

The Identification of an Immuno-genic Tumor-Associated Antigen: The First Step in the Development of an Effective Tumor Vaccine

*Primary Investigator: Rita Trammell, Ph.D.
Funding Agency:
Memorial Medical Center Foundation*

No effective treatment exists for the aggressive tumors of metastatic prostate cancer and sarcoma, but the development of antitumor vaccines, which would harness a patient's own immune system to fight these diseases, is a promising approach.

Dr. Trammell's project is taking a first step in that effort by identifying tumor-rejection antigens in sarcoma and prostate cancer patients.

Generally, vaccines work by encouraging the body's immune system to react to an antigen as if it were a genuine disease threat. Antigens are molecules that appear on the surface of cells, and the immune system can recognize differences between antigens, making cancer cells more visible to the immune system.

Identifying these antigens would allow Dr. Trammell to develop vaccines capable of inducing a potent, long-lasting immune response that would specifically kill tumor cells.



Tumor Metastasis Suppressor Gene on Human Chromosome 7 in Prostate Cancer

*Primary Investigator:
Kounosuke Watabe, Ph.D.
Funding Agency:
William E. McElroy Foundation*

Dr. Watabe hypothesizes that human chromosome 7 encodes a tumor metastasis suppressor gene that is capable of keeping prostate cancer from spreading, or metastasizing. While this gene may not stop new tumors from forming, the lack of

function of this gene may stimulate the progression of the metastatic disease in prostate cancer patients.

Dr. Watabe hopes to isolate this gene and characterize the suppressor activity both *in vitro* (in an artificial environment) and *in vivo* (in the body). His long-term goal is to explain the functional roles of this gene during the progression of prostate cancer and to develop a diagnostic tool to accurately predict the clinical outcomes of patients.



Quantitative Ultrastructural Correlates of Cisplatin Damage to the Stria Vascularis and D-Methionine Otoprotection

*Primary Investigator:
Kathleen Campbell, Ph.D.
Funding Agency:
Central Research Committee*

Cisplatin chemotherapy is increasingly used to treat a variety of cancers. Unfortunately, one of its major side effects can be permanent hearing loss.

Dr. Campbell is studying cisplatin's impact on the stria vascularis, which is the metabolic power supply for the inner ear. Her research group has documented that cisplatin causes major damage in the stria vascularis, and that damage could be prevented by administering D-methionine, a naturally occurring amino acid present in many foods, prior to the cisplatin chemotherapy drug.

In addition, D-methionine not only can protect against hearing loss but many of the other chemotherapy side effects including gastrointestinal toxicity, weight loss, kidney damage and neural damage.

In conjunction with SIU School of Medicine. Dr. Campbell was the first to establish that D-methionine can be given prior to the administration of

cisplatin and protect hearing. She has patented D-methionine's protection against cisplatin's toxic effects on the ear and hearing. She is now working toward clinical trials using this protective agent.



Effects of Dietary Soy Isoflavones on Rejection of Organ Transplants

*Primary Investigator:
Timothy P. O'Connor, M.D.
Funding Agency: Illinois Council on Food and Agricultural Research*

Organ transplants are hampered by the risk of rejection, requiring expensive medications with potentially serious side effects. Dr. O'Connor has found that genistein, an isoflavone found in soybeans, can lower an animal's ability to reject a transplanted organ.

This project is examining whether a diet rich in soy and soy isoflavones can delay organ rejection in an animal transplant model. If the initial research is successful, Dr. O'Connor will then investigate which components and properties of soy cause this effect. Ultimately, this may determine whether a soy-rich diet could improve outcomes for persons with transplants.

For more information about these projects, contact the Office of Research and Faculty Affairs at 217-782-7936.

The following research projects previously highlighted in Aspects are funded by the Memorial Medical Center Foundation:

Regina Kovach, M.D.: Screening and Assessing for Family Violence in Emergency Rooms (SAFER);

Stephen M. Milner, M.D.: The Regulation of Beta Defensin in Cultured Human Keratinocyte