
International Forum on Antibiotic Resistance

Establishment & Activities: 2000–2006

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1. Introduction

Bacterial resistance to antibiotics is a globally important healthcare problem, as recognised by the World Health Organization¹, the European Commission², and the United States Centres for Diseases Control and Prevention (CDC).³

The International Forum on Antibiotic Resistance (IFAR) is a multidisciplinary, international group of scientists concerned with the evaluation of current knowledge regarding antibiotic resistance and the means for its control.

The IFAR was established in 2001 during the collaborative development of the Global White Paper on Bacterial Resistance in Community-Acquired Respiratory Tract Infections (RTIs).⁴ Since then, the IFAR has held a series of annual Colloquia to allow a select group of experts to discuss in detail a defined area of cutting edge research concerning various aspects of antibiotic resistance.

IFAR is presently led by an Executive Committee comprising:

- Prof. Roger Finch (Nottingham, UK)
- Prof. Keryn Christiansen (Perth, Australia)
- Asst. Prof. Joshua Metlay (Philadelphia, USA).

In 2006, the structure of IFAR will be revised following its recent formal affiliation with the European Society of Clinical Microbiology and Infectious Diseases (ESCMID) and the International Society for Infectious Diseases (ISID). In the past, IFAR has also had fruitful, collaborative relationships with representatives of the Infectious Diseases Society of America, the CDC, and the United States Food and Drug Administration (FDA).

Until 2006, the IFAR was supported by an unrestricted educational grant from Sanofi-Aventis, which was provided without influence on the objectives, content, conclusions or publication of the Colloquia. The group is now seeking alternative sponsorship.

The IFAR has provided a unique forum for productive discussions concerning key aspects of antibiotic resistance. This document explains the establishment of the IFAR faculty and outlines the activities of the group to date.

¹ World Health Organization. WHO global strategy for the containment of antimicrobial resistance. Geneva: World Health Organization; 2001.

² European Commission. Communication from the Commission on a Community Strategy Against Antimicrobial Resistance. COM 2001 333 Vol. I. Brussels: Commission of the European Communities; 2001.

³ Interagency Task Force on Antimicrobial Resistance. Public health action plan to combat antimicrobial resistance. Atlanta, GA: Centers for Disease Control and Prevention; 2001.

⁴ Clin Microbiol Infect 2002; 8 Suppl 2: 1–128.

2. Global White Paper on Bacterial Resistance in Community-Acquired RTIs

In 2000–1, Interel Health (Brussels, Belgium) invited an international, multidisciplinary faculty of experts to collaborate in the development of a state-of-the-art publication that would evaluate the current evidence-base concerning key aspects of bacterial resistance in community-acquired RTIs:

- The socio-economic and clinical burden of resistance
- Surveillance of bacterial resistance
- The role of the patient
- Evaluation of treatment guidelines for RTIs
- National and international strategies for resistance control
- Evaluating interventions for resistance control

In February 2001, the following faculty members met in Dublin, Ireland, to present their contributions to this project. Moreover, in light of the success of the initiative, the faculty committed to ongoing collaborative activities under the name, International Forum on Antibiotic Resistance.

Specialty	City/country	Subspecialty interests/contribution
Microbiology		
Fernando Baquero	Madrid, Spain	Surveillance, epidemiology, antibiotic use
Otto Cars	Solna, Sweden	Surveillance, epidemiology, antibiotic use, interventions
Keryn Christiansen*	Perth, Australia	*IFAR Executive Committee. Surveillance, molecular epidemiology, control interventions
David Felmingham	London, UK	Surveillance
Waleria Hryniewicz	Warsaw, Poland	Surveillance, molecular epidemiology, EARSS
Keith Klugman	Atlanta, USA	Molecular epidemiology (esp. pneumococcus)
Katsunori Yanagihara	Nagasaki, Japan	Surveillance (representing Dr Shigeru Kohno)
Donald E. Low	Toronto, Canada	Surveillance, URI, LRTI
Caio Mendes	Sao Paulo, Brazil	Surveillance

ID physicians		
Claude Carbon	Paris/Lausanne	Various, incl. RTIs
Peter Davey	Dundee, UK	LRTI, UTI, outcomes, education, research methodology
Roger Finch*	Nottingham, UK	*IFAR Executive Committee. LRTI, resistance
Joshua P. Metlay*	Philadelphia, USA	*IFAR Executive Committee. LRTI, resistance, epidemiology and outcomes research
Jack S. Remington*	Stanford, USA	*IFAR Executive Committee (until 2004)
Daniel E. Singer	Boston, USA	LRTI, epidemiology and outcomes research
Respiratory physicians		
Charles Feldman	Parktown, S. Africa	LRTI, resistance
Patient advocate		
Angela Hayes	London, UK	International Alliance of Patient's Organizations
Veterinary		
Lord Soulsby	London, UK	Veterinary aspects. Co-author of UK Dept of Health Report on Antibiotic Resistance.
Additional attendees		
Clodna McNulty	Birmingham, UK	UK Public Health Laboratory Service

These contributions formed the basis of an integrated symposium held at the 41st Interscience Conference on Antibiotic Agents and Chemotherapy (ICAAC; December 2001, Chicago, IL). Hosted by the ECCMID, ISID and IDSA, the meeting included a presentation by Dr David Bell of the CDC and was covered by the BBC, the Wall Street Journal, *Lancet Infectious Diseases*, and *Scrip* magazine.

The resulting Global White Paper, published in 2002, comprises a series of evidence-based articles that critically discuss key aspects of resistance in RTIs. The following papers are preceded by forewords by Dr David Bell (CDC) and Ferdinand Sauer (European Commission, DG Health and Consumer Protection):

- Metlay JM, Singer DE. Outcomes in lower respiratory tract infections and the impact of antimicrobial drug resistance. *Clin Microbiol Infect* 2002;8 Suppl 2:1–11.
- Felmingham D, Feldman C, Hryniewicz W, Klugman K, Kohno S, Low DE, Mendes C, Rodloff AC. Surveillance of resistance in bacteria causing community-acquired respiratory tract infections. *Clin Microbiol Infect* 2002;8 Suppl 2:12–42.
- Davey P, Pagliari C, Hayes A. The patient's role in the spread and control of bacterial resistance to antibiotics. *Clin Microbiol Infect* 2002;8 Suppl 2:43–68.
- Finch RG, Low DE. A critical assessment of published guidelines and other decision-support systems for the antibiotic treatment of community-acquired respiratory tract infections. *Clin Microbiol Infect* 2002;8 Suppl 2:69–91.
- Christiansen K, Carbon C, Cars O. Moving from recommendation to implementation and audit: part 2. Review of interventions and audit. *Clin Microbiol Infect* 2002;8 Suppl 2:107–28.
- Carbon C, Otto C, Christiansen K. Moving from recommendation to implementation and audit: Part 1. Current recommendations and programs: a critical commentary. *Clin Microbiol Infect* 2002;8 Suppl 2:92–106.

3. IFAR Colloquia

Since 2002, the IFAR has held annual Colloquia preceding the ICAAC conference. These meetings have been specifically designed to allow a select group of experts to discuss in detail a centrally important aspect of antibiotic resistance and to provide a discourse between cutting edge research and routine clinical practice. To this end, participants have included young researchers, as well as established international experts and representatives of national and international authorities. Discussion papers based on these meetings have been published in reputable medical journals.

The Colloquia have been arranged as closed meetings held over one day and followed by a faculty dinner.

1st IFAR Colloquium, 2002

Educational interventions to improve antibiotic use in the community San Diego, CA, Sept 2002

This meeting focussed on public and professional educational strategies designed to aid the control of antibiotic resistance. To this end, experts in behavioural theory and workers with practical experience gained from large-scale national educational campaigns.

The following discussion paper based on this meeting has been published:

- Finch RG, Metlay JP, Davey PG, Baker LJ, on behalf of the International Forum on Antibiotic Resistance colloquium 2002. Educational interventions to improve antibiotic use in the community: report from the International Forum on Antibiotic Resistance (IFAR) colloquium, 2002. *Lancet Infect Dis* 2004; 4: 44–53

Programme

Welcome Prof. Roger Finch University of Nottingham and City Hospital, Nottingham, UK	9.00–9.10
Session I. Changing behavior	
Moderator: Prof. Roger Finch University of Nottingham and City Hospital, Nottingham, UK	
Public education: a critical perspective on behavior change models Dr Matthew Samore Dr Stephen Alder University of Utah, USA	9.10–9.30
Challenges to changing prescribing through education: What's so different about antibiotics? Dr Joshua Metlay University of Pennsylvania, Philadelphia, USA	9.30–9.50
Discussion	9:50-10.15
Coffee break	10.15–10.35

Session II. National campaigns: What's been done? Has it worked?	
Moderator: Prof. Roger Finch University of Nottingham and City Hospital, Nottingham, UK	
Case study I: USA Pat Cook Program Director, Centers for Disease Control and Prevention National Campaign for Appropriate Antibiotic Use in the Community	10.35–10.55
Discussion/clarification	
Case study II: Canada – ‘Do bugs need drugs?’ program Prof. Edith Blondel-Hill Capital Health, University of Alberta, Edmonton, Canada	10.55–11.15
Discussion/clarification	
Case study III: Europe Dr Herman Goosens University of Antwerp, Antwerp, Belgium	11.15–11.35
Discussion/clarification	
Case study IV: Australia Prof. John Turnidge The Women's and Children's Hospital, Adelaide, Australia	11.35–11.55
Discussion/clarification - Summation/group discussion	11.55–12.30
Lunch break – sandwiches for working lunch	12.30–1.15

Session III. Building a cost-effective campaign	
Moderator: Josh Metlay suggested	
Changing behavior: a commercial perspective – the Public-Private Handwashing Initiative Diana Grina - Invited Professional and Government Relations, Colgate Palmolive	1.15–2.00
Discussion	
Cost-effectiveness issues in educational campaigns Prof. Peter Davey Medicines Monitoring Unit, Ninewells Hospital and Medical School, Dundee, Scotland	2.00–2.45
Discussion	
Coffee break	2.45–3.05
Interactive session: Developing a framework for designing, implementing and testing antibiotic education programs Moderator: Peter Davey	3:05–4.45
Closing	4.45–5.00
Colloquium Dinner	7.30-10.00

IFAR Faculty

Prof. Jack Remington, Stanford University, Stanford, USA

Dr David Felimingham, GR Micro Ltd, London, UK

Prof. Waleria Hymniewicz, Sera and Vaccines Research Laboratory, Warsaw, Poland

Prof Keith Klugman, The Rollins School of Public Health, Emory University, Atlanta, USA

Dr Caio Mendes, Laboratório Fleury, São Paulo, Brazil

2nd IFAR Colloquium, 2003

Resistance, regulation and research Chicago, IL, Sept 2003

This meeting brought together scientists and regulatory authority representatives to discuss research and regulatory approaches that may improve the treatment of resistant infections and the minimization of resistance selection.

The following discussion paper based on this meeting has been published:

- Metlay JP, Powers JH, Dudley MN, Christiansen K, Finch RG, on behalf of The 2nd International Forum on Antibiotic Resistance Colloquium. Antimicrobial resistance, regulation, and research. Emerg Infect Dis 2006; 12: 183–90 [www.cdc.gov/eid].

Programme

Welcome Speaker: Jack S. Remington (USA)	
Session I. The scientific basis for regulatory responses to antibiotic resistance	
Moderator: Joshua P. Metlay (USA)	
Opening remarks Speaker: Joshua P. Metlay (USA)	9.00–9.10
1) Opportunities, challenges and deficiencies in research relating resistance and outcomes: Robert Bonomo (USA)	9.10–9.35
2) Improving prediction and performance by in vitro, animal, PK/PD and human studies	
A. In vitro: Alisdair McGowan (UK)	9.35–9.50
B. Animal models: David Andes (USA)	9.50–10.05
C. Clinical translation: Mike Dudley (USA)	10.05–10.20
Discussion	10.20–10.45
Coffee break	10.45–11.00
3) Current studies	
A. Hospital MRSA infections: How does resistance affect health outcomes? Ebb Lautenbach (USA)	11.00–11.15
B. Hospital MRSA infections: Are there solutions? Didier Pittet (Switzerland)	11.15–11.30
C. Community MRSA infections: Are they different? Can we apply hospital solutions? John Turnidge (Australia)	11.30–11.45
Summation/group discussion	11.45–12.30
Lunch	12.30–1.30

Session II. Resistance and regulation	
Moderator: Roger Finch (UK)	
Opening remarks Speaker: Roger Finch (UK)	1.30–1.40
1) How important is resistance in regulatory decision-making? How important should it be?	
A. Australia: Keryn Christiansen (Australia)	1.40–2.00
B. USA: John H. Powers, FDA (USA)	2.00–2.20
C. Europe/France: Benoit Schlemmer (France)	2.20–2.40
Discussion	2.40–3.00
Coffee break	3.00–3.20
2) What could the role of the regulator be in controlling resistance?	
A. A clinical perspective: John E. Edwards, Jr., IDSA (USA)	3.20–3.50
B. An industry perspective: Jean Paul Gagnon (USA)	3.50-4.20
3) Round table discussion	4.20–5.00
Conclusion	5.00-5.20
Colloquium Dinner	7.30-10.00

Invited Discussants

Herman Goossens (Belgium)
Michael W. Scheld (USA)
Richard Nieman (Aventis Pharmaceuticals, USA)
Edwin Schaart (Aventis Pharmaceuticals, USA)

IFAR Faculty

Waleria Hyrniewicz (Poland)
Katsunori Yanagihara (Japan)
Gerry Halls (UK)

3rd IFAR Colloquium, 2004

Triggering and optimising interventions to control antibiotic resistance: the role of mathematical modeling
Washington, D.C., Oct 2004

This meeting covered the following topics:

- What is the role of mathematical modeling in evaluating the selection and control of resistance?
- What effect on outcomes of resistance should trigger a change in empirical antibiotic use?
- Vaccination programmes to control resistance: how effective have they been and how can they be optimized?

A discussion paper based on this meeting is in progress.

Programme

Welcome Speaker: Keryn Christiansen (Australia)	8.50–9.00
Session I. Theoretical considerations: What can mathematical modelling tell us?	
Moderator: Josh Metlay (USA)	
Opening remarks Speaker: Josh Metlay (USA)	9.00–9.10
1) Models of the population dynamics of antibiotic treatment and the evolution of resistance Speaker: Bruce R. Levin (USA)	9.10–9.40
2) Applying spatial models to resistance transmission: case-study from Brazil Speaker: Carlos Kiffer (Brazil)	9.40–10.00
—Discussion and key points	10.00–10.40
—Coffee break—	
Session II. Empirical therapy: Is resistance affecting clinical outcomes in practice? When should resistance trigger a change in recommendations?	
Moderators: Gunnar Kahlmeter (Sweden) & Roger G. Finch (UK)	
Opening remarks Speaker: Gunnar Kahlmeter (Sweden: EUCAST/NCCLS)	11.00–11.10
1) Acute otitis media Speaker: Ron Dagan (Israel)	11.10–11.40
2) Community-acquired pneumonia Speaker: Javier Garau (Spain)	11.40–12.10
3) Pneumococcal meningitis Speaker: Michael Scheld (USA)	12.10–12.40
—Discussion and key points	12.40–1.00
—Lunch—	

Session III. Infection control and vaccination: application and optimization	
Moderator: Keryn Christiansen (Australia)	
Opening remarks Speaker: Keryn Christiansen (Australia)	1.45–1.55
1) Perspectives on Infection Control and Emerging Resistance: How do we know when something is working? Speaker: R. Wenzel (USA)	1.55–2.25
2) What compliance rates for infection control procedures ensure control of resistant organisms? A Case Study from Asia Speaker: W. Seto (Hong Kong)	2.25–2.55
—Discussion and key points	2.55–3.15
—Coffee break—	
3) Impact of resistance on carriage and invasive disease Speaker: Keith Klugman (USA)	3.25–3.45
4) Impact of vaccine on antibiotic use Speaker: Ron Dagan (Israel)	3.45–4.05
5) Impact of resistance by herd immunity in the US Speaker: Cynthia Whitney (USA)	4.05–4.25
—Discussion and key points	4.25–4.45
Conclusion	4.45–5.00
Colloquium Dinner	7.30–10.00

Invited Discussants

John Powers (FDA, USA)
 John Turnidge (Australia)
 Richard Nieman (Aventis Pharmaceuticals, USA),
 Jason O'Neil (Aventis Pharmaceuticals, USA),
 Jack Edwards (USA)

IFAR Faculty

Gerry Halls (UK)

4th Colloquium, 2005

Controlling antibiotic resistance by rapid identification of susceptible target infections and pathogen recognition

Washington, D.C, Dec 2005

The most recent Colloquium focused on the current status of rapid diagnostic approaches to common bacterial infections, and how these might impact on improving antibiotic prescribing in the hospital and community settings.

The following six topics were considered:

- Rapid detection of *Streptococcus pyogenes* pharyngitis
- Markers of acute inflammation in assessing and managing LRTI
- Targeted antibiotic management of ventilator-associated pneumonia
- Rapid identification of MRSA and patient management
- Rapid detection of *Streptococcus pneumoniae*
- Rapid identification of *Mycobacterium tuberculosis* and drug resistance.

Discussion papers based on this meeting are in progress.

Programme

Welcome: Roger Finch (UK)	08.45–09.00
Session I: Distinguishing antibiotic requiring from antibiotic non-requiring infections	
Rapid detection of <i>Streptococcus pyogenes</i> pharyngitis	
Speaker: Robert Sheeler (USA)	09.00–09.20
Discussant: Paul Little, (UK)	09.20–09.30
Discussion and key points	09.30–10.00
Markers of acute inflammation in assessing and managing LRTI	
Speaker: Beat Mueller, (Switzerland)	10.00–10.20
Discussant: Cristina Prat (Spain)	10.20–10.30
Discussion and key points	10.30–11.00
— Coffee break —	
11.00–11.30	
Targeted antibiotic management of ventilator-associated pneumonia	
Speaker: Jean-Yves Fagon (France)	11.30–11.50
Discussant: Jordi Rello (Spain)	11.50–12.00
Discussion and key points	12.00–12.30
— Lunch —	
12.30–13.15	

Session II: Improving prescribing precision through rapid identification of specific target organisms	
Rapid identification of MRSA and patient management	
Speaker: Marc Struelens (Belgium)	13.15–13.35
Discussant: John Turnidge (Australia)	13.35–13.45
Discussion and key points	13.45–14.15
Rapid detection of <i>Streptococcus pneumoniae</i>	
Speaker: Roman Kozlov (Russia)	14.15–14.35
Discussant: Thomas File, (USA)	14.35–14.45
Discussion and key points	14.45–15.15
— Coffee break —	
	15.15–15.30
Rapid identification of <i>Mycobacterium tuberculosis</i> and drug resistance	
Speaker: Luca Richeldi (Italy)	15.30–15.50
Discussant: Vincent Jarlier (France)	15.50–16.00
Discussion and key points	16.00–16.30
Conclusion	16.30–17.00
Colloquium Dinner	19.30–22.00

Invited Discussants:

John Powers (FDA, USA),
Keith Klugman (USA)
Ron Dagan (Israel)
Robert Moellering (USA)
Antoine Clermont (Sanofi-Aventis, France)

5th Colloquium, 2006

San Francisco, CA, Sept 2006

This meeting is in the early stages of planning. The IFAR Executive Committee together with ESCMID and the ISID agreed on the following preliminary title for the 2006 Colloquium:

“Defining the burden of antibiotic-resistant infection”

The clinical, societal and economic burden of antibiotic resistance remains poorly defined and quantified. This 5th colloquium would aim to collate and assess the most current research concerning the burden of resistance in both the hospital and community settings.

Authorities likely to be invited to participate include the US National Nosocomial Infection Surveillance (NNIS), the European Antimicrobial Surveillance System (EARSS) and the European Surveillance of Antimicrobial Consumption (ESAC) programmes.

Next steps

An IFAR business meeting is scheduled for 2nd of April in conjunction with the ECCMID in Nice, France. Prior to the meeting individual topics falling under aforementioned Colloquium title and possible speakers shall be nominated with a view to have an in-depth discussion on the programme at the business meeting.

4. ESCMID/ISID affiliation and future faculty

Since its inception, the IFAR has had a strong unofficial relationship with the ESCMID (www.escmid.org) and the ISID (www.isid.org). Indeed, the IFAR Executive includes the former ESCMID President, Prof. Roger Finch, and the current ISID President, Prof. Keryn Christiansen.

In spring 2005, the Executive Committees of each societies formally agreed that the IFAR would be jointly affiliated to both. IFAR will constitute a forum, or think-tank, linking the expertise of the two societies together with other experts affiliated to neither.

ESCMID and ISID will be closely involved in the direction and execution of IFAR activities. In December 2006, representatives all three organisations proposed the following structure for the IFAR:

- **Executive Committee:** 6 persons, 2 each representing existing IFAR faculty, ESCMID, and ISID. In addition, the Executive Committee will include one non-voting representative of the sponsor company.
- **Scientific Advisory Committee:** 9 persons, 3 to be nominated each from the existing IFAR faculty, ESCMID and ISID. The process of nomination is presently underway.

In the past, IFAR Colloquia have been run solely in conjunction with the ICAAC conference. In future, consideration will be given to holding meetings at the ESCMID and ISID conferences, as appropriate.

In addition to its formal links with ESCMID and ISID, the IFAR will continue to maintain and enrich its informal links with representatives of the IDSA.

Activities supplementary to the 2006 Colloquium (including the construction of a simple website) are under consideration, subject to available funds.

5. Budget

Over the last two years, i.e. in 2004 and 2005, the IFAR operated with a total yearly budget of approximately 110,000 Euro. This budget included all organisational costs of the Colloquium, preparatory business meetings held over the year, and fees in relation to the work carried out by the IFAR Secretariat (Interel Health and Lee Baker Medical Writing). It also included costs for the publication of the Colloquium proceedings.

Budget overview:

FEES	Euro
Faculty management	27,000
<ul style="list-style-type: none"> • Liaison with Faculty members • IFAR Tri-Society initiative • Intelligence gathering • External relations 	
Colloquium management	38,000
<ul style="list-style-type: none"> • Speaker management • Programme development • Publication & external relations • Participation 	
TOTAL FEES	65,000

EXPENSES/COSTS	in euro
Travelling costs	12,000
<ul style="list-style-type: none"> • Flight and taxi costs (Colloquium participants; IFAR Secretariat to Colloquium and business meeting, traditionally at ECCMID) 	
Accommodation (Colloquium participants; IFAR Secretariat at Colloquium and business meeting)	7,500
Catering (Colloquium, Colloquium dinner, participants)	6,500
Production costs	19,000
<ul style="list-style-type: none"> • Publication • Venue • AV • IFAR material (print material, CDs, etc) 	
TOTAL COSTS	45,000
TOTAL BUDGET	110,000

Subject to a possible future change in the level of communication activities of the IFAR (e.g. press briefings, involvement in discussions on implementation of EU legislation on “prudent use of antibiotics”, website), this budget can be reviewed as deemed appropriate.

6. Conclusion

The IFAR is a international multidisciplinary group of leading experts committed to ensuring that efforts to better understand and address the problem of antibiotic resistance remain a major healthcare priority.

The IFAR is seeking a financial sponsor also committed to the field of antibacterial therapy. The veracity of the IFAR meetings and publications have relied on an understanding of editorial independence from the previous sponsor. Nevertheless, sponsorship of the IFAR will permit the sponsor a (non-voting) seat on the Executive Committee and the gratitude of leading experts within this field.