

2nd World Congress and Exhibition on

Antibiotics and Antibiotic Resistance

October 13-15, 2016 Manchester, UK



Pietro Mastroeni

University of Cambridge, UK

Relationships between pathogen behavior, immunity and efficacy of antimicrobial drugs within a mammalian host

Salmonella enterica cause enteric systemic diseases (typhoid and paratyphoid fever), gastroenteritis and non-typhoidal septicemia in humans and other animals worldwide and some serovars have zoonotic potential. Salmonella infections can be difficult to treat and accurate targeting of appropriate therapeutic strategies must take into consideration the behavior of pathogens within the host. Persistence of the bacteria in the tissues and relapses can occur upon cessation of the treatment, especially in immunodeficient individuals. This is a grave medical problem especially in areas of the world where comorbidities such as malaria, HIV and malnutrition impair the immune system leading to higher incidence of both acute and recurrent bacterial infections, despite appropriate antimicrobial therapy. Better approaches to clear chronic infections are needed as these lead to disease reservoirs that are detrimental to human and veterinary medicine and can favor the selection of antimicrobial resistant populations. Despite the emergence of new multi-drug-resistant bacteria isolates and the fact that we are losing many of our front-line antimicrobials with very few new drugs currently in the pipeline, resistance to the action of antibiotics and treatment failures cannot always be ascribed to the fact that the bacteria carry antimicrobial resistance genes. In fact, difficulties in treating infection and recurrent relapses occur despite the fact that the bacteria retain sensitivity to the antimicrobial used for the treatment of the patient. This generates situations where drugs that are highly effective *in vitro* are less effective *in vivo*. The reasons for these discrepancies are difficult to explain using traditional pharmacokinetic and pharmacodynamics parameters. Privileged sites that are poorly accessible to antibiotics, dormant non-replicative status of the bacteria and lack of cooperation between immunity and antimicrobials have all been inferred to be plausible causal factors in poor therapy outcome. Research into innovative strategies that can improve targeting of the bacteria within the tissues of animals must be based on a more comprehensive understanding of the behavior of the pathogen within the host tissues. Approaches based on advanced microscopy, individually-traceable molecularly-tagged bacterial populations and mathematical modeling have allowed us to capture the many variables that affect the location, spread, division, death and persistence of microorganisms within an animal during the course of antibiotic therapy.

Biography

Pietro Mastroeni has received his Degree in Medicine and Surgery from the University of Messina, Italy. He moved to the University of Cambridge, UK where he completed his PhD before becoming a Research Fellow at Imperial College, University of London UK. He is currently a Reader in Infection and Immunity at the University of Cambridge. He has published more than 100 papers in reputed journals and serves as an Editorial Board Member.

pm274@cam.ac.uk

Notes: