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| http://images.magnetmail.net/images/clients/ACS/060612PillsIstock_thumb.jpgOne million billion billion billion billion billion billion: The number of new drugs awaiting discoveryCredit: iStock |

A new voyage into “chemical space” – occupied not by stars and planets but substances that could become useful in everyday life – has concluded that scientists have synthesized barely one tenth of 1 percent of the potential medicines that could be made. The report, in the journal ACS Chemical Neuroscience, estimates that the actual number of these so-called “small molecules” could be 1 novemdecillion (that’s 1 with 60 zeroes), 1 million billion billion billion billion billion billion, which is more than some estimates of the number of stars in the universe.Jean-Louis Reymond and Mahendra Awale explain that small molecules, which are able to cross cell walls and interact with biological molecules in the body, are prime targets for scientists who develop new medicines. Most existing medications are small molecules. The authors focused on the “chemical space” inhabited by all of the small molecules that could possibly exist according to the laws of physics and chemistry. Researchers have identified millions of these compounds – the ACS’ Chemical Abstracts Service database contains almost 67 million substances. Reymond and Awale estimate that the molecules synthesized and tested as potential drugs so far represent less than 0.1 percent of chemical space. To aid researchers looking for new ways to prevent and treat disease, they set out to find the best ways to search for new small molecules.The authors discuss several ways of getting a handle on chemical space, including by the size, shape and makeup of molecules. They show how computers can help researchers efficiently narrow a search for a new drug candidate. Computer modeling of chemical interactions can help researchers find a handful of promising molecules to synthesize and test in the lab. “Small molecule drugs are essential to the success of modern medicine,” the authors note, and suggest that their methods may be particularly useful for finding new pharmaceuticals that target the central nervous system.The authors acknowledge funding from the [University of Berne](http://www.mmsend88.com/link.cfm?r=800557068&sid=19178629&m=1949302&u=ACS&j=10493865&s=http://www.unibe.ch/eng/), the [Swiss National Science Foundation](http://www.mmsend88.com/link.cfm?r=800557068&sid=19178630&m=1949302&u=ACS&j=10493865&s=http://www.snf.ch/E/Pages/default.aspx) and the [NCCR TransCure](http://www.mmsend88.com/link.cfm?r=800557068&sid=19178631&m=1949302&u=ACS&j=10493865&s=http://www.transcure.org/).

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| http://images.magnetmail.net/images/clients/ACS/060612ACSCN_thumb.jpg[Click here](http://www.mmsend88.com/link.cfm?r=800557068&sid=19178632&m=1949302&u=ACS&j=10493865&s=http://web.1.c2.audiovideoweb.com/1c2web3536/060612acscn.jpg) for high-resolution image |

ARTICLE #1 **FOR IMMEDIATE RELEASE**“Exploring Chemical Space for Drug Discovery Using the Chemical Universe Database”[DOWNLOAD FULL TEXT ARTICLE](http://www.mmsend88.com/link.cfm?r=800557068&sid=19178633&m=1949302&u=ACS&j=10493865&s=http://pubs.acs.org/stoken/presspac/presspac/full/10.1021/cn3000422) CONTACT:Jean-Louis Reymond, Ph.D.University of BerneBerne, Switzerland 3012Fax: + 41 31 631 80 57Email: jean-louis.reymond@ioc.unibe.ch  [To Top](#top)http://images.magnetmail.net/images/clients/ACS/goldline.gifARTICLE #2 **FOR IMMEDIATE RELEASE****New secrets from “Bay of the Pirates” warship that sunk 2,300 years ago**Analytical Chemistry

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| http://images.magnetmail.net/images/clients/ACS/060612BiremeIstock_thumb.jpgNew secrets from “Bay of the Pirates” warship that sunk 2,300 years agoCredit: iStock |

A new study puts some finishing touches on the 2,300-year history of the beak-like weapon that an ancient warship used to ram enemy ships in the First Punic War, the conflict between ancient Rome and Carthage. The report, in ACS’ journal Analytical Chemistry, also identifies a major threat that conservators must address in preserving this archaeological treasure for future generations. Patrick Frank and colleagues explain that the ram, called a rostrum, was found in 2008 under 22 feet of water, 150 feet offshore from Acqualadrone (which means “Bay of the Pirates”) in northeastern Sicily. The Acqualadrone rostrum is bronze, with a wooden core that was preserved because of burial beneath the seafloor. Carbon-14 dating suggests that the warship sank around 260 B.C. after being damaged in the battle of Mylae during the opening stages of the First Punic War, which may have been among the largest wars of its time. Earlier research localized the metals in the bronze to mines in Spain or Cyprus. The authors, from the SLAC National Accelerator Laboratory at Stanford University and the University of Palermo, set out in the new research to learn more about the origin and condition of the rostrum wood.Their analysis of the acids and other substances in the wood showed that the strutwork of the Acqualadrone rostrum was pine, waterproofed with pine tar. Other woods, like juniper and oak, and other ancient marine sealants, like beeswax, were ruled out. Importantly, the research found copious sulfur in the wood that could turn into sulfuric acid, an extremely corrosive substance. Sulfuric acid is known to appear in recovered wooden marine archaeological treasures and can threaten their existence. The authors argue that iron and copper permeating the wood may catalyze that transformation, but they suggest that removing ozone from museum air could slow the conversion.The authors acknowledge funding from the [Department of Energy Office of Science](http://www.mmsend88.com/link.cfm?r=800557068&sid=19178634&m=1949302&u=ACS&j=10493865&s=http://science.energy.gov/), [Department of Energy Office of Biological and Environmental Research](http://www.mmsend88.com/link.cfm?r=800557068&sid=19178635&m=1949302&u=ACS&j=10493865&s=http://science.energy.gov/ber/), the [National Institute of General Medical Sciences](http://www.mmsend88.com/link.cfm?r=800557068&sid=19178636&m=1949302&u=ACS&j=10493865&s=http://www.nigms.nih.gov/), the [National Center for Research Resources](http://www.mmsend88.com/link.cfm?r=800557068&sid=19178637&m=1949302&u=ACS&j=10493865&s=http://www.nih.gov/about/almanac/organization/NCRR.htm) and the [National Institutes of Health](http://www.mmsend88.com/link.cfm?r=800557068&sid=19178638&m=1949302&u=ACS&j=10493865&s=http://www.nih.gov/).

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| http://images.magnetmail.net/images/clients/ACS/053012AnaChem_thumb.jpg[Click here](http://www.mmsend88.com/link.cfm?r=800557068&sid=19178639&m=1949302&u=ACS&j=10493865&s=http://web.1.c2.audiovideoweb.com/1c2web3536/060612anachem.jpg) for high-resolution image |

ARTICLE #2 **FOR IMMEDIATE RELEASE**“Ancient Wood of the Acqualadrone Rostrum: Materials History through Gas Chromatography/Mass Spectrometry and Sulfur X-ray Absorption Spectroscopy”[DOWNLOAD FULL TEXT ARTICLE](http://www.mmsend88.com/link.cfm?r=800557068&sid=19178640&m=1949302&u=ACS&j=10493865&s=http://pubs.acs.org/stoken/presspac/presspac/full/10.1021/ac3001258)CONTACT:Patrick Frank, Ph.D.Stanford UniversityStanford, Calif. 94305E-mail: pfrank@slac.stanford.edu  [To Top](#top)http://images.magnetmail.net/images/clients/ACS/goldline.gifARTICLE #3 **FOR IMMEDIATE RELEASENew technique for detecting mold contamination in homes and other buildings**Environmental Science & Technology

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| http://images.magnetmail.net/images/clients/ACS/060612MoldIstock.jpgNew technique for detecting mold contamination in homes and other buildingsCredit: iStock |

With mold contamination of homes an ongoing concern – and a special threat to the 2.5 million foreclosed houses in the U.S., shuttered with little ventilation – scientists are reporting a new method to detect and identify low levels of airborne mold. The report, which describes a simple, fast method that could provide an early indication of potential contamination, appears in ACS’ journal Environmental Science & Technology.Sutapa Ghosal and colleagues indicate that mold contamination of homes, especially after water damage from storms and floods, is an ongoing concern. Although most molds are harmless, scientists have linked some with health risks to humans. Traditional methods for detecting mold contamination involve identifying the spores that mold release into the air. Those tests are labor- and time-intensive, often requiring that the mold grow in the laboratory. Moreover, not every mold can grow under these conditions. That’s why the researchers have sought to develop a fast and easy method that can reliably detect and identify low levels of airborne mold – even single spores.The scientists describe a new method, which involves collecting air samples on a piece of commercially available aluminum foil, and then analyzing the spores with a technique called Raman microspectroscopy (RMS). They used the method to detect and identify single spores from seven common types of mold. The team says that use of the new test could help with many problems in the public health, forensics sciences and environmental fields.

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| http://images.magnetmail.net/images/clients/ACS/053012EST_thumb.jpg[Click here](http://www.mmsend88.com/link.cfm?r=800557068&sid=19178642&m=1949302&u=ACS&j=10493865&s=http://web.1.c2.audiovideoweb.com/1c2web3536/060612est.jpg) for high-resolution image |

ARTICLE #3 **FOR IMMEDIATE RELEASE**“Raman Microspectroscopy-Based Identification of Individual Fungal Spores as Potential Indicators of Indoor Contamination and Moisture-Related Building Damage”[DOWNLOAD FULL TEXT ARTICLE](http://www.mmsend88.com/link.cfm?r=800557068&sid=19178643&m=1949302&u=ACS&j=10493865&s=http://pubs.acs.org/stoken/presspac/presspac/full/10.1021/es203782j)CONTACT:Sutapa Ghosal, Ph.D.Environmental Health Laboratory BranchCalifornia Department of Public HealthRichmond, Calif. 94804Phone: 510-620-2815Fax: 510-620-2825Email: Sutapa.Ghosal@cdph.ca.gov [To Top](#top)http://images.magnetmail.net/images/clients/ACS/goldline.gif ARTICLE #4 **FOR IMMEDIATE RELEASE: A PressPac Instant Replay\*****Antidote for cocaine overdose shows promise in lab tests**Molecular Pharmaceutics

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| http://images.magnetmail.net/images/clients/ACS/041812CocaineIstock_thumb.jpgAntidote for cocaine overdose shows promise in lab testsCredit: iStock |

Scientists are reporting development and successful testing in laboratory mice of a substance that shows promise for becoming the first antidote for cocaine toxicity in humans. According to a report in ACS’ journal Molecular Pharmaceutics, the new so-called “passive vaccine” reversed the motor impairment, seizures and other dangerous symptoms of a cocaine overdose, which claims thousands of lives each year among users of the illicit drug.Kim D. Janda and Jennifer B. Treweek explain that their previous research established the validity of using vaccines as treatments for drug addiction and contributed to the promotion of one cocaine active vaccine (and three nicotine active vaccines) to clinical evaluation in humans. These so-called “active” vaccines elicit antibodies that bind circulating cocaine (and nicotine) molecules in the blood and prevent these drug molecules from reaching the brain. In doing so, vaccinated patients are “immune” to the drug’s effects, and as a result, they feel no pleasurable effects from the drug if they backslide during recovery. The report describes the development of a cocaine passive vaccine, which consists of pre-formed human antibodies against cocaine that are 10 times more potent in binding cocaine molecules. This improved potency accelerates their ability to reverse cocaine toxicity, where time is of the essence. When administered by emergency medical teams or in hospital emergency departments, these passive vaccines could represent a life-saving therapeutic for overdose victims. The vaccine “represents a viable treatment strategy for the human condition of cocaine overdoses,” the report concludes.The authors acknowledge funding from the [Skaggs Institute for Chemical Biology](http://www.mmsend88.com/link.cfm?r=800557068&sid=19178644&m=1949302&u=ACS&j=10493865&s=http://www.scripps.edu/research/skaggs/) and the [National Institute on Drug Abuse](http://www.mmsend88.com/link.cfm?r=800557068&sid=19178645&m=1949302&u=ACS&j=10493865&s=http://www.drugabuse.gov/).

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| http://images.magnetmail.net/images/clients/ACS/060612MolPh_thumb.jpg[Click here](http://www.mmsend88.com/link.cfm?r=800557068&sid=19178646&m=1949302&u=ACS&j=10493865&s=http://web.1.c2.audiovideoweb.com/1c2web3536/060612molph.jpg) for high-resolution image |

ARTICLE #4 **FOR IMMEDIATE RELEASE**“An Antidote for Acute Cocaine Toxicity”[DOWNLOAD FULL TEXT ARTICLE](http://www.mmsend88.com/link.cfm?r=800557068&sid=19178647&m=1949302&u=ACS&j=10493865&s=http://pubs.acs.org/stoken/presspac/presspac/full/10.1021/mp200588v)CONTACT:Kim D. Janda, Ph.D.The Scripps Research InstituteLa Jolla, Calif. 92037Phone: 858-784-2516Fax: 858-784-2595E-mail: kdjanda@scripps.edu**\* 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****Nanomedicines promise fewer side effects in treating cancer**Chemical & Engineering News

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| http://images.magnetmail.net/images/clients/ACS/060612CEN_thumb.jpg[Click here](http://www.mmsend88.com/link.cfm?r=800557068&sid=19178648&m=1949302&u=ACS&j=10493865&s=http://web.1.c2.audiovideoweb.com/1c2web3536/060612cen.jpg) for high-resolution image. |

A new generation of cancer treatments based on nanotechnology is making its way out of the laboratory and into the clinic with the promise of targeting cancer cells while steering clear of healthy tissue, according to the current edition of Chemical & Engineering News (C&EN). C&EN is the weekly newsmagazine of the American Chemical Society (ACS), the world’s largest scientific society.In the cover story, C&EN Senior Editor Bethany Halford explains that today’s anti-cancer medications impact healthy tissue in the process of killing cancer cells. Patients thus may experience side effects, such as nausea and vomiting, that in some instances can be so severe that patients decline further treatment. New nanomedicine cancer treatments promise to focus on diseased tissue while leaving healthy parts of the body unscathed, reducing the severity of side effects.The article explains how a new generation of nanoparticle-based medications bring anti-cancer drugs directly to the tumor. Because of their ultra-small size, particles of these drugs can slip through tiny passages in the blood vessels that nourish tumors, get inside tumors and even individual cancer cells, and do their work with precision. The article describes nanomedicines that already are in clinical trials with cancer patients and others that are moving in that direction. ARTICLE #5 **FOR IMMEDIATE RELEASE**"Tiny Tech To Treat Cancer"This story is available at: [http://cenm.ag/nanotech](http://www.mmsend88.com/link.cfm?r=800557068&sid=19178650&m=1949302&u=ACS&j=10493865&s=http://cenm.ag/nanotech)  [To Top](#top)http://images.magnetmail.net/images/clients/ACS/goldline.gif **Journalists’ Resources****About the PressPac**The ACS PressPac consists of alerts to journalists about potentially newsworthy research published in ACS journals and Chemical & Engineering News. These alerts, or news tips, are not traditional press releases that provide comprehensive coverage of the research. Journalists can read the full text of the research provided with each alert and use the contact information for the lead authors to resolve any questions about the research or its newsworthiness.**News media registration for ACS’ 244th National Meeting & Exposition in Philadelphia**News media [registration](http://www.mmsend88.com/link.cfm?r=800557068&sid=19178651&m=1949302&u=ACS&j=10493865&s=https://www.xpressreg.net/register/acsf082/media/reginfo.asp) is now open for the American Chemical Society’s (ACS’) 244th National Meeting & Exposition in Philadelphia, August 19-23, 2012. The event will include more than 8,600 reports on new discoveries in medicine and health, food and nutrition, energy, the environment and other fields where chemistry plays a central role. One of the largest scientific conferences of 2012, the meeting will take place at the Pennsylvania Convention Center and area hotels.To view the full news release about meeting registration, [click here](http://www.mmsend88.com/link.cfm?r=800557068&sid=19178652&m=1949302&u=ACS&j=10493865&s=http://portal.acs.org/portal/acs/corg/content?_nfpb=true&_pageLabel=PP_ARTICLEMAIN&node_id=222&content_id=CNBP_029922&use_sec=true&sec_url_var=region1&__uuid=3e808d0e-dcbd-4957-9ceb-468b230b8951).**Press releases, briefings and more from ACS’ 243rd National Meeting**[www.eurekalert.org/acsmeet.php](http://www.mmsend88.com/link.cfm?r=800557068&sid=19178653&m=1949302&u=ACS&j=10493865&s=http://www.eurekalert.org/acsmeet.php) [http://www.ustream.tv/channel/acslive](http://www.mmsend88.com/link.cfm?r=800557068&sid=19178654&m=1949302&u=ACS&j=10493865&s=http://www.ustream.tv/channel/acslive%20) **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://www.mmsend88.com/link.cfm?r=800557068&sid=19178655&m=1949302&u=ACS&j=10493865&s=http://www.insidescience.org/) to visit the Inside Science News website.**C&EN Video Spotlight: Testing Vehicle Emissions On-the-Go**Hear the chemistry story of the box-like gadget Ford Motor Company and the Environmental Protection Agency use to test vehicle emissions, all in the name of developing cleaner, more fuel-efficient cars and trucks. The machine, called the Semtech-DS, is the product of a collaboration between Ford and instrument company Sensors, Inc. As Ford scientist Mark Dearth explains, the instrument detects a variety of pollutants in tailpipe emissions, including carbon monoxide. It mounts onto heavy-duty trucks and off-road vehicles for testing engine emissions in real-world conditions.[Click here](http://www.mmsend88.com/link.cfm?r=800557068&sid=19178656&m=1949302&u=ACS&j=10493865&s=http://www.youtube.com/watch?v=VmglCodvjfk&feature=youtu.be) to view the video.**Must-reads from C&EN: Chemistry of the Human Clock**People have internal time-keepers regulated by about 20 genes, and scientists are delving into the mysteries of how these circadian rhythms impact obesity, heart disease and fertility. For the full story, contact Michael Bernstein at m\_bernstein@acs.org.**ACS Pressroom Blog** The ACS Office of Public Affairs' [pressroom blog](http://www.mmsend88.com/link.cfm?r=800557068&sid=19178657&m=1949302&u=ACS&j=10493865&s=https://communities.acs.org/community/science/science_news) highlights research from ACS’ more than 40 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://www.mmsend88.com/link.cfm?r=800557068&sid=19178658&m=1949302&u=ACS&j=10493865&s=http://www.bytesizescience.com), 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://www.mmsend88.com/link.cfm?r=800557068&sid=19178659&m=1949302&u=ACS&j=10493865&s=https://twitter.com/signup). Then visit [http://twitter.com/ACSpressroom](http://www.mmsend88.com/link.cfm?r=800557068&sid=19178660&m=1949302&u=ACS&j=10493865&s=http://twitter.com/ACSpressroom) and click the ‘join’ button beneath the press room logo. **C&EN on Twitter**Follow @cenmag <[http://twitter.com/cenmag](http://www.mmsend88.com/link.cfm?r=800557068&sid=19178661&m=1949302&u=ACS&j=10493865&s=http://twitter.com/cenmag)> for the latest news in chemistry and dispatches from C&EN's blog, CENtral Science <[http://centralscience.org](http://www.mmsend88.com/link.cfm?r=800557068&sid=19178662&m=1949302&u=ACS&j=10493865&s=http://centralscience.org)>.**ACS Press Releases** [Press releases](http://www.mmsend88.com/link.cfm?r=800557068&sid=19178663&m=1949302&u=ACS&j=10493865&s=http://portal.acs.org/portal/acs/corg/content?_nfpb=true&_pageLabel=PP_NEWSRELEASES&node_id=222&use_sec=false&sec_url_var=region1&__uuid=50b5ab93-801d-4d0d-868f-b9507ff9d709) on a variety of chemistry-related topics.[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://www.mmsend88.com/link.cfm?r=800557068&sid=19178664&m=1949302&u=ACS&j=10493865&s=http://portal.acs.org/portal/acs/corg/content?_nfpb=true&_pageLabel=PP_ARTICLEMAIN&node_id=1355&content_id=CNBP_028033&use_sec=true&sec_url_var=region1&__uuid=e8e6ee76-0abe-4e78-84c4-3717c995c65e). **Prized Science video series**

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Prized Science: How the Science Behind ACS Awards Impacts Your Life video series is new for 2011! In the first episode, see how Ahmed Zewail, Ph.D., developed a technology that's paving the way for new medicines, new fuels and new materials that will give people longer, healthier, happier lives. Zewail is the winner of the 2011 Priestley Medal. The second episode features the work of David Craik, Ph.D., who made advances toward new drugs for treating health problems that affect millions of people around the world, including antibiotic-resistant bacteria and AIDS. Craik is the winner of the ACS 2011 Ralph F. Hirschmann Award in Peptide Chemistry, sponsored by Merck Research Laboratories. More episodes will appear later in the year. The series is available at the [Prized Science](http://www.mmsend88.com/link.cfm?r=800557068&sid=19178665&m=1949302&u=ACS&j=10493865&s=http://portal.acs.org/portal/acs/corg/content?_nfpb=true&_pageLabel=PP_ARTICLEMAIN&node_id=446&content_id=CTD1_018821&use_sec=true&sec_url_var=region1&__uuid=594bce97-0b05-4df7-b759-1a0f9156c5d8) website and on DVD. **First Living, Dancing Periodic Table of the Elements**

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That 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://www.mmsend88.com/link.cfm?r=800557068&sid=19178666&m=1949302&u=ACS&j=10493865&s=http://bytesizescience.com/index.cfm/2011/3/29/The-Chemistry-Dance) 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' celebration of the International Year of Chemistry. Check out the fun and share the link.**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://www.mmsend88.com/link.cfm?r=800557068&sid=19178667&m=1949302&u=ACS&j=10493865&s=http://www.youtube.com/watch?v=AbfW_CMMe48) follows a person who sees more and more everyday necessities and conveniences disappear before his widening eyes.[The Chemistry of Sourdough Bread](http://www.mmsend88.com/link.cfm?r=800557068&sid=19178668&m=1949302&u=ACS&j=10493865&s=http://www.bytesizescience.com/index.cfm/2010/9/27/Chemistry-of-Sourdough)[The Chemistry of Fireworks](http://www.mmsend88.com/link.cfm?r=800557068&sid=19178669&m=1949302&u=ACS&j=10493865&s=http://www.bytesizescience.com/index.cfm/2010/6/25/Bytesize-Science-Presents-The-Chemistry-of-Fireworks)[The Chemistry of Grilling and Barbecuing](http://www.mmsend88.com/link.cfm?r=800557068&sid=19178670&m=1949302&u=ACS&j=10493865&s=http://www.bytesizescience.com/index.cfm/2010/6/15/Chemistry-of-Barbeque) [To Top](#top)  http://images.magnetmail.net/images/clients/ACS/goldline.gif**ACS Podcasts**

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