

Update 2009

Innovation Areas:

Energy



BioDevice/ BioPharma



Medical Imaging & Brain Medicine



Nano- technology



Imaging & Digital Media



Overview

In March 2006, the Utah State Legislature passed Senate Bill 75 creating the Utah Science, Technology and Research initiative (USTAR).

This measure provided funding to:

1. Recruit world-class researchers to University of Utah (U of U) and Utah State University (USU);
2. Build state-of-the-art interdisciplinary research and development facilities;
3. Form first-rate science, innovation, and commercialization teams across the state.

This initiative focuses on leveraging the proven success of Utah's research universities in creating and commercializing innovative technologies to generate more technology-based start-up firms, higher paying jobs, and additional business activity leading to an expansion of the tax base.

In a little more than three years of operation, USTAR is on or ahead of plan in its three program areas – Research Teams, Building Projects, and regional Technology Outreach. As of July 2009, there were an estimated **128 full-time equivalent (FTE) research jobs statewide** directly related to USTAR research. The building projects were employing an estimated **594 workers**.

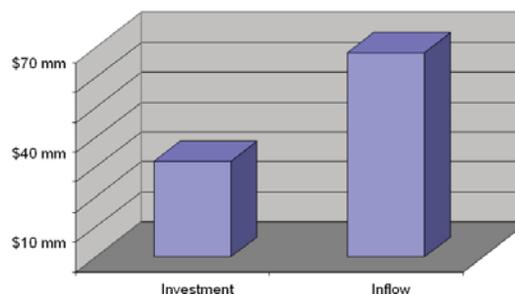
Research Teams

Leading researchers have been recruited to Utah and teams developed internally within strategic innovation focus areas. The focus areas:

- Are built on existing University strengths
- Create vast commercialization opportunities
- Target large, strategic global markets
- Leverage Utah industry strengths

In the last year, new hires continue to augment existing research teams in all focus areas, and recruitment has begun in newly formed teams in the energy, biodevice/biopharma, and digital media focus areas.

Cumulative State Investment in USTAR Research vs. Inflow of Federal/Industry Research Grants



State's investment in USTAR research is leveraged on more than a two-to-one basis.

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Technology Outreach & Innovation Program

Building Projects

USTAR funding supports construction of state-of-the-art interdisciplinary research and innovation facilities at the U of U and USU. Each structure will provide research teams with strategic core facilities to advance innovation and commercialization in their respective focus areas. These facilities are designed to be “industry magnets” for innovation collaboration.

Ground breaking at USU took place in October 2008 and at the U of U in April 2009. Both projects are on schedule and within budget.

Technology Outreach Innovation Program

USTAR’s Technology Outreach Innovation Program (TOIP) is the engine to drive commercialization activities. TOIP’s mission is to support the accomplishment of USTAR’s financial, employment, and research objectives by lending experienced leadership, deep business understanding, and functional expertise to the most promising opportunities and focus areas.

The regional program is led by industry-experienced directors deployed across Utah. Each director heads an Outreach Center located at one of the state’s higher educational institutions.

Due to budget cuts incurred in the 2009 Legislative session, USTAR consolidated from five to four Outreach Centers. The Northern Utah office (based at Weber State University) and Central Utah office (based at Utah Valley University) have split the territory formerly covered by the now-closed Salt Lake/Tooele office.

Offices in Southern Utah (Dixie State College and Southern Utah University satellite) and Eastern Utah (USU - Uintah Basin) remain active.

The directors assist in expanding the transfer of new or improved technologies from state universities to existing companies and advancing cutting-edge research on behalf of Utah’s leading firms.

Besides working with scores of emerging and existing technology businesses and entrepreneurs in their regions, the directors have pursued regional initiatives. More detail on these activities is provided later in the report (page 12).

Funding

Funding for the initiative arises from Senate Bill 75 (2006) and Senate Bill 240 (2009). Details are as follows:

Senate Bill 75

- Ongoing \$15 million a year for Research Team recruitment and support (*cut to \$13.5 million in the Feb. 2009 legislative session*)
- Ongoing \$4 million a year for regional Technology Outreach (*cut to \$1.8 million in the Feb. 2009 legislative session*)
- One-time funding for the Building Projects:

\$50 million from General Fund (*cut to \$4 million* in the Feb. 2009 legislative session*) plus

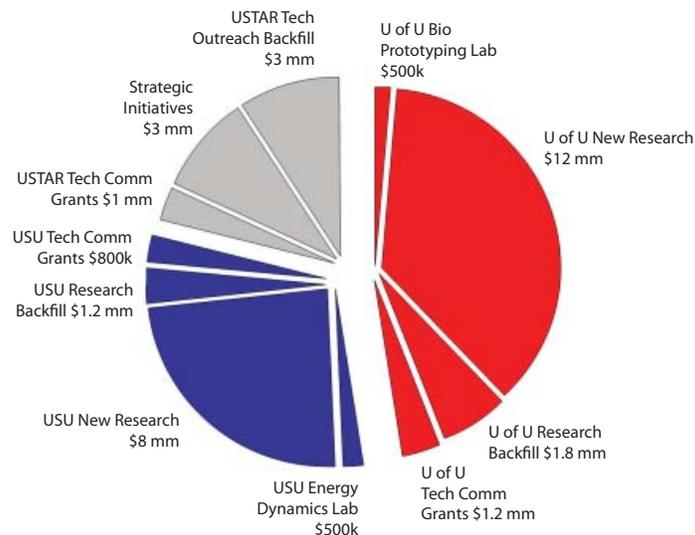
\$111 million in general obligation bonding, plus

\$40 million matching contributions from the universities, comprised of:

\$30 million from the U of U (completed)
\$10 million from USU (completed)

* *The balance is anticipated to be bonded in the future.*

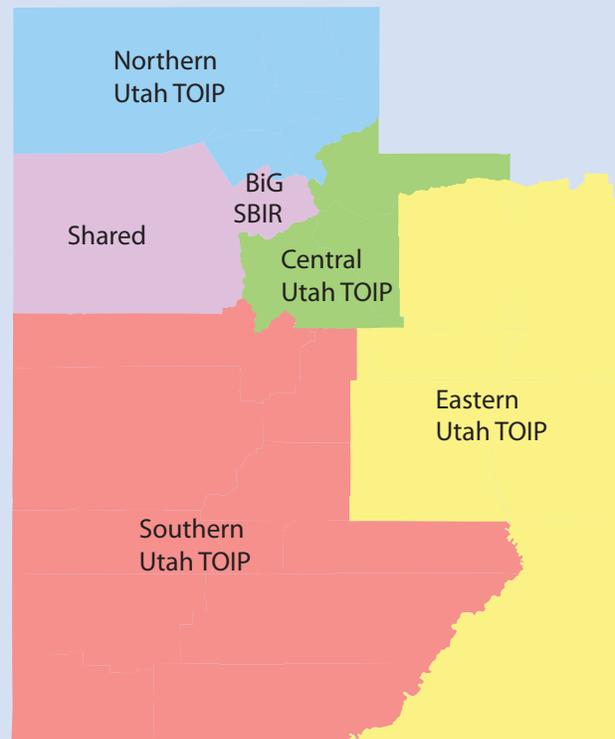
ARRA Funding (SB 240 - FY2010 and FY2011 Total)



Senate Bill 240

Also in March 2009, SB 240 provided a total of \$33 million from the American Recovery and Reinvestment Act (ARRA) for FY2010-11. USTAR is allocating these funds as follows:

- \$23 million for existing and new research teams
- \$3 million over two years to implement outreach center programs, including SBIR-STTR Assistance Center and BioInnovations Gateway
- \$2 million to augment existing grant programs at U of U and USU. These are intended to help non-USTAR faculty commercialize breakthroughs.
- \$1 million to enhance initiatives at USU (Energy Dynamics Lab) and U of U (biomedical prototyping)
- \$1 million to catalyze commercialization through Utah's other public institutions of higher learning via the Technology Commercialization Grant program
- \$3 million over two years for strategic initiatives across the Research and Technology Outreach programs



Organization

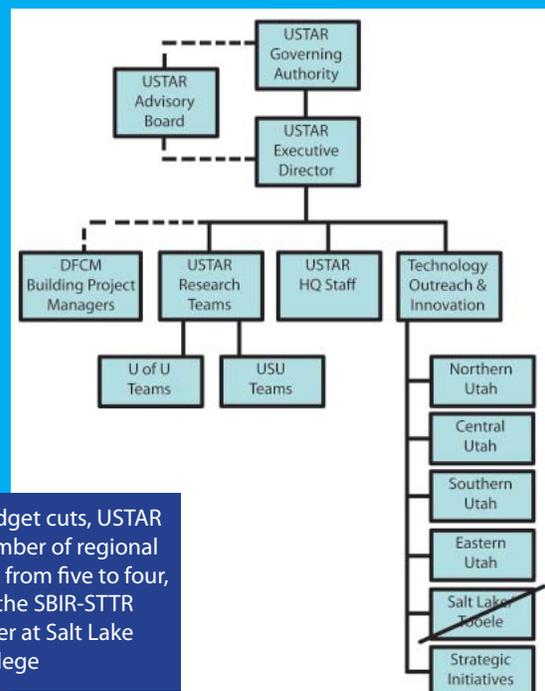
The USTAR Governing Authority board is an experienced and committed team of ten leaders with diverse experience in inventorship, entrepreneurship, financial capital, university research, and running and growing companies.

- Dinesh Patel, Ph.D., Managing Director, vSpring Capital (Chairman)
- Spencer P. Eccles, Executive Director, Governor's Office of Economic Development (Vice Chairman)
- Scott Anderson, CEO, Zions Bank
- Richard Ellis, Utah State Treasurer's Office
- Jim Dreyfous, Managing Director, UV Partners
- Hunter Jackson, Ph.D., CEO of Navigen Pharmaceuticals
- Dan Olsen, Ph.D., Brigham Young University
- Cynthia Burrows, Ph.D., University of Utah
- Charles J. Precourt, VP of Business Development, ATK
- Rich Linder, CEO, Coherex Medical Inc.



Dinesh Patel

USTAR staffing is comprised of regional technology outreach staff (directors, analysts, and interns) and headquarters personnel. The TOIP offices work with local entrepreneurs and businesses, provide strategic consulting to the university USTAR research teams, and pursue regional initiatives. The headquarters team supports the TOIP offices, and provides executive administration, accounting/finance, and marketing communications services. Please note that 2009 budget cuts reduced our regional offices by one.



Due to 2009 budget cuts, USTAR reduced the number of regional outreach offices from five to four, while retaining the SBIR-STTR Assistance Center at Salt Lake Community College

Metrics of Success

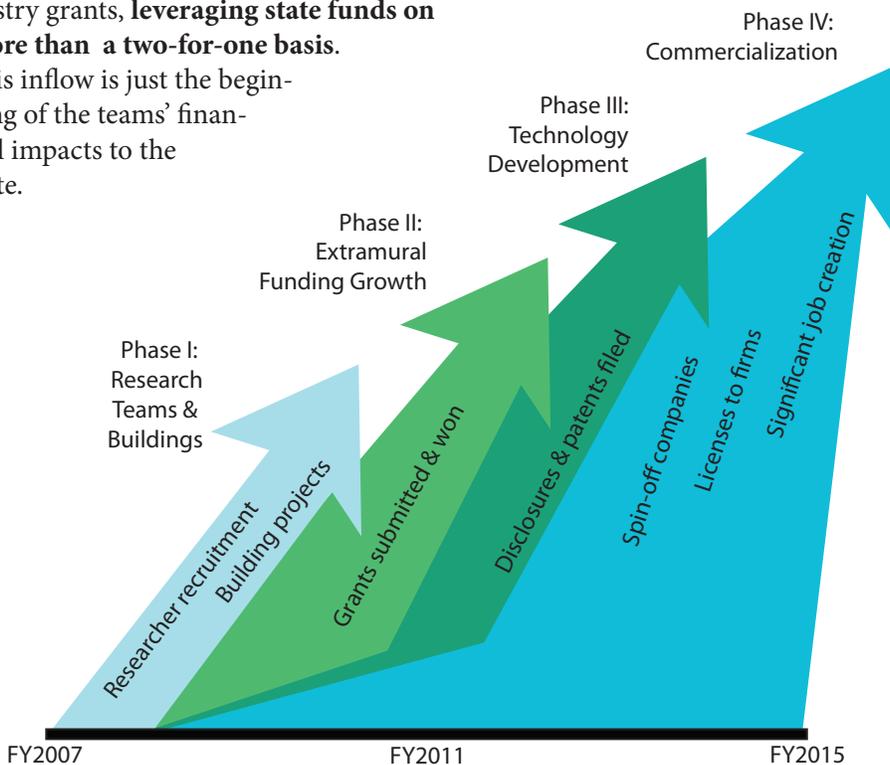
The USTAR initiative is a long-term, multi-year effort. Our first two years focused on building a strong foundation for growth. In this initial “launch” period, we hired a significant number of USTAR researchers, commenced the building projects, and put in place an experienced team of technology outreach leadership around the state.

USTAR is in the phase where we are seeing significant gains in federal grants attracted to the state, as well as steady progress in disclosures and patents filed. USTAR is pleased to report that we are on or ahead of plan in all key metrics (see chart on page 5).

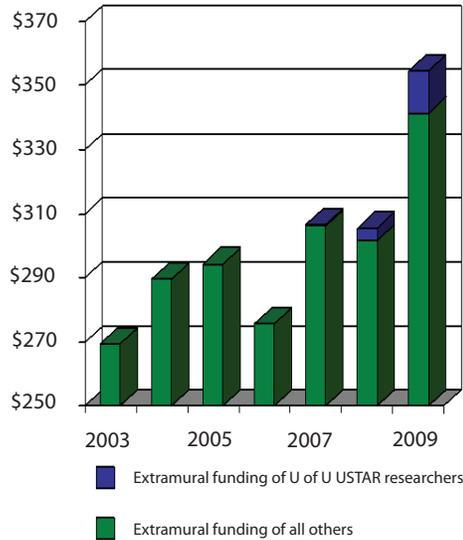
For example, from 2008 to 2009 the U of U experienced 16 percent growth overall in research awards (\$306 million to \$355 million), an impressive performance in a very tough economy for funding. Perhaps even more impressive is that **USTAR faculty accounted for 27 percent of this growth**, or \$13.3 million in awards in FY2009.

USU researchers have seen similar gains in the inflow of extramural funding. In aggregate, for fiscal years 2007-2009 combined, the state’s investment in USTAR research teams totaled \$33.7 million. Based on that investment, these teams have - according to preliminary figures - won more than \$71.3 million* in federal and industry grants, **leveraging state funds on more than a two-for-one basis.**

This inflow is just the beginning of the teams’ financial impacts to the state.



USTAR Faculty are driving the growth of the University enterprise



U of U statistics indicate that research programs of USTAR faculty have significantly increased the inflow of federal and industry research grants to the University.

USTAR researchers have made more than two dozen invention disclosures (preliminary to patents) and eight separate patent filings. In terms of employment in FY2009, 128 FTEs were employed in USTAR research statewide.

Equally important, USTAR is beginning to see progress in a metric we expect to blossom in the later stages of the initiative, the creation of new companies. To date, USTAR researchers have started four new companies and attracted two more to the state. This is on track with economic projections developed in 2005 when USTAR was formulated.

USTAR’s growth is projected to occur in four phases, from the launch of research teams (Phase I) to new company/job creation (Phase IV). In reality, this growth is not so much sequential, but rather taking place along a continuum. Nonetheless we are seeing significant inflow of extramural research funding, as predicted.

* Based on expected multi-year grant funding through 2014.

Research Teams



USTAR Research Progress

Category	June 30, 2008 Cumulative	June 30, 2009 Cumulative
Faculty hiring activity	15 senior faculty hires	22 senior faculty hires
Research employment	65 FTE	128 FTE*
State investment in USTAR research	\$14.8 mm	\$33.7 mm
External research grants awarded	\$11.85 mm	\$71.3 mm**
External research grants pending	\$106.3 mm	\$143.2 mm**
Patents filed or issued	4	8
Companies started in Utah	1	4
Companies brought to Utah	2	2

* In FY2009, 128 FTE include USTAR hires and those externally funded by awarded grants.

** Preliminary figures, subject to revision pending additional university data. Figures include grants submitted in FY2009 and awarded before Sept. 30, 2009.

BioDevice/BioPharma

- Biomedical Device Innovation
- Cell Therapy & Regenerative Medicine
- Advanced Nutrition
- Synthetic Bio-manufacturing
- Veterinary Disease/Diagnostics

Nanotechnology

- Nano Micro Circuitry
- Nanotechnology Biosensors
- Micro & Nano Systems Integration

Energy

- Biofuels
- Fossil Energy: Carbon Engineering
- Intuitive Buildings
- Alternative Energy

Imaging Technologies and Digital Media

- Imaging Technology
- Advanced Sensing & Imaging
- Space Weather
- Digital Media
- Interactive Design

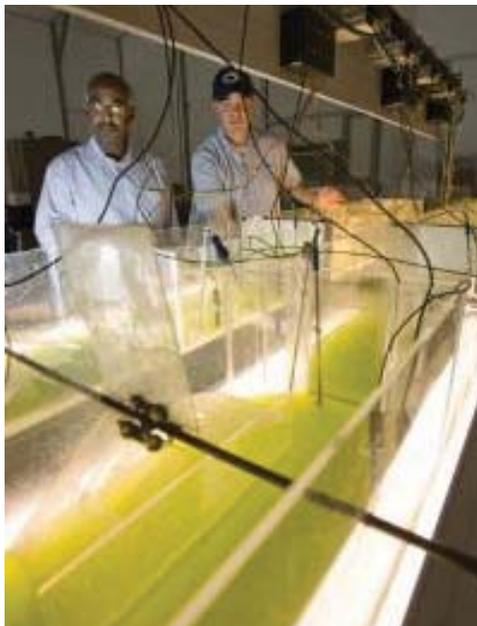
Medical Imaging and Brain Medicine

- Circuits of the Brain
- Imaging Psychiatric Diseases
- Diagnostic Imaging
- Nanoscale & Biomedical Photonic Imaging

USU Feature Stories

Advancing Environmental Quality in Logan and Beyond

In August 2009, Utah State University and the City of Logan announced a joint municipal and university team to develop a pilot facility for extracting harmful phosphates from Logan City waste lagoons. The facility will harvest algae that consume nitrogen and phosphorus and convert them into biofuel. Leading the effort is the USU Biofuels team, which is funded by USTAR.



“This project promises to improve water quality and reduce the city’s use of fossil fuel,” said Ronald C. Sims, Department Head, USU Biological and Irrigation Engineering. “What’s also very exciting is that a successful pilot could lead to products and services aimed at the 16,000 other wastewater treatment lagoon systems in the United States.”

According to the researchers, because of large capital project cost avoidance, the project has the potential to save Cache Valley residents \$60 a month on utility bills.

One of the leaders of USU’s alternative energy efforts is USTAR researcher Jeff Muhs, who is a nationally known expert. He also was senior author on a comprehensive report, “Algae Biofuels and Carbon Recycling,” which was released during his testimony before Congress in May 2009.

Mapping the Wind

The Center for Active Sensing and Imaging (CASI) at Utah State University is developing laser technology called LIDAR for remote sensing and 3D imaging.

Like its cousin RADAR, LIDAR (Light Detection and Ranging) bounces laser light off of objects to accurately measure the size, shape and location of land, buildings, and even the air.

LIDAR can literally “map the wind,” helping to detect air pollution and site wind farms. LIDAR is also used to raise freeway bridges faster than ever. In short, research underway at USU is making advances in transportation infrastructure, energy, public health and other billion-dollar markets.

With USTAR funding, CASI built a mobile 3D camera, opening up new uses for what had previously been stationary, ground-based technology. LIDAR cameras can now capture exceptional detail of buildings and terrain from great heights in helicopters and planes or on the ground from moving vehicles.

Demonstrating remarkable creativity and productivity, the team made 21 invention disclosures and three patent filings. One patent has been issued, and technology is being licensed to commercial partners.

Indicative of growing markets, the team completed six external service contracts, with more in the works. One project analyzed air quality in California, while others supported commercial, transportation, and ecology projects in Utah.



More Effective Ways to Block Cholesterol

An effective way to lower cholesterol is to block its absorption in the intestine during the digestive process. An FDA-approved drug, ezetimibe, does such blocking. So do naturally occurring compounds – called phytosterols or plant sterols – that are found in vegetable oils, nuts and legumes. What additional benefits might come with a combined drug and dietary approach?

Michael Lefevre, A USTAR researcher at USU, is leading a study with human subjects to determine if prevention of cholesterol absorption is more effective when ezetimibe and a diet rich in phytosterols are combined.

USU's Center for Advanced Nutrition is following subjects from the Cache County area in a controlled study. Lefevre is the principal investigator. "It is believed that ezetimibe and phytosterols block cholesterol absorption in different ways, and thus, their effects could potentially enhance one another," Lefevre said.

The market for cholesterol-fighting drugs is estimated to be \$20 billion a year. Successful outcomes of this study could be national in scope and lead to new products.



Lab workers measure test ingredients in the state's first metabolic kitchen.



New Teams Funded at USU

Thanks to advancements in USTAR funding at USU through Senate Bill 240, emergency responders will make better decisions in natural disasters, doctors will more quickly diagnose diseases in farm animals before they spread, and "green" planners will reduce kilowatts of electricity inefficiently spent to light, heat and maintain Utah's commercial buildings.

IDIAS (Interactive Design for Instructional Applications and Simulations) team goal: Develop products to train security, fire fighting, medical and other emergency response teams through comprehensive simulations. Expanding upon recent advances in consumer game technology, the team will develop "serious game" environments to increase the effectiveness of first responders' decision making in real-life emergencies. Other areas of research for the IDIAS team include using simulation to measure and evaluate environmental changes, improvements to distance education, and the development of instructional materials for certification programs.

VDID (Veterinary Diagnostics and Infectious Disease) team goal: Veterinary diagnostic tests - a \$1 billion U.S. market - have limitations due to expense, limited reliability and lack of specificity. Drawing on USU's strengths in agricultural and veterinary science, VDID will produce innovative and novel ideas and technologies that will reach the market through new companies and licenses.

I2B (Institute for Intuitive Buildings) team goal: Reduce the energy wasted in lighting, cooling and ventilating commercial buildings by creating real-time scene measurement and interpretation techniques for lighting systems, namely a system of intelligent, self-adapting lights. The I2B team's research could save 50 percent of the electricity used for lighting in commercial buildings and make electrical power consumption more consistent, goals important to establishing Utah as a leader in the Department of Defense's Commercial Buildings Initiative.



USTAR Buildings: On Schedule, On Budget

Building Utah's Research Capacity

Leading researchers and industry will utilize two state-of-the-art interdisciplinary research and development facilities coming to Utah as a result of a key program of the USTAR initiative. The building construction process is being led by Project Managers from the Department of Facilities and Construction Management (DFCM).

Currently the projects are proceeding on schedule and in budget, thanks in part to favorable steel prices. In addition, it is estimated that the projects are employing as many as 800 construction workers in the second half of 2009.

The primary purpose of these buildings is to give our research teams top-of-the-line facilities in which to conduct their work in USTAR's key innovation focus areas.

The secondary purpose - also critical - is to foster the connection between industry, entrepreneurship and research. Each facility will serve as an industry magnet, encouraging collaboration between researchers and industry experts.

Funding for the projects came in March 2006 when State legislators created a \$161 million USTAR building fund. The universities provided a \$40 million match, bringing the entire building budget to \$201 million. The legislation required both of the research universities to donate land and make significant contributions towards cost prior to construction. Through June 30, 2009, approximately \$18.1 million in state funds have been spent on the projects.

USU donated a 33,000 square-foot building in Innovation Campus which is being used to house the existing innovation teams. The Legislature and Governing Authority approved the donation of both Building 620 and accompanying land to satisfy the university's \$10 million contribution.

USU

The USU building will house researchers pursuing advanced nutrition, veterinary and other life science efforts. This 110,000 square foot building is located in USU's Innovation Campus in North Logan.

Ground breaking took place October 17, 2008 and opening is slated in 2011. USU is seeking Leadership in Energy and Environmental Design (LEED) Gold Certification for the building.



Above: USU's 110,000 square-foot building is taking shape on Innovation Campus. Track progress at <http://webcam.usu.edu/ustar>

USU facilities are to include:

- Bio Safety Level 3+ lab
- Vivarium
- Clinical nutrition center
- Life science labs

Gramoll Construction is the Construction Manager General Contractor (CMGC) and AJC Architects is the Architectural and Engineering (AE) firm and design team lead. Payette Associates is designing some of the lab space.

Estimated Project Employment

Timeframe	Total Workers
Oct - Dec 08	75
Jan - Jun 09	313
Jul - Dec 09	594
Jan - Jun 10	894
Jul - Dec 10	810
Jan - Jun 11	750
Jul - Dec 11	450

Quarterly estimates of the number of workers involved in USTAR building projects (Source: CMGCs).



James L. Sorenson Molecular Biotechnology building - artist's rendition. You can view an animated fly-through of the 200,000 square-foot building at <http://newmedia.innovationutah.com/video-audio/>.

In FY2010, it is anticipated the two building projects will employ from 594 to 894 workers.

U of U

At the U of U, Layton Construction, Inc. is the Construction Manager General Contractor (CMGC) and Lord, Aeck & Sargent Architecture is the Architectural and Engineering (AE) firm and design team lead (with local collaboration with Prescott Muir).

Ground breaking took place on Earth Day, April 22, 2009, and construction of the 200,000 square foot facility should be complete in 2012.

The U of U facilities are to include:

- Nanofabrication
- Small Animal Imaging
- Optical Imaging
- Vivarium
- Neuroscience labs
- Biotechnology labs
- Data center

In the spring of 2009, the Sorenson Legacy Foundation donated \$15 million, and the new building will be named the "James L. Sorenson Molecular Biotechnology Building - A USTAR Innovation Center." This follows a \$1.25 million donation from the Micron Technology Foundation. The new building is envisioned to be part of a four-building interdisciplinary quadrangle located between lower and upper campus.

Much thought has gone into the location of the building, its design, its equipment, and other elements that will encourage interaction and collaboration across disciplines.

"The building site both physically and academically unites the health sciences campus with the main campus and its basic research resources. The building will bring talented people together to cross traditional boundaries and accelerate research at the interfaces of medicine, pharmacy, engineering, computer science and life sciences," said Dinesh Patel, USTAR Governing Authority chairman. "We intend the building to be at the crossroads of interdisciplinary translational research on campus and across the state."

Earth Day was an appropriate launch date. The energy efficient building (planned for LEED Gold Certification) should reduce energy use and cost from current laboratory code requirements by a minimum of 40 percent. Daylighting will allow natural light to reach at least 75 percent of the building's occupied spaces, and sunshades will modulate light as it enters the building at different times of day and from different angles throughout the year.

Some other key sustainable design strategies include:

- Multi-stage evaporative cooling systems that include energy recovery
- Vegetated bioswales to help capture and retain surface runoff to mitigate storm water quality and quantity
- Harvesting of rain water for use in site irrigation and sewage conveyance
- Use of local stone and copper construction materials as well as other renewable resourced materials, such as high fly ash content concrete
- Low VOC (volatile organic compound) finishes

U of U Feature Stories

Joint Venture to Make Utah the Leader in Clean Carbon Energy

U of U USTAR researcher Brian McPherson is spearheading the largest federally-funded project in the U.S. testing the feasibility of geologic sequestration of carbon dioxide (CO₂) to mitigate climate change. In simple terms, the project seeks to test the idea that the CO₂ released at power plants can be injected a mile underground and stored safely away from the atmosphere.

In February 2009, the U of U and Headwaters Incorporated (NYSE: HW) entered into a joint venture called Headwaters Clean Carbon Services LLC (HCCS) to offer carbon management services to CO₂-emitting companies, from carbon storage engineering to risk and liability management. McPherson's involvement in the joint venture is critical to its success.



Utah's unique geology offers deep strata to "cap" carbon dioxide storage.

In August 2009, HCCS secured a \$1.8 million Dept. of Energy (DOE) grant to develop a risk assessment model to determine quantitatively the potential risks and impacts of CO₂ storage, as well as the cost savings for risk mitigation.

Another upcoming project is to develop and operate a regional CO₂ storage site that will serve several power plants in central Utah. HCCS engineers estimate that the proposed regional CO₂ storage site could permanently store as much as 1 billion tons of CO₂. That's enough storage to sequester the emissions from at least six 500-megawatt coal-fired power plants for 50 years. This project should create jobs and expand the tax base in Utah.

On a related front, McPherson's research team has secured in September 2009 an additional \$2.7 million DOE funding to advance carbon sequestration technology.

TheraTarget Enters Pharma Partnership

An array of precisely directed, cancer-fighting drugs may be on the horizon, thanks to a company formed by U of U researchers.

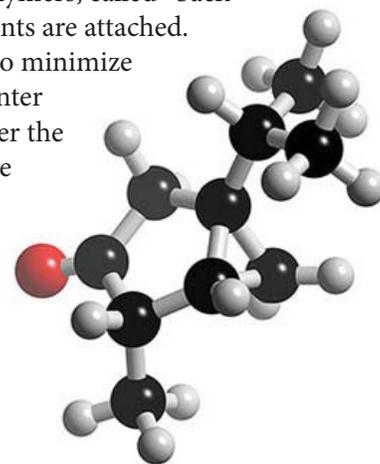


USTAR researcher Hamid Ghandehari

TheraTarget, Inc., a company launched in October 2008 by Jindrich (Henry) Kopecek and Hamid Ghandehari, is already providing services to a major pharmaceutical company with expertise in novel therapeutics for cancer. The agreement opens the way for TheraTarget to synthesize polymer-based drug delivery systems to expand the client's product line.

The synthesized compounds use technology pioneered by Kopecek and coworkers. The compounds are composed of chains of polymers, called "backbones," to which toxic agents are attached.

The compounds are able to minimize damage to healthy cells, enter cancerous ones, and deliver the cell-killing agents. Because of their high molecular weight, the compounds stay active in the bloodstream longer than conventional pharmaceuticals, thereby making the drug more effective.



"The beauty of these compounds is that they are not toxic in the bloodstream, but are in cancer cells," said Ghandehari, who joined the U of U faculty in 2007.

Unlocking Genetic Secrets

Julie R. Korenberg joined The Brain Institute and the Department of Pediatrics at the University of Utah as a USTAR Professor in early 2008. Her research has drawn international attention to Utah in some highly prestigious publications.

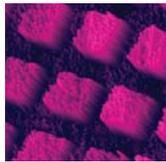
In May 2009, *Nature* published a paper she coauthored about the genetic basis of the low incidence of solid cancer tumors in Down Syndrome patients. In July 2009, the National Academy of the Sciences published research based on the highest resolution genetic map of the Down Syndrome genome to date, representing decades of Korenberg's work.

Her research leadership points the way to new treatments of cancer, congenital heart disease, mental retardation, and other conditions, not only in Down Syndrome patients but in the general population as well.

Thinking Big by Thinking Small

USTAR nanotechnology expert Marc Porter spearheaded the U of U's winning a \$3 million National Science Foundation grant. Codirector of the Nano Institute of Utah, Porter coordinated the efforts of 27 faculty members to land the funding for training of new Ph.D. candidates.

In addition, Porter's team made advances on new technology to improve testing and detection, including a water quality testing device for use in the International Space Station, a Herpes screening device for use by ARUP, and a prototype of a fast, easy-to-use in-clinic blood and bodily fluid testing device that works like a card scanner.



Oil and Gas Drilling with Fewer "Dry Holes"

The Eastern Utah TOIP office is working closely with Bill Keach (joint appointment at the U of U and Brigham Young University) on a project that could dramatically lower costs and environmental impact associated with oil and gas drilling in Utah. It may also increase the revenues that are generated on SITLA lands for education funding.



A "proof of concept" grant from USTAR enabled Keach to perform a series of tests of 3D Seismic Spectral Decomposition Analysis and related technology in the Uintah Basin.

Results from two rounds of testing indicate the technology can increase the well drilling success rate dramatically. The second round points toward techniques that could yield well drilling success in 80 percent of proposed sites, a level of efficiency previously unseen in the state's exploration industry.

Translating this technology into commercial techniques will take some time but it is expected that the state may gain some royalty revenues from activity on SITLA property. The

technology may also reduce surface impact for environmental mitigation.

The project involved partnering with Utah companies Pioneer Natural Resources to include Wind River Resources and Flying J, as well as Pioneer Natural Gas of Wyoming

Imaging the Brain

The Imaging Technology team – led by USTAR researcher Guido Gerig – is putting Utah at the forefront internationally in the fields of neurodevelopment and neuroimage analysis. The team's goal is to develop technology and computer modeling that leads to earlier detection and more effective treatment of Alzheimer's, Autism, Multiple Sclerosis, depression, schizophrenia, and other debilitating conditions.



The team includes USTAR innovators Tom Fletcher and Tolga Tasdizen, and represents collaboration between the U of U's Scientific Computer Institute and Brain Institute.

To date, USTAR has invested \$1.5 million in this effort, and the team has secured more than \$8.1 million in federal funding from the National Institutes of Health and other sources, with an additional \$6.8 million in the pipeline.

Helping Veterans in Distress

Tens of thousands of people commit suicide every year, and military veterans are among the at-risk groups. Deborah Yurgelun-Todd, a USTAR researcher at the U of U's Brain Institute, is trying to do something to help veterans and the general population.

Yurgelun-Todd was recently named director of the Veterans Administration's Mental Illness Research, Education and Clinical Center (MIRECC) in Salt Lake City. MIRECC was established by Congress with the goal of researching the causes and treatments of mental disorders and using education to put new knowledge into routine clinical practice in the VA.

As director, Yurgelun-Todd will foster collaborative in-state research and clinical efforts to reduce suicide rates and improve quality of life. She recently won a \$1 million VA grant to perform MRI studies on a group of 40 veterans.



Technology Outreach: Overview

Technology Outreach Leadership



Ted McAleer, Executive Director
 Location: Salt Lake City USTAR Headquarters
 Background: Teleoptic Digital Imaging, LLC, SunGard SCT, Procter and Gamble, PepsiCo, and the US Army



Curt Roberts, Northern Utah
 Location: Weber State University
 Counties: Box Elder, Cache, Davis, Morgan, Rich, Weber, and shared coverage of Salt Lake and Tooele
 Background: VP for Nike working on Tech Ventures and Global Strategy



Steven Roy, Central Utah
 Location: Utah Valley University
 Counties: Summit, Utah, Wasatch and shared coverage of Salt Lake and Tooele
 Background: Sun Microsystems, Andersen Consulting, LLP. Six Sigma black belt certification



Jill Elliss, Southern Utah - Acting Director
 Location: Dixie State College, Southern Utah University
 Counties: Beaver, Garfield, Juab, Kane, Iron, Millard, Piute, San Pete, Sevier, Washington and Wayne
 Background: Decades of experience in regional economic development



Al Walker, Eastern Utah
 Location: USU - Vernal, EGI at U of U
 Counties: Carbon, Daggett, Duchesne, Emery, Grand, San Juan and Uintah
 Background: Questar, Amoco and General Electric



Mary Cardon, SBIR/STTR Assistance Center
 Location: Salt Lake Community College- Miller Campus
 Counties: All of Utah
 Background: General Electric; Small Business Management; 15 years of management in newspaper industry



Dr. Suzanne Winters, BioInnovations Gateway
 Location: Granite Technical Institute (GTI)
 Affiliated Programs: Salt Lake Community College, Utah Valley University, GTI
 Background: Battelle, Science Advisor for Utah under Governor Leavitt

TOIP Metrics

Working with local companies and entrepreneurs, TOIP staff conducted 175 projects from Sept. 30, 2008 to Sept. 30, 2009:

Project Type	Completed	Open
Advisory / Mentoring Services	28	23
Assist with Fundraising*	18	17
New companies launched**	6	8
SBIR Proposals	17	3
Broker Technology or Licensing	2	1
Connect Higher Ed with Business		10
Assist with Technology Development	3	8
Referrals	14	6
Other	1	10

* Assisted clients with raising \$20.3 million in private equity investment

** Assistance to entrepreneurs, separate from USTAR researcher companies

Technology Commercialization Grants Program for Regional Higher Education

In an effort to bring innovative new technologies to market from Utah's public colleges and universities, USTAR TOIP has launched the Technology Commercialization Grant (TCG) and related programs.

With a typical award size of \$30,000, TCG grants will assist faculty at regional institutions to prototype, test, assess markets, and commercialize new products and services in high-growth markets. In addition, Utah-based companies willing to sponsor technology development work at regional public institutions of higher learning may jointly apply with a faculty member.

USTAR TCG funds are intended for use by faculty at Applied Technology Colleges (UCAT), College of Eastern Utah, Dixie State College, Salt Lake Community College, Snow College, Southern Utah University, USU Extension – Uintah Basin, Utah Valley University, and Weber State University. In the first round ended Sept. 30, 2009, we received 23 applications from seven institutions, with 16 industry co-applicants.

The regional higher education TCG program is part of an overall strategy to promote commercialization of higher education innovation. USTAR is funding similar grant programs at the U of U and USU, augmenting or expanding existing technology development resources at the research universities.

Technology Outreach: Regional Initiatives

SBIR-STTR Assistance Center

The federal Small Business Innovative Research (SBIR) and Small Business Technology Transfer (STTR) programs offer more than \$2.5 billion dollars annually to support the development of technology by small businesses across the nation. SBIR-STTR funding is an excellent source of early stage capital that doesn't require equity participation.

In recent years, Utah has won less than its fair share of these federal dollars. Nationwide, when companies and entrepreneurs draw on the writing and editing expertise of an assistance center, the success rate in winning SBIR-STTR funding triples. To address those needs, and with critical support from Salt Lake Community College, GOED and others, USTAR Technology Outreach spearheaded the creation of the SBIR-STTR Assistance Center (SSAC) to help small business statewide capture a larger share of federal research dollars.

SSAC is based at the Miller Innovation Campus of Salt Lake Community College, and USTAR staff members run the center. In just more than a year's operation, the center is working with more than 70 companies and entrepreneurs, and has submitted grant for more than \$5 million in federally funded capital.



Cluster Acceleration Project

USTAR's regional Technology Outreach centers are supporting the Cluster Acceleration Partnership (CAP), an initiative sponsored by the Utah System of Higher Education, the Department of Workforce Services, and GOED. The objective of CAP is to better utilize Utah's higher education assets to drive growth in critical economic clusters.

USTAR's staff are working closely with the sponsoring organizations as well as other key private industry leaders to develop strategies in three pilot clusters - Aerospace, Digital Media, and Energy. The intent is to build upon success and momentum in these three pilot areas and implement CAP projects for additional clusters.

BioInnovations Gateway

USTAR Technology Outreach was instrumental in Granite School District's obtaining a federal WIRED grant to open in fall 2009 the BioInnovations Gateway (BiG), an incubator specializing in Utah's life science industry.

BiG provides 25,000 square feet of wet and dry labs and office space for up to seven start-up companies to develop products and work with secondary and post-secondary students. Funding for the facility comes from:

1. Department of Labor Workforce Innovation and Regional Economic Development (WIRED) grant of \$583,000 (grant application coordinated by GOED)
2. Granite School District (GSD) retrofit construction funding of approximately \$300,000
3. USTAR funding of \$250,000 to purchase lab equipment plus USTAR funding for management staffing



BiG has drawn national interest from the Department of Labor, National Science Foundation and many communities looking to stimulate technology economic development, said State Science Advisor Dr. Tamara Goetz of GOED. Goetz noted that USTAR's involvement was critical to launching the new facility. "USTAR's financial commitment and the time Suzanne Winters has devoted to this project demonstrated to the federal funding sources the depth of statewide backing for the project."

According to a research study conducted for the U.S. Department of Commerce Economic Development Administration (EDA), researchers found that business incubators are the most effective means of creating jobs – more effective than roads and bridges, and other community infrastructure projects. The study showed incubators provide up to 20 times more jobs than community infrastructure projects.

Collaboration

In addition to our alignment with higher education institutions, USTAR collaborates with key proponents in growing Utah's innovation economy, including the Governor's Office of Economic Development (GOED), Salt Lake Chamber of Commerce, Utah Technology Council, EDCUtah, MountainWest Capital Network, Grow Utah Ventures, Wayne Brown Institute, regional Chambers of Commerce, SBDC offices, SEED initiatives, angel investor groups, and others.

Technology Outreach: Supporting Entrepreneurs

The “Concept to Company” competitions are ongoing innovation contests held in various regions across the state of Utah. The main objectives of the contests are to encourage and support Utah’s entrepreneurial innovators with the intent of helping them turn their concepts into a company. Each competition focuses on the unique entrepreneurial strengths of a region of the state.



The contests are organized and hosted by Grow Utah Ventures and Zions Bank. The premier sponsors of each contest are USTAR, Workman Nydegger, CFO Solutions and Ballard Spahr. Other local businesses may also provide sponsorship services for contests in that region.

Feedback from USTAR Client Companies:

"My experience with USTAR has been overwhelmingly positive! Their expertise and resources have proven invaluable during a critical growth stage of my company, Invectus Biomedical, a business focused on medical device technologies to improve women's health. USTAR helped me strategically assess my business and provided me with research and feedback that greatly increased my ability to market the Daisyclip product to investors. I truly wish there were more programs like USTAR."

-Annette McClellan, Invectus Biomedical
Salt Lake Biomedical Devices Contest

"Without USTAR, we'd still be in our garage trying to figure out how to find funding. USTAR assessed where we were, gave us some new tools, and pointed us to the right persons. I don't know how we could have found, let alone afford the kind of business acumen that USTAR provides."

- Toby Hazelbaker, Ogwa
Northern Utah Outdoor Recreation Contest

The Concept to Company Contest was a great opportunity for me to hone my "concept" into a clear and precise business idea... from marketing to key contacts to manufacturing ideas. This gave us tremendous momentum in moving the development of our product forward. In fact, we probably accomplished more in the four months after the contest than the two years prior. I'm very pleased that USTAR and its partners have worked hard to make this competition thrive especially during these trying economic times. The opportunities presented to budding entrepreneurs will pay dividends to the varied economic sectors of Utah for many years to come."

- Jared Loosli, Cool Cab
Southern Utah Technology Contest

"The Concept to Company contest experience was absolutely invaluable to the start of Flixify. This competition helped us refine our concept to the point of successfully launching our company."

- Josh Aikens and Jeff Poulton, Flixify.com
Southern Utah Technology Contest



Ogwa's portable, pressurized water system

"After the Concept to Company competition, USTAR stepped in and provided invaluable help in assessing my market, building financial statements, and developing a promotion plan for my product. Their help has been invaluable, especially as we seek financing and prepare for growth."

- Chris Wickliffe, WickWerks
Northern Utah Outdoor Recreation Contest

"The Concept to Company Contest has been a real benefit to me as an entrepreneur, it has given me motivation, insight, and confidence to pursue my ideas and dreams of building a new company. They have given me much needed technical support and help in designing my business plan."

- Kirk Harris, EasyLoadPro.com
Southern Utah Technology Contest

A Year of Progress: October 2008 to September 2009

Sept. 2009	U of U's Brian McPherson's team wins \$2.7 million grant (Dept. of Energy carbon sequestration). U of U's Marc Porter and others release a water quality testing device for the International Space Station . Grow Utah Ventures, Zions Bank and USTAR select Concept to Company Energy Innovation contest winners .
Aug. 2009	City of Logan teams with USU's USTAR-funded Energy Dynamics Lab and Biofuels teams announce water quality/biofuel pilot project . In a statewide higher education/commercialization initiative, USTAR TOIP launches the Technology Commercialization Grant program . U of U's Marc Porter leads group of 27 faculty that wins a \$3 million IGERT grant for biosensor Ph.D. training. Wayne Brown Institute and USTAR TOIP client Panoptic Security announces obtaining early-stage financing . USTAR launches blog and social media site, http://newmedia.innovationutah.com .
July 2009	U of U's Julie Korenberg publishes report of highest resolution genetic map of Down Syndrome, pointing the way to new treatments. USTAR helps U of U's Institute for Clean and Secure Energy launch a business advisory board . USTAR-supported BioInnovations Gateway at Granite Technical Institute opens its doors.
June 2009	USTAR TOIP client Corsa Motorsports debuts first hybrid race car in America Le Mans Series. U of U's Deborah Yurgulen-Todd named director of VA's Salt Lake City-based Mental Illness Research Education and Clinical Center.
May 2009	USU's Jeff Muhs testifies on algae biofuels before Congress and releases comprehensive national report . U of U's Julie Korenberg publishes report of cancer-protecting gene in Down Syndrome patients, pointing way to new cancer treatments. USU's Center for Advanced Nutrition launches human trial studying combined drug/diet approach to reduce cholesterol .
April 2009	U of U's Brain Institute selects six pilot projects by non-USTAR researchers to utilize high-end MRI device originally funded by USTAR. Ground breaking for U of U research building , the James L. Sorenson Molecular Biotechnology Building, takes place. USTAR TOIP team assists rural Utah stakeholders to hold Renewable Energy Fair in Milford. USTAR TOIP client MatchBin announces obtaining early-stage investment .
Mar. 2009	State Legislature passes Senate Bill 240, allocating ARRA funds to USTAR.
Feb. 2009	USTAR researcher John White named Executive Director of U of U's Brain Institute . USTAR TOIP team helps Velosum expand markets for its handheld technology. USU's Biofuels team announces winning a share of a multi-million dollar Dept. of Defense grant .
Jan. 2009	Grow Utah Ventures, Zions Bank and USTAR select Concept to Company Southern Utah contest winners. USTAR TOIP client Ogwa announces obtaining early-stage investment .
Dec. 2008	USU and U of U researchers present on projects and progress at the Governor's Science Luncheon. U of U's Ling Zang announces improvements to nanotechnology-based explosives detection device.
Nov. 2008	With a focus on conventional and alternative energy projects in the Vernal area , Kevin Shurtleff, Ph.D., joins USTAR TOIP Eastern Region.
Oct. 2008	USTAR assists U of U to launch Nano Institute of Utah , http://nanoinstitute.utah.edu U of U USTAR researcher Marc Porter announces prototype of "card swipe" medical test device . Ground breaking for USU research building takes place.