



UNSW
SYDNEY

School of Biomedical Sciences

Annual Report 2025

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Acknowledgement of Country

The School of Biomedical Sciences is primarily located at the UNSW Kensington Campus, on the unceded territory of the Bidjigal people, the Traditional Owners of these lands, seas and waters. We honour the Elders of the Nations that we walk together with, past and present, and acknowledge their ongoing connection to culture, community and Country.



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About the School

The School of Biomedical Sciences (SBMS) is a dynamic community of educators, researchers, and professional staff working at the forefront of health, medical and biomedical sciences. United by a shared commitment to excellence, our School aims to be the bridge between discovery science and major advances in medicine & health.

SBMS has a strong and diverse research portfolio spanning fundamental science through to translational and clinically focused research. Our researchers lead nationally and internationally recognised programs across key biomedical disciplines, supported by state-of-the-art facilities alongside strong clinical and industry partnerships that enable the translation of research into improved health outcomes.

As one of UNSW's largest teaching schools, we play a vital role in educating and inspiring the next generation of doctors, biomedical scientists, and health professionals.

Our graduates are well-prepared for professional practice and equipped with a strong understanding of biomedical research to support their future careers.

Our Mission

To advance world-class biomedical science and translate discoveries we make into outcomes that deliver positive societal impact. To equip the next generation of medical, health and science professionals to deliver better, equitable health for all through inspiring education and high-impact frontier research.

Our Strategic Priorities

- A no-compromise commitment to building an inclusive, values-driven School culture
- Embracing innovation and inclusivity in education
- The intentional pursuit of research excellence, research with impact & research translation
- Targeting partnerships in education and research within and outside of the School across all UNSW strategic pillars



2025 in Numbers



Our People

150

Fixed-term / Continuing / Convertible
Tenure-Track academics

Total — comprises the three figures below

37

Education-Focused academic staff

27

Teaching and Research academic staff

86

Research Only academic staff

71

Research Group Leaders

41

Professional / Technical staff

101

Higher Degree by Research students

10

Emeritus / Honorary academics

49

Visiting / Adjunct academics

78

Conjoint academics

Our Research

\$21.97M

Total research revenue in 2025

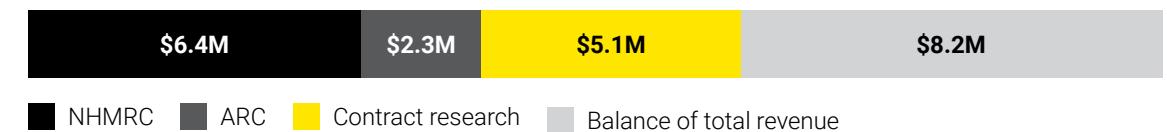
800+

Publications in 2025

50

In the *Cell* · *Nature* · *Science*
family of journals

This \$21.97M consists of



Our Education

\$46.12M

Total teaching revenue

^ 14% vs 2024 (\$40.47M)

762

Undergraduate equivalent full-
time student load
(excluding Medicine program)

^ 6%YoY · 22% / 5yr

5905

Across 50 courses
Undergraduate course enrolments
(excluding Medicine Program)

24

Higher Degree by Research
program completions

100+

Honours students
embedded in SBMS labs &
affiliated institutions

2489

Total enrolments across all
eight SBMS-convened Phase 1
Medicine program courses

Message from our Head of School

Professor Jake Baum



Welcome to the inaugural Annual Report from the School of Biomedical Sciences (SBMS).

Established in 2000 as the School of Medical Sciences – bringing together Anatomy, Pathology, Pharmacology and Physiology – SBMS has grown into one of UNSW's largest teaching and research schools. With the addition of the EMBL Australia Node for Single Molecule Science in 2022, we now comprise five departments: Anatomy, Molecular Medicine, Pathology, Pharmacology and Physiology.

SBMS is a vibrant hub of biomedical research, spanning discovery to clinical translation. Located at the intersection of the Kensington campus and the Randwick Health Innovation Precinct, our School is the beating heart of discovery and innovation within the Faculty of Medicine & Health.

We house world-class expertise in virology, immunology, neuroscience, cardiovascular and rare diseases, metabolic disorders, cancer, and the biochemical and cellular sciences. Our staff and students are advancing research across imaging, AI, genomics, structural biology, immunology, vaccinology, biophysics and 3D tissue models.

Our teaching spans undergraduate Medicine, Medical Science, Allied Health disciplines, and Science and Engineering degrees. We also lead majors in Anatomy, Physiology, Pharmacology, Pathology, Immunology, Neuroscience, and from 2026, Biophysics.

Finally, energising everything we do is an incredible professional team of laboratory managers, anatomy unit staff, and our secret power, an administrative A-team that excels in support of everything from finance to HR and communications.

This report offers a snapshot, looking back at an exceptional year of teaching, research and impact. Thank you to everyone who contributed to this report, particularly Amanda Lum as our Editor-in-Chief. I also want to acknowledge that no report can include everyone's achievements and contributions, there is always so much more to tell! For now, we hope you enjoy the selected stories and exemplars of the School's efforts and we look forward to welcoming you to visit us and become a partner with us into the future.

Enjoy!
Jake

Message from our School Manager

Mary Hervir

It is with great pride and warmth that I welcome you to the inaugural SBMS Annual Report. As School Manager, it is a privilege to work alongside our Head of School, Professor Jake Baum, and to support such a large, diverse, and vibrant School. The breadth of our students and staff enriches our daily work and strengthens our shared sense of purpose.

Our School is defined by its strong collegial spirit. Collaboration, respect, and inclusivity underpins everything we do, creating an environment where staff and students can thrive.

I am particularly proud of the many events that have brought our community together throughout the year. Our outreach activities have promoted UNSW, the Faculty, and the School to diverse audiences, showcasing our research excellence and inspiring future students. Equally important, our wellbeing initiatives – such as Harmony Day, Wear It Purple, R U OK? Day, and Wellness Month – have helped us care for one another, celebrate our diversity, and nurture a supportive culture.

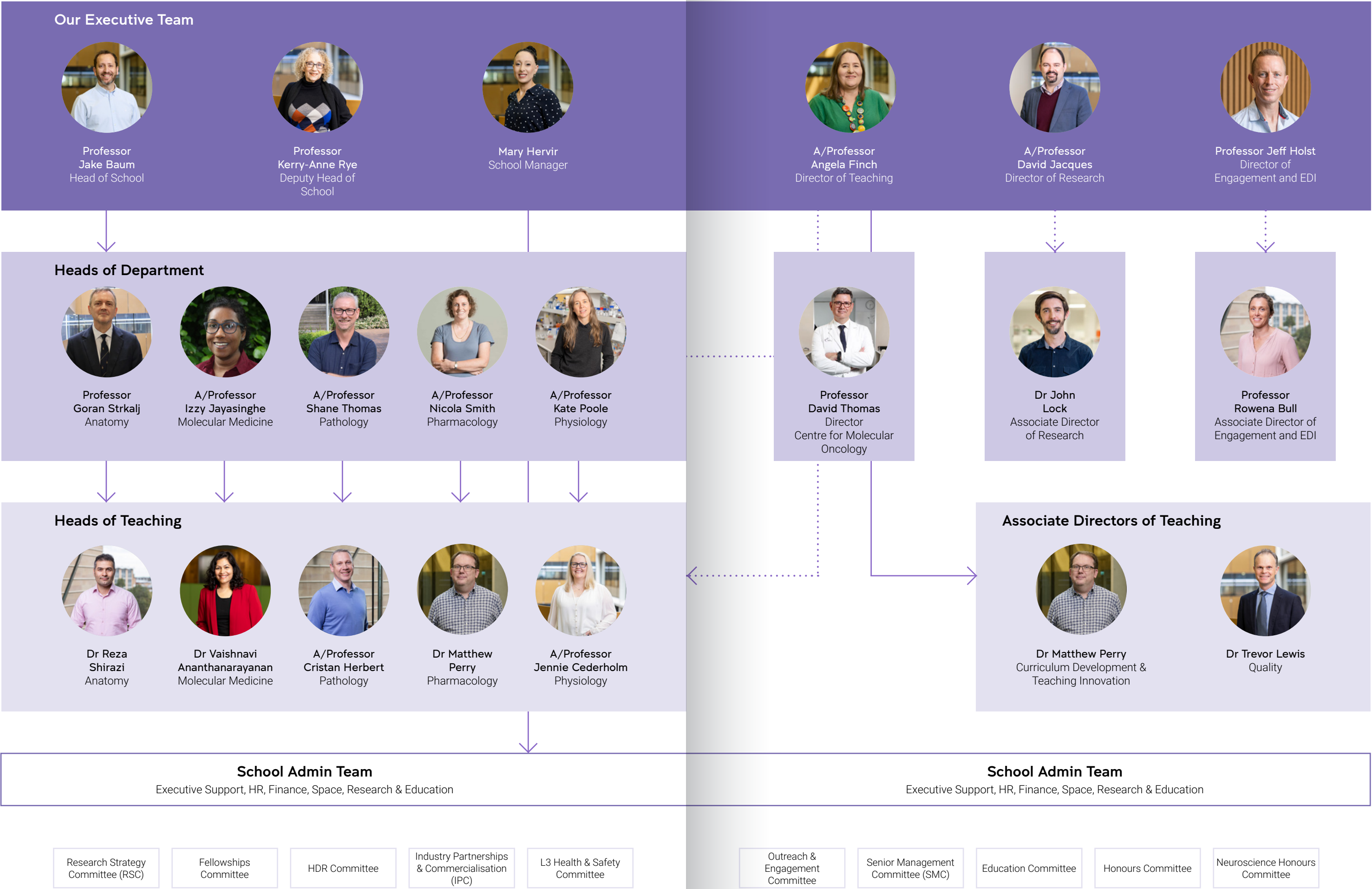
We also marked significant milestones, including special farewells and a revival of festschrifts, the first honouring Professor Margaret Morris, as well as launching new traditions such as the SBMS Run Club.

As one of UNSW's largest teaching- and research-intensive schools, our success depends on both academic excellence and the outstanding contributions of our professional staff. The SBMS Administration Team, Gross Anatomy Support Unit, Technical and Teaching Support Teams, and MEDRIOS are the backbone of our operations, ensuring the School runs smoothly and enabling our community to focus on teaching, research, and innovation.

Our School is a dynamic ecosystem, where every member plays a vital role. Looking ahead, I am optimistic about the opportunities before us and confident that, together, we will continue to build on our achievements and embrace new challenges.

I warmly invite you to engage with this Annual Report and celebrate what we have accomplished together.

Our School Structure



Research Update

Message from the Director of Research
A/Professor David Jacques

Research in SBMS has continued to build momentum over the past year. In a highly competitive research environment, our staff, researchers, and students have delivered work of exceptional quality and impact. This performance reflects both scientific excellence and a strong, collaborative research culture that supports ambition at all career stages.

SBMS's research spans fundamental discovery through to translational and applied science, addressing major challenges in human health.

Established strengths in molecular and cellular biology, infectious disease, immunology, neuroscience, pharmacology and physiology continue to define our profile, while growing activity at the interface of biomedicine, computation, and advanced technologies is expanding our capability.

Across these areas, researchers are working collaboratively across disciplines both internally at UNSW as well as between institutions locally and internationally to generate insights that are shaping their fields.

In 2025, we have performed strongly in competitive grant funding, with success across national and international schemes including NHMRC, MRFF, and ARC to name a few. These outcomes reflect the originality of our research programs and a culture in which ideas are strengthened through constructive peer engagement.



\$21.97M

Total Research Revenue in 2025

Including

\$6.4M

NHMRC Funding

\$2.3M

ARC Funding

\$5.1M

Contract Research Funding

Our researchers have published influential work in leading journals, reinforcing the School's reputation for rigorous, high-impact biomedical science.

800+

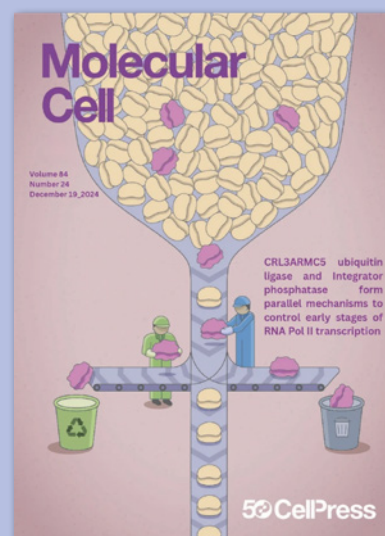
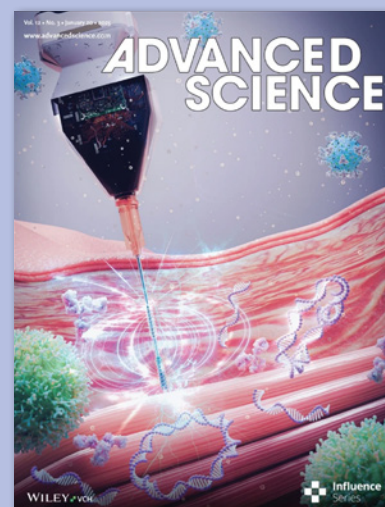
Publications in 2025

Including

50

Cell/Nature/Science family

Highlights from our SBMS



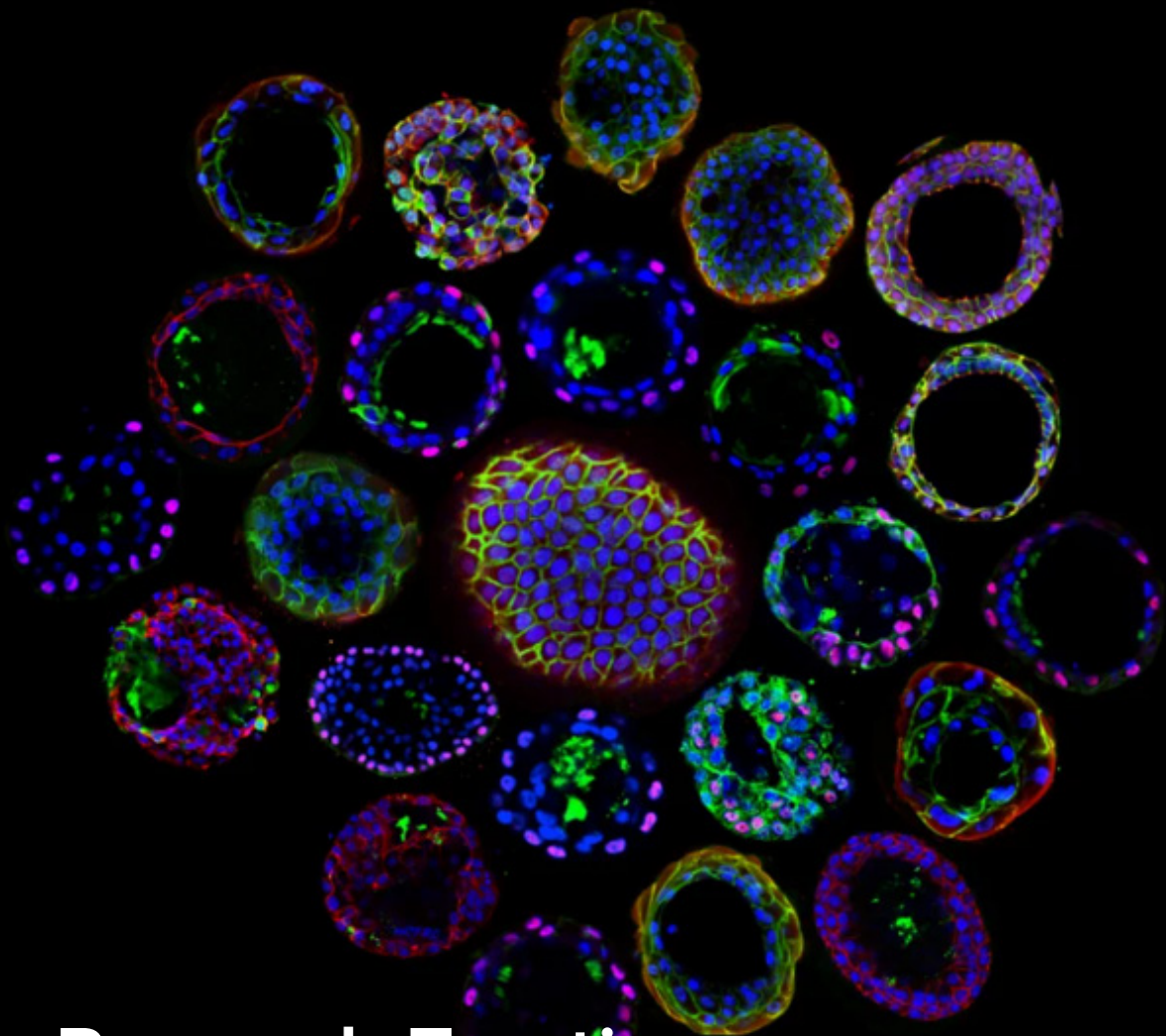
Wall of Fame



People are central to research excellence in the School. Our community of academic and professional staff, postdoctoral researchers, and postgraduate students is united by a shared commitment to discovery, mentorship, and collegiality. Engagement beyond the University also remains a hallmark of our research activity. Researchers in the School maintain active partnerships with clinical colleagues, industry, government, and community organisations, ensuring that discovery-driven research is connected to real-world needs and opportunities for translation and impact.

Looking ahead, the bridge between the Wallace Wurth Building and the recently opened Health Translation Hub provides SBMS with increased opportunity to deepen cross-disciplinary collaboration while also enabling us to promote the role of discovery science in future visions for medicine. In the immediate term, a key priority for the School is strengthening our development opportunities for early- and mid-career researchers. We remain committed to building an inclusive and sustainable research environment that enables excellence and encourages bold, curiosity-driven science.

I thank all members of the School for their contributions over the past year. The achievements highlighted in this report reflect a collective effort and a shared ambition to advance biomedical science, and I look forward to sharing our achievements over the year ahead.



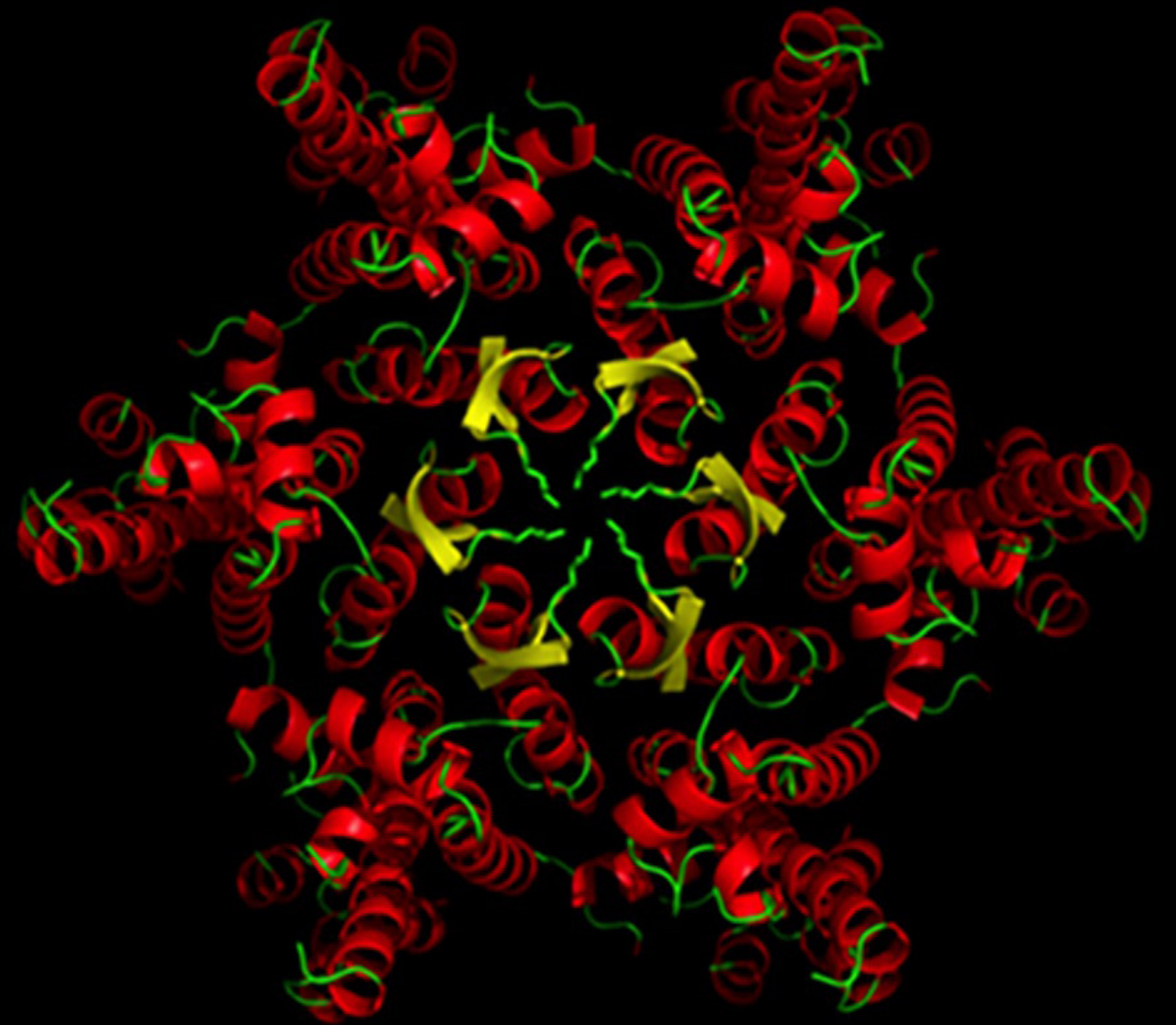
Research Frontiers

Organoids Without Borders: Advancing Precision and Regenerative Medicine

Human organoids are transitioning from experimental disease models into globally harmonised precision platforms and emerging regenerative therapies. Over the past year, Scientia Associate Professor Shafagh Waters has positioned UNSW within leading international consortia across Europe, North America and Asia, contributing to the standardisation of patient-derived organoid systems. These efforts focus on cross-site reproducibility, functional benchmarking, and alignment with regulatory frameworks, enabling organoids to serve as robust tools for predicting patient-specific therapeutic response.

This work is complemented by major advances in regenerative medicine. A/Professor Waters is leading Australia's first-in-human autologous airway stem cell transplant program, targeting chronic rhinosinusitis as an upstream driver of airway disease. In parallel, her laboratory is developing scalable induced pluripotent stem cell (iPSC)-derived epithelial platforms to support broader, off-the-shelf regenerative applications for researchers across the globe.

Through integration of precision organoid technologies with GMP-aligned cell manufacturing and international translational networks, this program bridges personalised and scalable therapeutic strategies. Collectively, these initiatives are a key contributor to the global advancement of precision oncology and regenerative medicine, accelerating the translation of laboratory innovation into clinically deployable solutions.



Structure of the Human T-cell Leukaemia Virus Capsid Protein

Human T-cell leukaemia virus type 1 (HTLV-1) remains a neglected and untreatable retroviral infection that causes severe and often fatal conditions, including adult T-cell leukaemia and HTLV-1-associated myelopathy. It disproportionately affects First Nations communities in central Australia where prevalence rates are among the highest reported worldwide. Despite its impact, no approved antivirals directly target the virus.

Building on breakthroughs in HIV, where capsid-targeting therapies such as lenacapavir have demonstrated long-acting efficacy, this research defines a new frontier in HTLV-1 intervention.

A recent study published in Nature Communications by SBMS researchers Ruijie Yu, Prabhjeet Phalora, Nan Li, Till Böcking and David Jacques, provides the first detailed molecular characterisation of the HTLV-1 capsid, identifying a critical surface pocket essential for viral infectivity.

By uncovering these structural vulnerabilities, the work establishes a foundation for the rational design of capsid-targeted antivirals. This approach opens the possibility of long-acting therapeutic and preventative strategies, with particular significance for remote and underserved communities where disease burden is highest.

Education Update

Message from the Director of Teaching

A/Professor Angela Finch



In 2025, SBMS continued to strengthen its position as a cornerstone of biomedical education within UNSW. Teaching revenue generated by the School increased to \$46.12M, up from \$40.47M in 2024 and \$35.27M in 2023, reflecting sustained growth, strong demand, and the School's expanding educational footprint.

SBMS delivered 762 undergraduate equivalent Full-Time Student Loads (EFTSL) in 2025 (excluding Medicine program as EFTSLs are not apportioned to contributing schools), representing a 6% increase on the previous year (718.41–762.35) and contributing to an overall 22% growth in EFTSLs over the past five years. The School delivered 50 courses, 40 into Science programs and 10 into Health Professional programs, across 16 degree programs. Total student enrolments in these 50 courses reached 5905.

This sustained growth in teaching activity and student demand underscores SBMS's pivotal role in delivering high-quality biomedical science education across UNSW's science and health portfolios.

SBMS offers majors in Anatomy, Pathology, Pharmacology, Physiology, Neuroscience, Immunology, and Biophysics (commencing in 2026).

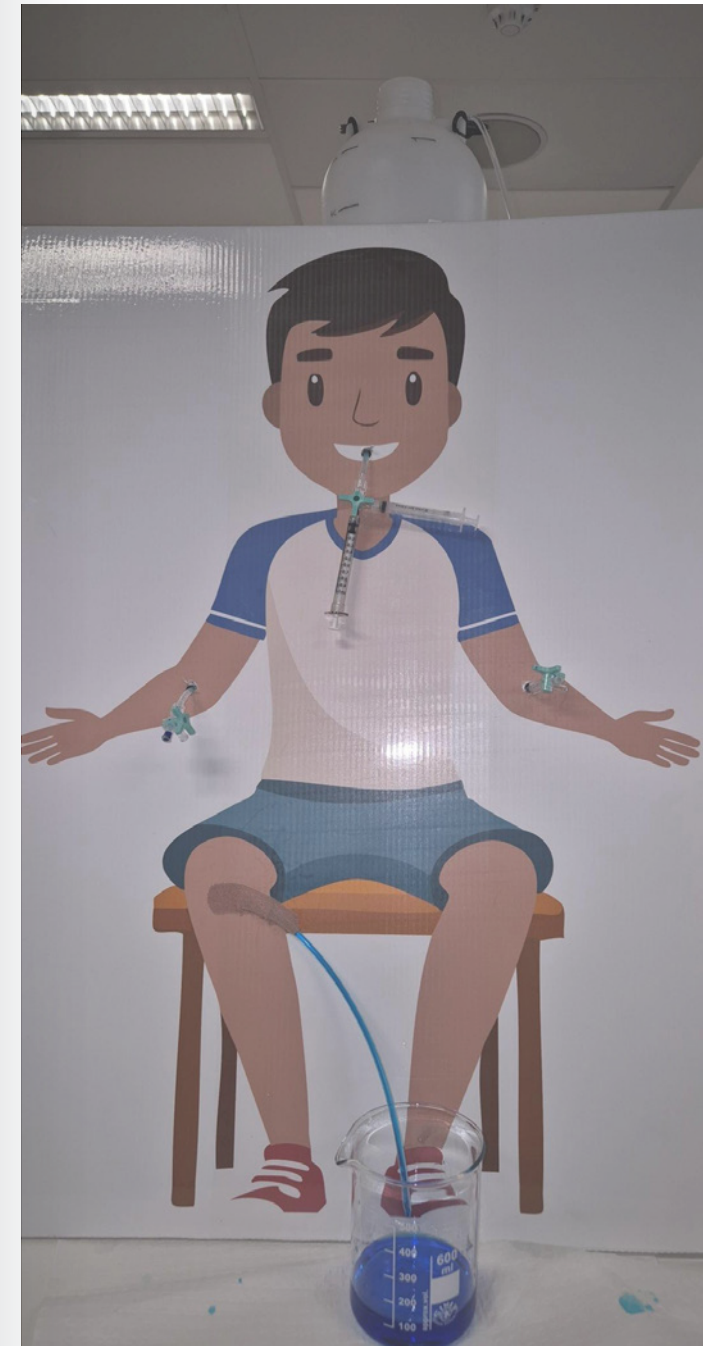
Our majors are taught primarily into the Bachelor of Science (3970), Bachelor of Advanced Science (Honours) (3962), and Bachelor of Medical Science (3991), as well as related dual-degree programs.

In 2025, Biophysics was approved as a new major within the Bachelor of Science (3970) and Bachelor of Advanced Science (Honours) (3962) programs. This major reflects the School's commitment to cutting-edge education in emerging interdisciplinary fields.

SBMS also plays a central role in the delivery of the undergraduate Medicine program. The School convenes all eight Phase 1 courses, with a combined enrolment of 2489 students, and contributes substantially to courses in Phases 2 and 3 (1191 enrolments in Phase 2 courses in 2025).

Research-integrated education remains a hallmark of the School, with more than 100 students undertaking an Honours research year in SBMS laboratories and affiliated research institutes and clinical research centres, reinforcing our commitment to the training of the next generation of biomedical scientists.

Overall, the School's sustained growth in education revenue, our enrolments, program innovation, and research-integrated teaching in 2025 reflects the strength, breadth, and strategic importance of SBMS's education portfolio.



Advancing Learning Through Cutting-Edge Simulation and Lab Innovation

In 2025, the Pharmacology Teaching Team introduced a new practical class using a pharmacokinetics simulation system. The simulated "patient" allows students to visualise the changes in drug concentration over time after a 'drug' (blue food dye) is administered and collect data for analysis. Investment in the development of 18 bespoke simulation units reflects our ongoing commitment to scalable, high-impact educational infrastructure and reinforces our position as a leader in innovative, hands-on biomedical sciences education.

During the year, legacy laboratory data acquisition units (PowerLabs) were upgraded to new PowerLab systems. This investment facilitates students' ability to capture high-quality physiological and pharmacological data and supports the continuation of our high standards in delivering innovative, engaging hands-on laboratory teaching.



Lifelong Learning

A major advancement in the Lifelong Learning domain in 2025 was the launch of Surgical Skills Workshops at SBMS. Supported by a recently upgraded mortuary facility with four fully-equipped surgical stations and high-definition audiovisual systems, the School has created an immersive clinical training environment for hands-on surgical education.

Drawing on the resources of the Anatomy Department, including cadaveric and plastinated specimens, anatomical models, and specialised dry-lab teaching spaces, the initiative has significantly strengthened the School's capacity to deliver advanced surgical training that fosters skill development, collaboration, and innovation in healthcare.

Our Teaching Footprint



\$46.12M

Total teaching revenue
^ 14% vs 2024 (\$40.47M)

11,607

total enrolments in undergraduate courses with SBMS ownership or involvement, in Science, Medicine, Health Professional, and associated dual-degree programs

762

Undergraduate equivalent Full-Time Student Load (EFTSL) in 2025 (excluding Medicine program)
^ 6% YoY 22% over 5 years

100+

Honours students embedded in SBMS labs & affiliated institutions

101

Higher Degree by Research students (with 24 completions in 2025)

37

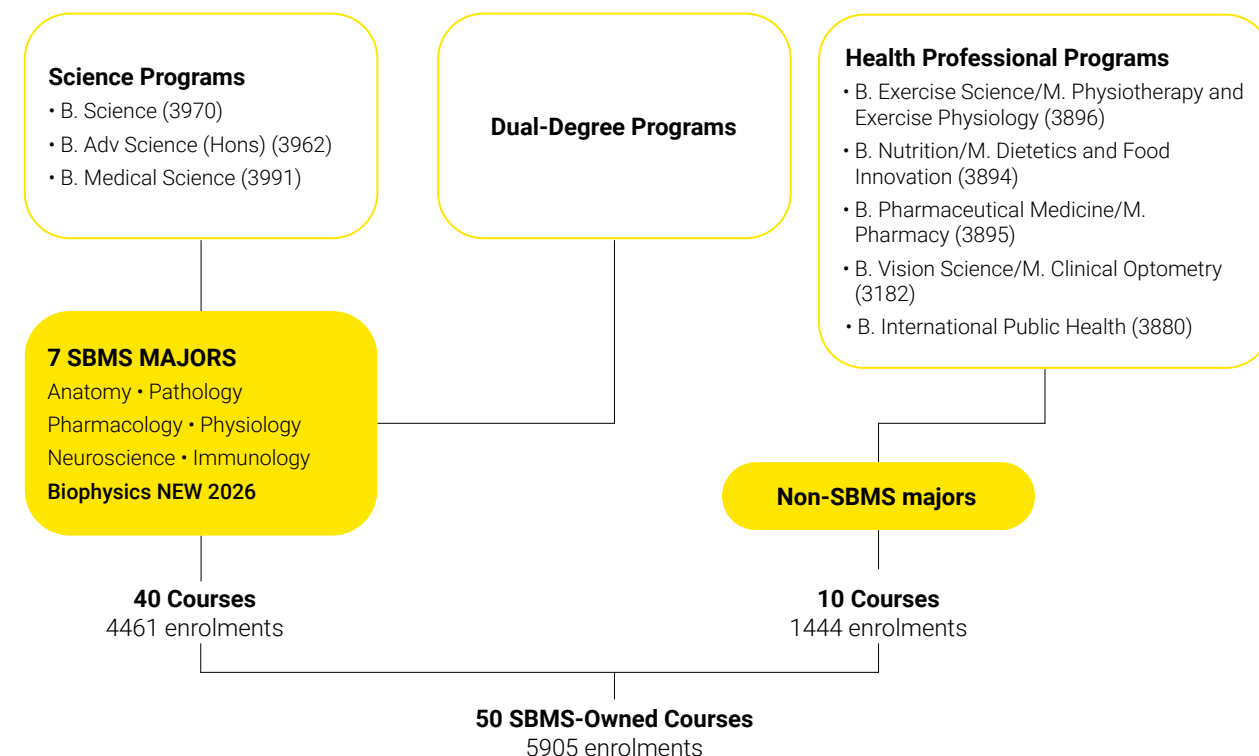
Education-Focused (EF) Academic Staff (31.2 FTE)

27

Teaching and Research (T&R) Academic Staff (25.43 FTE)

Undergraduate Bachelors Programs

16 Degree Programs
(Excluding Medicine program)



Bachelor of Medicine and Doctor of Medicine

Total
5702
enrolments across the full Medicine program teaching footprint

Phase 1
SBMS convenes all eight Phase 1 courses
2489
enrolments across all 8 SBMS-convened courses

Phase 2 and 3
SBMS contributes substantially to Phase 2 and 3 course teaching
1191
enrolments in Phase 2 courses with substantial SBMS contribution

Education Frontiers

A New Biophysics Major for SBMS

SBMS expanded its leadership in cutting-edge education with the creation of a new Biophysics major launching in 2026, making UNSW the only university in Australia to offer this degree major.

As one of the School's core research pillars, biophysics brings together researchers who investigate how the fundamental principles of physics shape biological systems across atomic through to cellular scales.

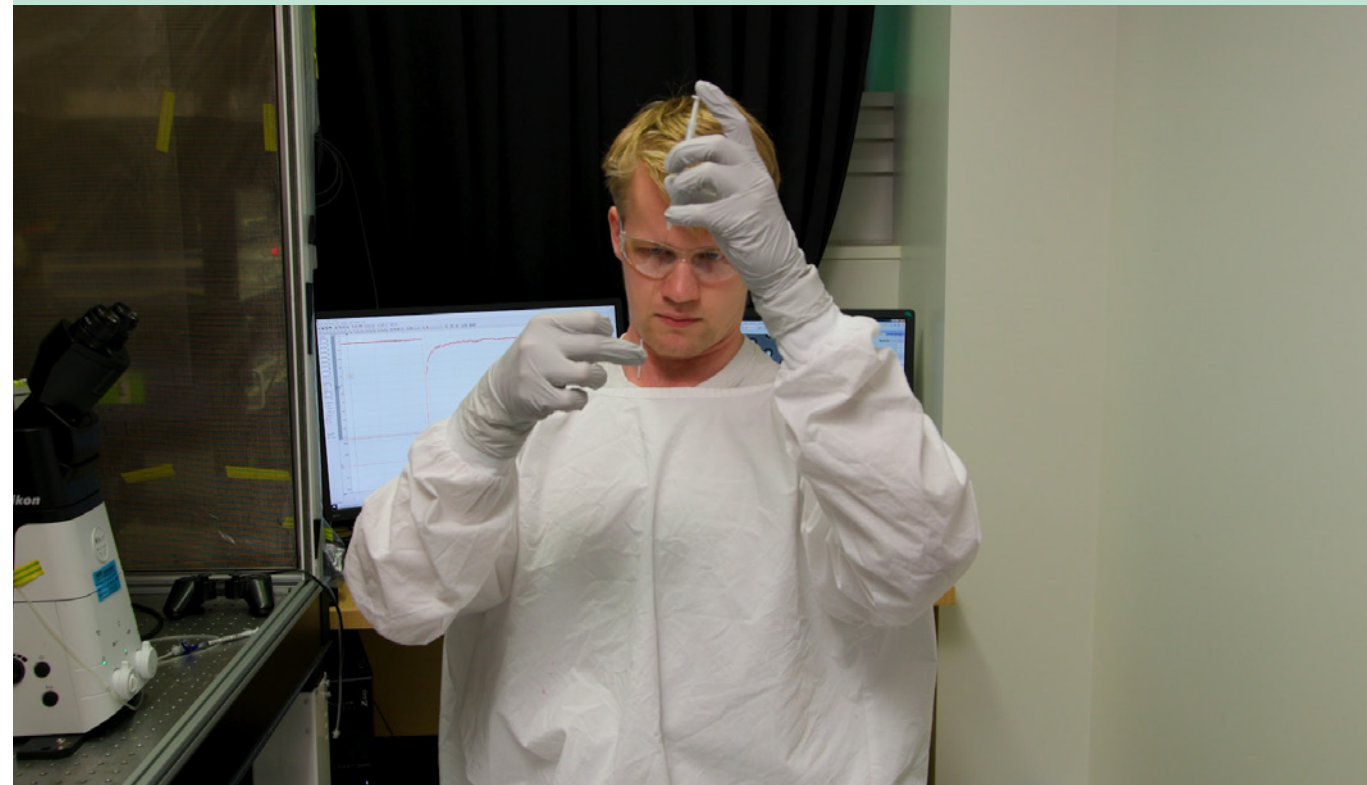
Researchers in the School are exploring groundbreaking questions in mechanobiology and single-molecule biophysics, examining how tiny molecular force sensors can influence cancer cell behaviour, how individual signalling molecules drive different physiological outcomes, and how changes in gravity affect biological systems.

Through innovative experimental tools, advanced imaging technologies, and strong collaborative networks, this work is generating insights with the potential to transform medicine and improve human resilience in extreme environments.

The new Biophysics major will give undergraduate students the opportunity to engage directly with this exciting field, gaining interdisciplinary training at the interface of physics and biology. By connecting students with world-leading researchers and state-of-the-art facilities, SBMS and its partners in the Schools of Physics, and Biotechnology & Biomolecular Sciences (BABS) are building the next generation of scientists equipped to tackle some of biology's most complex questions.

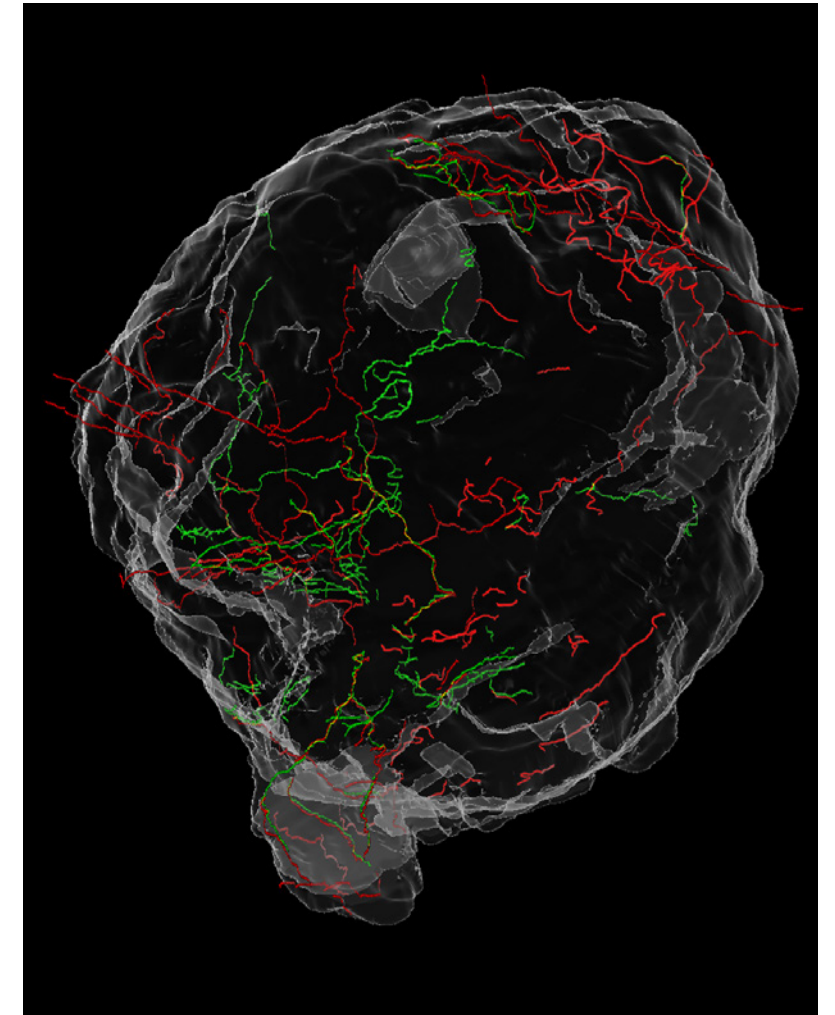


Scan or click this QR code to learn more about the new Biophysics major!



- > Dense sensory and sympathetic innervation of the popliteal lymph node. Whole-mount iDISCO immunolabelling and 3D projection of a cleared mouse lymph node, stained for the pan-sensory marker calcitonin gene-related peptide (CGRP; red) and the sympathetic marker tyrosine hydroxylase (TH; green).

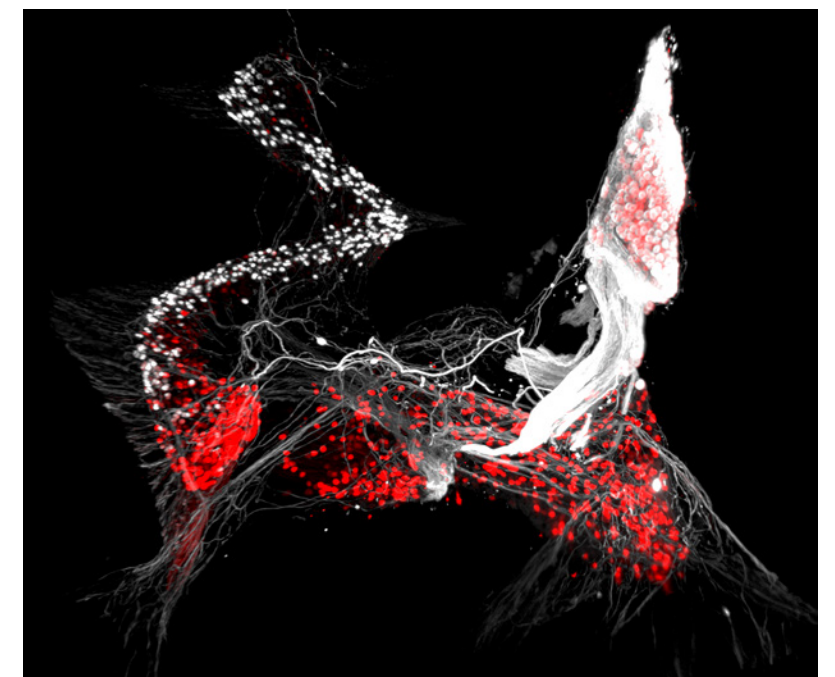
Image credit: Dr Sandra Fok, Research Associate, Katharina Gaus Light Microscopy Facility, UNSW.



- > Three-dimensional lightsheet image of the cochlear spiral ganglion, showing Peripherin-labelled neurons in white alongside mCherry-labelled transgenic neuronal populations.

Imaged at the Katharina Gaus Light Microscopy Facility and visualised in Imaris, these sensory neuronal populations were mapped in 3D for the first time in a 2025 study published in Scientific Reports by Pearson et al.

Image credit: Dr Lily Pearson





Professor Margaret Morris Celebrates Over 20 Years of Distinguished Service

2025 marked a key milestone for the School as we honoured the distinguished career of Professor Margaret Morris, celebrating her more than two decades of outstanding service in academia and research at UNSW.

As the inaugural Professor and Head of Pharmacology in the School of Biomedical Sciences, Margaret has continuously provided exceptional leadership, playing a pivotal role in shaping not only the discipline of Pharmacology but also the entire School.

An internationally recognised researcher, Professor Morris has authored >310 peer-reviewed publications, with more than 20,000 citations. Her diverse body of work has explored myriad questions, including how modern environmental factors – such as diet, stress and obesity – influence physical and mental health.

Her pioneering research into the intergenerational transmission of obesity is particularly noteworthy, especially the role of paternal epigenetic influence, which has hugely informed the field of developmental programming.

Professor Morris retired in 2025, leaving an incredible legacy of scholarship, leadership and mentorship of colleagues and students. Her commitment to the School will undoubtedly continue as she moves to an Emeritus Professorial role.

Celebrating Our Successes

This year, the School celebrated a range of major successes within the University and beyond. Here is a snapshot of some of 2025's stars!

Vice-Chancellor's Awards



Displays Respect
Ms Mary Hervir
School Manager



Progress Over Perfection
Dr Matthew Perry
Associate Director of Teaching (Curriculum Development and Teaching Innovation) & Head of Teaching in Pharmacology

Medicine & Health Faculty Awards

Education Awards

Eunice Cheng

- Educational Excellence Award – Casual or Sessional Teaching Staff
- Students' Choice Award for Inspirational Teaching – Undergraduate

Christina Byun, Trevor Lewis, Gabrielle Van Der Kraan and Jo Tay

- Education Innovation Award

Conferred Titleholder Awards

A/Professor Sradha Kotwal

- Conferred Academic Titleholder of the Year – Excellence in Research (Clinicians)

Research Awards

A/Professor Emma Sierecki and A/Professor Yann Gambin

- Research Innovation Award

Values in Action Awards

Faculty Nexus Team (Professor Patsie Polly)

- Values in Action: Collaboration Award

Dr Reza Shirazi

- Values in Action: Excellence Award

Pharmacy Teaching Lab Design Team (Balu Daniel)

- Values in Action: Innovation Award



Dr Deborah Burnett awarded Young Tall Poppy Science Award

Dr Burnett was recognised in 2025 for her research into a fundamental immune system paradox: how diverse antibodies are generated to fight infection while preventing autoimmunity.

"Being named a NSW Tall Poppy is a wonderful honour and I'm so thrilled to have my team and our collaborative network's efforts recognised this way"

This prestigious award celebrates early- to mid-career researchers who combine research excellence with a strong commitment to engaging the broader community.

Our Scientia Fellows



A/Professor
Nadeem Kaakoush
Pathology



Dr John Lock
Pharmacology



A/Professor
Orazio Vittorio
Pathology



Dr Angelica Merlot
CCIA



A/Professor
David Jacques
Molecular Medicine



A/Professor
Shafagh Waters
Pharmacology



Dr Deborah Burnett
Pathology



Dr Ramon
Martinez Marmol
Physiology

Scientia Industry Fellows (Commencing in 2026)



A/Professor
Yann Gambin
Molecular Medicine



A/Professor
Emma Sierecki
Molecular Medicine



A/Professor
Lindsay Wu
Pharmacology

2025 Academic Promotions

Lecturer

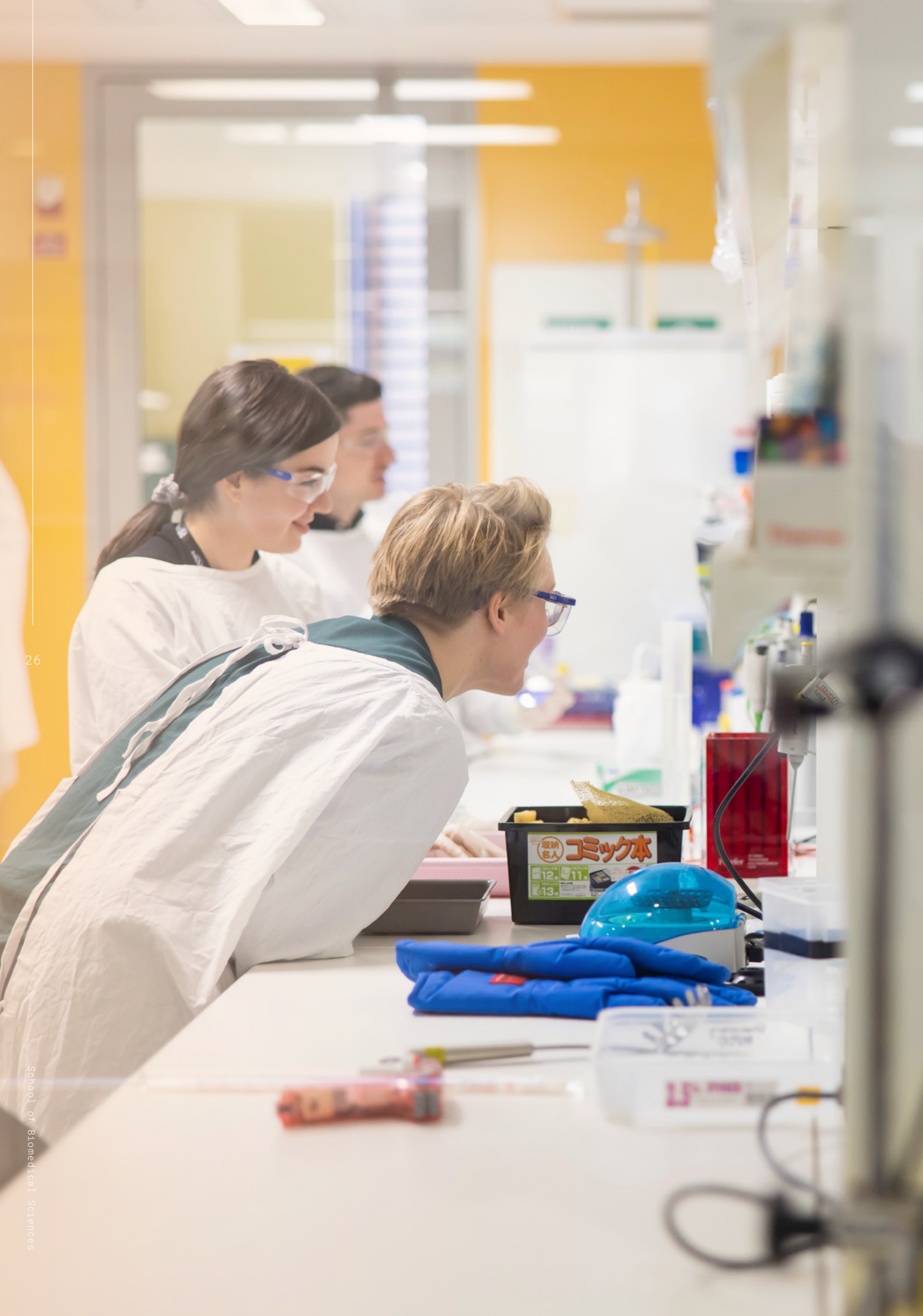
Dr Felix Aplin (Physiology)
Dr Gregory Walker (Pathology)
Dr Charles Foster (Pathology)

Professor

Professor Ingvars Birznieks (Physiology)

Associate Professor

A/Professor Lindsay Wu (Pharmacology)
A/Professor David Jacques (Molecular Medicine)
A/Professor Jennie Cederholm (Physiology)
A/Professor Chaturaka Rodrigo (Pathology)
A/Professor Daina Sturnieks (Anatomy)



Our Departments



Anatomy

The Department of Anatomy is a flagship contributor to UNSW's teaching mission, delivering approximately 35% of the SBMS teaching load, and is widely recognised, both nationally and internationally, for excellence in anatomy education, pedagogical innovation, and the scholarship of learning and teaching. In 2025, the Department continued to set benchmarks for educational quality, ethical practice, and societal impact.



Transforming The First-Year Anatomy Experience

Interacting with human tissue can be a challenging and confronting experience, particularly for first-year students who have had little to no prior exposure to these types of teaching materials.

In 2025, a team led by Dr Christina Byun developed a series of short, interactive and pedagogically informed anatomy videos aimed at introductory-level students. This video series was designed to produce an engaging introduction to anatomy while reducing the extraneous cognitive load and alleviating anxiety associated with the challenges of interacting with human tissue.

The team also completed the first stage of the Virtual Anatomy Laboratory project, supporting flexible, inclusive, and asynchronous engagement with 3D anatomical models. Student feedback has been strongly positive, and a formal evaluation of educational impact is currently in preparation for publication.

Delivering Outstanding Education And Student Success

In 2025, Anatomy education-focused (EF) academics continued to demonstrate sector-leading expertise, with the majority holding Fellowship of Advance HE, including four Senior Fellows. Anatomy academics have also been recognised through multiple Faculty- and University-level awards, reinforcing the Department's reputation for outstanding curriculum design and delivery.

This depth of educational leadership is reflected in consistently high levels of student satisfaction, with Anatomy-delivered courses exceeding University, Faculty, and School benchmarks year after year.

Beyond UNSW, Anatomy staff continue to attract national and international recognition for education research, with accolades from leading professional bodies including the Australian and New Zealand Association of Clinical Anatomists (ANZACA) and the International Federation of Associations of Anatomists (IFAA).

Anatomy Lab Pioneering A World-First Environmental Initiative

Ethical leadership, inclusion, and environmental sustainability are defining features of the Department's teaching and research activities.

In 2025, Professor Goran Štrkalj, in collaboration with Associate Professor Paul Osmond (UNSW School of Built Environment) and Ms Nikol Herrera Vranova (Anatomy Laboratory Manager), initiated the world's first environmental sustainability audit of an anatomy laboratory.

This initiative has positioned UNSW as a global leader in responsible anatomy education and aligns strongly with UNSW's sustainability and societal impact priorities.

Strengthening Research Excellence and Translation

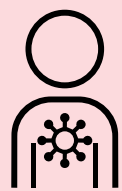
Associate Professor Daina Sturmeiks, the newly elected President of the Australia and New Zealand Falls Prevention Society, continued to provide strong research leadership through high-impact work in ageing, mobility, and falls prevention, strengthening interdisciplinary collaborations, supporting research translation into clinical and community settings, and mentoring early-career researchers.



Scan or click this QR code to experience the Anatomy of the Forearm interactive video lesson

2025 Publication Highlights

- Takami Y, Tomita K, Igarashi K, Kuwahara Y, Kitanaka J, Kitanaka N, Roudkenar MH, Mohammadi Roushandeh A, Saijo H, Kurimasa A, Sato T. (2025) Amoxicillin, a β -lactam antibiotic, enhances cisplatin sensitivity in cancer cells affecting mitochondria. *Biochemical and Biophysical Research Communications*, 766:151888.
- El-Haddad J, and Pather N. (2025) Developing an ethical framework for informed consent using human fetal and embryological collections: An Australian perspective. *Anatomical Sciences Education*, 8:192–208.
- Sturmeiks DL, Chan LL, Cerdá MTE, Arbona CH, Pinilla BH, Martínez PS, Seng NW, Smith N, Menant JC, Lord SR. (2025) Cognitive functioning and falls in older people: A systematic review and meta-analysis. *Archives of Gerontology and Geriatrics*, 128:105638.
- Komekbay Z, Shirazi R, Yessultanova G, Garifollin A, Tulyayeva A, Kereyeva N, Akhmetova S, Kaliev A. (2025) Bibliometric analysis of tumor marker application in gastric cancer diagnosis from 2019 to 2024. *Frontiers in Medicine*, 12:1547850.
- Archer M, Akerman K, DeSantis L, Dickson BV, Hand S, Hatcher L, Hellstrom JC, Jacobsen G, Louys J, Price GJ, Ryan H, Sniderman K, Travouillon K, Woodhead J. (2025) Australia's First Peoples: hunters of extinct megafauna or Australia's first fossil collectors. *Royal Society Open Science*, 12:250078.



Pathology

The Department of Pathology investigates the molecular and cellular mechanisms of human disease, develops clinically viable therapeutics, and is supported by major national and international funding. Its research spans cancer, infection and immunity, cardiovascular and metabolic disease, the microbiome, ocular and respiratory disease. The Department also delivers innovative, high-quality pathology teaching across Medicine and Science programs, supported by strong Honours and postgraduate research training.

Pathology Sets the National Standard for Medical Education

In 2025, the Pathology Department helped shape the future of medical education across Australia and Aotearoa New Zealand. Led by Dr Sophia Champion, a group of Pathology academics collaborated to develop the first draft of the RCPA Standardised National Pathology Curriculum, which was selected by the Royal College of Pathologists of Australasia as the foundation for a new unified national standard.

This landmark achievement positions UNSW as a leading authority in pathology education in the region. Dr Champion was subsequently invited to present this work at the International Academy of Pathology (Sydney 2025), highlighting UNSW's global influence in education design.



World-Class Research with Global Recognition

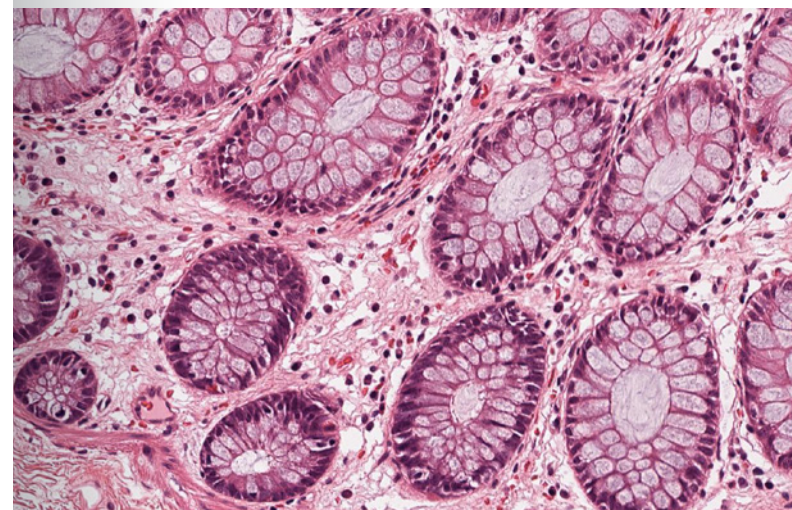
Pathology research also continues to move beyond the lab to deliver real-world outcomes.

Associate Professor Nadeem Kaakoush is currently co-leading a clinical trial of novel probiotics in partnership with St Vincent's Hospital and Icahn School of Medicine at Mount Sinai, while Professor John Pimanda leads multiple investigator-initiated trials in myelodysplasia, including MRFF-funded studies and a Phase 2 trial published in Nature Communications.

In 2025, Pathology researchers delivered internationally recognised research addressing some of the most urgent challenges in human health, with research papers and invited review articles published in top tier journals including Nature, Nature Microbiology, Nature Communications, Nature Reviews Endocrinology, Nature Reviews Disease Primers, Science Translational Medicine, Immunity and PNAS, and competitive funding secured across NHMRC, MRFF, Cancer Council NSW, and National Heart Foundation schemes.

2025 Publication Highlights

- Chen-Liaw A, Aggarwala V, Mogno I, Haifer C, Li Z, Eggers J, Helmus D, Hart A, Wehkamp J, Lamouse-Smith ESN, Kerby RL, Rey FE, Colombel JF, Kamm MA, Olle B, Norman JM, Menon R, Watson AR, Crossette E, Terveer EM, Keller JJ, Borody TJ, Grinspan A, Paramsothy S, Kaakoush NO, Dubinsky MC, Faith JJ. (2025) Gut microbiota strain richness is species specific and affects engraftment. Nature, 637:422-429.
- Fan Y, Ni M, Aggarwala V, Mead EA, Ksiezarek M, Cao L, Kamm MA, Borody TJ, Paramsothy S, Kaakoush NO, Grinspan A, Faith JJ, Fang G. (2025) Long read metagenomics-based precise tracking of bacterial strains and genomic changes after fecal microbiota transplantation. Nature Microbiology, 10:3258-3271.
- Thoms, J., Yan, F., Hampton, H., Davidson, S., Joshi, S., Saw, J., Sarowar, C., Lim, X., Nunez, A., Kakadia, P., Bhuyan, G., Zou, X., Nguyen, M., Ghodousi, E., Koch, F., Vafaee, F., Pickford, R., Raftery, M., Hough, S., Buckland, G., Bailey, M., Ghodke, Y., Absar, N., Vaughan, L., Pasalic, L., Fong, C., Kenealy, M., Hiwase, D., Stoddart, R., Mohammed, S., Lee, L., Passam, F., Larsen, S., Spring, K., Skarratt, K., Rebeiro, P., Presgrave, P., Stevenson, W., Ling, S., Tiley, C., Fuller, S., Roncolato, F., Enjeti, A., Hoenemann, D., Lemech, C., Jolly, C., Bohlander, S., Curtis, D., Wong, J., Unnikrishnan, A., Hertzberg, M., Olivier, J., Polizzotto, M., Pimanda, J. (2025) Clinical Response to Azacitidine in Myelodysplastic Neoplasms is Associated with Distinct DNA Methylation Changes in Haematopoietic Stem and Progenitor cells in vivo. Nature Communications, 16: 4451
- Glaros, E., Foot, J., Rayner, B., Schilter, H., Zhang, Y., Paumann-Page, M., Teixeira, MM., Jarolimek, W., Thomas, SR. (2025) Targeting vascular adhesion protein-1 and myeloperoxidase with a dual inhibitor SNT-8370 in preclinical models of inflammatory disease. Nature Communications, 16:3430
- Singh, M., Louie, RHY., Samir, J., Field, MA., Milthorpe, C., Adikari, T., Mackie, J., Roper, E., Faulks, M., Jackson, KJL., Calcino, A., Hardy, MY., Blombery, P., Amos, TG., Deveson, IW., Wende, HV., Floor, SN., Read, SA., Shek, D., Guerin, A., Ma, CS., Tangye, SG., Di Sabatino, A., Lenti, MV., Pasini, A., Cicciocioppo, R., Ahlenstiel, G., Suan, D., Tye-Din, JA., Goodnow, CC., Luciani, F. (2025) Expanded T cell clones with lymphoma driver somatic mutations accumulate in refractory celiac disease. Science Translational Medicine. 2025, 17(798)



H&E-stained section of colonic mucosa showing closely packed intestinal crypts lined by goblet cell-rich epithelium within the lamina propria

About the BEST Network and Slice

The BEST Network, established in 2012, supports innovation in biomedical education through high-quality teaching resources. Its central platform, Slice, is a global virtual microscopy image bank used worldwide. UNSW has helped shape Slice's development and now embeds it across medicine and science curricula, transforming histology and pathology teaching.

Innovating How We Teach, Assess and Support Students

The Department delivered core pathology teaching across all phases of the Medicine program and multiple Science and Medical Science courses, maintaining outstanding student satisfaction, including 100% overall satisfaction in Cancer Pathology for the fifth consecutive year. The Department led the coordination of viva voce examinations for approximately 280 final-year medical students run across five UNSW campuses, ensuring consistency and academic rigour.

Teaching leadership and impact were reflected in Associate Professor Cristan Herbert's award of Senior Fellowship of Advance HE and appointment as Lead, Medicine Student Selection and Admissions. A/Professor Herbert and Dr Champion also contributed to the Medicine program redesign through leadership of the Biomedical Science Panel. Professor Patsie Polly's appointment as Director of the UNSW Nexus Program further reinforced the Department's leadership in innovative and future-focused education.



Pharmacology

The Department of Pharmacology undertakes world-class research in drug discovery, cancer therapeutics, neuroscience, and precision medicine, while leading innovation in ethical, non-animal research models and artificial intelligence-enabled discovery. It also delivers high-quality education in pharmacokinetics, pharmacodynamics, and pharmacogenomics.



NAT-Net Driving National Leadership in New Approach Methodologies (NAMs)

In 2025, Associate Professor Shafagh Waters co-created the \$4.5 million NSW Government-funded Non-Animal Technologies Network (NAT-Net). This innovative model brings together researchers, industry partners, regulators and policy makers to accelerate the use of ethical, human-relevant, non-animal models – such as organoids, advanced cell systems, and computational approaches – to reshape best practice in drug development and safety testing.

Through its activities and partnerships, NAT-Net has elevated Australia's profile in the NAMs space. Engagement with global initiatives, networks, and thought leaders has ensured that Australian perspectives contribute to, and benefit from, international developments in policy, validation, and implementation of NAMs.

Complementing this, Associate Professor Nicola Smith, Head of Department and newly appointed President of Australasian Society of Clinical and Experimental Pharmacologists and Toxicologists (ASCEPT), contributed to national initiatives with Bellberry Limited and ASCEPT to guide the adoption of NAMs in drug development.

World-Class Research with Global Recognition

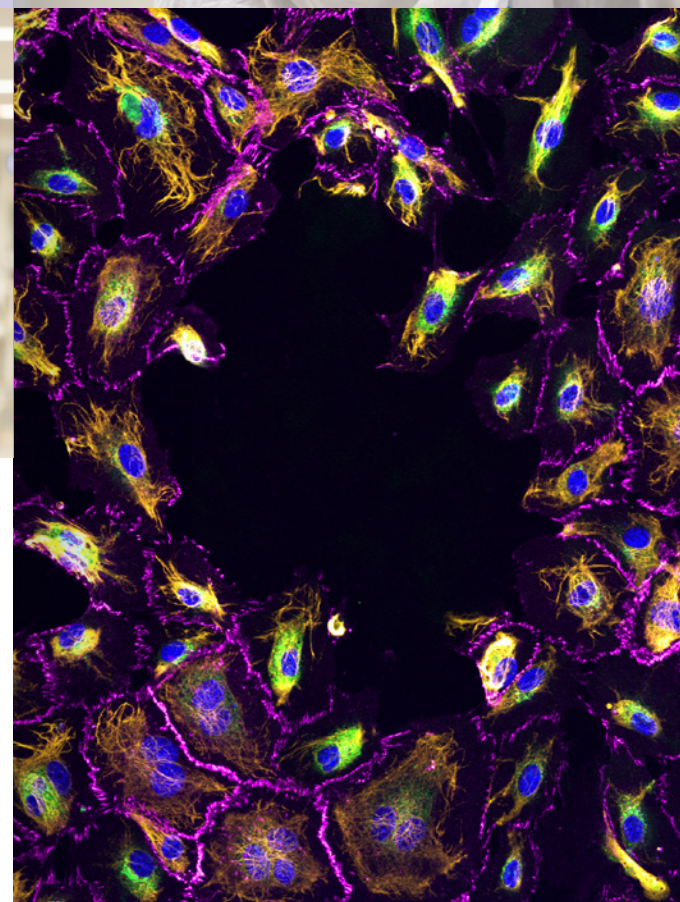
The Department of Pharmacology has continued to deliver globally significant advances in cancer research.

A major highlight was the award of \$25 million from the National Breast Cancer Foundation to the AllClear Consortium, with Dr John Lock serving as a workstream lead. Dr Lock's team also achieved a world-first breakthrough in deep multiplexed imaging of circulating tumour cells from liquid biopsies, enabling the simultaneous mapping of more than 50 molecular biomarkers and cancer cell states.

This technology opens new pathways for precision oncology and highly targeted therapies.

➤ **Opposite:** Confocal microscopy of human aortic endothelial cells undergoing EndMT, a plastic cell state change linked to atherosclerosis. Deep multiplexed imaging methods developed in the Lock Lab reveals nuclei, cell adhesions, vimentin filaments and eNOS, helping identify molecular targets and biomarker signatures to monitor and treat cardiovascular disease progression.

Image credit: Cells provided and treated by Dr Jacqueline Ku (Thomas Lab), labelled and imaged by Ayan Das (Lock Lab)



Educating Future Health Leaders and Engaging the Community

Under the guidance of Associate Professor Angela Finch (Director of Teaching) and Dr Matthew Perry (Associate Director of Teaching), Pharmacology contributed significantly to the Medicine program redesign and led a comprehensive review of SBMS majors. A flagship achievement was the introduction of PHAR3921: Pharmacokinetics, Pharmacodynamics and Pharmacogenomics, developed by Dr Johnson Liu, Marty Le Nedelec, Dr Perry, and Associate Professor Smith. The course achieved outstanding student satisfaction and was widely praised for its relevance and clarity.

Teaching excellence was recognised through multiple awards, including a VC Values in Action Award (Dr Perry), SBMS Hero of the Year (A/Prof Finch), and SBMS Student Experience Award (Dr J. Liu). Beyond the classroom, staff demonstrated strong community engagement through initiatives such as Professor Jeff Holst's Tour de Cure fundraising and Dr Natasha Kumar's SciX@UNSW BrainAtlas outreach, inspiring the next generation of scientists and health professionals.

2025 Publication Highlights

- Madawala, R., Banks, J.L., Hancock, S.E., Quek, L., Turner, N., Wu, L.E. (2025) CD38 mediates nicotinamide mononucleotide base exchange to yield nicotinic acid mononucleotide. *Journal of Biological Chemistry*, 301(3):108248
- Gunawan, I., Kohane, F.V., Dey, M., Nguyen, K., Zheng, Y., Neumann, D.P., Vafaei, F., Meijering, E., Lock, J.G. (2025) Extensible Immunofluorescence (ExIF) accessibly generates high-plexity datasets by integrating standard 4-plex imaging data. *Nature Communications*, 16(1):4606
- Sadegh, H., Choi, J.P. (2025) The Emerging Role of the Gut Microbiome in Cerebral Cavernous Malformation: A New Novel Therapeutic Strategy? *International Journal of Molecular Sciences*, 26(17):8622
- Fawcett, L.K., Chew, Z.A., Schneider-Futschik, E.K., Allan, K.M., Patel, H.R., Jaffe, A., Waters, S. (2025) Predictive capacity of paediatric nasal epithelial cells in sequential CFTR modulator therapy. *Thorax*
- Liu, Y., Machaalani, R., Markus, I., Shepherd, C.E., Kumar, N.N. (2025) Characterisation of putative retrotrapezoid nucleus (RTN) chemoreceptor neurons in the adult human brainstem. *Brain Structure and Function*, 230:131



Physiology

The Department of Physiology delivers foundational physiology education across Medicine, Biomedical Science, and Advanced Science programs, while advancing discovery-driven and translational research into human physiological function. With 25 publications from across the Department, extensive representation at diverse national and international conferences and 3 HDR completions, Physiology research continues to have an impactful and inspiring effect on our research communities.

Inspiring the Next Generation through Outreach and Training

Physiology staff delivered exceptional outreach and capacity-building activities in 2025.

Co-directed by Dr John Power and Associate Professor Kate Poole, UNSW hosted the Australian Course in Advanced Neuroscience for the first time, providing intensive training to early-career researchers nationwide.

Community engagement highlights included the NSW Australian Brain Bee Challenge, coordinated by Associate Professor Jennie Cederholm, and a highly successful Brain Awareness Week, engaging more than 250 students, teachers, and parents.



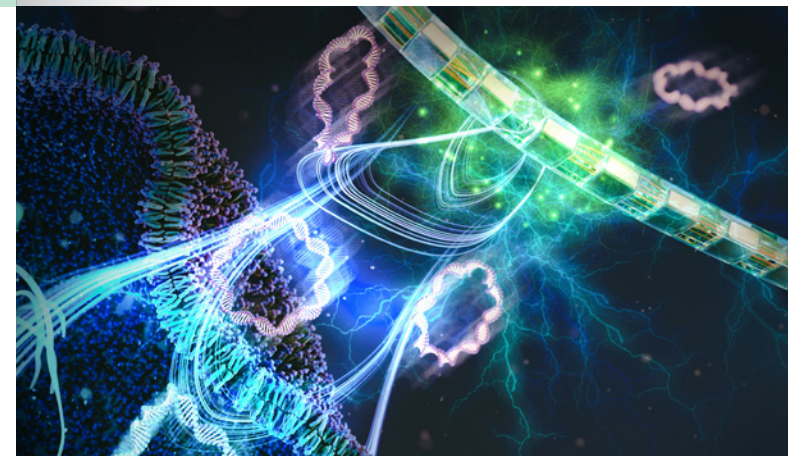
Breakthrough Discoveries In Force Sensing: From Cells To Nerves To Space Biology

Curiosity-driven research investigating how our individual cells sense forces by Associate Professor Kate Poole and her collaborators has led to the identification of a key role for force sensing molecules in regulating cancer cell behaviour and tumour progression. Building on these discoveries, Kate Poole's team expanded into space biology, investigating the effects of microgravity on physiological function. With exciting early findings published in 2025, this ongoing project will continue to advance the emerging field of space biology in the years to come.

Professor Ingvars Birznies and collaborators have also advanced our understanding of how touch sensation influences our ability to grip and manipulate objects, discovering that the material properties of human fingertips and changes in friction can influence the encoding of tactile information and grip strength.



Scan or click this QR code to watch Associate Professor Poole's talk on space biology



Scan or click this QR code to see how BaDGE technology has improved the lives of those with hearing loss

Translational Neuroscience Facility Driving Real-World Impact

Led by Scientia Professor Gary Housley, the Translational Neuroscience Facility has continued to advance its exciting and impactful program, producing molecular and cellular level insights into the function of sensory neurons in vivo, particularly in the ear.

Part of this exciting research was conducted by recently graduated PhD student, Dr Lily Pearson, whose outstanding thesis was recognised with the Mark Rowe Prize for Neurophysiology.

In 2025, the team published a proof-of-concept study highlighting the potential for this technology in DNA/RNA vaccine delivery, and secured an Australia's Economic Accelerator (AEA) Ignite Grant to support commercialisation of Vision BaDGE technology for wet age-related macular degeneration (AMD), with Dr Georg von Jonquieres as Lead Entrepreneur.

Global Leadership In Physiology Education

In 2025, Physiology educators have showcased our leadership in teaching and learning. Head of Teaching, Associate Professor Jennie Cederholm, delivered invited masterclasses on innovative physiology education strategies at the International Conference of the Pakistan Physiological Society.

Nationally, Dr Trevor Lewis celebrated the vibrant and impactful history of Physiology teaching in tertiary institutions while highlighting the need to continue building the Physiology education community across Australia in an invited lecture. Dr Lewis' upcoming leadership of the Australian Physiological Society (AuPS) Education Special Interest Group will continue to further strengthen UNSW's profile as a leader in discipline-based education.

2025 Publication Highlights

- Silvani, G., Kopecky, C., Romanazzo, S., Rodriguez, V., Das, A., Pandzic, E., Lock, JG., Chaffer, CL., Poole, K., Kilian, K. A. (2025). Capillary constrictions prime cancer cell tumorigenicity through PIEZO1. *Nature Communications*, 16(1)
- Wang, D., Silvani, G., Schroeter, L., Brynn, R., Chou, J., & Poole, K. (2025). The mechanosensitive channel ELKIN1 regulates cellular adaptations to simulated microgravity. *Npj Microgravity*, 11(1).
- Saal, HP, Birznies, I., Johansson, RS. (2025) Fingertip viscoelasticity enables human tactile neurons to encode loading history alongside current force. *eLife* 12:RP89616.
- Pinyon, J. L., von Jonquieres, G., Mow, S. L., Abed, A. A., Lai, K. Y., Manoharan, M., Crawford, EN., Xue, SH., Smith-Moore, S., Caproni, L.J., Milsom, S., Klugmann, M., Lovell, NH., Housley, G. D. (2025). Vector-Free Deep Tissue Targeting of DNA/RNA Therapeutics via Single Capacitive Discharge Conductivity-Clamped Gene Electrottransfer. *Advanced Science*, 12(3).
- Genoud, S., Chaichim, C., Porto, R. R., Tomanic, T., Stefen, H., Paric, E., Sarkar, S., Yoo, D., Gao, W., Hardeman, EC., Gunning, PW., Karl, T., Power, J., Fath, T. (2025). Knock-out of Tpm4.2/Actin Filaments Alters Neuronal Signaling, Neurite Outgrowth, and Behavioral Phenotypes in Mice. *Molecular Neurobiology*, 62(12)



Molecular Medicine

Molecular Medicine is a globally recognised centre for discovery-led and translational biomedical research and is home to the EMBL Australia Node in Single Molecule Science. It brings together interdisciplinary expertise to investigate the molecular and cellular mechanisms underlying health and disease, with strengths in infection, immunity, structural biology, and cell signalling.

From Bench to Business: Accelerating Translation and Innovation

Scientia Industry Fellows Associate Professors Yann Gambin and Emma Sierecki have continued to convert discovery into real-world impact through industry engagement, commercialisation, and infrastructure leadership, securing AEA Ignite funding for their translational research excellence. Their work on protein assembly and neurodegeneration has been recognised in high-impact journals and through active engagement with industry. In 2025, Gambin and Sierecki also completed the 10X Founders Program, pitching biomedical innovations to more than 300 investors.

Complementing this, Dr Daniel Luque and colleagues secured a \$4.2M ARC LIEF grant to establish a next-generation in situ structural biology platform, a transformational investment enabling UNSW researchers to tackle complex biomedical challenges with cutting-edge technology.

ARC Discovery Project Decoding Life at the Molecular Scale

In 2025, Molecular Medicine researchers delivered world-leading discovery science that deepens understanding of how cells function, adapt, and fail in disease.

Dr Vaishnavi Ananthanarayanan and Dr Gregory Redpath secured a highly competitive ARC Discovery Project grant (\$788,000) to investigate how molecular motor proteins control receptor signalling within cells - an essential process underpinning cell survival, growth, and communication.

By combining experimental biology with mathematical modelling, this work aims to predict how signalling pathways are switched on and off, opening new avenues for therapies targeting cancer and degenerative disease.

This program builds on Dr Ananthanarayanan's influential Journal of Cell Biology publication revealing how motor protein interactions regulate receptor movement in cells

Celebrating Diversity and Engaging the Public Through Creative Science

Curated by Drs Krystyna Gieniec, Valentina Rodriguez Paris, and Shirin Ansari, The Illuminators: Scope for Change microscopy exhibition was a flagship Diversity Fest event showcasing the work of 28 women (cis and trans) in STEM across UNSW and partner institutions.

Featuring researchers from Honours to senior academic levels and spanning multiple faculties, the exhibition challenged stereotypes of who can succeed in science and celebrated diverse career pathways. Now available as a permanent online resource, the exhibition extends UNSW's reach beyond campus, demonstrating how creative engagement can inspire future generations and embed inclusion into research culture.



Scan or click this QR code to experience The Illuminators: Scope for Change virtual exhibition



Glowing Mozzies
Image credit: Dr Claire Sayers, Baum Lab

2025 Publication Highlights

- Chacko, LA, Nakaoka, H., Morris, RG, Marshall, WF, Ananthanarayanan, V. (2025) Mitochondrial function regulates cell growth kinetics to maintain mitochondrial homeostasis. *Current Biology*, 35(21), 5278-5288
- Yu, R., Phalora, P, Li, N., Böcking, T., Jacques, DA. (2025) The Human T-cell Leukemia Virus capsid protein is a potential drug target. *Nature Communications*, 16, 10892
- Graves, NJ., Jaafar, AK., Gambin, Y., Sierecki, E (2025) Divalent and Trivalent Metallic Ions Differentially Affect Alpha-Synuclein Aggregation. *ACS Chemical Neuroscience*, 16(18), 3497-3512
- Eckert, J., Andrews, TGR., Pollard, J., Shen, Y., Essebie, P, Ladoux, B., Lagendijk, AK., Priya, R., Yap, AS., Morris, RG. (2025) Capturing nematic order on tissue surfaces of arbitrary geometry. *Nature Communications*, 16, 7596.
- Ramadan, A., Sheard, TMD., Alhindi, A., Jones, RA., Jayasinghe, I., Gillingwater, TH. (2025) Expansion microscopy reveals nano-scale insights into the human neuromuscular junction. *Cell Reports Methods*, 5(6)
- de Menezes, MN., Ge, Z., Cozijnsen, A., Gras, S., Bertolino, P, Caminschi, I., Lahoud, MH., Yui, K., McFadden, GI., Beattie, L., Health, WR., Fernandez Ruiz, D (2025) Long lived liver-resident memory T cells of biased specificities for abundant sporozoite antigens drive malaria protection by radiation-attenuated sporozoite vaccination. *PLoS Pathogens*, 21(5)

EMBL Australia Node

Founded in 2015 by Professor Katharina Gaus, the European Molecular Biology Laboratory Australia (EMBLA) Node in Single Molecule Science (SMS) is embedded within SBMS and forms a key part of the research environment of the Department of Molecular Medicine.

As part of the EMBL network, the Node provides international visibility and connectivity that strengthens UNSW's ability to recruit, develop and retain the next generation of research leaders. This is underpinned by a culture committed to cooperation, respect and integrity in the pursuit of transformative science.

EMBLA Node Head



Professor Till Bocking
Molecular machines

EMBLA Group Leaders



Dr Vaishnavi Ananthanarayanan
Cytoskeleton and molecular motors



Associate Professor Richard Morris
Theory of biological systems

EMBLA Group Leader Alumni



Associate Professor Yann Gambin
Single molecule science
(Current Scientia Industry Fellow at UNSW)



Associate Professor Maté Biro
Immune response
(Current Future Fellow at the Garvan Institute)

In 2025

2
ARC Centres of Excellence

- Mathematical Analysis of Cellular Systems
- Synthetic Biology



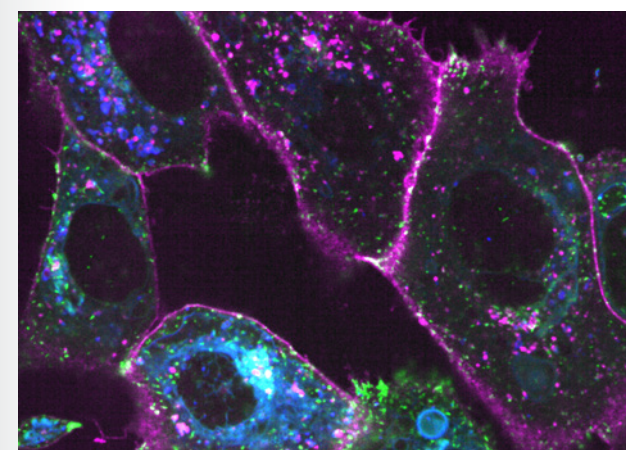
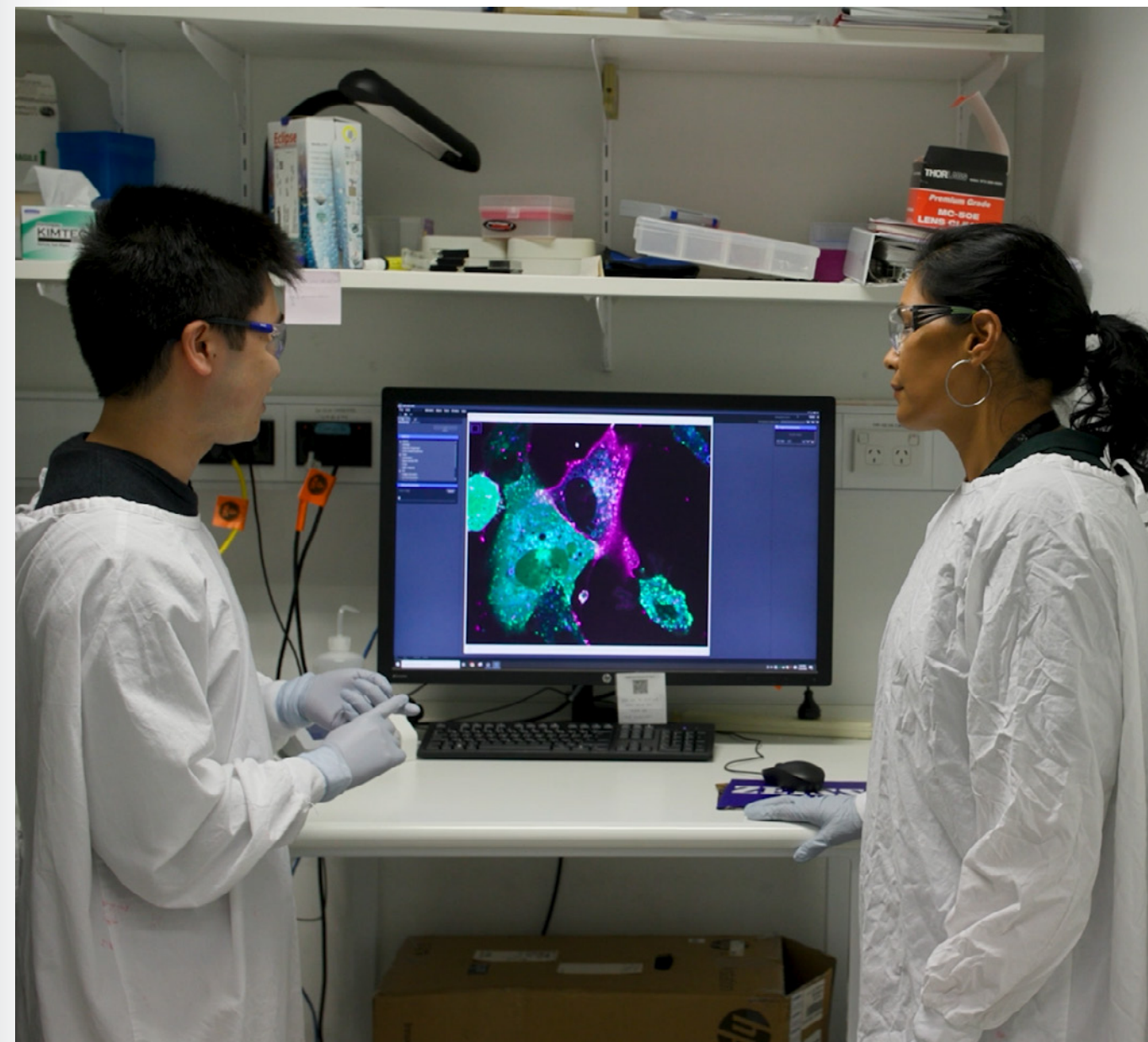
Australian Government
Australian Research Council

65
Journal Publications

Including

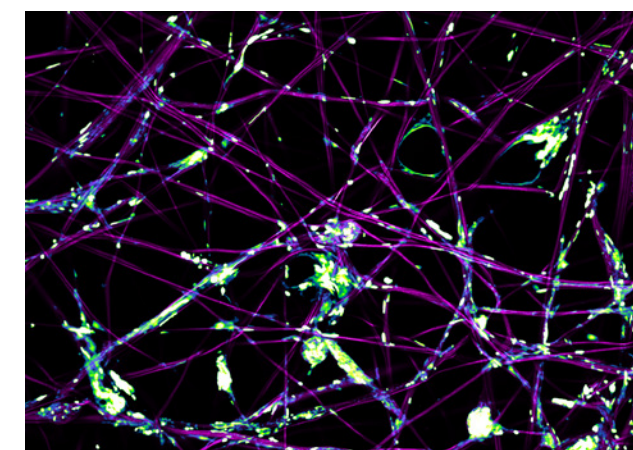
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Cell/Nature/Science family



➤ **Rab7/Rab11.** Visualisation of receptor trafficking through recycling and late endosomes.

Image credit: Jack Zhang, Ananthanarayanan Lab



➤ **iPSCs.** Human cortical neurons stained with fluorescent dyes for microtubules and mitochondria.

Image credit: Jack Zhang, Ananthanarayanan Lab



Centre for Molecular Oncology

The Centre for Molecular Oncology (CMO) applies basic, translational and clinical approaches to understanding cancer biology through patient-centred discovery programs and uses this information to improve patient outcomes through clinical trials.

Expanding Prospects In Cancer Screening

A major program of work within the Centre for Molecular Oncology is the national precision oncology platform, ProSPeCT, a \$190 million public-private initiative aimed at embedding precision oncology across Australia.

Completed in 2025, the platform is Australia's largest cancer and genomics initiative. It integrates genomic profiling, clinical data, and has advanced diagnostics to enable more personalised cancer care at scale.

The three-year ProSPeCT 1/Cancer Screening Program (CaSP) established national infrastructure and demonstrated large-scale genomic and screening integration. A \$30 million extension, ProSPeCT 2, is commencing in January 2026 to expand reach and accelerate clinical translation.

Complementing this work, the Centre has continued to advance large-scale genetic risk cohorts in sarcomas and early-onset cancers, enabling risk-stratified early detection through innovative approaches such as whole-body MRI and blood-based screening technologies.



\$200M+

Foreign investment
from industry-sponsored cancer clinical trials



1540+

Jobs created
(direct + indirect)



81

Cancer treatment centres
networked across all states and territories (27 in regional Australia)

Celebrating Big Ideas

Co-chaired by Professor David Thomas and Professor Vanessa Hayes, the UNSW-USYD Big Ideas Seminar Series convenes national and international thought leaders to explore pioneering concepts in oncology. The program fosters a collaborative, cross-institutional environment that accelerates the exchange of innovative ideas and advances in cancer research.

In 2025, nine seminars were delivered, each attracting more than 150 attendees from across research, industry, clinical practice, and the broader community. The series continues to strengthen interdisciplinary collaboration, elevate thought leadership, and drive the translation of cutting-edge discoveries into improved cancer outcomes.

CMO And The Coming Age Of Precision Oncology

CMO played a leading role in delivering the Australian Precision Oncology Symposium (APOS) 2025, reinforcing its position at the forefront of precision oncology.

With 376 attendees and 23 expert speakers, the meeting convened global and national leaders to accelerate the translation of innovation into clinical practice.

Centred on "The Coming of Age of Precision Oncology," the program showcased breakthroughs in therapeutics, technology, and real-world data driving improved patient outcomes. CMO leadership and researchers were prominently featured throughout. A live molecular oncology board demonstrated the real-time clinical impact of precision oncology, highlighting its growing role in guiding personalised cancer care.



Driving National Impact Through Strategic Partnerships, Engagement and Policy Leadership

CMO maintained extensive engagement across government, industry, academia, and the community in 2025, strengthening partnerships with national and international organisations. Collaborators included Omico, pharmaceutical leaders, professional and cooperative groups, patient advocacy organisations, and philanthropic foundations, alongside global precision oncology initiatives.

CMO's Director, Professor David Thomas, and researchers were highly active, delivering 20 invited presentations, including three keynotes, and contributing to panels, media, and podcasts, raising the Centre's profile and impact. CMO also played a key role in policy and advisory activities, contributing to national genomics frameworks, clinical trial networks, and strategic forums to help translate research into improved cancer care outcomes.

Our Support Services

Link Bridge to Health Translation Hub (HTH) →





SBMS Administration Team

The SBMS Administration Team is the backbone of the School, providing the expertise, coordination, and care that enable our community to thrive.

Working across the School, the team delivers specialist support in their respective areas while fostering a collegial, connected, and welcoming environment for all staff.

Comprised of Amanda Lum, Elyse Atkinson, Paola Spagnoli, Marina Dmitrieva, Ritwick Priyadarshi, and Mary Hervir, the team manages the essential functions that keep SBMS operating smoothly and effectively. Their work underpins strong governance and executive support, clear and timely communication, and the successful delivery of school events that bring our community together.

The team supports staff through recruitment and employment processes, manages access to systems, facilities, and resources, and maintains the communication channels that keep the School informed and connected. They also support teaching and research activities, oversee space and facilities management, and drive continuous improvement by refining processes, updating guidelines, and supporting key committees – ensuring SBMS remains responsive, efficient, and well-supported.



MEDRIOS

The Medicine & Health Research Infrastructure & Operational Services (MEDRIOS) team provides high quality and innovative research laboratory infrastructure service and support.

In 2025, MEDRIOS delivered significant, measurable improvements across SBMS laboratories by streamlining and standardising laboratory access, induction, and safety processes. Through a cross-functional Faculty of Medicine & Health working group, the team successfully implemented cross-lab access inductions, automated laboratory inductions, and standardised laboratory authorisation approval forms – driving greater efficiency, compliance, and collaboration across research groups.

MEDRIOS also improved the accessibility and usability of mandated WHS documentation and laboratory safety training, creating a smoother onboarding experience for staff and students.

Laboratory Managers led a comprehensive audit of SBMS liquid nitrogen vapour phase tanks, strengthening governance of high-value samples while optimising cold-storage capacity, improving inventory oversight, and laying the groundwork for future integration with UNSW's mySample system.

In parallel, MEDRIOS Laboratory Managers played a critical role as research infrastructure experts in the complex delivery of the UNSW Health Translation Hub and new bridge connection. These efforts reflect MEDRIOS's agile, service-driven model and commitment to sustainable, standardised laboratory operations. The team's achievements were recognised through LEAF accreditation, with multiple SBMS laboratories attaining Bronze and Silver status.



Technical Teaching Support Team

The Technical Teaching Support Team, within the Faculty of Medicine and Health, plays a vital role in delivering high-quality practical teaching across the Schools of Biomedical Sciences, Health Sciences, and Medicine.

The team of seven supports a wide range of disciplines, including Medicine, Physiology, Pharmacology, Pathology, and allied health programs.

Innovation is central to the team's work, with academic teaching ideas transformed into effective, low-cost practical models using mechanical and animal-based approaches to enhance student learning. The team also embraces technology, developing streamlined booking solutions through MS Power Apps to support laptop and equipment loans for exams and outreach activities.

Beyond teaching, the team has made a strong contribution to outreach, welcoming 20–30 Year 10 students annually for immersive work experience programs. They are actively involved in teaching space design, earning a 2025 Faculty Award for the innovative Pharmacy lab, and remain deeply committed to laboratory safety and sustainability, with Bronze LEAF certification achieved and expansion underway.



Teaching Support Team

The Medicine and Health Teaching Support Team provides critical operational support for coursework delivery across the Faculty's teaching schools, including the School of Biomedical Sciences.

Working closely with the Directors of Teaching and Student Central services, this team of nine underpins the smooth functioning of teaching operations, managing key processes such as term and assessment planning, results processing, prizes and awards administration, casual academic payments, myExperience coordination, and ongoing enrolment and class maintenance.

In 2025, the team made significant contributions to strengthening teaching administration and supporting SBMS academic staff.

They developed a series of clear, practical manuals and user guides to promote consistency across teaching processes, including comprehensive resources that supported UNSW's transition to the new casual academic payments platform. These materials helped academics navigate system changes efficiently while reducing administrative complexity.

The team also enhanced data-informed decision-making within SBMS by developing a PowerBI dashboard for the SBMS Education Committee. This dashboard has enabled more effective review of grades and assessment outcomes, providing accurate and accessible insights that support oversight of student progress and course performance.



Gross Anatomy Support Unit

The Gross Anatomy Support Unit (GASU) supports UNSW's Anatomy Laboratory, which provides hands-on learning experiences for students studying anatomy, focusing on gross anatomy, histology and embryology.

The GASU team is responsible for producing dissected specimens, cleaning and maintaining wet labs, set up and pack down of classes, auditing specimen tracking, and assisting academics and students.

GASU experienced an exceptionally busy and productive year in 2025, supporting a broad range of teaching, research, and operational activities. The Bequeathal Program admitted 23 donors during the year, with the team embalming 16 donors, cremating 13 donors, and preparing 92 new anatomical specimens to support teaching and learning.

GASU played a vital role in education, facilitating classes across 14 Medical Science courses and 13 Medicine courses.

A major milestone for the year was the successful reopening of the Surgical Skills Unit, which significantly expanded the unit's teaching and engagement capacity.

The team delivered three highly successful surgical workshops, receiving outstanding feedback from both participating organisations and individual attendees. One workshop was conducted for emergency surgeons from Liverpool Hospital, while two were delivered in partnership with AbbVie.

Strong demand led to an additional session and a confirmed booking for the following year. Interest has since expanded to physiotherapy professionals and an art school, highlighting the growing reach of the facility. These achievements reflect the team's adaptability, collaboration, and commitment to excellence.



Outreach

Staff in the School of Biomedical Sciences engage in a broad range of outreach activities that promote UNSW, the Faculty, and the School to diverse audiences. These activities span research-focused engagement as well as initiatives designed to build public understanding of medical sciences and inspire future students to consider pathways in health and biomedical science.

Highlights from 2025

UNSW Open Day 2025: The Full Biomedical Science Experience

Open Day 2025 was a resounding success for our School, attracting hundreds of prospective students and families to immersive laboratory experiences and advisory sessions. Staff and student ambassadors delivered engaging, hands-on demonstrations across anatomy, cancer research, infectious disease, neuroscience, and human-machine interfaces, showcasing the breadth and impact of biomedical science at UNSW. Visitor engagement exceeded expectations, with strong feedback highlighting SBMS as a standout destination and practical learning as a key drawcard.



Reaching Out To The Next Generation Of Biomedical Scientists

SBMS welcomed 32 enthusiastic Year 10 students from 12 Sydney high schools for an immersive work experience program in the Wallace Wurth Teaching Labs from 20-24 October. Over the week, students stepped into the world of Medical and Health Sciences, taking part in hands-on activities across anatomy, neuroscience, data science, and public health, guided by passionate SBMS staff and colleagues from across UNSW.

The week concluded with a session from UNSW Student Recruitment on study pathways and an inspiring talk from a current researcher, leaving students engaged and motivated about future opportunities in health and science.



Brains in Action at the Australian Brain Bee Challenge

The NSW State Finals of the Australian Brain Bee Challenge (ABBC), supported by SBMS and the School of Psychology, were held on 14 August 2025, bringing together 54 high-achieving Year 10 students from 14 high schools across the state. The event showcased strong engagement between schools, students, and academics, with eight new schools qualifying this year. Alongside the competition, students participated in hands-on neuroscience workshops and a visit to the Museum of Human Disease. Lucy Wang (Willoughby Girls High School) was crowned State Champion and will represent NSW at the National Finals in Hobart.



From The Grave To The Stars – A Spooky Science-y Halloween

On Halloween eve, we transformed science into spine-tingling fun with a spooky evening that explored the eerie and extraordinary mysteries of the human body.

Through creative, accessible talks, the evening showcased how research connects to real-world questions, from the physics of low gravity blood to forensic investigations of human remains. Presentations by Associate Professor Kate Poole and Dr Rachel Berry combined scientific expertise with hands-on experiences, sparking curiosity and dialogue. Concluding with a tour of the Museum of Human Disease, the event strengthened community connection, promoted scientific literacy, and highlighted SBMS's commitment to inclusive, impactful science engagement.



Anatomy Comes to Life in Science in the Swamp

As part of Science in the Swamp 2025, SBMS hosted an Anatomy Tent in the UNSW SciFest Village that became a focal point for visitors throughout the day. Featuring forensic anthropology activities, the tent offered hands-on, accessible science experiences that appealed to audiences of all ages. Engagement was constant, with strong interest from prospective students and particularly positive feedback from parents, who valued the opportunity to interact directly with scientists. The event was a great success that highlighted SBMS's ongoing commitment to public engagement, science communication, and inspiring curiosity in biomedical science.



Commercialisation

As part of the UNSW Entrepreneurial Campus initiative, SBMS is home to several spinout companies and entrepreneurial academics.

Spun out by Dr Lawrence Lee from SBMS, Swan Genomics has continued to advance its breakthrough single-molecule sequencing platform designed to overcome the limitations of current short- and long-read technologies.

Using proprietary nanoscale optical antennae, the platform amplifies the fluorescent signal of individual molecules by up to 1,000-fold, enabling the real-time detection and identification of single nucleotides with exceptional sensitivity.

Combined with ultra-low-cost chemical synthesis, this innovation has the potential to transform DNA sequencing by delivering unprecedented scale, accuracy, and cost-efficiency. By making large-scale genomic analysis more accessible, Swan Genomics is helping unlock powerful insights across entire populations – accelerating progress in disease diagnostics, personalised medicine, and biotechnology innovation.

SBMS 2025 Spinouts



Philanthropy

In 2025, significant philanthropic support has enabled new and innovative directions for Associate Professor Orazio Vittorio's cancer research. This funding provided Associate Professor Vittorio the flexibility to pursue high-risk, high-reward ideas that are often difficult to support through more traditional and conservative funding schemes.

Associate Professor Vittorio's work focused on developing a novel CRISPR-based strategy to target oncogenes carried on extrachromosomal DNA (ecDNA). These ecDNA elements are increasingly recognised as key drivers of tumour evolution and multi-drug resistance, particularly in aggressive brain cancers. By designing tools capable of selectively targeting oncogenes within ecDNA, the research aims to open a new therapeutic avenue to overcome treatment resistance and improve long-term patient outcomes.

To find out more and make a donation, scan or click this QR code.





Wellbeing

The health and wellbeing of our staff is a key priority for SBMS. Our strong, inclusive culture underpins everything we do, and we actively invest in creating a safe, supportive and empowering environment. Through initiatives that promote wellbeing, connection and balance, we aim to ensure our people feel valued, supported and able to thrive in their work and community.



Higher Degree by Research

Congratulations to our Higher Degree by Research students who completed their respective programs in 2025.

Belinda Balhatchet

The impact of job demands and resources on burnout and wellbeing in Australian surgical trainees
Supervisors: Boaz Shulruf, Heike Schutze (primary – joint) and Nicole Williams (secondary)

Raphael Caballes

Macromolecular Structure Prediction to Guide Protein Studies of RNA Viruses
Supervisors: David Jacques (primary), Till Böcking and Daniel Luque (secondary - joint)

Leeba Ann Chacko

Uncovering the rules underlying mitochondrial volume homeostasis
Supervisors: Vaishnavi Ananthanarayanan and Till Böcking (primary – joint)

Timothy Chalmers

Somatic Horizontal Transfer and the Impact of Bacterial Mobile Elements in Human Genomes
Supervisors: Lindsay Wu (primary), Nadeem Kaakoush and David Sinclair (secondary – joint)

Patrick Chau

Portobiliary anatomy and morphometry: Implications for liver interventions in paediatric and adult populations
Supervisors: Nicole Jones, Nalini Pather (primary - joint), and Daniel Moses (secondary)

Martin Do

Investigation of Cholesterol Dependent Cytolysin pore formation dynamics and their interactions with other biomolecules
Supervisors: Till Böcking, David Jacques (primary – joint) and James Walsh (secondary)

Brian Ee

Signal amplification of biosensors through DNA-scaffolded assembly
Supervisors: Lawrence Lee, Richard Morris (primary – joint) and Maté Biro (secondary)

Hemna Govindaraju

The mitochondrial secret(ome): Investigating mitochondrial stress-induced cell non-autonomous communication
Supervisors: Nigel Turner and Greg Smith (primary – joint)

Manisha Hari Rajan

Enhancing the Student Learning Experience: Exploring the Role of Virtual Learning Environments and Online Learning Tools within University Settings
Supervisors: Patsie Polly (primary) and Cristan Herbert (secondary)

Jessica Hayes

In Vitro Investigation of Neuroimmune Signalling in Neuropathic Pain: A Focus on Tregs, DRG Neurons, and Microglia
Supervisors: Gila Moalem-Taylor (primary) and Gary Housley (secondary)

Brendan Hughes

Bioinformatics analysis of T-cell receptor repertoires in auto-immune and viral disease
Supervisors: Fabio Luciani and Raymond Hall (primary – joint), Rowena Bull (secondary)

K M Ahsanul Kabir

Next Generation Tools for Pathogen Surveillance in Tropical Regions
Supervisors: Rowena Bull, Chaturaka Rodrigo (primary – joint) and Andrew Lloyd (secondary)

Thomas King

Preservation and Regeneration of Pancreatic β -cells with Apolipoprotein Mimetic Peptides
Supervisors: Kerry-Anne Rye and Blake Cochran (primary - joint)

Felix Kohane

Epithelial–mesenchymal state encodes distinct signalling behaviours in cancer cells
Supervisors: John Lock and Christine Chaffer (primary – joint)

Jenane Konesan

Non-antibiotic alternatives for the prevention or treatment of urothelial damage in urinary tract infections.
Supervisors: Lu Liu (primary) and Kylie Mansfield (secondary)

Bitong Li

Deciphering the Role of Transcription Factor Mobility and RNA Interplay in Embryonic Stem Cell Pluripotency
Supervisors: Till Böcking and Mathias Francois (primary – joint)

Samaneh Moallemi

Early biomarkers for plasma leakage in dengue infection
Supervisors: Chaturaka Rodrigo, Andrew Lloyd (primary – joint), Deepika Fernando and Anne Poljak (secondary – joint)

Sidrah Naseem

Signal Integration of Chimeric Antigen Receptor (CAR) and Co-Inhibitory Receptors
Supervisors: Jesse Goyette and Till Böcking (primary - joint)

Kinjal Jayesh Patel

Pharmacological Characterisation of Spexin Peptides at GPR161 and GAL2 Receptors
Supervisors: Nicola Smith (primary) and Angela Finch (secondary)

Lily Pearson

Spatiotemporal Profiling of Inner Ear Sensory Neuron Subpopulations
Supervisors: Gary Housley, Jennie Cederholm (primary – joint), Jeremy Pinyon and Georg von Jonquieres (secondary – joint)

Lok Bahadur Shrestha

Longevity and breadth of SARS-COV-2 specific memory B cells
Supervisors: Rowena Bull, Nicodemus Tedla (primary – joint) and Fabio Luciani (secondary)

Lina Sprogyte

Development of a preclinical mouse model of alkali-induced LSCD to detail clinicopathological features and investigate new diagnostic and therapeutic modalities
Supervisors: Nick Di Girolamo (primary) and Mijeong Park (secondary)

Xinye Wang

Influenza Dynamics from Pre- to Post-pandemic Periods: Epidemiology and Genetic Characteristics
Supervisors: William Rawlinson, Matthew Scotch (primary – joint), Sacha Stelzer-Braid, Ki Wook Kim and Gregory Walker (secondary – joint)

Ruijie Yu

Structural and Biophysical Characterisation of the Human T-cell Leukaemia Virus 1 Capsid Protein
Supervisors: David Jacques (primary) and Till Böcking (secondary)

Our origins in 1960s Sydney



Acknowledgements

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Amanda Lum

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Front and Back Cover: Recreating tumor tissue on plastic: Cancer islands (purple) encapsulated by a sea of connective tissue fibroblasts (gold)

Image credit: Dr Krystyna Gieniec (Molecular Medicine)

