

COMS/nanoUtah 2014 - Oral Presentations

This year, the Commercialization of Micro-nano Systems Conference (COMS) and nanoUtah Conference will partner for a four-day conference in downtown Salt Lake City. We encourage researchers, businesses, and students to present in one of the three themes and subthemes <http://coms2014.com/call-for-papers/>.

Logistics:

- Abstract Deadline: **July 1, 2014**
- **Submit on-line at:** <http://coms2014.com/call-for-papers/>
- Conference Date: October 12-15, 2014
- Location: The Grand America Hotel, 555 S. Main Street, Salt Lake City, UT 84111

To enter, participants must submit a 400-word maximum abstract at <http://coms2014.com/call-for-papers/> by **July 1, 2014**. No abstracts will be accepted after this date. Please follow the instructions below and view the sample abstract:

Abstract Submission:

- Speaker Name
- Email Address
- Message
- Company/Institution
- Phone Number
- Abstract Title
- List additional authors
- Identify your preferred session for presentation:
 1. Energy and Emerging Technologies
 2. Emerging Technologies in Biomedical Healthcare
 3. Technology Transfer
- Abstract: 400 words maximum

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, 2014 **All participants presenting must register for the COMS/nanoUtah 2014 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
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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 Voltammetry (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 μ TAS system could potentially be used for point-of-care, environment assessment or food analysis.

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