Australasian Society for Immunology Inc.

ASI NEWS

SEPTEMBER 2017

A POSTER SESSION WITH A VIEW

P 15

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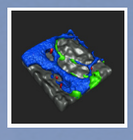
Immunology & Cell Biology

The flagship journal of the
Australasian Society for Immunology

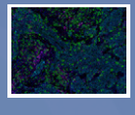
Catch up on recent special features from the journal, including:



Advanced microscopy and imaging techniques in Immunology and Cell Biology

In this Special Feature, we have compiled a series of articles that discuss the history of microscopes and imaging modalities. We look at how current platforms have influenced basic research of immunology and cell biology as well as their use in the clinic to diagnose and treat disease. We also discuss how future developments in technology will open avenues for an even deeper understanding of fundamental principles in biology and the challenges associated with handling vast amounts of data generated by technology that gives such a high level of detailed information.

(July 2017 issue)



Cancer Immunotherapy

This series of reviews highlights some of the recent advances in mobilizing effective host immunity to cancer. Cancer immunotherapy is at a critical and exciting stage of development. Progress in our understanding of cancer immunotherapy has been dramatic over recent years and we have selected six articles to highlight in this Special Feature.

(April 2017 issue)

Necroptotic death signalling: evolution, mechanisms and disease relevance

In recent years, research into a genetically encoded cell death program termed necroptosis has accelerated into vogue. Many laboratories are now racing to answer key questions such as: How and when does it occur? What does it do? What is it good (or not so good) for? Answers to these will ultimately guide efforts aimed at manipulating this new pathway for therapeutic benefit. In the six articles in this ICB Special Feature, the current state of play in necroptotic cell death research is dissected in considerable detail. The articles provide timely updates on what we have learnt so far and, importantly, where we might be going.

(February 2017 issue)

Start reading at: **nature.com/icb/focus**

SPRINGER NATURE

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Australasian Society for Immunology Inc.

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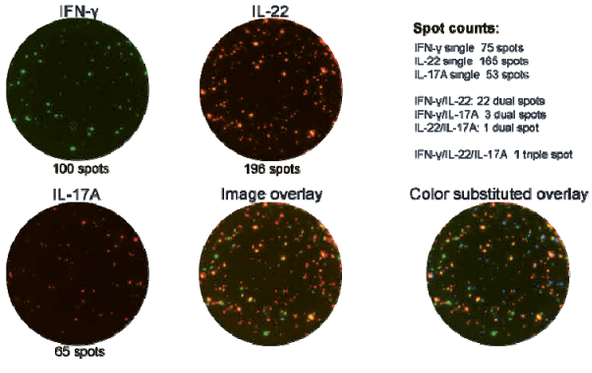

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SECRETARY'S REPORT

ELISSA DEENICK

As we head towards the end of the year there's lots of things happening with ASI. A new round of Postdoctoral and Postgraduate International Travel awards in now open and we've also put a call out for the 2nd Jared Purton award.

We're also calling for nominations for positions on council including:

- Vice President/President
- Deputy Treasurer/ Treasurer
- Councillor for NSW (only open for members residing in NSW)
- Newsletter Editor
- Coordinator of the Visiting Speaker Program

If you're interested in any of these roles please feel free to contact me or the people currently in these roles (see last page of the Newsletter for all the contact details).

You'll notice one of the roles that's open is that of Newsletter editor – I'd like to say a huge thank you to Joanna Roberts who has been in this role for the last 3 years and has done an amazing job improving the Newsletter and making it far more interesting to read. You'll notice that this issue is slightly delayed and probably a little shorter – that's because without her direction its fallen to my far less capable hands. If you like science communication this could be a role for you.

Finally the ASI annual meeting is now less than 2 months away. To find out all the great speakers they've got lined up head to the website http://www.asi2017.org

We'll also be holding the ASI Annual General Meeting on the Wednesday lunchtime, look out for the agenda that will be sent around soon and take the opportunity to turn up and ask council those burning questions you have about how the society is run. ■

I'd like to say a huge thank you to Joanna Roberts who has been in this role for the last 3 years and has done an amazing job improving the Newsletter and making it far more interesting to read.

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CRISPR/CAS9 TECHNOLOGY AND MOUSE GENE ENGINEERING AT GARVAN/ABR (MEGA)

ROBERT BRINK

Those of you who have glanced up even momentarily from your flow plots and Western blots will know the age of CRISPR has well and truly upon us. Not only is Jennifer Lopez making a TV series based on CRISPR but this new method for genome engineering is shaping as probably the most significant step-change in biomedical research and technology since the advent of PCR. A bold claim to be sure but one underscored by the exponential rise in publications on CRISPR (80 in 2011 to over 2,000 last year), the near daily appearance of new biotech companies based on CRISPR technology, and the inevitable battles for patent recognition and Nobel prize glory that are raging across the globe. Yes, CRISPR really is a thing.

So what is CRISPR exactly and what is all the fuss about? Well, as with many great tools (think antibodies, CAR T cells etc) the success of CRISPR technology can be traced back to the universal need of life forms for immune protection. Although long considered a curio of the bacterial and archaeal genomes, it was about 10 years ago that the Clustered Regularly Interspaced Short Palindromic Repeat (CRISPR) sequences and their partner CRISPR associated (Cas) endonuclease genes were found to in fact form an elaborate immune system directed against the viruses (phages) that infect these unicellular organisms. To achieve this protection, RNA that matches phage genome is synthesised from the CRISPR locus and used to target Cas nucleases to phage DNA and so introduce a clean double-stranded break that effectively kills the virus. Self/non-self discrimination is also built into this ancient immune system, with the phage DNA but not the bacterial DNA carrying the target sequence in the context of a critical tri-nucleotide restriction element called the PAM (Protospacer Associated Motif). Thus, despite their enormous evolutionary separation, the immune systems of both both bacteria and mammals arrived at a similar “signal + signal 2” paradigm to solve the problem of maintaining self-tolerance.

So how does the CRISPR system relate to genome editing? Put simply, the ability to direct a Cas endonuclease to a specific position within the genome and cleave the chromosome at this site enhances by orders of magnitude the efficiency of subsequent modification of the genome by either Non-Homologous End Joining (NHEJ) or Homologous Recombination (HR). The most frequently employed system for genome editing is that derived from Streptococcus pyogenes, in which the Cas9 nuclease searches out target sequences immediately 5’ of an “NGG” PAM restriction element. To target a specific site in the genome, Cas9 is loaded with a short RNA molecule (single guide RNA = sgRNA) of which the 5’ terminal 20 bases correspond to the PAM-associated target site. NHEJ repair of the cut site typically leads to short insertions or deletions, often creating inactivating frame-shift mutations when Cas9 is targeted to 5’ exons of a protein-coding gene. Alternatively, DNA cleavage can be repaired via HR with an exogenous oligonecleotide or

FIGURE 1

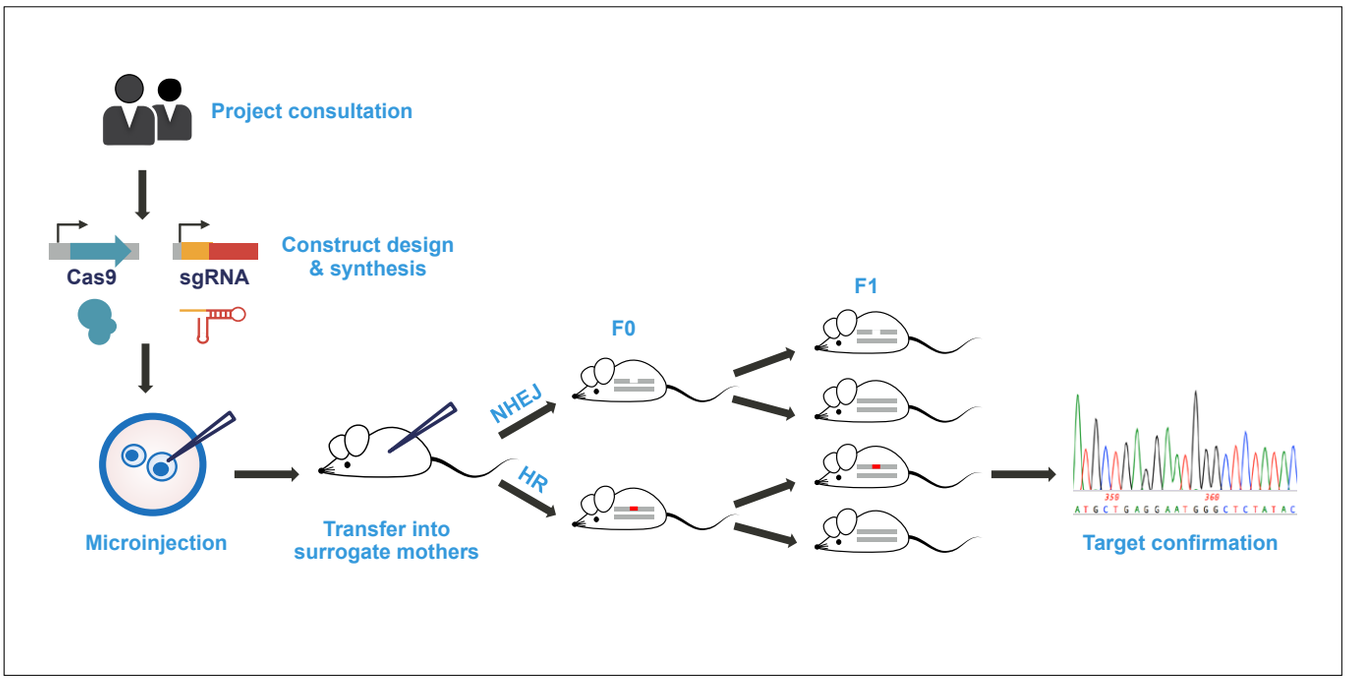


FIGURE 2: WORKFLOW FOR PRODUCING AN ENGINEERED MOUSE MUTANT USING CRISRP/CAS9

plasmid template to introduce specific alterations to the gene from single nucleotide changes to larger modifications such as insertion of loxP sites or reporter cassettes (Figure 2).

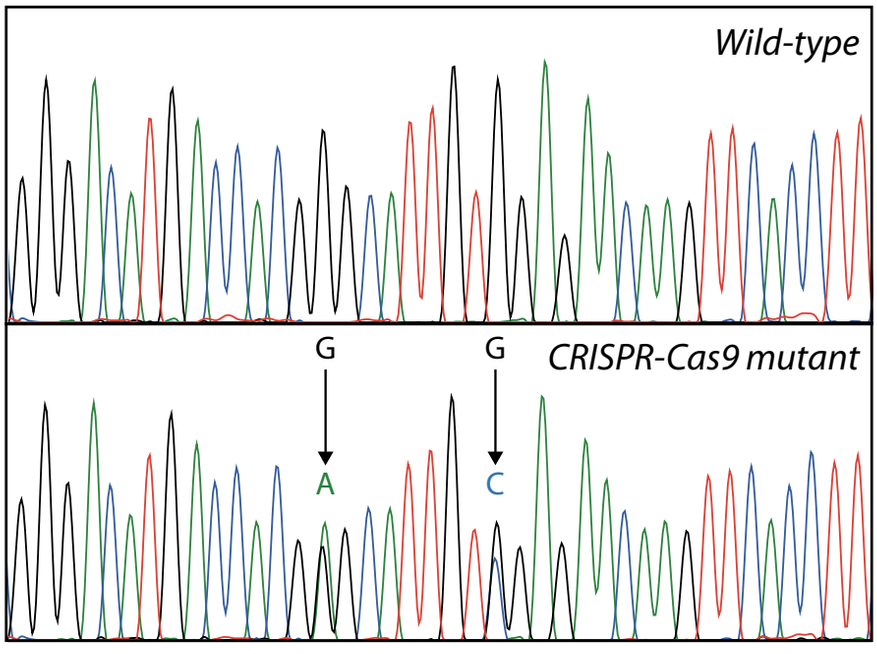
MEGA (Mouse Engineering Garvan/ABR) (Figure 1) was formed in mid-2014 as a partnership between Darlinghurst's Garvan Institute and the Australian BioResources (ABR) facility located in Moss Vale in the NSW Southern Highlands. MEGA's mission is to utilise CRISPR/Cas9 technology to provide biomedical researchers with rapid and cheap access to novel genetically modified mouse models. Project design and molecular biology is carried out by the crack team at Garvan (Figure 3) whilst the microinjections, embryo transfer and animal husbandry are all expertly handled by the team at ABR (Figure 5). Although many of MEGA's clients are located at Garvan or are NSW-based researchers who house their experimental mice at ABR, researchers from across the ASI network including New

FIGURE 3: GARVAN MEGA TEAM
(L-R) DAVID ZAHRA, KATHERINE BOURNE, JANA HERMES, CLARA YOUNG

Zealand, Victoria and Western Australia have made use of MEGA's GM mouse service. In total, over 120 GM mouse lines have been produced by MEGA including more than 50 already in 2017. Unlike conventional ES cell approaches, turnaround times for producing GM mice using CRISPR/Cas9 are rapid (as short as 8-10 weeks) and cheap (as little as $7,500 at MEGA). Whilst CRISPR/Cas9 can be used to engineer a range of different genetic modifications, they are proving especially popular with those engaged in human genome and exome sequencing projects. Thus, rapid generation of GM mice provides the most robust validation of disease-associated SNVs and other mutations in a relevant in vivo context (Figure 4). Anyone interested in utlising MEGA's service is welcome to contact me (Robert Brink, r.brink@garvan.org.au) or David Zahra (d.zahra@garvan.org.au) or visit the MEGA page on the ABR website (https://www.abr.org.au/services/genome-editing). ■

FIGURE 4: SANGER SEQUENCING OF CRISPR/CAS9 FOUNDER MUTANT MOUSE.

WILD-TYPE AND HETEROZYGOUS MUTANT MICE SHOWING ENGINEERED SINGLE NUCLEOTIDE SUBSTITUTIONS INTRODUCING A GLYCINE TO SERINE POINT MUTATION (GGC>AGC) AND A PAIRED VALINE SILENT MUTATION (GTG>GTC) TO INACTIVATE THE TGG PAM SITE.



In total, over 120 GM mouse lines have been produced by MEGA including more than 50 already in 2017.

FIGURE 5: ABR MEGA TEAM
(L-R) ELIZABETH LAWFULL, JANE CALDERWOOD, MITCHELL MOORE, MICHELLE BROWNLEE, KEVIN TAYLOR, SARAH MOORE, EDMOND CAIRNS, REBECCA BARNES

THE IUIS CORNER

J. ALEJANDRO LOPEZ

Here is a brief update of the news coming from IUIS. If you wish to follow the news coming directly from the IUIS, visit www.iuisonline.org.

ON FAKE NEWS

Also pervading the scientific environment, "fake" news and advertisements are ripe. Be aware of a **fake ICI** Conference (20th International Conference of Immunology) scheduled for February 2018 in London. This is **NOT** a *bona fide* meeting of the International Immunology Societies. Instead, the IUIS oversees the International Congress of Immunology every three years.

Following the ICI 2016 which took place in Melbourne, the next of such congresses will take place in 2019 and is known as IUIS 2019, to acknowledge the overarching gathering of all Immunological Societies.

PROVIDING ON-LINE IMMUNOLOGY EDUCATION

Immunopaedia.org is the official educational provider of online pre-course material for IUIS immunology courses in the developing world and in other countries. Supported and working closely with the IUIS Education Committee, Immunopaedia delivers relevant and current educational content to provide frameworks of knowledge to IUIS course participants before they embark on face-to-face courses.

Online pre-course material on Immunopaedia becomes available six weeks before an IUIS course. Participants are allowed time to study the content, read the suggested journals, listen to interviews with researchers and test their knowledge through quizzes. Content is produced by blending material derived from Bellanti's Immunology IV textbook, current journals and material provided by the various course facilitators thus ensuring the correct information is accurately conveyed. Immunopaedia provides basic and IUIS course-specific immunology material that aims to prime participants with relevant knowledge to ensure they get the very best out of their respective IUIS courses.

Immunopaedia is an educational website which aims to promote knowledge and research in the field of immunology worldwide and was founded in 2006 in South Africa by Professor Clive Gray. The aim was originally to provide an open-access and easy-to-understand summary of the effects of HIV infection on the immune system and to facilitate improvement in clinical practice. Immunopaedia has since progressed to include more general immunology knowledge by providing open-access immunology educational resources, clinical case studies, interviews with prominent immunologists and up-to-date news on discoveries and advances in immunology and health. ■

TRAVEL REPORTS

INTERNATIONAL WORKSHOP OF CHRONIC LYMPHOCYTIC LEUKEMIA

New York, USA, May 2017

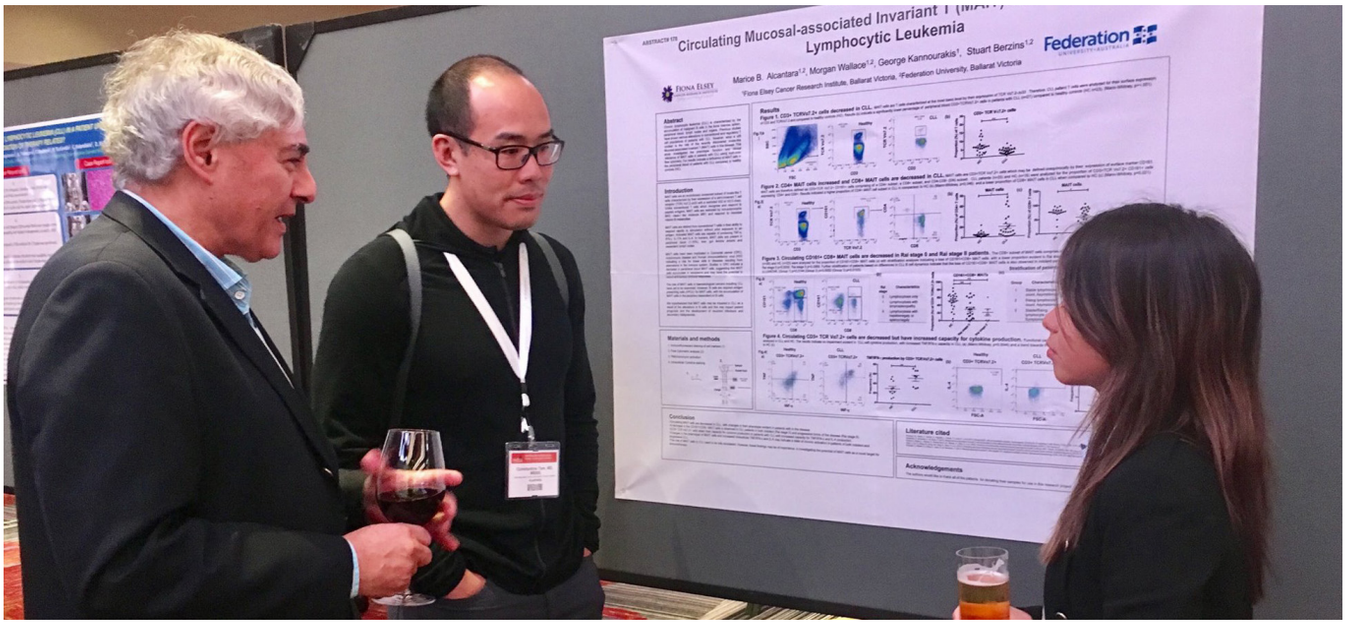
MARICE ALCANTARA, Federation University, Victoria, Australia

I received an ASI International Travel Award to attend the International Workshop of Chronic Lymphocytic Leukemia (iWCLL) held at Times Square in New York City (NYC) in May 2017. Over the past 30 years the meeting has been held to bring together international clinic-based and laboratory-based researchers in CLL. The main focus of the meeting is to provide a forum for attendees to make connections and contribute to advancing what is currently known about the still incurable disease.

CLL is the most common type of leukemia in the western world and is characterised by the accumulation of malignant B cells in the bone marrow, spleen, peripheral blood, lymph nodes and organs. The progression of CLL is highly variable and can be difficult to anticipate. While many patients may have an indolent disease where no symptoms are displayed initially, a state that can be maintained for decades and results in a relatively normal life expectancy, CLL can also progress rapidly with some patients exhibiting symptoms and enlarged organs almost immediately, with these patients succumbing to the disease within a few years. It is currently difficult to determine if or when patients may develop the aggressive form of the disease and, furthermore, predict the duration of its clinical course.

The conference ran over four days with the first day dedicated to a Young Investigators Meeting. As a PhD student, this provided me with a relaxed introduction to what would be a very focused clinical and laboratory meeting and I found the day to be very useful. There were 24 presentations scheduled for the day, and some of the talks I found most useful were those talks which focused on the changes in specific immune cells following Ibrutinib treatment in patients with CLL.

My PhD project focuses on the role of MAIT cells in CLL and I was fortunate enough to have my abstract accepted for a poster



ABOVE:WITH THE RESEARCH DIRECTOR OF OUR LAB PROFESSOR GEORGE KANNOURAKIS AND ASSOCIATE PROFESSOR CONSTANTINE TAM (PETER MACCALLUM) DISCUSSING OUR SHARED RESEARCH INTERESTS IN FRONT OF MY POSTER.

presentation. The presentation was a great opportunity for me to be able to present my work to clinicians and researchers in CLL and gain some feedback on where my work fits in the field. It was a great experience.

In addition to this, after the conference I had the opportunity of visiting the Mucida lab in Rockefeller University in NYC and the Cheroutre lab at La Jolla Institute for Allergy and Immunology in San Diego, California. At the Mucida Lab, I spent some time speaking to lab members about their research and about life and working in New York City, before getting a chance to walk around Central Park on my way home. In California, I spent an entire day speaking to Hilde Cheroutre, who is the Division head and Professor of the Division of Developmental Immunology at La Jolla Institute for Allergy and Immunology in San Diego, about her work and in turn speaking about the work that I do. I also had a chance to speak to her postdoc about his experience working in the lab and living in San Diego. Then, I got the chance to sit in their lab meeting where the current work of several postdocs was presented, which was a very insightful experience.

As I am in the final year of my PhD, being able to attend an international conference in CLL and also visit labs was a very valuable experience. I have been able to discuss my research with leading international clinicians and researchers and have been able to see how research is conducted overseas. It was a great opportunity that would not have been possible without the generous award from ASI. ■

ENJOYING DINNER IN NEW YORK CITY IN BETWEEN CONFERENCE PRESENTATIONS

INTERNATIONAL CONGRESS FOR MUCOSAL IMMUNOLOGY 2017

July 19-22, Washington DC, USA

JASON PAUL LYNCH, QIMR Berghofer Medical Research Institute

In July, I had the great pleasure of attending the International Congress for Mucosal Immunology in Washington DC. We arrived into DC amidst a heatwave and were greeted by temperatures above 40oC. I felt this rather appropriate given the sizzling line-up of speakers we were to be treated to over the next few days. Some of the 'biggest' names in mucosal immunology were in town: Yasmine Belkaid, Andrew Macpherson, Richard Blumberg, Greg Barton to name a few. The ICMI organisers insist that speakers present unpublished data and attendance at ICMI gives you great insight into the latest findings from these top laboratories. The smaller size of ICMI also provides a more intimate setting for these findings to be discussed in a robust manner.

I was most looking forward to the presentation by Ramnik Xavier of the Broad Institute/ MIT and Harvard. I was not disappointed. Dr Xavier presented data from genetic, structural, computational, and animal models together with clinical cohorts that support several novel molecular mechanisms that govern the inception of Crohn's disease and ulcerative colitis, two very common chronic inflammatory diseases of the gut. As someone with a primary interest in lung disease, my interest in this particular talk might seem peculiar but as we have come to understand more about the immune response to environmental triggers of asthma (e.g. viruses), it is becoming ever more apparent that the way in which the lung responds to these triggers is critically influenced by the gut microbiome. That this occurs during a critical 'window of susceptibility' in early life is a concept I explored during my PhD and have continued to investigate during my first year as a postdoc in Simon Phipps' Lab at The University of Queensland (now moved to QIMR Berghofer Medical Research Institute).

These findings were the subject of my oral presentation in the 'Asthma' session. Our chair was Stephanie Eisenbarth, an eminent Immunobiologist at Yale School of Medicine, who set the scene with an elegant description of the problem at hand: asthma heterogeneity, chronic airway inflammation and 'the chicken or the egg' with respect to gene-environmental interactions. I was first in session to present and I must admit I was a little more nervous than usual. But my talk went well, as evidenced by the feedback I received from audience members and a "let's grab a beer – you've earned it" from Simon. On a related note, I was pleasantly surprised to find that DC boasts superb array of 'hipster bars', one of which became a regular re-fuelling stop between the conference and our accommodation. Back to the

MARTIN LUTHER KING JR. MEMORIAL

conference and later that same day it was my turn to present my poster. I had some great discussion(s) with both junior and senior researchers, and these got me thinking about some potential new directions in which to take my work.

Of course, my time in Washington DC was not all symposia and posters. We had ample opportunity to explore the city. It was great to see the sites of DC. Of these, highlights included The Lincoln Memorial, The White House, The WW2 Memorial, The Washington Monument. However, the standout for me was seeing The Martin Luther King, Jr. Memorial (pictured).

I am very grateful to both the ASI and the Society for Mucosal Immunology for supporting my attendance at ICMI2017

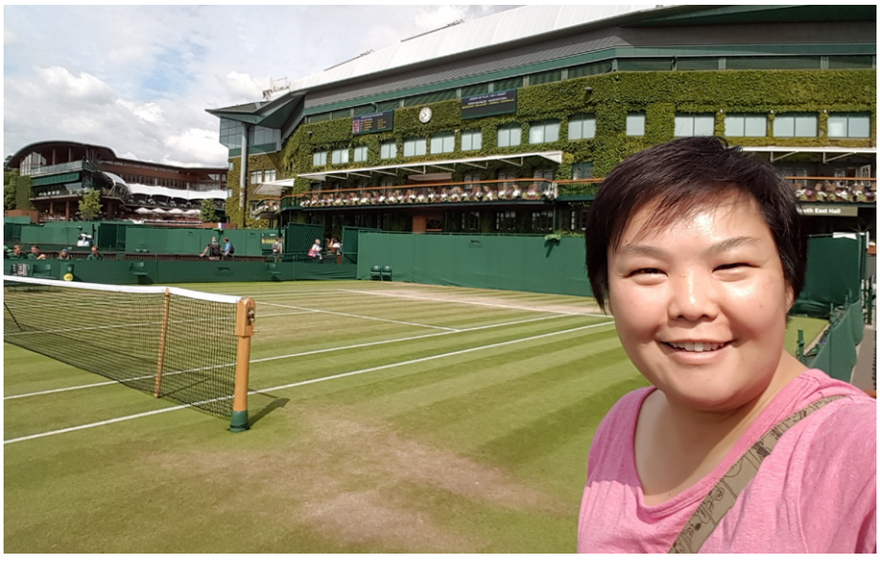
I am very grateful to both the ASI and the Society for Mucosal Immunology for supporting my attendance at ICMI2017. As I am shortly leaving Australia for a postdoc in Boston, I would also like take this opportunity to say how grateful I am to the ASI for all the opportunities that have been afforded to me over the past six years as a member of the Society. While I am looking forward to my new position in Boston, I am sad to be leaving Australia and I will miss the colleagues and friends I have made through being part of the ASI family. My partner and I intend to return to Australia at the completion of our postdocs so it's merely an au revoir from us for now! ■

PHIPPS LAB MEMBERS (LEFT TO RIGHT): SIMON PHIPPS, RHIANNON WERDER, JENNIFER SIMSON AND ME AT THE ICMI2017 CONFERENCE RECEPTION.

13TH WORLD CONGRESS ON INFLAMMATION

London, UK, July 8 – 12, 2017

DR CONNIE WONG, Monash University, Melbourne



DR CONNIE WONG AT WIMBLEDON

I attended the biennial World Congress of Inflammation, which was held in London between 8 – 12 July this year. The congress scientific program promised the best in inflammation science from distinguished researchers from across the globe, and it did not disappoint. The meeting covered key and emerging topics from across the spectrum of inflammatory mechanisms and therapeutic areas, with a specific focus on inflammation in ageing (inflammaging), infection and neuroinflammation.

A key indicator of the quality of a meeting is the calibre of the researchers attending. In this regard, the meeting was outstanding, featuring leading scientists such as Fiona Powrie, Luke O'Neill, Adrian Hayday, Mauro Perretti, Adriano Rossi, and many more.

A highlight of the meeting was the opening morning of the conference with plenary lectures by Janet Lord and Michal Schwartz. Janet Lord is Professor of Immune Cell Biology, director of the Institute for Inflammation and Ageing at Birmingham University Medical School and is also director of the MRC-Arthritis Research UK Centre for Musculoskeletal Ageing Research. In her plenary, we learned of the term "Inflammaging", which has been shown to be associated with increased risk of a range of age-related diseases including cardiovascular disease, sarcopaenia and dementia. The causes of this inflammation are varied and include increased sedentary behaviour and associated adiposity, a build-up of senescent cells (which are pro-inflammatory) as well as age-related changes to the immune system. Her recent publications have provided evidence that adults who maintain a high level of physical activity show no signs of inflammaging and also display few signs of the aging phenotype. In fact, the age-related changes to the immune system, including reduced neutrophil migrational accuracy and basal activation of monocytes, contributed to inflammaging via constitutive activation of PI3Kδ.

Michal Schwartz is a Professor of Neuroimmunology, incumbent of The Maurice and Ilse Katz Professorial Chair in Neuroimmunology, at the Weizmann Institute of Science, Rehovot, Israel. In her plenary, she took us on a journey of her stellar

PROF. MICHAL SCHWARTZ PRESENTING HER STIMULATING PLENARY

career that basically redefined the relationships between the brain and the immune system in health and disease. She was the pioneer suggesting that both monocytes and T cells are needed for repair of injured CNS tissues. Her more recent work identified the brain's choroid plexus epithelium, which forms the blood-CSF-barrier, as an active physiological immunological interface between the brain and the circulation, and as an entry gate for leukocytes, needed for brain homeostasis and repair. Furthermore, her team discovered that brain aging and neurodegenerative diseases are associated with dysfunction of this interface, and that unleashing the immune system can combat Alzheimer's disease.

I would also like to highlight the International Association of Inflammation Societies and conference advisory committee for the recognition of women in inflammation research by awarding "Women in Science Award & Lecture" to Jane Mitchell. It is important to note that the eligibility for this award is not restricted to women, but it also recognises men who support and help facilitate women researchers in their careers.

KOALA CLIPS AND BOOMERANG KEYRINGS AT THE SYDNEY 2019 WORLD CONGRESS ON INFLAMMATION BOOTH

My own talk was scheduled for the afternoon of the first full day of conference. I was the last speaker for our very own "Symposia Session – Australia"; titled "Novel inflammatory pathways and targets". I was delighted with the attendance at our session, as there were two other concurrent symposiums in nearby theatres. I was also inspired and encouraged by the feedback I received after the session. Speakers of this session were also tasked to assist in promoting the next World Congress on Inflammation by taking a turn in attending the Sydney 2019 World Congress on Inflammation booth at the London Meeting. Luckily, I brought along packs of koala clips and boomerang keyrings to give away (extremely well-received), as the organisers' shipment got lost and never arrived. Of course, I also made the most of London's sunshine and attractions. In addition to going to famous tourist attractions (e.g. London Bridge, Westminster Abbey, Buckingham Palace, Trafalgar Square, etc.), I was lucky enough to score tickets to Wimbledon – that was definitely a major travel highlight for a huge tennis fan.

LONDON EYE ON A BEAUTIFUL AND SUNNY DAY.

Overall, the conference has given me an invaluable insight and update into inflammation research internationally. The opportunities for feedback on my research and networking were many, giving me additional exposure to potential local and international collaborations.

Many thanks go to the Australasian Society for Immunology for supporting my travel to this conference by way of a Gordon Ada Senior Travel Award. ■

MOLECULAR AND CELLULAR BIOLOGY OF HELMINTHS XI

Hydra, Greece, 3-8 September 2017

KARA FILBEY, Malaghan Institute of Medical Research, Wellington, NZ

The Hydra conference is an annual meeting of around 90 people – nice and intimate – all focused on the biology of worms, and the immune responses to them. It is organised by my former PhD supervisor Rick Maizels (University of Glasgow, Scotland) and it was a joy to finally make it there, having heard stories about this wonderful island from many friends and colleagues.

Hydra did not disappoint! It's a tiny island, 1½ hours on the ferry from Athens, and has no motorised transport – horses are available at the port for getting you and your baggage wherever you need. The town itself is small and typically Greek – winding cobbled lanes, white-washed houses, harbour-side dining, crystal clear sea.

I was happily reunited with several old lab mates from Scotland, and made contacts with people I'd never met before. Being such a small conference, there is no excuse for not chatting and connecting with lots of the attendees. Several dinners and two excellent roof-top poster sessions helped facilitate this, as did the free afternoons when swimming was a common activity in the beautiful turquoise water just a short walk from the conference hotel.

There were sessions on the molecular biology of helminths and their secreted products, genomics and manipulation of helminths, drug development and vaccines, and the immunology involved in helminth infection. The keynote speech on the evening of our arrival was from Klaus Brehm (University of Würzburg, Germany) on tapeworm-induced cancer-like growths in the lung (alveolar echinococcosis) and the development of drugs to target this unusual phenomenon.

Astra Bryant (UCLA, USA) has been doing some fascinating work on temperature and scent as sensory cues used by different helminths in host-seeking behaviour. Worm infective larvae enter their hosts by passive ingestion or actively penetrating the skin, and therefore display very different behaviour and utilise various senses to locate their hosts.

Our fellow Antipodean Alex Loukas (James Cook University, Australia) talked about his group's work on how liver flukes can promote angiogenesis and wound repair through release of specific protein mediators and extracellular vesicles.

There were several talks from people working in the field on the epidemiology of worm infection in humans. Maria Yazdanbakhsh (Leiden University Medical Centre, The Netherlands) has found that

HYDRA TOWN. PHOTO: KARA FILBEY.

helminth infections are associated with lower insulin resistance in her Indonesian study participants. It is thought that the high levels of circulating IgE and eosinophilia in helminth infected people may be helping to keep insulin-resistance down, and this is linked to lower rates of obesity and diabetes in these populations. Mouse models of helminth infection are helping to tease apart the immune mechanisms involved in glucose tolerance and insulin resistance.

On the final day, Tim Geary (McGill University, Canada) gave a fascinating talk on the mechanisms of action of anthelminthic drugs, in particular ivermectin which has widespread use for several classes of helminth. Extensive in vitro experimentation has shown that whilst the drug acts to paralyse gastrointestinal helminths like Haemonchus contortus and prevent them feeding, the mechanism in tissue-dwelling filarial worms such as Brugia malayi, is quite different. Unlike other essential nutrients, iron cannot be obtained from the environment of the worm by uptake directly through the cuticle, as it is usually complexed with large carrier proteins in mammalian blood. It seems that ivermectin interferes with the ability of filarial worms to acquire iron through pharyngeal pumping, and the lack of iron results in extremely prolonged inhibition of egg production by the adult and the breaking of parasite transmission.

REUNION OF MAIZELS' LAB ALUMNI AND CURRENT MEMBERS.

BACK ROW: STEPHAN LOESER, CLAIRE DRURY, KARA FILBEY, ALEX LOUKAS, RICK MAIZELS, JOHN GRAINGER; FRONT ROW: IRMA SCHABUSSOVA, ANNA KILDEMOES, FUMI VARYANI, HENRY MCSORLEY, JAMES HEWITSON, DANIELLE SMYTH, JUDI ALLEN, CECEILA FERNANDEZ . PHOTO: KARA FILBEY.

Finally, talks by Henry McSorley (University of Edinburgh, Scotland) and Danielle Smyth (University of Glasgow, Scotland) highlighted the varied nature of immunomodulation by helminth parasites and their therapeutic

potential. Henry has been working on the identification and characterisation of a molecule found in the excretory-secretory (ES) products of Heligmosomoides polygyrus – a commonly used rodent gastrointestinal helminth with potent immunomodulatory effects in mice. His particular protein is a potent inhibitor of IL-33 release from epithelial cells in the lung and can recapitulate previous findings that both live worm infection, and the administration of the whole ES mixture can inhibit IL-33 release and lung inflammation after airway allergen administration. Danielle's work has continued a project I worked on in the Maizels' lab during my PhD, identifying the component in H. polygyrus ES that confers TGF-beta-like activity, and induces the conversion of naïve T cells into regulatory T cells (Tregs). Both molecules have exciting potential for therapy of many inflammatory disorders in humans.

The Hydra conference was extremely interesting and of huge benefit to me

The Hydra conference was extremely interesting and of huge benefit to me to attend, considering there aren't a huge amount of people in New Zealand working on the immunology of helminth infection! The location and small size of the conference both helped to make it a relaxed and collaborative atmosphere. I would like to thank the ASI for contribution to the funding of my trip, and to Graham Le Gros for supporting me to go. ■

THE POSTER SESSION ON THE ROOF OF THE TOWN MUSEUM

GORDON ADA SENIOR TRAVEL AWARD

Singapore and Italy

SCOTT BYRNE, University of Sydney, NSW, Australia

I was honoured and grateful to be awarded the Gordon Ada Senior Travel Award that allowed me to travel to Europe and Singapore in September 2017. First stop on my 13 day trip was Pisa via Rome to attend the 17th European Society for Photobiology meeting. Fellow ASI member, Professor Prue Hart and I had been invited to organise, chair and present in the session titled "Photoimmunology in health and disease". My PhD student and

SINGAPORE. L TO R: SCOTT BYRNE, YONGLIANG ZHANG, CHEN YU-SHEN, SHARON WOK

ASI member Benita Tse also had the opportunity to showcase her research in this session which was very well attended and received. The sensational Tuscan cuisine gave us plenty of excuses to continue discussions and foster collaboration after the formal sessions had finished. Overall it was an excellent meeting. One more thing … If you're fortunate enough to get to Pisa, you must treat yourself to gelato from the family-run La Bottega Del Gelato. But beware – there's often a long line.

The return to Sydney provided me with the opportunity to stop off in Singapore to visit two rising stars in immunology: Lai Guan Ng from Singapore Immunology Network (SIgN) and Yongliang Zhang from National University of Singapore (NUS). I was invited to present our group's latest research findings at both institutions. Valuable discussions with leading

PISA, ITALY. L TO R: KATIE DIXON (SYDNEY UNI), SCOTT BYRNE, PRUE HART AND BENITA TSE

immunologists Evan Newell and Nicholas Gascoigne continued over some very fine food and refreshing beers. My visit to Singapore was a highlight of the trip and has already resulted in early discussions about potential collaborations.

I'd like to sincerely thank the ASI for their support without which this trip would not have been possible. ■

BRANCH REPORTS

VICTORIA/TASMANIA

SCOTT MUELLER

As I write this we are gearing up to hold the 23rd annual scientific meeting of the Immunology Group of Victoria in the Yarra Valley (August 24-25th). The conference was over-subscribed and it promises to be a very interesting meeting with three international speakers, including an ASI VSP Prof. Adrian Liston (Belgium) as well as Prof. David Price (Cardiff) and Dr Kristin Ladell (Cardiff). National speakers include Mariapia Degli-Esposti, Matt Sweet, Charles Mackay, David Tscharke, Kate Stacey, James Vince, David Tarlinton and Meredith O'Keeffe.

On October 13th IgV is once again holding a one day Masterclass. This year's event will focus broadly on the topic of Immunotherapies and will be held in the new Victorian Comprehensive Cancer Centre (VCCC). We have a great line-up of local and national speakers, including Stuart Tangye (Garvan), Stephen Kent (PDI), Edwin Hawkins (WEHI), Irene Caminschi (Monash), Robyn O'Hehir (Monash), Nick Huntington (WEHI), Paul Neeson (PMCC) and Bruce Lyons (University of Tasmania). Tours of the VCCC building will also be offered after the scientific sessions for those interested in seeing a bit more of the impressive building. ■

On October 13th IgV is once again holding a one day Masterclass. This year's event will focus broadly on the topic of Immunotherapies

NEW ZEALAND

RIES LANGLEY

The NZASI Branch Meeting was held this year on 3-5 July and hosted by the University of Otago, Christchurch. Many thanks to the organizing committee for all their hard work in providing the branch with another highly successful meeting. Thanks to all the speakers from around the country for their excellent presentations and to our special guest speakers from Australia. Attendance was great with nearly 100 participants, despite the cold Christchurch weather (Figure 1).

Conference chair Dr Margaret Currie has provided the following summary of the meeting:

FIGURE 1: A STORMY MID-WINTERS DAY IN CHRISTCHURCH. ON THE RIGHT IS THE UNIVERSITY OF OTAGO, CHRISTCHURCH, LOCATED AT THE CHRISTCHURCH HOSPITAL. PHOTO COURTESY OF GABI DACHS.

NZASI BRANCH MEETING 2017

The NZASI Meeting was held in Christchurch for the first time in 2017. Christchurch was chosen as the venue to support the city as it rebuilds after the earthquakes of 2011. The NZASI also aimed to recruit new research staff and student members to the Society, and re-establish links between Canterbury and the wider NZ immunology community that have lapsed over the last decade.

CONFERENCE PROGRAM

Teoti Jardine (Waitaha, Kati Mamoe, Kai Tahu) gave the opening Mihi and Karakia, and also closed the conference with a karakia. The Chair of the organising committee (Dr Margaret Currie, University of Otago Christchurch) welcomed attendees to the conference.

Keynote speakers included: Dr Laura Mackay (University of Melbourne, Australia), Dr Ashley Mansell (Hudson Institute of Medical Research, Australia), Dr Helen McGuire (Centenary Institute & University of Sydney, Australia), Prof. Ian Hermans (Malaghan Institute of Medical Research, NZ), and Prof. Rod Dunbar (University of Auckland, NZ).

Prof Graham LeGros (Malaghan Institute of Medical Research, NZ), introduced the annual Watson Oration and gave a brief history of Jim Watson and his involvement in NZ science. The Watson Oration was given by Prof. Sarah Hook (University of Otago).

The remainder of the conference program was organised into the following sessions: Basic Science (Chair Franca Ronchese), Cancer (Chair Gabi Dachs), Inflammation (Chair Ries Langley), Infection (Chair Jo Kirman), and a final session to showcase research based in Christchurch (Chair Rod Dunbar).

SOCIAL EVENTS

An informal pre-conference get-together was held at the Pegasus Arms on Monday evening. The conference dinner was held at the beautifully restored Great Hall in the Christchurch Arts Centre (Figure 2). During the evening, Prof. Sarah Young (University of Otago) gave a warmly received address celebrating the life and work of the late Prof. Margaret Baird, a leading immunologist and former member of University of Otago.

AWARDS AND PRIZES

- **Glen Buchan (Buck) Award for Best Student Presentation**
  Kirsten Ward-Hartstonge, University of Otago
- **Heslop Award for Best Postdoctoral Presentation**
  Kara Filbey, Malaghan Institute of Medical Research
- **Marbrook Award for Best Research Assistant Presentation**
  Elsa Roussel, Malaghan Institute of Medical Research
- **NZASI Exhibitor's Passport Winner**
  Natalie Parlane, AgResearch (Hopkins Research Institute)
- **PeproTech prizewinners**
  Hamish Angus (University Otago), and Katharina Robichon (Victoria University Wellington).

ORGANISING COMMITTEE

- Dr Margaret Currie (Chair)
- Assoc Prof Gabi Dachs
- Prof Mark Hampton
- Assoc Prof Roslyn Kemp
- Dr Abel Ang
- Bailey Kennedy

VSP IN NZ

The Malaghan Institute of Medical Research hosted Adrian Liston (University of Leuven and the VIB) in August. Here's what MIMR PhD candidate Joshua Lange had to say on the visit:

I had the pleasure of meeting Adrian Liston at the Malaghan Institute of Medical Research when he visited to present his seminar on 'Shaping the human immune system'. Within my own research group, we utilise various techniques and approaches to harness the immune system to fight cancerous malignancies. Adrian's perspective on the immune system and how it is shaped due to multiple intrinsic and extrinsic factors brought a fresh perspective on how we view immunology. He was a very engaged speaker in our meeting and taught me a lot of biological models and current research I wasn't aware of. He was enthusiastic about discussing my own project and how his own research relates to it, which helped to generate new ideas. He then challenged me to think beyond the scope of my own 'niche' as to how my work could impact other areas of immunology. Overall, being able to listen to Adrian's seminar and meet him has been a valuable learning and professional development experience.

Check the ASI website for more details on the upcoming visit by Prof Cezmi Akdis (Swiss Institute of Allergy and Asthma Research) to Wellington in October. ■

FIGURE 2: THE GREAT HALL (1882), CHRISTCHURCH ARTS CENTRE (FORMERLY THE CANTERBURY COLLEGE). NEAR THE SITE OF RUTHERFORD'S BASEMENT 'LABORATORY' WHERE AS A STUDENT IN 1893 ERNEST RUTHERFORD CARRIED OUT EXPERIMENTS ON THE MAGNETISATION OF IRON BY HIGH-FREQUENCY DISCHARGES. PHOTO COURTESY OF GABI DACHS.

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PUBLICATIONS OF INTEREST

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Novel assay reveals a large, inducible, replication-competent HIV-1 reservoir in resting CD4+ T cells

doi: 10.1038/nm.4347

EasySep™ Human Resting CD4+ T Cell Isolation Kit

The transcriptional coactivator TAZ regulates reciprocal differentiation of Th17 cells and Treg Cells

doi: 10.1038/ni.3748

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Interferon-λ mediates non-redundant front-line antiviral protection against influenza virus infection without compromising host fitness

doi: 10.1016/j.immuni.2017.04.025

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Hypoxia ameliorates intestinal inflammation through NLRP3/mTOR downregulation and autophagy activation

Cosin-Roger J et al., Nature communications, July 2017. PMID 28740109.

http://dx.doi.org/10.1038/s41467-017-00213-3

Anti-HIF-1 alpha antibody [EP1215Y] (ab51608)

Nature communicationsLet-7 microRNA-dependent control of leukotriene signaling regulates the transition of hematopoietic niche in mice. Jiang X et al., July 2017. PMID 28743859

http://dx.doi.org/10.1038/s41467-017-00137-y

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Anti-TTF1 antibody [EP1

Nguyen TH, Tan AC, Xiang SD, Goubier A, Harland KL, Clemens EB, Plebanski M, Kedzierska K.

Understanding CD8+ T-cell responses toward the native and alternate HLA-A*02:01-restricted WT1 epitope.

Clin Transl Immunology. 2017 Mar; 6(3)

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Gao Y, Souza-Fonseca-Guimaraes F, Bald T, Ng SS, Young A, Ngiow SF, Rautela J, Straube J, Waddell N, Blake SJ, Yan J, Bartholin L, Lee JS, Vivier E, Takeda K, Messaoudene M, Zitvogel L, Teng MWL, Belz GT, Engwerda CR, Huntington ND, Nakamura K, Hölzel M, Smyth MJ.

Tumor immunoevasion by the conversion of effector NK cells into type 1 innate lymphoid cells.

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NK Cell Isolation Kit II, mouse

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TexMACS medium

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Nat Genet. 2017 Jul;49(7):1061-1072. doi: 10.1038/ng.3868.
Lineage-specific functions of TET1 in the postimplantation mouse embryo.
Khoueiry R, et al

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Biallelic mutations in the ubiquitin ligase RFWD3 cause Fanconi anemia.
Knies K, et al

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Nucleotide-binding oligomerization domain-containing protein 2 (Nod2) modulates T1DM susceptibility by gut microbiota.

Li YY, Pearson JA, Chao C, Peng J, Zhang X, Zhou Z, Liu Y, Wong FS, Wen L.

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PMID: 28592385

Cell Stimulation Cocktail (500X) TNB-4975

Skin-infiltrating, interleukin-22-producing T cells differentiate pediatric psoriasis from adult psoriasis.

Cordoro KM, Hitraya-Low M, Taravati K, Sandoval PM, Kim E, Sugarman J, Pauli ML, Liao W, Rosenblum MD.

J Am Acad Dermatol. 2017 Sep;77(3):417-424. doi: 10.1016/j.jaad.2017.05.017. Epub 2017 Jun 16.

PMID:28624119

Ghost Dye™ Fixable Viability Dyes

Complete human serum maintains viability and chondrogenic potential of human synovial stem cells: suitable conditions for transplantation

Mitsuru Mizuno, Hisako Katano, Koji Otabe, Keiichiro Komori, Yuji Kohno, Shizuka Fujii, Nobutake Ozeki, Masafumi Horie, Kunikazu Tsuji, Hideyuki Koga, Takeshi Muneta, Ichiro Sekiya

Stem Cell Res Ther. 2017; 8: 144. Published online 2017 Jun 13. doi: 10.1186/s13287-017-0596-0

PMCID: PMC5470274

PUBLICATIONS OF INTEREST

FROM OUR MEMBERS

ABBIE FRANCIS

Neutrophil activation during acute human anaphylaxis: analysis of MPO and sCD62L.
Francis A, Bosio E, Stone SF, Fatovich DM, Arendts G, Nagree Y, Macdonald SP, Mitenko H, Rajee M, Burrows S, Brown SG.
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PMID: 28560114

ANDREAS BEHREN

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Nature. 2017 Aug 16. doi: 10.1038/nature23643. [Epub ahead of print]
PMID: 28813417

ANDREW LEW

PMID:28362427

PMID:28401883

ANDREW S. FLIES

Comparative Analysis of Immune Checkpoint Molecules and Their Potential Role in the Transmissible Tasmanian Devil Facial Tumor Disease
Andrew S. Flies, Nicholas B. Blackburn, Alan Bruce Lyons, John D. Hayball, and Gregory M. Woods
Front Immunol. 2017; 8: 513.
PMID: 28515726
PMCID: PMC5413580
DOI: 10.3389/fimmu.2017.00513

PD-L1 Is Not Constitutively Expressed on Tasmanian Devil Facial Tumor Cells but Is Strongly Upregulated in Response to IFN-γ and Can Be Expressed in the Tumor Microenvironment
Andrew S. Flies, A. Bruce Lyons, Lynn M. Corcoran, Anthony T. Papenfuss, James M. Murphy, Graeme W. Knowles, Gregory M. Woods, and John D. Hayball
Front Immunol. 2016; 7: 581.
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ANGELA PIZZOLLA

Pattern recognition receptor immunomodulation of innate immunity as a strategy to limit the impact of influenza virus.
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ANNA COUSSENS

Paradoxical upgrading reaction in extra-pulmonary tuberculosis: association with vitamin D therapy.
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PMID: 28475709

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PMID: 28607084

ASCT2 (SLC1A5)-Deficient Mice Have Normal B-Cell Development, Proliferation, and Antibody Production.
Masle-Farquhar E, Bröer A, Yabas M, Enders A, Bröer S.
Front Immunol. 2017 May 12;8:549. doi: 10.3389/fimmu.2017.00549. eCollection 2017.
PMID: 28553292

ANTJE BLUMENTHAL

WNT ligands contribute to the immune response during septic shock and amplify endotoxemia-driven inflammation in mice.
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