

Research Activities of Farzaneh Daghigh, Ph.D.

Involved in three independent research projects:

1) Study of nitric oxide effects on inflammation: Several key enzymes in arginine metabolism are expressed as multiple isoenzymes whose expression can change rapidly and drastically in response to a variety of different stimuli in health and disease. Determination of the physiological and pathophysiological relevance of arginase isoforms and ornithine decarboxylase in regulation of nitric oxide by human gingival fibroblasts (HGF) following cytokine stimulation may have important implications for periodontitis and other inflammatory conditions such as rheumatoid arthritis. We investigate the role of some of the arginine dependent enzymes in HGF. Dr. David E. Ash, Professor and Chair in the Department of Chemistry of Central Michigan University, is a collaborator on this project which is supported by a grant from the CCDA (August 2008, from Center for Chronic Disorders of Aging).

2) Determination of the relevant changes in nitric oxide concentrations after osteopathic manipulative treatments (OMT), the accelerated passive exercise (AT101 table), or a combination therapy in normal healthy subjects and patient volunteers. Shear stress regulates endothelial structure-function through expression of mechanosensitive genes and production of vasoactive factors such as nitric oxide (NO). Normally, vascular endothelial cells are directly exposed to the shear stress generated by blood flow. This stimulates NO production from endothelial nitric oxide synthase (eNOS). Conversely, micromolar levels of iNOS-derived NO are associated with conditions such as diabetic atheroscleropathy and inflammatory conditions. A "passive exercise" induced by 15-45 minutes of "Periodic Acceleration" (resembling pedal pump OMT) will create a non-invasive, external mechanical means of inducing additional intravascular shear forces to supplement circulation and measurably enhance NO production from eNOS. Dr. Daghigh has been working with Dr. Michael Kuchera as a co-investigator since the launch of this project in 2003-2004. The support and funds for this and related projects have come from several foundations: Karen & Herbert Lotman Foundation (2003-2004), Philadelphia Health Care Trust (2006-2007), and an AOA Grant #07-10-557 (2007-2008).

3) A three year longitudinal educational assessment of medical nutrition in the PCOM's integrated curriculum in the first and second years of medical education. This study has been performed in collaboration with Dr. David Vettori (PCOM Class of 2007) and Dr. Jeffrey E. Harris, Department of Health, West Chester University.