

EP0033

ePoster Session

Interesting stories about virulence and pathogenesis

An intracellular phase at the initiation of sepsis for an extracellular pathogen - the pneumococcus

Giuseppe Ercoli¹, Marco Rinaldo Oggioni^{*2}

¹*University of Leicester, Leicester, United Kingdom*

²*University of Leicester, Department of Genetics, Leicester, United Kingdom*

Background: During transmission and pathogenesis of disease microbial populations face significant bottlenecks. We have shown that in an experimental sepsis model in mice pneumococcal bacteraemia develops from a single bacterial cell. As expected for human data, also in mice the spleen was found to be the principal player in reducing bacterial load after challenge, but data pointed also to the spleen as source for subsequent bacteraemia.

Material/methods: Confocal microscopy was used to search for the foci of infection in the spleen of mice infected with the pneumococcal strain D39 by the intravenous route.

Results: Our data show that pneumococci are initially efficiently killed by marginal zone macrophages, but that a subset of macrophages does not clear intracellular bacteria. In these macrophages pneumococci replicate actively and rapidly reaching up to hundred bacteria per cell. Already few hours after challenge infected macrophages burst and bacteria spread from this initial focus of infection to initiate progressive and fatal bacteraemia.

Conclusions: These findings have significant impact on the understanding of the pathogenesis of bacteraemia (in mice), but we hypothesise that the observed events have also significance in human infection and even more specifically when assessing the efficacy of antimicrobial treatment early during infection.