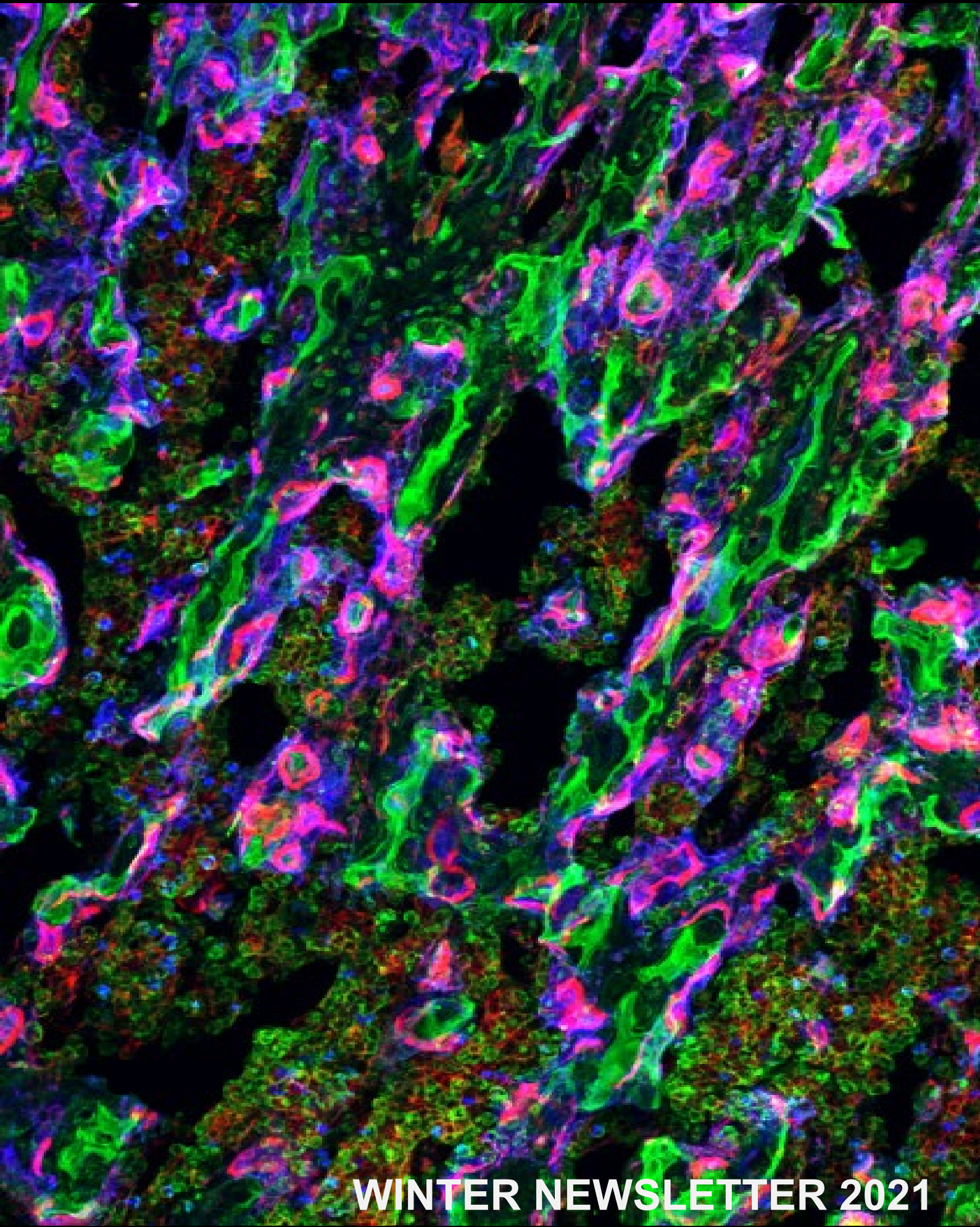


# ANZSCDB

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



**WINTER NEWSLETTER 2021**

# ANZSCDB

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



## Winter NEWSLETTER – July 2021

Dear ANZSCDB members,

Welcome to our winter newsletter for 2021. As I hope you will see in our news, there are moves towards opening up of more scientific activities and even partial return to in-person gatherings and events. For our Society this has already resulted in a very successful and enjoyable local-and-zoom symposium from Brisbane in the autumn, with an upcoming symposium in Melbourne and a spring event we can look forward to in Adelaide later in the year. We are full of admiration and thanks for the hard work of the local organisers, our State Reps and others, in hosting these events. As we are learning, every one of these events, and other conferences, is a massive juggling act, with arrangements in limbo up to the last minute, thanks to ongoing travel restrictions, lockdowns, and the continuing spectre of COVID hanging over our nations.

We Antipodeans face an interesting and challenging period ahead, as the rest of the world opens up and resumes conferencing - without us! While, in the previous newsletter, I applauded our governments for heeding science in their approach to the pandemic, I find myself utterly dismayed at the unscientific approach now being applied to vaccinating the population. So, until this is achieved, the rest of the world awaits us re-joining them.

Our other members performing heroic juggling acts are all those engaged in delivering undergraduate teaching and graduate training. With a widespread and shifting mix of remote and in-person contact, this continues to be a difficult period. So, massive thanks also to our members persevering to deliver the learning that is so important for the discipline and future careers of scientists and others.

### ***In this issue***

- [Member News](#)
- [Featured Online Lecture Series](#)
- [State Reports](#)
- [ANZSCDB Corporate Member News](#)

The Spring will also be a time for renewal of our Society executive and more news about this will be forthcoming.

A major and important message to you all right now, is that **our award season is coming up**. We will have a number of prestigious prizes on offer to acknowledge the scientific achievements of our members from early to senior career levels. We have image and paper prizes, and it is not too late to join the society to share in these rewards!

Please be ready to apply. These offer great opportunities to advance your CVs in the absence of the usual conference forums.

Thanks again for your forbearance and the strong community of cell and developmental biologists you, as members, maintain. Look out for each other.

Stay safe.

Warm regards,

Jenny Stow

President, ANZSCDB

## **Australian scientists recognised with Royal Society Fellowships**

In May this year, two world-renowned Australian scientists, Professor Marilyn Renfree AO FAAS FRS and Professor David Craik FAAS FRS, were elected as Fellows of the Royal Society. The Fellowship of the Royal Society is one of the highest academic accolades attainable, and ANZSCDB congratulates Professor Renfree and Professor Craik on their achievement.

Professor Renfree's work is of particular interest to the Society. As the foremost expert on marsupial biology with a focus on reproduction and development, Professor Renfree has made significant contributions to developmental biology. She received her BSc, PhD and DSc from ANU, after which she moved overseas, completing Fellowships at the University of Tennessee and the University of Edinburgh. Upon returning to Australia, she established herself as a leader in mammalian reproductive physiology, lecturing and conducting research at Murdoch University, Monash University and at the University of Melbourne where she is a Laureate Professor and holds the position of Secretary of Biological Sciences and Vice President of the Australian Academy of Science.



The focus of Professor Renfree's work is understanding the physiological control of reproduction and development, with a particular interest in the marsupials that dominate Australia's mammalian niches. Her key research areas include hormonal and metabolic control of diapause, sex-determination and differentiation, and hormonal control of parturition. Her discoveries in these areas in marsupials have changed our understanding of developmental processes in all mammals.

We congratulate Professor Renfree once again on her achievement, and greatly value her contributions to science in Australia and worldwide.

## Centre for Cancer Biology Awards

On the 25<sup>th</sup> of June, ANZSCDB proudly supported the annual awards of the Centre for Cancer Biology in South Australia. The CCB places heavy emphasis on recognising excellence in postgraduate and postdoctoral research and does so through the presentation of these awards.

Among a wide variety of awards, the Society supported the following prizewinners:

Jan Kazenwadel (Supervisor: Natasha Harvey)

**PhD Thesis Research Excellence Award - \$250**

Minky Cockshell (Bonder Lab)

**Photography Award - \$125**

Ellen Potoczky (Schwarz Lab)

**Video Award - \$125**

We congratulate the winners for their outstanding work and wish them the best in their future endeavours!



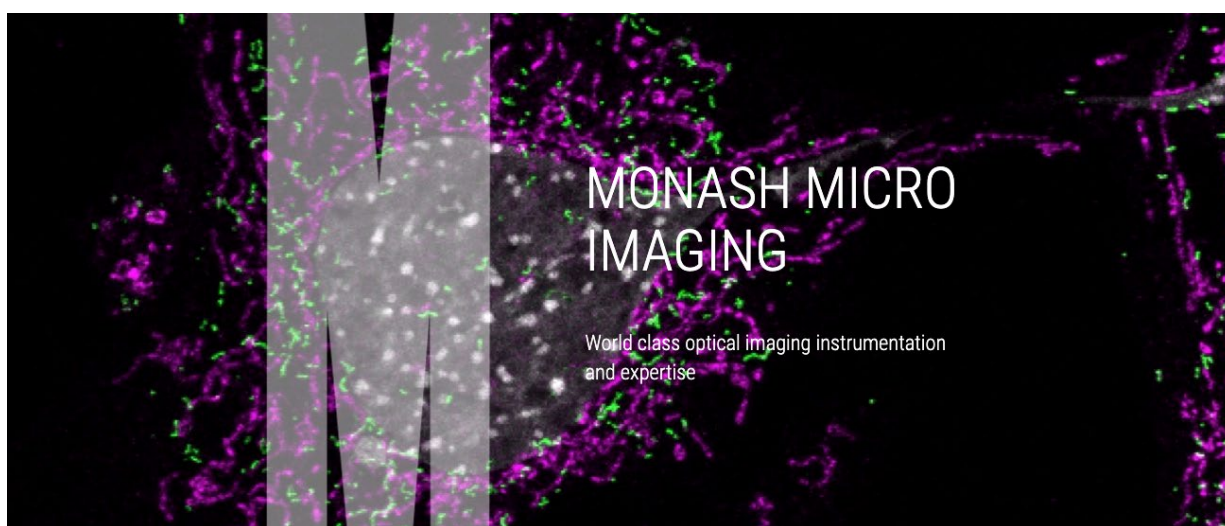
## Featured Online Symposia

While COVID-19 has severely limited our ability to meet in person at meetings and conferences, the rapid advancement of online platforms such as Zoom have allowed us to continue sharing our work. With the advent of 'academia online', many new and exciting online lectures and seminars have been established.

In one sense, this novel way of discussing and sharing science is more accessible than meeting in-person, as our members across countries, states and territories can communicate despite geographical distance.

Thus, we encourage our members to participate and engage in one or more of the following featured series and hope they will facilitate collaboration and foster closer relationships, perhaps even after COVID-19's disruptive influence has subsided. This issue, we highlight the Monash Advanced Imaging Webinar Series.

### Monash Advanced Imaging Webinar Series



Hosted by the Monash Micro Imaging facility, this symposium series focuses on advanced microscopy to highlight advances and breakthrough applications in optical imaging. Given there is a lot of webinar activity in Europe and US which does not suit our time zone, there was an opening for a series that spanned the SE Asia time zone.

The webinar is held about once a month on Wednesday at 11.00 am Melbourne time (AEDT) but may vary. Sign up to the webinar mailing list by contacting [jennifer.zenker@monash.edu.au](mailto:jennifer.zenker@monash.edu.au) or [MMI-Enquiries@monash.edu](mailto:MMI-Enquiries@monash.edu).

Selected presentations from previous sessions of the series can be viewed on the [\*\*Monash Advanced Microscopy Youtube Channel\*\*](#)

#### Upcoming Sessions:

21 <sup>st</sup> July	Florian Jug (Human Technopole, Max Planck Inst.)
TBD Aug	Alexander Aulehla (EMBL)
22 <sup>nd</sup> Sept	Stefan Jakobs (Max Planck Inst.)
20 <sup>th</sup> Oct	Andrew Moore (HHMI Janelia)

## Key Meeting Dates

### XIII Victorian Cell & Developmental Biology Meeting

#### VIC Satellite Meeting

26<sup>th</sup> August 2021



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

**XIII Victorian Cell & Developmental Biology Meeting**

**Thursday, 26<sup>th</sup> August 2021**  
**9am-5pm**

Ian Potter Auditorium  
University of Melbourne  
Kenneth Myer Building  
30 Royal Parade,  
Parkville, VIC 3062

**Invited speakers**  
**A./Prof. Kelly Smith**, *University of Melbourne*  
**Prof. Michael Samuel**, *University of South Australia*,  
*2020 ANZSCDB Emerging Leader*  
**Prof. Peter Gunning**, *University of New South Wales*,  
*2020 ANZSCDB President Medal recipient*



Event hosted in-person (COVID-dependent) in the Ian Potter Auditorium at **Kenneth Myer Building, Parkville, University of Melbourne**

Abstract submission closes Fri 30<sup>th</sup> July

Registration (FREE) closes Fri 13<sup>th</sup> August

Poster and talk prizes for Post-Docs and PhD students

Registration and abstract submission link: <http://tinyurl.com/VCDB13>

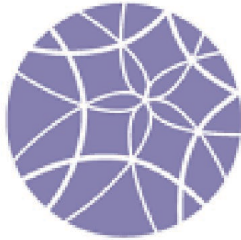
For more information, please contact VIC State rep: [jennifer.zenker@monash.edu.au](mailto:jennifer.zenker@monash.edu.au)

## **Cell signalling in development and disease**

### **SA Satellite Meeting**

**Save the date: 26<sup>th</sup> October 2021**

Confirmed speakers: A/Prof Ruth Arkell (ANU), A/Prof Archa Fox (UWA) & Dr Yoon Lim (UniSA)



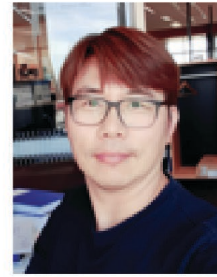
# **Centre for Cancer Biology**



**A/Prof Ruth Arkell**



**A/Prof Archa Fox**



**Dr Yoon Lim**

Event hosted at HB8-18, Centre for Cancer Biology, Bradley Building, University of South Australia

This meeting will also include selected short post-doctoral and student presentations

Registration details coming soon

For further information please contact ANZSCDB SA state reps:

[jantina.manning@unisa.edu.au](mailto:jantina.manning@unisa.edu.au) OR [winnie.kan@unisa.edu.au](mailto:winnie.kan@unisa.edu.au)



## Cell Bio – Virtual 2021

### ASCB|EMBO Meeting

1<sup>st</sup> -10<sup>th</sup> December 2021



#### Specialised meeting tracks by field

The meeting focuses on cell biology as the fundamental basis of biology as well as sessions on emerging interdisciplinary topics.

Registrations for talks and posters open now!

<https://www.ascb.org/cellbio2021/>

## ComBio2022

27<sup>th</sup> September to 30<sup>th</sup> September 2022

Registrations open April 2022



The logo for ComBio2022 Melbourne is displayed on the left. It features the text "ComBio 2022" in orange and blue, with "MELBOURNE" in blue to the right. Below the text is a stylized orange 'C' containing a blue silhouette of the Melbourne Convention and Exhibition Centre, and a blue and white penguin. To the right is a photograph of a red and green Melbourne tram (number 1080) on a street, with a metal barrier in the foreground.

**Melbourne Convention and Exhibition Centre**  
South Wharf, MELBOURNE 27 September - 30 September 2022

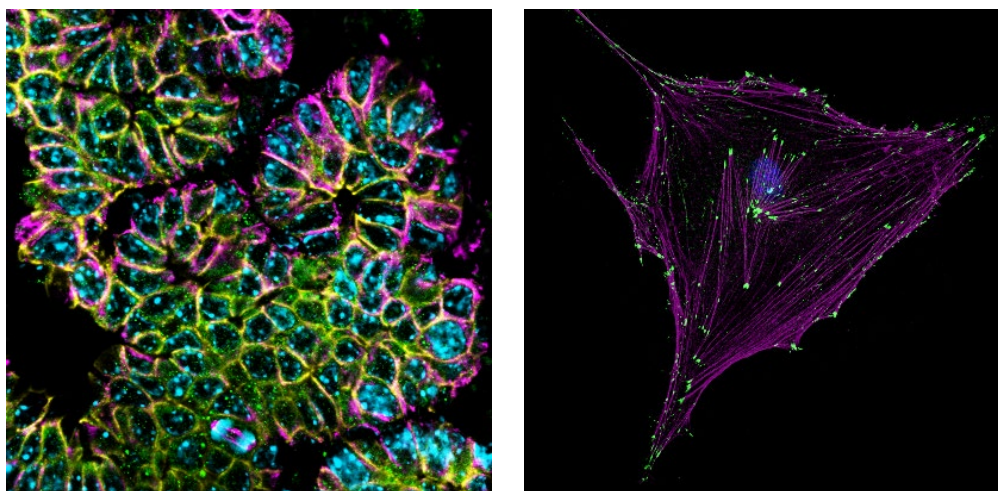
Twitter: <https://twitter.com/ComBio2022>

## State Reports

### SA State News and Activities Winter 2021

#### **Jomar Life Research Calendar 2021**

Beautiful images generated by Dr Sarah Boyle and Dr Zahied Johan (both from Tumour Microenvironment Lab, Centre for Cancer Biology) showcasing their research were selected for the Jomar Life Research Calendar 2021. Details of their images are described below.



#### Breast Cancer Endosomal Trafficking by Sarah Boyle (Left)

This is an image of breast cancer tissue section fluorescently labelled for a cytoskeletal microtubule component (magenta) and a marker of endosomes (green). Cell junctions are labelled yellow and nuclei cyan. Image acquired on a Zeiss LSM700 confocal system.

#### Paxillin and actin filaments of a dermal fibroblast by Zahied Johan (Right)

A fluorescent image of mouse dermal fibroblast grown on coverslip. The cell was stained for a focal adhesion molecule, Paxillin (green) and actin filaments (purple). Nucleus was labelled with DAPI (blue). Zahied's research focus is on the contribution of dermal fibroblasts in mediating diabetic wound healing. This image was acquired on Zeiss LSM 700 using a 63x objective.

## **ASMR South Australian Scientific Meeting**

The Australian Society for Medical Research (ASMR) South Australian Scientific Meeting was recently held at the Adelaide Convention Centre on June 9<sup>th</sup>, 2021. Kay Myo Min (Vascular Biology and Cell Trafficking Lab, Centre for Cancer Biology), was selected as a finalist for the prestigious Ross Wishart Memorial Award given to a PhD student or recent PhD graduate for the most outstanding presentation at the meeting. Her presentation was titled "Desmoglein-2 promotes an aggressive phenotype of

pancreatic cancer: implications for therapeutic intervention". Dr Zahied Johan (Tumour Microenvironment Lab, Centre for Cancer Biology) was selected for an oral presentation in the Cell Biology & Immunology session for his work titled "Accelerated healing of diabetic wounds by efficient recruitment of fibroblasts upon inhibiting a 14-3-3/ROCK regulatory signalling axis".

### **Selected publications led by our SA members:**

Foot NJ, Kumar S. The Role of Extracellular Vesicles in Sperm Function and Male Fertility. *Subcell Biochem.* 2021;97:483-500. doi: 10.1007/978-3-030-67171-6\_19.

Lim Y, Dorstyn L, Kumar S. The p53-caspase-2 axis in the cell cycle and DNA damage response.

*Exp Mol Med.* 2021 Apr;53(4):517-527. doi: 10.1038/s12276-021-00590-2. Epub 2021 Apr 14.

Manning JA, Shah SS, Nikolic A, Henshall TL, Khew-Goodall Y, Kumar S. The ubiquitin ligase NEDD4-2/NEDD4L regulates both sodium homeostasis and fibrotic signaling to prevent end-stage renal disease.

*Cell Death Dis.* 2021 Apr 14;12(4):398. doi: 10.1038/s41419-021-03688-7.

### **2021 Meeting**

Our South Australian ANZSCDB scientific meeting will be held on Tuesday 26 October 2021, titled "Cell signalling in development and disease." This will be a one-day meeting with A/Prof Ruth Arkell (the John Curtin School of Medical Research, ANU), A/Prof Archa Fox (School of Human Sciences and the School of Molecular Sciences, UWA) and Dr Yoon Lim (ANZSCDB Early Career Researcher Award winner 2020, Centre for Cancer Biology) as confirmed speakers. There will also be excellent opportunities for students and early career researchers to present their work and to win prizes.

Report written by ANZSCDB State Representatives Winnie Kan and Jantina Manning.

## **ANZSCDB Corporate Member News:**

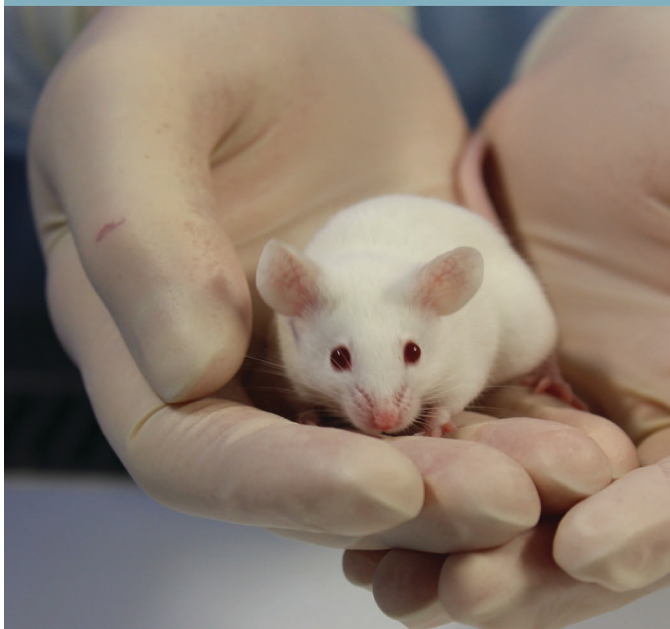
We would like to thank the following corporate sponsors. Please visit their websites below and peruse their advertisements at the end of this newsletter.

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Garvan Institute  
of Medical Research

## **Livecyte's Automated Tracking exposes a global research dilemma.**

### **What is the research problem are we solving?**

Cell migration is an essential and highly regulated process involved in many areas of biology including embryonic development, tissue homeostasis and regeneration. Cell migration also plays a key role in cancer where it drives tumour metastasis. Monitoring cell migratory behaviour over long periods of time requires imaging techniques with very low phototoxicity. Conventionally techniques such as brightfield or phase contrast imaging are used, but these modalities are poorly suited to automated cell identification. Thus, many researchers are forced to track cell motion by hand in order to understand their migratory behaviour.

### **Why is that a problem?**

Manually tracking cells is extremely time consuming and laborious – it isn't a trivial time-waster - <https://vimeo.com/553476933>. However, perhaps even more critically, manually tracking cells is not as accurate as people assume and significant variability can occur from person to person.



Manual tracking using a point and click system is the most common method for measuring motility of multiple cells over time. Whilst manual tracking is commonly deployed throughout the time-lapse, it is time and labour intensive, suffers from inter-operator variability, ill-defined cell centroid positioning, and an intrinsic lack of morphological data [1]. In many cases, the vast number of cell images collected during a time-lapse means only a subset of cells is tracked within a population leading to a poor approximation of migration rates. Multiple available tracking tools offer a certain level of image pre-processing and background filters which may also perturb tracking measurements from one user to the next, depending on the method of tracking used [1].

### **What is the dilemma?**

Time v Accuracy!

Principal Investigators often have risen through the ranks of research, through many technological changes with a strong tenet of result accuracy accepting that research can be a labour of love taking time and commitment. Early career researchers are likely to be more focused on time saving as they currently suffer the pain of incessant clicking that is typical in the manual tracking approach. Unfortunately, many studies have shown the inherent errors posed by manual tracking suggesting that the current paradigm is equally flawed for both time and accuracy.

The promise of time saving and accuracy with automated tracking isn't as easy as simply writing an algorithm; fundamental changes to the way cells are analysed is essential. This may be a rethink of our reliance on fluorescence microscopy. Adherence to the doctrine that accurate live cell tracking needs time, minimal photoperturbation with excellent contrast is paramount.

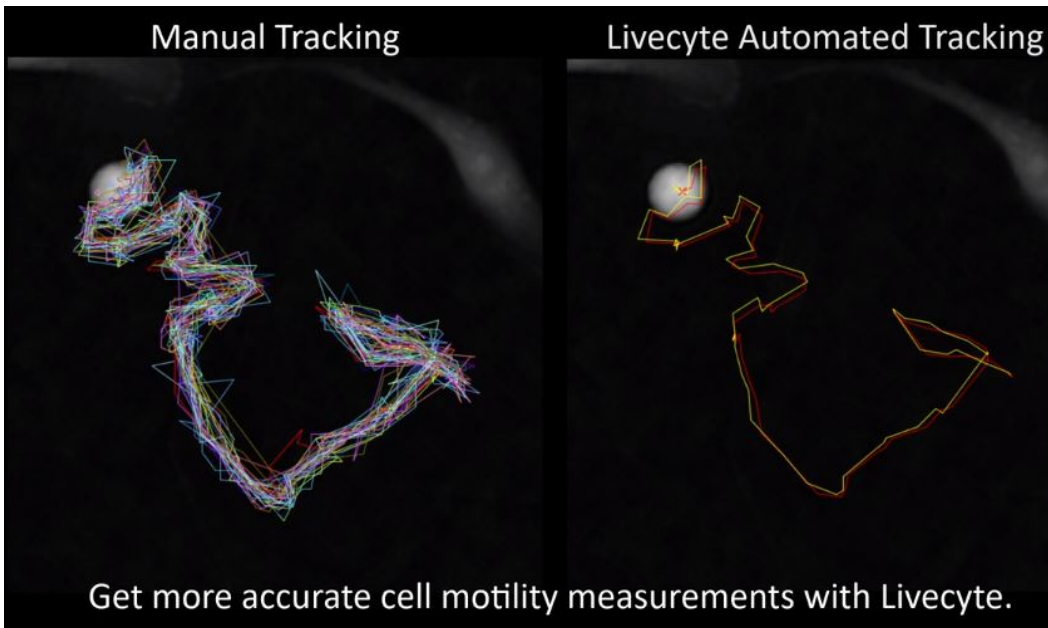
### **How does Livecyte solve this?**

Automated tracking allows for the analysis of large time-lapse data sets to truly understand and analyse cell behaviour in an efficient, reproducible, and statistically robust way [2]. Most simple automated tracking approaches, however, are dependent on high contrast images (as seen in fluorescence) where cells may be segmented by thresholding, i.e., pixels above an intensity threshold are seen as cell and the rest is background.

Livecyte uses a quantitative phase imaging modality called ptychography which is both ideally suited to automated cell tracking and extremely low phototoxicity. Additionally, we show Livecyte's single-cell tracking is accurate and provides outputs consistent with averaging the manual tracking of many users. Livecyte's Analyse software has easy-to-use algorithms that automatically segment and track all cells in a field of view. Whilst these algorithms can be customised to allow for tailoring to a user's specific requirements, the automatic tracking data generated using the default parameters can be found in this application note ["Uncovering the inconvenient truth behind manual tracking"](#). This study demonstrated how single pixel errors in mouse click position can add up to cause significant errors in track length, and a lack of standardisation causes substantial variability.

Livecyte presents clear advantages through automated tracking to remove the subjective nature of the manual approach by standardising the tracking process whilst also allowing the possibility of more cells being tracked with greater accuracy in a far quicker manner.





### How do you learn more?

ATA Scientific can assist with demonstrations, seminars, information, papers, application scientists and importantly facilitate a conversation with Phasefocus if required. Please contact Peter Davis at ATA Scientific: [pdavis@atascientific.com.au](mailto:pdavis@atascientific.com.au)

### References:

1. Huth, J., Buchholz, M., Kraus, J.M., Schmucker, M., Von Wichert, G., Krndija, D., Seufferlein, T., Gress, T.M. and Kestler, H.A., 2010. Significantly improved precision of cell migration analysis in time-lapse video microscopy through use of a fully automated tracking system. *BMC cell biology*, 11(1), p.24.
2. Meijering, E., Dzyubachyk, O. and Smal, I., 2012. Methods for cell and particle tracking. In *Methods in enzymology* (Vol. 504, pp. 183-200). Academic Press.

## **Keeping up to date**

The **ANZSCDB** has a [Facebook page](#) for news updates and is also on Twitter as [@ANZSCDB](#).

Please engage with us via social media for society news and updates and tag us in your work-related posts.

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## **Would you like to contribute to the ANZSCDB newsletter?**

Please send items to [Nathan Pavlos](#), the society Secretary.

The newsletter will be published approximately every three months and distributed to all ANZSCDB Members via e-mail.

Please ensure that your submissions are no more than 100 words and have been fact-checked.

**A special thanks to Mr Bryan Tay (UQ) for his excellent assistance with compiling the Newsletter.**