



Association for Laboratory Automation

For Immediate Dissemination

February 11, 2009

Contact Information

Lauren Hammer
Telephone: +1.630.305.0003
lhammer@labautomation.org

Where are they now?

ALA Innovation Award Winners Continue Trajectory of Success

CHICAGO – The Association for Laboratory Automation (ALA), a multi-disciplinary, non-profit scientific association spanning diverse industries and technology sectors, launched its prestigious *ALA Innovation Award* in 2005. This annual award recognizes a LabAutomation conference speaker whose podium presentation is considered exceedingly innovative; contributes to the exploration of technologies in the laboratory; and comprises independence of thought, clarity of vision, extraordinary technical originality, and seminal integration and automation strategies. The award includes a \$10,000 cash prize.

To commemorate the fifth year of the *ALA Innovation Award* program, the final technical session presented at LabAutomation2009, January 24-28, in Palm Springs, CA, showcased the original achievements and subsequent progress of past award winners.

From LabAutomation2005, Dana Spence, Ph.D., of Michigan State University in East Lansing, MI, presented "Monitoring Abnormal Metabolism in Red Blood Cells and its Physiological Consequences: Four Years Later with a Focus on Diabetes." Dr. Spence described expanded applications of his microfluidics-based platform that interrogates abnormal metabolism in red blood cells. Since winning the award in 2005, when his group was focused on understanding how red blood cells release ATP when they are physically deformed, Dr. Spence and his team have continued development of the platform and used the underlying technology to understand the relationship between ATP release and platelet adherence to endothelial cells. In addition, they have been able to monitor intercellular communication by detecting nitric oxide production in endothelial cells after stimulated release of ATP from red blood cells. Dr. Spence detailed how they are using the technology to determine the role that the red blood cell plays in serious medical conditions such as multiple sclerosis, cystic fibrosis, and stroke.

From LabAutomation2006, Steven Hofstadler, Ph.D., of Ibis Biosciences in Carlsbad, CA, presented "The Ibis T5000 Universal Biosensor." Dr. Hofstadler started with a brief overview of Ibis and described how the organization, recently acquired by Abbott Molecular, funded development of its Ibis biosensor platform with grants and contracts from numerous government entities, including the U.S. Department of Defense, National Institutes of Health, Department of Homeland Security, Center for Disease Control, Federal Bureau of Investigation (FBI), and others. Since winning the *ALA Innovation Award*, Ibis moved its polymerase chain reaction (PCR)-mass spectrometry-based platform forward in a number of arenas, including clinical diagnostics, human forensics, and bioweapons surveillance. Dr. Hofstadler shared two examples of how the technology is being utilized on two very different fronts. Combining PCR primers that target broadly conserved regions of the influenza genome with mass spectrometric interrogation of amplicons, Dr. Hofstadler illustrated how the same assay panel could be used to interrogate human clinical specimens and a diverse collection of avian influenza isolates derived from birds. In a different example, it was shown that using primers that target the hypervariable region of human mitochondrial DNA, the same instrument (the Ibis T5000) is being used as a platform to forensically differentiate humans. This approach is presently being validated by the FBI forensics unit in Quantico, VA. Since 2006, many Ibis T5000 instruments have been installed in research labs around the country; the next generation Ibis platform is to be marketed worldwide by Abbott starting in 2009.

- more -

Innovation Award Winners Continue Success

Page 2

From LabAutomation2007, Andre Marziali, Ph.D., of Boreal Genomics and the University of British Columbia in Vancouver, Canada, presented "SCODA: A New Method for Biomolecule Concentration." Dr. Marziali described recent advances in his group's Synchronous Coefficient of Drag Alteration (SCODA) technology, which exploits the non-linear behavior of DNA in gels subjected to rotating electric fields to focus and extract nucleic acids. Examples were shown from a variety of sample types, including relatively clean specimens, environmental samples containing high concentrations of humic acids, and extremely complex backgrounds from tar sands. Since winning the *ALA Innovation Award*, the technology has undergone considerable development – an isolation/purification that would have taken nearly two hours in 2007 can now be accomplished in close to five minutes, and can produce a concentration factor of nearly 10,000 with an efficiency of approximately 80 percent. By controlling the temperature of the gel matrix, some degree of selective accumulation can be accomplished with preference for high or low molecular weight DNA fragments. A version of the technology now has been developed to allow for selective extraction of nucleic acids from a sample based on their sequence content, with single nucleotide resolution. The latest configuration of this emerging technology was on exhibit at LabAutomation2009's Innovation AveNEW and is now commercially available through Boreal Genomics' Aurora instrument.

From LabAutomation2008, James Landers, Ph.D., of the University of Virginia in Charlottesville, VA, presented "Microfluidic Approaches to Better Diagnostics: Triumphs and Challenges." Dr. Landers described advances in the integrated microfluidics platform for which he received the 2008 award. This microchip device integrates many functions such as DNA extraction, PCR, electrophoresis and laser induced fluorescence detection. Landers' group has shown that the ability to integrate these usually separate functions enables clinical diagnosis on the order of minutes instead of the usual time frame of days. Dr. Landers' recent interests have focused on the engineering challenges associated with miniaturizing the entire platform, including the optical detection scheme and the external heating/cooling sources that effect PCR. It also was shown that significantly improved temperature control for PCR is obtained with a halogen light source compared to the incandescent source used on the original platform. Dr. Landers' group is exploiting new applications of the technology to characterize clonal expansion of cell lines associated with "liquid cancers," such as lymphoma and leukemia. Additionally, significant progress has been made in several non-clinical applications. For example, a micro fluidics-based human forensics platform, the imSTR, was shown to produce a full (CODIS 13) STR profile in under 90 minutes with allelic balance comparable to much larger (and slower) non-integrated capillary-based platforms. The imSTR system under development will have a footprint of ~ 2' x 2' and has the potential to provide rapid on-site DNA profiles of both clinical and forensic relevance.

As evidenced by the significant strides forward described in each presentation, the emerging technologies represented by the *ALA Innovation Award* honorees continue to evolve and achieve success. These technologies are poised to make significant contributions in a number of diverse technology arenas, including clinical diagnostics, law enforcement, environmental studies, and fundamental cellular biology.

At the close of LabAutomation2009, Hyongsok (Tom) Soh, Ph.D., of the University of California, Santa Barbara, was honored as the 2009 *ALA Innovation Award* winner for his podium presentation, "High Performance Magnetic Separation in Microfluidic Channels."

For more information about ALA, visit www.labautomation.org or call 888.733.1ALA (1252). For more information about LabAutomation2009, visit www.labautomation.org/LA09.

###

The Association for Laboratory Automation (ALA) is a worldwide organization representing leaders in all aspects of laboratory automation. ALA seeks to provide a greater understanding of the importance and value of automation technologies in laboratory settings, to advance science and promote education related to laboratory automation by encouraging the study, advancing the science and improving the practice of medical and laboratory automation.

LabAutomation2010, January 23-27, Palm Springs Convention Center, is a five-day event bringing together laboratory automation business leaders and scientists from around the globe in conjunction with the world's largest exhibition of laboratory technologies.

ALA thanks Agilent Technologies for their premier sponsorship contribution to LabAutomation2009 and for their commitment to ALA through the Premier Sponsorship of LabAutomation2010.