A microbiogram can be categorized as susceptible to an antibiotic only after phenotypic antimicrobial susceptibility testing (AST) based on MIC determination. Antimicrobial resistance can be detected by phenotypic methods and/or by the detection of a specific resistance mechanism or gene can never be taken to imply that a microorganism is susceptible. Through MIC determination or disk diffusion testing, the drug’s ability to inhibit the growth of the microorganism is quantified. To categorize bacteria as susceptible or resistant, an AST system requires the determination of breakpoint concentrations. In Europe there are several national breakpoint committees (France, Germany, Norway, Sweden, Netherlands and United Kingdom). Together with ESCMID and the European Centre for Disease Prevention and Control (ECDC) they organize EUCAST (read about EUCAST on www.eucast.org). It is tasked with harmonizing European breakpoints and methods and with working closely with the European Medicines Agency (EMEA) to determine breakpoints for new antimicrobials. In the USA, the CLSI (Clinical Laboratory Standards Institute; formerly NCCLS and FDA (Food and Drug Administration)) both determine breakpoints and CLSI delineates methodology and zone-diameter correlates. EUCAST and its subcommittee on antifungal susceptibility testing have harmonized breakpoints for existing antifungal agents and, together with EMEA, have set breakpoints for several new drugs. EUCAST breakpoints are now the only breakpoints in the European Speciation of Product Characteristics (SPCA). European countries without national committees have often subscribed to CLSI breakpoints and AST methodology. Only rarely has this been a national decision; more often it has evolved as a tradition among colleagues because there was no obvious alternative. This resulted in the use of seven systems in Europe. Through MIC determination or disk diffusion testing, the ability of a microorganism is susceptible.

European plan to guarantee that we all mean one and the same term. Antimicrobial resistance surveillance programmes can only gain in stature and credibility when resistance rates from different countries mean the same thing. The European Antimicrobial Resistance Surveillance System (EARSS) collects antimicrobial resistance data in the form of, SI or R on selected invasive pathogens from all European countries. The fact that the categorizations are based on different breakpoints rules out the use of source of the collected data. Analysis of the relationship between consumption and resistance is hampered by the lack of international agreement.

It is little to ask that we all use the same yardstick when measuring antimicrobial resistance. The national breakpoint committees in Europe, ESCMID and the EU (DG Sanco and ECDC) have invested much time and resources to achieve a common set of European breakpoints, and now we are almost ready to provide what is needed. There is an internationally agreed International Standards Organisation (ISO) reference method for the determination of MICs. Clinical breakpoints for existing drugs have been harmonized and are available on the EUCAST website, together with documents describing the rationale for our decision and links to distributions of MIC values for microorganisms without resistance mechanisms. The website also provides rules for interpretative reading of susceptibility test results; the rules have been assembled and assessed by a EUCAST subcommittee. The manufacturers of automated devices for AST are working hard to provide systems with European breakpoints by 2009.

But two more things are needed:

– Each country needs to adopt a national strategy for susceptibility testing. Many countries have some form of “National Antimicrobial Breakpoint Survey” and those that do not are encouraged to form one during 2008/2009. The NAC may be empowered to develop national strategies and recommendations for one or more “elderly” antimicrobials. One of these “elders” should be antimicrobial susceptibility testing. A person from the NAC would be a natural representative on the EUCAST General Committee. EUCAST and ESCMID will, if requested, help form NACs.

– EUCAST needs to provide the many laboratories using disk diffusion for AST with a method with zone diameter correlates for the European breakpoints. The decision to develop a European disk diffusion test has been taken and work has commenced. It will be based on Mueller-Hinton medium with an inoculum corresponding to 0.5 McFarland standard. It is our intention to provide zone diameter correlates for European clinical breakpoints during 2009.

Several countries have already started the process of forming national strategies. These processes will be backed by EUCAST, ESCMID and ECDC. It is in the interest of all of us to have a coherent European plan to guarantee that we all mean one and the same thing when we proclaim a particular microorganism susceptibility or resistance to an antimicrobial drug.

### Antimicrobial Susceptibility Testing – Time for Europe to Come Together

**Editorial**

Gunnar Kahlmeter, Chairman of EUCAST and ESCMID Professional Affairs

gunnar.kahlmeter@btknoszeg.org

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Minutes
Meeting during the 18th ECCMID in Barcelona on 20 April from 18:15 h – 19:30 h
1 Welcome and President’s Report
Giuseppe Cornaglia welcomed the 82 ESCMID members attending the Assembly 2008. He noted that the minutes of the Assembly 2007 have been published in ESCMID News 2-2007 and that the invitation and agenda for the Assembly 2008 had been correctly sent out as stated in the Statutes and also published in ESCMID News 1-2008.
As an introduction to the reports by the individual officers, Giuseppe Cornaglia made a few general comments about the Society’s major strategic developments. In our own view, ESCMID now clearly represents the entire scientific and medical community in the field of clinical microbiology and infectious diseases in Europe. At the same we plan to pay more attention to our membership by increasing the direct benefits for ESCMID members.
During the reporting period, the composition of the Executive Committee changed: Hélène Aubry-Damon, Paris, FR, resigned from her position as Professional Affairs Of cer in Clinical Microbiology in July 2007; she was replaced by Gunnar Kahlmeter, Vaxjo, SE, who was co-opted as a new member to the Executive Committee. For the changes of the CJM Editors see item 10 below. Pentti Huovinen will be the 19th ECCMID 2009 President; he joined the Executive Committee as an ad hoc member at the day of the Assembly, while Bernhard Ruf, 17th ECCMID President, left the Committee at the end of 2007.
A Commission for Equal Opportunities was founded to sensitise our organization about a proper balance about gender, geographical area or eld of expertise. A rst report will be presented at the next Assembly in 2009.
2 Report of the Secretary General
Javier Garau presented the current membership gures. As of end 2007, ESCMID had 3,549 regular members, 500 more than one year ago. Interestingly, this increase in membership is a consistent trend in all countries. The best-represented country is still the UK with 263 members, followed by Germany (225) and the Netherlands (210). Currently 52 societies are afliated with ESCMID.
The age distribution shows that 60% of our membership is between 33 and 52 years old, with a sharp decline in the number of younger or older members.
Questions from the board: Hartmut Lode, DE, asked whether ESCMID considers introducing a joint membership between national societies and ESCMID. Javier Garau responded that our approach is the af liation of national societies. We already represent about 19,000 clinical microbiology and infectious diseases specialists across Europe. Roger Finch, UK, referred to the encouraging increase in members and suggested running a survey among new members about the reason for joining ESCMID. Javier Garau agreed and speculated that the increase of ECCMID participants also helps ESCMID to grow due to the combined registration.
3 Presentation of the ESCMID Awards
Ragnar Norby, Chair of the ESCMID Awards Subcommittee, rst referred to the new programme of training fellowships and research grants with substantially increased funding in 2008 compared to previous years. The list of recipients thus grew considerably. He had the pleasure to rst introduce the ESCMID Awarded and then the recipients of a grant and a fellowship:
ESCMI Award for Excellence in Clinical Microbiology and Infectious Diseases
- Pentti Olavi Huovinen, born 1956 in Helsinki, Finland; MD, PhD, Professor and Director of the Department of Bacterial and In ammatory Diseases at the National Public Health Institute (KTL), Finland, in recognition of his outstanding contributions to understanding antibiotic resistance, especially resistance towards macrolides. Title of his award lecture: Microbes and man; from unexpected to unknown
ESCMI Young Investigator Awards for Research in Clinical Microbiology and Infectious Diseases
- Sylvain Brisse, born 1968 in Sète (Hérault), France; PhD, Research scientist at the Unit for Biodiversity of Emerging Bacterial Pathogens at the Institut Pasteur in Paris, in recognition of his outstanding achievements in the eld of microbial phylog enomics, population genetics and epidemiological typing. Title of his award lecture: Diversity and virulence in microbial pathogens: an evolutionary perspective
- William Hope, born 1969 in the Springs, Australia; MBBS, FRACP, FRCPA, PhD, Senior Research Fellow in Department of Medicine at the University of Manchester, in recognition of his outstanding achievements in the eld of pathogenesis, diagnosis and treatment of fungal infections. Title of his award lecture: Antifungal pharmacokinetics and pharmacodynamics: the optimisation of antifungal therapy for immuno-compromised patients
ESCMI and bioMérieux Award for Advances in Clinical Microbiology in East Central or Eastern Europe
- Ivan Nikolaev Ivanov, born 1978 in Sofia, Bulgaria; research er at the National Reference Centre for Diagnosis and Control of Nosocomial Infections, So, in recognition of his outstanding contribution to improving PCR assays for rapid detection and typing of microbial DNA in clinical and environmental samples
ESCMI Research Grants
- Richard M. Anthony
Royal Tropical Institute, KIT Biomedical Research, Amster dam, The Netherlands
Project: The effect of sequential acquisition of mutations associated with resistance to the primary drugs of M. tuberculosis in vitro
- Mäire Begley
Department of Microbiology and Pharmaceutical Centre, University College Cork, Cork, Ireland
Project: Bile as an environmental cue for the regulation of Listeria monocytogenes virulence-associated characteristics
- Frank Bruning
Department of Applied Molecular Biology, Saarland University, Saarbrücken, Germany
Project: Recombinant yeast as novel mucosal live vaccine
- Geraldine Carney
Mucosal Immunity Laboratory, Central University Hospital of Vaud, Lausanne, Switzerland
Project: The role of bactericidal permeability increasing protein associated with intestinal in ammation and infection
- Marie Hallin
Service de Microbiologie Hôpital Erasme, Brussels, Belgium
Project: Exploration of resistance and virulence factors harboured by methicillin-resistant S. aureus of animal and human origin
- Christine Imbert
Faculty of Medicine and Pharmacy, University of Poitiers, Poitiers, France
Project: Isolation and characterisation the modulating factor responsible for the Candida albicans bio lm inhibition
- Lucia Palecechi
Department of Molecular Biology, University of Siena, Si ena, Italy
Project: Mechanisms of acquired antibiotic resistance in bacteria from very remote human communities with minimal antibiotic exposure
- Spyros Pournaras
Department of Microbiology, University Hospital of Larissa, Larissa, Greece
Project: Clinical impact and molecular analysis of linezolid and vancomycin-resistant Enterococcus faecium (VRE) clinical strains from Greece
- Dóra Szabó
Institute of Medical Microbiology, Semmelweis University, Budapest, Hungary
Project: Molecular mechanisms and epidemiology of the X-nolone resistance in Gram-negative nosocomial bacteria
- Martín Sundqvist
Department of Clinical Microbiology, Central Hospital, Vax jo, Sweden
Project: Clonal analysis of uropathogenic Escherichia coli to trace bacterial population changes in response to a large scale antibiotic intervention study in the community
- Pierre Tarravin
Infectious Diseases and ICU, Pochantonn University Hospi tal, Rennes, France
Project: Streptococcus and Enterococcus sp. isolated from blood culture and/or valves in patients with infective endocarditis: molecular epidemiology and comprehensive susceptibility testing
- Alma C. van de Pol
Department of Virology, University Medical Center Utrecht, The Netherlands
Project: Is the viral load of respiratory viruses associated with the severity of respiratory symptoms in young children with lower respiratory tract infections at the paediatric intensive care unit?
- Willem van Schaik
Department of Medical Microbiology, University Medical Center Utrecht, Utrecht, The Netherlands
Project: Functional genomics of hospital-acquired Enterococcus faecium
- Anne Vergison
Paediatric Infectious Diseases Department, Université Libre de Bruxelles, Brussels, Belgium
Project: Evolution of Streptococcus pneumoniae epidemiology in Belgian children
ESCMI Training Fellowships
- Esther Heikens
University Medical Center Utrecht, The Netherlands
- Christopher Stenfors
Medical University of Vienna, Austria
- Carolina Berghlund
Orebro University Hospital, Sweden
- Didier Hocquet
University Hospital, Besancon, France
- Zornitsa Valentinova Mladenova
National Center of Infectious and Parasitic Diseases, So, a, Bulgaria
- Ihab Habib
Ghent University, Belgium
- Evelyne Snelders
Radboud University Nijmegen, The Netherlands
- Sabeeha Ahmed
International Centre for Diarrhoeal Disease Research, Dhaka, Bangladesh
4 Financial Report of the Treasurer
Elisabeth Nagy pointed out that our independent auditor from BDO, Freiburg, DE, has examined the annual accounts 2006 and 2007 and recommended approval without any objection. For the rst time an Assembly can thus approve the accounts of the preceding year. The treasurer further stated that there are no tax ars of payments and that the non-pro t status of the Society has never been contested. She then presented the nal opera tional results for 2006 and 2007 (Tables 1 and 2) and the balance sheets for 2006 and 2007 (Tables 3 and 4).
Based on the excellent financial situation of ESCMID, the Executive Committee increased spending in 2007 in most areas to the benefit of the membership. In addition, the free reserve was increased by EUR 200 000 to EUR 695 904. Elisabeth Nagy pointed out that this budget 2008 foresse further increases in the funding of research grants, training fellowships, medical guidance development and educational and scientific activities.

Questions from the floor:
Pramod Shah, Frankfurt, Germany, congratulated ESCMID on these results and asked whether indeed ESCMID spends more than EUR 0.5 Mio for administration. Elisabeth Nagy confirmed this figure in numbers that currently seven people are employed in the Executive Offices to manage and support the increasing number of activities of the Society. Pramod Shah suggested that the financial accounts be published on the ESCMID website. Elisabeth Nagy referred to the minutes, which will include all figures and be published as in previous years in ESCMID News and on the website. Hartmut Lode, Berlin, DE, wondered about the German authorities accepting revenues of several Mio EUR on the Society’s bank accounts. Giuseppe Cornaglia answered that indeed our assets should not further increase. Peter Schoch confirmed that we will strive in future for balanced budgets with expenses equaling income. Our current assets allow ESCMID to survive two years without revenues; this is the amount accepted by the authorities for a non-profit society.

Table 1: Operating results 2006

<table>
<thead>
<tr>
<th>Expenses</th>
<th>Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive Office</td>
<td>-202 225</td>
</tr>
<tr>
<td>Membership fees</td>
<td>38 347</td>
</tr>
<tr>
<td>Membership services</td>
<td>-95 380</td>
</tr>
<tr>
<td>ECCMID &amp; other scientific activities</td>
<td>2 324 925</td>
</tr>
<tr>
<td>Executive &amp; other committees</td>
<td>46 543</td>
</tr>
<tr>
<td>Publications [exclusive]</td>
<td>-211 212</td>
</tr>
<tr>
<td>CMI &amp; other journals</td>
<td>149 214</td>
</tr>
<tr>
<td>Educational &amp; scientific activities</td>
<td>-197 795</td>
</tr>
<tr>
<td>Awards, grants &amp; fellowships</td>
<td>-65 790</td>
</tr>
<tr>
<td>Professional &amp; public affairs [exclusive ECCMID, ESGB, EAS, EACMI, ISAP]</td>
<td>-344 476</td>
</tr>
<tr>
<td>Taxes</td>
<td>-15 761</td>
</tr>
<tr>
<td>Total expenses</td>
<td>-1 996 986</td>
</tr>
<tr>
<td>Total income</td>
<td>2 687 681</td>
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<tr>
<td>Result</td>
<td>1 700 705</td>
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</tbody>
</table>

Table 2: Operating results 2007

<table>
<thead>
<tr>
<th>Expenses</th>
<th>Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive Office</td>
<td>-434 547</td>
</tr>
<tr>
<td>Membership fees</td>
<td>82 555</td>
</tr>
<tr>
<td>Membership services</td>
<td>-417 459</td>
</tr>
<tr>
<td>ECCMID &amp; other scientific activities</td>
<td>1 263 931</td>
</tr>
<tr>
<td>Executive Committee</td>
<td>-48 166</td>
</tr>
<tr>
<td>Publications [exclusive]</td>
<td>-391 894</td>
</tr>
<tr>
<td>CMI &amp; other journals</td>
<td>202 906</td>
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<tr>
<td>Educational &amp; scientific activities [exclusive]</td>
<td>-284 204</td>
</tr>
<tr>
<td>Awards, grants &amp; fellowships</td>
<td>-67 400</td>
</tr>
<tr>
<td>Professional &amp; public affairs [exclusive ECCMID, ESGB, EAS, EACMI, ISAP]</td>
<td>-224 148</td>
</tr>
<tr>
<td>Taxes</td>
<td>-20 930</td>
</tr>
<tr>
<td>Total expenses</td>
<td>-2 103 128</td>
</tr>
<tr>
<td>Total income</td>
<td>2 790 443</td>
</tr>
<tr>
<td>Result</td>
<td>5 196 241</td>
</tr>
</tbody>
</table>

Table 3: Balance sheet as of 31 Dec 2006

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed assets</td>
<td>7 921 535</td>
</tr>
<tr>
<td>Circulating assets</td>
<td>1 523 165</td>
</tr>
<tr>
<td>Cash</td>
<td>381 234</td>
</tr>
<tr>
<td>Accounts receivable</td>
<td>1 783 010</td>
</tr>
<tr>
<td>Prepaid expenses</td>
<td>60 194</td>
</tr>
<tr>
<td>Total balance</td>
<td>4 474 027</td>
</tr>
<tr>
<td>Profit carried forward plus free reserve as of Jan 2006</td>
<td>2 160 843</td>
</tr>
<tr>
<td>Profit carried forward as of 31 Dec 2005</td>
<td>2 340 228</td>
</tr>
<tr>
<td>Result 2006</td>
<td>179 815</td>
</tr>
</tbody>
</table>

Table 4: Balance sheet as of 31 Dec 2007

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed assets</td>
<td>4 347 966</td>
</tr>
<tr>
<td>Circulating assets</td>
<td>1 252 167</td>
</tr>
<tr>
<td>Cash</td>
<td>487 190</td>
</tr>
<tr>
<td>Accounts receivable</td>
<td>733 037</td>
</tr>
<tr>
<td>Prepaid expenses</td>
<td>7 622</td>
</tr>
<tr>
<td>Total balance</td>
<td>4 560 522</td>
</tr>
<tr>
<td>Profit carried forward plus free reserve as of Jan 2006</td>
<td>4 148 835</td>
</tr>
<tr>
<td>Profit carried forward as of 31 Dec 2005</td>
<td>2 160 843</td>
</tr>
<tr>
<td>Result 2007</td>
<td>2 398 982</td>
</tr>
</tbody>
</table>

9. Report of the Scientific Affairs Officer
Jordi Vila reported that there were still 16 Study Groups operating under the auspices of ESCMID, members of the ESCMID Working Group, “Infections in the ICU” (organized with the ESCMID). Due to considerable overlap of their portfolios, Robert Read and Gunnar Kahlmeter, the Professional Affairs Officers for Infectious Diseases and Clinical Microbiology, respectively, teamed up presenting their reports.

Robert Read first referred to the formation of a Professional Affairs Subcommittee (PAS) with some 19 members from both specialties. Its prime goal is to advise the Executive and guide decisions making in Professional Affairs. Towards this goal a place so far, which focused, among others, on the preparation of a professional Affairs Workshop “Moving Forward in Cooperation” taking place from 9–10 October 2008 in Rome. He then gave an overview of the ongoing medical guidelines developments:

- International guidelines for management of severe sepsis and septic shock (in cooperation with the Surviving Sepsis Campaign, published in Crit. Care Med. 2006; 35:296–327)
- Guidelines on the diagnosis and management of Clostridium difficile-associated disease (ESCMID guidelines, ongoing, led by Ed Kuipers, Leiden, NL)
- Lower respiratory tract infection (ongoing, in cooperation with ERS)
- Endocarditis (ongoing, in cooperation with EAN)
- Coherence-related urinary tract infection (ongoing, in cooperation with IDSA)
- Urinary Tract Infection (ongoing, in cooperation with IDSA)
- Another project being implemented is related to facilitating balanced exchange of ESCMID members: Departments of Clinical Microbiology or Infectious Diseases can apply for the status of an “ESCMID Collaborative Centre” and publish their profile on the ESCMID website. This entails them to participate in an “ESCMID Observership Programme” by receiving individual invitations on the ESCMID website. Of course, these invitations will be reserved for ESCMID members and be funded by ESCMID.

Robert Read then presented the “road map” towards the compilation of a “White Book” on Clinical Microbiology and Infectious Diseases. It is based on an online questionnaire to be filled in by national representatives. The database containing detailed information about the organizational basis of our specialties in Europe will eventually be published in ESCMID News and on the Internet.

Another project being implemented is related to facilitating balanced exchange of ESCMID members: Departments of Clinical Microbiology or Infectious Diseases can apply for the status of an “ESCMID Collaborative Centre” and publish their profile on the ESCMID website. This entails them to participate in an “ESCMID Observership Programme” by receiving individual invitations on the ESCMID website. Of course, these invitations will be reserved for ESCMID members and be funded by ESCMID.
Kevin Towne, having reached the end of his term, stepped down from of ce as Editor-in-Chief of CMI at the end of March 2008. Ragnar Norrby thanked him for his achievements. The new Editor-in-Chief, in charge of new submissions since 1 April 2008, is Didier Raoult, Marseille, FR.

Another change took place in the editorial of ce for the CMI supplements. Carl Erik Nord, who had several functions in the Society since 1986, resigned from being Supplements Editor and was replaced by George Schmid, Geneva, CH. Ragnar Norrby also thanked him for his many contributions to the Society.

11 Report of the President of the 18th ECCMID 2008

Giuseppe Cornaglia congratulated Fernando Baquero, the President of the 18th ECCMID, on an outstanding congress. Since Fernando Baquero was unable to attend, Peter Schoch presented the numbers of this year’s ECCMID, which breaks all records:

- Number of participants: 9,585, thereof: 7,964 delegates, 405 accompanying persons, 1,216 exhibitors’ personnel
- Best countries: ES, UK, GR, US, FR, DE, IT
- Exhibitors: 166 exhibiting companies, 2,983 m² net area
- Press: 84 registered journalists, ten press releases.

The contact time during keynote lectures, symposia, educational workshops, meet-the-expert and oral sessions increased to 238 hours.

12 Report of the Chair of the 18th ECCMID Programme Committee

Andreas Voss was most pleased by the strong response of the scientific community to the call to submit abstracts of their original research. ECCMID has received a record number of 3,655 abstracts from 88 different countries. A total of 233 reviewers conducted a blind review the abstracts, of which 36% were rejected. This high rejection rate has certainly contributed to the high quality of this year’s poster sessions. The most popular topics were resistance surveillance, non-molecular diagnostic laboratory methods, public health and community-acquired infections, and fungal infections.

The total number of speakers and chairs was 849. They came from 46 different countries (see Figure 2).

Andreas Voss then acknowledged the members of the 18th ECCMID Programme Committee, which he called his “dream team”, for compiling such a superb scientific programme.

13 Amendment of the Statutes

The proposed amendments of the Statutes fall into two categories as pointed out by Giuseppe Cornaglia:

i) The current Statutes do not foresee a specific responsibility for the President-elect, for which reason it is proposed to unify this position with that of the Secretary General. This makes sense since the latter position should be held by an experienced person, which is certainly the case for the President-elect. This corresponding change of the Statutes, § 4 Organization, was unanimously approved.

ii) So far, the candidates for the Executive Committee to be put on the ballot sheet were selected by a nominating committee. In order to strengthen the democratic basis of our Society and to give more voice to our membership, it is proposed, following a proposal from Pramod Shah, Frankfurt, DE, that candidates be put on the ballot if at least 30 members support the nomination with their signatures. At least 15 supporting members must come from countries other than the country of the nominated candidate. Nominees who fail to be elected may not be nominated again for the immediate following term.

Comments from the floor:

Andrew Ullmann, Mainz, DE and Pramod Shah, Frankfurt, DE, both proposed to drop the latter requirement in order to give full competence to the membership to nominate whomever they want. Giuseppe Cornaglia defended the proposal. It seeks a balance between strengthening the democratic rights of the membership and – at the same time – foresees measures to prevent repetitive lobbying campaigns for individual candidates.

The changes of Statutes related to the nominating rights by the membership were approved by a vast majority with two votes against the proposal and ve abstentions.

14 Formal approval of the actions and discharge of the Executive Committee

Giuseppe Cornaglia asked for a hand vote to approve the actions of the Executive Committee in 2007 and to grant discharge to the Executive Committee. Both were unanimously approved and granted, respectively.

15 Other business

Giuseppe Cornaglia informed the Assembly that ESCMID has again concluded a Memorandum of Understanding with the International Society of Chemotherapy (ISC) concerning the conduct of a joint congress ECCMID / ICC in 2011. It will be the 21st ECCMID and the 27th ICC and be held in Milan, Italy.

Comment from the floor: Kurt Naber, Straubing, DE, commended current ISC President his enthusiasm for the Memorandum of Understanding. The basis for the continued cooperation is the huge success of the joint 17th ECCMID/25th ICC in 2007 in Munich.

There was no further request to speak.

Close of the meeting

Giuseppe Cornaglia thanked the members for attending. He adjourned the meeting at 19:30 h.

Basel, 7 July 2008
This article is the first issue of short column entitled From the Executive to appear from now on regularly in ESCMID News to inform our members about developments and initiatives within our Society.

**General and Managerial Issues**
- Preparations have started for the election of two new members to the Executive Committee for the term 2009 – 2013. Members of good standing since at least one year have been asked to nominate candidates. Members will be asked to cast their vote in December 2008 through the Internet.
- The company Association Global Services (AGS) has been asked by Giuseppe Cornaglia for a strategic assessment of ESCMID’s position, legal status and governance. The report will form the basis for planning the future development of ESCMID.
- The ESCMID Bylaws have been recently extensively revised by the Executive under the supervision of the Secretary General, Javier Garau. For the full new version see the ESCMID website.
- This year’s Assembly of Members took place on 20 April 2008 in Barcelona. The minutes are published on the ESCMID website and in this issue of ESCMID News. They include the detailed reports by all Officers including that of the treasurer Elisabeth Nagy, which demonstrates the financial health of our Society.
- Peter Schoch has announced his resignation from the position as ESCMID Managing Director. Peter Cologna will be the new Managing Director as of 1 November 2008.

**Scientific Affairs**
- On 25 July 2008 an expert meeting on Chikungunya organized by Jordi Vila took place in Barcelona under the auspices of ESCMID and ASM. It addressed epidemiological, diagnostic and treatment aspects and was recorded for dissemination through the ESCMID and ASM websites.
- A proposal for a joint ESCMID/bioMérieux grant for young scientists from East Central and Eastern Europe for research in the field of diagnostic microbiology has been approved. For details see the ESCMID website.

**Education**
- As a basis for planning ESCMID’s educational activities, a coherent strategy defining objectives, priorities and procedures was developed by Murat Akova. Yearly proposals for postgraduate courses and workshops are sought from ESCMID Study Groups and affiliated societies and must be received by the end of June of the preceding year. The plan foresees a maximum of twelve educational events per year (in addition to the Summer School and educational workshops at ECCMIDs) and strives for scientific and geographical balance of our educational offer. Additional measures will be taken to optimise the educational impact through advertisement, by providing financial support and by making slides available to ESCMID members through the Internet.

Peter Schoch for the Executive Committee
Results of the Opinion Poll

Andreas Voss, ECCMID Programme Director

This year 7,964 delegates attended the ECCMID 2008 in Barcelona, an increase of 1,975 delegates (25%) compared to the joint ECCMID/ICC last year. Hence, the number of congress participants still continues its steady increase with a few dips in the trend since the first ECCM in 1983 with 850 participants (Figure 1).

Figure 1. Number of delegates and received abstracts for the ECCMIDs since 1983

We are happy to report that 1,133 participants filled out the online opinion poll for this year’s ECCMID. Overall, the vast majority of the respondents was highly satisfied with the congress. Responses from all questions, except for those requiring a written response, can be found on the ESCMID website, “Opinion Poll”.

As was the case last year most respondents (83%) found that the programme met their expectations. Among the few mentioned were virology and vaccinology, two topics which will be given more attention next year at the ECCMID in Helsinki.

Along with the increasing number of participants over the years, the scientific programme was also growing and offered in 2008 more topic coverage than ever with a total of 238 hours of contact during keynote lectures, symposia, oral and meet-the-expert sessions and educational workshops. Eighty-two percent of responders indicated that the programme met their expectations of getting the latest scientific information in their field (Figure 2). Naturally a programme with many simultaneous sessions has the disadvantage that individuals cannot attend all the sessions they would like. The possibility of capturing some or all sessions to be made available after the congress is being considered again for next year.

Figure 2.

5. Did the scientific programme meet your expectations of getting the latest scientific information in your field?

<table>
<thead>
<tr>
<th></th>
<th>yes</th>
<th>81.6%</th>
<th>925</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>no</td>
<td>3.1%</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>partially</td>
<td>15.3%</td>
<td>173</td>
</tr>
</tbody>
</table>

We are pleased to report that most participants found the poster session quality either better or the same as in previous years (Figure 3). The abstract rejection rate, which was 36%, will not be increased in the near future as a balance seems to have been struck between quality and giving scientists the opportunity to present their work.

Some participants complained that there was too little space between the poster rows to accommodate ad hoc discussions with presenters without interfering with visitors to adjacent posters. We will improve this in future by planning for larger poster sessions. A number of participants also would like poster sessions to be longer than one hour so as to be able to see more of them per session. This option will be carefully evaluated for next year.

Figure 3.

7. The quality of the poster sessions is a constant concern. This year we have significantly increased the abstract rejection rate to 36%. How do you rate the quality of the poster sessions in 2008?

<table>
<thead>
<tr>
<th></th>
<th>improved</th>
<th>65.6%</th>
<th>743</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>worsened</td>
<td>2.1%</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>no change</td>
<td>32.3%</td>
<td>366</td>
</tr>
</tbody>
</table>

During breaks, when participants crowded into the halls and foyers, seating opportunities and tables were found to be scarce. This will be kept in mind when setting up the facilities for the ECCMID conference centre next year in Helsinki. On a positive note, most lecture halls seem to have been large enough to accommodate the delegates who wanted to attend a given session.

As in previous years there were again comments made about an insufficient number of catering facilities within the congress building as well as a low food quality offered. We are almost sure that this will not be a problem next year. The Conference Centre in Helsinki has many restaurants and food corners of good quality which render special measures, such as distributing lunch boxes, unnecessary.

This year some participants missed hotel shuttles to the congress centre, which were available in some previous years when the congress centre was less accessible by public transportation. The decision as to whether to provide shuttle service is dependent on the centre’s accessibility via public transportation.

Finally, we would like to thank all of you who responded to the opinion poll. Your feedback is invaluable to improving upon the congress. We look forward to seeing you in Helsinki from the 16–19 May 2008.

ESCMID NEWS 02/2008

SOCIETY

12

ESCMID NEWS 02/2008

SOCIETY
The First European Day of Fighting Infection held on 23 April 2008 in Barcelona was a great success and it is planned to be the first of many to come. If you were unable to attend this year, you can find the Powerpoint presentations on the ESCMID website (www.escmid.org/presentations). More information about future renditions will be available on the ESCMID website at a later date.

The ESCMID Executive Committee

Javier Garau gave an interesting talk about the social and cultural influence of St. George, his importance to Western culture and his relation to the Day of Fighting Infection.

Alasdair Geddes speaking about quarantine and lazarettes from the Middle Ages through the 20th century.

Group photo of speakers (l. to r.): Raul Isturiz, Fernando Baquero, Didier Raoult, Giuseppe Cornaglia, Franco Cardini, Javier Garau, Alasdair Geddes, Sherwood Gorbach.
ECCMID Photo Gallery
18th ECCMID 2008 Barcelona

From the CMI Editorial Office
Information and Guidelines for Authors

Following the recent changes in editorial responsibility the guidelines for authors and instructions for online submission to Clinical Microbiology and Infection have been revised. In particular, please see the sections below concerning Manuscript Categories and Authorship. Amendments and procedures that are frequently misunderstood are underlined.

The guidelines, which will be updated periodically, are available on the ESCMID website (www.escmid.org/CMI). Clinical Microbiology and Infection (CMI), the official publication of the European Society of Clinical Microbiology and Infectious Diseases, was initiated in 1995 and publishes manuscripts presenting the results of original research in clinical microbiology, infectious diseases, virology and parasitology, including immunology and epidemiology as related to these fields. The journal also publishes invited editorials and reviews, as well as guidelines and position papers originating from ESCMID Study Groups and ESCMID-sponsored conferences.

Submission process

Please see http://mc.manuscriptcentral.com/cmi for submission instructions. Manuscripts must be submitted via the account of the Corresponding Author.

- Please enter author names in full, following the conventional use of capitalization (do not use either all lower case or all upper case).
- Correct and individual email addresses must be entered for all authors. For Co-authors, this will delay the review process until all co-authors’ addresses are furnished.
- Please upload manuscripts as Word documents rather than pdf files.
- In case of difficulties, please contact ScholarOne (Get Help Now in the upper right corner of the screen). For security reasons, the Editorial Of ce is unable to provide passwords.

Submission document

Each online submission must be followed by mailing a document signed by all named authors. Co-authors may submit this document separately, but the documents should be identical for a given submission and must include the assigned tracking number (CMI-XX-XXXX).

The submission document must be a single pdf document. The only exception is the Acknowledgement section, which may be provided in a separate pdf. The submission document must be legible and readable. The manuscript should be written in English and should be submitted in a single pdf file. The submission document should contain all the information required for the peer review process.

- Manuscript categories
  - Original article
    - Maximum of 2500 words
    - 5 – 10 key words
    - 100 references maximum
    - 5 tables/figures maximum (optional colour online)
  - Research note
    - Maximum of 1000 words (no subheadings)
    - 20 references maximum
    - 5 key words
    - 2 tables/figures maximum (optional colour online)
  - Correspondence
    - 500 words maximum
    - 10 references maximum
    - 2 tables/figures maximum (optional colour online)
  - Items of correspondence should be limited to preliminary data that are timely and highly relevant to the scope of the journal. Commentaries on papers recently published in the journal are also welcome.

- Editorial and Reviews
  - Please do not submit uninvited manuscripts. The Editorials and Reviews to be published during 2009 have been invited in conjunction with monthly themes. Proposals for Guest Editorship of a theme section for publication in 2010 are welcome.

- ESCMID publications
  - Manuscripts from ESCMID Study Groups or proposals for publications originating from ESCMID Conferences should be discussed with the Editorial Of ce prior to submission.
  - Please contact Judith Crane, Managing Editor (judith.craner@escmid.org) to propose a theme section or an ESCMID publication.

Do not send a scanned version of the submission document electronically and do not send the document by fax; please send by post to the address below:

Judith Crane, CMI Editorial Of ce, 39 Quai de Grenelle, 75015 Paris, France

Manuscript categories

- Original article
  - Maximum of 2500 words
  - 5 – 10 key words
  - 100 references maximum
  - 5 tables/figures maximum (optional colour online)

- Research note
  - Maximum of 1000 words
  - 20 references maximum
  - 5 key words
  - 2 tables/figures maximum (optional colour online)

- Correspondence
  - 500 words maximum
  - 10 references maximum
  - 2 tables/figures maximum (optional colour online)

Items of correspondence should be limited to preliminary data that are timely and highly relevant to the scope of the journal. Commentaries on papers recently published in the journal are also welcome.

Editorials and Reviews

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ESCMID publications

Manuscripts from ESCMID Study Groups or proposals for publications originating from ESCMID Conferences should be discussed with the Editorial Of ce prior to submission.

Please contact Judith Crane, Managing Editor (judith.craner@escmid.org) to propose a theme section or an ESCMID publication.
Consistency is important: contributions from different authors and text from different sources must be rewritten to create a coherent and homogenous text.

**Format**

All manuscripts must be double-spaced, with wide margins, and should have continuous line numbers throughout.

**Title page**

All submissions in all manuscript categories must include a title page indicating the intended category, the title, the full names and institutional affiliations of each author, a running title of up to 55 characters, the designated number of keywords, a word count for the main text, and a complete postal address, email address, and international telephone and fax numbers for the single Corresponding Author (telephone and fax numbers will not be published).

**Illustrations and figures**

Data reported in tables or figures should not be repeated in the text. Figures should be submitted electronically, with a high resolution (at least 300 dpi). Please save artwork as EPS files and bitmap files as TIFF. Ideally, vector graphics that have been saved in metafile (WMF) or pict (PCT) format should be embedded within the body of the text file. Please avoid using tints. Hard copies of all figures must be retained by the authors and may be required during the publication process. Hard copy figures should be professionally prepared in the form of high-quality photographic prints (not less than 13 x 18 cm) or electronically produced laser prints on A4 bonded paper. Please be aware that all illustrations will be significantly reduced in size for publication (often to a single column width). All descriptive or explanatory captions should be typed double-spaced on a separate page following text and tables, and should include full explanations of any abbreviations used in the figure. In the full-text online edition, colour figure legends may be truncated in abbreviated links to the full screen version. Therefore, the first 100 characters of any figure legend should inform the reader of key aspects of the figure. Some illustrations and figures will appear in colour online and will be available for downloading without charge.

**Tables**

Each table should be presented on a separate page with a descriptive or explanatory title, and numbered consecutively as cited in the text. Wherever possible, tables should be typed as text, using “tabs” to align columns. The use of table editors should be avoided, as they should be used as tabular graphics software. Please do not use paragraph returns within tables to indicate spacing within blocks of text; use instead a soft return (shift, return). Abbreviations may be used, but must be explained in full as footnotes. Units of measurement must be clearly indicated.

Supporting information (formerly Supplementary material)

Extensive data sets or large figures may appear as Supporting Information on line. In this case, it remains the authors’ responsibility to ensure that all figures or tables are illustrative of the text, but not redundant, and presented in such a way that non-specialist readers are likely to find the information understandable. Supporting Information will appear in colour as deemed appropriate.

**Ethical considerations**

Reports of research involving human subjects must include a statement in the Methods section that informed consent was obtained, as well as a statement of approval by a local human investigations committee. Similarly, experiments involving animals must have been conducted under appropriate licensing/approval arrangements, details of which should be included in the Methods section.

**References**

Authors are responsible for the accuracy and completeness of all references and are also responsible for ensuring that references are not used out of context. References should be numbered sequentially in the text in square brackets before punctuation marks, according to the Vancouver style (examples of references following).

Article


Article from a supplement


Book


Chapter from a book


Meeting abstracts, Websites and Databases, Articles in Press

Meeting abstracts are not acceptable as references within the Methods section, but are acceptable as preliminary unpublished results (if not older than 2 years) and should be cited parenthetically within the text rather than in the list of References (e.g. 14th European Congress of Clinical Microbiology and Infectious Diseases, abstract XXX). Similarly, references to websites or databases should be made parenthetically within the text, as should references to unpublished data, personal communications and articles submitted for publication. Copies of manuscripts in press or submitted manuscripts should be uploaded at the time of submission to facilitate the review process.

**Editorial process/peer review**

An automated message confirming receipt is sent upon submission. Please be aware that the submission process is not complete until you receive this message indicating a tracking number (CLM-XX-XXXX).

Submissions are screened for completeness and quality of files and will not enter the review process until the online files are satisfactory. Submissions are initially reviewed by the Editor-in-Chief and are either assigned to an Associate Editor or declined as being out of scope or lacking priority considering the current rate of rejection (c. 75%). The peer review process is managed by Associate Editors who are responsible for assessing priority and for selection of reviewers. Submissions may be declined without external review as deemed appropriate by the Editor-in-Chief and Associate Editors.

Correspondence concerning papers that have been reviewed should be directed between the Associate Editor and the Corresponding Author.

Revised submissions are handled directly by the Associate Editor and should be resubmitted within 6 weeks. The intent is a short-term process of revision; however, some submissions may require several revisions. Although unusual, a submission may be declined after revision if the response to suggestions and requests is deemed incomplete or inadequate.

The current status of submissions is available via your Author Centre (select the appropriate category under My Manuscripts and view status on the right side of the screen). Do not contact ScholarOne concerning editorial status.

**Publication**

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Forms are available from the submission website and here: www.blackwellpublishing.com/pdf/CLM_Copy.pdf.
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Reprints
A pdf file will be made available to the Corresponding Author for purposes of creating reprints for personal use. To purchase reprints for commercial purposes or wide distribution, use the reprints order form which will be included with the proof pages.
John Degener (The Netherlands) mentioned that ECDC has initiated ESCMID and the national societies and organizations. Infection societies to take part in this important event.

In two previous articles (ESCMID News 2007; issue 2:14-17 and issue 3: 10-12) it has been explained how the specialty of Medical Microbiology has been represented by a commission or subsection of the UEMS Section of Medical Biopathology for decades. Medical Biopathology is an umbrella for a number of laboratory-oriented medical specialties. The informal organization of Medical Microbiology under this umbrella is no longer acceptable in modern Europe, in which the large majority of countries recognize Medical Microbiology as a full specialty with a prominent place in medical care and the prevention of infectious diseases.

Although the criterion for creating a new Section of at least one-third of UEMS member states recognizing the full specialty was more than met (20 of 27 UEMS members recognize Medical Microbiology), the project was hampered by the resistance of the Section of Medical Biopathology to allow a split off. This can be well understood because of the various ways one may look in Europe at the position of Medical Microbiology in the practice of laboratory medicine. Members of the so-called polyvalent commission of the Section of Medical Biopathology argued that in their specific national situation, a split off would weaken the profession and would make the practice of laboratory medicine less efficient from a logistic and financial point of view.

As became clear during long discussions in the meetings of the Section of Medical Biopathology the arguments against a split off were not insignificant but a majority of country delegations decided to let the country delegates from the national medical associations decide by a majority vote at the next spring meeting in Brussels in 2008.

In December 2007, an extraordinary meeting of the European Council took place. This was in preparation of the ESCMID Workshop on Professional Affairs. Giuseppe Cornaglia emphasized that this was an exception and that the next official meeting of the European Council will be the regular meeting during the 19th ECCMID in 2009 in Helsinki.

Giuseppe Cornaglia thanked the participants for their participation and adjourned the meeting at 14:15 h.

Basel, 27 June 2008

John Degener (The Netherlands) mentioned that ECDC has initiated the European Antibiotic Awareness Day that will be held for the first time in November this year. Ragnar Norrby confirmed that the European Antibiotic Awareness Day is an initiative of the ECDC in close collaboration with other Institutions of the European Union and the Member States. ECDC only provides promotional material but no further support. The cost for the campaign is covered by the Member States' governments. Giuseppe Cornaglia added that the European Day for Fighting Infection will focus on fighting infection only and will not specifically address antibiotic resistance to avoid an overlap with the ECDC initiative.

John E. Degener, Past convener of the Commission of Medical Microbiology of the UEMS Section of Medical Biopathology, Candidate for Dutch Delegate of the UEMS Section of Medical Microbiology (in formation)

Recent and future highlights in the process of becoming an independent Section

- 11 – 13 October 2007, UEMS Council meeting, Bratislava: Commission of Microbiology makes plea for an independent Section. Decision made to let the country delegates from the national medical associations decide by a majority vote at the next spring meeting in Brussels in 2008.
- 19 April 2008, UEMS Council Meeting, Brussels: vote for an independent Section with 22 votes in favour, 2 against and 4 abstentions. Section is to be named “Section of Medical Microbiology”.
- 21 April 2008, during 18th ECCMID, Barcelona: discussion among the Medical Microbiology commission delegates about the next steps to be taken.
- 17 May 2008, Section of Medical Biopathology meeting, Bern: decision made to maintain a “Division” of Medical Microbiology within the Section of Medical Biopathology.
- 27 September 2008, Section of Medical Microbiology meeting, UEMS premises, Brussels: vote to be held to elect the board members of the Section of Medical Microbiology and a follow up discussion planned on the harmonization of modern training programmes for the specialty in the EU.
Moving Forward in Co-operation: Join the Debate on Our Professional Future

Gunnar Kahlmeter, Professional Affairs Officer, Clinical Microbiology, gunnar.kahlmeter@ltkronoberg.se

Robert C. Read, Professional Affairs Officer, Infectious Diseases, r.c.read@shef.ac.uk

Conditions for specialty training in Clinical Microbiology and Infectious Diseases in Europe are veritable minestrone of widely different curricula and organizational requirements.

Pitfalls lie in wait not only for our young and not-so-young professional members aiming for an international career, but also for the harmonization and improvement of microbiological diagnostics, clinical care and public health in Europe.

The professional structures in which clinical microbiologists and infectious disease physicians operate are of great interest to ESCMID, especially in the areas where European cooperation is needed. If we cannot achieve complete pan-European harmonization, then at least we can try to understand completely the situation across our different nations, and identify the problems that we face, at the individual and national levels as well as internationally. In the year of its 25th anniversary ESCMID has therefore decided to devote two major initiatives to advancing professional affairs in Europe.

1. ESCMID Questionnaire on Professional Affairs

ESCMID and the UEMS Sections of Infectious Diseases and Medical Microbiology have jointly developed a questionnaire on professional affairs in Clinical Microbiology and Infectious Diseases. It aims to gather data on how the two specialties are organized in Europe. Every effort has been made to make the questionnaire relevant and the questions “generic”. Specialists in many different countries have been consulted.

The results of the questionnaire will form the basis of national websites for Clinical Microbiology and Infectious Diseases under the auspices of ESCMID. The websites can be regularly updated and constitute a current record of how CM and ID are organized throughout Europe, eventually for all 47 countries. The final data set will also be published in condensed form in ESCMID News.

The preliminary results of the questionnaire will be presented at the forthcoming Workshop on Professional Affairs in Rome, Italy (see next item).

2. ESCMID Workshop on Professional Affairs

ESCMID is organizing a Workshop on Professional Affairs in Clinical Microbiology and Infectious Diseases in Rome, Italy. It is entitled Moving Forward in Co-operation.

The objectives of this workshop are to review the professional status of Clinical Microbiology and Infectious Diseases across Europe and to discuss new initiatives to improve the organizational basis for medical practice in these disciplines, which will have an impact on professional mobility and recognition. We have recruited an impressive faculty, and we look forward to lively debate and discourse. We hope that many of you will take the opportunity to discuss the future of Clinical Microbiology and Infectious Diseases in Europe.

Clinical Microbiology, in particular, is the target of structural changes from initiatives outside and inside the specialty. The external challenges come from politicians and administrators who believe that laboratory medicine is laboratory medicine irrespective of specialty. The internal challenges are much more positive - they emanate from the fact that staffing a successful microbiological laboratory today is vastly different than it was 25 years ago. But the plethora of educations and job descriptions found today can create internal unrest. “Working together” is an important issue in years to come.

Challenges for infectious disease physicians include the lack of recognition of the specialty in some countries, commissioning of services, and issues of disease-territoriality in which we find ourselves competing with other specialties within medicine.

The active participation of ESCMID members in this workshop is of utmost importance, particularly that of young ESCMID members. To those of you who are today’s decision makers, we ask you to identify the up-and-coming young CM and ID specialists who will be tomorrow’s decision makers and encourage them to come to Rome to discuss their future. Registration details can be found on the ESCMID website: www.escmid.org/Conference/Workshop.

ESCMID Workshop on Professional Affairs in Clinical Microbiology and Infectious Diseases

Moving Forward in Co-operation

Rome, Italy

9–10 October 2008

A workshop to debate the professional challenges facing all who work in the fields of Clinical Microbiology and Infectious Diseases in Europe.

Workshop Faculty

Maurice Weis, Aranjuez (ES)

Fernando Bagues, Madrid (ES)

Emmanuelle Dorémiaux, Creteil (FR)

Antonio Cassone, Rome (IT)

Roberto Cauda, Rome (IT)

Gianluca Carminati, Verona (IT)

John Edward Degner, Grazigurie (NL)

Istvan Dusza, Szekszard (HU)

Heiko Frimodt-Müller, Copenhagen (DK)

Javier Sarau, Barcelona (ES)

Helge Gorem, Maastricht (NL)

Ilaria Humphrey, Dublin (IE)

Suzanne Jakob, Stockholm (SE)

Tineer Jakob Paris (FR)

Suzana Katić Mamić, Zagreb (HR)

Winfried Karrer, Fribourg (CH)

Mika Meurman, Turku (FI)

Ingrid Winton Eke, Lund (SE)

Ragnar Nordb, Sofia (SE)

Ardanaz Paredes, Rome (IT)

Nicola Pettorelli, Rome (IT)

Marco Plojak, Ljubljana (SI)

Roberto Rea, Sheffield (UK)

Gran Mario Rosinetti, Siena (IT)

Gra J.M. Ruiz, Oviedo (ES)

Marc Struelens, Brussels (BE)

Sophia Stavropoulou, Rennes (FR)

Aysegul Tandoc, Zagreb (HR)

Joe WM van der Meer, Nijmegen (NL)

Andreas Voos, Nijmegen (NL)

More information on:

www.escmid.org/Conference/Workshop
Set between the mountains and the sea, Barcelona is one of the most beautiful and vibrant cities in Spain and the capital of the autonomous region of Catalonia. It was an excellent setting for the largest ECCMID ever, taking place from 19–22 April 2008. This once rather rundown industrial centre has undergone a seismic change that culminated in the hosting of the Olympic Games in 1992, an event which completely transformed Barcelona. Barcelona has since become something of a Mecca for the world’s top architects, who have locked there to conjure up an array of modern structures and avant-garde designs. Many have drawn their inspiration from the seminal work of Barcelona’s most famous son, the modernist architect Antonio Gaudi, whose unique style can still be savoured in a number of key buildings around the city. His masterpiece is the un nished Sagrada Familia southeast towards the Mediterranean. His pattern of climate change, however, is too uniform within and between countries to provide the sole, or even the most important explanation for the extreme heterogeneity in TBE epidemiology within Europe and beyond, a multifactorial model in space and time is more powerful. Analysis of the situation in Central and Eastern Europe has established that many of these factors were driven by the socioeconomic changes associated with the end of Soviet rule, and include climate, land cover, land use, wildlife, agricultural practices, industrial activities, (un)employment and income. The same principles may apply to the periodic epidemics of Crimean-Congo haemorrhagic fever.

Meningococci and meningococcal invasive disease: new insights into the pathogenetic mechanisms
A. Jonsson (Uppsala, SE)
A transgenic mouse model and bioluminescently labelled meningococci were used to monitor bacterial spread after infection. Bacteria accumulated in the nasal mucosa, and the colonization was dependent on meningococcal pili and on GNA992, an outer membrane protein. Lethal disease was accompanied by bacterial enrichment in the thyroid gland, and by decreased thyroid hormone levels. Bacterial visualisation demonstrated waves of bacterial clearance and growth, which selected for bacteria expressing the phase variable outer membrane protein, Opa. Meningococcal lipooligosaccharide (LOS) has long been identified as a major in amatory mediator of fulminant meningococcal sepsis and meningitis. However, both wild-type meningococci and an LOS mutant induced equivalent disease severity in TLR4−/− mice, but failed to cause fatal sepsis in TLR4+/− mice. Further, fatality associated with meningococcal sepsis in mice is induced by the proin amatory host response by recognition of one or more unidenti ed non-LOS components by TLR4.

Community methicillin-resistant Staphylococcus aureus: hyper-virulent or just hypoe
F. Tenover (Atlanta, US)
Reports of community-associated methicillin resistant Staphylo-

coccus aureus (CA-MRSA) infections among healthy persons who have had no recent contact with healthcare and who have none of the traditional risk factors for MRSA infection are increasing in countries around the world, including the USA, Aus-

tralia and the Nordic countries. Infections have been observed in different groups, including children in daycare, sports partici-

pants, military recruits, prisoners in institutional settings and men who have sex with men. The predominant infection is skin and soft tissue, although severe and fatal infections have been reported. Multiple different strain types are causing CA-

MRSA infections, including ST1, ST8, ST30, ST59 and ST80. The most predominant community strain in the USA is pulse eld electrophoresis type USA300 (ST8), which has overtaken the hospital USA400 strain. The USA300 strain is now not only circulating within the community, but also within healthcare in-

stitutions. Data on the virulence of USA300 strains and the out-

comes of CA-MRSA infections are quite divergent. Is CA-MRSA more a media event than a fearful new epidemic?

Diabetic foot osteomyelitis
B.A. Lipsky (Seattle, US)
Diabetic foot osteomyelitis (DFO) occurs in 20–60% of patients who develop a foot wound, usually via contiguous spread from soft tissue infection. DFO markedly increases the risk for hospi-

talization and amputation. Most infections are caused by staphylo-

cocci, but other organisms can be involved, sometimes resulting
in a polymicrobial infection. Accurate diagnosis of bone infection is best done by obtaining a bone specimen (either percutaneously or at surgery) for both culture and histology. Among the available imaging tests, MRI is superior, bone scans being too non-speci . Clinical signs and symptoms are unreliable, but the probe-to-bone test is easy and relatively helpful. As for treat-

ment, most authorities recommend resecting any necrotic or grossly infected bone. Recently, retrospective case series have shown that some cases of presumed osteomyelitis can be put into

long-term remission with antibiotic therapy alone, usually with highly bioavailable antibiotics given for a prolonged period (3 months or longer). If one removes all infected and necrotic bone, the duration of treatment can be considerably shorter (days to weeks). Some evidence suggests that including rifampin (com-

bined with at least one other anti-staphylococcal antibiotic) im-

proves outcome; clindamycin and beta-lactam agents are also frequently used. No adjunctive treatment (e.g., hyperbaric oxy-

gen, granulocyte colony stimulating factor, larval biotherapy) has been proven bene cial. When treatment of osteomyelitis fails, surgeons should opt for the most minor option com-

parable with good residual foot function.

Association between group A beta-haemolytic streptococci and vulvovaginitis in adult women: a case control study
M.J. Brains, R.A.M.J. Damoiseaux, G.J.H.M. Rujs (Zwolle, Hatten, NL)
Group A streptococci are established as a cause of vulvovaginitis in children, but evidence of infection in adult women is limited. The signi cance of group C, F and G streptococci in vaginal or a is also unclear. This case control study investigates the as-

sociation between non-group B beta-haemolytic streptococci and vulvovaginitis in adult women. Non-group B streptococci were isolated from 86 (8.5% of 1,010) cases and from 6 (2.9% of 206) controls (P<0.01). The signi cant difference was caused by group A streptococci that were isolated from 49 (4.9%) cases and not from any of the controls (P<0.01). Isolation rates of group C, F and G streptococci from cases were low and did not differ statistically from those from controls. Group A beta-

haemolytic streptococci are associated with persistent vaginal discharge and symptoms in adult women. They should be diag-

osed and reported as a pathogen in vulvovaginitis. The role of other non-group B streptococci requires more study because of the low numbers isolated. For adequate management of vaginal discharge, culturing is necessary if initial treatment fails.

Antibiotics and chemotherapy
Optimizing outcomes: getting it right from the start
Y. Carmeli (Tel Aviv, IL)
Resistance to antimicrobial drugs is a growing health and eco-

nomic concern. Rates of resistance to community- and hospital-

acquired Gram-negative and Gram-positive pathogens have risen
signi cantly over the past several years. Infections caused by these drug-resistant pathogens are associated with greater mor-

bidity and mortality, prolonged hospitalizations, and increased costs, compared with infections from sensitive strains. The early iden tication of patients at higher risk for polymicrobial-resist-

ant infections is a key factor in guiding the selection of empiric antibiotic therapy. Selection of agent(s) from various classes of antibiotics should be individualized based on the patient’s clini-

cal status and renal function and by the agent’s microbiological activity (coverage), resistance characteristics, and therapeutic
dynamics. The prompt selection of appropriate broad-spectrum
empiric antibiotic therapy is essential to provide adequate cover-
age for the pathogens of concern and “Getting it Right from the Start”. The use of pharmacokinetic (PK) and pharmacodynamic (PD) simulations can help guide the decision-making process for the selection of antibiotic(s), dosage(s), and duration of infusion(s). For example, extending infusion times may lead to better outcomes for the treatment of infections caused by organisms with high minimum inhibitory concentration (MIC) values by extending the time above the MIC without requiring an increase in dosage.

European MIC breakpoints for antimicrobial susceptibility testing are now harmonized by EUCAST: why European harmonization? D. Brown (Cambridge, UK) At least seven different MIC breakpoint committee guidelines for antimicrobial susceptibility testing have been used in Europe. Consequently Europe has had several different sets of antimicrobial breakpoints and a range of variations in technical methods. It became increasingly evident that harmonization of breakpoints was necessary both for therapy and resistance surveillance. ESCMID set up EUCAST in 1997 with a representative from each European country and six representatives from industry. In 2002 EUCAST was restructured and the major responsibility for the work of EUCAST was taken on by the active national breakpoint committees in Europe. A Steering Committee was formed, proposals from which are distributed to the EUCAST General Committee, relevant expert groups and industry for consultation. The final decision is made by majority vote in the Steering Committee, taking account of any comments made during consultations. In this process the expertise of the national breakpoint committees is utilized, there is wide consultation on proposals and the national committees take responsibility for implementation of decisions. Subcommittees have been set up to deal with specific topics including susceptibility testing of fungi and anaerobies, and expert rules in susceptibility testing. A website has been established (www.eucast.org) that gives details of EUCAST activities. EUCAST breakpoints and publications. Another website has been developed for the collection of MIC data and its presentation as species-specific wild type MIC distributions. EUCAST has been funded by ESCMID, the national breakpoint committees, a grant from the EU and now by ECDC. Industry does not contribute financially but is asked to contribute data required for determining breakpoints and to comment on proposed breakpoints. EUCAST has achieved harmonization of most existing breakpoints in Europe. It has a formal relationship with EMEA regarding the setting of breakpoints for new agents and the revision of breakpoints for existing agents. The process has been applied to several new drugs. Documents on various aspects of susceptibility testing have also been published.

Usage of carbapenems significantly increases the rate of new colonization due to antibiotic-resistant bacteria in hospitalized patients E. Tacconelli, G. De Angelis, M. Cataldo, et al. (Rome, Siena, Brescia, Florence, Milan, IT) During a 12-month prospective multicentre cohort study, new acquisitions of antibiotic resistant bacteria per 1’000 days of treatment with antibiotics were investigated. The aims were to establish the mean time to acquisition and to measure the patients’ risk factors for acquiring antibiotic-resistant bacteria. Nasal and rectal samples were taken from patients before starting antibiotics and then on days 2, 4, 7, 15 and 30. The resistant bacteria that were investigated included methicillin resistant Staphylococcus aureus (MRSA), vancomycin-resistant enterococci (VRE), and ciprofloxacin-resistant Pseudomonas aeruginosa (CR-PA). A total of 6’245 swabs from 864 patients were processed, with 5% of patients acquiring an antibiotic-resistant organism. The incidence of antibiotic-resistant bacteria per 1’000 days of therapy varied among antibiotics, with the highest being carbapenems with 14/1000 patient days and, in a multivariate analysis, carbapenems, along with length of hospital stay and age, were significant predictors for acquisition of antibiotic-resistant bacteria.

Comparison of antibiotics with placebo for the treatment of presumed acute bacterial sinusitis: a meta-analysis of randomized controlled trials M. Falagas, K. Giannopoulos, K. Vardakas, et al. (Athens, GR) There is controversy regarding the benefit of antibiotics for the treatment of patients with presumed acute bacterial sinusitis. In a meta-analysis of randomized, placebo-controlled trials (RCTs), the effectiveness and safety of antibiotics for this indication was evaluated. Sixteen RCTs were included, (three of which performed exclusively in children), involving 21 antibiotic arms (8 amoxicillin, 4 penicillin V, 3 amoxicillin/clavulinate, and 6 other antibiotics). The study concluded that antibiotic treatment of presumed acute bacterial sinusitis compared to placebo is associated with a rounded 10% added benefit in clinical outcomes, at a cost of an approximately equal increase in the rate of adverse events. Considering that observed adverse events are generally not serious, and that not using antibiotics may carry an appreciable risk for patients, the benefit is balanced and similar to what is generally observed with other interventions. The risks associated with such treatment.

European Surveillance of Antimicrobial Consumption (ESAC): outpatient parenteral antibiotic treatment in Europe S. Cosenza, A. Muller, and the ESAC Project Group Outpatient parenteral antibiotic treatment represents more than 1% of the total outpatient antibiotic use in only six out of the 20 European countries studied. As for the total outpatient antibiotic use and the use of different antibiotic groups and substances, this striking variation in the proportions of parenteral antibiotic use in Europe (see figure) needs more data for explanation.

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Healthcare-associated bacteremia pneumonia: aetiology, severity of disease and outcomes M. Salvado, L. Lozano, E. Calbo, et al. (Terrassa, ES) Recent studies have been focused on healthcare-associated pneumonia (HAP) trying to distinguish them from truly community-acquired (CAP) or hospital-acquired pneumonia (HAP). This study, conducted in a 450-bed acute care teaching hospital averaged 1.4% and 1.8% respectively in CAP and HAP. A total of 825 patients were enrolled in the study. At least one positive blood culture was obtained from 175 patients (21%). The study found that the most common bacteria isolated were Pseudomonas aeruginosa (16%) and Staphylococcus aureus (11%). The severity of bacteremia pneumonia was evaluated using the severity index of the International Network for the Study of Pulmonary Infections (INFLUENZA). The study concluded that bloodstream infections were associated with a rounded 10% added benefit in clinical outcomes, at a cost of an approximately equal increase in the rate of adverse events. Considering that observed adverse events are generally not serious, and that not using antibiotics may carry an appreciable risk for patients, the benefit is balanced and similar to what is generally observed with other interventions. The risks associated with such treatment.

Acute exacerbations of chronic obstructive pulmonary disease A. Torres (Barcelona, ES) Most mild exacerbations of chronic obstructive pulmonary disease (COPD) would not require antibiotic treatment because they are viral in origin or because they are not infectious. However, in clinical practice it is difficult to distinguish between these two situations. A recent study by this group confirmed that the existence of sputum purulence is a sensitive and specific variable associated with positive bacterial cultures in bronchoalveolar samples. However, there are patients who cannot expectorate and some of them may have a bacterial infection. In these cases, biological markers could help to differentiate between viral and bacterial infections. In one randomized trial, procalcitonin (PCT) has been found to be useful in the decision to continue or discontinue antibiotics without recurrence problems. The limitations are the need of a blood sample and the availability of methods able to detect small amounts of PCT. In terms of pathogenesis, the most controversial issue is the role of Pseudomonas aeruginosa, with some studies reporting isolation in 10 to 15% of exacerbations. Antipseudomonal treatment is recommended.
Enterococcal infections

New insights into the pathogenesis and treatment of enterococcal endocarditis

B.E. Murray (Houston, US)

Recent studies have suggested that shorter aminoglycoside (AG) regimens and, for enterococcal strains with high-level resistance to all AG, the combination of ampicillin with ceftriaxone may also have adequate efficacy for E. faecalis infective endocarditis (IE). Therapy for enterococci caused by vancomycin-resistant E. faecium remains more problematic. Relatively little is known about the pathogenesis of enterococcal IE. Recent studies by this group have identified pili in E. faecalis, encoded by the ubiquitous ebp (for enterococcal adhesin and biofilm related pilus) locus and made up of three subunits, each of which have the characteristics of cell wall anchored MSCRAMMs. These pili are important in initiating biofilm formation, in experimental IE (EIE) and in sеrum-induced adherence to fibroblasts, suggesting involvement in initiating E. faecalis IE. The ebp locus is regulated in part by the fms system, a homolog of the agr system of staphylococci. The group has also identified a ubiquitous collagen adhesion, Ace (also an MSCRAMM), whose expression is induced by serum and collagen, and found that this adhesion is also important in E. faecalis EIE. Similarly, its homologue (Acm, an adhesion to collagen of E. faecium), is important in the pathogenesis of E. faecium EIE and in adherence to heart valves. Preliminary data suggest that immunization against recombinant Ace or Acm is protective against adherence to heart valves. Further studies are underway to investigate alterations in cellular metabolism in enterococcal SCV.

Clostridium difficile associated disease

Clostridium difficile: new and old treatment options

E. Bouza (Madrid, ES)

Metrionidazole and vancomycin are currently the drugs of choice. The group has also identified a ubiquitous collagen adhesion, Ace (also an MSCRAMM), whose expression is induced by serum and collagen, and found that this adhesion is also important in E. faecalis EIE. Similarly, its homologue (Acm, an adhesion to collagen of E. faecium), is important in the pathogenesis of E. faecium EIE and in adherence to heart valves. Preliminary data suggest that immunization against recombinant Ace or Acm is protective against adherence to heart valves. Further studies are underway to investigate alterations in cellular metabolism in enterococcal SCV.

Clostridium difficile: new and old treatment options

S. Baines, R. O’Connor, W. Fawley, et al. (Leeds, UK; Rome, IT; Leiden, NL)

Resistance to MET or vancomycin in CD has rarely been reported and generally limited to occasional strains. This group now repeats previous surveillance for MET and vancomycin resistance in common CD ribotypes. No reduced susceptibility to MET was observed. All CD ribotype 106 or 027 isolates were susceptible to MET (MICs <2 mg/L). However, two (24%) CD ribotype 001 isolates had reduced susceptibility to MET by spiral gradient endpoint (SGE). The geometric mean MIC was 3.5 mg/L (P<0.001). Results varied according to the method used, and both the agar base and broth used to prepare inocula affected the MET MIC values for CD. Neither E-test nor CLSI methods detected the CD strains with reduced susceptibility to MET, but this was confirmed by the alternative Al method. The geometric mean MICs of CD ribotype 001 isolates from 1995–2001 (n = 27) and those identified by SGE with reduced susceptibility to MET (n = 21) were 1.03 and 5.9 mg/L, respectively (P<0.001). MLVA typing revealed subgroups of ribotype 001 isolates that were more closely associated with reduced susceptibility to MET than others. This study confirms the emergence of reduced susceptibility to MET, which is easily missed unless appropriate methods are used. Increased vigilance is needed to identify reduced antibiotic susceptibility in CD, and to detect increased treatment failure associated with MET.

Infection control

Is it time for pan-European surveillance of healthcare-related infections?

P. Gastmeier (Berlin, DE)

International comparisons yield interesting insights regarding quality of care, beyond the field of healthcare-associated infections (HAI) prevention. Therefore, the exchange of experiences among national surveillance systems should be encouraged. However, the interpretation of differences of HAI rates should be made very carefully. Differences in healthcare systems, legal and cultural aspects, as well as differences in the methods of the surveillance systems, may have an enormous influence. A further most crucial aspect of surveillance data is their validity, and its evaluation is very difficult. The European Centre for Disease Prevention and Control has to decide in the future which level of European surveillance of HAI should be achieved. Of course there are several options: 1) The harmonization process of the individual national surveillance networks should be continued to finally achieve a uniform European HAI surveillance system. This process already started with Hospitals in Europe link for infection control through surveillance (HELCIS; since 1994) and was continued with Improving patient safety in Europe (IPSE) activities (since 2005) for surveillance of surgical site infections and HAI surveillance in Intensive care units. 2) The harmonization process should be stopped because it is not really feasible to create a useful European database, and the effort should be concentrated on a regular exchange of experience between the national networks, on the organization of validation studies, joint risk factor studies, etc. 3) ECDC should create a pan-European surveillance for infections with problems in identification and application of the definitions, e.g. nosocomial CDAD/1000 patient days or nosocomial laboratory confirmed BSI per 1000 patient days (adjusted according to the frequency of diagnostics). 4) ECDC should start pan-European surveillance with a totally new European surveillance system with interesting “or “at-risk” patient groups, without the need for modification of the existing systems (e.g. bone marrow transplant recipients, very low birth weight newborns, etc.). The advantages and disadvantages of the different strategies were discussed.

Copy and paste – is the search and destroy policy suitable for fighting Europe?

C.M.J.E. Vandebroucke-Grauls (Amsterdam, NL)

Since the early 1980s the Netherlands has adopted a search and destroy policy with respect to methicillin-resistant Staphylococcus aureus (MRSA). This policy implies a national guideline for control, with search for carriers among defined groups of patients and healthcare workers, strict isolation and treatment of carriers. The guideline is enforced by the Health Inspectorate. In addition, a national surveillance system has been implemented. From this surveillance we know that, as of 2006, MRSA was detected in approximately 2’000 persons (both patients and...
healthcare workers; the number comprises carriers and infected persons). This very low number is confirmed by the EARSS data. The Netherlands is one of the countries in Europe with the lowest burden of MRSA. The stringent Dutch policy has been applicable for so many years, because the number of carriers is so low. We realize that screening and strict isolation “the Dutch way” are impossible when the number of MRSA carriers becomes too high. From the Dutch experience, however, lessons can be learned and that may provide a basis for “copy and paste” of part of the Dutch approach in countries with a higher burden of MRSA. Among these are the national approach and the national surveillance, which provide support to all healthcare workers involved and motivation to keep up the efforts.

**Laboratory and typing methods**

**MLST – 10 years of experience**

Since multi locus sequence typing (MLST) was proposed in 1998 as a portable approach to the identification of bacterial clones, it has become a gold standard method for the characterization of many bacterial pathogens and a number of non-pathogens. MLST has made it possible to compare the bacterial isolates obtained in different parts of the world and at different times simply and accurately using generic techniques. In addition to solving many of the problems inherent in the characterization of isolates from diverse recombinogenic bacteria, MLST has also provided data that have enabled extensive studies of bacterial population genetics, speciation, and evolution, providing substantial added value to epidemiological studies. The MLST approach also provides indications as to the most efficient means of exploiting the next generation of DNA sequencing machines.

**Use of DNA microarrays in molecular typing**

Microarrays are solid supports spotted with thousands of tiny DNA probes that can be used to determine rapidly which genes are present in a bacterium or sample. They have caused a revolution in our understanding of bacterial population structures and how they vary and evolve, and have also helped to identify markers of virulence or epidemiology. Microarrays are also extremely valuable for developing and validating improved routine typing methods. In the typing laboratory where methods need to be cheap, rapid, accurate and reproducible, microarrays technology is expensive and experimental. However, this is changing and when printed with appropriate probes and validated, their uses are only limited by the ability to interpret the data generated.

**Latin American Workshop on Mechanisms of Resistance to Antimicrobial Agents**

Juan Carlos Tinoco, Workshop Organizer, jctinoco@prodigy.net.mx

Jordi Vila, ESCMID Scientific Affairs Officer, j.vila@ub.edu

With the support of the European Society for Clinical Microbiology (ESCMID), in collaboration with the American Society for Microbiology (ASM) and the Mexican Association for Infectious Diseases and Clinical Microbiology (AMIMC), a Latin American Workshop on Mechanisms of Resistance to Antimicrobial Agents was held from 9 – 10 June 2008 in Mexico City.

The objective of the workshop was to provide the participants with current background information and offer a practical session on the study of antimicrobial resistance mechanisms and the molecular epidemiology in clinical relevant Gram-positive and Gram-negative microorganisms.

The event took place at the Instituto Nacional de Ciencias Medicas y Nutricion Salvador Zubirán (INCMNSZ) in Mexico City. 159 students from five countries including Venezuela, HONDURAS, Canada, Singapore, and Mexico met for a more theoretical presentation during the morning and 30 students from selected institutions from these countries participated in the afternoon microbiology practice session.

The first day was dedicated to Gram-positive bacteria. In the first presentation, Jose Sifuentes-Osornio, from the INCMNSZ, Mexico City, offered a review of the regional epidemiology of antimicrobial resistance in these organisms. Stephen Brecher, from VA Boston Healthcare System, USA, discussed the evolution, mechanisms, and laboratory detection of antibiotic resistance in *S. aureus* and coagulase-negative Staphylococci. The dissemination to the community of methicillin-resistant *S. aureus* was emphasized. Later, David Farrel, from GR Micro Limited, in the UK, lectured on the epidemiology of antimicrobial resistance in *S. pneumoniae*, with a special analysis of macrolide-resistance and the impact of vaccination on this problem. Stephen Jenkins, from Weill Cornell Medical College in New York, presented relevant aspects of macrolide-resistance in group A streptococci and Stephen Brecher, covered the important aspects of the evolution of bacterial resistance in enterococci and how to detect it in the laboratory. As the final talk of the day, Stephen Jenkins gave a lecture titled Resistance among less common Gram-positive bacteria and PK/PD presentation.

Using two clinical cases as an example, he emphasized the problems in the isolation, identification and interpretation of the susceptibility tests in some of the Gram-positive bacilli not commonly found in clinical practice. He finished his presentation by stressing the importance of the application of the pharmacokinetic and pharmacodynamic principles in the antibiotic prescribing.

On the following day, Gram-negative bacteria were reviewed. Celia Alpuche, from the Instituto de Diagnostico y Referencia Epidemiologica in Mexico City, reviewed the most important aspects of the regional epidemiology of bacterial resistance in Gram-negative bacilli. *Acinetobacter baumannii*, as the paradigm of multiresistant bacteria, was then presented by Jordi Vila, from the Hospital Clinic and School of Medicine, University of Barcelona, Spain. The multiple mechanisms for antimicrobial resistance, its molecular basis and its evolution together with clinical impact were analyzed in this lecture. Giuseppe Cornaglia from Verona University, Italy, discussed the epidemiology and mechanisms of antimicrobial resistance in *Pseudomonas*. Gian Maria Rossolini, from Siena University, Italy, lectured on the emergence, dissemination, and clinical impact of the carbapenemases in Enterobacteriaceae and non-fermentative Gram-negative bacilli. The methodology for its detection in the microbiology laboratory was also discussed. Patrice Nordmann, from Hospital Bicetre, Paris, presented information related to extended spectrum beta-lactamases, with special emphasis on their epidemiology and laboratory methodology to detect them. In the last presentation, Jordi Vila discussed the mechanisms and epidemiology of quinolone resistance in Enterobacteriaceae.

The programme was designed to allow enough time for a Q&A session after each presentation and the students participated eagerly and openly. Additionally, the instructors and students continuously interacted even during the coffee breaks.

During the afternoon, practical sessions allowed participants to learn about some applied tools to search for mechanisms of resistance to antimicrobial agents and reveal molecular epidemiology. Part of or the complete procedure of plasmid analysis, extraction and separation of outer membrane proteins by one dimensional gel electrophoresis, REP-PCR and pulsed field gel electrophoresis were performed. Each session started with a short description about the background of the tool and after that the students formed six groups of five students to implement the procedure.

At the end of the meeting, Giuseppe Cornaglia, current president of ESCMID, extended an invitation for students to take an interest in the ESCMID programmes. He also suggested organizing student exchange and investigational programs.
Infections with Multiresistant Pathogens: Microbiological, Clinical and Therapeutic Aspects

Hartmut Lode, Head of Research Center for Medical Studies, Berlin, Germany, halohoch@zedat.fu-berlin.de

This very successful course on Infections with Multiresistant Pathogens was held in Berlin, Germany, on 14 and 15 March 2008, at the Institute for Clinical Pharmacology and Toxicology of the Charité University Campus Benjamin Franklin, W. Grainger (Vienna), H. Lode and R. Stahlmann (Berlin) organized the event under the auspices of the Paul-Ehrlich Society for Chemotherapy, the Robert-Koch-Institute and the German Society for Infectious Diseases. It addressed an urgent clinical and therapeutic problem: physicians are faced with in their daily struggle against infections caused by multiresistant Gram-positive and Gram-negative pathogens. Patients in ICUs and haematological and transplant departments are especially at risk for these infections and exhibit high mortalities. Optimizing prevention, diagnostic measurements and appropriate therapeutic decisions based on pathogenic insights is a great challenge for physicians responsible for these patients. Altogether, 40 participants from 17 European countries and four non-European countries, specialists and fellows in infectious diseases, infection control, microbiology, intensive care medicine, oncology, chest diseases and transplant medicine gathered in Berlin for this two-day meeting. Seventeen high-quality lectures were held by well-known specialists in these areas who presented the latest knowledge on epidemiology, diagnostics/microbiology, therapy, infection control and prevention, illustrated by many cases from the lecturers’ own clinical experience.

The course focused on nosocomial infection with special topics in haematological and ventilated patients, addressed the pharmacokinetic/pharmacodynamic aspects of antimicrobial therapy and covered current standard therapies. A greater portion of the course was reserved for new developments in antimicrobial drug research with emerging new compounds that recently have entered the market or are pending approval in the near future. These include new cephalosporines, carbapenems, and tetracyclines and glycopeptides. One of the biggest problems clinicians currently face is the increasing resistance against antibiotics which includes the selection of multi-drug resistant strains exacerbated by wide-spread and improper use of antimicrobial agents. The consequences can be severe: As a result of vancomycin overuse, the management of infections in vancomycin-resistant Enterococcus faecium infection relies on new compounds such as daptomycin, linezolid, tigecycline andquinupristin/dalfopristin, while beta-lactams and glycopeptides are useless (W. Grainger, Vienna).

Also multiresistant strains of Streptococcus pneumoniae and Staphylococcus aureus challenge professionals all over the world every day. Antimicrobial resistance in S. pneumoniae is increasing worldwide, affecting beta-lactams, macrolides and tetracyclines, depending on the geographical region. In Germany, antibiotic resistance rates to penicillin and macrolides have increased considerably from approximately 8.5% in 1997 to 28% in 2006. Rates are even considerably higher in some other European countries. Particularly, macrolide resistance has become a global problem and relates to clinical failure. Macrolide monotherapy should thus no longer be used as a first-line therapy against S. pneumoniae. Of more concern, 40% of pneumococci display multi-drug resistant phenotypes, with a highly variable prevalence among countries. Multiple antibiotic resistance (resistance to 3 antibiotics*) first emerged in South Africa in 1978. Pneumococci showed a clonal spread of resistant mutants worldwide since then (M. van der Linden, Aachen).

Vaccination remains an interesting alternative to reduce the risk of developing S. pneumoniae infection. However, the limitation of this approach lies in the dif culty of including the most prevalent serotypes, which can result in selection of non-vaccinal multi-drug resistant clones. Currently, a multi-resistant 19A strain is emerging worldwide (M. Pletz, Hannover).

One of the biggest problems clinicians currently face is the increasing resistance against antibiotics which includes the selection of multi-drug resistant strains exacerbated by wide-spread and improper use of antimicrobial agents. The consequences can be severe: As a result of vancomycin overuse, the management of infections in vancomycin-resistant Staphylococcus aureus (MRSA) which colonizes the nasal vestibule in about 30% of healthy humans and becomes pathogenic in predisposed patients after endogenous or exogenous transmission routes by contact infection. MRSA often are multiply resistant; in case of severe infections, treatment options are limited with the consequence of enhanced lethality. Spread of nosocomial MRSA is mainly associated with clonal dissemination. New clonal lineages evolve and displace the older ones. The reasons for “epidemicity” are still unknown. Community MRSA are an example of recent evolution of MRSA with particular capacities for causing necrotizing infections and for successful competition with the resident colonizing methicillin-sensitive S. aureus population outside the hospital setting (W. Witte, Wemigenode).

G. Comaglia (Verona, Italy) reported that the

U.S. Food and Drug Administration (FDA) recently approved the first rapid blood test for MRSA. As a strategy to control and prevent MRSA infection and to avoid spread of MRSA in healthcare facilities, patient isolation and strict compliance with hand hygiene is recommended. Screening of former MRSA carriers, contact patients and patients at risk supported by an alert system can prevent infections with MRSA, but is often restricted by the anticipated costs of implementation, despite the fact that the economic benefit from prevented infections substantially outweighs the cost (P. Gastmeier, Berlin).

H. Lode (Berlin) emphasized that antibiotic resistance increases mortality and health care costs of nosocomial infections. Therefore, combating increasing antibiotic resistance requires a new approach. Traditionally antibiotic therapy has been driven by concerns about the development of resistance and costs as well as the desire to avoid the use of antibiotics when infections are not confirmed. As a consequence, therapy was often initiated with narrow-spectrum antibiotics. The provision of optimal antibiotic therapy in severely affected patients should not cause a delay in effective therapy. It must also be characterized by broad coverage of relevant pathogens and activity against resistant organisms and be highly active at the site of infection.

In multiple drug therapy, each clinician should be aware of interactions between the applied drugs, a topic that is often neglected in everyday life on a hospital ward. The consequences of interactions are manifold and may result in reduced efficacy (drug failure) and enhanced effects and risks for toxicity that call for dosage adjustment as R. Stahlmann (Berlin) pointed out in his lecture.

In discussions about pathogens with increasing clinical relevance, fungi must not be forgotten and this allowed for two exciting talks about the clinical and therapeutic aspects of resistance in fungal infections by G. Maschmeyer (Potsdam) and S. Schwarz (Berlin).

This two-day postgraduate education course was a raving success for its organizers. The cornerstone of its success was the excellence of the invited speakers, the soundness of the material presented and the stimulating atmosphere which nurtured lively discussions between audience and lecturers. The meeting was a good opportunity for the participants to enhance their network contacts and to initiate and establish future interaction between the different researchers or research groups.
The 47th ESCMID Postgraduate Technical Workshop on Gene Expression during Infection, was held at the Certosa di Pontignano (Siena, Italy) from 2 to 5 March 2008. Marco Oggioni of the University of Siena and Matthias Wittwer of the University of Bern organized the workshop under the auspices of both the University of Siena and EMESG, the ESCMID Meningitis Study Group. The main venue of the workshop was the marvellous medieval monastery, the Certosa di Pontignano, near Siena, which is the Congress Centre of the University of Siena. All participants and faculty were hosted at the Certosa and all lectures took place there. The yards and gardens of the monastery were an excellent setting for informal discussion and interaction during coffee breaks and free time for the whole workshop duration. The workshop was focused on the theoretical and practical approaches involved in studying the host-pathogen interaction, especially with meningitis and meningococcal pathogens. The objective of EMESG is to promote and disseminate studies and knowledge on meningitis. As stated in the statutes of EMESG, a multidisciplinary approach is necessary for the study of bacterial meningitis necessitating the inclusion of scientists active in the field of clinical and molecular microbiology, immunology and infectious diseases. It is, therefore, the objective not only of EMESG, but also of this first EMESG joint workshop, to facilitate cooperation between diverse disciplines focusing on meningitis. The workshop was aimed at providing updated theoretical and practical information on methods for gene-expression analysis during infection. It was organized in two lecture sessions with seminars held by the workshop faculty, four sessions with short talks given by the workshop participants and two practical workshops offered to the participants divided into smaller workgroups.

The theoretical lectures provided examples of how gene-expression data can be used to study host-pathogen interactions. The opening lecture on pathophysiological aspects of bacterial meningitis and the use of microarray technology was held by Matthias Wittwer of the University of Bern, who gave a general overview on bacterial meningitis from the point of view of an infectious disease specialist. His presentation readily encompassed the epidemiology and clinical aspects of the disease as well as the underlying cellular mechanisms and secondly showed the use of the microarray technology as a valuable tool to decipher the transcriptional alterations underlying the complex pathophysiological processes of bacterial meningitis. The next lecture by Marco Oggioni of the University of Siena described the use of real-time PCR in detecting gene-expression patterns in bacteria infecting mice. The main conclusion of this presentation was that patterns of gene expression are an important tool to suggest the physiology of bacteria during infection, and that a great amount of experimental work is needed downstream of gene-expression analysis to confirm the relevance of the experimental data. It takes at least two years of experimental work for a student/postdoc to confirm the significance and causality of the up- or down-regulation of a single gene during infection; this underlines the importance of experimental work to confirm in vitro results, which often is perceived to be a stand-alone conclusive experiment. The medical aspects of fungal meningitis were discussed by Stefan Zimmerli of the University of Bern. He described the clinical picture of Aspergillus infection and introduced an animal model of mould meningitis. His presentation demonstrated how experimental Aspergillus meningoencephalitis that closely mimics key features of human cerebral aspergillosis can be used to study the pathophysiology of this disease. Gene-regulation patterns identified by microarray analysis provide both important insights into the host’s response to infection and guidance for confirmatory experiments on con ramatory experiments on the protein level.

On the third day of the workshop, two lectures focused on host response to infection, one on the microbiology of Neisseria meningitidis infection and two on antimicrobial resistance. Aras Kadioglu gave a lecture on host immune responses to pneumococcal infection focusing on models of nasopharyngeal carriage and acute pneumonia. His lecture highlighted the role of neutrophils, surfactant protein-D and CD4 T-cells in early host protection, and the counteracting roles of pneumococcal virulence factors such as pneumolysin and neuraminidases. He gave examples of where and when techniques such as RT-PCR could be useful during in vitro models of infection. The lecture was followed by a talk by Matthias Klein. After giving a general overview of the distinct pathophysiology of cerebral infections, he presented results of recent and yet unpublished studies on the detection of Streptococcus pneumoniae in meningitis, using in vitro experiments and a mouse model of experimental pneumococcal meningitis. The main focus was on the role of pathogen recognition receptors in pneumococcal meningitis, targeting TLR2, TLR4, and TLR9 and their adapter protein MyD88, which functions as a bottleneck in TLR signalling. He showed that despite a role of TLR2, TLR4, and TLR9 for pneumococcal detection in vitro, mainly TLR2 and TLR4 seem to be responsible in vivo. Furthermore, he discussed bone marrow chimera experiments that suggest that especially perivascular cells are involved in the detection of pneumococci during cerebral infection. In the context of his talk, he demonstrated the use of the protein-array technology in assessing the immune response in an in vivo model of infection (looking at the protein expression level), which was an important addendum to the curriculum of the workshop. Davide Serruto, of Novartis Vaccines, presented how bio-informatic analysis of bacterial genomic sequences and the application of microarray technology have significantly advanced our understanding of the pathogenesis of Neisseria meningitidis. He illustrated how microarray technology has been instrumental in understanding the gene expression profile of N. meningitidis when interacting with host cells and how FNR regulon analysis improved our understanding of the ability of meningococcus to proliferate in oxygen limiting conditions. Moreover, he briefly showed how genome-based technologies have also the potential to help in the development of a recombinant vaccine against meningococcal serogroup B. He insisted on describing the experimental design and technical approaches he uses to investigate the gene expression profile of Neisseria in human blood.

Since most of the participants had a background in the study of antimicrobial drug resistance, two lectures of the second day focused on this aspect. Gianni Pozzi of the University of Siena described the use of real-time PCR for the study of bacterial populations which carry composite mobile genetic elements. Due to the mobility of the elements and the autonomous mobility of parts of the elements, the observed microbial populations are heterogeneous. In this context a quantitative analysis of elements, target sites, and transposition intermediates opens entirely new prospects for the study of the.
Profile of Sylvain Brisse

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Sylvain Brisse’s research is in the area of the phylogenetic diversity and population structure of microbial pathogens, with the aim of understanding the evolution of virulence, antimicrobial resistance and other important traits. His work ranges from fundamental aspects of pathogen evolution to practical applications in taxonomy, molecular identification, and strain tracking. He applies innovative methods from the field of genomics, such as multiple gene sequencing and DNA arrays, to the study of bacteria, parasites, viruses and fungi. His main current models are Listeria monocytogenes, Salmonella enterica, Klebsiella and Chikungunya virus. On the wider phylogenetic scale, he investigates the biodiversity of the Enterobacteriaceae with the aim of understanding how this heterogeneous family evolved; he is also interested in the renovation of species definition and taxonomy and in developing universal sequence-based typing methods.

Sylvain carried out his PhD at the University of Montpellier, France, on the phylogenetic structure of Trypanosoma cruzi, the protozoan parasite which is the causative agent of Chagas disease. His molecular identification assays are now widely used to identify T. cruzi strains at the lineage level. In 1998, he joined Professor Jan Verhoef at the Department of Medical Microbiology at the University Medical Centre, Utrecht, The Netherlands, where he undertook research on important nosocomial pathogens such as Klebsiella, Acinetobacter baumannii and Pseudomonas aeruginosa. He is curator of one of the international MLST websites. He has also played a leading role in the molecular epidemiology component of ENARE (European Network of Antimicrobial Resistance and Epidemiology).

Sylvain was invited to join the Institut Pasteur, Paris, as a research scientist in 2003. He is Head of the Technological Platforms Genotype of Pathogens and Public Health. Highlights of his career at the Pasteur Institute include the identification of Mycobacterium prototuberculosis, the progenitor species of the tuberculosis bacilli, and the investigation of an explosive outbreak of Chikungunya virus on the French island of La Réunion in 2006.

Sylvain is Scientific Officer of the ESCMID Study Group on Epidemiological Markers, which aims at fostering the development of genotyping tools for strain tracking and studies of pathogen populations.

Interview with Sylvain Brisse
Q: Please describe your PhD work on Trypanosoma cruzi and explain how this advances our understanding of Chagas disease.
A: My research involved, first of all, classifying the natural strains of T. cruzi found in the wild in South, Central and North America into six different lineages, using genetic markers to work out the phylogenetic relationships between them. We found that the geographic distribution of the lineages is specific and they have distinct ecological distributions. I also wanted to know how T. cruzi really evolved. I learned that two of the lineages were actually hybrids. This evidence of recombination was a surprise, as it has always been assumed that T. cruzi reproduced exclusively by clonal binary fission. All this sheds new light on the pathogenicity of Chagas disease and may help explain why some people get the intestinal form and some get the cardiac form – although it is still difficult, as the disease tends to develop over many years. We also have many more new molecular tools for identification and diagnosis of T. cruzi infection at the lineage level which I hope will be developed and applied further in the future.

Q: What is the ENARE group and how did your previous experience in phylogenetics help your work with this project when you were in Utrecht?
A: ENARE is a project that was concerned with the surveillance of antibiotic resistance in European hospitals. We gathered a huge collection of fresh clinical isolates and compared strains for their antibiotic susceptibility. My mission in integrating the team was to apply my knowledge of phylogenetics and population genetics to this strain collection. One important goal was to see whether multi-drug resistant strains spread between countries, which was found to be the case for several pathogens such as Acinetobacters.

For further information on this project, visit the following websites:
- ESCMID Young Investigator Awardee for Research in Clinical Microbiology and Infectious Diseases during the ECCMID 2008
- Profile of Sylvain Brisse
Q. You have become a leading expert on Klebsiella. Why is this species important in public health and what have you learned about it?

A. Klebsiella is a very important species in nosocomial infection – second among Gram-negatives only to E. coli as a cause of bacteremia in European hospitals. It becomes quickly resistant to new antibiotics, such as the new cephalosporins, and easily causes outbreaks. So Klebsiella is always of interest to those concerned with hospital hygiene. Sub-types of K. pneumoniae also cause a number of infections in the community, including acute pneumonia and a type of pyogenic liver abscess which is emerging in Taiwan and elsewhere in Asia. Klebsiella infections also cause neglected diseases in developing countries, such as rhinoscleroma or donovanosis. Klebsiella species are very diverse and hard to identify. I began to analyse Klebsiella phylogenetics and found, for instance, several new species among strains traditionally considered as “K. pneumoniae” – which goes to demonstrate the complexity of this genus. We have shown that K. pneumoniae is the origin of the SHV and several other beta-lactamase families. Parallel evolution of these genes, with the lineages that harbour them, suggest that these important antibiotic resistance genes have been present in Klebsiella for several million years.

Q. What tools have you developed or used for studying nosocomial infection and the spread of antimicrobial resistance?

A. We have always used molecular tools. For instance, we developed ribotyping tools in Utrecht; this is a type of nongrouping method for comparing strains that relies on genes for ribosomal RNA. We were validating this as a standard tool for inter-hospital strain comparisons and it did look promising, although it did not really allow for enough discrimination between strains. Multilocus VNTR (variable number tandem repeat) analysis (MLVA) is another important tool for molecular typing of strains. We now mostly use MLST (multilocus sequence typing), which de nes clones based on gene sequences. One of my goals now is to develop universal MLST systems that could analyze many species at once.

Q. What international collaborations have you been/are most important to you in your career to date?

A. My former directors Michel Tibayrenc in Montpellier, Prof. Jan Verhoef in Utrecht, and Patrick Grimon at the Pasteur Institute have always been supportive of my research and gave me the necessary freedom to develop my own ideas. Prof. Marc Strelens in Brussels and Prof. Alex van Belkum in Rotterdam have also provided important encouragement and have inured my work.

Q. Please describe your work on Mycobacterium pro tuberculosis and its impact on our understanding of tuberculosis.

A. Mycobacterium tuberculosis has always been believed to be homogeneous. It has been hard to nd any polymorphisms in strains identi ed around the world – therefore it has been a challenge to type TB. We knew there had been a clonal expansion of the tubercle bacilli about 35,000 years ago, but we did not know where it came from. Working with Cristina Gutierrez and others at the Institut Pasteur, I discovered bacilli in Djibouti, East Africa, which were very distinct from classical TB and proved to be extant strains of an ancestral species. The present strain, known as the M. tuberculosis complex (MTBC) and which has been so successful, actually appeared to be a genomic mosaic resulting from horizontal gene transfer prior to its clonal expansion. Indeed, we could show a lot of genetic recombination between lineages of the ancestral species. We deduced that combination of genomic bits from different lineages has made the MTBC clone very successful. Further, the amount of synonymous nucleotide variation in housekeeping genes suggests that tubercle bacilli could have been contemporaneous with early hominids in East Africa. Discovery of the ancestor of TB means we can look into its genetics and understand why the current strain is such a successful pathogen in humans.

Q. You also worked on the outbreak of Chikungunya virus in La Réunion – how did you tackle this problem and what was the outcome?

A. The outbreak of Chikungunya virus on La Réunion, in the Indian Ocean, was a public health emergency that emerged early in 2006. One third of the population was infected, for the rst time in history on this island. No one knew why the outbreak had become so explosive. The Institut Pasteur, triggered by its National Reference Centre for Arboviruses, decided to look at the genome of the strains involved. We sequenced the entire genome to nd six chosen outbreak isolates as well as sequencing the E1 surface glycoprotein from 127 patients to see if there had been some shift that could explain the success of the outbreak. We identi ed a particular mutation, called E1-226V, which changes a single amino acid on the surface of the virus so that it becomes more effective in colonizing the mosquito vector, Aedes albopictus. The mutated virus multiplies 100 times faster than usual so the vector acts as a more heavily loaded weapon when it infects people. In this outbreak, we found that the mutated form of the virus replaced the old form within a few weeks and the evolution took place during the course of the outbreak. This mutation of Chikungunya virus has now been found in other outbreaks in South India and Gabon. This mutation seems to be very bene cial to the virus and what we are witnessing since 2006 is a good example of convergent evolution.

Q. Describe your current role and responsibilities at Institut Pasteur.

A. We are two-fold. I have a research position in the evolutionary biology of microbes, trying to understand bene cial evolution and population biology. I am interested in questions such as how virulence and antibiotic resistance evolve. I also run, together with my colleague Valerie Caro, a lab dedicated to genotyping pathogens of public health importance and to carrying out evolutionary studies on populations of pathogens. Given the concentration of specialists for all sorts of microbes, the Institut Pasteur is a great place to do this sort of work!

Q. Looking back over your career so far, what have been the highlights and which achievements have given you the most satisfaction?

A. First – my work with T. cruzi, where we discovered very distinctive lineages that could help explain the clinical forms of the disease. I am hoping this work will be developed into diagnostic tools. Then, the discovery of the ancestral form of TB and, nally, the work on the Chikungunya virus which gave our group a lot of visibility. This was a nice experience and, of course, very important in terms of public health.

Q. What will the ESCMID award enable you to do?

A. I want to travel to do some research abroad and learn some new genomics techniques. Analysis tools evolve so quickly that there is always something for me to learn. The Award will also enable me to nance some young scientists to join me for a short period.

Q. What is the ESCMID award about? Who do you intend to nominate or how will you use it?

A. The ESCMID award is meant to allow younger generations of microbiologists to travel and conduct research abroad.

Profile of William Hope

William Hope’s research is concerned with identifying antifungal and anti-infective agents for optimal therapeutic outcomes. He works in the emerging eld of antifungal PK-PD (pharmacokinetics-pharmacodynamics) which explores the relationship between drug exposure and antifungal efcacy and this is starting to make an impact on the development of new antifungal agents. He looks at experimental systems in which the interaction between antifungal compounds, immunological efcators and clini- cally relevant biomarkers can be identi ed. Clinical implications of experimental data are explored with population pharmacokinetics and Monte Carlo simulation techniques. Thereby, dosages likely to have a therapeutic efcacy can be identi ed and fed into clinical trial design.

William did his medical training at the Flinders University in South Australia, followed by postgraduate training at the Royal Brisbane Hospital. He then specialized in infectious diseases and took up a research post at the University of Manchester, UK, in 2002. His work in recent years has focused upon optimizing therapy for candidiasis and pulmonary aspergillosis. He used mathematical modelling to investigate combination chemothera- py for C. albicans in a mouse model of infection and then used Monte Carlo simulation to bridge these results to man. Here in India he has found that smaller doses of 5- aminocysteine and amphotericin B
the use of empirical treatments, often involving toxic, expensive ill patients. The difficulty of diagnosis in aspergillosis leads to tions, where molecular diagnostics such as PCR can be used. in invasive pulmonary aspergillosis (IPA) lags behind other infec tropenia and stem cell transplant recipients. The overall mortal Q. How did you come to develop an interest in clinical mycol biology when I obtained a joint fellowship between Manchester relatively fewer diagnostic and therapeutic targets. I had just er to humans than other microorganisms which means there are gy? Could be used together without loss from cell kill, showing that a less toxic approach to treating the infection is possible. He has used a similar approach to provide an understanding of the beaviour of micafungin in neonatal candidiasis. Another major achievement has been the development of a new in vitro model of pulmonary aspergillosis which will answer vital questions about this life-threatening infection. Following positions in the United States at the National Can cer Institute, Bethesda, New York, and the Ordway Research Insti tute, Albany, New York, William returned to Manchester in 2007 to a permanent position as a Senior Research Fellow.

Q. How did you come to develop an interest in clinical mycology? A. Mycology is interesting because less is known about fungi than bacteria and viruses. Fungi are phylogenetically much clos er to humans than other microorganisms which means there are relatively fewer diagnostic and therapeutic targets. I had just completed my training in infectious diseases and clinical micro biology when I obtained a joint fellowship between Manchester and the National Institutes of Health with David Denning and Thomas Walsh both of whom are leading figures in this field. This gave me the opportunity to learn a wide range of techniques in clinical mycology.

Q. Why has pulmonary aspergillosis been such an important part of your work? A. Pulmonary aspergillosis is important because it is a common cause of morbidity and mortality in immunocompromised pa tients. Pulmonary aspergillosis usually affects people with neu tropenia and stem cell transplant recipients. The overall mortal ity is approximately 50 percent. The accuracy of the diagnosis of invasive pulmonary aspergillosis (IPA) lags behind other infec tions, where molecular diagnostics such as PCR can be used. Invasive diagnostic procedures are often precluded in critically ill patients. The difficulty of diagnosis in aspergillosis leads to the use of empirical treatments, often involving toxic, expensive drugs which may be given to those who do not even have aspergillosis. Typically these drugs might include amphotericin B deoxycholate, or its lipid formulations, triazoles, such as posa conazole, or the echinocandins, which are a new group of semi synthetic systemic antifungals. The cost of these treatments can account for a significant proportion of a hospital’s drug budget. Q. What are the techniques and tools you use in your work? A. My main interest is in antifungal pharmacology and how antifungal drugs can best be used. I want to find ways to identify dosages and schedules that are likely to lead to optimal out comes. Doing this work in a conventional clinical setting is slow, so I am interested in using experimental models to speed the process up. I use population pharmacokinetics which reflects how a broad range of people will handle a drug. Typically this will depend upon factors such as age, sex, race and pharmacoe netics, but even after considering these variables, a large amount of unexplained or residual variance remains. Population pharma cokinetics provides robust estimates of this variance and one can use these models to understand the behaviour of a drug. Q. What contribution have you made in candidiasis? A. I worked with an echinocandin called micafungin, for which all the clinical efficacy data has been obtained in adults. There is a condition in premature neonates called haemagogenous Candida da meningoencephalitis (HMCE) where the fungus invades from the bloodstream into the brain. With little prior information, it is difficult to identify the dose of micafungin that should be used in clinical trials in this patient group. We worked with a rabbit HMCE model and determined the efficacy of micafungin for this condition. We then bridged these experimental results to hu mans. We have been able to describe how the drug behaves in neonates and use this information to design clinical trials which are likely to yield meaningful conclusions in the most cost ef fective and efficient manner. The dose used in adults is 1 – 2 mil ligrams per kilo bodyweight, but in neonates we predicted that one needs a considerably larger dosage of 10 – 15 milligrams per kilo bodyweight — this is obviously much higher than is intuitively apparent. If we had not known this, and a lower dosage was used, the clinical trial may have been terminated early be cause of poor outcomes.

Q. Can you describe the model you have built of the invasive pulmonary aspergillosis? A. Aspergillus primarily affects the lung. I developed this model using Transwell inserts which sit in 24-well tissue culture plates. The model consists of a semi-permeable membrane with human alveolar cells grown on top and endothelial cells on the bottom. Conidia, or spores, are environmentally ubiquitous and inhaled by humans continuously. The normal immune sys tem prevents germination and the initiation of invasive disease. In immunocompromised patients conidia escape immunological surveillance and germinate to form hyphae which invade the lung and cause tissue damage. It has previously been hard to build experimental models of this infection because conidia and hyphae are biologically so different. Our new model is a physiologically faithful mimic of the pathophysiology observed in hu mans and we can use it to understand characteristics and deter minants of fungal invasion. We have demonstrated that most of the important pathological events occur within the first 24 hours. It has also been possible to tie the invasion to the kinetics of a range of clinically relevant biomarkers, such as galactomannan (a carbohydrate secreted by the fungus) which is increasingly being used for the diagnosis of IPA. We have had several visitors in Manchester learning how to make the lung model and I am hopeful this will facilitate important collaborations in the UK and in Europe. Q. In your working life, what is your balance between clinical and research interests? A. I provide two clinical sessions each week with patients who have infectious diseases such as TB and chronic pulmonary as pergilllosis. I am about to start a consultation service for solid organ transplant recipients. There is no evidence that opportun istic infections are abating — perhaps because the number of im munocompromised patients is increasing, and the immunosup pressive treatments are becoming more aggressive. I am conducting various experimental projects, using both in vivo and in vitro systems. I am also involved in various clinical trials of antifungal drugs and am collaborating with others on pharma cokinetic analyses.

Q. What do you think you will gain from the ESCMID award? A. I will use the award to support work with others on projects such as cryptococal infection which causes meningitis in peo ple with AIDS and which is a big problem in Africa where the drugs to treat it are not affordable.

Q. What have you learned about the best use of antifungal drugs in clinical practice? A. Antifungals are not as prone to resistance as antibacterials and antivirals. However, Aspergillus resistance is emerging in the Netherlands and we also have seen this in Manchester. There are not many antifungal drugs in the developmental pipeline, so we need to understand how to use the drugs we do have in an optimal way. I think that we will increasingly need to find ways to individualize therapy, so that we can optimally treat the pa tient in front of us rather than using estimates derived from a population of patients.

Q. Looking back, which of your scientific achievements has been the most satisfying? A. I would have to say the neonatal candidiasis work because it has had a direct clinical impact.
Infections Susceptibility in Senescent Microglial Cells

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My current research focuses on the correlation between inflammation in microglial cells and neurodegenerative disorders. In the spring of 2008 I visited the laboratory of W. J. Streit at the McKnight Brain Institute, University of Florida, Gainesville, for approximately three months to gain specialized expertise in microglial cell isolation.

Background

Because the population is aging in Western society, disorders of the elderly, such as neurodegenerative disorders, are becoming more common. As a result, the most important neurodegenerative disorder, Alzheimer’s disease (AD), is causing significant increases in both morbidity as well as mortality. Despite extensive research, the cure for this devastating disease is still lacking. Thus, it is crucial to gain knowledge about previous events to better understand disease pathology.

In this regard, the role of inflammation and infection is becoming increasingly recognised. Viruses, such as human immunodeficiency virus (HIV), herpes simplex virus (HSV) or cytomegalovirus (CMV) and recently also the intracellular bacterium Chlamydia pneumoniae (Cpn) have been suggested to contribute to AD. Moreover, infection may possibly be the missing link between normal aging and the development of a pathological disorder, such as AD.

Microglial cells could play a significant role in these processes. In previous studies from our lab, we reported that microglial cells, although rather resistant to Cpn infection, release several pro-inflammatory cytokines post-infection. The amounts of produced factors were found sufficient to cause neurodegeneration, one of the hallmarks of AD. As it has been shown that the activation of microglial cells coincides with plaque formation, our results might be key in AD pathology. Likewise, it has already been suggested that microglial cells primed by aging or by disease will respond differently to secondary stimuli such as inflammation or infection than microglial cells in a young healthy brain. This reaction could have an important effect on the initiation or aggravation of disease.

Therefore, we intended to test the hypothesis that senescent/diseased microglial cells respond differently to infection/inflammation, compared to microglia in a young healthy brain, thereby evoking pathological conditions. To solve these research questions, we planned to isolate microglial cells from the brain of young, old, and transgenic AD mice.

The training

Since our lab has no experience in isolating mouse microglial cells and since the difficulty of performing this technique was confirmed through a literature review, I visited the laboratory of W. J. Streit to learn how to isolate microglial cells from an adult mouse brain. The aim was to set up and optimize this isolation method during the visit. In the end, we were able to establish an innovative and improved technique to isolate microglial cells, for the first time from aged mouse brains. By immunofluorescent staining of microglial cells, astrocytes, and neurons, a 95-98% pure microglial culture could be maintained for at least one week. Finally, functionally properties of microglial cells were also investigated. As such, the uptake of amyloid beta by our isolated microglia was visualized.

Concerning my research question of whether infection profiles were different for young and aged primary mouse microglial cells, some pilot studies were performed. Microglial cells were isolated with this new method from 2- and 14-month-old C57Bl6 mice. The cells were cultured and 24 hr after plating were infected by centrifugation for 1 hr with Cpn at a multiplicity of infection of 1. After 24 hr of additional culturing, the cells were fixed and stained for Cpn, using a fluorescent antibody directed against the major outer membrane protein of the pathogen. Preliminary data indicate that young as well as aged microglial cells can be infected with the bacteria. Still, the susceptibility seemed higher in the aged microglial cells. Nevertheless, additional experiments are required to confirm and interpret these results.

Summary

The isolation techniques from the training abroad will be integrated into my home laboratory to better answer our research question of whether senescent/diseased microglial cells will respond differently to inflammation and infection than young healthy cells. Also, the impact on hallmarks of AD has to be investigated. For this reason, future experiments will consist of the isolation of microglia from young, aged and AD transgenic mice. Next, these cells will be stimulated with various pathogen-associated molecular patterns (PAMPs) or infected with Cpn for various time periods. In addition, susceptibility of the various microglia groups to the pathogen, activation markers and inflammatory responses will be compared post infection/inflammation. Finally, the media of the stimulated/infected microglia will be transferred to a neuronal cell layer to analyze the incidence of various hallmarks of AD, such as neurodegeneration and amyloid/tau pathology.

A better understanding of these processes will provide a solid basis for the initiation of new treatment strategies in the future.
A View into Communicable Disease Control in Malaysia

Report on Training in a Foreign Institution

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I am currently undertaking specialist training in public health. With support from an ESCMID Training Grant I travelled to Malaysia for a two-week training stay, which helped to broaden my experience in preparation for a consultant post and to better plan for my remaining time in public health training. Such training also allowed me to gain exposure in a variety of settings, in which communicable disease control is practiced.

Objectives of the training
As well as further developing my competency and consolidating my core skills in the practice of communicable disease control, the international placement was to enable me to develop specific interests to enhance career opportunities. The placement should further my credibility both nationally and internationally at the interface of communicable disease control, clinical microbiology and academic research.

There are clear benefits in understanding the systems in other countries and knowing some of the key people in relation to responding to global communicable disease issues. It is important for modern consultants in communicable disease control to have international exposure and understanding given the effect that air travel has on the spread of communicable diseases. An international placement in Southeast Asia is extremely valuable in gaining a global perspective.

The training
Malaysia continues to strengthen its public health system. It is recognized as a developing force in public health and academic research. Contacts at the Faculty of Medicine (University of Malaysia), the Institute for Medical Research, and the Public Health Laboratory, all of which are in Kuala Lumpur, as well as contacts at the Malaysia campus of the University of Monash were developed during 2006 due to our complementary interests in pneumococcal infection and other vaccine-preventable diseases.

I visited various establishments in Kuala Lumpur and I gave talks at a number of these occasions. During my visit I learnt about the public health system, communicable disease control, and also built upon my existing academic contacts.

Background
Malaysia is a developing nation. Although its cities host leading financial institutions in the region, there are huge issues surrounding the health of the population. The world’s tallest twin towers sit in a city where there are high levels of poor health.

In 2006, the population of Malaysia was 26.64 million with an average annual growth rate of 1.9. The state of Selangor has the highest resident population of 4.9 million. Malaysia has a young population (42% are under the age of 20 years) whilst the working population totals some 16.9 million (15 to 64 years of age). There is an almost equal gender split (50.9% to 49.1%, male to female). The crude birth rate and crude death rate were 18.7 and 4.5 per 1'000 population, respectively. Life expectancy at birth for males was 71.8 years and 76.3 years for females (compared to 56 years and 58 years in 1957).

In 2006, there were 1’905’089 hospital admissions during 2006. The Ministry of Health uses these statistics for determining levels of morbidity and mortality. Normal childbirth was the most common cause of hospitalization (14.91%) followed by complications of pregnancy, childbirth and the puerperium (12.39%). Diseases of the respiratory system and circulatory system accounted for 7.3% and 7.26% of admission, respectively. Cancer is reported infrequently (3.13%). Of the 40’586 deaths in Ministry hospitals, septicaemia was the most common (16.87%), followed by heart and circulatory diseases at 15.7%. Pneumonia accounted for 5.81% of deaths.

Communicable Disease Control
The Disease Control Division of the Ministry of Health plays an important role in the prevention and control of diseases. Its remit includes communicable and non-communicable diseases. It therefore has a role in health promotion. I met with officials from the Communicable Disease Section. Some infectious diseases are notified under the Prevention and Control of Infectious Diseases Act 1988; these include cholera, typhoid, food poisoning, hepatitis A and dysentery. Notification of other infectious diseases occurs by syndrome rather than specific infection. For the latter, there were 25 notifications from three hospitals in 2006. Acute respiratory syndromes accounted for twenty of these.

In 2006, there was no polio and the incidence of whooping cough, neonatal tetanus and diphtheria remains at less than 1 per 100’000 population. Measles has decreased from 5.39 per 100’000 population in 2005 to 2.27 in 2006. Hepatitis B has also decreased, from 5.69 per 100’000 population in 2005 to 4.67 in 2006.

Cholera, typhoid/paratyphoid, hepatitis A and dysentery continue to decline. Apparently, the incidence of food poisoning is low. Only 6’938 cases (incidence rate of 26.04 per 100’000 population) were reported during 2006 but the numbers fluctuate from year to year.

Influenza surveillance was strengthened in 2004 due to the prospect of pandemic influenza. It is monitored via an influenza-like illness sentinel surveillance system using consultation rate as its indicator. It is carried out in 246 government and private clinics and hospitals throughout the country. The consultation rate remained below the threshold of 1.0 per 100’000 population throughout 2006 (as for 2004 and 2005). Malaysia has a National Influenza Pandemic Preparedness Plan which was launched in January 2006. A table-top exercise was conducted in April 2006, an exercise took place at Kuala Lumpur International Airport in September 2006, and a regional pandemic response exercise was organized in June 2007.

There has been a year on year increase in dengue cases although, in 2006, there was a decrease to 38’556 cases (144.7 per 100’000 population). Of these, 94.6% were dengue fever with the remainder being dengue haemorrhagic fever. However, only 47.3% of all cases were confirmed.

Malaria continues to decrease. There were 5’294 cases (19.9 per 100’000 population) in 2006 as compared to 5’569 cases in 2005. Most cases occur in Sabah (57.2%) and Sarawak (26.7%) on East Malaysia. Of all cases, 40.1% were in foreigners.

Malaysia has an intermediate TB burden. In 2006, there were 16’665 new cases registered of which 10’274 were infectious. The incidence rate (all forms) is 62.6 per 100’000 population.
5,830 new infections reported. Of these, 75% were contracted through needle sharing. Malaysia has a large population of foreign workers. The population is medically examined and those deemed “un fit” are not allowed to renew their work permit. Infectious diseases found amongst this population in 2006 included hepatitis B (33.5%), abnormal chest X-ray indicative of TB (31.3%), syphilis (8.7%). Disease surveillance also occurs amongst Hajj pilgrims. In the 2006 pilgrimage there were 54 reported deaths, the main cause being heart attack (18 deaths), followed by septicaemia (5 deaths), lung infections or pneumonia (3 deaths) and others (28 deaths).

The Infection Control Unit of the Ministry of health was established in 2002. It systematically monitors hospital-acquired infection and develops infection control policy. A point prevalence study has been conducted in 14 state hospitals and three university hospitals each March and September since 2003. According to this study, the prevalence of hospital-acquired infections has decreased from 7.4% in March 2003 to 3.54% in September 2006. MRSA surveillance is conducted monthly with an apparent downward trend of 0.35% in 2003 to 0.25% in 2006. ESBL rates are below 0.5%.

National Public Health Laboratory
The National Public Health Laboratory (NPHL) was set up to provide specialist reference laboratory services for government hospitals. The laboratory received 4,744,026 clinical and 3,895 food samples were processed for the purposes of diagnosis, surveillance and outbreak investigation. The workload is limited at the moment as the respective roles of the NPHL and Institute for Medical Research (IMR) are being realigned.

Institute for Medical Research
The IMR is a government institution that undertakes medical research of national priority. Its budget in 2006 was RM38 million and it has 671 positions (of which 544 are Iled). There are 52 ongoing projects and, in 2006, there were 58 scientific papers and 13 reports published. The centre of personal interest is the Infectious Diseases Research Centre (IDRC), which has Bacteriology, Entomology, Parasitology and Virology Units. The units focus their research on the molecular diagnosis and transmission of infectious diseases. The overall role of the IMR is being discussed since, currently, it has some remit for typing of bacteria and viruses, and also for investigating outbreaks. However, with the developing of the NPHL, the IMR will have a more research-focused role.

Summary
The international placement full filled all its aims. I gained a good knowledge of the health systems in Singapore and Malaysia, and more specifically a good understanding of the public health systems. Due to my personal interests, I also gained an excellent overview of the arrangements for communicable disease control in each country. I also had the opportunity to build on my existing academic collaborations with clinical and academic microbiologists and infectious disease consultants in Singapore and Kuala Lumpur. These collaborations will continue to develop over time.

I gave numerous presentations to a broad audience and also further developed my competency in numerous areas as planned.

125-year Anniversary of Christian Gram’s Staining Method

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Hans Christian Joachim Gram (1853–1938; Fig. 1) was the 1st child of professor of law, Frederik T.J. Gram, and his wife Louise. He graduated in 1871 from the Metropolitanskolen. His father died when Christian was 18 years old and according to tradition, at that time, Christian became responsible for his family although his six brothers and sisters were still children and he himself had not nished his education (1, 2).

Initially he studied natural science (botany) at the University of Copenhagen and became an assistant to professor of zoology Jaspert Steenstrup (1813–97) at the zoological collections of the University. Steenstrup convinced Gram to study medicine which he himself had done, but Gram also continued to work with botany at Eugen Warming’s (1841–1924) laboratory, who had published the 1st Danish bacteriological paper in 1876 (3, 5). During his medical study, Gram and his fellow students admired the novel bacteriological work of Carl Julius Salmansen (Fig. 2) who worked as a young medical doctor at the Kommunehospital in Copenhagen and later became professor of general pathology (bacteriology) (4, 5). His knowledge of botany, microscopy and natural science was highly advantageous and decisive for Gram’s career (3).

After he switched from the study of botany to medicine, he graduated as a medical doctor in 1878. His clinical training was undertaken at the Kommunehospital in Copenhagen (2, 3). In 1882 (7). During his medical study, Gram and his fellow students admired the novel bacteriological work of Carl Julius Salmansen (Fig. 2) who worked as a young medical doctor at the Kommunehospital in Copenhagen and later became professor of general pathology (bacteriology) (4, 5). His knowledge of botany, microscopy and natural science was highly advantageous and decisive for Gram’s career (3). After he switched from the study of botany to medicine, he graduated as a medical doctor in 1878. His clinical training was undertaken at the Kommunehospital in Copenhagen (2, 3). In 1882, he received a gold medal from the University for a scientific paper and continued his research which was accepted as a doctoral thesis, Investigations of the size of erythrocytes in humans, in 1883. This became a highly cited standard for this topic for many years since his measurements were very precise and because he described the increasing size of erythrocytes in pernicious anemia and jaundice (2, 3).

Gram’s wife Louise (1865–1900) became chronically ill and died of tuberculosis when their two boys were 3 and 10 years old, but Christian’s three unmarried sisters, “the aunties”, volunteered to keep house and bring up the children (1). Gram was deeply in uenced by the death of his wife and socially isolated himself after that time but worked even harder than before. He enjoyed travelling and had a summer house “Siesta” in Asilgrove in North Zealand (1). One of Christian’s grandchildren remembers that he was a snappy old man (Fig. 4) but he had a very good relationship to his granddaughter (1, 6).

The Danish pioneer of bacteriology, Carl Julius Salmosnse (1847–1924) obtained the 1st European university chair of medical bacteriology and became head of the Laboratory for Medical Bacteriology in 1883 (Fig. 2) at the University of Copenhagen (5) and his task was to organize laboratory courses of bacteriological techniques. The 1st course took place in the spring (3 months) and autumn (2 months) of 1883 in the museum of botany and Christian was among the eleven participants (5). Gram had planned to visit famous bacteriologists in other countries after nishing the course and Salomonsen gave him a letter which introduced him to the pathologist Carl Friedländer at Friedrichshain’s Hospital in Berlin. Salomonsen knew Friedländer from his own visit to Robert Koch in 1882 (7).

Gram arrived at Friedländer’s laboratory on 22 October 1883 and worked in his laboratory until 20 March 1884 (7). Several staining methods were available for bacteriology at that time, but when they were applied on tissues from infected organs both bacteria and nuclei from the cells of the patients or the experimental animals were stained. It was therefore dif cult to distinguish bacteria from...
nuclei in the tissue cells. Friedländer studied the aetiology of pneumonia and he had detected capsaicin in autopsies from patients who had died of pneumonia (6, 7). Gram had already worked on the development of a combined staining method for sliced samples from kidneys. He employed aniline-gentiana violet and iodine solution to obtain blue nuclei and brown urinary cylinders. The aniline-gentiana violet stained samples were usually difficult to decolorize by ethanol but when he added iodine solution after the aniline-gentiana violet staining, the samples became completely decolorized by ethanol. This observation was the background for Gram’s development of his famous staining method in which pneumococi, the common causative agents of pneumonia, became more intensely stained than by any of the other staining methods whereas nuclei and other tissue components became completely decolorized by ethanol. It was in fact the first method which stained bacteria but not nuclei (7). The time needed for Gram’s staining method was 15 min for ordinary bacteria but 12–24 h for mycobacteria. Gram employed staining with Ehrlich’s aniline-gentiana violet (or fuchsin) followed by Lugol’s iodine solution in water (as mordant), which at that time was used frequently by bacteriologists for staining of specimens.

Gram observed that a number of different bacteria were stained black-reddish (Fig. 5) whereas other e.g. typhoid bacteria were decolorized, but that they (and the tissue components) could be visualized by counterstaining with e.g. Bismarck brown or vesuvian. Gram’s staining method has only been slightly modified since 1883 and the current modification employs crystal violet followed by iodine solution in water, decolourization with ethanol, and counterstaining with fuchsin. The procedure can be completed in 3 min.

The significance of Gram’s staining method became immediately clear to him since he noticed severe errors in Friedländer’s interpretation of the aetiology of pneumonia, mixing up the pneumococci observed by microscopy with the Klebsiella pneumoniae (later called Friedländer’s bacillus) he cultured from the patients and used for animal experiments (7). Gram was therefore very hesitant to criticize Friedländer’s work publically because it would support his opponent Albert Fraenkel (1848 – 1916), who cultured the pneumococci and used them for animal experiments (later called Fraenkel’s pneumococci) (7). The publication of Gram’s method was therefore slightly delayed (15 March 1884; 7, 8). There is little doubt that he realized the importance of his staining method (7, 8) and it was also recognized by the scientific community because it allowed categorizing bacteria in two large, unrelated groups, Gram-positive and Gram-negative, with crucial implications not only for identification of bacteria and taxonomy, but also as a rapid diagnostic tool in the daily work in bacteriological laboratories all over the world. This was further internationally acknowledged by a public demonstration in the Academy in Science in Paris in 1886 by Emile Roux (1853 – 1933) from Institut Pasteur, who used Gram’s staining method to identify gonococci (3). The universal use of Gram’s staining method means that Gram probably is the name which is used most frequently in bacteriology laboratories and elsewhere every day for identification of bacteria and taxonomy, but also as a rapid diagnostic tool in the daily work in bacteriological laboratories all over the world.

The biochemical and structural background for the Gram-differential staining method was explained in 1929 by V. Burke and M.W. Barnes as a young man

Figure 1. Christian Gram

Figure 2. Carl Julius Salomonsen (1883), pioneer Danish bacteriologist

Figure 3. Sonne, C. Christian Gram

Figure 4. Christian Gram after he had retired

Figure 5. Gram staining of Streptococci from blood culture. Gram’s original stained slides do not exist. [x100, photo by E. Nega]
Making Sense of Microbial Typing for Infection Control: ESGEM and the New Guidelines

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Molecular typing is now an essential component of microbiology and of infection control services provided across Europe and in many other countries of the world. Recent quantum advances in comparative genomics have yielded a wide choice of powerful methods for studying the genomic relatedness of microbes. The epidemiology of microorganisms does not recognise national boundaries. Collaboration between scientists working in different countries is therefore essential to standardize methodology and to track the spread of particular virulent or resistant microbial pathogens.

ESGEM is a group of ESCMID members who share an interest in epidemiological typing systems. The Study Group first wrote consensus guidelines to optimize the use and evaluation of microbial epidemiologic typing systems in 1996 (1) following extensive consultation within the group. Until that time there was no agreement as how best to assess and utilize microbial typing approaches to explore epidemiological hypotheses. The scientific literature was of varied quality. Since their publication, the guidelines have been quoted as a reference point for many scientists around the globe. Please see www.escmid.org/guidelines for the full version of the guidelines.


The principles have been used in many scientific papers describing new typing approaches or how best to use typing methods to explore epidemiological hypotheses related to hospital and community outbreaks. They are also of use in studies to evaluate the success or otherwise of interventions to prevent or control healthcare-associated and community infections (2).

Since these guidelines were written there have, of course, been numerous innovations and improvements in existing technology and analytical approaches, together with an astronomical improvement in our understanding of microbial genomes, as well as extensive discussion on how typing results should be interpreted to assign isolates to types. ESGEM thus decided to update the guidelines. The updated guidelines (3) describe new and old phenotypic and genotypic methods for typing all clinically relevant bacterial species, their underpinning principles, advantages and disadvantages. Criteria for their evaluation, application, and very important for everyday practice in many laboratories, especially for PFGE and PCR-based methods, where divergent views had been expressed so far – interpretation of their results are also proposed with an extensive glossary of terms that many will find useful for teaching purposes. Finally, the issues of reporting, standardization, quality assessment, and international networks are discussed. We anticipate that the current guidelines will be as popular as their predecessors and serve as a reference point for many scientists around the globe.
The GRACE Network of Excellence (www.grace-lrti.org) includes among its collaborating partners two leading European Societies – ESCMID and The European Respiratory Society (ERS). These Societies have within their portfolio of activities two key components of the GRACE project, namely antimicrobial resistance and lower respiratory tract infections. This partnership creates both opportunities for collaborative research and an effective and successful arrangement for the educational and training outputs of GRACE.

ESCMID and ERS have enthusiastically supported the programme of GRACE Postgraduate Courses (PGCs) and Workshops (WSs). PGCs have preceded the ECCMID Congresses held in Munich in 2007 (second PGC) and in Barcelona this year (fourth PGC). The first and third GRACE PGCs were held in conjunction with the ERS Congresses in 2006 and 2007 which will also host the fifth PGC later this year.

The recent PGC in Barcelona highlighted the healthcare burden of LRTI in Europe, looking at antibiotic use and resistance, morbidity and mortality in both primary care and hospital care, the socioeconomic considerations, and disease prevention by vaccine use. This programme was complemented with data from the GRACE Package (WP8) on attitudes of doctors and patients and from WP9/10 on the observational and interventional studies which are now underway in the GRACE primary care network. The PGCs and WSs are the building blocks of a broadly based curriculum designed by GRACE WP12. Over the five-year period of funding available to the GRACE PGCs and WSs, many of the important areas of knowledge relevant to the science and practice of antimicrobial resistance, lower respiratory tract infections and genomics of man and microorganisms will be covered. These are captured within the GRACE objectives and highlight new research information from the project. Delegates have given high approval ratings for the PGCs to date. It is therefore important to emphasize that the outputs of these events are freely available online at the GRACE e-learning portal (www.ersnet.org/grace) which can also be accessed through the ESCMID and ERS websites. Thus the “delegate” base for GRACE education and training activities is very much greater than those professionals who have attended the courses in person.

For the next ECCMID in Helsinki in May 2009, a sixth PGC – now called an “Educational Workshop” to be consistent with the nomenclature of the ECCMID educational events – has been developed and will focus on “Challenge and Change in Pneumonia” with features on two key community pathogens, namely Streptococcus pneumoniae and community-associated-MRSA. The introduction of conjugate pneumococcal vaccine in Europe is likely to bring about significant changes to the impact of pneumococcal disease as uptake of the vaccine extends across the Continent. By way of contrast, community-acquired MRSA has yet to make a significant impact in Europe but from experience across the Atlantic, it is a truly devastating illness on the occasions it affects the lungs.

Some more good news from the collaboration between ESCMID and GRACE is that in addition to the PGC there is to be an ECCMID Symposium in Helsinki co-organized by ESPRIT and GRACE. ESPRIT is one of the Society’s expert groups, and stands for the ESCMID Study Group for Primary Care Topics. Finally, the inclusion of two posters in the European Network Corner at the recent ECCMID provided a further opportunity for GRACE to share its research programme and educational outputs with delegates attending the Congress. This is another example of how GRACE benefits from the strong support it receives from ESCMID and in particular Javier Garau who is not only a member of the ESCMID Executive Committee but is also a member of the GRACE WP12 Education and Curriculum Committee.
ESCMID's mission is to improve the diagnosis, treatment and prevention of infectious diseases by promoting and supporting research, education and training in the infection disciplines. This is achieved by scientific exchange, educational programmes, grants and awards, certification and consultation with professional and government agencies.

Front Page: Christian Gram, who developed the Gram stain, and his two sons Kai Gram (left) and Hans Christian J. Gram (right) in front of the Rigshospitalet, Copenhagen, where he was physician-in-chief of the Department of Internal Medicine A. This year marks the 125-year anniversary of the Gram stain.