

Winter 2006 SEMINAR SERIES

F21C Bioprocessing & Biosensing Center

• DIVISION OF FOOD SYSTEMS & BIOENGINEERING •

PRESENTER: **Guillermo Aguilar Ph.D., Assistant Professor**

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TITLE: **Aggressive cooling (cryogen) and aggressive heating (laser) toward the improvement of vascular dermatologic conditions.**

ABSTRACT:

The combination of cryogen spray cooling (CSC) and laser irradiation have proven to be a viable solution to treat various dermatologic vascular lesions, such as port wine stain birthmarks (PWS), hemangiomas, and ectasias, among others. Patients with these lesions are treated with laser pulses that induce permanent thermal damage to the target blood vessels. However, absorption of laser energy by melanin causes unintended epidermal heating, which may result in complications such as hypertrophic scarring and dyspigmentation. By applying cryogen spurts to the skin surface for a short period of time (10-100 ms), the epidermis can be precooled prior to the application of the laser pulse, avoiding or eliminating undesirable skin lesions.

My work in this area focuses on the fundamental understanding of the thermal processes involved within the tissue during combined CSC and laser irradiation. I will present results of ongoing studies which are aimed at improving the current therapeutic outcome of vascular lesion patients, in general, and PWS in particular. These studies are: (1) Feasibility studies (numerical and animal) of vessel photocoagulation induced by the use of multiple cryogen spurts intermittently applied with multiple laser pulses (MCS-MLP); (2) Assessment of non-specific cryo-injury induced by prolonged exposure to CSC; and, (3) Effects of vacuum pressures on the thermodynamics of cryogen spray atomization and its influence on the optical, mechanical and thermal response of human skin.

DATE • TIME • LOCATION:

Tuesday, February 28, 4:00pm
Ag Eng Bldg 105 • Refreshments