

## Third Year Review, what's in store

SCELSE will undergo its Third Year Review 15-17 July, 2014, whereby the Centre's progress and achievements thus far will be assessed by an international review panel (IRP), together with the Ministry of Education (MOE) and National Research Foundation (NRF), which jointly provide the Research Centre of Excellence's (RCE's) core support.

The IRP consists of four experts in biofilm-related science: Prof. Kenneth Timmis (Helmholtz Center for Infection Research), Prof. Ken Neelson (University of Southern California), Prof. Edward DeLong (Massachusetts Institute of Technology) and SCELSE's Scientific Advisory Board ex-officio member Prof. Alexander Zehnder (Alberta Water Research Institute), who will assess the Centre's performance and provide an evaluation report with recommendations for its ongoing operation.

SCELSE's performance and progress as a Research Centre of Excellence will be evaluated using various means such as a written Self-Assessment

Report (already distributed to SCELSE members), oral presentations on research output given by SCELSE research directors,



Clockwise from top left: K. Timmis, E. DeLong, A. Zehnder, and K. Neelson.

and publications.

SCELSE's scientific strategy will be assessed, as well as the extent to which its leadership has crafted a shared vision within the Centre at

all levels, and the relationship with stakeholders such as the hosting universities of NTU and NUS.

"The process of assessing our achievements over the past three years has been rewarding. We have made great progress and are now placed among the top biofilm research centres in the world. We should all be very proud of this," Centre's director Prof. Staffan Kjelleberg said.

During the 3-day review selected students, research fellows and faculty members from SCELSE will meet with IRP members to discuss their perspectives on SCELSE's research environment. All SCELSE members will have the opportunity to meet with the IRP during a dinner at the Van Kleef Aquatic Science Centre on the first day of the review (July 16). "This will be a good opportunity to meet the IRP members in an informal setting and for them to get to know SCELSE from the ground up," Prof Kjelleberg said. "It is therefore important that all SCELSE members attend this event."

There will also be two lunch-time poster sessions where the Centre's research will be on display.

## Calendar

SCELSE Seminars  
11am -12pm, SBS-08

**23 July: (Adhoc)** Korneel Rabaey (Ghent U.)

### Meetings

*Environmental Engineering* meeting:  
Fridays 9am, B3 Meeting Room

### Programs & Courses

**Aug '14 & Jan '15:** Biophysical Platform Program, open for student intake. <http://www.scelse.sg/programs>

**07-24 July:** SCELSE's Summer Course

### Conferences 2014

**24-29 August:** 15th International Symposium on Microbial Ecology (ISME). Seoul, S. Korea.

**5-6 Sep:** Academic Medicine – Transforming Vision into Reality: SingHealth Duke-NUS Scientific Congress 2014, Singapore General Hospital.

**10-12 Sep:** The Perfect Slime - Nature, Properties, Regulation and Dynamics of EPS, IWA Conference, Essen, Germany.

**7-8 Oct:** 4th Annual Next Generation Sequencing Asia Congress, co-located with the 2nd Annual Single Cell and Transcriptomics Asia Congress, Singapore. <http://www.ngsasia-congress.com/agenda/>

## BIOFILMS 6: An international experience.

Vienna, the city of music, hosted Biofilms 6 this year, gathering about 300 researchers from 33 nations across the globe to better understand microbial biofilms. The conference, which was held at the picturesque main building of the University of Vienna, is a unique and highly interactive meeting of minds. Attendants agree that it is a great platform for networking with experts and for keeping abreast with current scientific issues and research frontiers.

The main research focus of the conference this year was on the evolution and ecology of biofilms by Prof Farooq Azam from the Scripps Institution of Oceanography at UC San Diego and Prof Kevin Foster from the University of Oxford, and on biofilm

models by Prof Phil Stewart from the Center of Biofilm Engineering at Montana State University. Emerging technologies were also presented including, microfluidics by Prof Roman Stocker from MIT, optical coherence tomography (OCT) by Prof Li Chunyan from the Karlsruhe Institute

of Technology, and correlation spectroscopy by the SCELSE-ZEISS team. Adding to the beauty of this scientific venue was the conference's gala dinner at the Liechtenstein palace. The royal family granted



The University of Vienna

special access to the participants to celebrate the launch of Nature Partner Journal (npj) Biofilms and Microbiomes, (see previous SCELSE Newsletter).

By Kumaravel Kandaswamy.

# SCELSE

## PEOPLE PROFILE



## Suparna Mitra Research Fellow

Someone once said that science and art have their meeting point in method. Dr Suparna Mitra who, in her own words, is a researcher by profession and an artist by love, can surely attest to that. She is currently a senior research scientist in the metagenomics and systems biology research group, as well as a self-taught oil-pastel paint artist. Suparna's research experience comes from handling metagenomics data obtained from different sequencing technologies and methods she has developed for comparative metagenomics. Further, she has been working with various types of metagenomes and metatranscriptomes from medical and environmental data. She has applied her skills in a broad range of areas involving mixed collaborations. "I am fortunate to be able to use my skills across many disciplines," Suparna says. Together with researchers



"Togetherness"

from the University of Copenhagen and the Costerton Biofilm Center in Denmark, she is elucidating the microbial community diversity in atherosclerotic plaque samples in human patients, while from a completely different focus she is also helping to understand microbial communities in Singapore's waterways. Other human health based projects she has been working includes, the obesity-associated human gut microbiome (University of Hohenheim and University of Tuebingen, Germany), the wound-associated microbiome in human patients (National University Hospital), and the eye microbiome (Singapore's National Eye Centre, DUKE-NUS and Nanyang Polytechnic). Suparna completed her BSc in mathematics in 2003, and her MSc

in statistics (biostatistics) in 2007. She later became interested in the applied side of statistics and in the new genomics era, obtaining her PhD in bioinformatics in 2010 from the University of Tuebingen. During her PhD, she focused on massive data sequencing and took part in the development of software parts in MEGAN, a well-established metagenomics analysis tool. Her PhD thesis "Comparative metagenome analyses," which concentrated on the application of statistics and data analysis in next generation sequencing; the newly evolved side of metagenomics, was awarded the prestigious honour *summa cum laude*. "I love painting. I have only had basic training in my school days...after that I am self-taught and my works are mostly for my comfort of mind," Suparna says, just before talking about the faith and strength of bonding depicted in her oil-pastel painting "Togetherness" (picture on the left).

## Publication profile

SCELSE researchers show how both antibiotic usage and host environment may establish rapid evolutionary selective forces in colonising *Acinetobacter baumannii*. Genomic analysis and MIC assays revealed multiple drug resistant (MDR) strains and their effect on population dynamics during colonisation. This is an important discovery because major threats to public health these days are hospital-acquired infections (HAIs). *Escherichia coli*,

*Klebsiella pneumoniae*, *Pseudomonas aeruginosa* and *Acinetobacter baumannii* are commonly found in hospital environments, and therefore the causing agents of most HAIs. *A. baumannii* has become one of the leading pathogens causing HAIs, as it can remodel its genome in a rather rapid selective process. Several major epidemic clonal complexes of *A. baumannii* have been found in different healthcare facilities around the world, each of which contains

## The cost of hosting microbial evolution in your body

a subset of diversified strains. Nonetheless, not much is known on the population dynamics during colonisation of *A. baumannii* within the host. Seven out of nine sampled *A. baumannii* strains belonged to the international clone II (CC92 clonal complex). *A. baumannii* strains were found to be stable in three patients, but there was a change of strain in one patient. Using comparative genomic analysis, results revealed that the accessory genome

of these strains contained a large set of virulence encoding genes, which may be determinant in population dynamics. Single nucleotide polymorphisms (SNPs) analyses between *A. baumannii* strains isolated from the same patient revealed genome modification at the micro-scale level. And when *A. baumannii* colonised different patients, parallel evolutionary traits were observed during genome diversification.

### THE 2014 SCELSE SUMMER COURSE IS HERE!!

SCELSE's fourth Summer Course will be running from July 7th through 24th. Thirty participants from NTU and different universities around the world, including Spain, USA, Sweden, UK, Poland, Japan, Thailand, Vietnam, and Italy are attending this year's exciting summer course program. Please visit [www.scelse.sg/programs/summer-course.html](http://www.scelse.sg/programs/summer-course.html) for more details.



Hanchun Wen, Ke Wang, Yang Liu, Martin Tay, Federico M. Lauro, Hong Huang, Huayu Wu, Hongjie Liang, Yichen Ding, Michael Givskov, Yiqiang Chen, and Liang Yang. IN PRESS. **Population dynamics of *Acinetobacter baumannii* clonal complex during colonization of patients.** *Journal of Clinical Microbiology*.

Many congratulations to SCELSE PhD student Wu Yichao for his ISME Travel Award. Yichao will give an oral presentation about his research in the group of Asst Prof Cao Bin, at the ISME conference in August 15th.

### Newsletter contacts

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