Syntrophy
Volume 19
Issue 9 2018

THE AUSTRALIAN SOCIETY FOR MICROBIOLOGY NSW-ACT BRANCH (ABN 24 065 463 274)

From the Editor

by Mitchell Brown

Welcome to Syntrophy edition 9 for 2018. We have a jam-packed edition prepared for you this month, kicking off with Maria Mempin's fantastic focus article 'Biofilm, breast implants and anaplastic large cell lymphoma.' What an interesting read about the potential involvement of bugs in the aetiology of yet another malignancy. Maria is a PhD candidate at the Faculty of Medicine and Health Sciences at Macquarie University. She completed a Masters of Research in Advanced Medicine in the areas of cellular immunity and immunopathology and has since been working on the role of bacterial antigens in cancer development under the supervision of Associate Professor Karen Vickery. Thanks for a great read Maria.

In this edition you will find event reports from our recent Goldsworthy memorial lecture and dinner, the lecture being delivered by the committee's very own Professor Dee Carter (details pg.#6). We hold this event every second year to commemorate the life and career of Neil Ernest Goldsworthy. You will also find details from our recent Careers' night, which I had the pleasure of speaking at. (details pg.# 5). Great to have so many people attending these events and making them such enjoyable and productive evenings.

We have a busy events schedule as we race towards the end of yet another year with several events coming up before Christmas that we urge you to get involved in, including; Bugs by the Beach 2 on the 15th-16th of November (details pg.# 10); The Clinical SIG one day meeting on the 4th of December (details pg.# 7); and the branch Christmas party on the 6th of December (details pg.# 4). We hope you enjoy the read.

IN THIS ISSUE

ASM NSW & ACT BRANCH HOLIDAY PARTY

6th December 2018
7:00 – 9:00pm
The Rocks Brewery
Building 2, 160 Bourke Street
Alexandria NSW

See details page #4

Regular Features

NEXT SYNTROPHY

Deadline for submissions to next issue: **22nd November 2018**

CONTACT SYNTROPHY COORDINATOR
syntrophy@asmnsw.com.au

Upcoming Events

BUGS BY THE BEACH 2

15-16th November 2018
The University of Newcastle, Australia
NeW Space Building Level 5, X502
Hunter St & Auckland St, Newcastle

See details page #10

JAMS MEETING

27th November 2018
From 5.45pm
Upstairs, Harpoon Harry,
40-44 Wentworth Avenue, Surry Hills

See details page #12

Meeting Calendar

SAVE THE DATE

ASM NSW Branch Clinical Meeting
4th December 2018
9.00am – 3.00pm
Westmead Hospital

See details page #7

SAVE THE DATE

Sydney Micro Meeting
1st February 2019
University of Sydney Architecture

More details to follow

Branch Sponsors 2018

SILVER SPONSORS

ThermoFisher SCIENTIFIC

www.thermofisher.com.au

BRONZE SPONSORS

abacus dx

www.abacusdx.com

Alere™

www.alere.com

Focus

Biofilm, breast implants and anaplastic large-cell lymphoma.

by Maria Mempin, Department of Biomedical Sciences, Macquarie University, Sydney, Australia 2000

Anaplastic large-cell lymphoma is a recently diagnosed, rare non-Hodgkin CD4+ T-cell lymphoma, only associated in women with breast implants (BIA-ALCL). First reported in 1997 [1], its detection and incidence has risen worldwide due to the increase use of breast implants for both aesthetic and reconstructive surgery. It is now defined by the World Health Organisation as a distinct new cancer [2]. In Australia, there is a high incidence rate with the Australian Therapeutic Goods Administration (TGA) reporting 70 confirmed cases, including four deaths [3]. The TGA estimates the risk of developing BIA-ALCL to be between 1:1,000 and 1:10,000 women with breast implants [3]. However, the true incidence is likely to be higher due to under reporting and the lack of awareness of this disease. BIA-ALCL commonly presents as a localised late peri-implant seroma and less commonly as a mass type with potential to metastasise. The aetiopathogenesis and optimal treatment remains unknown, although a number of reported observations point to an underlying biofilm infection as a potential cause.

All patients with BIA-ALCL have been exposed to implants with an outer textured shell (Figure 1A) and implants with a higher surface area texture carry a 14 times higher risk of causing BIA-ALCL [4]. This is consistent with our findings that textured implants support up to 72 times higher growth of bacterial biofilms as compared with smooth implants (Figure 1B) both *in vitro* and *in vivo* [5]. Moreover, we have shown a significant linear relationship between biofilm infection of breast implants and T-cell hyperplasia and T-cell activation in both a pig model and in human specimens recovered from patients with chronic implant infection [6]. More recently, we characterised the surface texture of 11 available commercial implant types and their capacity to support bacterial growth [7]. In this study, we showed that high surface area and surface roughness was associated with significant potentiation of bacterial attachment and growth for both Gram-positive and Gram-negative organisms. It is postulated that the surface area of the texture provides bacteria with a better substrate on which to proliferate with the complexity of the surface also preventing access of host cells to mount an effective immune response.

The role of bacteria has been supported by our discovery of high levels of bacterial contamination within BIA-ALCL specimens [8]. Interestingly, the microbiome of these samples differ significantly from the microbiome surrounding implant capsules recovered from women without BIA-ALCL. The presence of a significantly higher proportion of Gram-negative bacteria suggest that their associated antigens may provide differential activation of lymphocytes as compared with Gram-positive bacteria which predominate in non-tumour associated implant capsules [8].

It is important to note that 30% of women with BIA-ALCL develop this malignancy following implant reconstruction for breast cancer [4], pointing to a possible additional genetic risk for carcinogenesis. A unifying hypothesis has been put forward to explain both observed biology and epidemiology of BIA-ALCL. It is hypothesised that a potential stimulus for developing BIA-ALCL is chronic bacterial, (particularly Gram-negative) antigen stimulation, resulting in sustained T-cell proliferation that potentially leads to malignant transformation. This is in combination with implant surface texture, patient genetic susceptibility and implant exposure time.

The incidence of BIA-ALCL is increasing worldwide and heightened awareness of this disease is required to recognise it early and ensure early removal of the breast implant. Several questions still remain unanswered, current research is focused on investigating the underlying aetiopathogenesis of BIA-ALCL by studying implant, patient as well as initiating and potentiating factors. The role of bacteria, biological pathways and host predisposition in antigenic stimulation and transformation of T-cells into lymphoma is a novel and previously unexplored area of research. The wider implications for bacterial interaction with the human immune system and its potential to initiate or potentiate malignancy may well uncover an important and potentially treatable cause(s) of cancer.

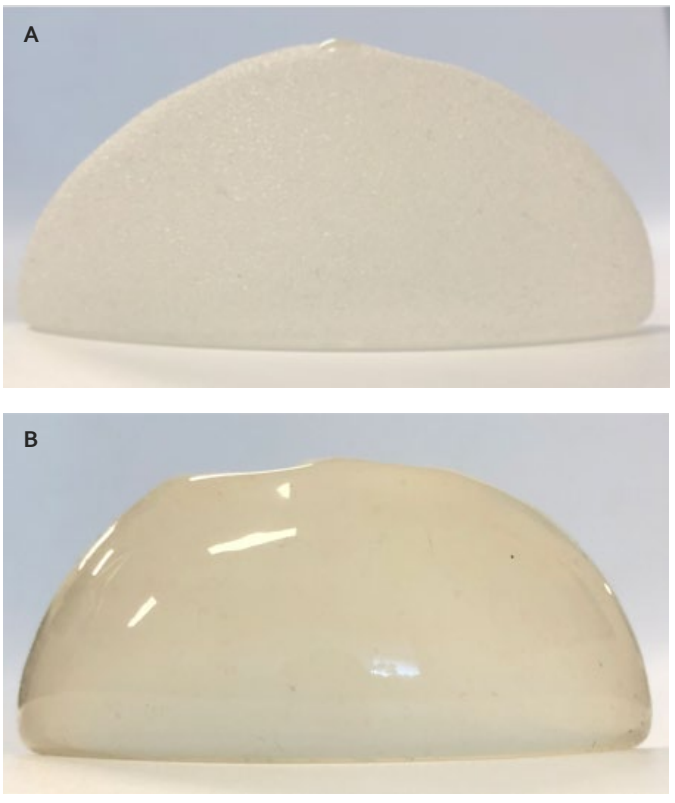


Figure 1. (A) Textured and (B) smooth surface breast implant devices used for breast augmentation and reconstruction.

ABOUT THE AUTHOR

Maria Mempin is a PhD candidate at the Faculty of Medicine and Health Sciences at Macquarie University. She completed a Master of Research in Advanced Medicine in the areas of cellular immunity and immunopathology and has since been working on the role of bacterial antigens in cancer development under the supervision of Associate Professor Karen Vickery.

Address for Correspondence: Maria Mempin, Faculty of Medicine and Health Sciences, Level 1, 75 Talavera Rd, Macquarie Park, NSW 2113. Email: maria.mempin@mq.ed.au.

REFERENCES

- 11. Keech, J.A., Jr. and B.J. Creech, Anaplastic T-cell lymphoma in proximity to a saline-filled breast implant. Plast Reconstr Surg, 1997. 100(2): p. 554-555.
- 2. Swerdlow, S.H., et al., The 2016 revision of the World Health Organization (WHO) classification of lymphoid neoplasms. Blood, 2016: p. 2375-2390.
- 3. TGA, Breast implants and anaplastic large-cell lymphoma. Update - additional confirmed cases of anaplastic large-cell lymphoma. 2018.
- 4. Loch-Wilkinson, A., et al., Breast implant–associated anaplastic large cell lymphoma in Australia and New Zealand: High-surface-area textured implants are associated with increased risk. Plast Reconstr Surg, 2017. 140(4): p. 645-654.
- 5. Jacombs, A., et al., In vitro and in vivo investigation of the influence of implant surface on the formation of bacterial biofilm in mammary implants. Plast Reconstr Surg, 2014. 133(4): p. 471-480.
- 6. Hu, H., et al., Chronic biofilm infection in breast implants is associated with an increased T-cell lymphocytic infiltrate: implications for breast implant-associated lymphoma. Plast Reconstr Surg, 2015. 135(2): p. 319-3129.
- 7. Jones, P., et al., The functional influence of breast implant outer shell morphology on bacterial attachment and growth. Plast Reconstr Surg, 2018. 142(4): p. 837-849.
- 8. Hu, H., et al., Bacterial Biofilm Infection Detected in Breast Implant-Associated Anaplastic Large-Cell Lymphoma. Plast Reconstr Surg, 2016. 137(6): p. 1659-1669

The Australian Society for Microbiology
bringing Microbiologists together

Careers in Microbiology

by Dee Carter

On the rather wet and chilly evening of 18 October, around 50 undergraduate and postgraduate students gathered at the University of Sydney to hear about the different career paths of five microbiology graduates. Mitchell Brown began by describing his life as a hospital scientist at Westmead, where he now runs one of the most advanced diagnostic labs in the country. He noted the changes that have occurred over the years and that the highly competitive work environment means it's vital to ensure job applications are of the highest standard possible. Jocelyn Basseal then talked about her transition from a microbiology PhD to working in publishing. Joss emphasised the importance of networking and, as a mother of three children, discussed the challenges that come with combining family life with a career. Anthony Brzoska then took over and described his change from working in a lab to working in a law firm, which clearly required a lot of hard work but has paid off in job security and financial benefits. Thea King then took us through her career, starting at CSIRO then undertaking qualifications in science policy before her current position at the New South Wales Food Authority. She articulated the importance of keeping an open mind and a flexible approach to new opportunities as they arise. Rounding it off, Christel Armstrong gave a lively talk about working in industry, with her long-term goal of a place on the board of different companies. She noted that sometimes to end at the top, you must start at the bottom, and described how she enjoys the opportunity to travel and meet new people, and how her work is constantly changing and is always interesting and challenging.

Once the talks were over the attendees had time to chat with the speakers informally over pizza and drinks. Overall it was a great evening with many students commenting on how they enjoyed hearing such diverse perspectives on careers that began with undergraduate microbiology. The ASM NSW branch committee extends a special thanks to all speakers and to Nick Coleman for his stellar job organising the refreshments.

Figure legends:

Left, about 60 students (a mixture of undergraduate, honours and PhD) listened to the interesting and varied speakers.

Above top: Thea King

Above middle: Our Careers Night speakers – from left to right: Thea King, Jocelyn Baseal, Christel Armstrong, Mitchell Brown and Anthony Brzoska;

Above bottom: Enjoying pizza and networking after the event

The Australian Society for Microbiology
bringing Microbiologists together

The Goldsworthy memorial lecture and dinner

by Mitchell Brown

Well entrenched in the events calendar of the NSW/ACT branch is the Goldsworthy memorial lecture and dinner. We hold the event every second year to commemorate the life and career or Neil Ernest Goldsworthy (NEG to his mates), a notable dentist, dental researcher and microbiologist.

Neil Earnest Goldsworthy had a profound effect on the development of oral microbiology in Australia. While a senior lecturer in the bacteriology department of the University of Sydney he published relevant papers on strains of *Actinomyces* and *Aggregatibacter actinomycetecomitans* which in recent years have received renewed attention in relation to periodontal disease. He also worked on the classification of lactobacilli from carious teeth. He pioneered the use of lactobacilli counts as an aid in assessing susceptibility to dental caries, particularly within studies on diet. As early as 1939, Goldsworthy had recognised the potential importance of *Streptococcus mutans* as a cause of dental caries, although it did not come into prominence in dental research until the 1970's.

He was also bacteriologist to Royal North Shore Hospital from 1934 – 1946, with responsibilities in clinical service, as well as doing research and teaching in medical school at USYD, and during the war years was director of the Kolling institute at RNSH. In 1946 Goldsworthy was appointed director of Pathology at the United Dental Hospital, Sydney. Later that year, largely due to his efforts and foresight, an Institute of Dental Research was set up in the hospital, with Goldsworthy as its foundation director, a position which he held until his sudden death in 1960.

This year the Goldsworthy memorial lecture was delivered by Professor Dee Carter of the University of Sydney. Dee is a leading researcher and academic in microbiology specialising in the field of Mycology. Dee shared with us, among other things, insights from her years of hard work on Cryptococci, showing correlations between phenotype and disease and highlighted some of the great collaborative work her lab is undertaking with research partners in parts of the world with significant disease burden.

Thanks to Willa Huston and Jai Tree for organising a wonderful night filled with great views, food, company, and for everyone who was able to attend to hear Professor Carter's entertaining and enlightening lecture.

The Australian Society for Microbiology

bringing Microbiologists together

ASM Clinical SIG

One Day Meeting

When: 4th December 2018

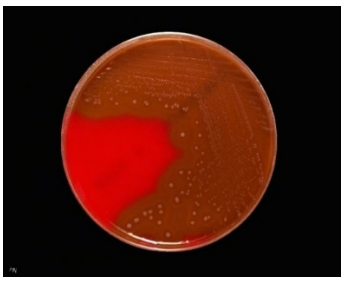
Where: Westmead Hospital Education Centre Lecture Theatre 2

Time: 9.00am – 3.00pm

Session 1 **Clinical Case Studies**

Session 2 **Modern Methods in Microbiology**

Session 3 **Public Health and General Microbiology**



COST
$15 ASM members
$35 non-members

PAYMENT INFO
Electronic Fund Transfer
Australian Society for Microbiology (NSW Branch)
BSB 659-000 Acct 671-774
Please add name in description

RSVP: Mitchell Brown by Wednesday 28th November for catering purposes

Email: mitchell.brown@health.nsw.gov.au

SOM: Combating Antimicrobial Resistance

School of Medicine

Scholarship code: 2018-105

The Ingham Institute conducts world-class medical research and Western Sydney University is one of its key partners. Founded by the community for the community, the Ingham's award-winning researchers are dedicated to finding better ways to improve health.

About the project

We are now offering **The Robert and Norma Ingham PhD Scholarship** to a highly motivated PhD candidate to work within a School of Medicine research group (based at the Ingham Institute) addressing the global health issue of antimicrobial resistance. The project is funded through 2021.

New antibiotics are desperately needed, and this project will explore the potential antimicrobial activity of novel compounds, particularly in the context of key hospital pathogens. In addition to susceptibility screening techniques, a variety of molecular approaches will be utilised to explore the mechanism of action for promising compounds. While based at the Ingham Institute, this project will involve working with external collaborators and industry partners.

What does the scholarship provide?

- Domestic candidates will receive a tax-free stipend of $30,000 per annum for up to 3 years to support living costs, supported by the Research Training Program (RTP) Fees Offset.
- Support for conference attendance, fieldwork and additional costs as approved by the School.

Eligibility criteria

We welcome applicants from a range of backgrounds, who are keen to apply their skills to key issues in combating antimicrobial resistance. In particular, the project is suitable for candidates with strong interests in microbiology and microbial resistance to antibiotics.

The successful applicant should:

- hold qualifications and experience equal to one of the following (i) an Australian First-Class Bachelor (Honours) degree, (ii) coursework Masters with at least 25% research component, (iii) Research Masters degree, or (iv) equivalent overseas qualifications.
- demonstrate strong academic performance in subjects relevant to microbiology and/or biology.
- have an understanding of the importance of antimicrobial resistance.
- be willing to learn analytical techniques applicable to microbiology.
- be enthusiastic and highly motivated to undertake further study at an advanced level.

International applicants are not eligible for this scholarship.

How to apply

1. Contact Associate Professor Slade Jensen (s.jensen@westernsydney.edu.au) to discuss your eligibility, the project requirements and your intention to apply.

2. Complete the scholarship application form (PDF, 222.11 KB).

3. Compile your CV, contact information for two referees and a one-page proposal stating how your research interests align with the project aims.

4. Ensure all documentation is certified according to Western Sydney University requirements.

5. All applications and supporting documentation must be submitted directly to the Graduate Research School as follows:

- Use the email subject line: **Application_2018_105_SOM**
- Submit to grs.scholarships@westernsydney.edu.au
- All attached documents must be submitted as PDF.
- In the body of your email, include your full name, your student ID (if you are a current or previous Western Sydney University student) and the full title of the scholarship.

Incomplete applications or applications that do not conform to the above requirements will not be considered.

Please contact the Graduate Research School via email at grs.scholarships@westernsydney.edu.au for more information.

Applications close 19 December 2018

**Applications close at 11.59pm Australian Eastern Standard Time (AEST).*

Bugs by the Beach 2 will bring together molecular microbiologists from the NSW-ACT area that work on fundamental scientific problems. The programme includes talks from microbiologists, geneticists, synthetic biologists and biophysicists. We hope to encourage communication between researchers and showcase technical capabilities within the region. The atmosphere will be relaxed and the schedule includes extended lunch breaks, giving you ample opportunities to chat with someone new.

Contact:
Ian.Grainge@newcastle.edu.au

THE UNIVERSITY OF NEWCASTLE AUSTRALIA

Venue
NeW Space Building Level 5, X502
Hunter St & Auckland St,
Newcastle NSW 2300

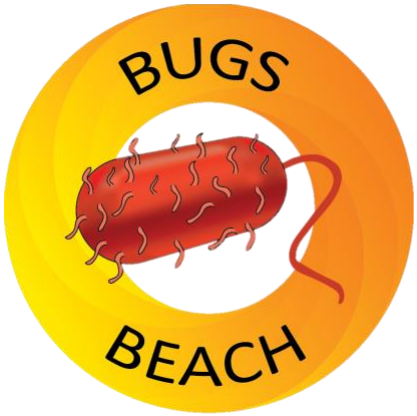
The Australian Society for Microbiology
bringing Microbiologists together

agrf
Empowering Australian Genomics

PRC FOR CHEMICAL BIOLOGY & CLINICAL PHARMACOLOGY

Registration closes November 5th.Please register here: https://goo.gl/forms/G8WjqZbgucHRL7Ly2
- free to ASM members, $30 to all others:
to make this payment please click HERE.

Program



Thursday November 15th

9.30 Welcome

9.35 Heather Hendrickson

10.15 *Morning Tea*

10.50 Tom Jeffries

11.20 Xiaojun (Holly) Yuan

11.40 Han Ho (University of Wollongong)

12.00 *Lunch*

2.00 Mike Manefield

2.30 Martina Sanderson-Smith

3.00 Nick Dixon

3.30 *Afternoon Tea*

4.00 Willa Huston

4.30 Amy Bottomley

5.00 Robert Moran

5.20-7.00 Posters

7.00 Dinner

Friday November 16th

9.30 Karl Hassan

10.00 Bradley Wright

10.20 *Morning Tea*

10.50 Iain Duggin

11.20 Dee Carter

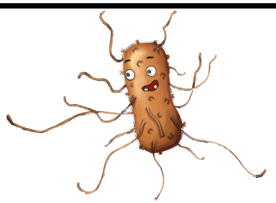
11.50 Giulia Ballerin

12.10 *Lunch*

JAMS
Joint Academic Microbiology Seminars

Remaining 2018 Session
Nov 27th

SAVE THE DATE!



What: A set of casual talks given by NSW-based, interstate, and international scientists on varying topics relating to microbiological research ranging from ecology to data science to public health (and everything in between!). Light catering is provided (by JAMS). Come have a pint and listen to what fellow Sydney/NSW scientists are up to!

Where: Upstairs, Harpoon Harry in Surry Hills, 40-44 Wentworth Ave, Surry Hills NSW 2010

When: From 5:45pm, last Tuesday of the month

#JAMSSyd @jamsorgau

FB: JAMS - Joint Academic Microbiology Seminars

Minima maxima sunt - The smallest things are the most important

CAPSIG (NSW) Appeal for Xmas Contributions

For over 25 years the CAPSIG (NSW) Committee has worked tirelessly to lobby freebies from pharmaceutical companies to fill our show bags for the CAPSIG Christmas seminar event. In the past, the retail value of the showbags was estimated to be in excess of $60 thanks to the support of our members and the generosity of their companies.

For those members who have been coming to the annual meeting over many years, you may have noticed the showbags have suffered considerable weight loss in recent years. This is due to the number of major pharmaceutical companies moving their operations off-shore, as well as the retirement of some supporting members and associates. Last year, in particular, we lost at least 4 major sponsors.

In the current climate, the total disappearance of showbags may become the reality; unless some of our ordinary members are able to help by lobbying their employers for product samples or promotional materials that would be suitable.

Based on previous experience amongst the CAPSIG members, it's a case of asking the right person in your company and being persistent. Contributing companies will be acknowledged at the CAPSIG seminar (unless requested not to) where we expect in excess of 150 industry members to be present.

Please contact one of your friendly committee members by October/ November (before our 2018 CAPSIG (NSW) December meeting!) if you are able to help.

We need your help to keep this annual tradition - please engage with your generous employers so we can continue this great event, for each and every Xmas, into the future.

The CAPSIG (NSW) Showbag Sub-Committee

Hilary Fong – 0416 239 868 / hilary.fong@unsw.edu.au

Melissa Bourke - melissa.bourke@biomerieux.com

Anna Maria Musico – annamariamusico@gmail.com

Yours sincerely

CAPSIG NSW Committee

The Australian Society for Microbiology
bringing Microbiologists together

ASM CONTACT DETAILS

ASM NSW-ACT State Branch

E. branch@asmnsw.com.au

ASM NSW-ACT Branch Chair

Mitchell Brown
T. +61 2 9845 6255
E. mitchell.brown@swahs.health.nsw.gov.au

ASM NSW-ACT Branch Secretary

Tim Newsome
T. +61 2 9351 2907
E. tim.newsome@sydney.edu.au

ASM NSW-ACT Branch Treasurer

Christopher Harmer
T. +61 2 9351 6028
E. christopher.harmer@sydney.edu.au

ASM National Office

9/397 Smith St,
Fitzroy VIC 3065
AUSTRALIA

T. 1300 656 423
F. 1300 655 841
E. admin@theasm.com.au

National ASM
www.theasm.org.au

ASM NSW-ACT Branch
www.asmnsw.com.au

Syntrophy is distributed via email to ASM Members located in NSW-ACT using details included on the ASM National Office database. *Not yet a member?* **Join today**: www.theasm.org.au/membership

Submissions and enquiries can be directed to the Syntrophy Coordinator, Susan Badman at syntrophy@asmnsw.com.au

Organisations with research opportunities or companies seeking to fill positions are welcome to place an advertisement in an upcoming issue of Syntrophy. Please contact the Syntrophy Coordinator with your details for inclusion.

Organisations interested in becoming a sponsor of ASM NSW-ACT Branch should contact the Branch Secretary to obtain a copy of the current sponsorship prospectus: sponsorship@asmnsw.com.au.