



A Fast Read on the Latest in Lab Automation

OCT 2008



This Month's Lab Man Podcast and Blog

Ethics and Technology

What if you determined that your employer was more interested in corporate profits vs. informing the public about the possible health risks of your company's product? Would you feel that the public ought to look out for themselves, and quietly keep doing your job? Would you try to change your employer's attitude? Would you simply quit? Or would you blow the whistle, knowing that your employer would not only fire you, but attempt to discredit you? Let's hope you never face this situation. But Dr. Jeffrey Wigand did. The LabMan talks to Dr. Wigand in advance of his plenary lecture at LabAutomation2009. [Podcast](#); [Blog](#); [Video](#).



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New Job Opportunities

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- Genentech**
- Senior Manager of Assay Transfer/
Senior Manager of Control Systems
Management
and more...

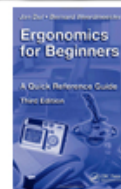
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New Data Resource to Advance Computer-Aided Drug Design

NIH News Release (10/09/08) Carlson, Emily

The University of Michigan (UM) is leading an effort to create and operate a Community Structure-Activity Resource to help develop computer programs that are more accurate in predicting potential drug candidates. This Web-based resource will be available to the scientific community for free, and will house molecular data about proteins that bind ligands. To create the online resource, a group of researchers from UM, led by Heather Carlson of the College of Pharmacy, will work with other groups to gather new molecular data, as well as compile existing data from both unpublished and published findings and various databases. Such a resource can be used to create computer programs to be used in studying the properties of a target protein and predict which ligands bind to the protein in a way that could be useful. Using protein molecular data, a program could also show compounds that could interact with proteins to cause unwanted side effects. According to Jeremy M. Berg, director of the National Institute of General Medical Sciences, such information is "critical" in developing new drugs.

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U of L Scientists Discover Way to Detect Diseases

Louisville Courier Journal (KY) (10/08/08) Howington, Patrick

Researchers at the University of Louisville's James Graham Brown Cancer Center have discovered technology that can detect diseases by heating and analyzing a patient's blood and creating a visual map of how blood proteins react. In preliminary studies, the team scanned blood from patients with Lyme disease, lupus, and rheumatoid arthritis. According to biophysicist Brad Chaires, who led the team, each disease has a distinct "fingerprint." Each scan looked different for each disease, and was distinct from those of healthy subjects. Louisville Bioscience Inc. has licensed the technology, which will probably be used to signal possible presence of a disease rather than provide a definite diagnosis.

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Rapid Tagging of Biomolecules

Chemical & Engineering News (10/06/08) Vol. 86, No. 40, P. 8; Drahl, Carmen

A team of chemists, led by Joseph M. Fox of the University of Delaware, has developed a new method of labeling biomolecules that needs no catalyst and is hundreds of times faster than the established click reactions. The new reaction is based on the cycloaddition of trans-cyclooctene to a tetrazine, which was previously known, but until now could not be used for cellular environments. Fox's team added pyridine moieties to tune the reactivity of the tetrazine, which then reacted rapidly with the cyclooctene in cell lysates.

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RTP Startup Lands \$750,000 NIH Grant for Personalized Medicine Tools

LocalTechWire.com (10/02/08)

The National Institutes of Health awarded a \$750,000 Small Business Innovation Research grant to BioMedomics. The funds will be used in developing technology that uses genomics and proteomics detection to help develop personalized healthcare tools. BioMedomics wants to develop biomarker-based testing that can be used at patient points-of-care

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Spit Proteins Could Lead to Oral Cancer Test: Study

Reuters (10/01/08)

Researchers at UCLA's School of Dentistry report using protein screening in human saliva to find five protein biomarkers that can predict oral squamous cell carcinoma 93 percent of the time. Saliva-based diagnostic tests are expected to grow after scientists from UCLA and other centers published a map in March that identified all 1,116 unique proteins found in human saliva glands. In the UCLA study, the researchers compared saliva samples from 64 patients with oral squamous cell carcinoma to saliva samples from 64 healthy patients to identify the five biomarkers. The team hopes to develop a device that can detect these markers for human trials. The study was reported in the journal *Clinical Cancer Research*.

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Fast-Track Cancer Test Unveiled by Yorkshire Team

Yorkshire Post (UK) (10/01/08) Waites, Mike

A group of researchers from Leeds University in Yorkshire, England, has developed technology that can detect biomarkers using antibodies, providing results in 15 minutes or less. This approach can help doctors more accurately refer their patients to specialists and provide faster diagnoses in hospitals. Previous tests show that biomarkers in prostate and ovarian cancer, strokes, multiple sclerosis, and other substances can be detected with this approach, with future technology possibly testing for tuberculosis or HIV. The test was developed via a 2.2 million pound collaboration of European researchers and companies. According to program manager Tim Gibson, the test can also be used to test for environmental issues, such as pesticides.

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FDA Clears New CDC Test to Detect Human Influenza

HHS News Release (09/30/08)

The U.S. Food and Drug Administration has approved a new test developed by the U.S. Centers for Disease Control and Prevention, called the Human Influenza Virus Real-Time RT-PCR Detection and Characterization Panel, that can detect flu viruses and tell the difference between seasonal and novel influenza strains. The device isolates and amplifies viral genetic material taken from a patient, and the material is labeled with fluorescent molecules. The molecules are then detected and analyzed by a diagnostic instrument called the Applied Biosystems 7500 Fast Dx. Several samples can be taken at once, with results available in four hours. The test will be available this fall to CDC-qualified laboratories, but reagents need to be regularly evaluated to ensure that the test is sensitive and specific enough to diagnose constantly changing flu viruses.

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'Hybrid' Sailors Drive LCS Anti-Sub Module

Navy Times (09/29/08) Fuentes, Gidget

A Sept. 18 demonstration at Naval Base Point Loma, Calif., showcased a new antisubmarine warfare (ASW) mission module for littoral combat ships (LCS) that is controlled remotely by technicians. The ASW module has two robot boats working as sonar platforms on the surface, along with a robot submarine with sensors of its own. Also linked with the system are an unmanned Fire Scout helicopter and a human-piloted MH-60R Seahawk helicopter. Sailors at the ASW detachment, all of whom are experienced sonar technicians, have been learning new skills related to operating the new technologies, both from books and with hands-on learning. "This is like hybrid sailors," said Sonar Technician (Surface) 1st Class Dale Barkley. "Automation helps take a lot of the stress off of us."

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Proteomics Ponders Prime Time

Science (09/26/08) Vol. 321, No. 5897, P. 1758; Service, Robert F.

Proteomics technology has seen vast improvements in the past decade, and now many researchers are advocating the start of a human proteome project (HPP) to survey the proteins found in human tissue. Proteomics researchers, labs, and especially the Human Proteome Organization (HUPO) have addressed a number of issues that have hindered its development in the past, such as sampling error and lack of uniform standards. While the details of HPP are still debated, most researchers agree on a basic plan to identify one protein for each human gene, building a protein "backbone." According to Mattias Uhlen, microbiologist and proteomics expert at the Royal Institute of Technology in Sweden, it would take decades to try to find all protein variants in all tissues. Other HPP goals considered include the creation of one antibody for every protein in HPP, or finding the partners of certain proteins. The estimated cost of such a project is about \$1 billion. To prove the technology and generate interest, HUPO is considering a pilot project that would catalog all proteins produced by chromosome 21, the smallest human chromosome. Most proteomics experts remain confident that HPP will commence, although the "how" remains unknown.

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Drexel Professor Gets EPA Grant for Water-Quality Sensor

Philadelphia Business Journal (09/26/08)

The U.S. Environmental Protection Agency has awarded a \$599,999 grant to Raj Mutharasan, a professor of chemical engineering at Drexel University. Mutharasan has developed millimeter-sized sensors that can detect materials in water at a level of one part per quintillion, completing tests in 15 minutes. The grant is to develop a biosensor that can detect cyanobacteria, or blue-green algae, and cyanotoxins, the toxins they produce.

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UVA Researcher Micro-Sizes Genetics Testing

Tech Journal South (09/25/08)

Scientists at University of Virginia, led by Prof. James Landers, are hoping to develop a hand-held device that uses "lab on a chip" technology to conduct DNA testing. The device could also be used in a doctor's office to provide rapid testing for infectious diseases and for cancer and other genetic defects. Crime scene investigators may be able to use it to analyze evidence, and agricultural biotechnologists could perform genetic analysis on hybrid plants with desirable properties. While the device can perform lab work in smaller volumes than in a regular lab, Landers says it can do the work 100 times faster. Landers published a review of his technology in the journal *Analytical Chemistry*.

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A Portable DNA Detector

Technology Review (09/24/08) Dume, Belle

Researchers at the University of California, Berkeley, have developed a portable DNA analyzer that can perform short tandem repeat (STR) analysis on blood samples at a crime scene. The device replicates a DNA fragment with a 160-nanolitre polymerase chain reaction reactor combined with an on-chip heater and temperature sensor in the device. The DNA is analyzed by capillary electrophoresis in a seven-centimeter separation channel. The researchers were able to produce reproducible STR profiles of DNA samples in 2.5 hours. While the system, which consumes about 20 watts of power, is reliable, the researchers emphasize that it is not yet commercially available and can only provide preliminary evidence. The team plans to improve the device's sensitivity and throughput so it can analyze several samples at once, and they hope for it to be commercially available in three to five years.

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Robot Assistant Gives Surgeons a Cutting Look

New Scientist (09/24/08) No. 2674, P. 21

Researchers from the Hamlyn Center for Robotic Surgery at Imperial College London have integrated eye-tracking technology into a da Vinci surgical robot in an effort to provide surgeons with additional assistance when positioning instruments such as endoscopes or lasers. Using the technology, a surgeon would be able to control instruments with their gaze. The device shines an infrared LED on each eye, uses cameras to track the movement of the pupil, and determines where the surgeon is looking based on the "glint" of reflected light on the cornea. The data is calculated to move instruments to different positions on the patient. Surgeons would activate the device with a foot pedal. The team plans to improve on the eye-tracking technology's current accuracy rate of within 3 millimeters, and its results could be made available at the IROS 2008 conference in Nice, France, at the end of September. "It could be useful in cardiovascular or gastro-intestinal surgery, which requires lots of complex maneuvers," says researcher Guang-Zhong Yang.

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DHS Radiation Detection Program May Exceed Cost Estimates by \$1 Billion, GAO Says

Government Executive (09/24/08) Peters, Katherine McIntire

The Government Accountability Office (GAO) estimates that the cost of a Department of Homeland Security program that would equip ports with radiation detection equipment will be \$3.1 billion, \$1 billion more than the Domestic Nuclear Detection Office's (DNDO) estimate. One point of dispute is over advanced spectroscopic portal monitors, the budget of which had not included operation and maintenance costs. The DNDO sponsored development of the advanced spectroscopic portal monitor in response to limitations in earlier radiation monitors. While the project's 2006 plan required these monitors to be used to screen ship, rail, and truck cargo, officials said in 2007 that the plan had been revised so that monitors were only needed for truck cargo.

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Cheap Cervical Cancer Test Is Boost for Poor Countries

New Scientist (09/23/08) MacKenzie, Deborah

Scientists funded by the medical charity PATH announced that they have been able to use an inexpensive, streamlined polymerase chain reaction (PCR) test to screen 2,400 Chinese women for cervical cancer. The researchers note that the new test could be conducted without electricity or running water, and it could be performed by paramedics with little instruction. Positive tests were checked under microscopes in Western labs, but the new PCR test demonstrated 90 percent accuracy. In addition, results were provided fast enough so women testing positive could be treated the same day. PATH said it hopes the test will cost under \$5.

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Better Best Before Dates

EurekaAlert (09/23/08)

The University of Manchester is using sensor technology to monitor the food supply chain in an effort to create more scientific and meaningful best-before dates. "By integrating our collaborative knowledge with the data we collect, we can better understand the whole supply chain of fresh food and start to reduce wastage," says Bruce Grieve, director of Manchester's Syngenta Sensors University Innovation Center (UIC). The project involves the use of printed sensors that will be based on radio frequency identification tags, and it will have battery-free data storage. Transmitters will move data via pulses of energy, which allows for small and affordable devices. UIC plans to work with fruit and vegetable import companies and food processors to test the concept in a real supply chain, and it plans to license and make the devices available next year. In addition to providing early detection for spoiled food, Britain's Sensors & Instrumentation Knowledge Transfer Network believes sensor technology could be used to identify toxins and monitor water and nutrient concentration in the soil. "New developments in sensing technology are helping to improve the efficiency of everyday processes, reduce costs, and benefit the environment," says Phil Cooper, director of the network.

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Enigma Diagnostics Awarded 1.8 Million Pounds to Develop Rapid DNA Test for Infectious Diseases

MTB Europe (09/23/08)

The U.K. Government's Technology Strategy Board has awarded 1.8 million pounds to develop a "gold-standard" portable, rapid, automated DNA analysis molecular test system to diagnose infectious diseases in decentralized and point-of-care settings. The program's focus will be on sexually transmitted diseases such as chlamydia and hospital-acquired infections such as methicillin-resistant *Staphylococcus aureus*. Enigma Diagnostics will lead the system development, and researchers at the Center for Healthcare Associated Infections at Nottingham University and Nottingham Trent University will develop real-time molecular assays.

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Gene Chips Unmask Cryptic Diseases

Nature (09/18/08) Vol. 455 , No. 7211 , P. 274 ; Hayden, Erika Check

Researchers report that deletions or duplications on a region of chromosome 1 are connected to autism, learning difficulties, mental retardation, heart problems, and other varied symptoms. Two recently published studies linked the same genomic area to schizophrenia. These studies used microarrays, glass slides embedded with fragments of DNA that can be used to identify small DNA defects by comparing the slide with one that holds normal DNA material. In the past two years, this technique has become more commonly used in clinics, and microarray supplier Agilent estimates that the worldwide market is near \$200 million and growing. However, genetic variation in healthy people makes it difficult to tell if a genetic change is the actual cause of a disorder. To compare microarray-based tests with traditional prenatal diagnosis techniques, starting in October doctors will enroll 4,000 patients in a study funded by the U.S. National Institute of Child Health and Human Development. Many doctors and scientists around the world believe that pooling their samples via databases will help decrease uncertainty regarding microarray technology.

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Ion Mobility-Mass Spec Combo

Chemical & Engineering News (09/15/08) Vol. 86 , No. 37 , P. 11 ; Arnaud, Celia Henry

Academic laboratories are increasingly using ion mobility spectroscopy (IMS) with mass spectrometry (MS) and commercial instrumentation, and they are enjoying a greater degree of separation as well as information to analyses. The researchers in the protein structural biology community were the first to embrace the IMS/MS combination, but the incorporation of variations of IMS into commercial instruments has helped to popularize the technique. Until now, researchers had to build their own instruments. In conventional IMS, ions travel through a gas-filled drift tube that has a low applied voltage, and its drift time can be used to calculate the ion's collision cross section, which is determined in part by the size and shape of the ion. Combining the separation mechanism with MS or liquid chromatography/MS allows researchers to resolve more components in a single analysis than with either of the other techniques alone. Michael T. Bowers, of the University of California, Santa Barbara, says a company should design an IMS/MS system with a conventional drift cell to offer higher resolution, and adds that the determination of absolute cross sections would allow them to include modeling capabilities in their software packages. "We're in the ascendancy of this technique," Bowers adds. Richard A. Yost, a chemistry professor at the University of Florida, says the device should not be very expensive, and the "killer application" has yet to be determined.

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"If birds fly over the rainbow, Garber, why, oh, why, can't I?"

"The boys in research seem to think it has something to do with acrodynamics, Chief."