DIVISION OF ALLERGY AND IMMUNOLOGY
Children's Hospital Medical Center

SUMMER RESEARCH OPPORTUNITIES
FOR UNDERGRADUATE WOMEN

APPLICATION DEADLINE: MARCH 3, 2003

The Division of Allergy and Immunology is pleased to offer the following research project(s) for the summer of 2003. Interested students are urged to contact the faculty member(s) directing the project that most interest them. By contacting the faculty member, you can discover more about the project, learn what your responsibilities will be, and if possible, develop a timetable for the twelve-week research period.

RESEARCH IN ALLERGY AND IMMUNOLOGY

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The main interest of the laboratory is broadly focused on deciphering mechanisms of allergic diseases, primarily asthma. Experimentation in the asthma field has largely focused on analysis of the cellular and molecular events induced by allergen exposure in sensitized animals (primarily mice) and humans. While these studies have provided the rationale for the development of multiple therapeutic agents that interfere with specific inflammatory pathways, the development of the asthma phenotype is likely to be related to the complex interplay of a large number of additional genes, and their polymorphic variants. Our preliminary studies have focused on transcription profile analysis in asthma models. Several novel pathways were identified and are being studied further. Those include:

1. **Metabolism of arginine via the arginase pathway.** These results identify a new pathway, not previously associated with asthma, involving transport of L-arginine via CAT2 and metabolism of L-arginine via arginase. Given the role of arginase in regulating nitric oxide production, collagen deposition, and cell differentiation/proliferation, these results provide the basis for pharmacologically targeting the arginase pathway in allergic lung disorders.

2. **Lysophospholipid receptors in asthma.** In an effort to provide unbiased insight into disease pathogenesis, we took an empirical approach involving transcript expression profiling of lung tissue from mice with experimental asthma. Notably, there was strong induction of the mRNA for the G-protein coupled receptor T cell death-associated gene (TDAG)8. Preliminary studies have shown that TDAG8 is a receptor for psychosine (galactosylsphingosine), a lipid that accumulates in biological fluids in disease states. Importantly, TDAG8 was initially described as a receptor that is upreguated with activation of T cells. Our long-term goal is to determine the relevance of TDAG8 and psychosine in allergic inflammation.