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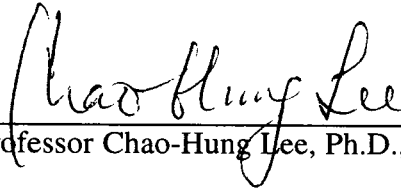
EFFECTS OF *PNEUMOCYSTIS CARINII* ON ALVEOLAR MACROPHAGE
FUNCTION DURING INFECTION

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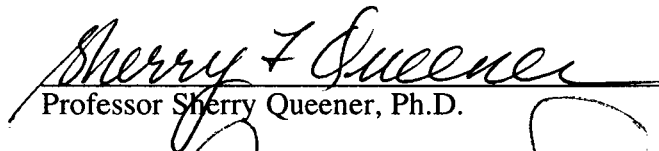


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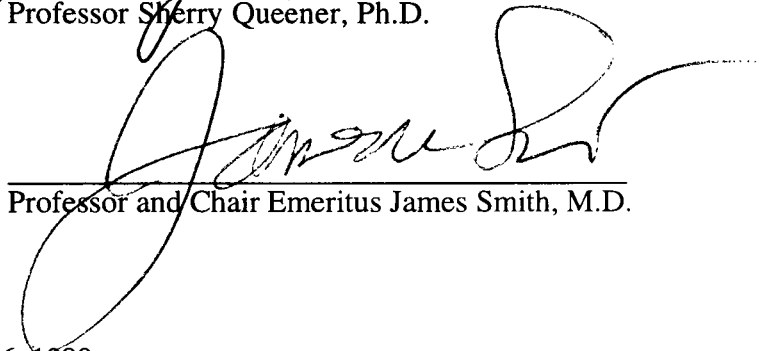
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Abstract

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Effects of *Pneumocystis carinii* on Alveolar Macrophage Function During Infection

Pneumocystis carinii (*P. carinii*) causes a severe pneumonia in immunosuppressed populations. The definitive immune defect that permits *P. carinii* survival and proliferation is not known, but defects in cellular immunity or humoral immunity render a patient susceptible. *In vitro*, macrophages exposed to *P. carinii* phagocytose the organism and kill the organism through liberation of tissue necrosis factor, but there is no evidence of a strong role for macrophages in clearance of the organism during infection. To better understand the role of the alveolar macrophage in the host response to *P. carinii*, alveolar macrophages lavaged from immunosuppressed, *P. carinii*-infected rats were assessed for their function and response. Results indicate that alveolar macrophages from *P. carinii*-infected animals are defective in both number and selected functions. *P. carinii*-infected animals exhibit a 70% decrease in the number of alveolar macrophages obtained by lavage. These alveolar macrophages are defective in receptor-mediated phagocytosis of latex beads; they have been demonstrated previously to be defective in phagocytosis of the organism itself. Adherence properties were also reduced in these cells. Interestingly, alveolar macrophages from *P. carinii*-infected animals are normal with respect to Fc-mediated phagocytosis and respiratory burst, but nitric oxide production is reduced to nearly undetectable levels. This result indicates both a decrease in the killing ability in these alveolar macrophages and a decrease in their ability to regulate the pulmonary immune response. Production of some pro-inflammatory cytokines is increased, while others are reduced, but not to a greater degree than in immunosuppressed animals. These observations indicate that inflammatory mechanisms are intact. Results, taken as a whole, indicate that alveolar macrophages in Pcp are defective in their ability to clear *P. carinii* and that the immunosuppressive actions normally controlled by alveolar macrophages are diminished.

Table of Contents

Table of Figures	ix
Table of Tables	x
Introduction	1
<i>Pneumocystis carinii</i> Definition and Issues Related to Prevalence	1
History of <i>Pneumocystis carinii</i> Research	6
Morphology and Life Cycle of <i>Pneumocystis carinii</i>	10
<i>Pneumocystis carinii</i> Cell Wall Components and Lipid Profile	17
<i>Pneumocystis carinii</i> Genome and Selected Genes	22
<i>Pneumocystis carinii</i> Biochemistry and Physiology	29
Taxonomy of <i>Pneumocystis carinii</i>	32
Transmission of <i>Pneumocystis carinii</i>	39
Culture of <i>Pneumocystis carinii</i>	44
<i>Pneumocystis carinii</i> Therapy and Issues of Drug Design	49
Pulmonary Macrophages and the Pulmonary Immune Response	56
<i>Pneumocystis carinii</i> Pathogenesis and Host Immune Response	63
Objectives	77
Study Rationale	77
Hypothesis	79

Specific Aims	79
Materials and Methods	81
Immunosuppressed Rat Model of <i>P. carinii</i> Pneumonia	81
Inoculation of Immunosuppressed Rat Model	81
Analysis of <i>Pneumocystis carinii</i> Challenge	82
Staining of <i>Pneumocystis carinii</i> Organisms	83
Isolation of Rat Alveolar Macrophages	85
Quantification of Alveolar Macrophages	87
Isolation of Rat Alveolar Polymorphonuclear Cells	88
Latex Bead Phagocytosis Assay	88
Photographic Analysis of Phagocytosed Latex Beads in	
Lavaged Alveolar Macrophages	90
Alveolar Macrophage Adherence Assay	90
Nitric Oxide Assay	91
Intracellular Superoxide Assay	93
Extracellular Reactive Oxygen Species Assay	95
ELISA Assays for Rat IL-1 β , TNF- α , and MCP-1	96
Statistics	98
Results	99
Infection Severity in Rat Model of Pcp.	99
Lavage of Alveolar Macrophages	100
Number of Alveolar Macrophages in Bronchoalveolar	
Lavage Fluid from Rats	101
Adherence of Lavaged Alveolar Macrophages	101
Phagocytosis of Carboxylated Latex Beads by Lavaged	
Alveolar Macrophages	102

Polymorphonuclear Cell Counts in Bronchoalveolar	
Lavage Fluid from Rats	103
Nitric Oxide Production by Lavaged Alveolar Macrophages	104
Production of Superoxide as Induced by Fc-receptor Mediated Phagocytosis	
by Lavaged Alveolar Macrophages	105
Release of Reactive Oxygen-Containing Species by Lavaged	
Alveolar Macrophages	107
MCP-1 Production by Lavaged Alveolar Macrophages	110
IL-1 β Production by Lavaged Alveolar Macrophages	108
TNF- α Production by Lavaged Alveolar Macrophages	110
Discussion	112
Conclusions	133
Relevance of Study to Human <i>Pneumocystis carinii</i>	
Pneumonia	136
Future Studies	139
Literature Cited	141