STRONG CHILDREN'S RESEARCH CENTER

Summer 2012 Research Scholar

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ABSTRACT

Title: ***Identifying Human Homologues in Pneumocystis jiriveci to Regions of A12 Protein from Mouse Pneumocystis.***

Abstract: *Pneumocystis* is an opportunistic fungal pathogen with devastating consequences to immunocompromised hosts; especially individuals afflicted by HIV or cancer, and organ transplant recipients. *Pneumocystis* cannot be cultured *in vitro* and must be produced in an *in vivo* system. The study of Pc is further complicated by the fact that each mammalian host harbors its own unique strain of Pc. Thus, the strain that infects humans, *Pneumocystis jirovecii* (*Pj*) is different from that which infects other mammals. Previous research indicates that regions of a protein, referred to as A12, are able to confer immunity and protect against increased *Pneumocystis* infection in mice. These regions were found to be homologous in the *Pneumocystis* strains infecting both mouse and rat species. Since a high level of conservation was identified in two distinct host species, we aimed to determine if the same homology existed in the human *Pj* gene. This would set the foundation for a potential vaccine target, allowing individuals to develop the appropriate immune response and achieve resistance against future infection with the pathogen. Through the use of degenerate oligodeoxyribonucleotide primers, a PCR product from a *Pj* infected human sample was amplified, cloned, screened, and sequenced. The region selected for analysis was found to have a 43% similarity and a 33% identity at the amino acid level to the homologous region in mouse derived *Pneumocystis*. This indicates a strong level of homology in the A12 gene between the different strains of *Pneumocystis*. Further studies will utilize more stringent primer pairs with the goal of identifying regions of the A12 gene that may have greater homology, as well as elucidate the sequence of the entire human homologue in human *Pneumocystis*.