

STRONG CHILDREN'S RESEARCH CENTER

Summer 2013 Research Scholar

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ABSTRACT

Title: *The Effect of Macrophage Phenotype on Phagocytosis of Pneumocystis*

Pneumocystis (Pc) is an opportunistic fungal pathogen capable of causing life-threatening pneumonia in immuno-compromised individuals, such as those suffering from AIDS or immunosuppression due to chemotherapy or organ transplantation. Interestingly, our laboratory has identified an inbred strain of mouse, known as FVB, which appears to be completely resistant to Pc, even after depletion of their CD4⁺ T-cells to mimic the deficiencies seen in immuno-compromised hosts. Previous research on Pc in mice has shown that the phagocytic activity of alveolar macrophages serves as an important mechanism for Pc-clearance from the lungs of infected individuals, and that two distinct macrophage phenotypes exist. M1 macrophages promote inflammation while M2 macrophages promote phagocytosis and are associated with enhanced Pc clearance. Preliminary studies from our group suggest that the alveolar macrophages of resistant FVB mice are more efficient in phagocytizing Pc than other strains. Here we attempt to determine the predominant alveolar macrophage phenotype present in Pc-susceptible (C.B-17) and Pc-resistant (FVB) mice strains by comparing transcription of M1 (NOS2) and M2 (ARG1 and MRC1) specific genes in order to determine if the FVB macrophage phenotype is responsible for the observed Pc resistance. RNA was isolated from alveolar macrophages lavaged from the lungs of both strains. A reverse transcription (RT)-PCR pilot study was performed with the isolated RNA and conditions were optimized. In addition, a protocol for assessing the rate of non-specific macrophage phagocytosis *in vivo* was also developed. Subsequent studies will aim to quantitatively compare macrophage phenotypes in these mice strains through qRT-PCR, as well as compare macrophage phagocytosis specifically of Pc using the conditions and protocols developed in this study.