ALA
Association for Laboratory Automation

LabSnap™

A Fast Read on the Latest in Lab Automation

FEB 2008

This Month's Lab Man Podcast and Blog

Innovation and Change at LabAutomation2008
The ALA does many things to encourage and recognize innovation! Check out the "live" podcasts from **LabAutomation2008** with the New Product Award winners, the Student Poster Award winner and a specialist in Career Development. Read The Lab Man blog for more impressions of this years event! Podcast; Blog.

Cross-Industry News

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ALA News

Networking, Leading-Edge Plenary Speakers, Outstanding Podium Presentations, Engaging Short Courses, Product Launches and an Exhibit Floor Buzzing With Energy Are All Part of **LabAutomation2008**; View Photos of the Event Here

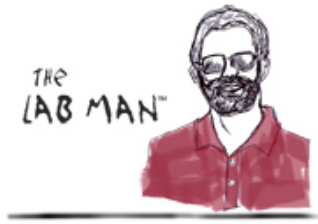
LabAutomation2008 Plays Host to Scientific Innovation and Collaboration; Attendance Continues to Rise

ALA Recognizes Excellence; Crowns Several Award Winners at **LabAutomation2008**

Special Panel at LabAutomation2008 Explores and Defines the Stages of Career Development and Diversity

Winner of the ALA Segway to Success Campaign is Announced at **LabAutomation2008**; Other Lucky **LabAutomation2008** Attendees Win Vacation Give-Away, Autographed Books and More

Boston Scientific Co-Founder John Abele and Real-Life "Insider" Jeffrey Wigand, Ph.D., to Headline **LabAutomation2009**



New Job Opportunities

Tecan US
- Field Automation Specialist, CA, Bay area

Varian, Inc.
- Product Manager - Sample Preparation

Dow AgroSciences
- High Throughput and Automation Specialist - Bioprocess R&D

and more...

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Kerstin & Hilmar's Book of the Month
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What's so funny? Click here for this month's *The New Yorker* cartoon.

Go here for a printable version of this issue.

New Tests Spot Infectious Bugs More Quickly

Wall Street Journal (02/05/08) P. D1 ; Wang, Shirley S.

Hospitals are turning to new types of diagnostic test that provide results in hours rather than days. These new tests are especially efficient at identifying antibiotic-resistant organisms. Instead of growing organisms in a dish and examining them under a microscope, the new tests rely on genetic information. The technology allows the strain of the superbug to be identified and whether it is resistant or vulnerable to an antibiotic. The tests are also useful in cases where organisms cannot be grown. Compared to conventional tests, the new tests are expensive, but those that are approved by the U.S. Food Aden Drug administration are often covered by health insurers. Two fast clinical tests were recently added to physicians' tool kits: one test identifies methicillin-resistant Staphylococcus aureus, while the other consists of multiple tests to identify 12 viruses and strains.

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Cellix to Capitalize on Launch of Latest Product

Sunday Business Post (Ireland) (02/03/08)

Cellix, a biotechnology firm based in Ireland, will seek an additional $1 million for funding its biotechnology launch of the Vena Flux Platform. The semi-automated microfluidic cell-based assay system allows pharmaceutical companies to assess the impact of introducing medication in human blood vessels. The manufacturer had previously released the Microfluidic SP platform, but the Vena Flux will provide a considerably faster method of performing microfluidic assays.

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Model Is First to Compare Performance of 'Biosensors'

Law Health Weekly (02/02/08) P. 420

Researchers from Purdue University are the first to determine why smaller biosensors are more sensitive than larger ones. To make this determination, the researchers needed to create a new mathematical model, utilizing the Cantor transformation to make the computations work. The new model explains how biosensors comprising a single nanotube exceed those comprising several nanotubes or flat planar sensors with regard to performance. According to Purdue University electrical and computer engineering professor Ashraf Alam, "What we found ... was not that smaller sensors are better able to detect target molecules, but that they are better able to capture target molecules. It's not what happens after the molecule is captured that determines how well the sensor works. It's how fast the sensor actually captures the molecule to begin with that matters most." The study, published in Physical Review Letters, has major implications for the development of lab-on-a-chip technology for medical diagnostics, environmental monitoring, and other applications.

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Manage Lab Analysis With Process and Quality Control

Practicing Oil Analysis (02/08) Templeton, Lisa

To ensure that their results are accurate, laboratories need to evaluate their testing procedures through statistical process control (SPC). Labs can use such tools as NWA Quality Analyst software to evaluate its testing methods. To gauge precision over time, a lab needs a stable sample featuring an analyte in a matrix similar to production samples. This kind of sample is typically obtained commercially or in-house and is tested over a period of time to gauge standard deviation. Results need to be plotted on a laboratory control chart, where each value is plotted on the chart instead of averaging several repeat measurements. To calculate control limits, NWA Quality Analyst uses the average range to estimate the standard deviation of a process or, alternatively, calculates the standard deviation directly from the individual data points. Meanwhile, "spike recovery" quality control samples can be used to find the method bias under day-to-day operating conditions. Spike recovery is calculated from several tests conducted on the same sample. A spike recovery chart can be used to show specific data that has gone beyond control limits and exhibits pattern rule violations, which could be caused by an inexperienced technician, for example.

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Quality Finds Balance

MIS (02/08) Goswami, Kanika

BPCL, India's third largest oil company, has 3,000 employees devoted to testing samples of its fuel over the four-stop distribution channel. The company's Technical Service Department conducts tests at the refineries, manufacturing plants, depots, and filling stations to ensure its products are of the highest quality. Despite the creation of 23 testing centers and 22 mobile labs across India, the testing process was controlled by humans and inefficient. The company took a cue from its refineries and implemented a Laboratory Information Management System (LIMS) that would conduct automated tests at intermediate stages of production and integrate its labs into an Web-based collaboration system, which handles all the data and test results. The solution was created with the help of Caliber Technologies and features three modules to control workflow: the sample manager, the resource manager, and the system manager. BPCL encountered some difficulty in getting clients to register on the LIMS, and it created an interface between the LIMS and the SAP system to make the process more efficient. The company also faced connectivity issues and launched an intranet to minimize downtime in the event of a disaster.
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Labs Oppose Medicare Experiment

San Diego Union-Tribune (01/30/08) Bigelow, Bruce V

San Diego County clinical laboratories Sharp HealthCare, Scripps Health, and the Internist Laboratory of Oceanside have asked a San Diego federal judge to issue an injunction against a pilot project designed to cut the cost of medical laboratory testing performed for Medicare patients by requiring labs to follow a competitive bidding process for 303 commonly-ordered tests, including blood typing, urinalysis, and screening for insulin, hepatitis, and Lyme disease. Under the three-year initiative, clinical labs in the San Diego region must submit bids for all the covered tests by Feb. 15 to remain eligible for reimbursement from Medicare. "The three-year demonstration project singles out the San Diego region for testing of a new competitive bidding program that if implemented will force many small community laboratories out of business," says Patric Hooper, an attorney who filed the suit on behalf of the three labs. "[The project will also] force systems like Sharp HealthCare and Scripps Health to refuse service to non-hospital patients who have come to rely on their labs for ongoing testing." Hooper says that the program could lead to fewer labs and higher costs. The project was mandated by Congress in 2003 as part of efforts to boost the efficiency of Medicare. "We're not challenging the congressional mandate," says Hooper. "We are challenging the way they are implementing it. The only problem is that it completely disrupts the current system of providing laboratory services." The federal government spent $6.7 billion for clinical lab testing under Medicare in 2006.
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Lab On a Chip Developed for Cheap, Portable Medical Tests

Science Daily (01/29/08)

University of Alberta researchers have engineered an inexpensive, portable lab-on-a-chip unit for genetic testing. In the journal The Analyst, researchers describe the reusable microchip-based system. In the time since the article was submitted to the Royal Chemical Society, researchers at the University of Alberta's Micro and Nano Fabrication Facility have reduced its development costs to about $100, with the overall system costing $1,000. The nanotechnology breakthrough consists of a highly-integrated microfabricated chip that utilizes a few molecules of the sample to produce rapid results and is expected to minimize healthcare system costs and provide patients and physicians with considerably faster medical results. The portable system would be practical for use in conducting rapid genetic testing in physician offices or for public health officials conducting environmental testing, as results are provided in about an hour.
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Making Sense of Biomonitoring

Chemical Engineering News (01/28/08) Vol. 85 , No. 4 , P. 52 ; Hogue, Cheryl

Biomonitoring attempts to determine how much of a particular chemical can be detected in a person's blood, urine, or breast milk, but scientists do not know just yet whether the detected level is a cause for concern. In an effort to better understand the data, the U.S. Environmental Protection Agency, Health Canada, various chemical manufacturers, and trade associations are working to create "biomonitoring equivalents," calculating a safe level of the chemicals to use as a benchmark. Summit Toxicology President Sean Hays says biomonitoring equivalents could be used to determine whether public health risks exist and whether there is a need for further study of particular chemicals—not as a screening tool for chemical levels in individuals. Scientists must take into consideration absorption, distribution, metabolism, and excretion of the chemicals by the body when creating biomonitoring equivalents. Experts stress that biomonitoring equivalents do not measure the level of chemicals in target organs, like adrenal glands, ovaries, testes, or the brain. Additionally, they do not indicate whether a person was exposed to a particular chemical in small amounts over a lengthy time span or a large amount at one time. Scientists note that other factors must be taken into account when calculating toxicity, such as vitamin or mineral deficiencies, exposure to a variety of chemicals that interact with one another, and access to medical care.
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So Long Lab Rats?

Associated Press (01/28/08) Hill, Michael

A researcher at Rensselaer Polytechnic Institute (RPI) has developed a small, rectangular glass chip that could one day eliminate the need for animal testing. In the past, animal testing has been integral in the development of a variety of medical advances, including the polio vaccine and the artificial heart valve. Currently, animal testing is used to test the safety of pharmaceutical products and chemical compounds. However, there has been some backlash against using animals for this purpose, and the European Union will ban animal testing for cosmetics beginning in 2009. Although there are several alternatives, including synthetic skin substitutes and computer simulations, the chip developed at RPI is considered the most effective. The chip is the size of a microscope slide, but it holds hundreds of white dots filled with human cell cultures. It replicates human reaction to potentially toxic materials in an efficient and timely manner. One limitation is that it is unable to assess future risk, such as if a substance raises the risk of cancer. Prof. Jonathan Dordic hopes to bring the chip to market by next year as a cheap alternative to animal testing. His company has received $3 million in federal assistance to do further tests on the chip.
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Lab-on-Chip Technology: Scientists Bring MRI/NMR to Microreactors

Science Daily (01/28/08)

A team of researchers with the U.S. Department of Energy's Lawrence Berkeley National Laboratory (Berkeley Lab) and the University of California at Berkeley have successfully used magnetic resonance imaging (MRI) technology in the study of gas-phase reactions on the microscale. During their research, the team was able to develop a technique in which parahydrogen-polarized gas is used to produce an MRI signal that is strong enough to provide direct visualization of the gas-phase flow of active catalysts in packed-bed microreactors. According to Louis Bouchard, one of the researchers involved in the project, this is the first time that hyperpolarized gas has been used to directly study catalytic reaction products on such a small scale without the use of tracer particles or gas. Bouchard added that the technique makes it possible to conduct more studies of heterogeneous catalysis in which all the benefits of MRI, including velocimetry and spatially dependent quantities, are available.
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International Consortium Announces the 1,000 Genomes Project

NIH News Release (01/22/2008)

The National Institutes of Health's National Human Genome Research Institute (NHGRI), the Wellcome Trust Sanger Institute, and the Beijing Genomic Institute have unveiled the 1,000 Genomes Project, in which gene sequences of 1,000 or more people will be used to create a new map of the human genome. The map will be made available through public databases in the hopes that researchers will use it to create new methods for diagnosing, treating, and prevention common illnesses. While maps of more than 100 regions of the genome already are available, they are not detailed enough. According to NHGRI director Dr. Francis Collins, "This new project will increase the sensitivity of disease-discovery efforts across the genome five-fold and within gene regions at least 10-fold. By harnessing the power of new sequencing technologies and novel computational methods, we hope to give biomedical researchers a genome-wide map of variation down to the 1 percent level." Both single nucleotide polymorphisms and structural variants will be mapped as part of the project. The first year-long phase of the project will comprise a trio of pilot projects to determine how best to conduct the sequencing and develop the new map. The genomes of two nuclear families will be sequenced at deep coverage, involving about 20 passes of each genome, as part of the first pilot. The second will comprise the genome sequencing of 180 people at low coverage, involving about two passes of each genome, and as part of the third pilot, researchers will sequence the exons of 1,000 genes from 1,000 people; protein-coding genes make up just 2 percent of the genome, and taking a closer look at these coding regions will help researchers determine how to extract more information. Several populations in various regions around the globe will participate in the DNA sequencing project, including Utah residents with European ancestry, residents of the southwestern United States with African ancestry, the Yoruba in Nigeria, Gujarati Indians residing in Houston, and Chinese people living in Beijing.
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CNPs Inject Fluid Into Cells

Photonics.com (01/18/2008)

Engineers and physicians at the University of Pennsylvania have developed a new type of pipette that does not have the disadvantages that are associated with glass micropipettes. This new type of pipette is made by depositing a carbon film inside quartz micropipettes, and then wet-etching away the quartz tip to expose a carbon nanopipe. The carbon nanopipettes (CNPs) can be made in a variety of sizes, from a few tens to a few hundred nanometers, and they can be mass-produced, say the researchers. Despite their small size, they are much stronger and more flexible than traditional glass micropipettes. If the tip of a CNP is pressed against a surface, the carbon tip bends and flexes, then recovers its initial shape once the pressure is removed. CNPs can also be used to measure electric current and probe cells, unlike glass micropipettes, which can cause permanent cell damage and cannot be used as injectors and electrodes at the same time. Researchers say CNPs will be useful in measuring the electrical signals of cells during fluid injection.
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A New, Faster Way to Read DNA

Washington Post (01/17/08) P. GZ6 ; Jenkins, Chris L.

Scientists at George Mason University and the National Institute of Standards and Technology (NIST) have developed a device that can rapidly assess DNA samples.The device features a microchip that can accommodate several laboratory functions. It heats samples using microwaves to quickly boost their temperatures, so that a tiny portion of DNA can be read accurately. The chips can range in size from square millimeters to several square centimeters, say university officials. Researchers estimate it might take 10 years for the technology to be commercially viable. By that time, a tiny drop of blood or saliva could be used to get results within an hour. The device would be connected to a notebook computer that would display results. “The idea here is that we would like to do the things we do in a chemical laboratory that involve beakers and test tubes . . . and make them small,” said Michael Gaitan, a NIST team leader. Such “lab-on-a-chip” devices could be used for crime investigations, testing exhaust emissions, and reading medical samples, according to Gaitan and Siddarth Sundaresan, a graduate student at George Mason and an employee at GeneSiC Semiconductor.
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New York Presses to Deploy More Bioweapons Sensors

Washington Post (01/09/08) P. A3 ; Hsu, Spencer S.

New York City officials want the White House to be more supportive of plans to expand the deployment of bioweapons sensors. In December 2007, a limited number of early warning sensors, designed to detect the airborne release of biological warfare agents, were activated in sensitive areas of Manhattan. Although the federal government spent over $400 million to install air samplers in 30 cities as part of the BioWatch program, New York officials say that the administration’s support has waned. Although the White House is unsure whether the new sensors are effective enough to install at a price of $100,000 each, New York officials assert that the new air samplers would help detect an emergency faster. The older samplers allowed scientists to identify a pathogen within 30 hours, while the newer model automatically detects pathogens and can keep organisms alive long enough to be analyzed. Detecting pathogens faster can help authorities treat victims earlier and get a faster start on the search for the perpetrators. Despite claims that the federal government is not supporting the project, the Department of Homeland Security (DHS) provided enough funding to cover 90 percent of the cost for the new system. DHS is focusing more on developing more advanced sensors, and will hold pilot tests of alternative sensors in 2008.
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MIT Gas Sensor Is Tiny, Quick

MIT News (01/10/08) Trafton, Anne

MIT professor Akintunde Ibitayo Akinwande is leading the development of tiny sensors that could be used to detect minute quantities of hazardous gases much faster than currently available devices. The researchers have taken the common gas chromatography and mass spectrometry (GC-MS) techniques and shrunk them to fit in a device the size of a computer mouse. Eventually, the team plans to build a detector the size of a matchbox. Akinwande says scaling down gas detectors makes them easier to use in a real-world environment, reduces the amount of power they require, and enhances their sensitivity to trace amounts of gases. Current GC-MS machines take about 15 minutes to produce results, are about the size of a full paper grocery bag, and use 10,000 joules of energy. The new device consumes about four joules and can produce results in about four seconds. Shrinking the device will also allow for precision manufacturing through microfabrication and batch-fabrication for inexpensive production. Akinwande and MIT research scientist Luis Velasquez-Garcia plan on presenting their work at the Micro Electro Mechanical Systems 2008 conference.
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Microneedles Enhance Drug Administration Through Skin

Science Centric (01/05/2008)

University of Kentucky and Georgia Institute of Technology scientists were recently able to prove microscopic needles are a valid method of transdermal drug delivery. Microneedles painlessly puncture the skin making it easier to dose patients with drugs, proteins, DNA, or vaccines with fewer side effects. The study, published in the Proceedings of the National Academy of Sciences, tested the delivery method using the drug naltrexone. Patches with 50 stainless steel microneedles were pressed onto each subject's skin before applying the naltrexone gel. Subjects were then monitored for 72 hours. Appropriate dosage levels of the drug stayed in the subjects' blood for at least 48 hours. In addition, the naltrexone gel achieved therapeutic levels using only a 10 mg to 12 mg dose compared to the 50 mg required in an oral treatment, greatly reducing the chance of adverse drug reactions.

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Method Created to Directly Sequence RNA

Small Times (01/08)

Researchers at Dortmund, Germany's Institute for Analytical Sciences have created a method that could result in the direct sequencing of DNA without the existing complicated analytical strategies. Volcker Deckert and his team have formulated a procedure of directing sequencing genetic code employing Raman spectroscopy and atomic force microscopy. To date, the researchers have successfully studied RNA. Deckert and his colleagues utilize an atomic force microscope in order to read RNA stands. Guided by the microscope, a miniscule, silvered glass tip glides over the RNA strand as a laser beam ignites the section being studied. The dispersed light's spectrum provides highly accurate data concerning the molecular structure of the section since all of the nucleic acids vibrate differently. If the procedure can be used for DNA, the researchers claim it could restructure the decoding of genetic data. The findings are reported in the Angewandte Chemie journal.

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"Well, I'm off to brave the elements, so to speak."