## LAY ABSTRACT

This proposal describes a pilot study that is designed to produce compelling preliminary data of the distinct anti-inflammatory properties of the two major omega-3 polyunsaturated fatty acids found in fish oil supplements, eicosapentaenoic acid (EPA, 20:5, omega-3) and docosahexaenoic acid (DHA, 22:6, oemga-3). Recent investigations suggest that EPA and DHA have independent benefits that may result in greater benefit of one or the other, depending on the underlying inflammatory condition being treated. Lipid mediators, such as the leukotrienes, contribute to chronic inflammation as seen in some asthmatic patients. EPA itself can prevent the synthesis of leukotrienes. In addition certain metabolic products of EPA and DHA can reduce airway inflammation and constriction. It is known that EPA and DHA exerts some of their beneficial effects distinct from each other, but the exact underlying mechanisms are not fully understood. We are planning to use the mouse model of asthma and compare the effects of feeding EPA versus DHA enriched diets. In addition we are investigating the effects of EPA and DHA on inflammatory cells (mostly eosinophils and monocytes) isolated from the inflamed lungs of mice, as well as on human eosinophils and monocytes. These cells are the major sources of leukotriene production in the lung. Cells will be pre-treated with DHA, EPA, or both fatty acids and stimulated to elicit leukotriene or cytokine/ chemokine production. Results from these experiments can open the door for future interventions studies on the effects of EPA and DHA in asthmatic patients.