomography. 50th Lorne Conference on Protein Structure and Function, Lorne Proteins 2025, 9-13 February, 2025, Lorne, Victoria.

Riya Joseph*: Poster presentation. A structural perspective on pore formation and regulation of Bacteroides fragilis toxins. 50th Lorne Conference on Protein Structure and Function, Lorne Proteins 2025, 9-13 February, 2025, Lorne, Victoria. ***Student Poster Prize***



Riya Joseph, Lorne Proteins 2025

Ashleigh Kropp: Poster presentation. Respiratory chain coupling proteins: A novel and widespread mechanism for microbial quinone reduction. 50th Lorne Conference on Protein Structure and Function, Lorne Proteins 2025, 9-13 February, 2025, Lorne, Victoria.

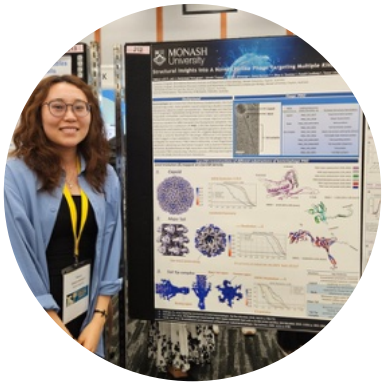


Dr. Matthew Johnson, Lorne Proteins 2025

Dr. Yan Li: Poster presentation: Structural Insights into A Novel Chi-like Phage Targeting Multiple Klebsiella spp. 50th Lorne Conference on Protein Structure and Function, Lorne Proteins 2025, 9-13 February, 2025, Lorne, Victoria.

Dr. James Lingford: Poster presentation. [NiFe]-hydrogenases in Asgard archaea resemble Complex I. 50th Lorne Conference on Protein Structure and Function, Lorne Proteins 2025, 9-13 February, 2025, Lorne, Victoria.

Dr. Shadi Maghool: Poster presentation. Structural basis for ether-bridge formation by divergent alpha-ketoglutarate dependent non-heme iron enzymes involved in antibiotic biosynthesis. 50th Lorne Conference on Protein Structure and Function, Lorne Proteins 2025, 9-13 February, 2025, Lorne, Victoria.



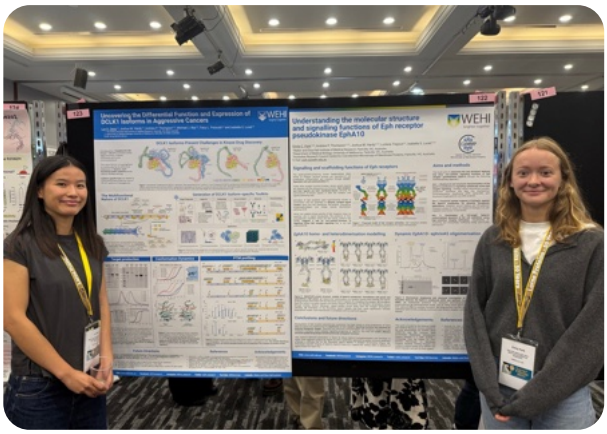
Dr. Yan Li, Lorne Proteins 2025

Dr. Jesse Mobbs: Poster presentation. Structural investigation of allosteric modulation of the delta opioid receptor. 50th Lorne Conference on Protein Structure and Function, Lorne Proteins 2025, 9-13 February, 2025, Lorne, Victoria.

Dr. Sarah Mueller: Poster presentation. Elucidating the structural dynamics of the nickel transporter Ynt and its implications for urease activity in Proteus mirabilis. 50th Lorne Conference on Protein Structure and Function, Lorne Proteins 2025, 9-13 February, 2025, Lorne, Victoria.

Fabian Munder: Poster presentation. High-affinity PQQ import is widespread in gram-negative bacteria. 50th Lorne Conference on Protein Structure and Function, Lorne Proteins 2025, February 9-13, 2025, Lorne, Victoria.

Isa Nuryana: Poster presentation. Exploring uncharacterised flagellar proteins in the S-layer containing Gram-positive bacterium, Bacillus solimangrovi. 50th Lorne Conference on Protein Structure and Function, Lorne Proteins 2025, 9-13 February, 2025, Lorne, Victoria.



Lyn Deng and Emily Park, Lorne Proteins, 2025

Emily Park: Poster presentation. Understanding the molecular structure and signalling functions of Eph receptor pseudokinase EphA10. 50th Lorne Conference on Protein Structure and Function, Lorne Proteins 2025, 9-13 February, 2025, Lorne, Victoria.

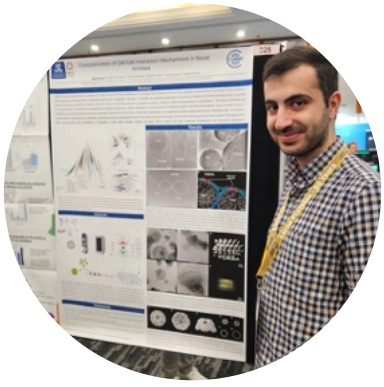
Dr. Sarah Piper, Lorne Proteins 2025

Dr. Sarah Piper: Poster presentation. Visualising structural biology data of Class B1 GPCRs in 3D animations. 50th Lorne Conference on Protein Structure and Function, Lorne Proteins 2025, 9-13 February, 2025, Lorne, Victoria.

Milad Reyhni*: Poster presentation. Characterization of cell-cell interaction mechanisms in novel archaea. 50th Lorne Conference on Protein Structure and Function, Lorne Proteins 2025, 9-13 February, 2025, Lorne, Victoria. ****Student Poster Prize***

Dr. Christopher Stubenrauch: Poster presentation. How is the bacterial flagellar secreted through the Gram-positive S-layer? 50th Lorne Conference on Protein Structure and Function, Lorne Proteins 2025, 9-13 February, 2025, Lorne, Victoria.

A/Prof. David Thal: Poster presentation. A structural basis of allosteric ligand selectivity at GPCRs. 50th Lorne Conference on Protein Structure and Function, Lorne Proteins 2025, 9-13 February, 2025, Lorne, Victoria.



Milad Reyhni, Lorne Proteins 2025

A/Prof. David Thal

Dr. Luca Troman: Poster presentation. Single particle cryo-EM analysis of spirochete periplasmic flagella. 50th Lorne Conference on Protein Structure and Function, Lorne Proteins 2025, 9-13 February, 2025, Lorne, Victoria.

Local Meetings

Somavally Dalvi*: Selected talk.Crossing the barrier: Understanding the life cycle of membrane-containing phages at molecular resolution. Phage bites Symposium 2025 (Australia Society for Microbiology), April 1 2025, online via zoom . ***Student speaker prize, best talk.***

Somavally Dalvi*: Selected talk. Crossing the barrier: Understanding the life cycle of membrane-containing phages at molecular resolution. Mobile Genetic Element Meeting 2025 (Australian Society for Microbiology), 17 - 18 Feb 2025, LaTrobe University, Melbourne City Campus. ****First runner up for the oral presentation prize.***

PDB ENTRIES

235,183

TOTAL TO DATE

PDB ENTRIES

26,504

3DEM STRUCTURES TO DATE

Academic Presentations

Academic Seminars

Dr. Brian Cary - CCeMMP Seminar Series - "Prolonged Signaling of Backbone-Modified Glucagon-like Peptide-1 Analogues with Diverse Receptor Trafficking." April 8, 2025, online.

Dr. Jesse Mobbs - Department of Biochemistry and Pharmacology (University of Melbourne) Seminar - "Cryo-EM Insights of Allosteric Modulation in Muscarinic and Opioid Receptors." April 2, 2025, Bio21, Parkville.

Isabella Russell - PhD exit seminar - Investigation Constitutive Activity in Class A and B1 GPCRs, March 26, 2025, Monash University, Parkville.

Dr. Jesse Mobbs, Bio21, April 2025

Publications

New Publications

Callegari S, Kirk NS, Gan ZY, Dite T, Cobbold SA, Leis A, Dagley LF, **Glukhova A**, Komander D (2025). Structure of human PINK1 at a mitochondrial TOM-VDAC array. Science, 388(6744):303-310. DOI: 10.1126/science.adu6445

Cao J, Belousoff MJ, Johnson RM, Keov P, Mariam Z, Deganutti G, Christopoulos G, Hick CA, Reedtz-Runge S, Glendorf T, Ballarín-González B, Raun K, Bayly-Jones C, **Wootten D**, **Sexton PM** (2025). Structural and dynamic features of cagrilintide binding to calcitonin and amylin receptors. Nat Commun 16: 3389. https://doi.org/10.1038/s41467-025-58680-y
9BLB, 9BLC, 9BUE, 9BTW, 9BTL, 9BP3, 9BQ3, 9BUB, 9BUC, 9BUD

Cary BP, Hager MV, Mariam Z, Morris RK, **Belousoff MJ,** Deganutti G, **Sexton PM, Wootten D**, Gellman SH (2025). Prolonged signaling of backbone-modified glucagon-like peptide-1 analogues with diverse receptor trafficking. Proc Natl Acad Sci USA, 122 (14): e2407574122. https://doi.org/10.1073/pnas.2407574122
9EBN, 9EBO, 9EBQ

Dinh LV, Dangerfield J, DeBono A, Keller A, **Josephs TM, Gregory K, Leach K**, Capuano B (2025). Next-generation analogues of AC265347 as positive allosteric modulators of the calcium-sensing receptor: pharmacological investigation of structural modifications at the stereogenic centre. Int J Molec Sci, 26(6):2580. doi: 10.3390/ijms26062580

Johnstone BA, Christie MP, Joseph R, Morton CJ, **Brown HG, Hanssen E**, Sanford TC, Abrahamsen HL, Tweten RK, **Parker MW** (2025). Structural basis for the pore-forming activity of a complement-like toxin. Sci Adv, 11(13):eadt2127. doi: 10.1126/sciadv.adt2127. 8G33 (X-RAY); 9CCP, EMD-45451; 9CCQ, EMD-45453; EMD-45448; EMD-45449; EMD-45450; EMD-45452; EMD-45454; EMD-45455.

Li CK, **Gregory KJ**, Jörg M. (2025). Ligand-directed covalent labelling of adenosine receptors. Purinergic Signalling (published 24 February 2025). https://doi.org/10.1007/s11302-025-10073-y

Reva ON, Cono VL, Marturano L, Crisafi F, Smedile F, **Mudaliyar M, Ghosal D**, Selivanova EA, Ignatenko ME, Ferrer M, Fernandez-Lopez L, Krupovic M, Yakimov MM (2025). DPANN symbiont of Haloferax volcanii accelerates xylan degradation by the non-host haloarchaeon Halorhabdus sp. iScience 28(2): 111749. DOI: 10.1016/j.isci.2025.111749

Rose JJA, **Johnson MD, Reyhani M**, Baitinovic S, Severe RJ, **Ghosal D**, Petrovski S (2025). Mutations in Gordonia amarae mycolic acid biosynthetic pathway confer resistance to Patescibacteria parasite Mycosynbacter amalyticus. Nat Commun, 16 (1): 2202. https://doi.org/10.1038/s41467-025-56933-4

Russell IC, Lee D, Wootten D, Sexton PM, Bumbak F (2025). Cryo-EM as a tool for illuminating activation mechanisms of human class A orphan GPCRs. Pharmacol Rev, 100056. https://doi.org/10.1016/j.pharmr.2025.100056

Sentosa DD, Metcalfe RD, Sims NA,| **Putoczki, TL**, **Griffin MDW** (2025). The structure of the IL-11 signalling complex provides insight into receptor variants associated with craniosynostosis. FEBS J, 292(3): 500-509. 10.1111/febs.17307l

Venugopal H, **Mobbs J**, Taveneau C, **Fox DR**, Vuckovic Z, Gulati S, Knott G, **Grinter R, Thal D**, Mick S, Czarnik C, Ramm G (2025). High-resolution cryo-EM using a common LaB6 120-keV electron microscope equipped with a sub-200-keV direct electron detector. Sci Adv, 11(1):eadr0438. doi: 10.1126/sciadv.adr0438

Preprints

Burger WAC, Mobbs JI, Rana B, Wang J, Joshi K, Gentry PR, Yeasmin M, Venugopal H, Bender AM, Lindsley CW, Miao Y, **Christopoulos A, Valant C, Thal DM.** Cryo-EM reveals a new allosteric binding site at the M5 mAChR. BioXriv Feb 8, 2025, doi: https://doi.org/10.1101/2025.02.05.636602

Updated Publications

Burgess AE, Loughran TA, Turk LS, Dunlop JL, Jamieson SA, Curry JR, Filipcik P**, Brown SHJ,** Mace PD (2025). DET1 dynamics underlie co-operative ubiquitination by CRL4DET1-COP1 complexes. Sci Adv, 11(9):eadq4187. doi: 10.1126/sciadv.adq4187

Released Structures

PDB:9BLB, EMD-44652 - Human Calcitonin Receptor in Complex with Gs & Cagrilintide Backbone (non-acylated) in bypass conformation
PDB:9BLC, EMD-44653 - Human Calcitonin Receptor in Complex with Gs & Cagrilintide Backbone (non-acylated) in CT-like conformation
PDB:9BLW, EMD-44678 - Human amylin1 Receptor in complex with Gs & Cagrilintide backbone (non-acylated)

- Jason Cao, Matthew Belousoff, Denise Wootten, Patrick Sexton.
- Cao et al. Structural and dynamic features of cagrilintide binding to calcitonin and amylin receptors. Nat Commun 16: 3389, 2025. https://doi.org/10.1038/s41467-025-58680-y

PDB:9BTW, EMD-44898 - Human Amylin3 Receptor in complex with Gs & cagrilintide
PDB:9BUE, EMDB- 44907 - Human calcitonin Receptor in complex with Gs & cagrilintide in the CT-like conformation (repeat)
PDB:9BP3, EMD-44760 - Human Amylin1 Receptor in complex with Gs & cagrilintide
PDB:9BQ3, EMD-44796 - Human Amylin2 Receptor in Complex with Gs & Cagrilintide
PDB:9BUB, EMD-44904 - Human calcitonin Receptor in complex with Gs & cagrilintide in the bypass conformation
PDB:9BUC, EMD-44905 - Human calcitonin Receptor in complex with Gs & cagrilintide in the bypass conformation (repeat)
PDB:9BUD, EMD-44906 - Human calcitonin Receptor in complex with Gs & cagrilintide in the CT-like conformation

- Jason Cao, Matthew Belousoff, Rachel Johnson, Patrick Sexton, Denise Wootten.
- Cao et al. Structural and dynamic features of cagrilintide binding to calcitonin and amylin receptors. Nat Commun 16: 3389, 2025. https://doi.org/10.1038/s41467-025-58680-y

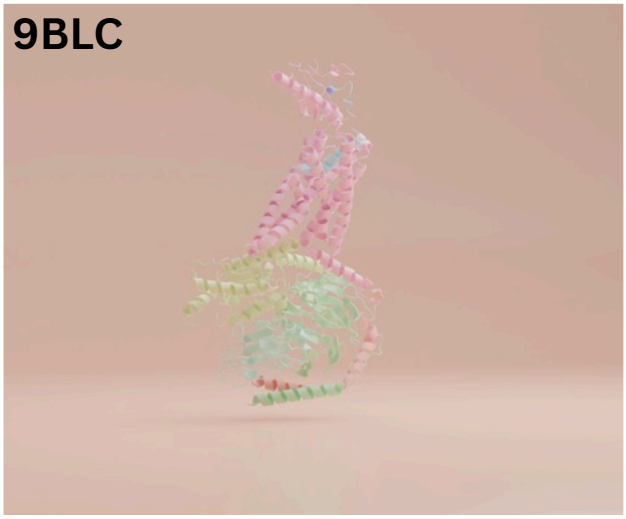
PDB: 9CCP, EMD-45451 - Cryo-EM structure of the EaCDCL pore
PDB: 9CCQ, EMD-45453 - Cryo-EM structure of the prepore-like EaCDCL short oligomer
EMD-45448 - Double-stacked pore and prepore-like complex (C1 symmetry)
EMD-45449 - Double-stacked pore and prepore-like complex (C30 symmetry)
EMD-45450 - EaCDCL pore complex (C1 symmetry)
EMD-45452 - Prepore-like EaCDCL short oligomer (C1 symmetry)
EMD-45454 - EaCDCL pore complex, non-stacked control (C1)
EMD-45455 - EaCDCL pore complex, non-stacked control (C30 symmetry)

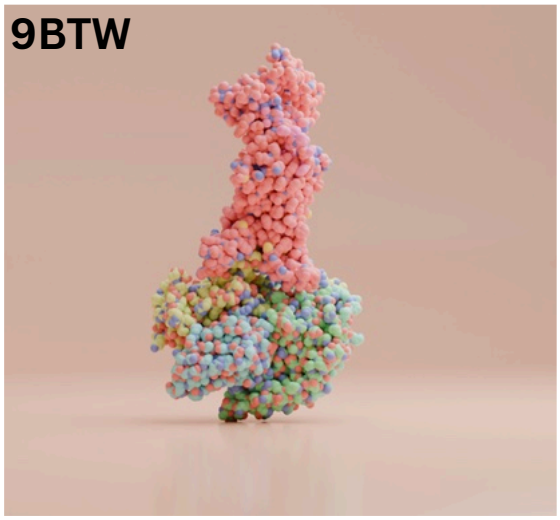
- Bronte Johnstone, Michelle Christie, Hamish Brown, Eric Hanssen, Michael Parker.
- Johnstone et al., Structural basis for the pore-forming activity of a complement-like toxin. Sci. Adv, 11: eadt2127, 2025. DOI:10.1126/sciadv.adt2127

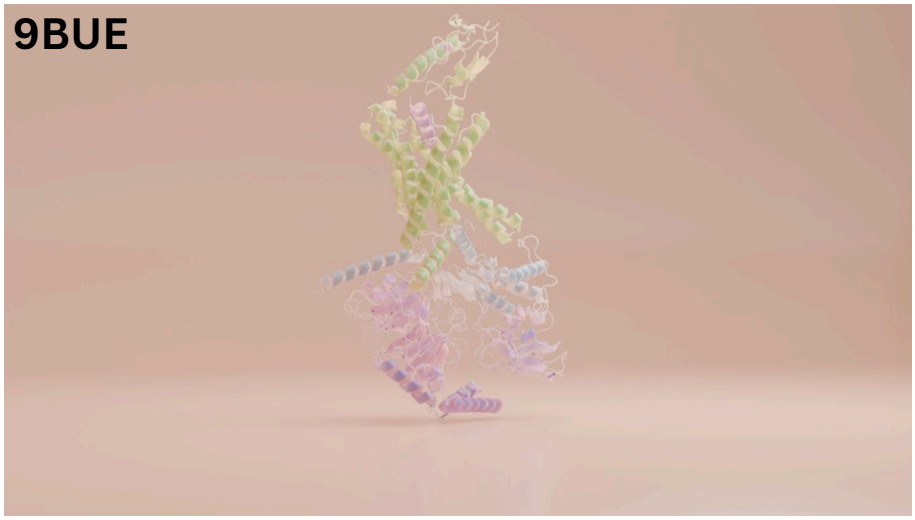
PDB:9EBN, EMD-47882 - Peptide 1 bound to GLP-1R/Gs complex
PDB:9EBO, EMD-47883 - Peptide 2 bound to GLP-1R/Gs complex (conformer 1)
PDB:9EBQ, EMD-47884 - Peptide 2 bound to GLP-1R/Gs complex (conformer 2)

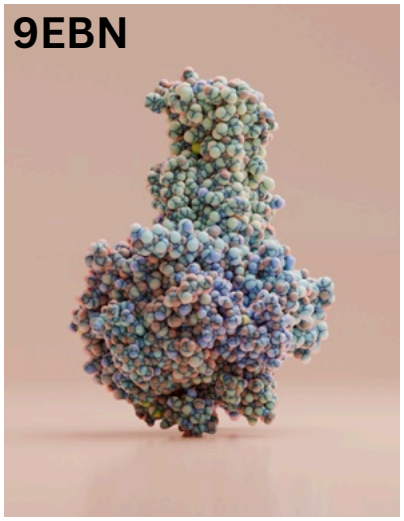
- Brian Cary, Matthew Belousoff, Denise Wootten, Patrick Sexton.
- Cary et al., Prolonged signaling of backbone-modified glucagon-like peptide-1 analogues with diverse receptor trafficking. PNAS (USA), 122 (14): e2407574122, 2025. https://doi.org/10.1073/pnas.2407574122.

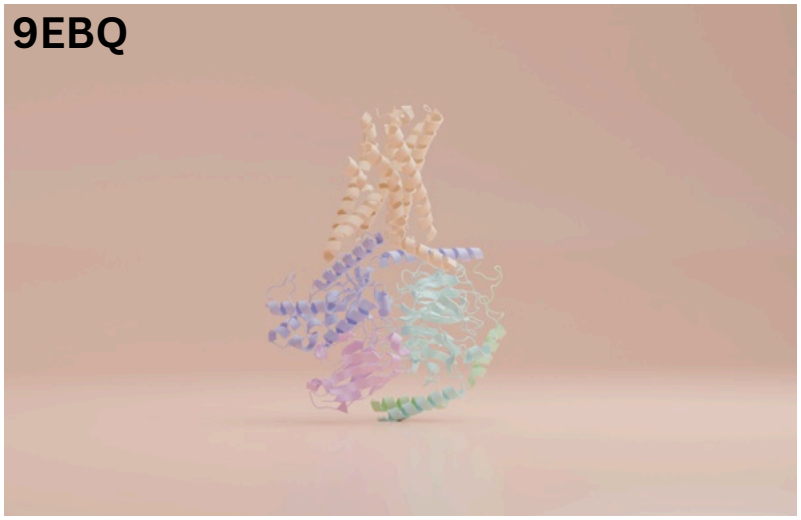
CCeMMP Cryo-EM Structure Image Gallery











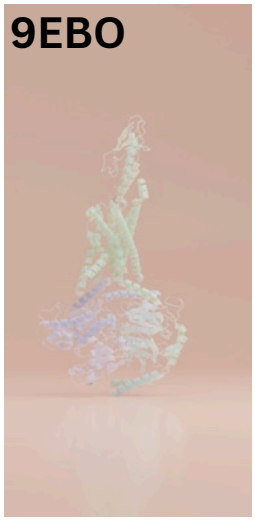


Image credit page 22: Lyn Deng

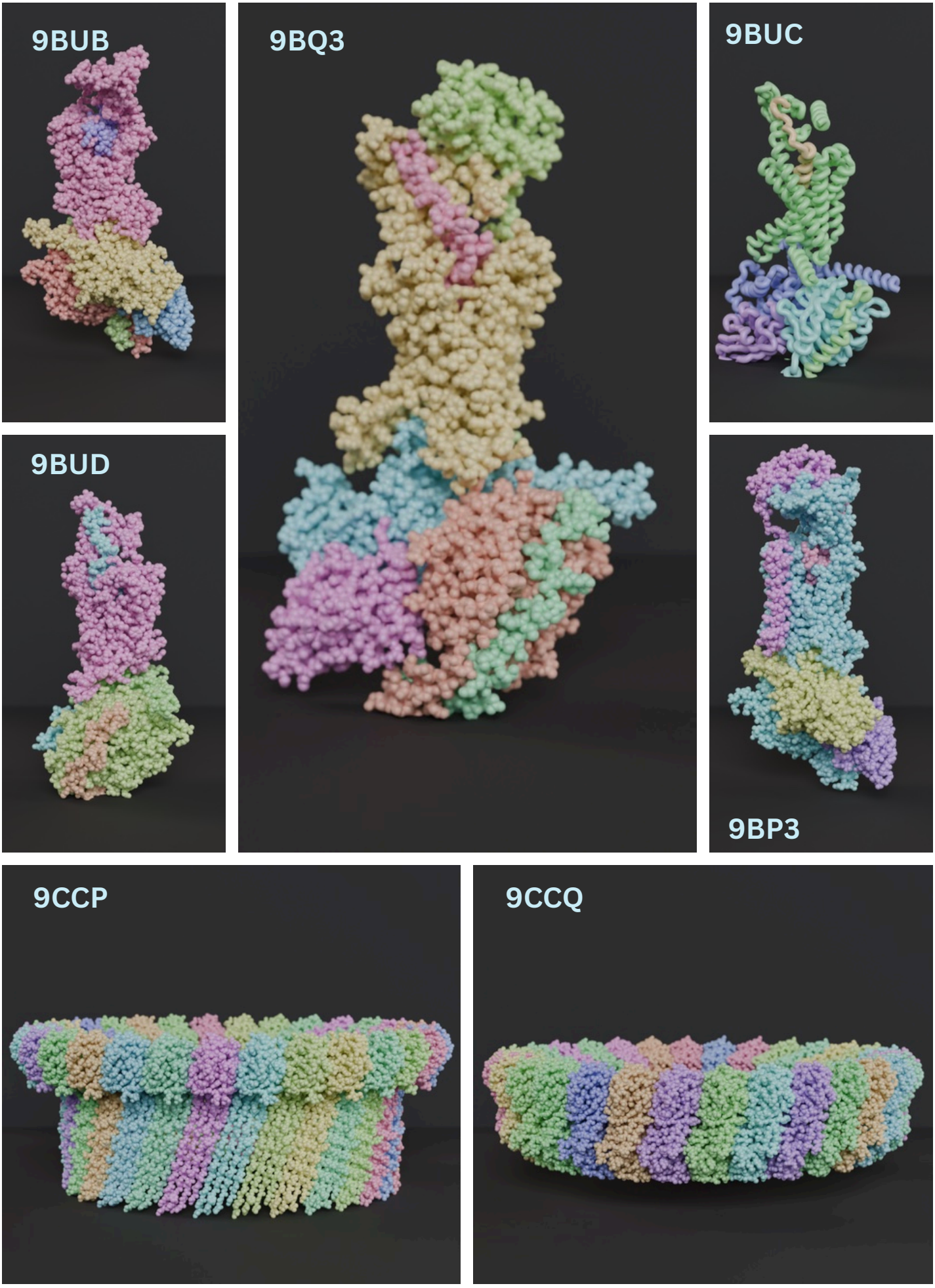


Image credit page 23: Dr. Jason Cao, Dr. Jesse Mobbs

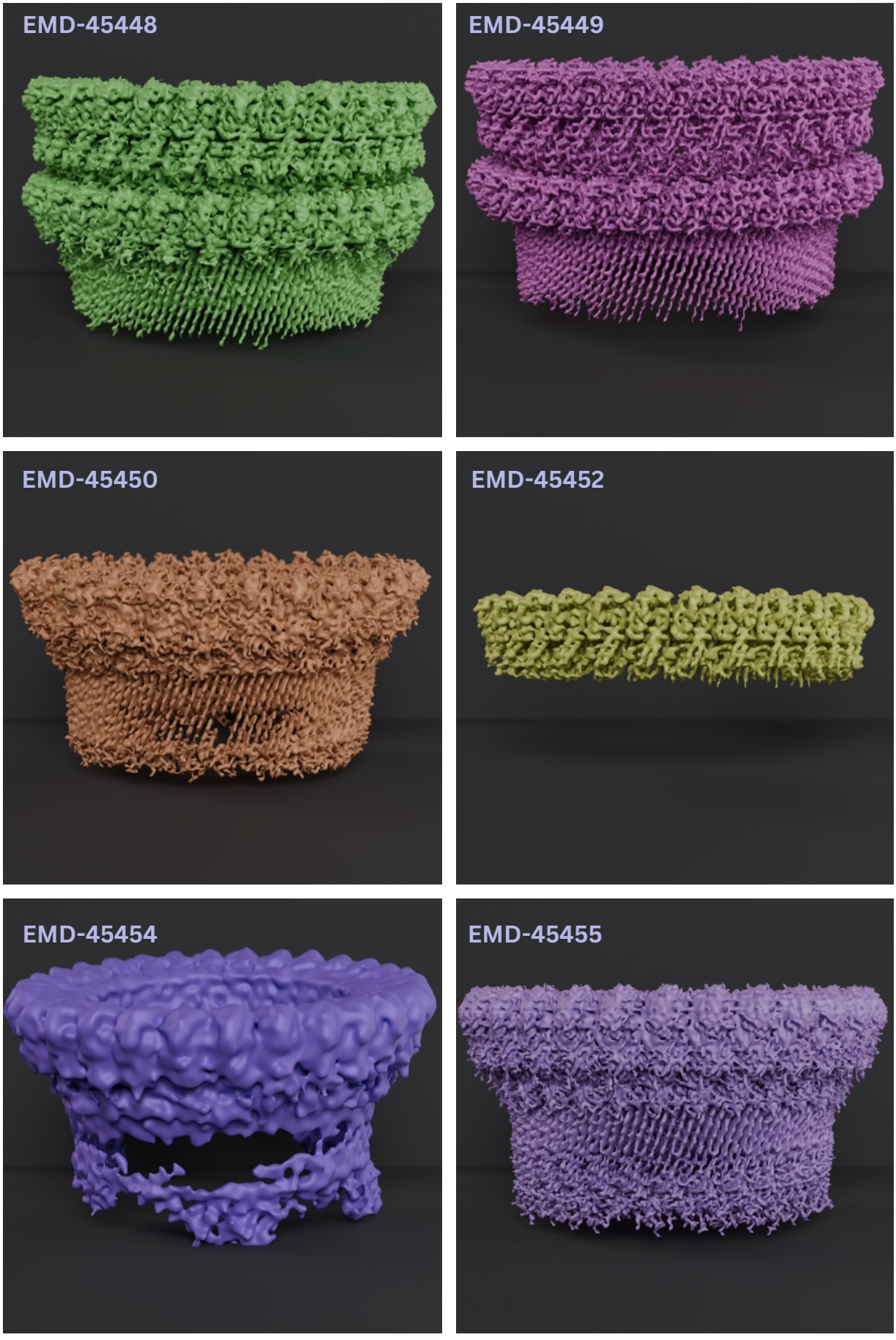


Image credit page 24: Dr. Jesse Mobbs