



American Institute of Chemical Engineers

-2012 Student Night-



Each year, the AIChE-Pittsburgh Section hosts a Student Night that includes the four regional graduate and undergraduate Chemical Engineering programs: Carnegie Mellon University, University of Pittsburgh, West Virginia University and Youngstown State University. The Regional University Student Night provides an excellent opportunity to socialize, network and discuss your research and work interests with colleagues and area professionals in your discipline. This is the one networking opportunity that you won't want to miss!

When: Wednesday, February 15th, 5:45 pm

Where: William-Pitt Student Union, University of Pittsburgh,
Ballroom

Speaker: Dr. Yang Liu, University of Pittsburgh

Topic: Quantification of Nano-Structural Properties of a Cell's
Nucleus for Early Cancer Detection

Agenda: 5:45-6:30 Registration
5:45-6:30 Poster Session
6:30-Dinner, Dr. Yang Liu's Presentation, Professional
Promise Award Ceremony

Menu: London Broil, Broiled Salmon or Vegetarian (Napoleon),
Salad, Vegetable, Desert

Price: \$30 per person (Students \$20, free with poster)

Graduate and undergraduate students are invited to display posters that summarize their research. This is encouraged to promote networking and to introduce their topical research to the various attendees. Chemical Engineering discipline technical research areas such as: materials, carbon capture, nanotechnology, CO₂ sequestration, catalysis, energy, fuels, biotechnology, sustainability, coatings and public policy are welcome.

- Please RSVP by February 7th to Gary Hall, Vice-Chair, Phone: 412-963-0303, E-mail: gary.hall@sauereisen.com. Your RSVP must include: Name, University, E-mail, and Entrée selection.
- If you choose to display a poster, please identify the title of your poster in your RSVP. We will contact you for special backing or mounting instructions.
- CANCELLATIONS: If you must cancel your reservation, please do so on or before February 7th; otherwise, we are required to bill.

The 2012 Professional Promise Awards are presented to selected students at the conclusion of the AIChE Regional University Student Night program.

Quantification of Nano-Structural Properties of a Cell's Nucleus for Early Cancer Detection

Conventional pathology presently remains the gold-standard for cancer diagnosis. However, due to the limited resolution of optical microscopy, which detects structural alterations only at the micron-scale and not the nano-scale, diagnoses may be missed when the sample is exceptionally small, or is taken in the early course of the tumor development, or is not taken directly from the tumor. There is an urgent need for more effective tools to identify patients at the highest risk of malignant cancer. Recognizing that nano-structures associated with molecular events during tumorigenesis may provide potentially diagnostic features, our group has developed a suite of optical microscopy techniques that uses the light interference effect and spatial-frequency encoding to quantify the structural changes within the cell nucleus with a nano-scale sensitivity. We demonstrated the feasibility of nano-structural characteristics from the cell nucleus to detect cancer in cells initially labeled as “negative” or “indeterminate” by expert pathologists that were subsequently confirmed to be cancerous using our technique. These nano-structural properties show great promise as a highly sensitive optical biomarker for cancer detection.

Yang Liu, Ph.D.

**Assistant Professor of Medicine, Department of Bioengineering
University of Pittsburgh**

Dr. Yang Liu is currently an Assistant Professor of Medicine with the Department of Bioengineering at University of Pittsburgh. She received a Ph.D. in Biomedical Engineering from Northwestern University in 2006 and worked at Johnson & Johnson for two years. Dr. Liu's research focuses on the development and clinical translation of novel optical microscopy techniques and optical spectroscopy to improve the early cancer detection and risk assessment. Her group recently developed quantitative phase microscopy and spatial-frequency encoded imaging microscopy to characterize the nano-structural properties in label-free objects that shows great promise to detect cancer at a better sensitivity than conventional pathology. She has published 40 peer-reviewed journal papers and 8 issued and pending patents, and made over 50 conference presentations.

