



**DELIVERING MODERN MICROBIAL SCIENCE**  
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## **SGM Spring 2010 Meeting**

Edinburgh International Conference Centre

**29 March—1 April 2010**

**Systems, Mechanisms and Micro-organisms**

### **PROGRAMME PREVIEW**

Register before **26 February** to take advantage of discounted early registration fees

society for general microbiology  
**sgm conferences**

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## Trade Exhibition

*Location*

Cromdale Hall

*Opening times*

Monday–Wednesday

Thursday

**0900–1900**

**0900–1300**



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## Oral offered papers and posters

Please note that the details of these will be available on the website and also in the *Programme Booklet* and the *Abstracts CD* distributed at the conference.

## CPD

This meeting has been approved for CPD by the Royal College of Pathologists and the Institute of Biomedical Science. Forms are available at the registration desk and should be completed daily by delegates. Certificates will be issued on departure from the conference.

## Registration

This is available online: [www.sgmeicc2010.org.uk](http://www.sgmeicc2010.org.uk)  
Earlybird discounted rate deadline: **26 February**

## Introduction

This year's SGM spring conference will be held at the Edinburgh International Conference Centre, an excellent venue right in the heart of Scotland's historic capital city.

The scientific programme is an exciting mixture of symposia, workshops and keynote lectures on a wide range of topics in modern microbial science. Whatever your field of microbiology, there will be a session of personal interest. In addition to the talks and debates delivered by the world's top experts, there will be poster sessions, a trade exhibition and social events including the Gala Dinner at *Our Dynamic Earth*.

Details of all the sessions and events at the conference are given in this preview booklet, along with information on registration and accommodation.

We hope that you will join us in Edinburgh for an event that will not only be enjoyable, but also offer ample opportunities to update your knowledge, share scientific information and meet with colleagues old and new.

**Chris Hewitt**, Scientific Meetings Officer

## Society for General Microbiology

[www.sgm.ac.uk](http://www.sgm.ac.uk)

Founded in 1945, the SGM is the largest microbiological society in Europe. It has over 5,500 members world-wide. The Society fulfils its aim to promote the science and significance of microbiology through a range of activities. These include publishing four international journals (*Microbiology*, *Journal of General Virology*, *International Journal of Systematic & Evolutionary Microbiology* and *Journal of Medical Microbiology*) and running regular scientific meetings.

The Society also offers grants and awards and actively promotes the public understanding of microbiology.

*Microbiology Today* magazine keeps members up-to-date with developments in microbiology and Society activities.

### **Society for General Microbiology**

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## General information

### Location

#### Edinburgh International Conference Centre (EICC)

The Exchange, Edinburgh EH3 8EE (main entrance on Morrison Street)

The EICC is regarded as Scotland's foremost conference venue. It has excellent facilities for presentations in the scientific sessions and good catering on site. A bar will be available to delegates. The EICC is set in the heart of a city rich in history, culture and heritage. It is in walking distance of Waverley Train Station and Edinburgh International Airport is within easy reach. The EICC is surrounded by good quality hotels, but there is also a wide range of budget accommodation in the city.

A map and travel directions are at [www.eicc.co.uk](http://www.eicc.co.uk)

### Registration

Register online at:

[www.sgmeicc2010.org.uk](http://www.sgmeicc2010.org.uk)

Registration fees include refreshments, lunch, drinks receptions, the abstracts CD, exhibition entry and all conference literature. Specially discounted rates are available for:

- SGM Associate/Postgraduate Student Associate Members
- Ordinary Members in the first 3 years of their first postdoc who are presenting an offered paper or poster

Earlybird registration rate deadline:

**26 February**

### Registration desk

Location:

**Strathblane Hall**

Opening times:

**Sunday 1600–1900  
Monday–Thursday 0830–close of scientific sessions**

Contact telephone number:

**+44 (0)131 519 4101**

### Accommodation

A range of hotels and guesthouses to suit all pockets is available. Book online through Reservation Highway Ltd (email [admin@reservation-highway.co.uk](mailto:admin@reservation-highway.co.uk); tel. **+44 (0)1423 525577**) via [www.sgmeicc2010.org.uk](http://www.sgmeicc2010.org.uk) or find your accommodation independently.

### Grants

Conference grants are available to SGM Associate Postgraduate Student Members, Retired SGM Members and Associate Members who are technicians. For details and application forms see [www.sgm.ac.uk/grants](http://www.sgm.ac.uk/grants)

## At a glance

Sunday 28 March	Monday 29 March	Tuesday 30 March	Wednesday 31 March	Thursday 1 April
<b>MORNING</b>				
	ED01 <b>The 'omics revolution: elucidating the pathways of virus infection</b>	ED01 <b>The 'omics revolution: elucidating the pathways of virus infection</b>	ED11 <b>Applications of 'omics</b>	ED20 <b>The global challenges of virus infection</b>
	ED02 <b>Signalling and systems biology</b>	ED02 <b>Signalling and systems biology</b>	ED12 <b>Gut microbes and health: from molecular to metabolic impact</b>	ED12 <b>Gut microbes and health: from molecular to metabolic impact</b>
	ED03 <b>Microbiology of oceans</b>	ED03 <b>Microbiology of oceans</b>	ED14 <b>Virus workshop: DNA viruses</b>	ED21 <b>Environmentally induced morphogenesis</b>
	ED04 <b>Renewables</b> <i>Joint with IChemE Biochemical Engineering Subject Group</i>	ED09 <b>Innovation in microbiology learning and teaching</b> <i>Joint with HEA Centre for Bioscience</i>	ED13 <b>Regulatory networks</b>	ED22 <b>Small regulatory RNAs</b>
	EDPM <b>SGM Prize Medal symposium: Controlling the cell cycle</b>	ED10 <b>STIs: now</b>	ED15/16 <b>Virus workshop: RNA viruses</b>	ED23 <b>Gene function analysis</b>
	ED06 <b>Parasites and pathogens: how to hijack the host and evade the immune response</b>		ED17 <b>Virus workshop: Epidemiology and modelling</b>	
			ED18 <b>Virus workshop: Retroviruses</b>	
			<b>Journal of Medical Microbiology Editorial Board</b> 1200 Lunch 1330 Meeting	
	1200 <b>SGM Medal Lecture: Sir Paul Nurse</b> <i>Controlling the cell cycle</i>	1200 <b>Fleming Prize Lecture: Steve P. Diggle</b> <i>Microbial communication and virulence: lessons from evolutionary theory</i>	1200 <b>Marjory Stephenson Prize Lecture: Jan Tommassen</b> <i>Assembly of outer membrane proteins in bacteria and mitochondria</i>	



Sunday 28 March	Monday 29 March	Tuesday 30 March	Wednesday 31 March	Thursday 1 April
<b>AFTERNOON</b>				
<b>Registration</b> <i>1600–1900</i>	ED01 <b>The 'omics revolution: elucidating the pathways of virus infection</b>	ED01 <b>The 'omics revolution: elucidating the pathways of virus infection</b>	ED11 <b>Application of 'omics</b>	ED20 <b>The global challenges of virus infection</b>
	ED02 <b>Signalling and systems biology</b>	ED02 <b>Signalling and systems biology</b>	ED12 <b>Gut microbes and health: from molecular to metabolic impact</b>	
	ED03 <b>Microbiology of oceans</b>	ED03 <b>Microbiology of oceans</b>	ED13 <b>Regulatory networks</b>	
	ED04 <b>Renewables</b> <i>Joint with IChemE Biochemical Engineering Subject Group</i>	ED09 <b>Innovation in microbiology learning and teaching</b> <i>Joint with HEA Centre for Bioscience</i>	ED14 <b>Virus workshop: DNA viruses</b>	
	ED06 <b>Parasites and pathogens: how to hijack the host and evade the immune response</b>	ED10 <b>STIs: now</b>	ED15 <b>Virus workshop: Negative-stranded RNA viruses</b>	
	ED05 <b>The FRC Path and beyond</b>		ED16 <b>Virus workshop: Positive-stranded RNA viruses</b>	
			ED19 <b>Virus workshop: Global challenges of virus infection</b>	
<b>LATE AFTERNOON / EARLY EVENING</b>				
<b>Pre-conference event for early-career microbiologists</b>	<b>Welcome Drinks</b> <b>Poster viewing</b>	<b>Drinks</b> <b>Poster viewing</b>	<b>Drinks</b> <b>Poster viewing</b>	
	ED08 <b>Workshop for early-career microbiologists: Effective presentation skills</b>	<b>Gala Dinner</b> <i>Our Dynamic Earth</i>	<b>Public engagement event: Professor Glenn Gibson</b> <i>Getting to the guts of microbes in health and disease: the trillions of bacteria within us all</i>	
	<b>Microbiology Editorial Board</b> <i>1745 Meeting</i> <i>2000 Dinner</i>		<b>Journal of General Virology Editorial Board</b> <i>1800 Meeting</i> <i>2000 Dinner</i>	

## SGM Prize Medal Lecture

Monday 29 March

**Sir Paul Nurse (President, Rockefeller University, USA)**

*Controlling the cell cycle*



Paul Nurse's research focuses on the molecular machinery that drives the cell cycle. His major accomplishment was the identification of the genes acting as the key regulators of the cell cycle in both yeast and human cells. The major regulator molecule, called CDK (cyclin-dependent kinase) is essential to life in all eukaryotes and is conserved over hundreds of millions of years of evolution.

For this work he shared the 2001 Nobel Prize with Leland H. Hartwell and R. Timothy Hunt. The Nobel Prize in Physiology or Medicine recognized the three scientists for advancing scientific understanding about the biological process by which cells make copies of themselves both in health and in diseases such as cancer.

Born in 1949 in Norwich, Great Britain, Paul graduated from Birmingham University in biology. In 1973, he received a PhD in cell biology/biochemistry at the University of East Anglia.

After completing postdoctoral studies at universities in Bern, Edinburgh and Sussex, Paul joined the Imperial Cancer Research Fund (ICRF) in 1984. For the next 4 years, he headed ICRF's cell cycle control laboratory.

In 1988, he joined the University of Oxford to chair its Department of Microbiology. Five years later, he returned to ICRF as its Director of Research. In 1996, he was promoted to Director General. In 2002, he was appointed Chief Executive of Cancer Research UK, which was formed from the merger of ICRF and the Cancer Research Campaign. He became President of Rockefeller University, New York in 2003.

In addition to the Nobel Prize, Paul has received the Albert Lasker Award for Basic Medical Research, the General Motors Cancer Research Foundation Alfred P. Sloan Jr Prize and Medal, the Royal Society Copley, Wellcome and Royal Medals (UK), Pezcoller Award (Italy), Rosenstiel Award and Medal, Heineken Prize (Netherlands), Jimenez Diaz Medal (Spain), Jeantet Prize (Switzerland) and the Gairdner Foundation International Award (Canada).

A Fellow of the Royal Society, Paul is a member of the Council for Science and Technology, which advises the Prime Minister and the Cabinet of Great Britain. He also is a member of the European Molecular Biology Organization (EMBO), a foreign associate of the US National Academy of Sciences, and a founding member of the UK Academy of Medical Sciences. He was honoured with a knighthood in Great Britain in 1999 for services to cancer research and cell biology, and he was awarded the Legion d'Honneur (France) in 2002.

*A complementary Prize Medal Symposium will also take place on 29 March (see p. 7).*



# SGM Prize Medal Symposium: *Controlling the cell cycle*

**Monday 29 March**

**Organizers: Neil A.R. Gow & Peter Sudbery**

The use of model micro-organisms has played a key role in understanding the mechanisms that control cell division – as dramatically illustrated by the work of Sir Paul Nurse on the fission yeast *Schizosaccharomyces pombe* that led to the award of the Nobel prize in Physiology or Medicine in 2001. To accompany his lecture *Controlling the cell cycle*, world-leading scientists will present their latest work. The talks will be based on a range of micro-organisms including bacteria, budding and fission yeasts, and the human fungal pathogen *Candida albicans*. Topics will focus on chromosome segregation, the role of the cytoskeleton, cell growth and the operation of cell cycle checkpoints. These talks will illustrate the power of microbiology in addressing fundamental aspects of cell growth, division and differentiation.

*Talks include:*

**Mechanism and regulation of DNA replication in budding yeast**

John F.X. Diffley (Cancer Research UK, South Mimms)

**The cycle of budding yeast, in shades of green and red**

Bruce Futcher (Stony Brook University, USA)

**CDKs and the yeast-hyphal decision in *Candida albicans***

Yue Wang (Proteos, Singapore)

**Chromosome segregation and cell division in *Caulobacter crescentus***

Christine Jacobs-Wagner (Yale University, USA)

**Organizing microtubule organizers**

Kenneth E. Sawin (University of Edinburgh)

**Consequences of aneuploidy**

Angelika B. Amon (Koch Institute for Cancer Research, MIT, USA)

**PRIZE MEDAL LECTURE**

***Controlling the cell cycle***

Sir Paul Nurse (President, Rockefeller University, USA)

See profile on p. 6.

## Fleming Prize Lecture

Tuesday 30 March

**Steve Diggle (University of Nottingham)**

*Microbial communication and virulence: lessons from evolutionary theory*



Steve began his career by leaving school early to become a rock star (failed). To fund this habit he worked for several years as a laboratory technician in a variety of places, including the Paterson Institute for Cancer Research. He then studied for a degree in Biological Sciences at the University of Salford. After completing his studies, he undertook a PhD with Professors Paul Williams and Miguel Camara at Nottingham which focused on quorum sensing and the regulation of virulence in the opportunistic pathogen *Pseudomonas aeruginosa*. He further developed this during a period of postdoctoral work and focused on understanding the role of 2-alkyl-4-quinolone quorum sensing molecules in the virulence of *P. aeruginosa* and other species. During this period he became interested in why such systems exist in micro-organisms rather than simply how they work, which led to him obtaining a 5-year Royal Society Research Fellowship in 2006. This has led to collaborations with evolutionary biologists and a more conceptual approach to studying quorum sensing. Steve's work now combines evolutionary theory with empirical studies of interest to both evolutionary biologists and microbiologists. It is hoped that by combining traditional approaches with evolutionary theory, we can begin to address questions such as what factors influence cooperation and the evolution of virulence in microbes and can we exploit these to develop new antimicrobial strategies?

## Marjory Stephenson Prize Lecture

Wednesday 31 March

**Jan Tommassen (Utrecht University, The Netherlands)**

*Assembly of outer membrane proteins in bacteria and mitochondria*



Jan studied biology and chemistry at Utrecht University in the Netherlands. He graduated in 1978 with a major in microbiology, followed in 1982 by a PhD on the PhoE protein of *Escherichia coli* K-12 gained under the supervision of Ben Lugtenberg. Lugtenberg moved shortly thereafter to Leiden University, and Jan took over his post at Utrecht. Since 2001, he has been Professor in Prokaryotic Microbiology there. Throughout his career, Jan has studied transport processes in the cell envelope of Gram-negative bacteria. Currently, he is researching the transport of outer membrane proteins and lipopolysaccharides and their assembly in the outer membrane, structure/function relationships of outer membrane proteins, protein secretion systems, and the development of a vaccine against *Neisseria meningitidis*.



## Social events

**Monday 29 March**  
**(1730–1900)**

**Welcome Drinks Reception** (*Cromdale Hall, EICC*)

Drinks and nibbles will be served among the trade stands and posters. All are welcome to come along and network with fellow delegates.

**Tuesday 30 March**  
**(1930 for 2000)**

**Gala Dinner** (*Our Dynamic Earth, Holyrood Road, Edinburgh EH8 8AS*)

*Our Dynamic Earth* is an award-winning science centre that takes a journey through our planet's past, present and future, with interactive exhibits and impressive technology. Guests will take their pre-dinner drinks in the Earthscape Galleries, telling the story of Planet Earth's evolution through time, perhaps pausing beside a real iceberg to sip their wine or walking through the rainforest. The delicious three-course meal, with wine, will be served in the airy, glass-walled Stratosphere, which has stunning views over Arthur's Seat.

**Entry to the event is by pre-paid ticket only.**

## Poster viewing

**Monday–Wednesday**

*Cromdale Hall, EICC*

**Display:** 0830–1915

**Viewing:** 1730–1900

*Wine and soft drinks will be served at the evening poster viewing sessions. Cash bar available.*

## Public Engagement Lecture

**Wednesday 31 March**  
**(1830)**

**Glenn R. Gibson** (University of Reading)

***Getting to the guts of microbes in health and disease***

This lecture will overview the trillions and trillions of bacteria that inhabit the human gut. It will describe who they are, where they come from, how many there are inside the body, how they survive in different areas of the gut and describe how they handle our daily diet. The power of gut microbiology and its role in human nutrition (positive and negative) will be included. The critical role of gut bacteria in promoting better health will also be described and there will be information on how your diet can help to sustain this. The role of the gut flora in various clinical states will be overviewed, such as colorectal cancer, irritable bowel syndrome, ulcerative colitis, gastroenteritis. Evidence will be presented for each and the mechanisms involved.

The popular concepts of probiotics and prebiotics and their ability to positively alter gut flora composition will be looked at. Population groups that may benefit from these approaches (and why) will be discussed. Building upon this information, new research on the generation of a novel prebiotic will be presented. Its use in several recent trials will be described, as well as future plans.

*Glenn Gibson is Professor of Food Microbial Sciences at the University of Reading where he leads a multi-disciplinary research programme in gut microbiology, mainly relating to the bacteriology of human health and disease.*

***This lecture will be open to the general public, but delegates are welcome to attend.***

## Development events for early-career microbiologists

### *Welcome workshop*

**Sunday 28 March 2010 (1800–2000)**

**Organizers: Joanna Heaton & Jane Westwell**

Conferences are all about communicating with other scientists – either formally when you present your research as a poster or a talk or informally when you chat with other delegates during refreshment breaks. A conference also offers networking opportunities which can lead to fresh ideas, a new collaboration or maybe even your next job.

This workshop is for PhD students and postdocs wanting to make the most of the communication opportunities this week (and in future) – especially if they haven't been to many scientific meetings before. You will find out how to get the best out of your SGM membership and also take part in some fun activities to improve communication skills and add value to your conference experience.

Supper and a drink will be provided.

***Pre-registration for the event, via the online booking form, is essential.***

### *ED08 Effective presentation skills*

**Monday 29 March**

**Organizer: Jane Westwell**

Love it or loath it, presenting your work is a vital part of your development as a researcher – there is little point in pushing back the frontiers of knowledge if you don't share your findings with the scientific community.

At SGM we believe that our conferences should provide plenty of opportunity for early-career members to hone their presentation skills in a supportive environment. In addition to our lively poster evenings, many scientific sessions include slots for offered papers which are often delivered by early-career microbiologists. Not to mention the opportunity to compete in the *Sir Howard Dalton Young Microbiologist of the Year* contest.

Undoubtedly, presenting your research can be a daunting experience – whether you are standing in front of a poster or giving a talk. When you get it right, nothing beats the satisfaction of knowing you have made a good presentation and answered questions well. But how can you maximize your chances of success?

Join Paul Hoskisson, lecturer at University of Strathclyde and SGM Council Member, in an entertaining and interactive workshop. Paul will share his experience with delegates and demonstrate how to give a memorable talk whilst avoiding pitfalls.

# ED01 The 'omics revolution: elucidating the pathways of virus infection

Monday 29 & Tuesday 30 March

Organizers: Adrian Whitehouse & Paul Kellam

2010 marks the 10 year anniversary of the release of the draft human genome. In that time the power of different methods for investigating host and virus interaction have increased beyond imagination. This symposium brings together international leaders in all aspects of genome scale virology, from the use of next generation sequence methods to discovery of new viruses to the structural biology of the virus universe. The symposium will address how we use these data to understand virus evolution, host–virus interactions and the genetics of host susceptibility to infection.

*Talks include:*

## Microbe hunting in the 21st Century

W. Ian Lipkin (Columbia University, New York, USA)

## The evolution of influenza viruses

Derek J. Smith (University of Cambridge)

## Adenovirus e1a induces S-phase and a stem cell phenotype by dynamically relocalizing chromatin modifying complexes across the genome

Arnie J. Berk (University of California at Los Angeles, USA)

## Decoding host–pathogen interactions: a (epi)genomic viewpoint

Sunil K. Ahuja (University of Texas, USA)

## Viruses, microRNAs and RNA interference

Bryan R. Cullen (Duke University, North Carolina, USA)

## How can we save the world from the next pandemic – can systems and computational biology be more effective than 50 years of traditional virology?

Michael Katze (University of Washington, USA)

## A systematic analysis of virus–host protein interactions in herpesviruses

Jürgen Haas (University of Edinburgh)

## Organization of the viral universe – structure leads the way

Dennis H. Bamford (University of Helsinki, Finland)

## High throughput proteomic analysis of the adenovirus infected nucleolus

David A. Matthews (University of Bristol)

## Using genetics to study host–virus interactions

Susan S. Ross (University of Pennsylvania, Philadelphia, USA)

*Plus offered papers and posters*

## ED02 Signalling and systems biology

Monday 29 & Tuesday 30 March

Organizers: Robert G. Endres & Johnjoe McFadden

Microbes respond to a variety of stimuli that are transduced through signalling pathways to affect gene expression, metabolism or cell dynamics. Whilst earlier studies focused on single molecules, it has become apparent that such molecules only function properly in the larger context of signalling networks and the whole cell. Application of quantitative methods and modelling has unravelled the design principles of signalling pathways, allowing for a more comprehensive understanding of signal integration in biological systems. The purpose of this symposium is to bring together scientists from different disciplines and backgrounds to discuss the latest results in the field.

*Talks include:*

### BACTERIAL SIGNALLING AND MOTILITY

#### Response rescaling in bacterial chemotaxis probed by *in vivo* FRET

Tom Shimizu (FOM Institute for Atomic & Molecular Physics, Amsterdam, The Netherlands)

#### Lambda life cycle: a view from the single phage

Ido Golding (University of Illinois at Urbana-Champaign, USA)

#### Mechanisms of mycobacteria interference with cell-intrinsic immunity processes

Thierry Soldati (University of Geneva, Switzerland)

#### The what, when, how, where, and (why) of protein localization in bacterial cell cycle control

K.C. Huang (Stanford University, USA)

### FROM GENE TO POPULATIONS

#### Interkingdom chemical signalling in bacterial pathogenesis

Vanessa Sperandio (U.T. Southwestern Medical Center, Dallas, USA)

#### Cooperation in a synthetic microbial system

John Chuang (The Rockefeller University, New York, USA)

#### Effects of molecular noise and size control on variability in the budding yeast cell cycle.

Fred Cross (Rockefeller University, USA)

#### Growth phase transitions in *Streptomyces*

Colin Smith (University of Surrey)

#### Ultrasensitivity and cellular decisions

Peter Swain (University of Edinburgh)

## HOST–PATHOGEN INTERACTIONS

### The systems biology of phagocytosis

Brian D. Robertson (Imperial College London)

### Computer simulations of stochastic phenotypic switching

Andrzej M. Kierzek (University of Surrey)

### Differential control of bacterial gene expression

Eduardo A. Groisman (Washington University School of Medicine, USA)

### Individuality of bacterial response to stress

John D. McKinney (Swiss Federal Institute of Technology, Lausanne, Switzerland)

### O<sub>2</sub> be a pathogen: signalling of host microenvironments to promote *Shigella* virulence

Christoph M. Tang (Imperial College London)

*Plus offered papers and posters*

## EUKARYOTIC CELL BIOLOGY

### Spatiotemporal control of cellular microenvironments with photonics

Holger Kress (Yale University, USA)

### The responses of fungal pathogens to environmental insults

Alistair J.P. Brown (University of Aberdeen)

### A systems biology approach to understand bi-directional organelle trafficking

Gero Steinberg (University of Exeter)

### Computational modelling of cell movement and chemotaxis – surprising results from a pseudopod-centred view of a cell

Robert H. Insall (CR-UK Beatson Institute for Cancer Research, Glasgow)

## ED03 Microbiology of oceans

Monday 29 & Tuesday 30 March

Organizers: A. Mark Osborn, Ian M. Head, David J. Scanlan & Tom A. Richards

The oceans are a microbial world, where pelagic and benthic micro-organisms drive oceanic primary production and carbon and nutrient cycling to support and sustain marine food webs and ecosystems. Recent developments in molecular biology, coupled to advances in remote sensing and development of sampling methods to study extreme and/or inaccessible marine habitats have revolutionized the study of oceanic microbiology. This symposium presents highlights of recent research on the diversity, ecology and function of marine microbial life spanning four key themes. First, the symposium explores diversity within the ocean microbiome, before considering the role of micro-organisms in pelagic primary production and nutrient cycling. Subsequently, this symposium assesses the impact of viruses and grazers in driving microbial loops, before concluding with discussion of the diversity and function of life in benthic and deep-sea habitats.

*Talks include:*

### Marine bacterioplankton diversity along spatial gradients

Jed A. Fuhrman (University of Southern California, Los Angeles, USA)

### The functional role of the SAR11 (*Pelagibacter*) group in oceanic surface waters

Stephen Giovannoni (Oregon State University, USA)

### Metagenomics of the deep Mediterranean

Francisco Rodriguez-Valera (Universidad Miguel Hernandez, Spain)

### Oceanic nitrogen fixation

Jonathan P. Zehr (University of California, Santa Cruz, USA)

### Nitrate reduction and fixed N loss in anoxic waters

Bess B. Ward (Princeton University, USA)

### Light and the niche adaptation paradigm in marine picocyanobacteria

Frederic Partensky (Centre National de la Recherche Scientifique, Roscoff, France)

### Environmental controls on pelagic primary production

Richard J. Geider (University of Essex, Colchester)

### Regulatory RNAs in marine phototrophs

Wolfgang Hess (University of Freiburg, Germany)

**Evolution and adaptation in the eukaryotic phototroph  
*Micromonas***

Alexandra Z. Worden (Monterey Bay Aquarium  
Research Institute, USA)

**High bacterioplankton consumption by the smallest  
oceanic algae in the Atlantic Ocean**

Mike Zubkov (National Oceanography Centre -  
Southampton)

**Parasitic dinoflagellates in marine systems**

Laure Guillou (Centre National de la Recherche  
Scientifique, Roscoff, France)

***Plus offered papers and posters***

**Two decades of viral community ecology: what have  
we learned?**

Markus Weinbauer (Observatoire Océanologique de  
Villefranche sur Mer, France)

**Marine viral genomics**

Oded Beja (Technion – Israel Institute of Technology,  
Israel)

**Metagenomics as entry into trait-based molecular  
ecology**

Peer Bork (EMBL, Heidelberg, Germany)

**The marine microbial transcriptome**

Jack A. Gilbert (Plymouth Marine Laboratory)

## ED04 Renewables

*Joint session with the IChemE Biochemical Engineering Subject Group*

**Monday 29 March**

**Organizers: Andrew W. Hayward & Gill M. Stephens**

Crude oil is microbial in origin; liquid transportation fuels, chemical feed stocks / plastics, fertilizers, pesticides, etc. ,have always been microbial in origin. So what does 'Renewables' mean? It means being more creative with microbiology and the associated disciplines in avoiding the fossilization process completely. In trying to achieve this over the next very few years, microbiologists and biochemical engineers are going to be in demand, it is a good time to be a microbiologist. In this session we hope to present just some of the interesting possibilities that are either on their way, or maturing into commercial reality.

*Talks include:*

### **Engineering microbes to provide us with 3HP/acrylic acid**

Vassily Hatzimanikatis (Ecole Polytechnique Fédérale de Lausanne, Switzerland)

### **Bioethanol: some recent microbial developments**

Graeme Walker (Abertay University, Dundee)

### **Commercializing cellulosic ethanol**

Kirstin Eley (TMO Renewables Ltd, Guildford)

### **Butanol**

Edward Green (Green Biologics Ltd, Abingdon)

### **Integrated bio- and chemocatalysis to produce high value chemicals from renewable feedstocks**

Gill M. Stephens (University of Nottingham)

### **Case study: Bioethanol plant**

Tony Skadorwa (Simon Carves Ltd, Cheadle Hulme)

### **GLYFINERY – A biorefinery for the conversion of glycerol to value added products**

Mhairi Workman (Technical University of Denmark)

### **Understanding the wiring of ethanol-producing yeasts**

Goutham Vemuri (Chalmers University of Technology, Göteborg, Sweden)

### **Microbial hydrogen production from sustainable biomass sources by thermophilic marine bacteria, *Thermotogales***

Niels T. Eriksen (Aalborg University, Denmark)

### **Genetic engineering of industrial yeast strains for the production of bioethanol and biobutanol from C5 and C6 sugars**

Eckhard Boles, Gunter Festel & Christian Weber (Goethe-Universität Frankfurt, Germany)

### **Bacterial production of the biodegradable polymer polyhydroxyalkanoate**

Kevin E. O'Connor (University College Dublin, Ireland)

### **Solar-driven hydrogen production in green algae**

Peter Nixon (Imperial College London)

**Plus offered posters**

## ED05 Infection Trainees workshop: the FRC Path and beyond

**Monday 29 March**

**Organizers: Janet Hurst & Jane Westwell**

A career development workshop, for Infectious Diseases, Medical Microbiology/Virology trainees, focusing on some of the skills needed to pass the FRCPath and looking ahead to applying for a consultant post. The session will also include an update on core infection training and an opportunity to influence SGM's future activities to support infection specialty training.

### **Talks**

#### **Core infection training update**

Martin Gill (University Hospital Birmingham NHS Trust) will outline the new curriculum, under development, leading to a new CCT in Infection. The aim is to produce Infection Specialists who will be competent to deal with the laboratory and clinical aspects of infection in UK hospitals in the 21st Century.

#### **Critical appraisal of the scientific literature**

Critical appraisal of research papers is an important skill. David Blackbourn (University of Birmingham) will lead an interactive workshop where delegates will develop literature appraisal skills considering questions such as: how you can decide what you are reading is worth your time and effort? How do you evaluate the methodology and place the results into a broader context? Registered delegates will receive workshop materials in advance.

#### **How to prepare for a consultant interview**

Making the step to a consultant post takes time and requires excellent preparation. Sophie Collier (Royal Free NHS Trust, London) will take a look at the process from the applicant's point of view and share tips for success.

#### **Preparing for a consultant post – the appointment process**

Andrew Swann (Leicester Royal Infirmary) will give an interviewer's perspective on consultant appointments. After outlining the process he will give advice on successful techniques both during delivery of the presentation and for the interview itself.

#### **SGM and Infection Training – now and the future**

SGM organizes a range of activities to support medical microbiology, virology and infectious disease trainees. Sara Burton (Education Division Vice-chair) will outline what the society currently offers and invite suggestions for future events.

### **ED10 STIs: now!**

The session on 30 March on STIs will also be of great interest to attendees at the workshop. (see p. 20). This offers a marvellous opportunity to extend knowledge and gain CPD credits.

#### **Special registration package available**

*Non-SGM members attending the workshop may register at member rates for the events on 29 and 30 March.*

## ED06 Parasites and pathogens: how to hijack the host and evade the immune response

Monday 29 March

Organizers: Michael L. Ginger & Andy Waters

Microbial parasites have evolved mechanisms that enable them to avoid detection by the sentinel immune system. They may for example take up residence within human cells, create a moving target by varying the antigens presented on their surface, disguise themselves by molecular mimicry, or actively modulate the immune recognition and signalling responses of the host. This symposium will present the most recent findings in this area, in the context of both eukaryotic, prokaryotic and viral pathogens.

*Talks include:*

### EVASION OF ACQUIRED IMMUNITY – ANTIGENIC VARIATION

#### Trypanosome antigenic variation: from silent genes to noisy populations

J. David Barry (University of Glasgow)

#### Antigenic variation and malaria

Chris I. Newbold (John Radcliffe Hospital, Oxford)

#### Superinfection as a driver of genomic diversification in antigenically variant pathogens

Guy Palmer (Washington State University, USA)

#### *Toxoplasma gondii* and the host immune response

Chris Hunter (University of Pennsylvania, Philadelphia, USA)

#### Broad neutralization of HIV-1 and influenza viruses in the face of enormous antigenic variation

Ian A. Wilson (The Scripps Research Institute, La Jolla, USA)

### SURVIVING INNATE IMMUNITY

#### Innate immunity with a *Drosophila* model

Petros Ligoxygakis (University of Oxford)

#### Immune responses of *Anopheles gambiae* against malaria parasites

Elena A. Levashina (AVENIR group Inserm, Strasbourg, France)

#### Who puts the tubercle in tuberculosis?

David G. Russell (Cornell University, USA)

*Plus offered papers and posters*

## ED09 Innovation in microbiology learning and teaching

*Joint session with Higher Education Academy Centre for Bioscience*

**Tuesday 30 March**

**Organizers: David J. Adams & Alan J. Cann**

### KEY SKILLS FOR THE RESEARCH AND INDUSTRIAL MICROBIOLOGIST

When asked what they are looking for in a microbiology graduate, employers often stipulate a well-rounded individual who is self-motivated, can solve problems and interacts productively with fellow scientists. This symposium will give you the opportunity to discuss innovative approaches to delivering this paragon. The first half will look at how we can foster the key skills of creativity, problem-solving and enquiry-based learning in the laboratory and field. This will include a keynote presentation about an exciting 'Phage-Hunting' project from the University of Pittsburgh, which allows students from a range of educational backgrounds to engage in authentic scientific enquiry. We will then explore the impact of social networking tools, both on our students' learning and on our own teaching practice. The symposium should be of interest to anyone involved in teaching microbiologists who wants to learn how to exploit the power of emerging approaches and technologies. If you think Twitter is just for chatting to celebrities, it's time to take a fresh look!

### PROMOTING KEY SKILLS IN MICROBIOLOGY TEACHING

*Talks include:*

#### **A culture of creativity: techniques to foster new ideas**

Carol A. Wakeford (University of Manchester)

#### **Problem solving: strategies, solutions, success**

Tina L. Overton (Higher Education Academy, Hull)

#### **Laboratory skills**

Gus Cameron (eBioLabs, University of Bristol)

#### **Where there's smoke there's PHIRE: authentic research projects for novice researchers**

Graham F. Hatfull (University of Pittsburgh, USA)

#### **Using Web2.0 technologies for teaching microbiology – information overload or filter failure?**

D. Cameron Neylon (STFC Rutherford Appleton Laboratory, Didcot)

#### **Social media in microbiology education and research**

Vincent Racaniello (Columbia University Medical Center, New York, USA)

#### **Automated discovery of scientific literature**

Kevin Emamy (CiteULike, London) & Jason Hoyt (Mendeley, London)

### **Special registration fee for SGM non-members**

*Non-members attending this session may register at the heavily discounted member registration rate on the day of this event only (30 March).*

## ED10 STIs: now

Tuesday 30 March

Organizers: Catherine A. Ison & Dietrich Mack

One million people are infected with an STI every day worldwide. The diseases are passed from person to person through unprotected sex. Infections are caused by a wide range of bacteria, viruses and parasites; many conditions last for years and some can result in death. Not all STIs exhibit symptoms. Top international speakers in the field will present the latest research into the epidemiology, diagnosis, prevention and treatment of these pathogens. They will highlight the synergy of pathogenesis between some organisms and explore the problems caused by antimicrobial resistance. Clinical aspects of STIs will also be covered.

*Talks include:*

### Genomics of variant type *Chlamydia trachomatis* and Lymphogranuloma venereum agents

Ian N. Clarke (University Medical School, Southampton)

### *Neisseria gonorrhoeae*: epidemiology of antimicrobial resistance and impact for therapy

Catherine A. Ison (Health Protection Agency Centre for Infections, London)

### Recurrent bacterial vaginosis

Phil Hay (St George's Hospital, London)

### *Mycoplasma* and *Ureaplasma* infections

Victoria J. Chalker (Health Protection Agency, London)

### Human papilloma virus vaccination and prevention of carcinoma

Kate Soldan (Health Protection Agency, London)

### Syphilis

Patrick French (University College London)

### Recent developments in HIV antiretroviral drug resistance

Deenan Pillay (University College London)

### Current diagnosis of sexually transmitted diseases

Ron C. Ballard (Centers for Disease Control & Prevention, Atlanta, USA)

*Plus offered papers and posters*

# ED II Applications of 'omics

Wednesday 31 March

Organizer: Paul H. Everest

This symposium aims to look at the effect 'omics technologies have had on the biological understanding of disease caused by pathogenic microbes, the host's response to infection and the basic biology of these micro-organisms. The sessions expand on all aspects of the 'omics revolution in biology including gene expression technology, dissection of microbial metabolism, glycomics of bacteria and the biological applications of high throughput sequencing. These sessions complement and expand on the 'Applications of 'omics' theme for the virus group meeting by highlighting similar applications for bacteria and parasites and the infected host.

Talks include:

## Systems genetics approaches to study the interaction of lactobacilli and their hosts

Peter Van Baarlen (University of Wageningen, The Netherlands)

## Tuberculosis and related mycobacterioses

Stephen V. Gordon (University College Dublin, Ireland)

## Rescuing obligate intracellular *Coxiella burnetii* from its host cell

Robert A. Heinzen (Rocky Mountain Laboratories, Montana, USA)

## Structural proteomics of bacterial and viral pathogens

Jonathan Grimes (University of Oxford)

## Integrating microbial populations using high-throughput genotyping and phenotyping

Gordon Dougan (The Wellcome Trust Sanger Institute, Cambridge)

## 'Omics of clinical microbiology

Nicholas J. Loman (University of Birmingham)

## Host responses to infection

Simon Waddell (St George's, University of London)

## Virtual and chemical genetics of malaria

Elizabeth A. Winzeler (Scripps Research Institute, USA)

## The application of genomics to study fungal cell wall biosynthesis

Carol A. Munro (University of Aberdeen)

## Balancing commensalism and pathogenicity: genome flexibility and heterogeneous gene expression in healthcare-associated *Staphylococcus epidermidis*

Wilma Ziebuhr (Queen's University of Belfast)

## Novel antibacterial drug discovery: the post genomic challenge

David J. Payne (GlaxoSmithKline, Collegeville, USA)

## Bacterial glycomics: glycoprospecting and glycoengineering

Brendan W. Wren (London School of Hygiene & Tropical Medicine)

Plus offered posters

## ED12 Gut microbes and health: from molecular to metabolic impact

Wednesday 31 March & Thursday 1 April

Organizers: Glenn R. Gibson, Michael L. Ginger, Lucinda M.C. Hall & Cath E.D. Rees

The past decade has seen major advances in our understanding of the interactions between the gut microbiota and the host. The use of molecular technologies has helped to reliably determine microbial type in this highly complex microbial ecosystem and also provided tools to assess probiotic and prebiotic functionality *in vitro* and *in vivo*. Many new products directed towards gut flora interaction have arisen and our understanding of health aspects of these has progressed quickly. With the application of high throughput biochemical approaches to gut microbial interactions, there is increasing knowledge on the metabolic impact of the microbiota. It is apparent that disorders within and outside of the gut can be affected by activities of the indigenous microflora. This symposium will summarize the latest findings in the area and explore new avenues of research.

*Talks include:*

### The Human Microbiome project

James Versalovic (Texas Children's Hospital, USA)

### Application of metabonomics to gut microbial interactions

Elaine Holmes (Imperial College London)

### Simplified models for mechanistic studies on host-microbe interactions

Michael Blaut (German Institute of Human Nutrition, Germany)

### Fermentation processes in the large intestine, and their metabolic impact on the host

George T. Macfarlane (University of Dundee)

### Protozoan parasites and host-pathogen interactions

John Samuelson (Boston University, USA)

### Genomes and gut: what do we know now?

Willem de Vos (Wageningen and Helsinki University, The Netherlands)

### Dietary interventions: pro-, pre- and synbiotics

Bob A. Rastall (University of Reading)

### Diet, gut microbiota and ageing

Kieran Tuohy (University of Reading)

### Application of GI interventions and gut diseases (UC, CD, IBS, CRC)

Simon M. Cutting (University of London, Egham)

### Yeast cell wall antigens and Crohn's disease

Daniel Poulain (Centre Hospitalier Régional Universitaire de Lille, France)

### The gut microbiota as a target in the management of obesity and associated diseases

Nathalie Delzenne (Université Catholique de Louvain, Belgium)

*Plus offered papers and posters*

# EDI 3 Regulatory networks

Wednesday 31 March

Organizer: Jeff Green

One of the characteristics of most microbes is the ability to adapt their behaviour in the face of ever changing environmental challenges. These adaptations occur at several levels of organization (e.g. gene expression, protein activity, metabolite concentration). The advent of high-throughput technologies has made these adaptive processes increasingly accessible to experimental and computational analysis. It is clear that the regulatory networks that underpin and control adaptation are complex and highly integrated and are thus increasingly subjected to systems level analyses. In this symposium speakers from several disciplines come together to discuss the latest developments in systems microbiology of regulatory networks.

Talks include:

## Dissecting the dynamics of transcriptional regulatory networks

M. Madan Babu (University of Cambridge)

## Protein assembly regulation in *Bacillus subtilis*

Richard A. Daniel (University of Newcastle Medical School)

## Systems biology of the yeast cell cycle

Lilia Alberghina (University of Milano-Bicocca, Italy)

## Lambda networks

John W. Little (University of Arizona, USA)

## Inner membrane associated stress and the Phage Shock Protein (psp) regulatory network

Martin Buck (Imperial College London)

*Plus offered papers and posters*

## Robustness of bacterial chemotaxis networks

Victor Sourjik (University of Heidelberg, Germany)

## Chemotaxis

Judy P. Armitage (University of Oxford)

## Chemotactic response and adaptation dynamics in *Escherichia coli*

Robert G. Endres (Imperial College London)

## Regulatory networks controlling bacterial chromosome structure

David C. Grainger (University of Warwick)

## Cyclic-di-GMP signalling in the regulatory networks of *Escherichia coli*

Regine Hengge (Freie Universität Berlin, Germany)

## Virus workshops

### ED14 DNA viruses

Wednesday 31 March AM & PM

Organizers: Adrian Whitehouse & Paul Kellam

### ED15/16 RNA viruses

Wednesday 31 March AM

Organizers: Ian Goodfellow &

Steve Goodbourn

### ED15 Negative-stranded RNA viruses

Wednesday 31 March PM

Organizers: Steven Goodbourn &

John W. McCauley

### ED16 Positive-stranded RNA viruses

Wednesday 31 March PM

Organizers: Ian Goodfellow & Mark Harris

### ED17 Epidemiology and modelling

Wednesday 31 March AM

Organizers: Judy Breuer & William L. Irving

### ED18 Retroviruses

Wednesday 31 March AM

Organizers: Aine McKnight & Andrew Lever

### ED19 Global challenges of virus infection

Wednesday 31 March PM

Organizers: Katie J.M. Jeffery & Paul Klenerman

**Keynote speaker:**

WHO linking science and public health in malaria  
vaccines

Vasee Moorthy (World Health Organization,  
Switzerland)

# ED20 The global challenges of virus infection

Thursday 1 April

Organizers: Martin Cranage, Paul Duprex & Katie Jeffery

Viruses 'respect' neither geographical nor political borders. Currently this is best exemplified by the swine 'flu pandemic which has critically thrown the spotlight onto the interconnectivity that exists across the globe. This symposium recognizes the global dimension of virus infection, both in the developed and the developing world. The scene will be set by David Heymann (Chair of the Health Protection Agency) who will provide a unique insight into global virology based on an international career at the cutting edge of public health. This will be augmented by state of the art lectures focusing on HIV, influenza, hepatitis C virus, rotavirus, Dengue and measles virus.

Talks include:

## Global challenges in virus infection

David Heymann (Health Protection Agency, London)

## Influenza: expecting the unexpected

Malik Peiris (The University of Hong Kong)

## The H1N1 influenza pandemic: transmission dynamics, impact and public health response

Neil Ferguson (Imperial College London)

## Rotavirus and other enteric viruses

Roger Glass (Fogarty International Center, National Institutes of Health, Bethesda, USA)

## Measles: pathogenesis and control

Diane E. Griffin (The Johns Hopkins Bloomberg School of Public Health, Baltimore, USA)

## Dengue

Jeremy Farrar (Hospital for Tropical Diseases, South East Asia Infectious Disease Clinical Research Network, Viet Nam)

## Hepatitis C: present and future

Stephen Livingston (Alaska Native Tribal Health Consortium, USA)

## HIV

Robin Shattock (St George's University of London)

## Novel vectors and antigens for a next generation HIV-1 vaccine

Dan H. Barouch (Beth Israel Deaconess Medical Center, Boston, USA)

*Plus offered posters*

## ED21 Environmentally induced morphogenesis

Thursday 1 April

Organizers: Adrian J. Harwood & Peter Sudbery

Morphogenetic programmes are often hard-wired to various environmental triggers to enable organisms to fine-tune their behaviour, reproduction and sexual cycles to prevailing conditions. Such mechanisms require sophisticated monitoring of environmental parameters and the coupling of relevant responses to developmental programmes controlled at the transcriptional and post-transcriptional levels. This symposium will examine how micro-organisms have evolved in order to perceive and respond to their environments and how these signals activate differentiation and morphogenesis.

Talks include:

### Switches and modulators of *Dictyostelium* chemotaxis

Adrian J. Harwood (Cardiff University)

### Tracing the DIF signalling pathways that direct cellular differentiation in *Dictyostelium*

Jeff G. Williams (University of Dundee)

### Cell morphogenesis in *Saccharomyces cerevisiae* and *Candida albicans*: roles of small G-proteins and phosphoinositide phosphates

Robert Arkowitz (Université de Nice, France)

### Regulation of polar tip extension through NDR kinase signalling in *Neurospora crassa*

Stephan Seiler (University of Göttingen, Germany)

Plus offered posters

### Phenotypic switching in *Candida*

David Soll (University of Iowa, USA)

### The *Candida albicans* multisensor, Cyr1p, mediates fungal gaseous signalling and virulence

Fritz Mühlischlegel (University of Kent)

### Environmental stress and the evolution of multicellularity in the volvocine green algae

Stephen Miller (University of Maryland, USA)

### Environmental signalling of trypanosome differentiation

Keith Matthews (University of Edinburgh)

## ED22 Small regulatory RNAs

Thursday 1 April

Organizers: Mark P. Stevens & Arnoud H.M. van Vliet

In the last decade it has become clear that non-coding RNA molecules regulate many processes in all phyla of life. They control gene expression by sequestering protein regulators or basepairing with mRNAs, and play a role in prokaryotic antiviral defence. Virus-encoded small RNAs subvert cellular pathways and some bacterial pathogens suppress host small RNA function via injection of protein effectors. The ability of small RNAs to silence gene expression (RNA interference) is offering powerful insights into eukaryote biology and may be exploited for control of pathogens. This symposium will showcase examples of the above areas from leading researchers in the field.

Talks include:

### Discovery and mechanisms of small RNAs in pathogenic bacteria

Jörg Vogel (Max Planck Institute for Infection Biology, Berlin, Germany)

### Post-transcriptional regulation by the Csr (Rsm) system

Tony Romeo (University of Florida, Gainesville, USA)

### CRISPR RNA protects prokaryotes against viruses and plasmids

John van der Oost (University of Wageningen, The Netherlands)

### Biochemical dissection of mammalian RNA silencing pathways

Gunter Meister (Max Planck Institute of Biochemistry, Germany)

### RNAi-mediated inhibition of HIV-1 replication

Ben Berkhout (University of Amsterdam, The Netherlands)

### Suppression of the plant microRNA pathway by bacterial effector proteins

Olivier Voinnet (Institut de Biologie Moléculaire des Plantes, Strasbourg, France)

### Redundant small RNAs and feedback control in *Vibrio cholerae* quorum sensing

Sine Svenningsen (University of Copenhagen, Denmark)

*Plus offered papers and posters*

## ED23 Gene function analysis

Thursday 1 April

Organizers: Paul H. Everest & Mick F. Tuite

The catalogue of sequenced and annotated microbial genomes continues to grow at a frightening rate with each new sequence revealing yet more genes of unknown function. Sequencing genomes is no longer the challenge, but rather it is defining function(s) of the predicted gene products in the living microbial cell. This symposium will highlight some of the innovative *in vivo* approaches to this challenge drawing on examples from bacterial pathogens, yeasts and slime moulds. The approaches covered range from large-scale mapping of genetic networks through to the direct visualization of gene activity in the living microbial cell.

*Talks include:*

**Dissecting regulatory networks in host–pathogen interaction by chromatin immunoprecipitation**

Stewart Cole (Ecole Polytechnique Fédérale de Lausanne, Switzerland)

**Identifying gene function in *Clostridium difficile***

Neil F. Fairweather (Imperial College London)

***Salmonella* metabolism during infection**

Dirk Bumann (Biozentrum, University of Basel, Switzerland)

**Visualizing gene transcription in living social amoeba cells**

Jonathan Chubb (University of Dundee)

**Global mapping of genetic and chemical-genetic networks in yeast**

Charlie Boone (University of Toronto, Canada)

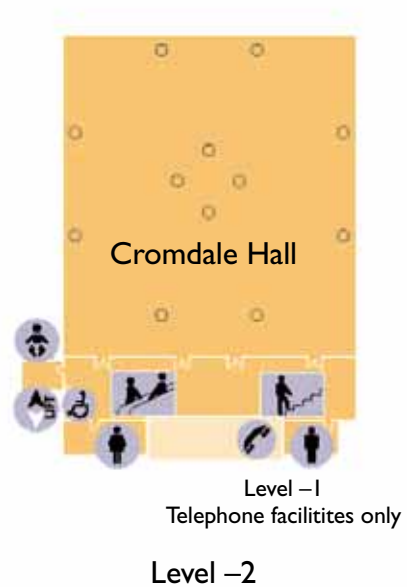
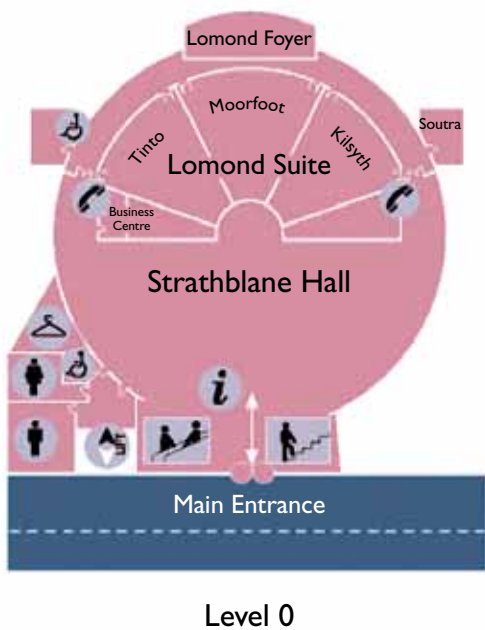
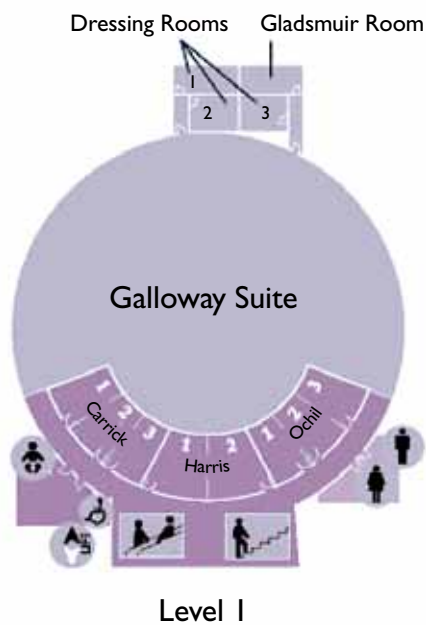
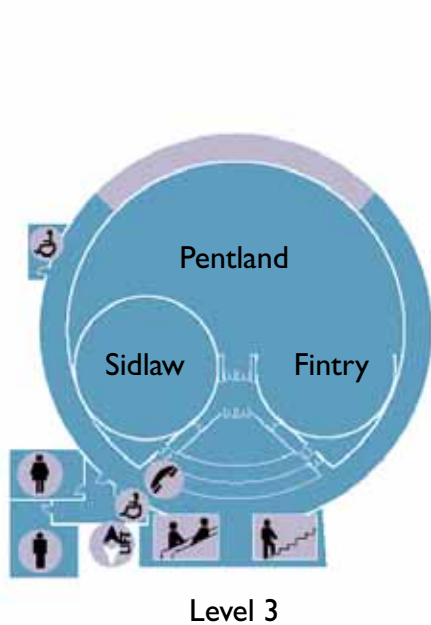
**Using parallel sequencing to map genetic interactions in yeast**

Fritz Roth (Harvard Medical School, USA)

*Plus offered papers and posters*



# EICC Floor Plans



# Antibodies and reagents for Microbiology research

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