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|  http://images.magnetmail.net/images/clients/ACS/MushroomsiStock000012032454MediumHIRES.jpgScientists have found that a new commercial processing technology is suitable for boosting the vitamin D content of mushrooms and has no adverse effects on other nutrients.Credit: iStock  |

A new commercial processing technology is suitable for boosting the vitamin D content of mushrooms and has no adverse effects on other nutrients in those tasty delicacies, the first study on the topic has concluded. The technology, which involves exposing mushrooms to the same kind of ultraviolet light that produces suntans, can greatly boost mushrooms’ vitamin D content. It appears in ACS’ Journal of Agricultural and Food Chemistry.Ryan Simon and colleagues note that many people do not get enough vitamin D in their diets. Few natural foods are high in the vitamin, and there are limits on what foods can be fortified to boost the vitamin D content. Although few people realize it, mushrooms are an excellent natural source of vitamin D. Some producers have embraced results of earlier studies, suggesting that exposing mushrooms to ultraviolet B (UVB) light can significantly boost the vitamin D content.The scientists set out to answer several questions about commercial-scale UV light processing of mushrooms. Among them: Does it produce consistently high levels of vitamin D and does it adversely affect other nutrients in mushrooms? They compared button mushrooms exposed to UVB light, those exposed to natural sunlight and those kept in the dark. The UVB-exposed mushrooms got a dramatic boost in vitamin D (700 percent more of the vitamin than those mushrooms exposed to no light) and the UVB processing had no effect on levels of vitamin C, folate, riboflavin, niacin and a host of other essential nutrients.The authors acknowledge funding from the [U.S. Mushroom Council](http://paracom.paramountcommunication.com/ct/6654731%3A9754024817%3Am%3A1%3A195942604%3AF14AEC2BC6FC09B7FA2BAF4065CAE9D0%3Ar).

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|  http://images.magnetmail.net/images/clients/ACS/9711AgandFoodcoverLOWRES.jpg[Click here](http://paracom.paramountcommunication.com/ct/6654732%3A9754024817%3Am%3A1%3A195942604%3AF14AEC2BC6FC09B7FA2BAF4065CAE9D0%3Ar) for high-resolution image |

ARTICLE #1 **FOR IMMEDIATE RELEASE**“Vitamin D Mushrooms: Comparison of the Composition of Button Mushrooms (Agaricus bisporus) Treated Postharvest with UVB Light or Sunlight”[DOWNLOAD FULL TEXT ARTICLE](http://paracom.paramountcommunication.com/ct/6654733%3A9754024817%3Am%3A1%3A195942604%3AF14AEC2BC6FC09B7FA2BAF4065CAE9D0%3Ar) CONTACT:Ryan Simon, M.Sc.Cantox Health Sciences InternationalOntario, CanadaPhone: (905) 542-2900Fax: (905) 542-1011E-mail: rsimon@cantox.com [To Top](#top)http://images.magnetmail.net/images/clients/ACS/goldline.gifARTICLE #2 **FOR IMMEDIATE RELEASE****“TF beacons” may light path to new cancer tests and drugs**Journal of the American Chemical Society

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|  http://images.magnetmail.net/images/clients/ACS/9711GeneadvanceCOVERLOWRES(1).jpgNewly developed fluorescent sensors called “TF beacons” may have multiple uses in diagnosing cancer, searching for new cancer drugs, and other areas. Credit: Peter Allen, University of California, Santa Barbara |

Scientists are reporting development of a long-sought new way to detect the activity of proteins that bind to the DNA in genes, often controlling the activity of genes in ways that make cells do everything from growing normally to becoming cancerous. Their report appears in the Journal of the American Chemical Society. Kevin Plaxco, Francesco Ricci and colleagues note that more than 10 percent of the 25,000-30,000 genes in the human body contain instructions for manufacturing these so-called DNA-binding proteins. Most of these proteins are master regulators called transcription factors (TFs). They start or stop the first step in the process in which gene's instructions are put into action. TFs bind to DNA and turn genes on or off. Understanding and measuring the activity of TFs is important because they are involved in health and disease, with many linked to cancers, for instance. With existing ways of detecting the activity of TFs being slow and cumbersome, the scientists set out to overcome that barrier.The scientists describe development and successful tests of fluorescent sensors that they term "transcription factor beacons." The beacons signal the activity and concentration of TFs directly in biological samples by switching from a dark state to a fluorescent state upon binding to their specific TF. Using TF Beacons is simpler and works faster than current methods, and the scientists say TF beacons may have multiple uses in diagnosing cancer, searching for new cancer drugs and other areas.

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|  http://images.magnetmail.net/images/clients/ACS/9711JACScoverLOWRES.jpg[Click here](http://paracom.paramountcommunication.com/ct/6654734%3A9754024817%3Am%3A1%3A195942604%3AF14AEC2BC6FC09B7FA2BAF4065CAE9D0%3Ar) for high-resolution image |

ARTICLE #2 FOR IMMEDIATE RELEASE“Transcription factor beacons for the quantitative detection of DNA binding activity”[DOWNLOAD FULL TEXT ARTICLE](http://paracom.paramountcommunication.com/ct/6654735%3A9754024817%3Am%3A1%3A195942604%3AF14AEC2BC6FC09B7FA2BAF4065CAE9D0%3Ar) CONTACT:Kevin W. Plaxco, Ph.D.University of California, Santa BarbaraSanta Barbara, CA 93106Phone: 805-893- 5558Fax: 805-893- 4120Email: kwp@chem.ucsb.eduOrFrancesco Ricci, Ph.D.University of Rome Tor VergataRome, ItalyEmail: francesco.ricci@uniroma2.it [To Top](#top)http://images.magnetmail.net/images/clients/ACS/goldline.gif ARTICLE #3 **FOR IMMEDIATE RELEASENew type of solar cell retains high efficiency for long periods**Journal of the American Chemical Society

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|  http://images.magnetmail.net/images/clients/ACS/SolarCellconceptiStockLOWRES.jpgA type of solar cell breaks the double-digit barrier in efficiency and has other advantages over traditional solar cells. Credit: iStock  |

Scientists from the University of Picardie Jules Verne and the Swiss Federal Institute of Technology are reporting development of a new genre of an electrolyte system for solar cells that breaks the double-digit barrier in the efficiency with which the devices convert sunlight into electricity. Their study appears in Journal of the American Chemical Society.Frederic Sauvage, Michael Graetzel and colleagues describe research that aimed to develop an improved version of a highly promising solar cell that is less expensive than conventional solar cells made from the semi-conductor material, silicon. These so-called dye-sensitized solar cells (DSCs), or Graetzel cells (named for the discoverer, Michael Graetzel), have other advantages. They can be manufactured in light-weight flexible sheets, for instance, that are more durable and suitable for roll-up applications such as window shades. Hindering commercial use of DSCs has been their lack of stability, with the electricity output tending to decline over time.The new study reports development and successful lab tests of a new electrolyte composition suitable for the DSC, constructed with different material that is both stable and has a relatively high efficiency of 10 percent. It has an improved electrolyte system, the substance that conducted electricity inside the solar cell. The new device retained at least 95 percent of that sun-converting ability for 1,000 hours of testing.The authors acknowledge funding from the [European Commission](http://paracom.paramountcommunication.com/ct/6654736%3A9754024817%3Am%3A1%3A195942604%3AF14AEC2BC6FC09B7FA2BAF4065CAE9D0%3Ar) and the [Swiss National Science Foundation](http://paracom.paramountcommunication.com/ct/6654737%3A9754024817%3Am%3A1%3A195942604%3AF14AEC2BC6FC09B7FA2BAF4065CAE9D0%3Ar).

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|  http://images.magnetmail.net/images/clients/ACS/9711JACScoverLOWRES(1).jpg[Click here](http://paracom.paramountcommunication.com/ct/6654738%3A9754024817%3Am%3A1%3A195942604%3AF14AEC2BC6FC09B7FA2BAF4065CAE9D0%3Ar) for high-resolution image |

ARTICLE #3 **FOR IMMEDIATE RELEASE**“Butyronitrile-based electrolyte for dye-sensitized solar cells”[DOWNLOAD FULL TEXT ARTICLE](http://paracom.paramountcommunication.com/ct/6654739%3A9754024817%3Am%3A1%3A195942604%3AF14AEC2BC6FC09B7FA2BAF4065CAE9D0%3Ar) CONTACT:Michael Graetzel, Ph.D.Ecole Polytechnique Federale de LausanneLausanne, SwitzerlandTel: +41 (0)21 693 31 12Fax: +41 (0)21 693 61 00Email: Michael.graetzel@epfl.chOrFrederic Sauvage, Ph.D.Universite de Picardie Jules VerneCNRSAmiens Cedex, FrancePhone: 03 22 82 7 9 71Fax: 03 22 82 75 90Email: Frederic.sauvage@u-picardie.fr [To Top](#top)http://images.magnetmail.net/images/clients/ACS/goldline.gif ARTICLE #4 **FOR IMMEDIATE RELEASE: A PressPac Instant Replay\*Progress in tissue engineering to repair joint damage in osteoarthritis**Molecular Pharmaceutics

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|  http://images.magnetmail.net/images/clients/ACS/6811XrayofArthriticHandsiStockLOWRES(1).jpgScientists are reporting new evidence that damaged cartilage tissue in osteoarthritis and other painful joint disorders can be encouraged to regrow and regenerate. Credit: iStock |

Medical scientists now have “clear” evidence that the damaged cartilage tissue in osteoarthritis and other painful joint disorders can be encouraged to regrow and regenerate, and are developing tissue engineering technology that could help millions of patients with those disorders. That’s the conclusion of a new analysis of almost 100 scientific studies on the topic, published in ACS’s journal Molecular Pharmaceutics.Tong Cao, Wei Seong Toh and colleagues point out that damage to so-called articular cartilage — the smooth, white, rubbery tissue that covers and cushions the ends of bones in joints — is one of the most challenging problems in medicine. That’s because the tissue lacks blood vessels and has little ability to repair itself and regrow. Wear-and-tear damage thus builds up over the years, resulting in conditions like osteoarthritis, which affects 27 million people in the United States alone. Osteoarthritis is a fast-growing public health problem because of the world’s aging population and because of a sharp increase in obesity, which increases wear on joint cartilage. To assess progress toward medical use of tissue engineering to treat joint damage, the researchers scanned global research on the topic.They found that scientists have developed many new tissue engineering methods, including implantation of so-called “scaffolds” made of biomaterials that mimic cartilage matrix in the body. The scaffolds could guide the transplanted cells, orchestrate the host cell response, and provide structures and microenvironment substances to help rebuild cartilage at the injury site. “In summary, there is promise in future research involving the development of multi-functional biomaterial delivery systems that affect cartilage tissue regeneration on multiple levels,” the article states.The authors acknowledge funding from the [Agency for Science, Technology and Research Singapore](http://paracom.paramountcommunication.com/ct/6654740%3A9754024817%3Am%3A1%3A195942604%3AF14AEC2BC6FC09B7FA2BAF4065CAE9D0%3Ar) and the [U.S. Department of Veterans Affairs](http://paracom.paramountcommunication.com/ct/6654741%3A9754024817%3Am%3A1%3A195942604%3AF14AEC2BC6FC09B7FA2BAF4065CAE9D0%3Ar).

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|  http://images.magnetmail.net/images/clients/ACS/6811MolecularPharmaceuticsLOWRES(1).jpg[Click here](http://paracom.paramountcommunication.com/ct/6654742%3A9754024817%3Am%3A1%3A195942604%3AF14AEC2BC6FC09B7FA2BAF4065CAE9D0%3Ar) for high-resolution image |

ARTICLE #4 **FOR IMMEDIATE RELEASE**“Biomaterial-mediated delivery of microenvironmental cues for repair and regeneration of articular cartilage”[DOWNLOAD FULL TEXT ARTICLE](http://paracom.paramountcommunication.com/ct/6654743%3A9754024817%3Am%3A1%3A195942604%3AF14AEC2BC6FC09B7FA2BAF4065CAE9D0%3Ar)CONTACT:Tong Cao, Ph.D., DDSNational University of SingaporeSingapore 119083Phone: +65-6772-6845Fax: +65-6778-5742E-mail: tong\_cao@nuhs.edu.sg **\* A previous PressPac item that you may have missed**  [To Top](#top)http://images.magnetmail.net/images/clients/ACS/goldline.gifARTICLE #5 **FOR IMMEDIATE RELEASE****Boom in fracking for oil and gas recovery sparks new technology**Chemical & Engineering News

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| http://images.magnetmail.net/images/clients/ACS/08936-cover.jpg[Click here for high-resolution image.](http://paracom.paramountcommunication.com/ct/6654744%3A9754024817%3Am%3A1%3A195942604%3AF14AEC2BC6FC09B7FA2BAF4065CAE9D0%3Ar) |

With a technology called “fracking” sparking energy booms — and controversy — worldwide, Chemical & Engineering News (C&EN) describes advances in the workhorse materials used to produce oil and gas from previously inaccessible deposits deep below Earth’s surface. C&EN is the American Chemical Society’s weekly newsmagazine. In the article in C&EN’s current edition, Senior Business Editor Melody M. Bomgardner explains that fracking or hydraulic fracturing involves pumping massive amounts of grainy substances, called proppants, down oil or natural gas wells. Proppants enable production from rock formations 10,000 or 20,000 feet below the surface. To access the oil and gas in these deposits, they need to be fractured open with a mixture of fluid and proppants pumped down wells under high pressure. The grains literally prop up the fissures in these rocks so that oil and gas can flow to the surface.The article describes development of a new genre of proppants to meet the needs of today’s drillers. For wells that reach more than a mile down, drillers may need 10 million to 20 million pounds of proppants to get oil or natural gas flowing. Drilling companies are going after more-difficult-to-access reserves of oil and gas that require tougher proppants. Some of the new materials, for instance, use high-tech ceramics like those used in aerospace and military applications or sand with each particle coated with curable resins. ARTICLE #5 **FOR IMMEDIATE RELEASE**"Proppant Progress"This story is available at:[http://pubs.acs.org/cen/business/89/8936bus3.html](http://paracom.paramountcommunication.com/ct/6654745%3A9754024817%3Am%3A1%3A195942604%3AF14AEC2BC6FC09B7FA2BAF4065CAE9D0%3Ar)[To Top](#top)http://images.magnetmail.net/images/clients/ACS/goldline.gif **Journalists’ Resources****Press releases, briefings, and more from ACS’ 242nd National Meeting**[www.eurekalert.org/acsmeet.php](http://paracom.paramountcommunication.com/ct/6654746%3A9754024817%3Am%3A1%3A195942604%3AF14AEC2BC6FC09B7FA2BAF4065CAE9D0%3Ar) [http://www.ustream.tv/channel/acslive](http://paracom.paramountcommunication.com/ct/6654747%3A9754024817%3Am%3A1%3A195942604%3AF14AEC2BC6FC09B7FA2BAF4065CAE9D0%3Ar) **Inside Science News Service**For thoroughly enjoyable multimedia coverage of the science behind the news — a valuable resource for journalists and news media organizations everywhere. [Click here](http://paracom.paramountcommunication.com/ct/6654748%3A9754024817%3Am%3A1%3A195942604%3AF14AEC2BC6FC09B7FA2BAF4065CAE9D0%3Ar) to visit the Inside Science News website.**Must-reads from C&EN: Cancer-Fighting Viruses**Doctors have known for more than a century that some viruses have an amazing ability to kill cancer cells. Now these healing viruses are being tested in the clinical trials needed to see if this new approach can be used in everyday medicine. For the full story, contact Michael Bernstein at m\_bernstein@acs.org. **ACS Pressroom Blog** The ACS Office of Public Affairs' [pressroom blog](http://paracom.paramountcommunication.com/ct/6654749%3A9754024817%3Am%3A1%3A195942604%3AF14AEC2BC6FC09B7FA2BAF4065CAE9D0%3Ar) highlights research from ACS’ 39 peer-reviewed journals and National Meetings. **Bytesize Science Blog** Educators and kids, put on your thinking caps: The American Chemical Society has [a blog for Bytesize Science](http://paracom.paramountcommunication.com/ct/6654750%3A9754024817%3Am%3A1%3A195942604%3AF14AEC2BC6FC09B7FA2BAF4065CAE9D0%3Ar), a science podcast for kids of all ages.  **ACS Satellite Pressroom: Daily news blasts on Twitter** The satellite press room has become one of the most popular science news sites on Twitter. To get our news blasts and updates, create a free account at [https://twitter.com/signup](http://paracom.paramountcommunication.com/ct/6654751%3A9754024817%3Am%3A1%3A195942604%3AF14AEC2BC6FC09B7FA2BAF4065CAE9D0%3Ar). Then visit [http://twitter.com/ACSpressroom](http://paracom.paramountcommunication.com/ct/6654752%3A9754024817%3Am%3A1%3A195942604%3AF14AEC2BC6FC09B7FA2BAF4065CAE9D0%3Ar) and click the ‘join’ button beneath the press room logo. **C&EN on Twitter**Follow @cenmag <[http://twitter.com/cenmag](http://paracom.paramountcommunication.com/ct/6654753%3A9754024817%3Am%3A1%3A195942604%3AF14AEC2BC6FC09B7FA2BAF4065CAE9D0%3Ar)> for the latest news in chemistry and dispatches from our blog, C&ENtral Science <[http://centralscience.org](http://paracom.paramountcommunication.com/ct/6654754%3A9754024817%3Am%3A1%3A195942604%3AF14AEC2BC6FC09B7FA2BAF4065CAE9D0%3Ar)>.**ACS Press Releases** [Press releases](http://paracom.paramountcommunication.com/ct/6654755%3A9754024817%3Am%3A1%3A195942604%3AF14AEC2BC6FC09B7FA2BAF4065CAE9D0%3Ar) on a variety of chemistry-related topics.**International Year of Chemistry** The 63rd General Assembly of the United Nations proclaimed 2011 the International Year of Chemistry (IYC-2011) to increase global recognition of how http://images.magnetmail.net/images/clients/ACS/IYC(1).jpgchemistry and related sciences contribute to everyday life and the future. [ACS’ IYC site](http://paracom.paramountcommunication.com/ct/6654756%3A9754024817%3Am%3A1%3A195942604%3AF14AEC2BC6FC09B7FA2BAF4065CAE9D0%3Ar) is a gateway for information on the global celebration of chemistry and its role in other sciences, literally from astronomy to zoology.[To Top](#top)http://images.magnetmail.net/images/clients/acs/goldline.gif**ACS Videos**The American Chemical Society encourages news organizations, museums, educational organizations, and other web sites to embed links to these videos.**Spellbound: How Kids Became Scientists**

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The road to a Nobel Prize began for one scientist in elementary school when his father placed a sign on his bedroom door proclaiming him to be a “doctor.” This is just one of the many experiences that helped launch the careers of scientists from diverse backgrounds who are featured in a new ACS video series called [Spellbound: How Kids Became Scientists](http://paracom.paramountcommunication.com/ct/6654757%3A9754024817%3Am%3A1%3A195942604%3AF14AEC2BC6FC09B7FA2BAF4065CAE9D0%3Ar). **First Living, Dancing Periodic Table of the Elements**http://images.magnetmail.net/images/clients/ACS/Dancescreenshot(1).jpgThat famous chart displaying the chemical elements that make up everything on Earth — a fixture on the walls of classrooms and labs — literally comes alive in this new video from the American Chemical Society (ACS). [Chemists Can Dance!](http://paracom.paramountcommunication.com/ct/6654758%3A9754024817%3Am%3A1%3A195942604%3AF14AEC2BC6FC09B7FA2BAF4065CAE9D0%3Ar) features scores of chemists wearing symbols representing the elements, kicking up their heels to the tune of an original rap song. It's all part of ACS's celebration of the International Year of Chemistry. Check out the fun and share the link.**Prized Science: Taming the Red Tides**The latest episode in the American Chemical Society’s new video series, Prized Science: How the Science Behind ACS Awards Impacts Your Life, focuses on the quest http://images.magnetmail.net/images/clients/ACS/PrizedScienceEp4(1).jpgto cure a terrible form of food poisoning caused by population explosions of algae that stain the water red and produce a potent toxin. Entitled “Taming the Red Tides,” the high-definition video focuses on Michael Crimmins, Ph.D., winner of the 2010 Ernest Guenther Award in the Chemistry of Natural Products. The series is available at the [Prized Science](http://paracom.paramountcommunication.com/ct/6654759%3A9754024817%3Am%3A1%3A195942604%3AF14AEC2BC6FC09B7FA2BAF4065CAE9D0%3Ar) website, [YouTube](http://paracom.paramountcommunication.com/ct/6654760%3A9754024817%3Am%3A1%3A195942604%3AF14AEC2BC6FC09B7FA2BAF4065CAE9D0%3Ar), [iTunes](http://paracom.paramountcommunication.com/ct/6654761%3A9754024817%3Am%3A1%3A195942604%3AF14AEC2BC6FC09B7FA2BAF4065CAE9D0%3Ar) and on DVD. **A Day Without Chemistry** Imagine a day without cars, electric lights, TV, telephones, safe food, and water, medicine, clothing, your house, and thousands of other familiar objects that make up modern society. Do it, and you are imagining a day in a world without chemistry. ACS explores that thought-provoking premise in a new high-definition video released as part of the celebration of the International Year of Chemistry. [A Day Without Chemistry](http://paracom.paramountcommunication.com/ct/6654762%3A9754024817%3Am%3A1%3A195942604%3AF14AEC2BC6FC09B7FA2BAF4065CAE9D0%3Ar) follows a person who sees more and more everyday necessities and conveniences disappear before his widening eyes.[The Chemistry of Sourdough Bread](http://paracom.paramountcommunication.com/ct/6654763%3A9754024817%3Am%3A1%3A195942604%3AF14AEC2BC6FC09B7FA2BAF4065CAE9D0%3Ar)[The Chemistry of Fireworks](http://paracom.paramountcommunication.com/ct/6654764%3A9754024817%3Am%3A1%3A195942604%3AF14AEC2BC6FC09B7FA2BAF4065CAE9D0%3Ar)[The Chemistry of Grilling and Barbecuing](http://paracom.paramountcommunication.com/ct/6654765%3A9754024817%3Am%3A1%3A195942604%3AF14AEC2BC6FC09B7FA2BAF4065CAE9D0%3Ar) [To Top](#top)  http://images.magnetmail.net/images/clients/ACS/goldline.gif**ACS Podcasts**

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