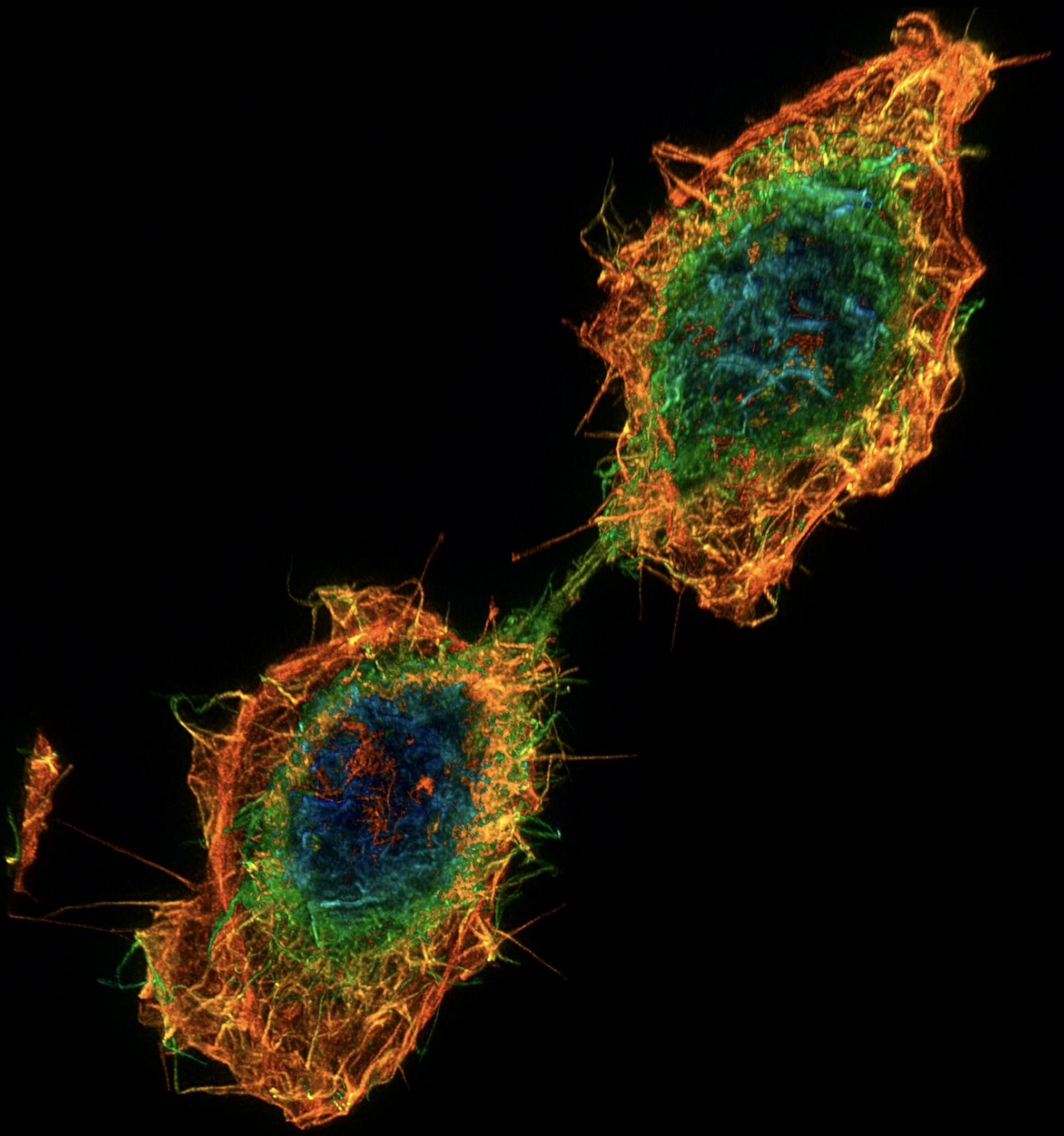
ANZSCDB

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



AUTUMNN NEWSLETTER 2024

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

In this issue

NEWSLETTER April 2024

President's letter

Dear ANZSCDB members and colleagues,

It is with great pleasure that I share the latest updates and exciting developments within our society. The preparation for our branch meetings is well underway and the Queensland Branch is the first to host their meeting for this year. The 14th Queensland Cell and Developmental Biology Meeting will be held on the 3rd of June, 2024 at the Global Change Institute in The University of Queensland. The scientific program will feature cutting-edge research presentations by Andrea Loreto from the University of Sydney, as well as Larisa Labzin, Robert Parton and Fiona Simpson from The University of Queensland. It is not too late to register by the 17th of May and our society is offering a discounted ANZSCDB membership to all presenters for a nominal registration fee to presenting participants. Our branch meetings are invaluable platforms for our members to meet, exchange ideas, forge new collaborations, and foster a sense of community within our society and I hope that many of you will be able to take part.

One of the most anticipated events of the year for our society is the announcement of the prestigious ANZSCDB awards for 2024. The calls for the President's Medal, Emerging Leader Award, two Early Career Researcher Awards, two Image Awards and two Publication Awards are currently open. We are excited to acknowledge and celebrate excellence in the cell biology and developmental biology communities through these awards at different career stages. Please nominate your colleagues or apply for the awards yourself, as the applications are open until 5pm 28th June 2024. Our Society is committed to the principles of fairness, transparency, equity and diversity, including gender equality, in assessing and administering these awards.

One of the most exciting events this year is the Biomolecular Horizons 2024 (BMH2024) conference, that will be held in Melbourne from the 22nd to the 26th of September. This highly anticipated international gathering promises to be a true celebration of scientific excellence, bringing together leading scientists from around the globe and Australia. The conference program is shaping up to be truly exceptional, featuring keynote presentations from renowned experts, cutting-edge symposia, and ample opportunities for networking and collaboration. I encourage all of you to mark your calendars and actively participate in this event. We will announce and celebrate our ANZSCDB awardees at the BMH2024 and we will have the opportunity to meet and have our annual ANZSCDB Society meeting and dinner.

I look forward to celebrating your achievements and milestones, and encourage you to send your exciting publications, news, images and discoveries that you'd like to share with our community.

Sincerely,

Aleksandra Filipovska

ANZSCDB

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

ComBio

ComBio is the biannual meeting of the ANZSCDB. This year, ComBio is branded through Biomolecular Horizons 2024 and held as a joint event between IUBMB, FAOBMB, and ComBio at the Melbourne Convention Centre. Leonie Quinn (ANU) and Sharad Kumar (UniSA) led ANZSCDB representation on the organising committee and have planned our upcoming event. This is an extraordinary opportunity for all our members to participate in this meeting featuring an impressive lineup of plenary and keynote speakers. Your active participation and support are invaluable to us, and we encourage you to share this information widely within your network. We hope to see all of you there! (More details in pages 19 - 22).

Cover: “Two cell in mitosis.” **Dr. Neftali Florez Rodriguez** (The Charles Perkins Centre).

Keep 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 Alexis Diaz-Vegas, the society Secretary, or get in touch with your state representative. We want to hear about your latest papers, promotions, prizes and other news, perspectives, or opinion pieces about life as a student, RA, Postdoc or PI in cell biology or developmental biology. The newsletter will be published 3 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.

Our Executive Committee Members

Prof. Aleksandra Filipovska Professor Aleksanda Filipovska is an NHMRC Senior Research Fellow and Research Professor at the Harry Perkins Institute of Medical Research and the University of WA. H er research interests are in the regulation of mitochondrial gene expression by RNA-binding proteins in health and disease. In addition, her research group uses next generation sequencing technologies to identify pathogenic mutations in mitochondrial genes that cause mitochondrial disease in genetically isolated populations.

Dr. Alexis Diaz-Vegas, a cell biologist with a PhD from The University of Chile, has dedicated his research to understanding the implications of mitochondrial dysfunction in metabolic diseases. Their postdoctoral work at the Advanced Centre for Chronic Diseases (ACCDIS) in Chile focused on studying mitochondrial-endoplasmic reticulum interaction in cardiac hypertrophy. Joining the University of Sydney in 2019 as a postdoctoral research fellow, Alexis has delved into the role of mitochondria in muscle and adipocytes health.

Dr. Jan Manent, a research fellow at the Australian Regenerative Medicine Institute at Monash University, holds a PhD in Human Genetics from Pierre and Marie Curie University in Paris. His research journey began with a focus on Neurofibromatosis type 2 during his doctoral studies, where he developed in vitro models of related Schwann cell tumors. Transitioning to postdoctoral roles at Harvard Medical School and the Peter MacCallum Cancer Centre, he delved into signal integration in organ growth and cancer using Drosophila melanogaster. Following industry experience at Cell Mogrify, he joined Associate Professor Edwina McGlinn's laboratory at ARMI, investigating gene regulatory networks in early mammalian embryo growth and patterning using mouse models and pluripotent stem cells. Actively involved in the Australia and New Zealand Society for Cell and Developmental Biology since 2013, Jan served as the Victoria state representative from 2021 to 2023.

MEMBERS SPOTLIGHT

Dr Jantina Manning is an early career researcher at the Centre for Cancer Biology, University of South Australia & SA Pathology.

Jantina has made outstanding research contributions in understanding the role of ubiquitination in cellular physiology and disease. She will be presenting her work on genetic regulation of kidney disease in the upcoming Pint of Science event on May 15th.

Learn more about her work here!

- Nicolson S, Manning JA, Lim Y, Jiang X, Kolze E, Dayan S, et al. The Drosophila ZNRF1/2 homologue, detour, interacts with HOPS complex and regulates autophagy. Communications Biology. 2024;7(1):183. (https://www.nature.com/articles/s42003-024-05834-1)
- Umargamwala R, Manning J, Dorstyn L, Denton D, Kumar S. Understanding Developmental Cell Death Using Drosophila as a Model System. Cells. 2024;13(4):347. (https://www.mdpi.com/2073-4409/13/4/347)

ANZSCDB

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

Our member Erick de Lima Junqueira, a PhD candidate at Monash University (Burke Lab) attended the 2023 EMBL Postgraduate Symposium in December. Read here Erick's view about the AMBL 2023 conference:

"My experience at EMBL-Australia PHD Course was one of the most enriching experiences I've had outside my university during my PhD so far. My experience at EMBL could be divided into three categories: scientific development, professional development, and personal development.

The scientific development began with the opportunity to visit the facilities of The John Curtin School of Medical Research at the Australian National University. The lectures were planned to cover the diversity of the selected participants, and the workshops, although brief, were well-explained and guided. I wish there had been more hands-on opportunities during the workshops, but I understand the time constraints of the two-week intensive program.

The professional development was an eye-opener in terms of future perspectives. EMBL managed to comprehensively address the diverse pathways that can be pursued during and after the PhD. We were introduced to examples of academics who transitioned to industry, as well as industry professionals who latter pursued an academic career. We met people who took short breaks in their careers and others who had longer hiatuses. Some people progressed linearly in their careers, while others followed more winding paths. The message I took away was that each journey is unique, and extracting the best from each stage is essential for the success of the next step, even if that next step isn't fully defined yet.

The "3-minute thesis" was a highlight of the event. The ability to condense my research into a short yet substantial and understandable presentation was a valuable challenge. Communicating our research is crucial for the advancement of scientific communication and professional development, and this experience was an important first step for many of us.

The highlight of my experience was the personal development fostered by the incredible networking among the participants of EMBL-Australia 2024. Even months after the course, we continue to stay in touch, whether in small groups or at large gatherings. This support network has become a valuable resource, both emotionally and professionally. In short, when I arrived at EMBL, I felt like it was just my PhD and I on one road, but when I left EMBL, I left with an interconnected highway of like-minded colleagues and friends to share this journey with.

Would I recommend EMBL-Australia? Absolutely. I can't wait for this year's applications to encourage other PhD students to experience this unique opportunity."

ANZSCDB

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

AWARDS NOMINATION

We are excited to acknowledge and celebrate excellence in the cell biology and developmental biology communities through the 2024 ANZSCDB award round, which is **open now until 5pm 28th June 2024**.

ANZSCDB awards span the spectrum of career stages from PhD students through to established leaders and celebrate unique aspects of cell biology and developmental biology. Please consider applying or nominating, and encourage your colleagues to join ANZSCDB!

The Society is inviting nominations for the ANZSCDB:

- President's Medal
- Emerging Leader Award
- Early Career Researcher Awards (2x)
- Image Awards (2x)
- Publication Awards (2x, from PhD students)

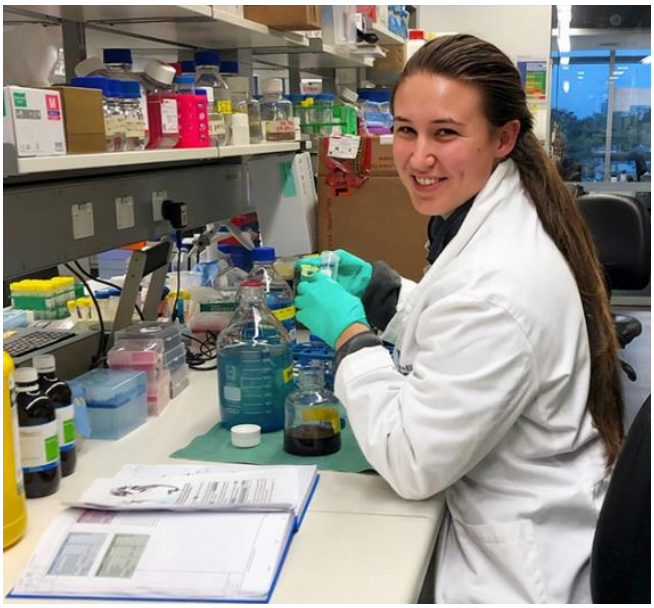
ANZSCDB is committed to the principles of fairness, transparency, equity and diversity, including gender equality, in assessing and administering these awards.

Please see attached eligibility and selection criteria, also available at anzscdb.org. A single pdf file comprising all documents should be emailed c/o the ANZSCDB Secretariat anzscdb@asnevents.net.au by 5pm 28th June 2024.

GET TO KNOW OUR PREVIOUS AWARDEES.

Dr. Natalia Benetti

Natalia obtained the publication award in 2023 and is now a postdoctoral researcher in Professor Stefan Mundlos's lab at the Max Planck Institute for Molecular Genetics in Berlin.



What inspired the idea or concept behind your published work? What was the creative process in turning that inspiration into a research project?
We wanted to ask a fundamental question about developmental timing and epigenetics: whether depleting the epigenetic regulator SMCHD1 in the oocyte has long-lasting effects on the embryo. We used a mouse model with Cre-mediated knockout of Smchd1 in the oocyte, then started by looking at skeletal patterning, as zygotic Smchd1 mutants have altered skeletal phenotypes. We were surprised to see abnormal skeletal patterning since these embryos expressed paternally-inherited *Smchd1* from the morula stage of development.

The project evolved from there, where we also saw *Hox* gene expression changes attributable to the phenotype, meaning that the “memory” that maternal SMCHD1 establishes at *Hox* genes preimplantation must be maintained for correct timing of Hox gene activation approximately one week later in development.

What were some of your most challenging moments or obstacles you faced during your research, and how did you overcome it? How do you think this helped for future projects?
Writing up the manuscript in the middle of my PhD and during Melbourne’s long COVID lockdowns was the most challenging aspect of my research. I managed this by planning how I would write the manuscript, then focusing on carefully writing each section and taking breaks when I needed to. I also had extensive support and mentorship from my amazing PhD supervisors Professor Marnie Blewitt and A/Prof Edwina McGlinn.
During the writing process, I learned valuable skills such as project management, time management, and setting realistic goals for each part of the process. These skills have already helped me with establishing my postdoc project and writing fellowship applications.

How has receiving this award impacted your career development? Do you have any advice regarding the process of applying for prizes, grants, or awards in general?
Receiving the ANZSCDB Publication Award has helped me get a great postdoc position in the lab of Professor Stefan Mundlos at the Max Planck Institute for Molecular Genetics in Berlin.
When applying for awards, I would recommend taking the time to write a thorough application that concisely addresses the requirements/questions of the award. Let your passion and drive for your research come through in your application too!

ANZSCDB Early-Career Researcher Awards

Purpose:

The aim of these awards is to encourage and support early-career researchers who are working towards independent research careers in Australia and New Zealand within the disciplines of cell and developmental biology. This stage is one of the most exciting in the career of a research scientist, during which skills are consolidated and areas of research expertise established. Up to **two awards** will be available, one to recognise a researcher working in the Cell Biology field and another for a researcher working in the Developmental Biology field.

Eligibility:
Candidates will:
• Have worked up to 5 years FTE in a post-Ph.D. research position at close of nomination
• Have been a financial member of ANZSCDB for at least one year

Nomination:
Candidates may self-nominate or be nominated by any financial member of ANZSCDB.

Selection criteria:
The principal criterion will be the excellence of the candidate, assessed via the following criteria:

a. Scientific achievements *(i.e. what research the candidate has done)* (40%) –Discoveries leading to high-quality publications as first author (but also last or corresponding author if relevant); indicators of quality such as editorials or other highlighters, cover features, citations, evidence of impact or influence on the field, commensurate with career stage.

b. Leadership, engagement, mentorship *(i.e. what the candidate has done besides research)* (40%) – Organizational roles including conference and seminar organisation; participation in peer-review; outreach, advocacy; teaching, supervision, mentorship; contributions to the discipline including contributions to the Society, all assessed commensurate with career stage.

c. National and/or international profile *(i.e. how others have responded to what the candidate has done)* (20%) – invitations to speak; invited reviews; invited appointment to committees; honours, awards and prizes; grants and Fellowships

ANZSCDB is committed to the principles of fairness, transparency, equity and diversity, including gender equality, in assessing and administering this award.

All criteria will be judged relative to opportunity, taking into account the following factors:

- Number of FTE years post-doctoral research conducted
- Mentoring, research support and funding available to the candidate
- Career interruptions, including those due to employment outside academia, periods of unemployment, part-time employment or other interruptions, childbirth, carer responsibilities, misadventure or illness
- Ongoing family, medical or other circumstances that may impact on research output
- Teaching, administrative, or other duties that may have impacted on research output
- Any other aspects of career or opportunities for research that are relevant to the assessment
- The career and productivity impact of COVID-19 and lock-downs will be taken into general consideration, applicants should feel free to note exceptional circumstances.

Required documentation:

1. A two-page document addressing the selection criteria (minimum 12-point font, 2cm margins).
2. A short (maximum half-page) statement addressing the opportunity issues described above, including the total length of any period of career interruption, an estimate of FTE available for scientific pursuits, the outputs of which are being evaluated, and hence a figure for total FTE in a postdoctoral research position at the time of submission
3. A list of the candidate's most significant publications (maximum 5) since the award of a Ph.D., each annotated with a short (maximum 6-line) statement of the significance of the work and a description of the candidate's role(s) in the work.
4. A full CV.

A single pdf file comprising all documents should be emailed c/o the ANZSCDB Secretariat anzscdb@asnevents.net.au by 5pm 28th June 2024.

Judging:
Evaluation, shortlisting, and ranking of candidates will involve all members of the ANZSCDB Committee and the President. In situations where there is a tied vote or a lack of consensus, the President may cast the deciding vote or may choose to extend each award to more than one candidate.

A pool of least four candidates will be required in any given round for the competition to be considered valid.

ANZSCDB reserves the right to award joint candidates, or not confer an award, in any given round.

Prize: Winners will receive a certificate, a talk at a future scientific meeting of/or involving the Society and reimbursement of costs up to $1000 incurred to attend the meeting on provision of receipts to **anzscdb@asnevents.net.au**.

ANZSCDB Emerging Leader Award

Purpose:

The aim of this award is to encourage and support emerging investigators who are building independent careers in Australia and New Zealand in the disciplines of cell and developmental biology. This stage is one of the most challenging and crucial in the career of a research scientist.

Eligibility:
Candidates will:
• Have worked up to 10 years FTE in an independent position at close of nomination
• Have been a financial member of ANZSCDB for at least one year

Nomination:
Candidates may self-nominate or be nominated by any financial member of ANZSCDB.

Selection criteria:
The principal criterion will be the excellence of the candidate, assessed via the following criteria.

a. Scientific achievements *(i.e. what research the candidate has done)* (40%) – ground-breaking and influential discoveries leading to high-quality publications as first, last or corresponding author; indicators of quality such as editorials or other highlighters, cover features, citations, evidence of impact or influence on the field.

b. Leadership, engagement, mentorship *(i.e. what the candidate has done besides research)* (40%) – Organizational roles including conference and seminar organisation; participation in peer review; outreach, advocacy; teaching, supervision, mentorship; contributions to the discipline including contributions to the Society.

c. National and/or international profile *(i.e. how others have responded to what the candidate has done)* (20%) – invitations to speak; invited reviews; invited appointment to committees; honours, awards and prizes; grants and Fellowships.

ANZSCDB is committed to the principles of fairness, transparency, equity and diversity, including gender equality, in assessing and administering this award.

All criteria will be judged relative to opportunity, taking into account the following factors:

- Number of years in an independent position.
- Mentoring, research support and funding available to the candidate.
- Career interruptions, including those due to employment outside academia, periods of unemployment, part-time employment or other interruptions, childbirth, carers' responsibilities, misadventure or illness.
- Ongoing family, medical or other circumstances that may impact on research output.
- Teaching, administrative, or other duties that may have impacted on research output.

- Any other aspects of career or opportunities for research that are relevant to the assessment.
- The career and productivity impact of COVID-19 and lock-downs will be taken into general consideration, applicants should feel free to note exceptional circumstances.

Required documentation:

1. A two-page document addressing the selection criteria (minimum 12-point font, 2 cm margins).
2. A short (maximum half-page) statement addressing the opportunity issues described above, including the total length of any period of career interruption, an estimate of FTE available for scientific pursuits, the outputs of which are being evaluated, and hence a figure for total FTE in an independent position at the time of submission
3. A list of the candidate's most significant publications (maximum 5) since independence, each annotated with a short (maximum 6-line) statement of the significance of the work and a description of the candidate's role(s) in the work.
4. A full CV.

A single pdf file comprising all documents should be emailed c/o the ANZSCDB Secretariat anzscdb@asnevents.net.au by 5pm 28th June 2024.

Judging:

Evaluation, shortlisting, and ranking of candidates will involve all members of the ANZSCDB Committee and the President. In situations where there is a tied vote or a lack of consensus, the President may cast the deciding vote or may choose to extend the award to more than one candidate.

ANZSCDB reserves the right to award joint candidates, or not confer an award, in any given round.

Prize:
The winner will receive a certificate, a trophy, a talk at future annual scientific meeting of/or involving the Society and reimbursement of costs up to $1500 incurred to attend the meeting on provision of receipts to **anzscdb@asnevents.net.au**.

ANZSCDB

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

ANZSCDB Image Awards

Purpose:

The aim of these awards is to showcase the beauty of Cell and Developmental Biology by celebrating the awe-inspiring imaging of our ANZSCDB members. Up to **two awards** will be available, one to recognise outstanding images or movies (i.e. live imaging) in Cell and Developmental Biology. We encourage submissions from all ANZSCDB members across Australia and New Zealand.

Eligibility:

- The applicant must be a financial member of ANZSCDB at the time of the application.
- Images must be taken using an optical or electron microscope. Macro photography is not eligible.
- Each applicant may submit a maximum of ONE image and ONE movie in each category.
- No submission can receive the award more than once, although applicants can submit the same image/movie in different years.
- Each entry must be the original work of the applicant and must not contain any material that infringes copyright, trademark, privacy or other intellectual property rights.
- The applicant grants ANZSCDB the right to reproduce, publish, transmit or otherwise communicate to the public their entry, in whole or in part, in or using any media for any purpose without permission or payment.

Selection criteria:

The awards are based on the best image or movie in the field(s) of Cell Biology and/or Developmental Biology.

ANZSCDB is committed to the principles of fairness, transparency, equity and diversity, including gender equality, in assessing and administering this award.

Required documentation:

1. A copy of the image/movie file (format should be TIFF, PDF or video format. Images should be high resolution with a recommended file size ~3-4MB, movies no larger than 100MB, as .avi or .mp4). For large files, please provide a URL link to a shared folder for download (e.g. CloudStor, Google docs). Other sharing services that require the receiver to create an account will not be accepted.

2. A brief title and description of the work (~100 words- detailing the microscope/technique used, sample/staining preparation etc).

Submissions should be emailed c/o the ANZSCDB Secretariat anzscdb@asnevents.net.au by 5pm 28th June 2024.

Judging:

Evaluation, shortlisting, and ranking of submissions will involve all members of the ANZSCDB Committee and the President.

Entries will be assessed based on the overall aesthetics of the images/movie, technical difficulty in obtaining the image/movie, research relevance and creativity/originality.

In situations where there is a tied vote or a lack of consensus, the President may cast the deciding vote or may choose to extend each award to more than one candidate.

ANZSCDB reserves the right to award joint candidates, or not confer an award, in any given round.

Prize: Winners will receive a certificate and reimbursement of costs up to $250 incurred to attend a meeting of/involving the Society on provision of receipts to **anzscdb@asnevents.net.au**. Winning Images/Movies will be highlighted in ANZSCDB promotional materials and websites. Please ensure that images/movies submitted will not infringe copyright or ownership rules if displayed or disseminated by the society (this may entail altering the content, e.g. colours or field of view, for published material).

The President's Medal

Purpose:
The President's Medal recognizes a career of outstanding achievement in the disciplines of cell and developmental biology in Australia or New Zealand. It is the highest award of the Australia and New Zealand Society for Cell and Developmental Biology.

Eligibility:
The competition is open to any researcher based in Australia or New Zealand, and working in the disciplines of cell and developmental biology. Candidates are generally expected to be members of ANZSCDB. However, non-members with strong demonstrated commitment to cell and developmental biology may also be considered.

Nomination:
Possible candidates will be sought by inviting all members to suggest names of suitably eminent individuals to the President.

Selection criteria:

1. Scientific achievements *(i.e. what research the candidate has done)* (40%) – ground-breaking and influential discoveries leading to seminal publications as senior (last) or corresponding author; indicators of quality such as editorials, cover features or other highlighters; citations; demonstrated impact and influence on the field.

2. Leadership, engagement, mentorship *(i.e. what the candidate has done besides research)* (40%) – executive and leadership roles; journal editorship; high-level roles in peer review; outreach, advocacy and policy development; teaching, supervision, mentorship; contributions to the discipline.

3. National and/or international profile *(i.e. how others have responded to what the candidate has done)* (20%) – invitations to give plenary and keynote addresses or named lectures; invited reviews; invited senior appointment to committees; honours, awards and prizes; grants and Fellowships.

ANZSCDB is committed to the principles of fairness, equity and diversity, including gender equality, in assessing and administering this award.

Required documentation:

1. The nominator will provide a short statement (up to one page) addressing the candidate's credentials in relation to the selection criteria.

2. CV of the candidate.

In addition, any factors limiting the opportunity of the candidate to demonstrate scientific excellence should be identified.

The career and productivity impact of COVID-19 and lock-downs will be taken into general consideration, applicants should feel free to note exceptional circumstances.

A single pdf file comprising all documents should be emailed c/o the ANZSCDB Secretariat anzscdb@asnevents.net.au by 5pm 28th June 2024.

Judging:

Evaluation and ranking of candidates will involve all members of the ANZSCDB Committee and the President. In situations where there is a tied vote or a lack of consensus, the President may cast the deciding vote.

The preferred candidate will be asked to confirm their ability to attend the annual meeting of the Society before an award is made. In cases where the preferred candidate is unavailable to speak, the award will be made to an alternative candidate who is available.

ANZSCDB reserves the right to present a joint award, or decline to present an award, in any given round.

Prize:

The winner will receive a medal, a talk and free registration, travel and accommodation to attend a future scientific meeting of/or involving the Society.

Rollover of nomination:

Candidates who are unsuccessful will remain in contention for two years after the first year of their nomination, i.e. for a maximum of three years. An updated documentation package should be supplied in each subsequent year of consideration.

ANZSCDB

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

ANZSCDB Publication Awards

Purpose:

The aim of these awards is to encourage and support graduate research students who are working towards the completion of higher research degrees in Australia and New Zealand within the disciplines of cell and developmental biology. ANZSCDB encourages high quality, peer-reviewed work among its student members. Up to **two awards** will be available, one to recognise the best publication by a graduate student in the Cell Biology field and another for a graduate student working in the Developmental Biology field. We encourage applications from student members across Australia and New Zealand.

Eligibility:
The applicant:

- Must be a financial member of ANZSCDB at the time of the application.
- Must be undertaking a higher degree (i.e. PhD, Masters), or be within 2 years full-time equivalent of obtaining their higher degree.
- Whilst applicants may submit one work in each category (i.e. Cell or Developmental Biology), the same work cannot be submitted in different categories.
- No one publication can receive the award more than once, although applicants can submit the same publication in different years.
- Applicants should be the first author or joint first author of the publication.
- The date of publication will be considered as the date that the final 'print' version of the manuscript first becomes available online and this date will need to be listed on the application. The 18 month eligibility window for a manuscript is relative to this date.

Selection criteria:
The awards are based on the best papers in the fields of Cell Biology or Developmental Biology published in the 18 months prior to the closing date of the award.

ANZSCDB is committed to the principles of fairness, transparency, equity and diversity, including gender equality, in assessing and administering this award.

Required documentation:

1. A copy of the final version of the accepted work.
2. For publications In Press, a copy of the editor's letter of acceptance, showing clearly submission and acceptance dates of publication.
3. A letter of recommendation from your supervisor. In their letter of recommendation, the supervisor should comment on the standard of the journal in which the paper has been published, indicating its ranked position in the field, the number of journals in the field.
4. A brief statement of the significance of the work (100 words).
5. A description of the applicant's role in the work. If the work has multiple authors, there must also be a statement outlining the percentage contribution of each author to the work. This must be signed by the paper's corresponding author(s).

6. Any media coverage that has resulted from the work may also be included as supporting evidence for the impact of the work.

A single pdf file comprising all documents should be emailed c/o the ANZSCDB Secretariat anzscdb@asnevents.net.au by 5pm 28th June 2024.

Judging:
Evaluation, shortlisting, and ranking of applicants will involve all members of the ANZSCDB Committee and the President.

Publications will be assessed on their significance, quality and impact.

In situations where there is a tied vote or a lack of consensus, the President may cast the deciding vote or may choose to extend each award to more than one candidate.

ANZSCDB reserves the right to award joint candidates, or not confer an award, in any given round.

Prize: Winners will receive a certificate and reimbursement of costs up to $250 incurred to attend a meeting of/involving the Society on provision of receipts to anzscdb@asnevents.net.au.

BIOMOLECULAR HORIZONS2024: DISCOVER CREATE INNOVATE / ComBio 2024 MELBOURNE 22nd COMBIO CONFERENCE

22 TO 26 SEPTEMBER 2024 MELBOURNE CONVENTION AND EXHIBITION CENTRE www.bmh2024.com

As a valued ANZSCDB member, we invite you to join us at Biomolecular Horizons 2024 to be held in Melbourne from 22-26 September 2024. This important forum will bring together three prestigious congresses, each with a strong history of attracting the Bioscience and Biotechnology communities to discuss and examine the latest developments and research:

- 22nd ComBio Conference (ComBio)
- 26th Congress of the International Union of Biochemistry and Molecular Biology (IUBMB)
- 17th Congress of the Federation of Asian & Oceanian Biochemists & Molecular Biologists (FAOBMB)

PROGRAM OVERVIEW

This truly global forum will bring together renowned scientists from across the world, from Nobel Laureates to early career scientists. Visit the website for an overview of the program and more details on the outstanding array of international presenters will be leading the program including:

PLENARY SPEAKERS

BRIAN KOBILKA
Stanford University USA
Nobel Prize in Chemistry 2012
Grimwade Award Lecturer

PAMELA SILVER
Harvard University
USA
IUBMB Jubilee Award Lecturer

SERGEY OCVHINNIKOV
Harvard University
USA

SANDRA EADES
University of Melbourne
AUSTRALIA

PETRO TERBLANCHE
Afrigen Biologics & Vaccines
SOUTH AFRICA

CAIXIA GAO
Chinese Academy of Sciences
CHINA

INVITED KEYNOTE SPEAKERS

KEI SATO
The University of Tokyo
JAPAN

MARIAN WALHOUT
University of Massachusetts
USA

YUE WAN
Genome Institute of Singapore
SINGAPORE

WEI XIE
Tsinghua University
CHINA

NORBERT PARDI
University of Pennsylvania
USA

ALEXIS KOMOR
UC San Diego
USA

ALEXANDRA NEWTON
UC San Diego
USA

NICK BARKER
Institute of Molecular & Cell Biology
SINGAPORE

JENNIFER LISTGARTEN
UC Berkeley
USA

SHOBHNA KAPOOR
Indian Institute of Technology
INDIA

ELIZABETH MCKINLEY
University of Melbourne
AUSTRALIA

RICHARD J ROBERTS
New England Biolabs
USA

PETER FINERAN
University of Otago
NEW ZEALAND

ROMMIE AMARO
UC San Diego
USA

HOZUMI MOTOHASHI
Tohoku University
JAPAN

JOB DEKKER
University of Massachusetts
USA

VICTOR NIZET
UC San Diego
USA

SEIGO SHIMA
Max Planck Institute
GERMANY

NIENG YAN
Tsinghua University
CHINA

GREG COOK
University of Otago
NEW ZEALAND

DREW BERRY
WEHI
AUSTRALIA

HEATHER CHRISTOFK
UC Los Angeles
USA

LEO EBERL
University of Zurich
SWITZERLAND
FEBS Worldwide Award Lecturer

MICHAEL BARRETT
University of Glasgow
UNITED KINGDOM

YOU-ME KIM
KAIST
KOREA

JOHN CHAMBERS
Nanyan Technological University
SINGAPORE

MICHAEL FUNK
Science
USA

YOUNG SCIENTIST PROGRAM

Opportunities exist for PhD students to participate in additional programs or to apply for travel support through the Young Scientist Program or the IUBMB Travel Fellowships. Applications close 29 February 2024. To learn more, please visit our website.

REGISTRATION NOW OPEN - EARLY BIRD SAVINGS ON OFFER

Take advantage of early bird savings and register now! Secure your place at the Congress, join us at optional events, and secure accommodation within walking distance of the Melbourne Convention & Exhibition Centre. Visit the website for more information:

REGISTER HERE

DISCOVER MELBOURNE

Why not stay a day or two longer to experience Melbourne at its finest - a city with a rich multicultural mix celebrating the creativity and diversity of its people and the city. For more information view our website.

Be sure to follow the Congress on social media and be part of the conversation. Click on the icons below:

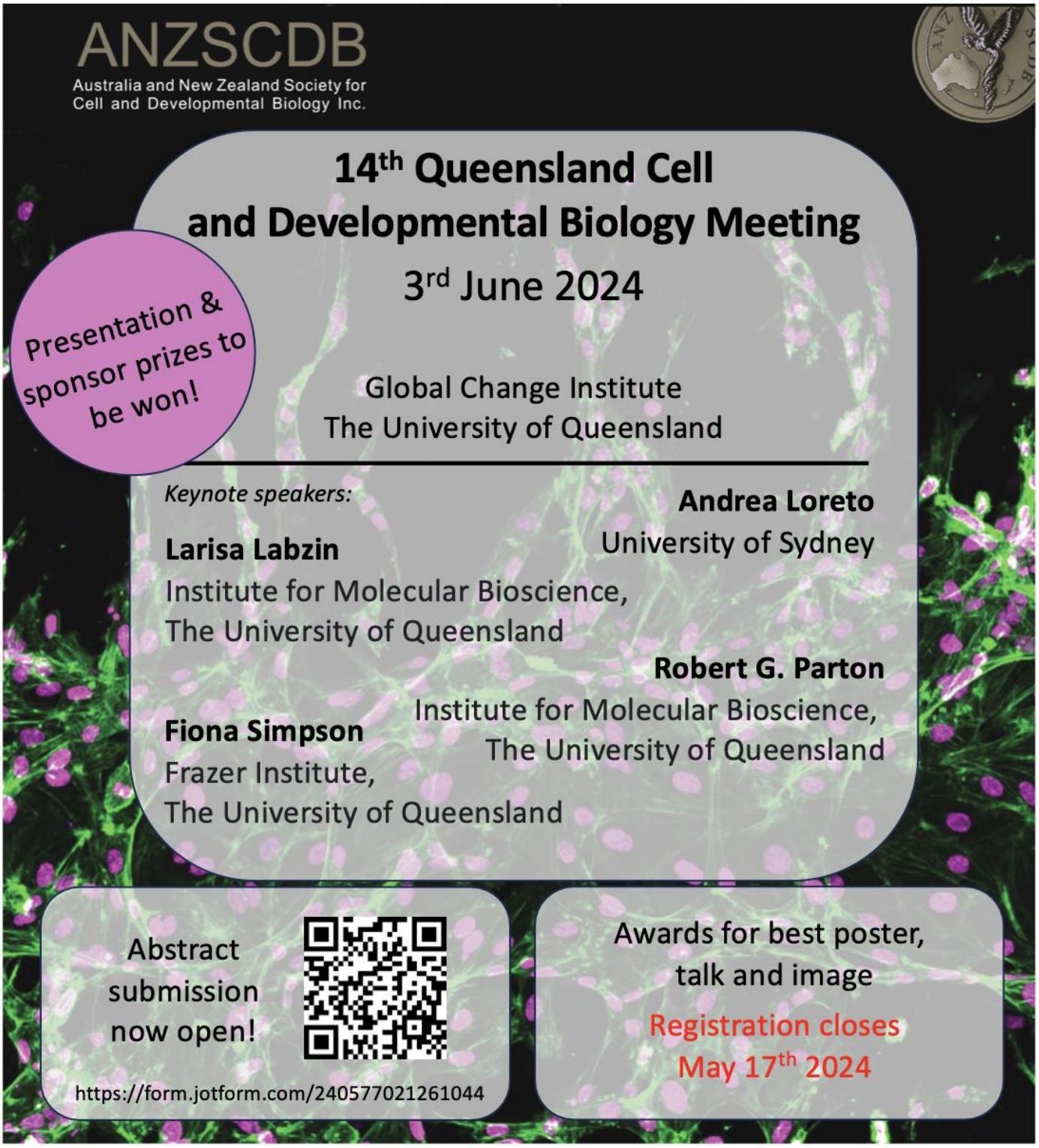
Don't miss out on this amazing opportunity to learn, connect, and grow. We look forward to welcoming you and colleagues to this significant event.

HOSTED BY:

SUPPORTED BY:

BMH2024 Congress Office:

119 Buckhurst Street
South Melbourne VIC 3205 Australia
T +61 3 9645 6311
E bmh2024@wsm.com.au
www.bmh2024.com



Special registration offer

We are offering a discounted ANZSCDB membership to all presenters for a nominal registration fee of $10/poster and $20/talk.

Registration for attendance will remain free.

Platinum Sponsor

Nikon

Gold Sponsor

John Morris GROUP

Silver Sponsor

ATA SCIENTIFIC instruments

Get to know your State Representatives

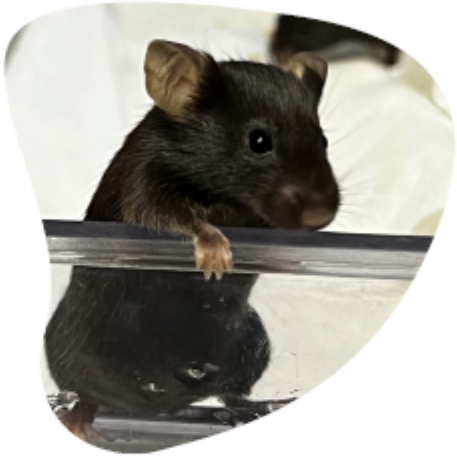
Australian BioResources

ABR Services

- Agistment of GM mouse lines
- Import & Export – Domestic / International
- Rederivation
- Cryopreservation
- MEGA (CRISPR/Cas9 – genome editing)
- Surgically modified models
- Online colony details provided via Stuart Web

ABR Sale Strain Mice

- Inbred, congenic, outbred, mutant and GM lines
- Housed and bred under SPF conditions
- Tail tattoos for identification
- Time mating confirmed using ultrasound
- Online ordering system StuartWeb



Garvan Molecular Genetics

- Mouse Genotyping
- Copy number analysis
- SNP analysis
- Mouse health screening
- DNA & RNA extraction
- Cell line identification
- Mycoplasma testing

ABR Contact

02 92958565

orders@abr.org.au

www.abr.org.au

PO Box 322, Moss Vale NSW 2577

Garvan Institute of Medical Research

Become a partner and save 15%

The Jackson Laboratory

NATA

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

De-risks cell transplantation therapy, increasing likelihood of success - Perry Cross Spinal Research Foundation

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

NEW Livecyte T-Cell killing assay quantifies effector-target cell interactions at the single cell level

- ✓ Generate multiple outputs with one experiment
- ✓ Ptychography technology removes the need for expensive lasers reducing running costs unlike other systems
- ✓ Leverage powerful tracking algorithms to explore population heterogeneity and track single cell lineage
- ✓ High-contrast label-free imaging, correlative fluorescence and auto image analysis from standard 96-well plate assays

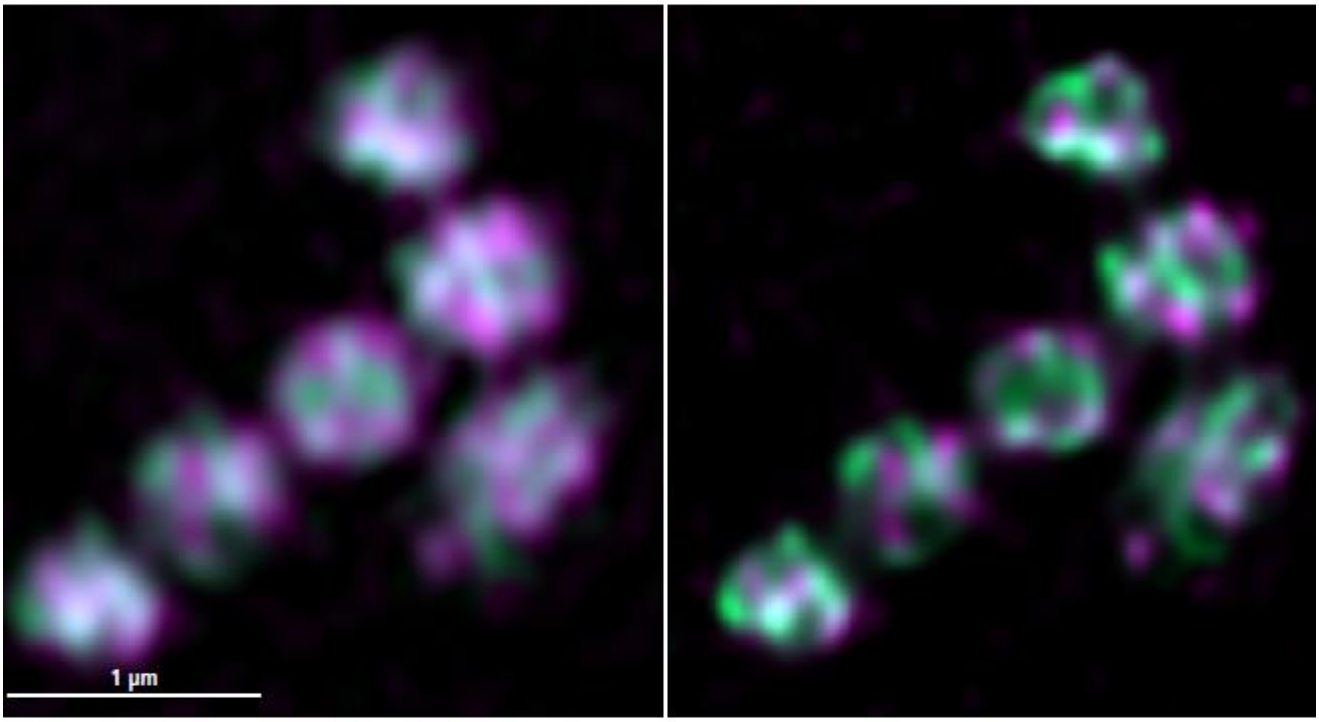
Register your interest for a demo today!

phasefocus

ATA Scientific Pty Ltd | enquiries@atascientific.com.au | www.atascientific.com.au | +61 2 9541 3500

Application Note

A Practical Guide of Deconvolution



Cover image:
Mitochondria in an *Arabidopsis thaliana* cell. mCherry (green) is targeted to the matrix and GFP (magenta) to the intermembrane space. Comparing Airyscan SR (left) and Airyscan Joint Deconvolution (right). Courtesy of J.-O. Niemeier, AG Schwarzländer, WWU Münster, Germany

ZEISS

Seeing beyond

Authors: Olivia Prazeres da Costa, Ralf Engelmann, Martin Gleisner, Lutz Schäfer, Xianke Shi,
Eva Simbürger, Max Voll, Klaus Weisshart, Georg Wieser
Carl Zeiss Microscopy GmbH, Germany
Date: December 2021

Confocal Deconvolution – LSM Plus

The history of deconvolution for confocal data is rather long, but the history of truly embedded and tailored deconvolution in confocal systems is rather short. The advances in development have taken place only in the last few years. At ZEISS, these advances have produced the new LSM Plus configurations of the LSM 900 and LSM 980.

In the last 10 years, ZEISS has developed two major improvements to their confocal instruments: parallel spectral detection, represented by the Quasar (Quiet Spectral Array) detector design, and resolution and speed detection, represented by Airyscan. For both, ZEISS implemented parallelization in acquisition as a tool to boost SNR and minimize sample stress. This fulfills a dream voiced by many users to combine these detection methods in confocal instruments. This also was one of the catalysts for the LSM 9 series, introduced in 2019, which provides the first implementation of these developments.

In 2021, ZEISS has made a big step in the direction of embedded and tailored deconvolution as an important technology with the release of the new LSM Plus. So, what was done here exactly? Spectral detection advanced from 32 channels (8 with 4 readouts) to 36 channels. Wider data bandwidth including Online Fingerprinting, and GaAsP cathode technology also contributed to increased versatility in the few last years. This meant a more cost effective 6-channel solution in 2018/19, and a more powerful 36 channel solution, including special NIR detector channels, in early 2021, all integrated in the same proven lambda stack and spectral unmixing workflow.

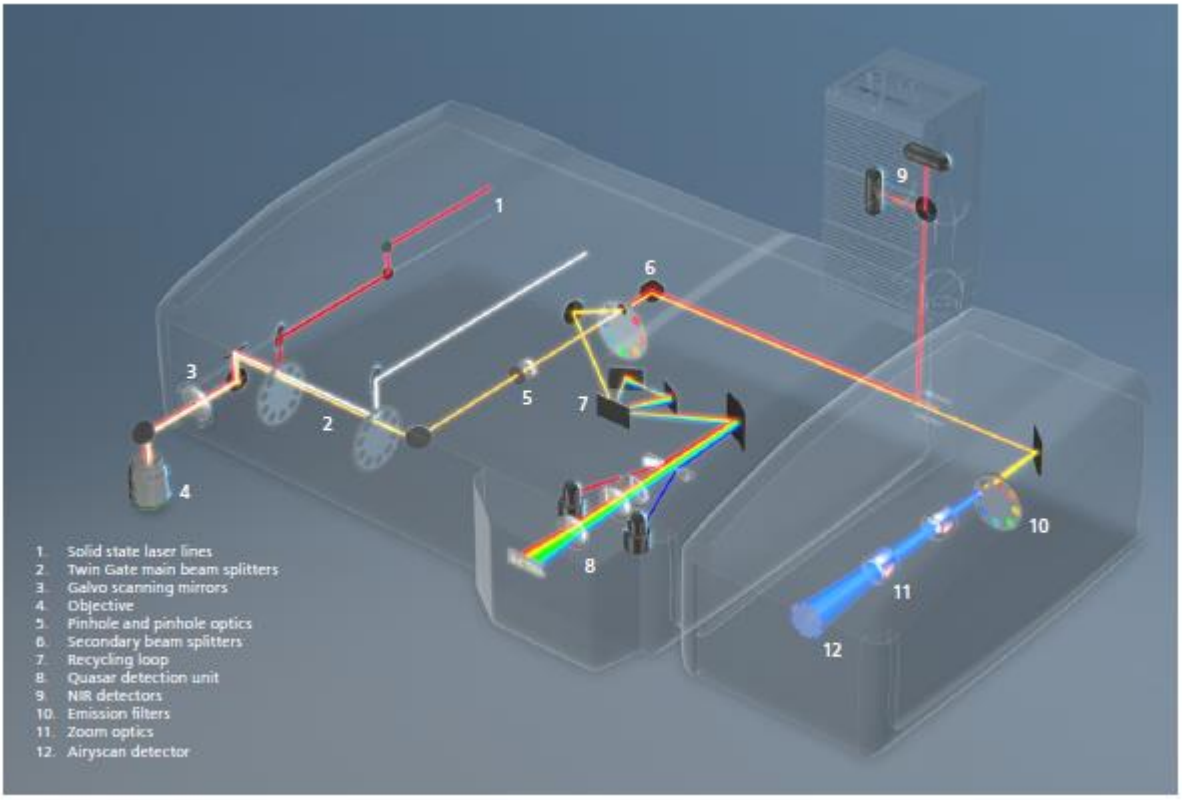


Figure 1 *Beam path of LSM 980 with Airyscan 2 and NIR detection*

Figure 2 *Spectral detection GUI, integrating several detector types which can be used with LSM Plus.*

The Airyscan detection developed from SIM-like super-resolution with improved SNR, to parallelized fast super-resolution, and advanced to instant 2D enhanced processing (2D SR mode for single plane acquisition), faster processing for big data (4-ring format) and even faster sensitive acquisition (8× parallelization MPLX mode). All these methods are based on an embedded tailored deconvolution on the processing side, which includes the mathematical steps of a weighted Sheppard Sum generation (Sheppard 1988), exact PSF modelling for the ZEISS LSM and a linear quantitative Wiener deconvolution. All this can run in real-time with a preview and has just one strength control parameter which even can be automated.

Bringing both technologies together was a challenge for ZEISS, since both features produce large amounts of data per acquired pixel. Consider spectral detection with up to 36 channels, and Airyscan with 32 elements. This would have resulted in 36×32, totaling 1152 channel elements for each pixel, a data load that exceeds any readout electronics on the market now and in foreseeable future. So, if spectral Quasar detection cannot fully come to Airyscan, can some Airyscan maybe come to Quasar? That indeed was the breakthrough that ZEISS started to develop two years ago, and which became a product in 2021, as the LSM Plus function for all ZEISS LSM 900 and 980.

Figure 3 *LSM Plus function with optimized acquisition settings. Sampling is set automatically and interlinked with the pinhole setting.*

LSM Plus utilizes processing components from Airyscan, in the form of the exact PSF modelling for the ZEISS LSM and the linear quantitative Wiener deconvolution, applied to the current 36-channel, NIR capable Quasar detection. LSM Plus can again run in real-time with a processing preview, and has just one control parameter, which again can be automated. Instant Online Fingerprinting function was also improved by adding the side PMTs of the Quasar and the NIR detectors, the optimized workflow, and the capability of LSM Plus processing, even in its most automated way – with Direct Processing using Auto processing strength. Though LSM Plus works with all detectors, including non-descanned detectors (NDD) for multiphoton imaging, it is not limited to use on very expensive systems. It also benefits a 2-channel ZEISS LSM 900.

Additionally, there is a true collaboration between Quasar and Airyscan when using the multitracking mode. Here, Airyscan becomes an additional channel in the spectral acquisition setup, providing extra high resolution in addition to the LSM Plus processed channels. More than 40 data channels are processed in this mode, and after the deconvolution steps of Airyscan and LSM Plus, the resulting channels can undergo a spectral unmixing for perfect dye separation. By closing the pinhole in the LSM Plus channels, the resolution can be pushed further to get an optimal match to the Airyscan channel.

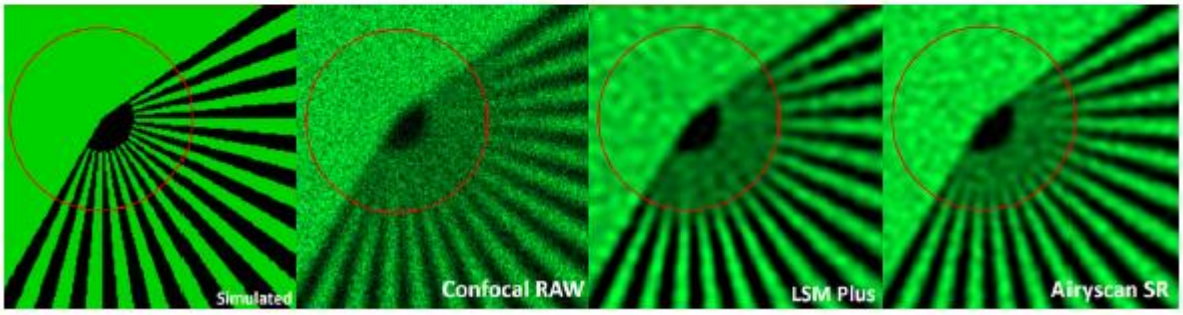


Figure 4 *Resolution limits of Confocal, LSM Plus (Confocal Wiener DCV), and Airyscan SR detection. In addition to the resolution gain, both Airyscan and LSM Plus reduce noise and improve visibility.*

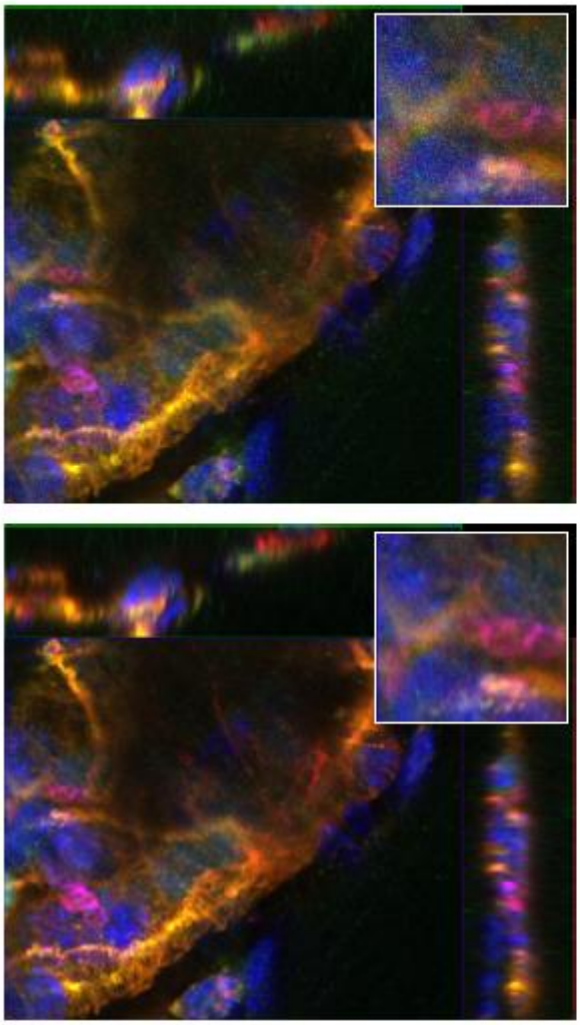


Figure 5 *Murine cremaster muscle, multi-color label with Hoechst (blue), Prox-1 Alexa488 (green), neutrophil cells Ly-GFP, PECAM1 Dylight549 (yellow), SMA Alexa568 (orange), VEGEF-R3 Alexa594 (red), platelets Dylight649 (magenta). Acquired with 32-channel GaAsP detector using Online Fingerprinting on ZEISS LSM 980, without (top) and with LSM Plus (bottom). Sample courtesy of Dr. Stefan Volkery, MPI for Molecular Biomedicine, Münster, Germany*

What are the technical capacities of LSM Plus, and what is the deconvolution behind it?

Resolution	Confocal	LSM Plus e.g. 0.8 AU	LSM Plus e.g. 0.3 AU (closed PH)	Airyscan SR* (1.25 AU)
X/Y	250 nm	160 nm**	120 nm**	120 nm**
Z	700 nm	500 nm	500 nm	350 nm
Spectral range	380–900nm	380–900 nm	380–900 nm	400–750 nm

*without Airyscan JDCV;
**measured with Nanoruler DNA Origami samples 160 nm/120 nm spacing

What's behind the LSM Plus processing?

The calculation used for LSM Plus is based on the Airyscan Wiener Filtering, but with the use of just one channel and the PSF for the confocal image. This yields all the advantages of this calculation like fast linear processing and online preview. The processing is quantitative and uses just one strength parameter, which is set automatically to a suggested best fitting value. The size of the pinhole is an additional parameter which influences the representation of frequencies and the maximum possible resolution. A smaller pinhole results in higher spatial frequencies and therefore higher usable sampling rates which positively contribute to the achievable resolution. Closing the pinhole of course requires enough signal from the sample.The resolution gain of LSM Plus can be higher than the usual DCV factor of 1.4. The reason for this is the quality of the optimized PSF models, which can adjust to the instrument properties in the same way as with Airyscan. Another advantage is the robustness of the Wiener filtering used here, which is applied in the event of image noise or aberrations. Such a mismatch does not create annoying artifacts, but it does reduce the maximum resolution which can be achieved. The perceived SNR is always better with LSM Plus, even with non-optimal samples.

LSM plus offers an embedded and optimally tailored deconvolution which improves the spectral detection properties of ZEISS LSM 980 and ZEISS LSM 900 and complements other features of the LSM, like NIR detection, Online Fingerprinting, multiphoton imaging or Airyscan.

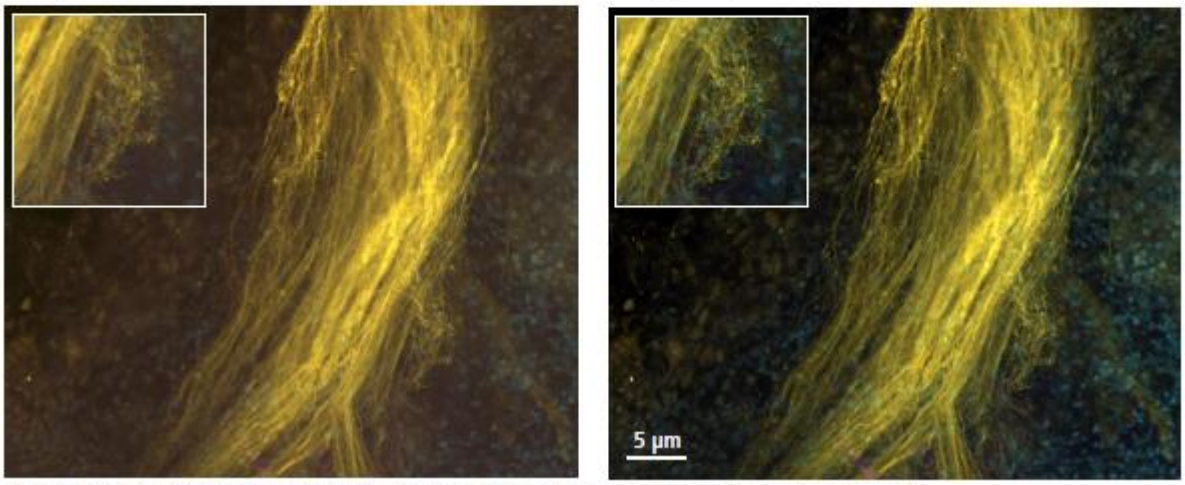


Figure 6 *Cockroach brain neurons (Alexa 488: yellow, Alexa 647: magenta) and DNA (Hoechst: cyan), without (left) and with (right) LSM Plus. Sample courtesy of M. Paoli, Galizia Lab, University of Konstanz, Germany*

Bibliography

- Biggs, D.S.C.: Accelerated iterative Blind Deconvolution. Ph.D. Thesis, University of Auckland, New Zealand (1996)
- Born, Max & Wolf, Emil: Principles of Optics, Pergamon Press (1959)
- van Cittert, P. H.: "Zum Einfluß der Spaltbreite auf die Intensitätsverteilung in Spektrallinien. II," Z. Phys. 69, 298–308 (1931)
- Gibson, S.F. & Lanni, F.: Experimental test of an analytical model of aberration in an oil-immersion objective lens used in three-dimensional light microscopy, JOSAA, Vol 9, Issue 1 (1992)
- [SIM_02] M. G. L. Gustafsson, J. Microsc. 2000, 198, 82.
- Holmes T.J., Biggs D., Abu-Tarif A.: Blind Deconvolution. In: Pawley J. (eds) Handbook Of Biological Confocal Microscopy. Springer, Boston, MA. https://doi.org/10.1007/978-0-387-45524-2_24 (2006)
- [SIM_04] X. Huang, J. Fan, L. Li, H. Liu, R. Wu, Y. Wu, L. Wie, H. Mao, A. Lal, P. Xie, L. Tang, Y. Z., Y. Liu, S. Tan, L. Chen, Nat. Biotechnol. 2018, 36, 451.
- Jansson, P. A. ed.: Deconvolution of Images and Spectra (2Nd Ed.) (Academic Press, Inc., Orlando, FL, USA (1996)
- [SIM_01] A. Löschberger, Y. Novikau, R. Netz, M.-C. Spindler, R. Benavente, T. Klein, M. Sauer, I. Kleppe, "Super-resolution imaging by dual iterative structured illumination microscopy", Carl Zeiss Microscopy GmbH, April 2021
- Lucy, L.B.: An iterative technique for the rectification of observed distributions, Astron. J., 1974, 79:745-754
- Meinel, Edward S.: Origins of linear and nonlinear recursive restoration algorithms, J. Opt. Soc. Am. A 3, 787-799 (1986)
- Richardson W.H., Bayesian-based iterative method for image restoration. J. Opt. Soc. Am., 1972, 62 (6): 55-59
- Roth S. et. al.: Optical Photon Reassignment Microscopy (OPRA) (2013), arXiv:1306.6230
- Schaefer LH, Schuster D, Herz H.: Generalized approach for accelerated maximum likelihood-based image restoration applied to three-dimensional fluorescence microscopy. J Microsc. 2001 Nov;204(Pt 2):99-107. doi: 10.1046/j.1365-2818.2001.00949.x. PMID: 11737543.
- Schaefer et. al. "Structured illumination microscopy: artefact analysis and reduction utilizing a parameter optimization approach" Journal of Microscopy, Vol. 216, Pt 2 November 2004, pp. 165–174
- Schaefer, Lutz & Schuster, D.: Structured illumination microscopy: improved spatial resolution using regularized inverse filtering (2006)
- Sheppard C.J.R.: Super-resolution in confocal imaging, Optik - International Journal for Light and Electron Optics 80(2):53 (1988)
- Sheppard C.J.R.: The Development of Microscopy for Super-Resolution: Confocal Microscopy, and Image Scanning Microscopy (2021), Applied Sciences 11(19):8981
- [SIM_03] Dr. Jörg Siebenmorgen, Dr. Yauheni Novikau, Ralf Wolleschensky, Dr. Klaus Weisshart, Dr. Ingo Kleppe, "Introducing Lattice SIM for ZEISS Elyra 7 Structured Illumination Microscopy with a 3D Lattice for Live Cell Imaging", December 2018
- Tikhonov, A.N. & Arsenin, V.Y.: Solutions of ill Posed Problems. Wiley, New York (1977)
- Van der Voort, H.T.M. and Strasters, K.C.: Restoration of confocal images for quantitative analysis. J. Micros., 178, 165-181 (1977)
- Verveer, Peter J. and Jovin, Thomas M.: Efficient superresolution restoration algorithms using maximum a posteriori estimations with application to fluorescence microscopy J. Opt. Soc. Am. A,14, 1696-1706 (1997)
- Wallace, W. et al.: A workingperson's guide to deconvolution, Biotechniques, Nov. 2001, Vol 31, No 5
- Wiener, Norbert: Extrapolation, Interpolation, and Smoothing of Stationary Time Series. Wiley, New York NY (1949)
- [SIM_05] Y. Zhang, S. Lang, H. Wang, J. Liao, Y. Gong, J. Opt. Soc. Am. A 2019, 36, 173

Carl Zeiss Microscopy GmbH
07745 Jena, Germany
microscopy@zeiss.com
www.zeiss.com/microscopy