nanoUtah 2013 - Oral Presentations

nanoUtah 2013 encourages Utah researchers, businesses, and students to present a 15-minute overview of their recent achievements, unique capabilities, or difficult challenges requiring nanotechnology solutions, with the potential of facilitating collaboration opportunities for further research, partnered development, and potential commercialization.

Logistics:
Abstract Deadline: **September 1, 2013**.
Submit on-line at: http://www.nanofab.utah.edu/submit_abstract
Conference Dates: October 18, 2013
Location: The University of Utah Campus, Sorenson Molecular Biotechnology Building (SMBB)

To enter, participants must submit an electronic copy of a MS Word file, 250-word maximum abstract at http://www.nanofab.utah.edu/submit_abstract by **September 1, 2013**. No abstracts will be accepted after this date. Please follow the instructions below and view the sample abstract:

Abstract Submission:

- Use Arial font, size 10
- Identify your preferred session for presentation:
    1. Materials & Characterization
    2. Devices & Sensors
    3. Energy, Catalysis, & Environment
    4. Medicine
- Abstract Title (Italic)
- Speaker Name (Bold)
- List additional authors from same institution
- Affiliation (Institution: Departments)
- List additional authors from other institution
- Affiliation (Institution: Departments or Location)
- Contact information, including email
- Abstract: 250 words maximum- MS word file (no figures or references)

Abstract Review Criteria:
Abstracts will be reviewed by the session chairs. The number of presentations is limited. Technical merit, opportunity for collaboration, and timely submission will be considered when selecting presenters. Presenters will be notified of selection by September 15, 2013. **All participants presenting a 15-minute talk must register for the nanoUtah 2013 Conference.**

Presenters are encouraged to also present a poster to facilitate interaction. **If your abstract is not selected for an oral presentation, your abstract will be considered for the poster session.** Posters must not exceed 48” x 48”.

SAMPLE ABSTRACT

"A Fully Integrated Nucleic Acid Identification System for Bacteria Monitoring"

Preferred Session: Devices and Sensors

Speaker: **Bruce K. Gale**

Jungkyu Kim , John Elsnab, Michael Johnson, Rahul Sonkul, Cory Shorr, Cody Gehrke
University of Utah: Departments of Bioengineering and Mechanical Engineering

Prabhu Arumugam, Hua Chen
Center for Nanobiotechnology, NASA Ames

This presentation describes a totally integrated microfluidic system for detecting nucleic acids obtained directly from real biological samples. The microfluidic system was fabricated out of molded PDMS parts and consisted of a series of valves and chambers for control and reaction. Each microvalve and pump was sequentially controlled to extract the nucleic acid and deliver the sample to the sensor chip for electrochemical (EC) detection. A microfluidic cell for EC sensing, including counter and reference electrodes, were manufactured by sputtering Pt and printed Ag/AgCl paste onto a glass slide. The multiwalled carbon nanotube (MWCNT) sensing electrodes were fabricated by patterning Ni nanodots using e-beam evaporation, followed by carbon nanotube growth using CVD. The microfluidic system, silica cartridge, microfluidic cell, and MWCNT-EC sensor were integrated into a mounting setup for validation testing using E-coli. Sample preparation, including reagent and sample volume metering, were accomplished using the microfluidic system to control the chemical reactions required for cell lysis and nucleic acid extraction. Using the integrated microfluidic EC cell, three Differential Pulse Voltammetery (DPV) scans were consecutively performed before and after hybridization. From the peak potential of each scan, guanine oxidation was measured for identifying genetic information. With this integrated system, nucleic acid was extracted within 30 minutes and detects and identifies bacteria within 2 hours using an EC sensor, compared to several days for current tests. This μTAS system could potentially be used for point-of-care, environment assessment or food analysis.

Contact Information:
Bruce Gale
bruce.gale@utah.edu