

crisprpd 1.0



Abstract

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PI Title: ASSISTANT PROFESSOR

Project Title: DIETARY ENHANCEMENT OF NO SYNTHESIS IN ARTERIAL DISEASE

Abstract: *Peripheral arterial disease (PAD) affects 3 million Americans and is due to atherosclerosis of the aorta, iliac, and popliteal arteries. PAD causes lower extremity pain that results in limitations in walking ability and exercise performance. Atherosclerosis affects the endothelium of arteries and decreases the synthesis of nitric oxide (NO). Endothelium-derived NO causes vasodilation and increased blood flow. Clinical trials have shown that administration of the NO precursor, L-arginine, improves limb blood flow. However, the long-term efficacy of L-arginine on vascular biology, peripheral hemodynamics, exercise performance, walking ability, and limb pain in patients with PAD have not been demonstrated. The purpose of the training portion of this application are: 1) to build a solid theoretical foundation in vascular biology (i.e. molecular cell biology; molecular basis of atherosclerosis, membrane cell biology) by attending classes, journal clubs, and weekly research lab meetings; 2) develop skills in measurement of vascular hemodynamics and structure (i.e. duplex ultrasonography, plethysmography, chemiluminescent measurement of NO, magnetic resonance imaging and angiography) and; 3) develop knowledge and skills in nutritional assessment (i.e. seminars and classes in regulation of metabolism and measurements such as the 3 day recall and food frequency questionnaire). The specific aims of the research portion are: to examine the effectiveness of 6 months of L-arginine compared to placebo on limb hemodynamics; NO biosynthesis and endothelial function; angiogenesis and remodeling of conduit vessels; exercise performance and walking; and limb pain in PAD patients. The design is a double-blind randomized, placebo-controlled, experimental study of 45 patients with PAD. Measurements include venous plethysmography, chemiluminescent measurement of NO,*

magnetic resonance imaging and angiography, exercise treadmill, the Regensteiner questionnaire on walking ability, and the Visual Analog Scale for symptom intensity. Statistical analyses will include: repeated measures analyses of covariance.

Thesaurus Terms:

arginine, atherosclerosis, diet therapy, human therapy evaluation, nitric oxide, peripheral blood vessel disorder

angiogenesis, body movement, clinical trial, hemodynamics, limb, vascular endothelium angiography, clinical research, human subject, magnetic resonance imaging, plethysmography

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