

Upcoming event

Clinical SIG Meeting

Date: Monday 24th June 2013

Venue: Function Room, Level 4, St Vincent's Clinic

RSVP: Lucy-Anne Riley at lriley@stvincents.com.au

Please note the following deadline for submissions to Syntrophy Volume 14:5:2013 **closes 20th June 2013**. Email all contributions, as well as any suggestions or comments, to the Administrative Officer, Natasha Pavic, at natashapavic@hotmail.com.

Syntrophy is distributed to members via details recorded on the National office database. Print copies are available upon request.

Editorial board: Syntrophy is produced via the combined efforts of Natasha Pavic and the committee. The editorial is rotated amongst the editorial board members. The board members solicit the lead articles.

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From the Editor

The ASM Annual Scientific Meeting in Adelaide in early July is nearly upon us, and you can still register. Visit the website (www.theasm.org.au/meetings/asm-adelaide-2013/) to see the program, highlights and details on the Australasian Mycological Society Joint Conference which follows it. Our exciting breaking news is that this year we are introducing an award to assist people working in clinical laboratories to attend a suitable Scientific Meeting or Workshop. The terms of this award are attached and the support it provides reflects that of the BD Student award.

On May 30th at 4.30pm **Simon Foster** of the Krebs Institute, University of Sheffield will present a seminar entitled "Bacterial Cell Wall Architecture – Strength by Design", Lecture room 471, Building G08 (that's the Molecular Bioscience Building) Maze Ave, The University of Sydney. Many will remember Simon's talks at the Sydney Annual Scientific Meeting.

This year the Visiting Speaker Program is up and running again. We are fortunate to be

hosting two visiting speakers in Sydney, Jizhong Zhou and Gisela Storz, giving those who cannot attend the Adelaide meeting a chance to hear them. Professor Zhong from the University of Oklahoma is a molecular ecologist well known for his research in the fields of functional genomics, genomic technology and evolutionary genomics. He will be in Sydney on 2nd-3rd July before flying to Brisbane. He will talk at Sydney University on Wednesday 3rd at 6.30pm. Nick Coleman is coordinating his visit and if you'd like to meet with him please contact Nick (nicholas.coleman@sydney.edu.au). Professor Gisela Storz from the National Institutes of Health who studies the role of small, regulatory RNAs and small proteins (< 50 aa), will be in Sydney only on 12th July immediately after the Adelaide meeting and details of her seminar will be announced soon.

We have set the date for the 2013 AGM as Tuesday 20th August at the Waterview in Bicentennial Park, Homebush. More details will appear in the

next Syntrophy, but please put the date in your diaries. You will find notices a few events coming up in May/June in Dates for your Diary.

Finally, on financial matters, please contact the Branch treasurer, Jim Manos (jim.manos@sydney.edu.au). However, please remember that there is a limit of \$500 support for each event and that payment can be made only on presentation of receipts. We'd also like to know how many people attended each event and how many of those were current ASM members. This will help us to plan suitable promotional material to help you all to encourage more people to join the Society. If you believe you have a powerful case for a higher level of support, please contact the Secretary Peter Huntington (PHuntington@nscchahs.health.nsw.gov.au) who will raise it with the Committee at the next meeting. In this context, please remember that our brief is to support events for our members.

Ruth Hall, Chair, NSW-ACT State Branch Committee

FOCUS *Cephalosporin resistance in Acinetobacter baumannii via replacement of a chromosomal segment*

Mohammad Hamidian and Ruth M. Hall, School of Molecular Bioscience, University of Sydney

A. baumannii is an opportunistic and Gram-negative pathogen that causes hospital-acquired infections. *A. baumannii* isolates that are resistant to all or almost all antibiotics

currently used for treatment have been observed globally, posing therapeutic problems. Multiply antibiotic-resistant *A. baumannii* isolates belong to 2 main clones, referred to

as global clone 1 (GC1) and global clone 2 (GC2). Resistance genes are often clustered in a large resistance island located in the chromosome.

Continued on page 9...

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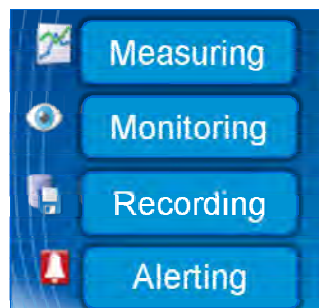


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Dates for your Diary 2013

Thursday 30th May

Bacterial Cell Wall Architecture –
Strength by Design

Simon J. Foster

Krebs Institute, University of Sheffield

Venue: Room 471, Building G08,
University of Sydney, Darlington Campus

Time: 4.30pm

Bacterial cell wall peptidoglycan is essential for the maintenance of cellular viability and shape determination for most eubacteria. It is a dynamic structure being synthesised, modified and hydrolysed to allow for cell growth, division and many other important cellular functions. Peptidoglycan biosynthesis is also the site of action of the cell wall antibiotics, such as penicillin. Using an interdisciplinary approach, including super-resolution microscopy, the architecture of peptidoglycan is being revealed, in turn beginning to resolve the important issue as to how bacteria are able to grow and divide.

Monday 24th June

Clinical SIG Meeting

Venue: Function Room, Level 4,
St Vincent's Clinic

Parking will be available in the Clinic Carpark
which is accessed by turning left from
Oxford Street into Boundary Street
at the back of the campus.

Time: Refreshments from 6pm, followed by
the talks

RVSP: Lucy-Anne Riley at
lriley@stvincents.com.au

Speakers and Talks:

Not Another Case of TB!
Indy Sandaradura

Electron Microscopy of *Dientamoeba*
fragilis
Damien Stark

Dientamoeba fragilis - A Blank
Canvas
Joel Barratt

Tuesday 20th August

ASM NSW-ACT Branch
Annual General Meeting

WatervieW,
Bicentennial Park, Homebush
Further details to come

News & Notices

Call for Lead Articles!!!

If you would like to contribute an article to *Syntrophy*, please contact Nick Coleman at nicholas.coleman@sydney.edu.au.

The requirements for all articles submitted are: 600 word limit

No more than 5 references

A short biography to be submitted with the article

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AmpliPhi is seeking a Senior Scientist to work in the AU laboratory. The post holder will be part of a global team developing bacteriophages (phages) for human and animal antibacterial medicines. We seek a candidate who is motivated by our mission to develop novel healthcare products.

Qualifications and skills:

- A degree in Microbiology and molecular biology experience is essential
- Previous experience with bacteriophages would be advantageous
- Experience in writing a range of technical documents including SOPs, protocols and data reports is a requirement
- Previous experience working in GLP, GMP or a drug development setting would be advantageous

Attributes:

- A clear and confident communicator who can provide concise discussion in person, by email and on conference telephone calls
- A self-starter with good levels of motivation
- Able to work independently and in a small team
- Able to work quickly and accurately
- A logical and inquisitive mind
- A systematic approach to tasks
- Flexible and willing to respond to challenges and deadlines as they arise
- Good attention to detail and focus on seeing tasks through the completion

Example duties:

- Selection, screening and optimisation of therapeutic phages against a variety of human and animal targets
- Preparation and maintenance of critical stocks of phages and bacteria
- Molecular and phenotypic analysis of critical stocks of phages and bacteria
- Maintaining accurate records on all activities conducted in the laboratory
- Recording, analysing and interpreting experimental data
- Responsibility for recording and tracking access to critical stocks and exchange of material between AmpliPhi sites and collaborators
- Preparing media and reagents, managing instrument calibration and maintenance and other general lab duties
- Writing SOPs, protocols and manuscripts for peer review

The post will be based Colworth Science Park, Sharnbrook, Bedfordshire. Travel to company sites in Sydney, Australia and Richmond, USA may be required.

One weekly out of hours (evening) teleconference will be required. Some overtime or shift work may be necessary when a project must be completed or when an experiment must be monitored out of hours.

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Candidates must be eligible to live and work in Australia.

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**Australian Society for Microbiology
NSW-ACT Branch**

Joe Levey Country Travel Award 2013

AWARD: The Joe Levey Country Travel Awards (up to two will be awarded per year) will consist of a maximum of \$500 to cover budget travel and accommodation costs for a country microbiologist to visit another laboratory or institution within NSW or the ACT, with the aim of learning a new technique, or to attend a scientific meeting within Australia.

ELIGIBILITY: All current Australian Society for Microbiology members who reside in a country region of NSW. Applicants must have been a member of ASM for at least 12 months before the Award application is submitted.

CRITERIA:

Applicants are required to submit the following:

1. A one page account of their current employment and responsibilities.
2. A one page proposal of their objectives in seeking further training. This proposal should provide clear justification of the need to travel. The ASM NSW-ACT Branch committee must be convinced that the training cannot be undertaken at, or near, the applicant's place of work and that the visit funded will result in benefits that could not reasonably be expected to have accrued at the applicant's place of work. Applicants must specify the proposed start and finish dates for training.
3. Statements of approval to undertake training from their supervisor and host.
4. Estimate of travel and accommodation costs & amount requested with justification. Payment will be made on presentation of tax invoices or receipts.
5. Recipients are required to write a brief one page report for Syntrophy, to be submitted no later than 4 weeks after the completion of training or conference attendance.

CLOSING DATE: 20th June 2013

APPLICATIONS TO:

Peter Huntington, ASM NSW-ACT Branch Secretary

Email: phuntington@nsccha.health.nsw.gov.au

Ph: (02) 9926 4329



**Australian Society for Microbiology
NSW-ACT Branch**

James Vincent Scholarship

SCHOLARSHIP: The James Vincent scholarship may take the form of either a travel grant to attend a relevant national or international conference, to obtain skills available only at another institution in Australia or overseas, or to satisfy other specific requirements of their higher degree research programme. The scholarship will be awarded by the School of Molecular Biosciences of the University of Sydney, under the recommendation of the NSW Branch of the Australian Society for Microbiology.

ELIGIBILITY:

- Honours and postgraduate research students at the University of Sydney or University of New South Wales.
- Students working in the area of symbiotic nitrogen fixation, the major research area of Professor Vincent, may receive preference.
- If not currently a student member of ASM, applicants must be eligible for membership and apply for membership at time of application for award.

CRITERIA:

1. Applicants should submit details of their academic record and two referee's reports
2. Applicants should briefly justify their proposal and suggested budget in terms of the object of the scholarship.
3. The value of the scholarship shall depend on the financial needs of the applicant subject to the availability of funding, but shall not exceed the previous year's net income to the fund. The amount offered each year will be limited to the earnings generated from the funds held in the Vincent award, less 10% which will be added to the capital to allow for growth.
4. The scholarship is tenable for 1 year.
5. 1 award per year. No award may be given in the event that the NSW branch committee in consultation with the J Vincent representatives at USyd and UNSW feel there is no suitable applicant.

CLOSING DATE: 30th June 2013

Send applications to:

Assoc. Prof. Andrew Holmes,
School of Molecular and Microbial Biosciences,
University of Sydney, NSW 2006
Email: andrew.holmes@sydney.edu.au

Or

Prof. Brett Neilan,
School of Biotechnology and Biomolecular Sciences,
The University of New South Wales
UNSW
SYDNEY NSW 2052
Email: b.neilan@unsw.edu.au



**Australian Society for Microbiology
NSW-ACT Branch**

Clinical Scientist Continuing Education Award

AWARD: The Award is a contribution of up to AUD\$1000 (towards registration fees / airfares / accommodation) to assist the recipient to attend the ASM Annual National conference, or any other scientific meeting or workshop with a microbiology component, in the same or following year as the Award is given.

ELIGIBILITY:

1. The nominee must be a clinical scientist primarily involved in routine diagnostic work, rather than research, who has distinguished themselves with excellent performance in the clinical laboratory.
2. The applicant must be residing in NSW-ACT for at least 5 continuous years before the Award application is submitted.
3. The applicant must be working full-time in a clinical laboratory in NSW-ACT for at least 5 continuous years before the Award application is submitted.

MEMBERSHIP STATUS: Applicants must have been FASM / MASM / SASM members of the NSW-ACT branch of the Australian Society for Microbiology for at least 5 continuous years before the Award application is submitted.

APPLICATION REQUIREMENTS:

Applicants must submit an application consisting of the following:

1. A covering letter supporting their eligibility of the Award, including their work achievements to date, a demonstrated pro-active contribution to microbiology and details of the conference / workshop they wish to attend, outlining how attendance will benefit their career.
2. A brief curriculum vitae outlining the applicant's qualifications, continuing education, employment history, publications and presentations.
3. Two referee's reports (to be submitted directly to the branch secretary) supporting the application for the Award, summarising and confirming the applicants eligibility. It is the responsibility of the applicant to ensure that their referees submit the reports to the ASM NSW-ACT branch secretary by the closing date.
4. Evidence of their involvement in NSW-ACT branch activities since they have been members. This could include attendance at scientific meetings, seminars, newsletter contributions or assistance in the organisation of microbiology events. Applicants with this record will be preferred, but not exclusively.

CONDITIONS OF THE AWARD:

1. One award per year. No award may be given in the event that the NSW-ACT Branch committee feels there is no suitable applicant.
2. Publication of the Awardee with photo in the Branch newsletter Syntrophy and at the Branch AGM.
3. Payment will be given on presentation of tax invoices or receipts.



**Australian Society for Microbiology
NSW-ACT Branch**

4. The Awardee will be required to write a brief 1 page report on their conference / workshop attendance (approx. 600 words). The report should be submitted no later than 4 weeks after the event for publication in the Branch newsletter Syntrophy.

CLOSING DATE: 30th June 2013

APPLICATIONS TO:

Peter Huntington, ASM NSW-ACT Branch Secretary

Email: phuntington@nsccaahs.health.nsw.gov.au

Ph: (02) 9926 4329



**Australian Society for Microbiology
NSW-ACT Branch**

ASM NSW-ACT Branch Mycology Award

AWARD: The ASM NSW-ACT Branch Mycology award consists of a trophy and certificate. The award is given in recognition of the applicant's contribution to the field of mycology. All areas of mycology are eligible. A Trophy will be awarded at the AGM of that year and will be engraved with the recipient's details. The Trophy will be held by the recipient for 1 year, returned prior to the AGM to allow branch engraving of the next recipient's details.

ELIGIBILITY: Any member (not student) who resides in NSW or ACT. In order to apply for this award the applicant should have been a member of ASM at least 12 months prior to the AGM.

MEMBERSHIP STATUS: AASM, SASM, MASM, FASM.

CRITERIA:

Applicants are required to submit the following:

- (1) CV including a list of publications and presentations
- (2) A one page account covering their academic achievements and work experience to date, especially in the field of mycology

The applicant will be considered on the basis of their promotion of mycology in Australia while based in NSW-ACT. This contribution may be assessed by publication record, community contribution or by a combination of both. Consideration will also be given to the applicant's contribution to the activities of the NSW-ACT branch. This may be through the organisation of branch activities, SIG activities or other similar contributions.

CLOSING DATE: 15th July 2013

APPLICATIONS TO:

Peter Huntington, ASM NSW-ACT Branch Secretary

Email: phuntington@nsccaahs.health.nsw.gov.au

Ph: (02) 9926 4329

Focus continued

However, the gene that confers resistance to third generation cephalosporins such as ceftazidime (CAZ) and cefotaxime (CTX) is not located in the resistance island. In *A. baumannii*, resistance to third-generation cephalosporins is known to occur due to the activation of a chromosomally located *ampC* gene (1). Activation of the chromosomal *ampC* gene is known to arise as a consequence of acquisition of an insertion sequence, ISAbal, upstream of the chromosomal *ampC* gene (Figure 1), and ISAbal provides the *ampC* gene with a stronger promoter (1, 3).

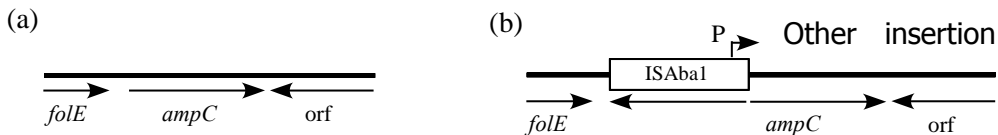


Figure 1: Context of the chromosomal *ampC* gene in *A. baumannii*. (a) represents the *ampC* gene without ISAbal and (b) shows the position of ISAbal relative to *ampC*. The thick central line represents the chromosome and the arrows below represent the genes and their direction.

sequences, such as ISAbal125, have also been detected upstream *ampC* and ISAbal125 also increases the expression of *ampC* leading to cephalosporin resistance (2).

We have assembled a large collection of multiply antibiotic resistant *A. baumannii* strains, most from Sydney hospitals and some from Brisbane and Adelaide. These strains were isolated between 1997-2011. 26 GC1 isolates were found in the collection. The structure of a large genomic resistance island and the multi-locus sequence type were determined, and used to group them. Two groups of 6 and 7 isolates had the same resistance island and the rest contained a different one.

In this study we investigated the molecular basis of cephalosporin resistance in multiply antibiotic resistant strains belonging to the GC1 clonal complex. 15 isolates exhibited resistance to CTX and CAZ and ISAbal1 was found upstream of the *ampC* start codon in all of them. The expression level of *ampC* relative to a susceptible strain was examined using quantitative Real-time PCR assay and the strains with ISAbal1-*ampC* exhibited ~8-10 fold higher expression level than the susceptible isolates with no IS upstream.

A combination of PCR mapping, DNA sequencing and bioinformatic analysis was used to characterize the *ampC* regions further. The *ampC* region from one or more representatives of each type was sequenced. This revealed a complex picture. In one group of 3 resistant strains there were 2 copies of *ampC* and the additional copy was part of an ISAbal1-bounded transposon (Figure 2).

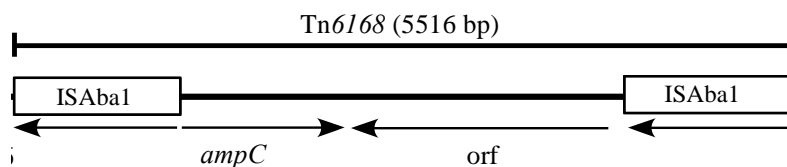


Figure 2: Structure of Tn6168. The thick central line represents the chromosome; open boxes show ISAbal1 and the arrows below represent the genes and their direction.

The *ampC* sequences in 2 groups were quite distinct, 2-3%, from the one found in the cephalosporin susceptible isolates. This was unexpected and indicates that the *ampC* gene and the ISAbal1 have been acquired from another *Acinetobacter* strain. In one case, the source of the different *ampC* gene and 3 kb region around it could be traced to strains from a different clonal complex (ST25).

Single nucleotide polymorphisms found in the sequence of ISAbal1 also suggests the insertion of different variants of ISAbal1 upstream of *ampC* in the GC1 clonal complex on multiple occasions.

Focus continued

This study found three different mechanisms by which strains became cephalosporin resistant. These were 1. insertion of ISAb₁, 2. acquisition of a transposon, Tn₆₁₆₈ and 3. incorporation of an ISAb₁-activated *ampC* gene from another strain. This study identified the horizontal transfer of chromosomally encoded resistance determinants as an important mechanism through which GC1 *A. baumannii* strains have become cephalosporin resistant.

References

1. **Corvec, S., N. Caroff, E. Espaze, C. Giraudeau, H. Drugeon, and A. Reynaud.** 2003. AmpC cephalosporinase hyperproduction in *Acinetobacter baumannii* clinical strains. *J. Antimicrob. Chemother.* **52**:629-635.
2. **Hamidian, M., D. P. Hancock, and R. M. Hall.** 2013. Horizontal transfer of an ISAb₁₂₅-activated *ampC* gene between *Acinetobacter baumannii* strains leading to cephalosporin resistance. *J. Antimicrob. Chemother.* **68**:244-245.
3. **Jacoby, G. A.** 2009. AmpC beta-lactamases. *Clin. Microbiol. Rev.* **22**:161-182.

About the author

Mohammad Hamidian is currently doing his PhD at the School of Molecular Bioscience, University of Sydney. The focus of his project is on the evolution of antibiotic resistance in *Acinetobacter baumannii*. His research interests include studying the role of mobile genetic elements in evolution of antibiotic resistance in Gram-negative bacteria.

ASM Contact Details

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VIC 3205, Australia

Tel: 1300 656 423

Fax: 1300 655 841

Email: admin@theasm.com.au

Submissions and enquiries can be directed to the Administrative Officer

Natasha Pavic at natashapavic@hotmail.com. Companies seeking to fill positions and ASM members seeking employment are welcome to place an advertisement in an upcoming issue of Syntrophy. Please contact the Administrative Officer with your details for inclusion.

Websites

National ASM:

www.theasm.org.au/

ASM NSW-ACT Branch:

www.asmnsw.com.au/

ASM National Conference Calendar

July 2013	ASM2013 Adelaide
July 2014	ASM2014 Melbourne
July 2015	ASM2015 Canberra