



Medical Education and Research Grant Outcome Report

Name: Novel Exploratory Approaches to Elucidating the Role of GRAIL in CD25+ T Regulatory Cell Biological Function

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Department: Pediatrics – Allergy/Immunology/Rheumatology

Program: New Investigator Program

Grant Duration: 03-01-06 to 02-29-08 (24 months)

Expenditures: \$91,560 (100% expended)

Use of Funds (Taxonomy): Basic research

Research Keywords: T cell, anergy/tolerance, CD25 T regulatory cell, immune regulation, suppression

► **Description:** This research into cellular immunology focuses on T regulatory (Treg) cells. The study of Treg cells potentially impacts not only basic but also translational research; these cells have been found to modulate the immune response. The study focused on the role of a gene, called GRAIL, in mouse and human T cells – in particular an important subset of CD4+ T cells, termed CD25+ Treg cells. The investigator's previous published work has found that GRAIL is upregulated in Treg cells, and expressing GRAIL by itself in a conventional T cell is sufficient for functional conversion to a Treg cell.

► **Results:** The studies found that GRAIL appears to be tightly regulated based on the types of activation the Treg cell receives. Additionally, work in mouse models further explored the contexts in which Treg cells may be developed outside of normal T cell developmental programs (i.e., the thymus). The investigators identified several model systems in which the origins of Treg cells and their biological function varied depending on the immune stimulus and context.

It is expected that these important findings will allow the investigators to better understand how Treg cells are promoted or silenced, and to correlate this with GRAIL expression. Further insights into how Treg cells function will lead to future direct implications to improved health.

Importantly, the expectation is that these findings will have implications for numerous disease states; translational research studies have been initiated.

► **Met Objectives:** Project completed

► **Timeline for Application of Results:** Unknown

► **New Partnerships or Collaborations:** None noted

► **Matched Dollars (cash or in-kind):** \$8,541

► **Dissemination:**

- Published articles: *Journal of Allergy and Clinical Immunology*; *Clinical and Experimental Immunology*
- Article submitted for publication
- Oral presentations (national): American Academy of Allergy, Asthma & Immunology; and the Federation of Clinical Immunology Societies
- Investigator collaborations within the Division of Allergy/Immunology

► **Additional Funding:** Received funding of \$300,000 from the American Academy of Asthma, Allergy, and Immunology (AAAAI) Research Trust Junior Faculty Development Award.