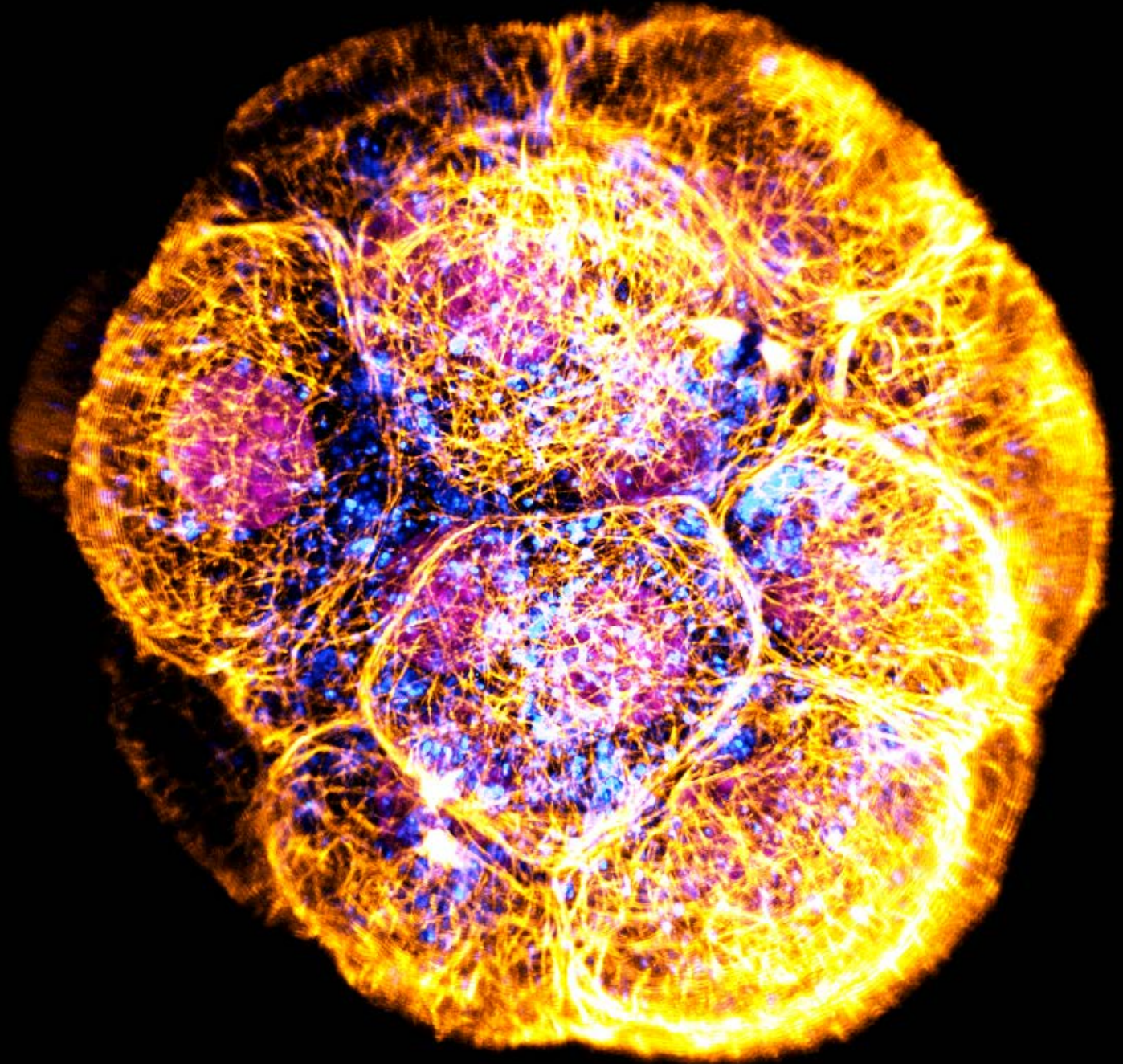


ANZSCDB

Australia and New Zealand Society for
Cell and Developmental Biology Inc.



WINTER NEWSLETTER 2022

ANZSCDB

Australia and New Zealand Society for
Cell and Developmental Biology Inc.



NEWSLETTER AUGUST 2022

President's welcome statement

This time a year ago many, if not all of us, were connecting through a series of tiny squares on our screens – presenting our research over zoom meetings, asking questions with a tiny yellow hand and sharing a smile as a child or animal made a celebrity guest appearance. How wonderful it has been to put away the stretchy pants and replace our yellow hand with our real ones and recommence face to face meetings and conferences. For many of us this started at the 21st Hunter meeting in Newcastle in May. What a great location to reconnect! I recall the energy in the room on the first night; the hum of banter with old friends and colleagues and the bursts of laughter that created such warmth. This year our invited speakers were local, and our program was filled with excellent presentations from our many students and postdocs. While we may have endured the longest lockdown, it was clear that our science has continued to move forward. We heard many stellar presentations on both cell biology and developmental biology and enjoyed excellent Plenary lectures from Professors Sally Dunwoodie and Rob Parton. You can read more about the 21st Hunter meeting from ANZSCDB members Jessica Greaney and Azelle Hawdon on page 13, who also happened to give excellent talks themselves on the workings of the early mouse embryo.

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On the theme of re-connection, my Twitter feed has informed me that we are amongst a sea of scientists re-engaging their minds and hearts. I've seen many reports from ANZSCDB members hopping on a plane OS for the first time in 3 years. I have followed suit, enjoying a Hippo pathway targeted therapy conference in Boston and an EMBO Drosophila conference in Crete. The Cretan sea was a perfect remedy for a cold Melbourne winter!

A tradition of ANZSCDB is to recognize and celebrate the achievements of our members and it was an absolutely highlight of my year to present the 2021 ANZSCDB President's Medal to Professor John Bertram (Monash University) and the 2021 ANZSCDB Emerging Leader award to a newly minted Professor James Murphy (WEHI). These awards were conferred by ANZSCDB's previous

executive committee, led by President Professor Jenny Stow, but were unable to be awarded in 2021 because of COVID. With restrictions lifting, around 50 ANZSCDB members assembled to celebrate these awards in person at the University of Melbourne on July 1st, with many also joining online. Both John and James gave very engaging reflections on their careers to date, and the many important contributions they have made to both research and teaching. John in particular has made remarkable contributions to teaching in Australia, having started the first ever Developmental Biology Major in a Bachelor of Science degree, which has had more than 15,000 enrolments at Monash University and is still going strong. What an amazing contribution to Australian developmental biology! These events remind me of how hard we all work; how important discoveries take years and even decades to unfold and the importance of celebrating these milestones along the journey. A big thank you to the University of Melbourne for providing the venue, to my fellow executive members Jenny Zenker and Alex Combes for organising the event and to everyone that joined us in person or virtually to celebrate John's and James' achievements.

Let's keep this momentum going! Moving forward, I am looking forward to ANZSCDB's peak conference – Combio. After COVID-induced postponements, we now get to come together in Melbourne between 27-30th September and once again meet up with colleagues to present and discuss our latest discoveries. We will also hold our AGM on Thursday 29th September, followed by a society dinner, which will be organised by our Victorian state representatives, Jan Manent and Brooke Huuskes. I look forward to seeing you all there.

Kieran Harvey,

ANZSCDB President

Cover art: 'Golden Orb', an image highlighting the intricate organisation of the microtubule cytoskeleton in the early mouse embryo, Azelle Hawdon (ARMI, Monash University), see Awards section for more information.

Keeping up to date: Remember to follow [@ANZSCDB](#) on Twitter for news and tag us in your work-related posts for retweets.

Contribute to the ANZSCDB newsletter!

Please send items to [Alex Combes](#), the society Secretary, or get in touch with your [state representative](#). We want to hear about your latest papers, promotions, prizes and other news, perspective, or opinion pieces about life as a student, RA, Postdoc or PI in cell biology or developmental biology.

The newsletter will be published 3-4 times a year and distributed to all ANZSCDB members via e-mail. Previous newsletters are hosted on our website.

Please ensure that your submissions are succinct and have been fact-checked.

Development, Stem Cells and Regenerative Medicine @ ComBio2022

combio.org.au/combio2022/

After a 2-year, pandemic-induced hiatus, the premier Australian Cell and Developmental Biology conference ComBio is back! This year, it will be held at the Melbourne Convention Center from September 27-30. The meeting will feature an

opening plenary lecture from Nobel Laureate Prof. Jennifer Doudna, on her pioneering work in CRISPR-mediated genome editing, alongside nine separate conference streams covering all aspects of cell and developmental biology, genetics, biochemistry and education.



The **Development, Stem Cells and Regenerative Medicine stream** is divided into 9 sessions, including regeneration, early development, mechanobiology, iPSCs, organogenesis, epigenetics, and stem cell fate. As the stream leaders, Seb Dworkin and myself would like to highlight some of the exciting science in our sessions:

Kynan Lawlor is a senior research fellow from the Murdoch Children's Research Institute (Melissa Little's lab) and will tell us about bioprinting technology to improve the scale and conformational control of kidney organoid production.

A/Prof Jess Frith, a group leader at Monash University will present her work on how a variety of surface topographies impact on mechanosensitive mesenchymal stromal cells. A/Prof Frith will tell us about how the shape of the nucleus, expression of nuclear envelope proteins, and chromatin organisation responds to mechanotransduction, and how this affects the cell's ability to undergo differentiation.

Professor Ruth Arkell from the John Curtin School of Medical Research will be telling us about an intriguing and exciting story on how *Zic3* causes defective Wnt signalling, and how this in turn affects the node and left right signalling and cardiac patterning.

Other notable presentations include talks from Travis Johnson (Monash University) on a systematic approach to revealing diets that treat inherited metabolic disease, Sara Hlavca (Monash University) on cellular heterogeneity in colorectal cancer, Benjamin Kroeger (Monash University) on Hippo signalling in epithelial organs and Lachlan Wallace (University of Melbourne) on netrin signalling in epithelial wound healing.

Finally, our stream will also feature an invited talk from the 2022 ANZSCDB emerging leader award winner A/Prof Kelly Smith (University of Melbourne), highlighting an impressive career and recent work in cardiac development and regeneration.

Development, Stem Cells and Regenerative Medicine stream coordinators,

A/Prof **Louise Cheng**,
Organogenesis and Cancer Program
Peter McCallum Cancer Centre



& Dr **Seb Dworkin**
Head, Developmental Genetics Group
& Senior Lecturer, La Trobe University

ANZSCDB Award Winners 2022

The society is incredibly proud to celebrate the impactful science, inspiring leadership and innovative ideas of its award winners for 2022. Please see the ANZSCDB [website](#) for more information on the 2022 winners. The 2022 President's Medal and Emerging Leader talks will be presented at COMBIO 2022.

ANZSCDB President's Medal Award

Prof Jose Polo, Director, Adelaide Centre for Epigenetics, University of Adelaide, Monash Biomedicine Discovery Institute & Australian Institute for Regenerative Medicine, Monash University.

Professor Polo is internationally recognised for ground breaking contributions to the transcriptional and epigenetic mechanisms that govern cell identity, in particular pluripotency and the reprogramming of somatic cells into induced pluripotent stem cells (iPSC). Polo and team have consistently reported breakthrough findings in these fields, with recent discoveries in generating induced trophoblast stem cells, and recreating the early stages of human development with an iPSC-derived in vitro model of the human blastocyst (iBlastoids). Jose has recently taken on a prominent leadership role as founding director of the Adelaide Centre for Epigenetics. The achievements of Polo and team are at the forefront of stem cell models of human development and an inspiration to our Society.



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ANZSCDB Emerging Leader Award

A/Prof Kelly Smith, Cardiac Genetics lab, University of Melbourne

Associate Professor Smith has established a strong research program in the genetic regulation of heart development. Smith's research uses large-scale forward genetics in zebrafish to identify and characterise novel regulators of cardiac development, disease, and regeneration. Smith's recent research has uncovered several novel regulators of heart development, including identification of an extracellular matrix component required for correct development of the cardiac valves, and another gene of unknown function required for normal cardiac rhythm. Smith is established as a leading researcher in the competitive field of cardiac development, securing substantial funding from the NHMRC in Project and Ideas grants and producing several high impact publications in leading international journals. We are extremely pleased to award this prize to Kelly to recognise ongoing contributions to our Society and the wider scientific community.



Kelly @ThatKelly · Jul 27

So excited by this. I love the @ANZSCDB. Such a great organisation! And so honoured to be included amongst past recipients. Cell & Dev Biol 4eva!



ANZSCDB Early-Career Researcher Awards

Dr **Lilian Schimmel**, Institute for Molecular Bioscience, The University of Queensland.

"My work studies the molecular mechanisms that guide blood vessel growth and function in development and disease. It is well appreciated that the stiffness of the environment surrounding blood vessels affects their growth and function, however the specific signals activated by mechanical forces like stiffness remain largely unknown in endothelial cells. By focussing on the signals in endothelial cells that regulate their interactions with the surrounding environment, I aim to identify specific signalling pathways that are involved in the response of endothelial cells to their surrounding environment and how those lead to abnormal and leaky blood vessel formation."

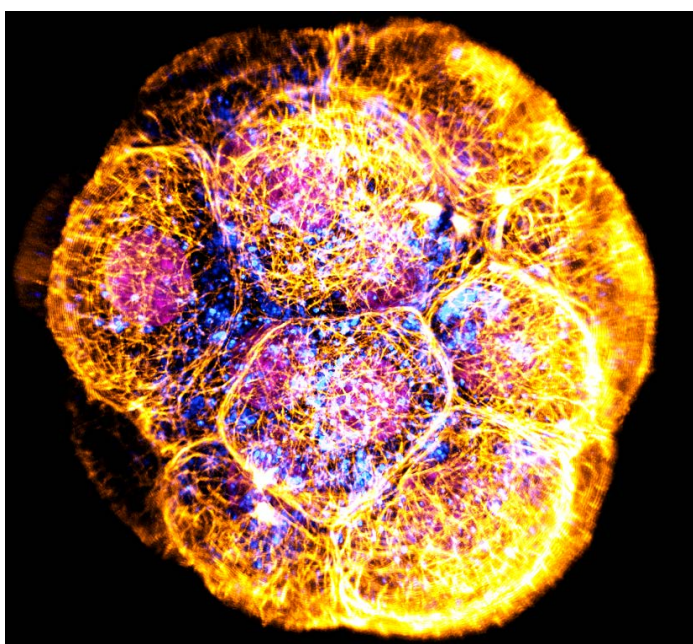


Dr **Ivar Noordstra**, Institute for Molecular Bioscience, The University of Queensland.

Dr Noordstra's work builds around the cytoskeleton and epithelial morphogenesis, with a special focus on the formation and maintenance of cell-cell interactions. Noordstra completed his PhD in the field of microtubule dynamics in the lab of Prof. Anna Akhmanova at Utrecht University in the Netherlands. During this time he applied advanced microscopy approaches to interrogate the molecular regulation of microtubule dynamics and how these control cell shape and invasiveness in 3D matrices. Noordstra won an EMBO Long Term Fellowship, which "gave me the freedom to lead a research project focussing on the function of E-cadherin nano- and micro clusters in epithelial development" within the Yap lab at IMB. "Through collaborations with colleagues in Australia, Spain and India, we elucidated the detailed molecular mechanisms underlying the formation of cell-cell junctions", describing "how cells identify topologies of cortical flow as a basis for decision to commit to junction assembly".



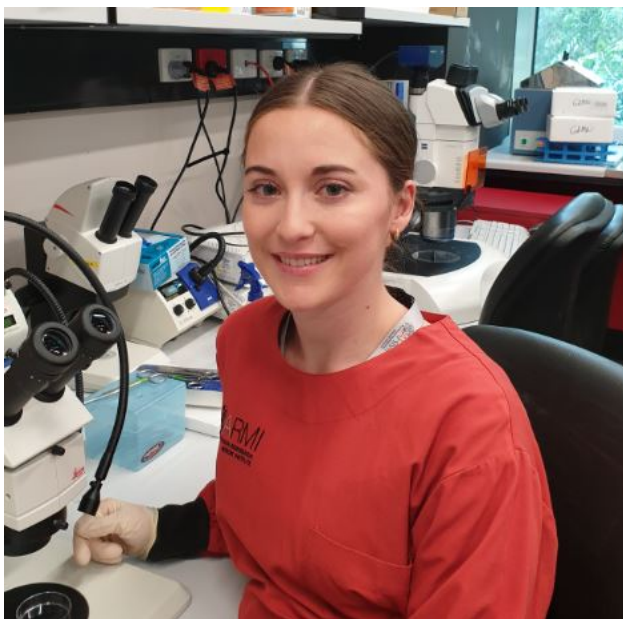
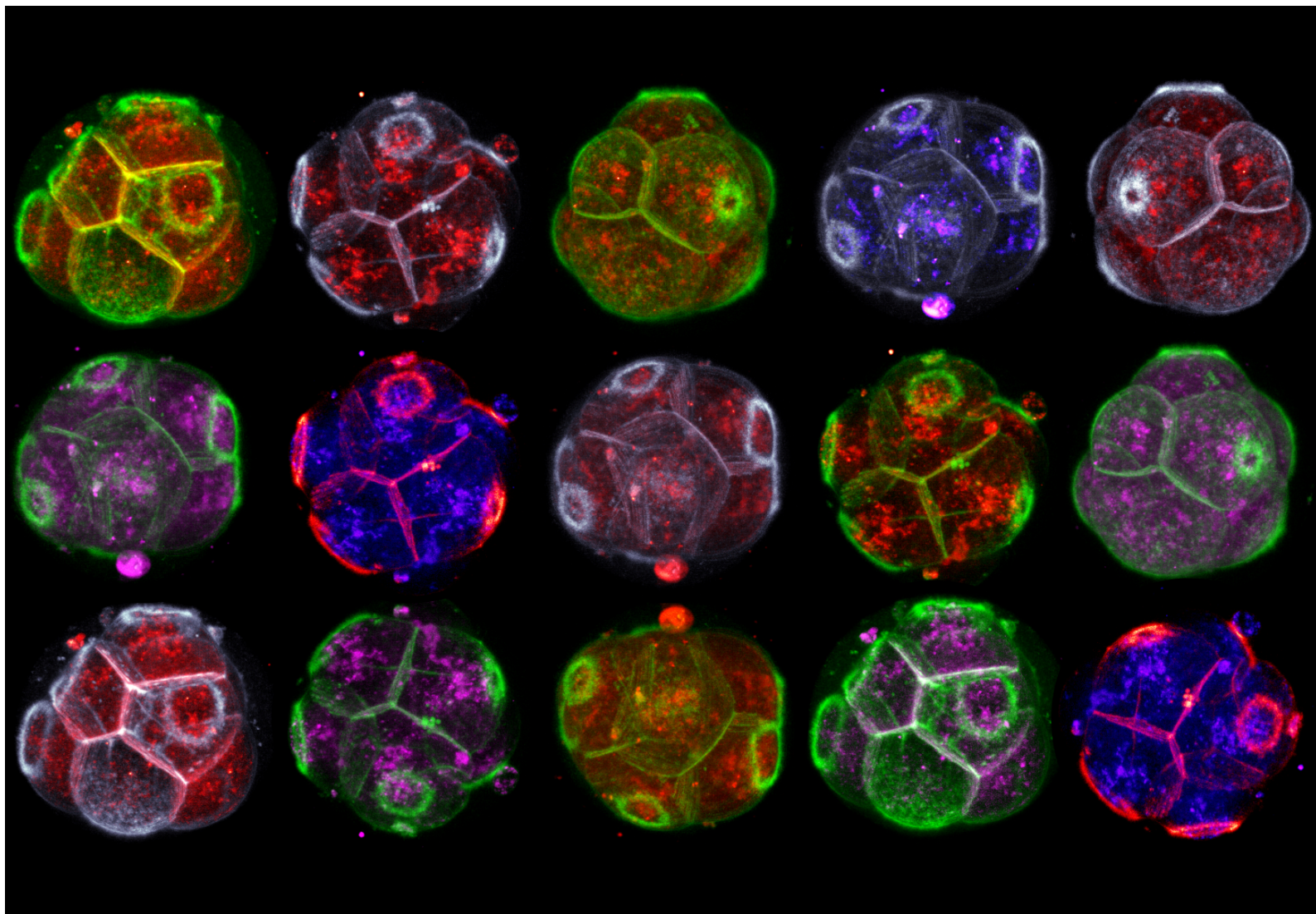
ANZSCDB Image Awards



Azelle Hawdon
Australian
Regenerative
Medicine
Institute,
Monash
University

Golden orb

The captivating complexity of the microtubule cytoskeleton (yellow) in the early mouse embryo as it intricately organises subcellular components such as lysosomes (purple/cyan), visualised by confocal microscopy (Zeiss, LSM980, Monash Micro Imaging Facility). DAPI (magenta).



Dr Jessica Greaney
Australian Regenerative Medicine
Institute, Monash University

Life imitating art

Taking inspiration from the Pop Art movement, this Warhol-esque array of live mouse embryos were captured on a Zeiss LSM780 confocal microscope. Embryos are expressing EB3-dTomato, allowing identification of microtubule growth hotspots as well as Membrane-GFP, showing apical cortical rings which will expand and constrict to compact the embryo during preimplantation development.

ANZSCDB (PhD student) Publication Award

Talhah Salmi, Peter MacCallum Cancer Centre, VIC

YAP regulates an SGK1/mTORC1/SREBP-dependent lipogenic program to support proliferation and tissue growth; Dev. Cell, 2022

<https://doi.org/10.1016/j.devcel.2022.02.004>

"Emerging evidence suggests that the Hippo pathway effector Yes-associated protein 1 (YAP) reprograms cellular metabolism to meet the anabolic demands of growth, although the mechanisms involved are poorly understood. Here, we demonstrate that YAP co-opts the sterol regulatory element-binding protein (SREBP)-dependent lipogenic program to facilitate proliferation and tissue growth."



Read the [preview commentary](#) about this work in Developmental Cell

Community project to record ANZSCDB history

While much of ANZSCDB history is captured in newsletters such as this, we lack centralized records of past ANZSCDB Executive, Committee, State Reps, and COMBIO award winners.

The current executive is working to consolidate this information and make it public through the ANZSCDB website, with all previous winners of the President's Medal, Emerging Leader, ECR awards [now online](#). However, **we need your contributions** to acknowledge past service and achievements within our community.

We have started an open access spreadsheet for members and friends to capture ANZSCDB exec & committee history. If you have ever served on the Exec, Committee, or as a State Rep, please fill in your details and any you can recall of others at that time through this link:

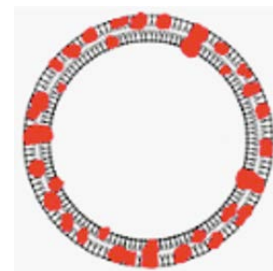
https://docs.google.com/spreadsheets/d/147YB0tHojU4j9QuLHDXDoZDs_VsLl0lhyF4O_-nVIP8/edit?usp=sharing

There are also documents and a folder to record and upload information about ANZSCDB history, useful records, and past prizes at COMBIO here:

https://drive.google.com/drive/folders/1B_4XHG7-vappNygQkiuv2_2h8sGxIzJL?usp=sharing

Did you know?

ANZSCDB is one of Australia's oldest scientific societies, being founded in 1980 by Atuhiro Sibatani (CSIRO, Sydney), Jenny Graves (La Trobe University) and Keith Dixon (Flinders University)¹. Graves was president of the Victorian Cell Biology Society in 1980 and recalls launching the Australian Society for Cell Biology as its founding President with assistance from Brian Gunning (ANU)², which soon expanded to include contemporaries across the ditch with a name change to the Australia and New Zealand Society for Cell Biology. The original logo for the ANZSCB (pictured) was conceived by Graves and Dick Wettenhall and sketched by Graves' "babysitter's teenage son", which persisted until it was replaced by Nadia Rosenthal's iconic redesign of the President's Medal in the 2000's. In a perspective article, Brian Key noted that it wasn't until 1997 that the society changed its name to include "Developmental" "as the interests of its membership in the field of developmental biology continued to grow"³.



- 1) Personal communication from Edna Hardeman
- 2) Personal communication from Jenny Graves
- 3) Key., B. The emergence of the field of developmental biology in Australia, Int. J. Dev. Biol. 46: 353-356 (2002)

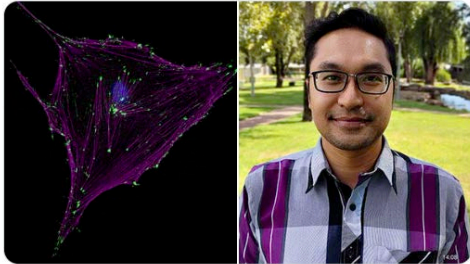
ANZSCDB Communication and Engagement Initiatives

ANZSCDB Member Profiles on Twitter

This year our State Representatives have driven a new initiative to showcase the great work of our members on Twitter. Profiles consist of photos and a brief description of the researcher and their work, with optional links to recent papers. Please reach out to your [State Representatives](#) or Secretary to coordinate a profile for yourself, a student, or colleague. The same goes for **papers**, **job ads** and **articles** of interest to the society!

ANZSCDB @ANZSCDB · Jul 15

Meet @ANZSCDB member @ZJohan, a postdoc from the Tumour Microenvironment Laboratory @CCB_Research in Adelaide. His research focuses on the role of the Rho-ROCK signalling pathway in the tumour microenvironment and wound healing



5 retweets 26 likes

ANZSCDB @ANZSCDB · Jun 24

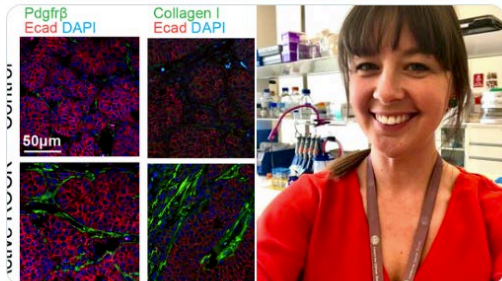
Meet @DworkinSeb, Head, Developmental Genetics Lab & Senior Lecturer in Pathophysiology @latrobe University. A long time @ANZSCDB member, Dr Dworkin identifies genes that drive craniofacial development and lead to craniofacial defects when mutated, using zebrafish & mouse models



1 comment 7 retweets 43 likes

ANZSCDB @ANZSCDB · Jun 10

Meet @ANZSCDB member @DrSarahBoyle, an ARC DECRA fellow @CCB_Research in Adelaide. Sarah's research seeks to understand the mechanobiology driving changes in the breast cancer microenvironment, and identify novel therapeutic opportunities to arrest tumour progression.



1 comment 7 retweets 31 likes

ANZSCDB @ANZSCDB · Jun 24

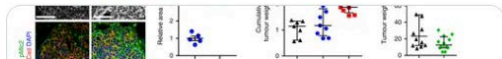
Check out the methods book on craniofacial development that @DworkinSeb recently edited



link.springer.com
Craniofacial Development

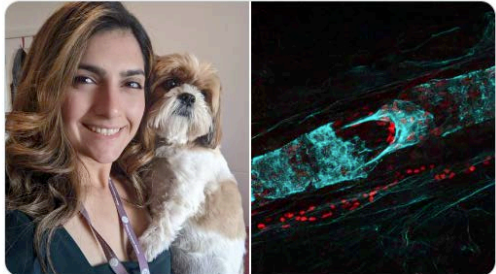
ANZSCDB @ANZSCDB · Jun 10

Check out @DrSarahBoyle's recent paper in NCB



ANZSCDB @ANZSCDB · May 27

Meet @ANZSCDB member and PhD student at @CCB_Research and @UniofAdelaide Saba Montazaribarforoushi, who works on genetic drivers of peri and postnatal diseases with a focus on the role of pathogenic variants in MDFIC in lymphatic anomalies and cardiovascular disease



1 comment 4 retweets 16 likes

ANZSCDB @ANZSCDB · Jun 3

Meet @ANZSCDB member, @FionaKMCheung who is a PhD student at @JosBowles Lab at the University of Queensland. Fiona studies germ cell development in the mouse model, with a focus on how foetal ovarian germ cells enter meiosis.



2 retweets 16 likes

ANZSCDB @ANZSCDB · May 27

Check out the recent paper from @DrNatashaHarvey, Saba and colleagues on pathogenic MDFIC variants



science.org
Pathogenic variants in MDFIC cause recessive cen...
Pathogenic variants in MDFIC cause complex lymphatic anomalies because of a crucial role for ...

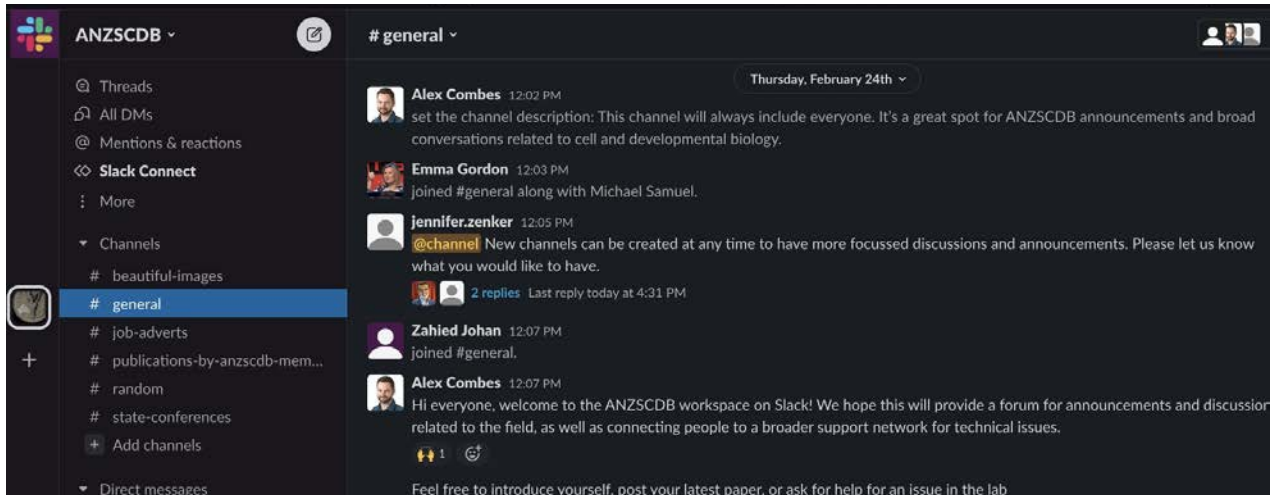
1 retweet 7 likes

ANZSCDB Slack Channel

We are currently trialling an ANZSCDB Slack Channel as a live forum for community discussion, Q&A, and support across the Society.

You can join the ANZSCDB Slack Channel here:

https://join.slack.com/t/anzscdb/shared_invite/zt-13zjxndlf-hVVVv51_vfXZ_xQzWFO4qA



News and Activities

Save the date for the ANZSCDB AGM ~6-8pm and Society Dinner from 8pm at COMBIO on 29th September 2022

Publication highlights from members

The **Ramialison and Johnson labs** have developed and implemented an innovative bioinformatics pipeline to predict genes involved in heart development and disease. Led by Dr. Hieu Nim, this pipeline relies solely on gene regulatory information (i.e. non-coding elements in the genome) and generated a long list of novel candidate genes, 35 of which were functionally validated in the fruit fly model. This was a collaborative effort between several members of our society.

Read the [article in Genome Biology](#) or [listen to the research on ABC Radio National](#)

Nim HT, Dang L, Thiyagarajah H, Bakopoulos D, See M, Charitakis N, Sibbritt T, Eichenlaub MP, Archer SK, Fossat N, Burke RE, Tam PPL, Warr CG, Johnson TK, Ramialison M.

A cis-regulatory-directed pipeline for the identification of genes involved in cardiac development and disease. *Genome Biol.* 2021 Dec 15;22(1):335.

The **Arkell Lab** has published a new review on how patterning mechanisms contribute to developmental disorders of brain development:

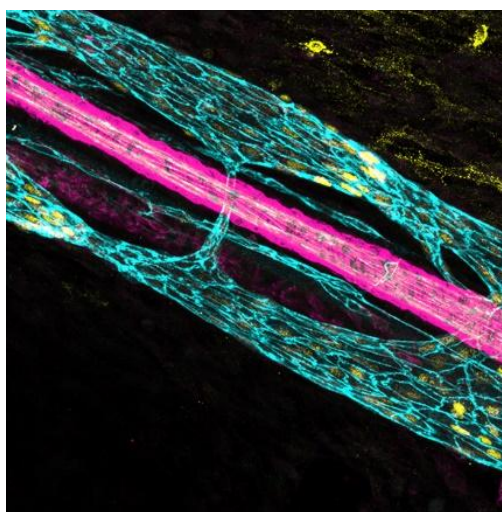
Barratt KS, Drover KA, Thomas ZM, Arkell RM.

Patterning of the antero-ventral mammalian brain: Lessons from holoprosencephaly comparative biology in man and mouse. *WIREs Mechanisms of Disease.* 2022 Feb 8;14(4) <https://doi.org/10.1002/wsbm.1552>

Publication Highlights continued on next page...

Stillbirth and chronic disease link identified by South Australian researchers

Congratulations to **Prof Natasha Harvey and team** whose recent work led to a world first discovery identifying a genetic mutation responsible for a lymphatic disorder that may cause stillbirth or severe, chronic disease in affected children. The genetic study of six families affected by stillbirth or lymphoedema revealed the link between a mutated protein coding gene called MDFIC and fluid accumulation in vital organs and tissues, demonstrating for the first time that MDFIC is important for controlling the growth and development of the lymphatic vessels in the fetus. The findings published in the journal *Science Translational Medicine* resulted from a collaboration between the research teams led by **Prof Natasha Harvey and Prof Hamish Scott** at the Centre for Cancer Biology, Prof Miiikka Vikkula's laboratory from the University of Louvain in Belgium and clinical teams at CHOP and University Greifswald.



A short video about the research produced by the UniSA media team can be viewed on YouTube: https://www.youtube.com/watch?v=HZvy2_u_zek

Link to the publication: <https://doi.org/10.1126/scitranslmed.abm4869>

Other selected publications from SA members:

Lohraseb, I., McCarthy, P., Secker, G., Marchant C., Wu J., Ali N., Kumar S., Daly RJ., Harvey NL., Kawabe H., Kleifeld O., Wiszniak S., Schwarz Q.. Global ubiquitinome profiling identifies NEDD4 as a regulator of Profilin 1 and actin remodelling in neural crest cells. *Nat Commun* **13**, 2018 (2022). DOI: <https://doi.org/10.1038/s41467-022-29660-3>

Farooq AU, Gembus K, Sandow JJ, Webb A, Mathivanan S, Manning JA, Shah SS, Foot NJ, Kumar S. K-29 linked ubiquitination of Arrdc4 regulates its function in extracellular vesicle biogenesis. *J Extracell Vesicles*. 2022 Feb;11(2):e12188. DOI: <https://doi.org/10.1002/jev2.12188>

Chipurupalli S, Ganesan R, Martini G, Mele L, Reggio A, Esposito M, Kannan E, Namasivayam V, Grumati P, Desiderio V, Robinson N. Cancer cells adapt FAM134B/BiP mediated ER-phagy to survive hypoxic stress. *Cell Death Dis*. 2022 Apr 18;13(4):357. DOI: <https://doi.org/10.1038/s41419-022-04813-w>

Kolesnikoff N, Chen CH, Samuel MS. Interrelationships between the extracellular matrix and the immune microenvironment that govern epithelial tumour progression. *Clin Sci (Lond)*. 2022 Mar 18;136(5):361-377. DOI: <https://doi.org/10.1042/CS20210679>

Highlight your papers in the next newsletter or via the [@ANZSCDB Twitter account](#).

Making mental health a priority among PhD Students

In the advent of the COVID-19 pandemic, the topic of mental health has gained increased attention. Mental health includes our emotional, psychological, and social well-being, and affects how we think, feel, and act. This often impacts numerous aspects of our life, such as how we tolerate stress, relate to others, and make healthy choices (e.g. diet, exercise, sleep, etc.). Mental health is important at every stage of life; and even more important when undertaking postgraduate research amidst the COVID-19 pandemic.

Anatomy Postgraduates Escaping Science (APES) is an autonomous, student-led society from the Department of Anatomy and Developmental Biology within the Biomedicine Discovery Institute (BDI) at Monash University, Clayton. Their objectives are to host social events for PhD students within their department to escape the lab, but also to support and advocate for the student cohort, wherever necessary.

In October 2021, as part of Mental Health Awareness Month, APES formulated a survey to assess the mental health status of the BDI PhD cohort. The objectives of this student-led survey were: (1) to evaluate the mental health status of the BDI PhD student cohort, both before and during the COVID-19 pandemic; (2) to raise awareness of the mental health issues faced by students to their supervisors and senior members of the BDI; and (3) to facilitate conversation on how PhD students may be better supported during this time by their labs and the student representatives.

The voluntary, anonymous survey was undertaken by 49 graduate students, representing approximately one fifth of the BDI PhD cohort. Pre-existing mental health issues were prevalent within the student cohort even prior to the onset of the COVID-19 pandemic, with 63% of participants reporting that they had struggled to some degree with their mental health prior to commencing their postgraduate studies. Alarming, but not unsurprisingly, 98% of participants stated that their mental health has impacted their PhD experience to some degree, with the majority stating this occurred only during the period of the COVID-19 pandemic. Many students reported experiencing "*...mild anxiety, depression, stress and burnout...*" but accepted this as being a "*common occurrence*" for most PhD students during their studies. Students who commenced their candidature pre-pandemic reported mostly mild impacts on their motivation, energy levels, ability to plan work, productivity, and quality of work output due to their mental health status, but showed moderate impacts on stress levels. For these students, the majority of these factors were exacerbated with the onset of the COVID-19 pandemic. Unfortunately, these factors were severely impacted in students who commenced their candidature during the pandemic.

For PhD students, their supervisory team and lab group are important pillars of support throughout their candidature. Encouragingly, the majority of participants reported that they were comfortable approaching at least one member of their supervisory/lab group regarding their mental health.

Furthermore, approximately two thirds agree that their main supervisor: (1) prioritises the mental health of the lab; (2) creates an environment where mental health can be openly discussed; and (3) caters to their mental health needs by being flexible with workload & work arrangements, which was extremely encouraging.

Although many of the participants had already struggled with their mental health prior to COVID-19, the APES survey revealed that the pandemic has significantly exacerbated these struggles. Overall, students want: (1) COVID-specific extensions to candidature and scholarships, with clear instructions on how to access these; (2) promotion of flexibility around their research projects and working arrangements; (3) increased awareness of available mental health resources; and (5) initiatives to brighten the mood and office spaces.

In response to this feedback, APES have formed a new Student Wellbeing Committee for 2022. Overall, this committee aims to create a support network for students, normalise talk about mental health and implement a healthier office space as recommended by students. Some of their planned initiatives include: (1) welcoming new students to the department and bridging isolation felt within the student cohort; (2) organising the office area and greening up the space with plants; (3) curating a student noticeboard to advertise upcoming events/seminars, available mental health resources at Monash and how to access them, and (4) facilitate regular exercise and mindfulness activities. All these initiatives have one overarching goal - provide a network of support for our peers throughout their postgraduate studies.

By Lauren Alesi, Harmanjeet Singh & Georgia Cuffe (pictured L-R below)
Biomedicine Discovery Institute, Monash University



We would love to receive more news and content from student and ECR members. Get in touch with alex.combes@monash.edu to discuss or send any submissions.

21st Hunter Cell Biology Meeting Report

Back in May of this year, we set out to join a gathering of cell and developmental biologists from around the nation. This meeting, famously known as The Hunter Meeting was (despite its namesake) held away from the sprawling vines of the Hunter Valley and was



instead held at the more readily accessible location of Newcastle, NSW. As delegates gathered in person for the first time since 2019, an air of excitement filled the auditorium at The NEX Exhibition and Convention Centre. Many of the regular attendees of this meeting were back and gladly greeted friends from around the country. They were joined by a particularly well-attended ECR proportion of delegates, due to a concerted effort by the organisers to welcome upcoming researchers to the meeting. With this complementary combination of attendees, The Hunter Meeting provided a unique setting focused on fostering the scientific development of ECRs and students, with a record number of posters showcased during the welcome function and a generous slew of prizes up for grabs.

Embedded within an exciting program advocating Australian-based science, was the Keith Stanley Plenary Lecture by Rob Parton (Institute for Molecular Bioscience, UQ), who took us on an exploration at the nanoscale level, providing an overview of his inspiring career and enlightened us on the form and function of the mysterious caveolae through his signature stunning visualisations. Sally Dunwoodie (Victor Chang Cardiac Research Institute and UNSW) presented the Hunter Plenary Lecture. Sally spoke about her internationally renowned research which employs the newest genomic technologies to identify disease-causing mutations and provided detailed insights into the impacts of gene-environment interactions during embryogenesis.

The Hunter Meeting boasted a diverse program which included a wide range of topics encompassing all aspects of cell and development biology, including innovative advances in single-cell technologies and cutting-edge microscopy techniques. The presentations stimulated thought-provoking questions followed by great discussions, which carried on to lively networking and social events, made possible with the support of ANZSCDB. A particular highlight was the Conference Dinner, held at a nearby restaurant featuring dinner, a live band and some impressive displays on the dance floor. Congratulations to all award winners who delivered outstanding presentations. Thank you to the organising committee and sponsors. We thoroughly enjoyed the experience as first-time attendees and we look forward to what the Hunter meeting will bring in 2023.

Report by Jessica Greaney and Azelle Hawdon



Jessica Greaney speaking at the meeting



ANZSCDB Postdoc talk prizes go to Ivar Noordstra, and Theresa Bonello, pictured with President Kieran Harvey and ANZSCDB Committee Member and Convenor of the 2022 Hunter meeting Jo Bowles.



L-R: Fiona Cheung, Brooke Kinsella, and Azelle Hawdon receiving ANZSCDB PhD talk prizes

2021 ANZSCDB Award Ceremony

The 2021 ANZSCDB Award meeting was held in the vibrant Ian Potter Auditorium at the University of Melbourne on 1st July 2022 to celebrate the achievements of ANZSCDB President's Medallist Professor John Bertram, and ANZSCDB Emerging Leader James Murphy, who was recently promoted to Professor.

After a rousing introduction from President Kieran Harvey, John Bertram launched into an impressive talk covering his contributions and impact on understanding of the developmental programming of kidney function, and the consequences for adult health. Despite the organiser's best efforts at wrangling Zoom, the persistent video feed from John's son, who joined the call from his bed in Sweden, was a source of much amusement for the rest of John's family who attended in person. Zoom antics aside, it was impressive to hear about John's research and about his work building a Developmental Biology Major at Monash University which has taught an estimated 15,000 students to date!

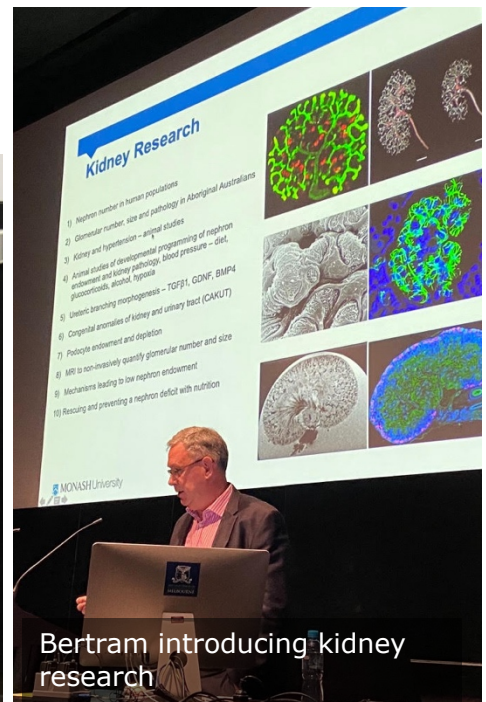
Next up Professor James Murphy gave a career-spanning talk about his entry into the field of signal transduction and landmark work defining the cellular functions of 'dead' enzymes, pseudokinases, and the role of one such pseudokinase MLKL in cell death via the necroptosis pathway. James highlighted the role of serendipity at various points in his career while walking through the discoveries that have led to both fundamental breakthroughs in pseudokinase biology, and translational impact by developing MLKL inhibitors and a spinout company to target inflammatory diseases.

The meeting concluded with a social event at the nearby University House.

Thanks to everyone who joined us in person and online, Alex Combes, on behalf of the ANZSCDB Exec.



James Murphy, Kieran Harvey and John Bertram



Bertram introducing kidney research



Walking to University House



Melanie Eckersley-Maslin engrossed in conversation about Gary Hime's jacket

2021 ANZSCDB Award Ceremony



Opening remarks by President Kieran Harvey



L-R: Jan Manent, Patrick Humbert, Jennifer Zenker and Seb Dworkin



L-R: Gary Hime, John Bertram, Roger Pocock, James Murphy & Kieran Harvey



Students and postdocs from La Trobe, Monash and Parkville campuses

Upcoming meetings

25th November 2022, Queensland Brain Institute
The University of Queensland

12th Queensland Cell and Developmental Biology Meeting

Keynote speakers: **Melanie Eckersley-Maslin**
Peter MacCallum Cancer Centre

Robert Harvey
University of the Sunshine Coast

Anne Lagendijk
IMB, The University of Queensland

Massimo Hilliard
QBI, The University of Queensland

<https://www.anzscdb.org/queensland>

10th South Australian ANZSCDB scientific meeting

2nd Nov 2022 @UniSA Bradley Building

This one-day meeting will feature invited talks from **Prof Kieran Harvey** (Peter MacCallum Cancer Centre and Monash University), **Prof Jose Polo** (Adelaide Centre for Epigenetics, University of Adelaide) and **Dr Sarah Boyle** (ANZSCDB Early Career Researcher Award winner 2020, Centre for Cancer Biology).

There will also be excellent opportunities for students and early career researchers to present their work and to win prizes.

ISMB 2022

Sydney, Australia
6th-9th November 2022

The 4th International Symposium on Mechanobiology



Confirmed Plenary Speakers
Martin Chalfie, Nobel Laureate, Columbia University, New York, USA
Rong Li, Mechanobiology Institute, National University of Singapore, Singapore
Michael Sheetz, The University of Texas Medical Branch at Galveston, Texas, USA
Stephan Grill, Max Planck Institute of Molecular Cell Biology and Genetics, Dresden, Germany

<https://ausmb.org/Mechanobiology2022.html>



CELL BIO

An ASCB | EMBO Meeting
Dec. 3-7, 2022 • Washington, DC



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FIVE COMPELLING REASONS TO USE LIVECYTE:



1. Nothing like it

<https://bit.ly/3oywmE5>

A huge array of analysis possibilities allow you to ask questions that no other system can answer - Dr Mat Hardman, University of Hull

2. Disrupts common theory

Livecyte was used to disprove a long held theory about how stable nevus melanocytes switch to cancerous melanoma cells - Dr Robert Judson-Torres, Huntsman Institute

3. Expect the unexpected

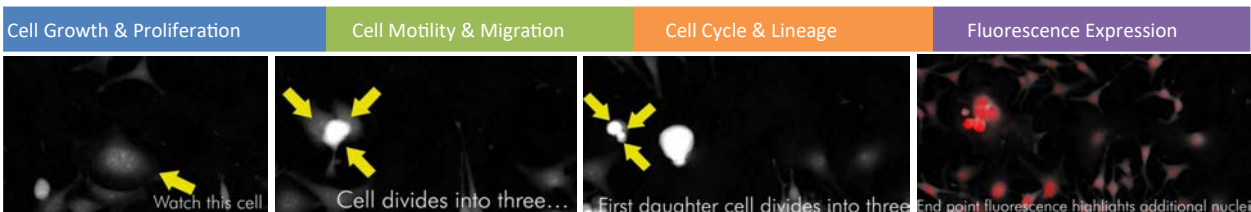
Livecyte has led to observations of unexpected cell behaviour when quantifying live-cell drug resistance - Dr Kurt Anderson and Dr Alix Le Marois, The Francis Crick Institute

4. See change as it happens

Used primary prostate cells to study new cancer treatment - Professor Norman Maitland, University of York

5. Simplifying not simpler

Livecyte removes barriers to entry for junior students - Greg Perry, St George's University of London



Uncover strange behaviours. See more at vimeo.com/Phasefocus

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How benign mole melanocytes can switch from a stable state to a cancerous melanoma.

Did you know in Australia, 1 person dies from melanoma every 5 hours. Melanoma is often referred to as 'Australia's National Cancer' and is the third most common cancer in Australia¹. Most are caused by prolonged and repeated exposure to UV radiation in sunlight, but there are some melanomas that are not sun related, eg. Bob Marley famously died of an acral lentiginous melanoma on his toe in 1981³. Melanocyte cells produce melanin to protect the deeper layers of skin but when unregulated or uncontrolled, melanomas can develop, metastasise and become life threatening.

A team of researchers working at University of California, San Francisco, in collaboration with The Huntsman Institute, Utah aimed to investigate the mechanisms by which a benign mole (nevus) can switch from being stable melanocyte cells to cancerous melanoma cells².

Ground-breaking results come to light

BRAF^{V600E} is a genetic mutation present in 80% of benign mole (nevus) melanocytes which has been shown to be the driver of 50% of all cutaneous melanomas². The gene doesn't automatically cause the development of a tumour but is believed to drive both rapid proliferation and the subsequent arrest stage that forms a nevus. Initial studies focused on characterising the growth and proliferation profiles of BRAF^{V600E} induced melanocyte cells. Subsequent investigations looked at primary nevi cells which had been transduced with an mCherry linked AURKB mutation (a downstream gene of BRAF^{V600E}). Differential proliferation profiles were studied between cells carrying the mutation, and those without it.

At the outset, many commonly used imaging techniques presented several challenges for this study particularly given the limited sample size. Devices that only measure population-level metrics were limited to a single data point per well, making it difficult to obtain reliable, robust results with the limited available cells. Commonly used fluorescence imaging and labelling introduce phototoxicity which disrupts the growth and proliferation of cells and can cause cell death. The requirement to use fluorescent imaging to confirm transduction, could consequently induce abnormalities in the growth and proliferation profiles of the cells.

Livecyte: Perfectly suited to resolving these issues and more

Livecyte⁴ presents high contrast, label free images where pixel intensity is directly proportional to cell dry mass – a unique property that measures the amount of matter in each cell. This enables robust cell segmentation and tracking leading to accurate single-cell measurements of proliferation, amongst others. Dry mass quantification facilitates the analysis of cellular growth profiles, not possible using other imaging techniques.

Livecyte treats every individual cell as a separate data point. Therefore, reliable, and significant cell proliferation data could be extracted from the small number of primary nevi cells. This would not be possible if treating each well as a single data point, as high throughput analysers do.

Livecyte demonstrates the importance of measuring growth and proliferation independently

Using Livecyte the research group discovered that induction of BRAF^{V600E} using increasing doses of doxycyclin lead to a reduced cell count, and quite unexpectedly, an increase in cell dry mass. The results indicate that growth arrest induced by BRAF^{V600E} is not by oncogene induced senescence (OIS), as expected in the literature, but instead by reversible mitotic cell cycle arrest.

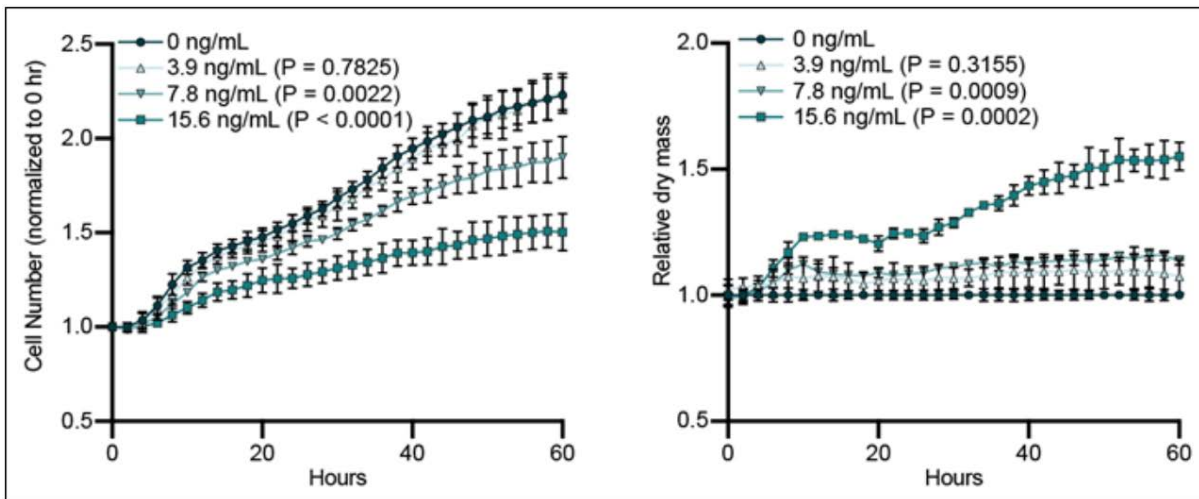


Figure 1: Cell proliferation and growth rates upon dosing with BRAF^{V600E} inducing doxycycline

Livecyte revealed that the mCherry expressing cells proliferated at a far greater rate than non-mCherry expressing cells. This indicates that AURKB is an integral player in the conversion of stable nevi melanocytes into melanoma.

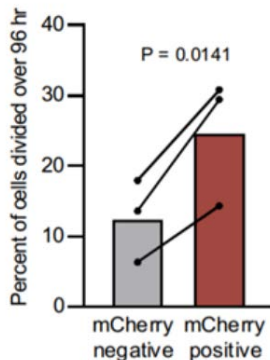


Figure 2: mCherry expressing cells with AURKB mutation were released from miRNA regulation and proliferated faster than those without the AURKB mutation

Livecyte is a powerful label-free cell imaging and analysis tool that automatically measures cell count, dry mass and mitosis in 96 well plate assays. This enables cell proliferation to be quantified independently from cell growth factors giving a more in-depth analysis of cell proliferative behaviours. Livecyte presents clear advantages to a researcher in the accuracy of measurements, as well as saving a considerable amount of time and energy.

For more information contact us

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3. [How should people with dark skin check for skin cancer? - ABC Everyday](#)
4. <https://www.atascientific.com.au/products/phasefocus-livecyte/>