



Touro University-California

College of Osteopathic Medicine

Research

RESEARCH AREAS

De novo lipogenesis

HDL metabolism

Potassium channels

Glycation/diabetes

Oxidative stress

CV-biomarkers

HIV fusion inhibitors

OMM fibromyalgia

Diabetes: diagnosis

Renal failure

TECHNIQUES

GC/MS, HPLC

Electrophysiology, patch clamp

Molecular biology

Biochemistry

Transgenic mice

NMR spectroscopy

Cell culture, immunohistochem.

Dr M. Gochin, PhD. Basic Science Department

Methods development in analytical chemistry at the interface between chemistry and biology.

We are quantifying biomolecular interactions using fluorescence and NMR, and exploring electrochemical quartz crystal microbalance technology in biosensor design. We are developing high throughput screening assays. Principal targets of our main screening assay are the fusion proteins of Class 1 viruses. These include coronavirus (SARS), filovirus (Ebola: Marburg), orthomyxoviruses (Influenza A), paramyxoviruses (RSV, Mumps, Measles, Sendai Virus) and retroviruses (HIV, HTLV). Small molecules identified through this assay can be developed into fusion (entry) inhibitors of these viruses. We are also interested in medicinal chemistry for the development of hits discovered through our screening program, using novel NMR methodology for structure-based drug design. We have some collaborations established towards this goal.

Funding: Start up funds Touro, NIH R21

Dr A. Gugliucci, MD, PhD. Basic Science Department

Glycation and oxidation in diabetes, renal failure and other chronic diseases

Our main research interests are diabetes mellitus and lipoprotein metabolism with an emphasis on stochastic modifications of proteins such as glycation, carbonyl stress and nitration. In particular we focus on HDL metabolism, the axis coagulation/fibrinolysis and the evaluation of biomarkers. Our research covers several angles of these subjects, ranging from cell biology to clinical studies and comprising research in cell culture systems, animal models and human subjects. We also explore the activity of natural antioxidants as protectors of the above-mentioned reactions and their potential use in CAM. In particular, we have pioneered studies on polyamines and Ilex paraguariensis "mate" tea.

Funding: JDRF and Touro intramurals
Collaborations: U. Illinois, U. Showa (Japan), U Sao Paulo (Brazil)

Dr P. Baginsky, MD Primary Care Department

Screening for Diabetes and Prediabetes in an Underserved Latino Population

We are testing several different simple alternatives to standard laboratory methods for screening for diabetes and prediabetes. These include fingerstick glucose testing after a standard meal. Several of these methods show great promise as a means of screening this high-risk population within the community, without requiring access to a laboratory.

Funding: LifeScan

Dr C. Marske, DO, Primary Care Department

Fibromyalgia treatment trial with neurontin and OMM

This pilot study was designed to prove or disprove that medication and/or OMM can improve the symptoms of fibromyalgia.

Funding: Touro intramural grant

Dr M. Clearfield, Dean

Lipoproteins and cardiovascular risk factors

Ethnic Differences In Traditional And Emerging Risk Factors For Individuals Developing Diabetes/Metabolic Syndrome And Coronary Heart Disease

DREAMS study

Our work explores the relationship of small, dense LDL (LMW LDL) with metabolic diseases like diabetes and metabolic syndrome. The relationship of Ca scores and LMW LDL demonstrated an association of the LDL phenotype with CHD. These studies are consistent with a reduced LDL particle diameter being a significant predictor of CHD.

Dr T. Elul, PhD, Basic Science Department

Growth Cone Motility In The Developing Visual System

We study the cellular, biomechanical and molecular mechanisms that underlie formation of neuronal circuits. Currently, we focus on the development of the visual circuit in tadpoles of the frog *Xenopus laevis*. We aim to understand how the optic axonal arbor projection is shaped in living brains of tadpoles. In this project, we describe the growth cone motility of optic axons *in situ* at high resolution, and then examine how biomechanical and molecular perturbations alter growth cone motility parameters. Specifically, we examine the role of catenin regulators of the cadherin cell-cell adhesion pathway in motility and associated biomechanical parameters of growing axons.

Funding: Touro intramural grant

Dr G. Klapstein, PhD. Basic Science Department

Electrophysiological changes in transgenic mice models of Alzheimer's and Huntington's diseases.

This laboratory focuses on single neuron recording and the role of MCT transporters on mice models of Alzheimer's and Huntington's diseases.

Dr JM Schwarz, PhD, Basic Science Department

Non alcoholic fatty liver disease, metabolic syndrome and de novo lipogenesis.

Metabolic disorders of carbohydrate (CHO) and fat metabolism have been studied independently, and the importance of their mutual interaction has been overlooked. Our research effort is center on whole body and hepatic fuel homeostasis with special attention to the inter-relationship between carbohydrate and fat metabolism. We use stable isotope tracer methodologies and gas chromatography mass spectrometry (GC/MS) to measure the dynamics of hepatic metabolism. Our research program aims at gaining a better understanding of the complex metabolic defect of insulin resistance, with special focus on the dynamics of the link between hepatic carbohydrate and lipid metabolic pathways, using non-invasive techniques *in vivo*.

Funding NIH R01

Dr E Hermel, PhD, Basic Science Department

Human caspase 12 is a solo player in the anti-inflammatory response.

The protein caspase 12 (casp12) has a downregulatory effect upon IL-1 activation and subsequent inflammatory immune reactions. To determine whether casp12 interacted directly with components of the inflammasome, (which is the master regulator of caspase-1 activation and IL1 production), we co-expressed recombinant human casp12 along with inflammasome components. Co-immunoprecipitation experiments using casp12 revealed that it did not interact with inflammasome components ASC, Cardinal, or Caspase 5. Casp12 may thus exert its downregulatory effects by direct interaction with caspase-1 and/or IL1.6

Funding: Touro intramural grant

Dr A. Miller, PhD, Basic Science Department

Biology of the HERG potassium channel.

This laboratory uses state-of-the-art patch clamping techniques and electrophysiology to study the activity and the actions of drugs and ions on a key potassium channel, implicated in arrhythmias such as torsade de pointes.

Funding: NIH R15

Dr N. Garcia-Russel, PhD. Basic Science Department

Bacterial chromosomal biology: Salmonella

We investigate environmental factors that can trigger phage escape from the Salmonella genome. We quantified phage escape using quantitative Real-Time PCR

Funding: Touro start-up