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| http://images.magnetmail.net/images/clients/ACS/080812Water_thumb.jpgLeveraging bacteria in drinking water to benefit consumersCredit: Comstock/Thinkstock |

Contrary to popular belief, purified drinking water from home faucets contains millions to hundreds of millions of widely differing bacteria per gallon, and scientists have discovered a plausible way to manipulate those populations of mostly beneficial microbes to potentially benefit consumers. Their study appears in ACS’ journal Environmental Science & Technology.Lutgarde Raskin and colleagues Ameet Pinto and Chuanwu Xi explain that municipal water treatment plants typically try to minimize the growth of microbes in the huge filters that remove small particles and substances that can serve as nutrients for bacterial growth. These facilities also add chlorine or other disinfectants to kill bacteria and prevent them from thriving in water distribution pipes. Nevertheless, it’s not possible to totally eliminate bacteria with current technology, making it important to determine how the filter and other water treatment steps impact the types and amounts of bacteria that remain. That’s why the researchers set out to do this in a study at a treatment plant in Ann Arbor, Mich.Their research provides suggestions on how to change which bacteria wind up in the drinking water. The scientists found that certain types of bacteria attach to the filters where they form biofilms from which small clumps can break off and make it into the drinking water supply. The water’s pH was a strong factor in determining which bacteria made it into the drinking water. Measures as simple as varying the water pH or changing how the filters are cleaned, for example, could help water treatment plant workers shift the balance toward bacteria that are beneficial for humans by not allowing the harmful bacteria to compete.The authors acknowledge funding from the [National Science Foundation](http://www.mmsend88.com/link.cfm?r=800557068&sid=19955254&m=2177794&u=ACS&j=10994894&s=http://www.nsf.gov/) and the [University of Michigan](http://www.mmsend88.com/link.cfm?r=800557068&sid=19955255&m=2177794&u=ACS&j=10994894&s=http://www.umich.edu/).

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| http://images.magnetmail.net/images/clients/ACS/080112EST_thumb.jpg[Click here](http://www.mmsend88.com/link.cfm?r=800557068&sid=20043539&m=2177794&u=ACS&j=10994894&s=http://web.1.c2.audiovideoweb.com/1c2web3536/080112est.jpg) for high-resolution image |

ARTICLE #1 **FOR IMMEDIATE RELEASE**“Bacterial Community Structure in the Drinking Water Microbiome Is Governed by Filtration Processes”[DOWNLOAD FULL TEXT ARTICLE](http://www.mmsend88.com/link.cfm?r=800557068&sid=20042566&m=2177794&u=ACS&j=10994894&s=http://pubs.acs.org/stoken/presspac/presspac/abs/10.1021/es302042t) CONTACT:Lutgarde Raskin, Ph.D.Department of Civil and Environmental EngineeringUniversity of MichiganPhone: 734-647-6920Email: raskin@umich.edu [To Top](#top)http://images.magnetmail.net/images/clients/ACS/goldline.gifARTICLE #2 **FOR IMMEDIATE RELEASE****Advanced explosives detector to sniff out previously undetectable amounts of TNT**Analytical Chemistry

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| http://images.magnetmail.net/images/clients/ACS/080812TNT_thumb.jpgNew explosives detector to sniff out previously undetectable amounts of TNTCredit: Ingram Publishing/Thinkstock |

With the best explosive detectors often unable to sniff out the tiny amounts of TNT released from terrorist bombs in airports and other public places, scientists are reporting a potential solution. Their research in ACS’ journal Analytical Chemistry describes development of a device that concentrates TNT vapors in the air so that they become more detectable*.*Yushan Yan and colleagues point out that TNT and other conventional explosives are the mainstays of terrorist bombs and the anti-personnel mines that kill or injure more than 15,000 people annually in war-torn countries. In large, open-air environments, such as airports, train stations and minefields, concentrations of these explosives can be vanishingly small – a few parts of TNT, for instance, per trillion parts of air. That can make it impossible for conventional bomb and mine detectors to detect the explosives and save lives.They describe development of a preconcentrator that increases the levels of TNT and related explosives by 1,000 times in less than one minute. The scientists made a “molecular sieve” membrane on the surface of holes about as big as a speck of dust. Molecules of explosives get trapped in these holes and concentrated enough that security agents could detect previously undetectable levels of explosives.The authors acknowledge funding from the [National Science Foundation](http://www.mmsend88.com/link.cfm?r=800557068&sid=19955256&m=2177794&u=ACS&j=10994894&s=http://www.nsf.gov/) and the [China Scholarship Council](http://www.mmsend88.com/link.cfm?r=800557068&sid=19955257&m=2177794&u=ACS&j=10994894&s=http://en.csc.edu.cn/).

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| http://images.magnetmail.net/images/clients/ACS/080812AnChem_thumb.jpg[Click here](http://www.mmsend88.com/link.cfm?r=800557068&sid=20043540&m=2177794&u=ACS&j=10994894&s=http://web.1.c2.audiovideoweb.com/1c2web3536/080812anchem.jpg) for high-resolution image |

ARTICLE #2 **FOR IMMEDIATE RELEASE**“Highly Selective Zeolite Membranes as Explosive Preconcentrators”[DOWNLOAD FULL TEXT ARTICLE](http://www.mmsend88.com/link.cfm?r=800557068&sid=20042567&m=2177794&u=ACS&j=10994894&s=http://pubs.acs.org/stoken/presspac/presspac/full/10.1021/ac301359j)CONTACT:Yushan Yan, Ph.D.University of DelawareNewark, Del. 19716Email: yanys@udel.eduWebsite: [www.che.udel.edu/yan](http://www.mmsend88.com/link.cfm?r=800557068&sid=19955259&m=2177794&u=ACS&j=10994894&s=http://www.che.udel.edu/yan)  [To Top](#top)http://images.magnetmail.net/images/clients/ACS/goldline.gifARTICLE #3 **FOR IMMEDIATE RELEASENew substances 15,000 times more effective in destroying chemical warfare agents**Biochemistry

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| http://images.magnetmail.net/images/clients/ACS/080812Mask_thumb.jpgNew substances 15,000 times more effective in destroying chemical warfare agentsCredit: iStockphoto/Thinkstock |

In an advance that could be used in masks to protect against nerve gas, scientists are reporting development of proteins that are up to 15,000 times more effective than their natural counterpart in destroying chemical warfare agents. Their report appears in ACS’ journal Biochemistry.Frank Raushel, David Barondeau and colleagues explain that a soil bacterium makes a protein called phosphotriesterase (PTE), which is an enzyme that detoxifies some pesticides and chemical warfare agents like sarin and tabun. PTE thus has potential uses in protecting soldiers and others. Natural PTE, however, works against only one of the two molecular forms of these chemical warfare agents, and it happens to be the less toxic form. The scientists thus set out to develop new versions of PTE that were more effective against the most toxic form.To improve the enzyme's activity, Raushel and colleagues used an approach called “directed evolution.” This technique imitates the way natural selection leads to improved forms of the biochemical substances in living things. In using directed evolution, the team made small random changes to the natural enzyme's chemical architecture and then tested resulting mutant enzymes for their ability to break down nerve agents. They isolated several mutants that fit the bill, including one that proved to be 15,000 times more effective than the natural enzyme.The authors acknowledge funding from the [National Institutes of Health](http://www.mmsend88.com/link.cfm?r=800557068&sid=19955260&m=2177794&u=ACS&j=10994894&s=http://www.nih.gov/).

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| http://images.magnetmail.net/images/clients/ACS/080812Bio_thumb.jpg[Click here](http://www.mmsend88.com/link.cfm?r=800557068&sid=20043541&m=2177794&u=ACS&j=10994894&s=http://web.1.c2.audiovideoweb.com/1c2web3536/080812bio.jpg) for high-resolution image |

ARTICLE #3 **FOR IMMEDIATE RELEASE**“Enzymes for the Homeland Defense: Optimizing Phosphotriesterase for the Hydrolysis of Organophosphate Nerve Agents”[DOWNLOAD FULL TEXT ARTICLE](http://www.mmsend88.com/link.cfm?r=800557068&sid=20042568&m=2177794&u=ACS&j=10994894&s=http://pubs.acs.org/stoken/presspac/presspac/abs/10.1021/bi300811t)CONTACT:Frank M. Raushel, Ph.D.Department of ChemistryTexas A&M UniversityCollege Station, Texas 77842Phone: 979-845-3373Fax: 979-845-9452Email: raushel@tamu.edu [To Top](#top)http://images.magnetmail.net/images/clients/ACS/goldline.gif ARTICLE #4 **FOR IMMEDIATE RELEASE: A PressPac Instant Replay\*****A step toward minute factories that produce medicine inside the body**Nano Letters

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| http://images.magnetmail.net/images/clients/ACS/062712PillIstock_thumb.jpgFamiliar capsules of medicine taken by mouth could have a counterpart in minute capsules that enable production of medicine inside the bodyCredit: iStock |

Scientists are reporting an advance toward treating disease with minute capsules containing not drugs — but the DNA and other biological machinery for making the drug. In an article in ACS’ journal Nano Letters, they describe engineering micro- and nano-sized capsules that contain the genetically coded instructions, plus the read-out gear and assembly line for protein synthesis that can be switched on with an external signal.Daniel Anderson and colleagues explain that development of nanoscale production units for protein-based drugs in the human body may provide a new approach for treating disease. These production units could be turned on when needed, producing medicines that cannot be taken orally or are toxic and would harm other parts of the body. Until now, researchers have only done this with live bacteria that were designed to make proteins at disease sites. But unlike bacterial systems, artificial ones are modular, and it is easier to modify them. That’s why Anderson’s group developed an artificial, remotely activated nanoparticle system containing DNA and the other “parts” necessary to make proteins, which are the workhorses of the human cell and are often used as drugs.They describe the nanoscale production units, which are tiny spheres encapsulating protein-making machinery like that found in living cells. The resulting nanoparticles produced active proteins on demand when the researchers shined a laser light on them. The nanoparticles even worked when they were injected into mice, which are stand-ins for humans in the laboratory, producing proteins when a laser was shone onto the animals. This innovation “may find utility in the localized delivery of therapeutics,” say the researchers. The authors acknowledge funding from the Misrock Foundation, the [Life Sciences Research Foundation](http://www.mmsend88.com/link.cfm?r=800557068&sid=19955261&m=2177794&u=ACS&j=10994894&s=http://www.lsrf.org/pages/geninfo.htm), the [National Cancer Institute](http://www.mmsend88.com/link.cfm?r=800557068&sid=19955262&m=2177794&u=ACS&j=10994894&s=http://www.cancer.gov/), the [National Institutes of Health](http://www.mmsend88.com/link.cfm?r=800557068&sid=19955263&m=2177794&u=ACS&j=10994894&s=http://www.nih.gov/) and the Marie D. & Pierre Casimir-Lambert Fund.

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| http://images.magnetmail.net/images/clients/ACS/080812Nano_thumb.jpg[Click here](http://www.mmsend88.com/link.cfm?r=800557068&sid=20043542&m=2177794&u=ACS&j=10994894&s=http://web.1.c2.audiovideoweb.com/1c2web3536/080812nano.jpg) for high-resolution image |

ARTICLE #4 **FOR IMMEDIATE RELEASE**“Remotely Activated Protein-Producing Nanoparticles”[DOWNLOAD FULL TEXT ARTICLE](http://www.mmsend88.com/link.cfm?r=800557068&sid=20042569&m=2177794&u=ACS&j=10994894&s=http://pubs.acs.org/stoken/presspac/presspac/full/10.1021/nl2036047)CONTACT:Daniel G. Anderson, Ph.D.David H. Koch Institute for Integrative Cancer ResearchDepartment of Chemical EngineeringHarvard MIT Division of Health Science and TechnologyMassachusetts Institute of TechnologyCambridge, Mass. 02139Phone: 617-258-6843Fax: 617-258-8827Email: dgander@mit.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****Back-to-the-future process yields “miracle wood”**Chemical & Engineering News

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| http://images.magnetmail.net/images/clients/ACS/080812CEN_thumb.jpg[Click here](http://www.mmsend88.com/link.cfm?r=800557068&sid=20042570&m=2177794&u=ACS&j=10994894&s=http://web.1.c2.audiovideoweb.com/1c2web3536/080812cen.jpg) for high-resolution image. |

A back-to-the-future technology, first used more than 100 years ago, has put a new form of wood on the market – a veritable “miracle wood” that resists the moisture-induced bowing, swelling, cupping, shrinking and cracking that have been downsides of natural wood for thousands of years. The new “acetylated wood” is the topic of a story in the current edition of Chemical & Engineering News (C&EN). C&EN is the weekly newsmagazine of the American Chemical Society, the world’s largest scientific society.Alexander H. Tullo, C&EN senior editor, explains that production of acetylated wood relies on a process much different from pressure treatment, which infuses insect- and rot-resistant chemicals into wood. Instead, the acetylation process uses heat, pressure and a substance termed acetic anhydride to permanently expand the cell walls in wood into a fixed position that resists water absorption. That absorption of moisture from the air, ground or rainfall underpins the familiar bending, bowing, rotting and other problems with natural wood.The article points out that acetylation technology has been available for more than a century, and acetylated wood pulp has been used to make photographic film, cigarette filters, coatings for playing cards and other products. It is getting a second life thanks to technological advances made since similar products failed to get off the ground in the 1930s. Manufacturers such as Eastman Chemical and Accsys Technologies attribute its new success to the growing desire for green products. The new wood has similar properties to modern construction materials like aluminum and PVC but a much smaller carbon footprint. And although it costs about three and a half times more than untreated wood, Eastman’s technology manager for acetylated wood says its durability makes it worth it for customers.ARTICLE #5 **FOR IMMEDIATE RELEASE**"Modifying Wood To Last, With Chemistry"This story is available at: [http://cenm.ag/wood](http://www.mmsend88.com/link.cfm?r=800557068&sid=20042571&m=2177794&u=ACS&j=10994894&s=http://cenm.ag/wood)  [To Top](#top)http://images.magnetmail.net/images/clients/ACS/goldline.gif **Journalists’ Resources****About the Weekly PressPac**The ACS Weekly PressPac consists of summaries of research published in the American Chemical Society’s more than 40 peer-reviewed journals and its weekly newsmagazine, Chemical & Engineering News. ACS journals publish more than 35,000 articles annually. Although not traditional press releases, PressPac content can be used to prepare news stories, in conjunction with the full-text PDF and an interview with the authors. PressPac stories and the accompanying full-text PDFs also can be an excellent resource for features and background.**News media registration for ACS’ 244th National Meeting & Exposition in Philadelphia**News media [registration](http://www.mmsend88.com/link.cfm?r=800557068&sid=19955265&m=2177794&u=ACS&j=10994894&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=19955266&m=2177794&u=ACS&j=10994894&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=19955267&m=2177794&u=ACS&j=10994894&s=http://www.eurekalert.org/acsmeet.php) [http://www.ustream.tv/channel/acslive](http://www.mmsend88.com/link.cfm?r=800557068&sid=19955268&m=2177794&u=ACS&j=10994894&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=19955269&m=2177794&u=ACS&j=10994894&s=http://www.insidescience.org/) to visit the Inside Science News website.**C&EN Video Spotlight: Artificial Jellyfish Could Make Waves in Tissue Repair**Researchers at Caltech and Harvard have made a polymer sheet that swims like a jellyfish. In this video, Janna Nawroth, a graduate student at Caltech, explains how the researchers combined a printed protein, some rat heart cells and flexible silicone to make the mock marine animal. The researchers say that the jellyfish mimic could help them learn about jellyfish evolution or might even help them test artificial heart valves or cardiac drugs in the future.[Click here](http://www.mmsend88.com/link.cfm?r=800557068&sid=20042572&m=2177794&u=ACS&j=10994894&s=http://www.youtube.com/watch?v=qAtC0U_OT38&list=UUB_zuUSmh_PVkqwkaDT-thA&index=1&feature=plcp) to view the video.**Must-Read from C&EN: Golds and Silvers in the Other Olympics**The 44th International Chemistry Olympiad, hosted by the U.S. for the first time in 20 years, was an epic contest of mental gymnastics. For the results, including a gold and two silvers for the U.S. team, contact newsroom@acs.org. **ACS Pressroom Blog** The ACS Office of Public Affairs' [pressroom blog](http://www.mmsend88.com/link.cfm?r=800557068&sid=19955270&m=2177794&u=ACS&j=10994894&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=19955271&m=2177794&u=ACS&j=10994894&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=19955272&m=2177794&u=ACS&j=10994894&s=https://twitter.com/signup). Then visit [http://twitter.com/ACSpressroom](http://www.mmsend88.com/link.cfm?r=800557068&sid=19955273&m=2177794&u=ACS&j=10994894&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=19955274&m=2177794&u=ACS&j=10994894&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=19955275&m=2177794&u=ACS&j=10994894&s=http://centralscience.org)>.**ACS Press Releases** [Press releases](http://www.mmsend88.com/link.cfm?r=800557068&sid=19955276&m=2177794&u=ACS&j=10994894&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=19955277&m=2177794&u=ACS&j=10994894&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=19955278&m=2177794&u=ACS&j=10994894&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. **The Periodic Table Table Featuring Theo Gray**

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Some people collect stamps. Wolfram Research co-founder and author Theo Gray collects elements. Step into his office, and you'll see a silicon disc engraved with Homer Simpson, a jar of mercury, uranium shells and hundreds of other chemical artifacts. But his real DIY masterpiece is the world's first ["periodic table table."](http://www.mmsend88.com/link.cfm?r=800557068&sid=19955279&m=2177794&u=ACS&j=10994894&s=http://www.bytesizescience.com/index.cfm/2012/2/22/The-Periodic-Table-Table-Featuring-Theo-Gray) Within this masterfully constructed table-top lay samples of nearly every element known to man, minus the super-radioactive ones.**Healing the voice: Synthetic vocal cords**

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[Synthetic vocal cords](http://www.mmsend88.com/link.cfm?r=800557068&sid=19955280&m=2177794&u=ACS&j=10994894&s=http://www.bytesizescience.com/index.cfm/2012/5/22/Bytesize-Science-Healing-the-voice-with-synthetic-vocal-cords%20) may someday heal the voices of singers like Julie Andrews -- whose legendary voice was permanently damaged in a 1997 operation. Filmed in the lab of 2012 ACS Priestley Medalist and MIT Institute Professor Robert Langer, our latest video explains how artificial polymer vocal cords may help repair damaged vocal tissue.[The Chemistry of Beer](http://www.mmsend88.com/link.cfm?r=800557068&sid=19955281&m=2177794&u=ACS&j=10994894&s=http://youtu.be/2xKpQ11CpVE)[The Chemistry of Cheese](http://www.mmsend88.com/link.cfm?r=800557068&sid=19955282&m=2177794&u=ACS&j=10994894&s=http://youtu.be/jMAlToEYHJM)[Without a scratch: Self-Healing Materials](http://www.mmsend88.com/link.cfm?r=800557068&sid=19955283&m=2177794&u=ACS&j=10994894&s=http://youtu.be/Bx3WTSSD5f0) [To Top](#top)  http://images.magnetmail.net/images/clients/ACS/goldline.gif**ACS Podcasts**

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