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Coalition: 100 Companies, Including 2 from UC San Diego, Prove Economic Boost of Research

Report: sequestration jeopardizes this source of progress, jobs and growth

Two innovative UC San Diego spinoffs are among the 100 companies cited by The Science Coalition in a new report touting the positive economic payoff of federally funded university research.

Genomatica, a biotechnology company that grew from research conducted in Bernhard Palsson's laboratory at UC San Diego; and Senomyx, a provider of flavor ingredients for the food and beverage industries that arose from research conducted by Charles Zuker at UC San Diego, help demonstrate how support of basic and applied research at American universities pays strong economic dividends.

The new report released today by The Science Coalition, "Sparking Economic Growth 2.0," illustrates one of the many returns on investment of federally funded scientific research: the creation of new companies. The report highlights 100 companies that trace their roots to federally funded university research and their role in bringing transformational innovations to market, creating new jobs and contributing to economic growth. An accompanying online database provides free access to company profiles and allows users to sort companies by federal funding agency, university affiliation, type of innovation and other criteria.

The basic scientific research that gives rise to companies like those in this report is in jeopardy, says the report. Federal funding for R&D has been on a downward trend for the past decade, with funding levels in 2013 at historic lows. Sequestration, which began in March 2013, is set to run through 2021 and will wring an additional $95 billion from federal R&D budgets over this period. This national disinvestment in

science will have real consequences. As the Sparking Economic Growth 2.0 companies illustrate, research and the transformative discoveries that flow from it require sustained funding over many years to yield results.

“Federal funding supports research in medicine, the sciences, the arts, oceanography, engineering and other fields,” said Sandra A. Brown, Vice Chancellor for Research at UC San Diego, “research that UC San Diego is internationally recognized for translating into innovations, medical breakthroughs, jobs and new businesses in San Diego, California, and the nation.”

Genomatica, for example, is working to transform the chemical industry by delivering new manufacturing processes that enable its partners to produce the world’s most widely-used chemicals from renewable feedstocks, with better economics and greater sustainability than petroleum-based processes.

Using its proprietary biotechnology platform, the company creates fermentation-based manufacturing processes designed to convert a range of renewable feedstocks into target chemicals that meet industry specifications for large, established markets. Among its first target chemicals are butanediol, or BDO, and butadiene.

As a graduate student, Genomatica CEO Christophe Schilling studied under Bernhard Palsson, the Galetti professor of bioengineering in the Department of Bioengineering at UC San Diego’s Jacobs School of Engineering. After receiving his Ph.D. in 2000, Schilling founded Genomatica with licensed technology developed in Palsson’s lab.

The initial research and development behind this technology was undertaken at UC San Diego with five grants totaling $2.2 million from the National Science Foundation and National Institute of General Medical Sciences, part of the National Institutes of Health. Since founding, Genomatica has raised $125 million in venture financing.

Senomyx, another example, has collaborative agreements with global food, beverage, and ingredient supply companies, some of which are currently marketing products that contain Senomyx’s flavor ingredients.

Eleven Senomyx flavor ingredients have received regulatory approvals in the U.S.; many of these have also been granted approval in additional countries.

The proprietary taste-science technologies at the root of Senomyx were discovered through research led by Charles Zuker, a professor of biochemistry and neuroscience at UC San Diego. Zuker's research discovered taste receptors for four of the five tastes (sweet, sour, bitter and savory) as well as the fact that each taste cell is hardwired for one taste. Scientists used to think that every taste bud could pick up on all five tastes, and that a different signal would be sent to the brain for each one. His work was supported by grants from the National Institute on Deafness and other Communication Disorders, part of the National Institutes of Health.

"Innovation is a cornerstone of American progress, improving our lives in countless ways and providing jobs and economic growth. For decades, innovation has been fueled by federally funded research that is conducted at universities across our nation," said University of Wisconsin-Madison Chancellor Rebecca Blank, an economist and former Acting Secretary of the U.S. Department of Commerce. "America's future economic prosperity depends on increased investments in research and education that will accelerate innovation and inspire future generations of scientists."

Chancellor Blank is one of several experts on innovation, competitiveness and technology transfer who provide comments in the report. Others include Lita Nelsen, director of MIT's Technology Licensing Office, Dr. Terri Lomax, vice chancellor of the Office of Research, Innovation & Economic Development at North Carolina State University, and Deborah Wince-Smith, president and CEO of the Council on Competitiveness.

"Sparking Economic Growth 2.0: Companies Created from Federally Funded University Research, Fueling Innovation and Economic Growth" is a companion report to one published in 2010 by The Science Coalition. That report also identified 100 companies created from federally funded university research. The companies in both reports were self-selected by the member universities of The Science Coalition and are illustrative of the many companies created from federally funded university research, as well as the far-reaching paybacks on federal research funding.

The estimated total investment in the fundamental university research that contributed to the discovery or core technology behind the companies in Sparking Economic Growth 2.0 was approximately $330 million*. This funding often occurred over many years and even decades. It is a relatively small sum compared to problems such as cancer, which costs the U.S. economy $552 million every day or cybercrime which costs $383.6 million a day. Federally funded researchers are working every day to solve these and countless other problems that adversely affect our health, safety and economy.

“This report demonstrates the power of the federal investment in basic scientific research,” said Science Coalition President Tim Leshan. “While research is only a small portion of the overall federal budget, the results are huge: discoveries with profound implications for our health, safety and quality of life; training for future generations of scientists, doctors and teachers; and innovations that give birth to new technologies, companies and industries.

“If America wants to maintain its innovative edge, create meaningful jobs and realize economic growth, then we must ensure that funding for scientific research is prioritized, even in times of cost-cutting,” he said.

The Sparking Economic Growth 2.0 report details:

- How university research and the companies born of such research are a driving force behind much of the innovation in the United States, providing essential seed corn for U.S. industry.

- The impact that research universities have on local economies, including through spin-out companies that locate close to their founding universities, contributing to the formation of regional innovation hubs and creating jobs.

- The factors that make university research-based companies unique and contribute to their success, including the nurturing ecosystem of research universities, which provides ready access to essential tools like technology transfer offices, business incubators, business schools and workforce talent.

- The success rate of the companies in the 2010 Science Coalition report, specifically those companies that were less than five years old at the time. Eighty percent of those companies remain operational today.

(Sparking Economic Growth 2.0 and accompanying database are available at here. Estimates are available for 91 out of 100 companies and focus on funding of the initial university research that gave rise to the discovery or core technology behind the companies.)

The Science Coalition is a nonprofit, nonpartisan organization of more than 50 of the nation’s leading public and private research universities. It is dedicated to sustaining the federal government’s investment in basic scientific research as a means to stimulate the economy, spur innovation and drive America’s global competitiveness. Learn more about The Science Coalition at here.

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