Our work focuses on lipid and lipoprotein metabolism in cells, in animals and in patients. We study mechanisms of intracellular lipid metabolism and trafficking, pathogenesis of atherosclerosis in animal models and lipid metabolism in patients. We also pursue development of new therapeutics in vitro, in vivo and in clinic.

Research Brief

Our mechanistic in vitro studies aim at understanding how cholesterol moves into the cells, out of the cells and around the cell. To do this, we investigate trafficking mechanisms and activities of two proteins that play a key role in cholesterol trafficking, ABCA1 and ABCA12, as well as the role of lipid rafts in regulating lipid metabolism. A related direction of our work is the role of infections in impairing cellular lipid metabolism; we investigate HIV, CMV and prion infections. Another direction of our work is discovering mechanisms of various atheroprotective functions of high density lipoproteins (HDL).

Our in vivo studies use animal models of atherosclerosis to investigate pathogenesis of this disease, involvement of infection in atherogenesis and to test therapeutic approaches, such as apoA-I mimetic peptides or new anti-inflammatory compounds.

Our clinical studies focus on lipid metabolism in patients with diabetes, coronary heart disease, AIDS and after dietary intervention or treatment with various therapies. We focus on metabolism of HDL, on conditions that affect this lipoprotein and on therapies that target it.

Methodologies

- Cell biology
- Cell imaging: various methods of confocal microscopy
- Biochemistry: clinical assays, analysis of protein expression & abundance
- Transfections, gene silencing
- Small animal models of atherosclerosis

Selected Publications

HIV Infection Reduces Cell-Surface ABCA1


Molecular Structure of a New ApoA-1 Mimetic Peptide

Hypothetical Scheme of Reverse Cholesterol Transport Pathway in Humans