

TECHNOLOGY ROUNDUP

A NEWS BULLETIN FROM
Technology Information Section (TIS)
Pakistan Scientific & Technological Information Centre



Nov-Dec, 2011

Vol. 3, No. 6

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- **International Conference on Sustainable Development**
- **Food Security 2011**
- **International Conference on Chemical, Ecology and Environmental Sciences (ICCEES'2011)**
- **International Conference on Chemical, Biological and Environmental Engineering**
- **International Conference on Ecological, Environmental and Biological Sciences (ICEEBS'2012)**
- **International Conference on Electrical Energy and Networks (ICEEN 2012)**
- **International Bhurban Conference on Applied Sciences & Technology**
- **Oil & Gas Asia Exhibition & Conference**

Tech News

Indigenous Technology

Quality Control in Pharmaceutical Industry-Quantitative and qualitative determination of pharmaceuticals using HPLC

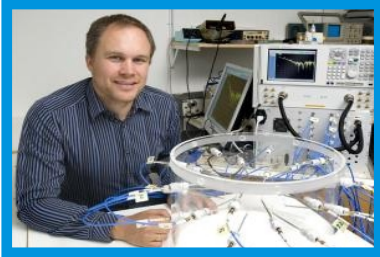
Quality control is an essential operation of the pharmaceutical industry. It involves the examination of a product, service, or process for certain minimum levels of quality. Drugs must be marketed as safe and therapeutically active formulations whose performance is consistent and predictable. The goal of a quality control unit in pharmaceutical industry is to identify products or services that do not meet a company's specified quality standards. If a problem is identified, the production of drug may be stopped temporarily. Quality control units' of pharmaceutical industries use various HPLC techniques to analyze different drugs. Some of these methods are ultraviolet (UV) detection, whereas others use expensive fluorescence and diode array detection which are not commonly available in every laboratory/industry.

In the present study more sophisticated and economic analytical methods are being developed for the evaluation of different pharmaceuticals like paracetamol, ciprofloxacin and azithromycin. Because of their good market value it is analyzed in almost every pharmaceutical industry for the use in medicine. Nearly, all other reported methods uses buffer in their mobile phase, for their analyses which not only decrease the column life, but are very expensive as well. So, in our work we tried to get rid of buffer in the mobile phase. The scientists of the present study claim that besides developing economic methods for analyses of drugs they can help pharmaceutical industry in their product approval for export purposes also.

Courtesy to

SMurtaza Sayed & Hasan M.Khan
Radiation Chemistry Laboratory, NCE Physical Chemistry
University of Peshawar

New Weapon against Cancer: Microwaves can be used to create Medical Images



A research team from Chalmers University of Technology has developed new techniques of cancer diagnosis and treatment with the aid of microwaves, which could play a pioneering role in the battle against cancer. Andreas Fager, Associate Professor of Biomedical Electromagnetic, has developed a system to detect breast cancer with the new technique. He points out that the method has several advantages over mammography.

Chalmers team expects to test two different techniques on patients within the next six months. One method is an alternative to mammography, i.e. using X-rays

to detect breast cancer. The other aims to treat tumours in the head and neck by heating the cancer cells. Microwaves can be used to create medical images, a new technique known as microwave tomography. Researchers obtain three-dimensional images showing significantly better contrast between healthy and malignant tissue compared to X-rays. That makes it easier to detect even really small tumours that may currently be obscured by healthy tissue, thus creating the preconditions for much more reliable diagnosis.

Unlike X-rays, the technique also emits negligible doses of non-ionising radiation less than a hundredth of the radiation to which you are exposed when talking on a mobile phone.

The idea is to use the technique in conjunction with a treatment couch, equipped with holes for the breasts, to which the thirty or so antennas required by the examination are connected. It should be considerably more comfortable for patients than mammography. The method is also much less expensive, not only because microwave equipment is not so costly, but also because the clearer images make interpretation easier for the doctors.

In the second Chalmers project, the microwaves are actually used to destroy the tumours by heating them, a process known as hyperthermia. Clinical studies have shown that treatment with conventional radiotherapy and chemotherapy in combination with hyperthermia may double the long-term ability to cure certain forms of cancer, such as cervical cancer and soft-tissue sarcoma.

Researchers are now developing a new hyperthermia system that can reach deep-seated tumours in the head and neck with high accuracy. In this way, higher temperatures can be reached in the tumour without affecting the surrounding tissue.

With time, the Chalmers team hopes to be able to combine both methods. As soon as a tumour is detected, the already connected antennas could be used to start treating the tumour directly while at the same time monitoring that the right tissue is heated up. The method should also be applicable for other parts of the body than breasts, head and neck. The Strokefinder is currently undergoing clinical trials at Sahlgrenska Hospital.

www.chalmers.se

'Magnetic Tongue' ready to help produce tastier Processed Foods

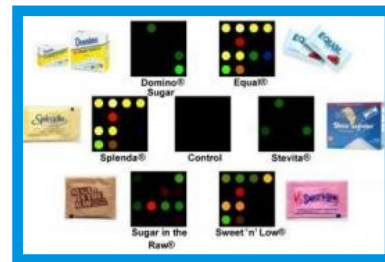
The emerging futuristic "e-sensing" devices intended to replace abilities that once were strictly human-and-animal-only. It is a "magnetic tongue" a method used to "taste" food and identify ingredients that people describe as sweet, bitter, sour, etc.

Antonio Randazzo, Anders Malmendal, Ettore Novellino and colleagues explained that sensing the odor and flavor of food is very complex process. It depends not only on the combination of ingredients in the food, but also on the taster's emotional state. Trained taste testers eliminate some of the variation, but food processors need more objective ways to measure the sensory descriptor of their

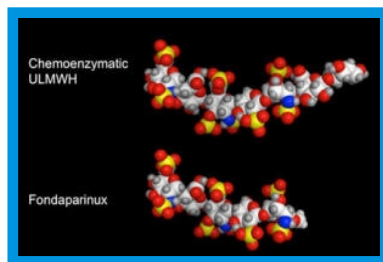
products. That is where electronic sensing technologies, like E-noses, come into play. However, current instruments can only analyze certain food components and require very specific sample preparation. To overcome these shortcomings, Randazzo and Malmendal's team turned to nuclear magnetic resonance spectroscopy (NMR) to test its abilities as "a magnetic tongue."

The researchers analyzed 18 canned tomato products from various markets with NMR and found that the instrument could estimate most of the tastes assessed by the human taste testers. But the NMR instrument went even farther. By determining the chemical composition, it showed which compound is related to which sensory descriptor. The researchers say that the "magnetic tongue" has good potential as a rapid, sensitive and relatively inexpensive approach for food processing companies to use. These techniques could save many lives and are more effective, less invasive and simpler than currently available alternatives

<http://portal.acs.org>



New Method to build important Heparin Drug



Linhardt, Senior Constellation Professor of Biocatalysis and Metabolic Engineering at Rensselaer Polytechnic Institute, and Jian Liu, a professor in the Eshelman School of Pharmacy at the University of North Carolina have discovered an entirely new process to manufacture ultra-low molecular weight heparin. The researchers have announced an important step toward making this a reality.

The research shows that the drug is identical in performance and safety to the current and successful anticoagulant fondaparinux, but is purer, faster, and less expensive to produce. This research represents an entirely new paradigm in drug manufacturing, with this discovery the researchers have successfully demonstrated that replacing the current model of drug production with a chemoenzymatic approach can greatly reduce the cost of drug development and manufacturing, while also increasing drug performance and safety, and reduce the possibility of outside drug contamination. It is expected that this is the first step in the adoption of this method for the manufacture of many other drugs.

According to Linhardt the new process uses chemicals and enzymes to reduce the number of steps in production of fondaparinux from approximately 50 steps down to just 10 to 12. In addition, it increases the yield from that process 500-fold compared to the current fondaparinux process, and could decrease the cost of manufacture by a similar amount.

Fondaparinux, which is sold as a name-brand drug and was also recently approved by the FDA as a generic drug, is a synthetic anticoagulant used to treat deep vein thrombosis, with over \$500 million in annual sales. It is part of a much larger family of anticoagulant drugs known as heparins. But, unlike most heparin products, it is chemically synthesized from non-animal materials. All other heparin-based drugs currently on the market use materials from the intestines of pigs and lungs of cattle as source materials. Such animal materials are more likely to become contaminated.

Linhardt said, relying on animals open the way for spreading viruses and prion diseases like mad cow disease through the use of these heparins, and because most of the raw material is imported, one cannot be sure of exactly what one is getting. But, fondaparinux is extremely costly to produce, the process to produce the drug involves many steps to purify the material and creates tons and tons of hazardous waste to dispose of.

The new process developed by Linhardt and Liu greatly reduces the number of steps involved in the production of the drug. This reduces the amount of waste produced and the overall cost of producing the drug.

The process uses sugars and enzymes that are identical to those found in the human body to build the drug piece by piece. The backbone of the material is first built sugar by sugar and then decorated with sulfate groups through the use of enzymes to control its structure and function in the body.

Linhardt and Liu have already start testing the drug in animal models with successful results and think the drug could be quickly transferred to the market.

Linhardt also thinks that this combined chemical and enzymatic synthesis can be quickly brought to patients in need and adapted for the production of many other improved carbohydrate-containing drugs. It can be quickly and easy commercialized to reduce the cost of this drug and help to shift how pharmaceutical companies approach the synthesis of carbohydrate-containing drugs.

<http://www.rpi.edu>

Electromobility: New Components going for a Test Run



The researchers at 33 Fraunhofer institutes put their heads together in the Fraunhofer System Research for Electromobility project to move electromobility one big step ahead.

In the future electric cars will replace the internal combustion engine. Professor Ulrich Buller is the Senior Vice President for Research at Fraunhofer Gesellschaft. He describes the idea behind system research: "We take care of overarching aspects starting with generating the energy and going all the way down to business models." Professor Holger

Hanselka told that they have defined a total of five concentrations: issues of decentralized power generation and power transport to vehicles, energy storage, vehicle engineering and system integration.

After the completion of the project, the institutes involved unveiled their findings on the ATP test track in Papenburg, Germany. Researchers invited visitors for a test ride in the experimental vehicles. Both of these electrical cars are based upon Artega GT, a two-seater sports car. Franz-Josef Wostmann, Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM in Bremen, Germany, told that they installed commercially available components into the Frecco 1.0 and concentrated on streamlining the way these components interact.

Frecco 2.0 contains components recently developed by these scientists. A case in point are wheel hub motors that the researchers from IFAM conceived in teamwork with their colleagues Institute for Integrated Systems and Device Technology IISB, the Institute for Mechanics of Materials IWM and the Institute for Structural Durability and System Reliability LBF. Franz-Josef Wostmann stressed, that they engineered the motor from the onset for the European market and selected a diameter to make sure it has room in a 15-inch wheel rim. In turn, the engine is adapted to the available construction space. This is why they had to come up with completely new components with maximum power density starting with the power electronics through setting up the cooling right down to the design.

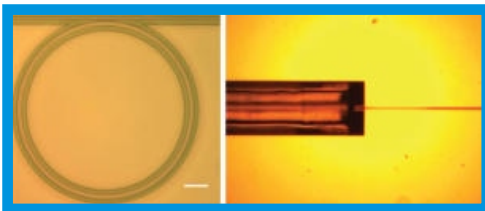
Totally new vehicle designs are possible since the researchers moved the entire drive train the entire engine including the center tunnel, cardan shaft and transmission out of the car and into the wheel hubs or even eliminated them altogether. For instance, the passenger compartment on a vehicle that is about the same size as a VW Passat would be as big as an S-Class Mercedes. Another advantage is the fact that every wheel gets the performance it needs. This means greater safety for each passenger

because each individual wheel cannot be separately braked, and accelerated. That gives the wheel hub motor torque vectoring; advancement over today's ESP.

Another innovation is the cast coil. NFraunhofer researchers can cast coils with a new technique instead of winding them as previously. This has the benefit that the installation space in the drive motor is used more efficiently. In contrast to the lot fill factor of approximately 55 percent normal today, experts achieve lot fill factors in excess of 90 percent. This permits higher power density and greater efficiency with an equally large coil installation space. Much smaller coils can be used due to the higher lot fill factors, or aluminum can be used with the same dimensions if engine output is supposed to stay the same. In the future, automobile manufacturers and suppliers will be able to use Frecco together with the Fraunhofer Institute for Manufacturing Technology and Advanced Materials for testing or advancing new components.

<http://www.fraunhofer.de>

Microring' Device could aid in future Optical Technologies



Researchers at Purdue University and the National Institute of Standards and Technology (NIST) have created a device small enough to fit on a computer chip that converts continuous laser light into numerous ultrashort pulses. Andrew Weiner, Professor of Electrical and Computer Engineering told that these pulses repeat at very high rates, corresponding to hundreds of billions of pulses per second.

The tiny "microring resonator" is about 80 micrometers, or the width of a human hair, and is fabricated from silicon nitride, which is compatible with silicon material widely used for electronics. Infrared light from a laser enters the chip through a single optical fiber and is directed by a structure called a waveguide into the microring.

The pulses have many segments corresponding to different frequencies, which are called "comb lines" because they resemble teeth on a comb when represented on a graph.

By precisely controlling the frequency combs, researchers hope to create advanced optical sensors that detect and measure hazardous materials or pollutants, ultrasensitive spectroscopy for laboratory research, and optics-based communications systems that transmit greater volumes of information with better quality while increasing bandwidth. The comb technology also has potential for a generation of high-bandwidth electrical signals with possible applications in wireless communications and radar.

The light originates from a continuous wave laser, also called a single-frequency laser.

This is a very common type of laser; the intensity of this type of laser is constant, not pulsed. But in the microring the light is converted into a comb consisting of many frequencies with very nice equal spacing. The microring comb generator may serve as a competing technology to a special type of laser called a mode-locked laser, which generates many frequencies and short pulses. One advantage of the microrings is that they can be very small.

The laser light undergoes "nonlinear interaction" while inside the microring, generating a comb of new frequencies that is emitted out of the device through another optical fiber.

Fahmida Ferdous, Doctoral student told that the nonlinearity is critical to the generation of the comb with the nonlinearity a comb of many frequencies can be obtained including the original one, and the rest are new ones generated in the microring

Although other researchers previously have demonstrated the comb-generation technique, the team is the first to process the frequencies using "optical arbitrary waveform technology." The researchers were able to control the amplitude and phase of each spectral line, learning that there are two types of combs -- "highly coherent" and "partially coherent" -- opening up new avenues to study the physics of the process.

Ferdous told that future work will include efforts to create devices that have the proper frequency for commercial applications.

<http://www.purdue.edu>

Robots Learn to Handle Objects, understand New Places

In Cornell's Personal Robotics Laboratory, a team led by Ashutosh Saxena, assistant professor of computer science is teaching robots to manipulate objects and find their way around in new environments for example, to handle your particular set of dishes and put them in your particular dishwasher.

A common thread running through the research is "machine learning" -- programming a computer to observe events and find commonalities. With the right programming, for example, a computer can look at a wide array of cups, find their common characteristics and then be able to identify cups in the future. A similar process can teach a robot to find a cup's handle and grasp it correctly. Saxena's team has found that placing objects is harder than picking them up, because there are many options. A cup is placed upright on a table, but upside down in a dishwasher, so the robot must be trained to make those decisions.

Saxena explained that they just show the robot some examples and it learns to generalize the placing strategies and applies them to objects that were not seen before. It learns about stability and other criteria for good placing for plates and cups, and when it sees a new object, it applies them.

In early tests they placed a plate, mug, martini glass, bowl, candy cane, disc, spoon and tuning fork on a flat surface, on a hook, in a stemware holder, in a pen holder and on several different dish racks. Surveying its environment with a 3-D camera, the robot randomly tests small volumes of space as suitable locations for placement. For some objects it will test for "caging" the presence of vertical supports that would hold an object upright. It also gives priority to "preferred" locations: A plate goes flat on a table, but upright in a dishwasher.

After training, their robot placed most objects correctly 98 percent of the time when it had seen the objects and environments previously, and 95 percent of the time when working with new objects in a new environment. Performance could be improved by longer training.

The researchers trained a robot by giving it 24 office scenes and 28 home scenes in which they had labeled most objects. The computer examines such features as color, texture and what is



nearby and decides what characteristics all objects with the same label have in common. In a new environment, it compares each segment of its scan with the objects in its memory and chooses the ones with the best fit.

Saxena told that the novelty of this work is to learn the contextual relations in 3-D. For identifying a keyboard it may be easier to locate the monitors first, because the keyboards are found below the monitors.

In tests, the robot correctly identified objects about 83 percent of the time in home scenes and 88 percent in offices. In a final test, it successfully located a keyboard in an unfamiliar room. According to Saxena said, context gives this robot an advantage. The keyboard only shows up as a few pixels in the image, but the monitor is easily found, and the robot uses that information to locate the keyboard.

<http://www.cornell.edu>

Forthcoming Tech Events

International Conference on Sustainable Development

5-7 December, 2011

Putrajaya, Malaysia

www.ontariointernational.org

Food Security 2011

14-15 December, 2011

London, United Kingdom

www.chathamhouse.org

International Conference on Chemical, Ecology and Environmental Sciences (ICCEES'2011)

17-18 December, 2011

Pattaya, Thailand

<http://psrcentre.org>

International Conference on Chemical, Biological and Environmental Engineering

18-19 December, 2011

Bangalore, Karnataka, India

<http://www.interscience.ac.in>

International Conference on Ecological, Environmental and Biological Sciences (ICEEBS'2012)

7-8 January, 2012

Dubai, United Arab Emirates

<http://psrcentre.org>

International Conference on Electrical Energy and Networks (ICEEN 2012)

7-8 January, 2012

Chengdu, China

www.iceen.org

International Bhurban Conference on Applied Sciences & Technology

9-12 January, 2012

Islamabad, Pakistan

<http://events.hellotrader.com>

Oil & Gas Asia Exhibition & Conference

21-23-February, 2012

Karachi, Pakistan

<http://events.hellotrader.com/pakistan>

Tech & Trade Offers

Heat Exchangers

- Spiral and Flat Type Finned Tube Heat Exchanger Shell and Tube Heat Exchangers
- Tube Bundles & Tube Stacks
- Air Cooled Finned Tube Heat Exchangers Steam Finned Tube Exchangers
- Air Preheaters



Radiators

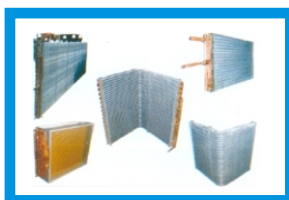


- Radiators for Earth Moving Machines
- Locomotives Radiators
- Radiators Assemblies & Cores
- Heavy Duty Radiator for Industrial Engines & OEM Replacement

- Heavy Duty Mechanical Bonded Tubes Radiators (MBTR)
- Industrial Radiators for Heavy Duty Diesel Engines & DG Sets

Coil Products

- Chilled Water
- Condenser (Air Cooled & Water Cooled)
Evaporator (DX)
- Hot Water
- Standard Distribution
- Tube in tube Coil
- OEM & Replacement Coils



Air Curtains (with Door Automation)



- Domestic Air Curtains
- Commercial Air Curtains
- Industrial Air Curtains
- As per customer requirements (Design Facility available)

Coil Industries (Pvt) Ltd.

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