

International Conference on  
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&  
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### Why do bacteria persist beyond antibiotic treatment

Bacterial diseases pose a grave threat for humankind causing approximately six million deaths per year. Treatment and resolution of bacterial infections to the point of eradication are particularly difficult, especially in individuals with immune-deficiencies, where post-antibiotic disease persistence and relapse become grave medical problems. Difficulties in treating bacterial infections are usually ascribed to the fact that pathogens carry Antimicrobial Resistance (AMR) genes. However, this is not always the case. *In vivo* response to treatment can be slow and populations of antibiotic-sensitive bacteria remain in the tissues after treatment. Our work is studying bacterial location, growth rates, spread between organs in relation to exposure to antibiotics in the tissues and heterogeneity in the bacterial population structure as key factors that determine efficacy of treatment. We have found correlations between location, bacterial growth rates *in vivo* and treatment efficacy in all organs except for MLN where bacterial loads remain largely unaffected by the administration antibiotics. The bacterial population structure of MLN is unique and different from that of the spleen and liver. Thus, MLN represent a compartmentalized site less susceptible to antibiotic treatment. We have identified host cell populations where the bacteria persist after antibiotic treatment and that act as a reservoir from which the infection can relapse. We are also using advanced methods to study the tissue distribution of antibiotics with respect of the location of the bacteria in various tissues and organs.

### Biography

Pietro Mastroeni has completed his graduation in Medicine and Surgery from the University of Messina, Italy. He pursued his PhD at University of Cambridge, UK and was a Research Fellow at Imperial College, University of London, UK. He is currently working as a Reader in Infection and Immunity at the University of Cambridge, UK. He was awarded the higher Degree of Doctor of Science (ScD) at St. Cambridge and he is also a Fellow of the Royal Society of Biology. He has published more than 120 papers in reputed journals, edited two books and he serves as an Editorial Board Member for several international journals.

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