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American Chemical Society

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ARTICLE #1 FOR IMMEDIATE RELEASE

Spinning a new role for CDs and CD players
Analytical Chemistry

CD-ROMs and DVDs and the hardware used to play these popular audio and video compact discs (CDs) have “enormous” potential as a new generation of portable, inexpensive instruments for home health monitoring and laboratory-based testing, scientists in Spain are reporting in the Oct. 15 issue of ACS’ Analytical Chemistry, a semi-monthly journal. CD technology could be adapted for tests ranging from the measurement of environmental toxins to at-home disease diagnosis, their report said.

In the study, Angel Maquieira and colleagues demonstrated technology that uses ordinary CDs and CD players as analytical tools with the potential for performing a range of key laboratory tests. As proof of principle, they developed a CD with a surface coating of so-called immunoassay materials and used it to identify three pesticides — 2,4,5-TP, chlorpyriphos, and metolachlor — placed on the disc. Upon spinning in a CD player with its standard laser light, the compounds caused changes in light intensity. A computer interpreted those changes and correctly named the compounds.

“The obtained results show the enormous prospective of compact discs in combination with CD players for multiresidue and drug discovery applications,” the article states. The researchers are currently working on ways to increase the sensitivity and versatility of the new technique.

ARTICLE #1 FOR IMMEDIATE RELEASE
“Microimmunoanalysis on Standard Compact Discs To Determine Low Abundant Compounds”

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ARTICLE #2 FOR IMMEDIATE RELEASE

Toward pure white light: Next-generation LEDs show bright promise
The Journal of Physical Chemistry (C)

Scientists in India are reporting an advance toward discovering a Holy Grail of the illumination industry — a white LED, a light-emitting diode that produces pure white light suitable for interior lighting of homes, offices and other buildings. Their study is in the Sept. 9 issue of ACS’ The Journal of Physical Chemistry C, a weekly publication.

In the report, D. D. Sarma and Angshuman Nag point out that practical versions of these so-called white LEDs would be brighter, longer-lasting and more energy efficient than conventional light sources such as incandescent and fluorescent lamps and could replace them in the future. However, scientists have faced several difficulties in developing pure white LEDs with all the requirements and desirable properties. Existing versions produce tinted, unstable shades of white light that mar their

performance.

The researchers report the first success in developing a new LED based on a new phosphor from semiconductor nanocrystals of cadmium sulfide mixed with manganese. It produces a stable shade of white light that remains constant over time and appears superior in overall performance in comparison to previous generations of white LEDs. The scientists now are working to boost its efficiency so that the white LED can be used in everyday applications.

ARTICLE #2 FOR IMMEDIATE RELEASE
“White Light from Mn2+-Doped CdS Nanocrystals: A New Approach"

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ARTICLE #3 FOR IMMEDIATE RELEASE

Pomegranate juice: Tart, trendy, and targeted on prostate cancer cells

Juice from the pomegranate shows promise for fighting prostate cancer. Click here for more information.

Journal of Agricultural and Food Chemistry Researchers in California are reporting new evidence explaining pomegranate juice’s mysterious beneficial effects in fighting prostate cancer. In a study scheduled for the Sept. 19 issue of ACS’ Journal of Agricultural and Food Chemistry, a bi-weekly publication, Navindra Seeram and colleagues have found that the tart, trendy beverage also uses a search-and-destroy strategy to target prostate cancer cells.

In previous research, Seeram’s group found that pomegranate juice consumption had a beneficial effect for prostate cancer patients with rising prostate-specific antigen (PSA) levels. Such increases in PSA signal that the cancer is progressing, “doubling time” a key indicator of prognosis. Men whose PSA levels double in a short period are more likely to die from their cancer. Pomegranate juice increased doubling times by almost fourfold.

In the new study, they researchers discovered evidence in laboratory experiments that pomegranate works in a “seek and destroy” fashion. On consumption, ellagitannins (ET), antioxidants abundant in pomegranate juice, break down to metabolites known as urolithins. The researchers showed that the urolithins concentrate at high levels in prostate tissue after being given orally and by injection to mice with prostate cancer. They also showed that urolithins inhibited the growth of human prostate cancer cells in cell culture.

“The chemopreventive potential of pomegranate ellagitannins and localization of their bioactive metabolites in mouse prostate tissue suggest that pomegranate may play a role in prostate cancer treatment and chemoprevention,” the researchers state, recommending further clinical studies with pomegranate and prostate cancer patients.

ARTICLE #3 FOR IMMEDIATE RELEASE
“Pomegranate Ellagitannin-Derived Metabolites Inhibit Prostate Cancer Growth and Localize to the Mouse Prostate Gland”

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ARTICLE #4 FOR IMMEDIATE RELEASE

Printing with enzymes instead of ink
Journal of Organic Chemistry

With all the advances in printing technology in recent years, the latest may rise to the top of a list that would make Gutenberg gasp. Scientists in North Carolina are reporting development and testing of a method for printing finely-detailed microscopic images with an enzyme, rather than ink. The report is scheduled for the Sept. 24 issue of ACS' Journal of Organic Chemistry, a bi-weekly publication.

In the study, Eric J. Toone and Robert L. Clark and colleagues point out that so-called microcontact printing has found wide application for rapidly transferring high-resolution images onto large surfaces. But current nanoprinting technology relies on the diffusion of ink, and cannot reproduce details smaller than one hundred nanometers in diameter—about 400 times smaller than the width of a human hair.

The new technology, termed biocatalytic microcontact printing, involves coating a nano-"stamp" with an enzyme — a protein that speeds up chemical reactions.

The enzyme then digests away a layer on the surface, leaving behind an imprint almost like an old-fashioned rubber stamp. Because no diffusion of ink is involved in the process, the resolution of microcontact printed images is about one hundredfold greater than possible with conventional technology. The technique may point the way toward faster, less expensive methods of nanolithography, which could be used to create complex structures for micromachines, biosensors, and other nanoscale devices, the researchers suggest.

Article #4 FOR IMMEDIATE RELEASE
"Biocatalytic Microcontact Printing"

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ARTICLE #5 EMBARGOED FOR 9 A.M., EASTERN TIME, Sept. 24, 2007

Drug-resistant tuberculosis rises, but new treatments in the pipeline
Chemical & Engineering News

An arsenal of promising new medications, vaccines, and diagnostic tests are moving toward the global battlefield that pits medicine against drug-resistant tuberculosis (TB), which is claiming a terrible toll,

particularly in HIV-infected individuals, according to an article [http://pubs.acs.org/cen/coverstory/85/8539cover.html] scheduled for the Sept. 24 issue of Chemical & Engineering News, ACS' weekly newsmagazine.

In the cover feature, C&EN senior correspondent Ann Thayer and assistant editor Carmen Drahl describe far-ranging efforts underway to develop new TB diagnostic tests and treatments. For years, conventional treatments for TB had slowed the spread of the disease, but the emergence of new drug-resistant strains has reduced the effectiveness of those medications. Researchers are developing more accurate diagnostic tests, new drugs to fight multidrug resistant strains, and ones that are more compatible with individuals who are undergoing treatment for HIV. Scientists are also developing more effective vaccines, including those that might show promise for both preventing and treating the disease, Thayer notes.

"In the past five years or so, the TB drug pipeline has shifted from nearly empty to having about 30 compounds under investigation; several are in early clinical testing," Thayer writes.

ARTICLE #5 EMBARGOED FOR 9 A.M., EASTERN TIME, Sept. 24, 2007
"Taking Down TB"

This story will be available on Sept. 24 at:
http://pubs.acs.org/cen/coverstory/85/8539cover.html

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FOR WIRED READERS

Science Elements: An ACS Podcast
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The ACS Office of Communications is podcasting PressPac contents in order to make cutting-edge scientific discoveries from ACS journals available to a broad public audience at no charge. Science Elements includes selected content from ACS' prestigious suite of 36 peer-reviewed scientific journals and Chemical & Engineering News, ACS' weekly news magazine. Those journals, published by the world's largest scientific society, contain about 30,000 scientific reports from scientists around the world each year. The reports include discoveries in medicine, health, nutrition, energy, the environment and other fields that span science's horizons from astronomy to zoology. Podcaster for Science Elements is Steve Showalter, Ph.D., a chemist at the U. S. Department of Energy's Sandia National Laboratories in Albuquerque, New Mexico, and ACS member.

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JOURNALISTS' RESOURCES

Press releases and more from ACS 234th national meeting
Aug. 19-23, 2007

A treasure trove of news sources, background material, and story ideas is available from the ACS' latest National Meeting. Reporters can view press releases; search an archive with abstracts of 9,500

scientific presentations and 1,000 non-technical summaries of those presentations; and access other resources at:

http://www.acspresscenter.org/index.php

ACS' Latest Annual Report

The 2006 ACS annual report, A New Vision at Work, can be a valuable resource for journalists trying to keep pace with chemistry and the multiple fields of science that involve chemistry. The report features a series of commentaries by chemists, including Nobel Laureate Robert H. Grubbs, on chemistry's role in working toward better medications, more nutritious food, sources of renewable energy, and other innovations. The newly published report is available for reading and downloading at: www.chemistry.org/2006annualreport.html

General Chemistry Glossary
http://antoine.frostburg.edu/chem/senese/101/glossary.shtml

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