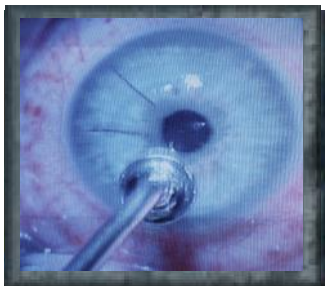




Career Cornerstone News

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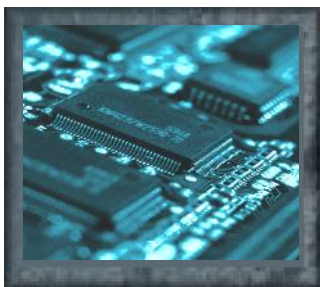
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Career Cornerstone News is a Publication of the Career Cornerstone Center, the Premier Online Resource for Exploring Career Paths in Science, Technology, Engineering, Mathematics, and Medicine.

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Believe in Ohio Supports Students in STEM

Believe in Ohio is a free new program from the Ohio Board of Regents and The Ohio Academy of Science designed to help prepare Ohio high school students for the future by:

- ◆ Introducing them to the "Innovation Economy of Future"
- ◆ Inspiring them to pursue their STEM educations and careers in Ohio
- ◆ Encouraging them to become the future innovators and entrepreneurs Ohio needs to help develop the new products, services and jobs of the future.

Although Believe in

Ohio includes many activities and incentives for teachers and students to participate, the



BELIEVE IN OHIO

centerpiece of the program is an "Annual STEM Commercialization & Business Plan Competition" that will begin in 2014-2015 in which students will compete for nearly \$2 million in cash awards and scholarships to Ohio's colleges and universities.

Believe in Ohio helps to address Ohio's brain drain by showcasing the substantial benefits Ohio has to offer and leverages the investments Ohio has made in the future through the Third Frontier

program. Additionally, Believe in Ohio will help create the new products, services and jobs of the future that Ohio will need.

Find out more at www.believeinohio.org and www.facebook.com/believeinohio.

Career Cornerstone offers career planning resources focused on Ohio and other states at <http://careercornerstone.org/states> that helps focus training and job opportunities at the state level.

Teen Wins \$250K in Science Prizes

A 17-year-old California high school senior recently won not one, but three major science competitions after being mentored by two University of California, San Diego, professors in a project that combined supercomputer modeling with experimental research to speed up the discovery of influenza virus inhibitors. In all, Eric Chen was awarded \$250,000 in prize money within the past 12 months by winning the trifecta of science competitions: the 2014 Intel Science Talent Search; the 2013

Siemens Competition in Math, Science & Technology; and the grand prize in the international 2013 Google Science Fair. Chen's computations focused on analyzing molecules that might block the activity of an enzyme called endonuclease, which all flu viruses use to reproduce. From a database of more than 450,000 compounds, he whittled down the list to 237. Subsequent lab



Eric Chen and UC San Diego Professor Rommie Amaro. Image by Erik Jepsen/UC San Diego Publications

work identified six candidates as potential anti-flu drugs. UC San Diego has applied for patents on those potential drugs.

TIDES: Teaching to Increase Diversity and Equity in STEM

The Association of American Colleges and Universities (AAC&U) has launched its newest STEM initiative, TIDES: Teaching to Increase Diversity and Equity in STEM. The overall goal of this three-year initiative is to increase the learning outcomes and retention of students historically underrepresented in the computer/information sciences and related STEM disciplines. The project will pursue two specific aims: to develop and implement curricula that will enhance underrepresented STEM student interest, competencies and retention rates; and to empower

STEM faculty to adopt culturally sensitive pedagogies and sustain the necessary changes in practice required for relevant and inclusive STEM teaching. With support from the Leona M. and Harry B. Helmsley Charitable Trust, the TIDES initiative invites applications from institutions of higher education (particularly predominantly undergraduate institutions, minority serving institutions and community colleges) to implement curriculum and faculty professional development activities, and develop models for

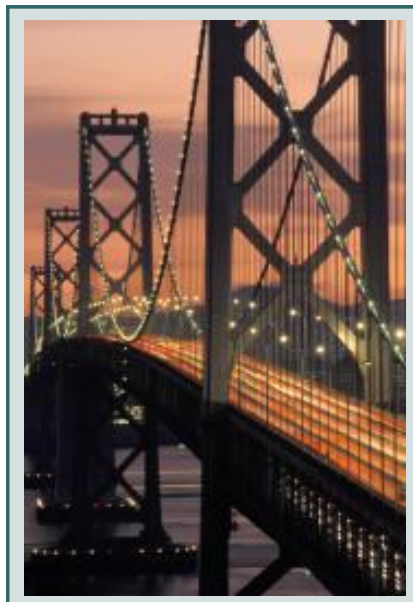


broader institutional change to advance equally evidence-based and culturally competent teaching in STEM fields. AAC&U is dedicated to promoting high-quality learning, accelerating broad-scale systemic innovation to advance diversity, and advancing inquiry across all liberal arts and sciences disciplines. Find out more about TIDES and the work of AAC&U at <http://www.aacu.org/pkal/tides>.

Degree Profile: Civil Engineer

Civil engineers design and supervise the construction of roads, buildings, airports, tunnels, dams, bridges, and water supply and sewage systems. They must consider many factors in the design process from the construction costs and expected lifetime of a project to government regulations and potential environmental hazards such as earthquakes and hurricanes.

Civil engineering encompasses many specialties. The major ones are structural, water resources, construction, transportation, and geotechnical engineering. Many civil engineers hold supervisory or



administrative positions, from supervisor of a construction site to city engineer. Others may work in design, construction, research, and teaching.

Civil engineers hold about 272,900 jobs in the U.S. Civil engineers generally work indoors in offices. However, they sometimes spend time outdoors at construction sites so they can monitor operations or solve problems at the site. Occasionally, civil engineers travel abroad to work on large engineering projects in other countries

The median annual wage for civil engineers is currently about \$79,340, and employment of civil engineers is projected to grow 20 percent from 2012 to 2022, faster than the average for all occupations. As infrastructure continues to age, civil engineers will be needed to manage projects to rebuild bridges, repair roads, and upgrade levees and dams.

A bachelor's degree in civil engineering is required preparation; a degree from an accredited program is highly recommended. Participating in a co-op, internship, or summer job will help you land a first job. More importantly, it will give you a chance to find out what you like to do and are good at doing

Find out more about a career as a civil engineer at www.careercornerstone.org/civileng/civileng.htm.

Self-Healing Engineered Muscle Grown in Lab

Biomedical engineers have grown living skeletal muscle that looks a lot like the real thing. It contracts powerfully and rapidly, integrates into mice quickly, and for the first time, demonstrates the ability to heal itself both inside the laboratory and inside an animal.

The study conducted at Duke University tested the bioengineered muscle by literally watching it through a window on the back of living mouse. The novel technique allowed for real-time monitoring of the muscle's integration and maturation inside a living, walking animal.

Both the lab-grown muscle and experimental techniques are important steps toward growing viable muscle for studying diseases and treating injuries, said Nenad Bursac, associate professor of biomedical engineering at Duke.

"The muscle we have made represents an important advance for the field," Bursac said. "It's the first time engineered muscle has been created that contracts as strongly as native neonatal skeletal muscle."

Through years of perfecting their techniques, a team led by Bursac

and graduate student Mark Juhas discovered that preparing better muscle requires two things—well-developed contractile muscle fibers and a pool of muscle stem cells, known as satellite cells.

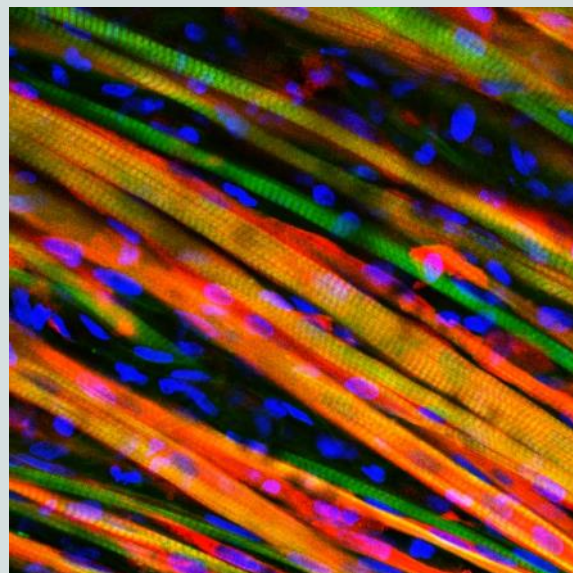
Every muscle has satellite cells on reserve, ready to activate upon injury and begin the regeneration process. The key to the team's success was successfully creating the microenvironments—called niches—where these stem cells await their call to duty.

"Simply implanting satellite cells or less-developed muscle doesn't work as well," said Juhas. "The well-developed muscle we made provides niches for satellite cells to live in, and, when needed, to restore the robust musculature and its function." The engineers are now beginning work to see if their biomimetic muscle can be used to

repair actual muscle injuries and disease.

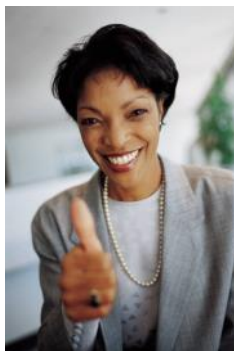
"Can it vascularize, innervate and repair the damaged muscle's function?" asked Bursac. "That is what we will be working on for the next several years."

Find out about careers in biology and bioengineering at www.careercornerstone.org.



*Long, colorful strands of engineered muscle fiber have been stained to observe growth after implantation into a mouse.
Image Credit: Duke University*

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New Data Show How States are Doing in Science

A newly updated, online, interactive state data tool allows policymakers, educators and other users to discern trends in education, science and research in each of the 50 states. This free resource supplements the state data in the 2014 Science and Engineering Indicators report, which provided information and analysis of the nation's position in science and engineering education and research. The biennial report is published by the National Science Board, the policy making body of the National Science Foundation (NSF).

The tool features 59 state indicators of state performance in education, the scientific workforce, research and development (R&D) investments and activities, and high-tech business. It offers tables, charts and graphs, and permits users to view and customize data in

multiple ways, such as making comparisons with other states, and looking at 20 year trends.

For most indicators, the states vary widely. For example, the number of science and engineering bachelor's degrees awarded in a state ranges from 9 (Alaska) to 39 (Vermont) per 1,000 individuals age 18-24. And, a share of a state's workforce employed in science and engineering occupations ranged



from 2.2 percent (Mississippi) to 7.6 percent (Virginia).

The state data tool is produced by NSF's National Center for Science and Engineering Statistics.

It supplements the latest edition of Science and Engineering Indicators, a 600-page volume that is the most comprehensive federal information and analysis of the

nation's position in science and engineering education and research.

The tool is available at <http://go.usa.gov/8rVx>.

College Graduate Hiring to Increase 8.6 Percent

Employers expect to hire more new college graduates this year for their U.S. operations than they did last year, according to a new survey from the National Association of Colleges and Employers (NACE). Overall, results of a recent survey show employers plan to hire 8.6 percent more Class of 2014 graduates than they hired from the Class of 2013. More than half of hiring employers report interest in bachelor's degree graduates in accounting and various business fields, engineering, and/or computer sciences. More than half also expect to hire master's level candidates, including M.B.A.s, for their U.S. operations.

In addition, the average starting salary for new college graduates earning bachelor's degrees has increased 1.2 percent over last year. With a jump of 3.7 percent, health sciences garnered the highest average starting salary increase among the disciplines for the Class of 2014, while humanities and social sciences and computer science trailed closely with gains of 3.5 percent and 2.9 percent, respectively.

Find out more about salary levels for hundreds of career paths at www.careercornerstone.org.

Average Salaries by Discipline

Discipline	2014 Average Salary	2013 Average Salary	Percent Change
Business	\$53,901	\$54,234	-0.6%
Communications	\$43,924	\$43,145	1.8%
Computer Science	\$61,741	\$59,977	2.9%
Education	\$40,863	\$40,480	0.9%
Engineering	\$62,719	\$62,535	0.3%
Health Sciences	\$51,541	\$49,713	3.7%
Humanities & Social Sciences	\$38,365	\$37,058	3.5%
Math & Sciences	\$43,414	\$42,724	1.6%
Overall	\$45,473	\$44,928	1.2%

Source: April 2014 *Salary Survey*, National Association of Colleges and Employers