

lettura magistrale

Giovedì 10 giugno 2004, 17.00-18.00, Sala Carraresi

LM.1

HOW DO BACTERIA MINIMIZE THE BIOLOGICAL COST OF ANTIBIOTIC RESISTANCE?

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Bacteria can become resistant to antibiotics following mutations in house keeping genes or acquisition of foreign DNA. In both instances, resistance generally imposes a cost to the fitness of the bacteria. Since microorganisms are subjected to the principle of parsimony, they have developed various ways to minimize the biological cost of resistance at the individual or population (community) level. The majority of the resistance determining mutations engender some fitness cost that is likely to be diminished by the occurrence of back or compensatory mutations. Gene fusion and integrons represent alternative approaches to limit the resistance cost by lowering gene expression. Inducible expression of resistance, at the transcriptional or translational level, is a common and efficient way to minimize the burden of resistance. Combinations of mutations in resident or acquired genes also allow genetic flexibility because of the possibility of reversion. The ultimate example of energy saving in the bacterial community is provided by inducible transfer of resistance genes following selective pressure by target antibiotics. These various possibilities will be exemplified in both, Gram-positive and Gram-negative bacterial pathogens, with antibiotic classes used to treat severe human infections.

LM.2

MICROBIOLOGY IN EUROPE : INITIATIVES FROM THE EUROPEAN SOCIETY OF CLINICAL MICROBIOLOGY AND INFECTIOUS DISEASES (ESCMID)

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Infectious disease diagnosis and management constitutes an increasingly complex challenge for health care systems. At the same time, advances in information technology, automation and molecular biology provide new tools. Constraints on health expenditure are prompting initiatives to review current practice with a view of cost-effectiveness. Within Europe, a variety of specialist services and organisational models have developed for diagnostic laboratories, infectious disease clinical services and infection control and prevention programmes. This diversity creates difficulties in building international surveillance, alert and response systems, which can be addressed in part by harmonisation of methods, quality assurance and accreditation. On the other hand, rising awareness of the global threat of emerging infectious diseases, including those caused by drug resistant microorganisms, is promoting the will for international co-operation, as indicated by the EU decision to launch the European CDC next year.

Efforts are made to strengthen and harmonise the training of health professionals in this field and develop models for effective infectious disease management and prevention. As the leading European organisation in the infection and medical microbiology fields, ESCMID provides a platform for the interaction of key players in academia, health care, regulatory and

public health agencies, national and European organisations, industry and media. The Society acts as a partner in defining the health targets, developing models of best practice, promoting excellence in science and providing training opportunities. The public health challenges from infectious diseases and their implications for healthcare services were discussed during an ESCMID workshop in Leuven, Belgium in March, 2004. The workshop was attended by 70 delegates representing 28 countries, including participants and contributors from the WHO, European Commission and UEMS. Recommendations were made to strengthen the interface of the infection disciplines with public health and benchmark health care services' performance. The current core training programme developed by the respective UEMS Sections for Infectious Diseases and Medical Biopathology, Microbiology Commission, was considered adequate. To warrant free movement of specialists and similar quality of care across Europe, core training curricula should be similar in all members states. The official recognition of medical microbiology should be supported in all countries. ESCMID contributes a strong post graduate training programme (thematic courses and laboratory workshops), to approximately 300 health professionals a year. Its Study Groups develop international studies and provide technical guidelines in various fields, such as antibiotic resistance surveillance. Its annual ECCMID congress offers opportunity of scientific exchange to over 5000 microbiologists and infection specialists. ESCMID is actively contributing to harmonisation of microbiological standards such as antibiotic resistance breakpoints and detection methods through its EU-supported European Committee on Antimicrobial Susceptibility Testing (EUCAST). In the future, we consider essential to reinforce our co-operation with national specialist societies through our European Council to foster professional and scientific excellence in microbiology and infectious diseases.