



The Syracuse, Rochester, and Binghamton Chapters in the  
Engineering in Medicine and Biology Society Present:

## Health-Tech Symposium Spring 2009

Thursday April 23rd 2009 2:00-7:00pm

At the [Welch Allyn Lodge \(http://www.thelodge.welchallyn.com/\)](http://www.thelodge.welchallyn.com/)  
4341 State Street Rd, Skaneateles Falls, NY 13153-0220

Join us for an opportunity to meet and interact with colleagues in the Medical Engineering field

Participate in a Plant tour of Welch Allyn's Automated Blood Pressure Cuff Manufacturing Operations

Listen to Innovative Presentations Given by Two of Central NY's Leading Researchers

View Poster Presentations on Bioengineering Research by Students from our Area Institutions

Enjoy an Informal Reception with Food, Beverages, & Jazz Music by Rochester Natives Tootinkamen

### Our Speakers Include:

**Carolyn Pierce, R.N., DSN**, is presently an assistant professor in the Decker School of Nursing and holds an appointment in the graduate program in bioengineering at Binghamton University. Her interdisciplinary research aims to synthesize the nursing focus on health with the bioengineering focus on complex systems. In concert with bioengineers, she performs research using plantar stimulation to augment function of the second heart in such altered health conditions as osteoporosis, heart failure, and mild cognitive impairment.

### Presentation Abstract:

Our research in the Clinical Science and Engineering Research Center (CSERC) at Binghamton University focuses on using plantar vibration to activate the CMP to improve lower extremity circulation in several disease states including: osteoporosis, heart failure, intradialytic hypotension, and cognitive impairment. While the primary pumping function of the heart is well documented, little attention has been given to the second heart, or the calf muscle pump (CMP), as an integral mechanism involved in maintaining homeostasis. Our research has shown that the CMP can be easily activated in those persons who have failure of the CMP with exogenously applied vibration to the plantar surface of the feet using a mechanical vibration plate which activates reflex arcs to contract the soleus muscle. Activation of the CMP allows for the return of fluid from the lower extremities to both maintain circulating blood volume and thus blood pressure. In addition the CMP serves to prevent fluid extravasation into the tissues of the lower extremities ultimately preventing tissue perfusion.



**Jim McGrath** is an Associate Professor in Biomedical Engineering at the University of Rochester. He has published numerous articles describing cell migration exhibited by endothelial cells as well as the ameboid-like migration of leukocytes. His work has also focused upon nanoparticle interactions with proteins and cellular systems. He jointly leads the **Nanomembrane Research Group** (NRG) with Philippe Fauchet where they are developing novel ultrathin silicon nanomembranes for biological applications.

**Presentation Abstract:**

Jim McGrath's presentation will focus on his work with the NRG and the revolutionary silicon-based membrane material discovered at the University of Rochester. The porous membrane is so thin it is invisible edge-on, and may revolutionize the way doctors and scientists manipulate objects as small as a molecule. Despite being only 50 atoms thick, the silicon filter can withstand surprisingly high pressures and may be a key to better separation of blood proteins for dialysis patients, speeding ion exchange in fuel cells, creating a new environment for growing neurological stem cells, and purifying air and water in hospitals and clean-rooms at the nanoscopic level.

Symposium Agenda:

2:00 First Welch-Allyn Tour Starts	4:25 Break (10 Minutes)
2:15 Second Tour Starts	4:35 Rochester Chapter & 2 <sup>nd</sup> Speaker Introductions
2:30 Third Tour Starts	4:40 2 <sup>nd</sup> Presentation (40 minutes)
3:30 Introductions & Welcome – EMB Syracuse	5:20 Q&A
3:35 Binghamton Chapter & 1 <sup>st</sup> Speaker Introductions	5:25 Conclusions & Thank You
3:40 1 <sup>st</sup> Presentation (40 Minutes)	5:30 Buffet & Networking
4:20 Q&A Session	7:00 Doors Closed

(<http://www.ewh.ieee.org/r1/syracuse/EMBSWeb/SyracuseEMBS.htm>)

**Please RSVP by sending an e-mail to [EMBS Webmaster \(syrembswebmaster@ieee.org\)](mailto:syrembswebmaster@ieee.org)**

Cost: \$20 for professionals, \$10 for IEEE Members, Free for students & EMBS Members. Payment received at the door

