

SAN DIEGO STATE UNIVERSITY
2011-2012 RESEARCH HIGHLIGHTS



SAN DIEGO STATE
UNIVERSITY

Leadership Starts Here



SAN DIEGO STATE UNIVERSITY

Leadership Starts Here

SDSU produces exceptional scholarship, research and creative endeavors to challenge students and serve society. Last year, 303 SDSU faculty and staff were the recipients of \$127 million in external funding. We congratulate and thank these researchers who are committed to making important discoveries and improvements in their diverse fields.

A full listing of 2011-12 awards can be found at www.foundation.sdsu.edu. A sampling of their work is profiled in the pages that follow here.

Stephen C. Welter
*Vice President for Research
and Dean of Graduate Affairs
San Diego State University*

Cover: Artist's rendition of the Kepler-35b system, by Lior Taylor. See page 10.



Building Muscles, at the Molecular Level

SANDY BERNSTEIN

Dr. Bernstein is a pioneer in understanding the molecular and structural basis of diseased and healthy muscle function. He studies myosin, the most abundant protein in muscle cells. Mutations in myosin can cause both heart and skeletal muscle diseases. Using the *Drosophila* (fruit fly) model, his work has provided significant insights and possibilities for the treatment of human myopathies and heart dysfunction.

Left: High resolution structure of the molecular motor myosin, color coded to highlight the constitutive (yellow) and variable (other colors) regions of the molecule from the fruit fly, *Drosophila melanogaster*. This protein is a key element driving muscle contraction. The Bernstein lab has shown that the variable regions account for functional differences in the biochemical and mechanical properties of different fruit fly muscles.

Photo: The Journal of Molecular Biology, Elsevier



Partnering to Prevent & Control Childhood Obesity

GUADALUPE X. AYALA

Public health researcher Guadalupe X. Ayala's intervention studies have resulted in improvements in health behaviors and health status in the Latino population. One of her current programs addresses childhood obesity in Imperial County, the California county with the highest rates of childhood obesity. Her project, a partnership with Clinicas de Salud del Pueblo, Inc and the Imperial County Public Health Department, involves community health centers, child care centers, elementary schools, restaurants, parks, as well as the family system and home environment.

Top: Dr. Guadalupe Ayala and Dr. John Elder visit the produce manager of the Pancho Villa store in City Heights.

Photo: Lauren Radack

Middle: SOL Youth participant with research assistant. SOL Youth is a multi-site epidemiologic study designed to examine risk and protective factors associated with childhood obesity and the metabolic syndrome.

Photo: Jeffrey Lamont Brown/Tallgrass Pictures

Bottom: SOL Youth participant with Dr. Greg Talavera, Co-Investigator. *Photo: Jeffrey Lamont Brown/Tallgrass Pictures*





Understanding Damage Caused by Prenatal Alcohol Exposure

SARAH MATTSON

Psychologist Sarah Mattson investigates the influence of prenatal alcohol exposure on changes in brain and behavior and studies the types of neuropsychological, cognitive, and behavioral problems seen in children with Fetal Alcohol Syndrome and Fetal Alcohol Spectrum Disorders. She and her colleagues in the Center for Behavioral Teratology use neuropsychological and neuroimaging tools to study the effects of alcohol and other substances and conditions on the developing nervous system and later cognitive and behavioral function.

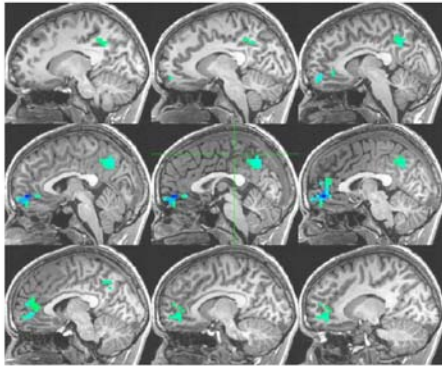
Top: Sample 3D facial photograph used to develop novel diagnostic tools for fetal alcohol spectrum disorders.

Bottom: Brain activation maps showing differences between children with histories of heavy prenatal alcohol exposure and controls on a task requiring the ability to inhibit a response.

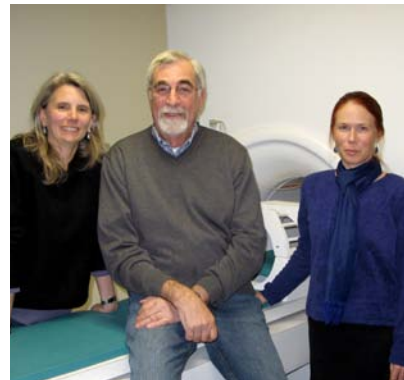
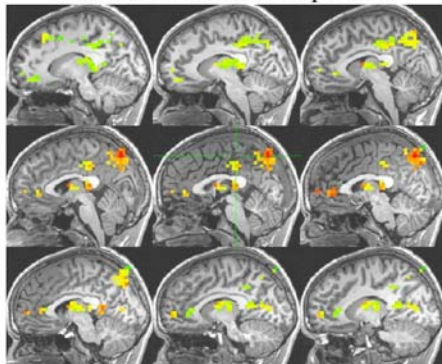
Below: Drs. Sarah Mattson, Ed Riley and Jennifer Thomas of SDSU's Center for Behavioral Teratology.

Photos: Mattson Lab

Control



Prenatal Alcohol Exposure



The Power of an M8

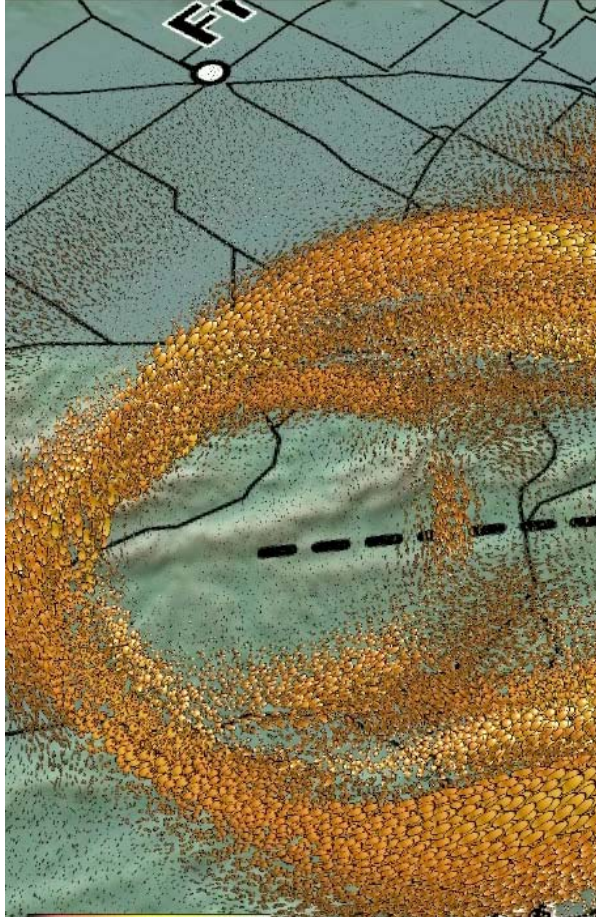
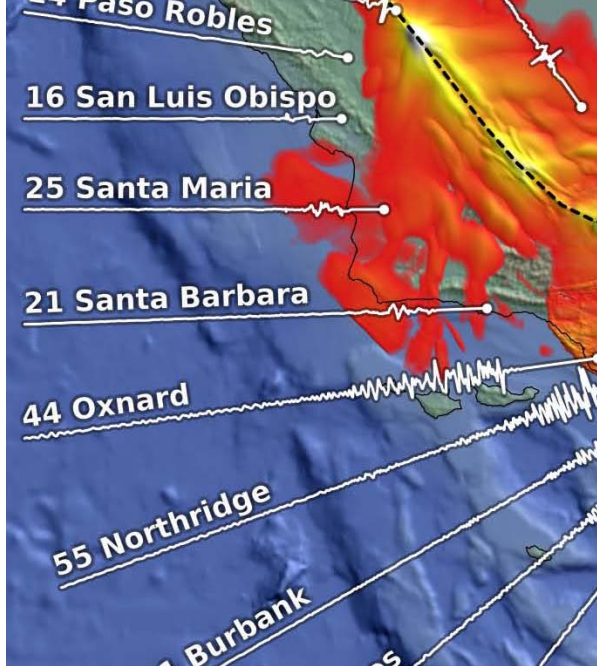
KIM OLSEN

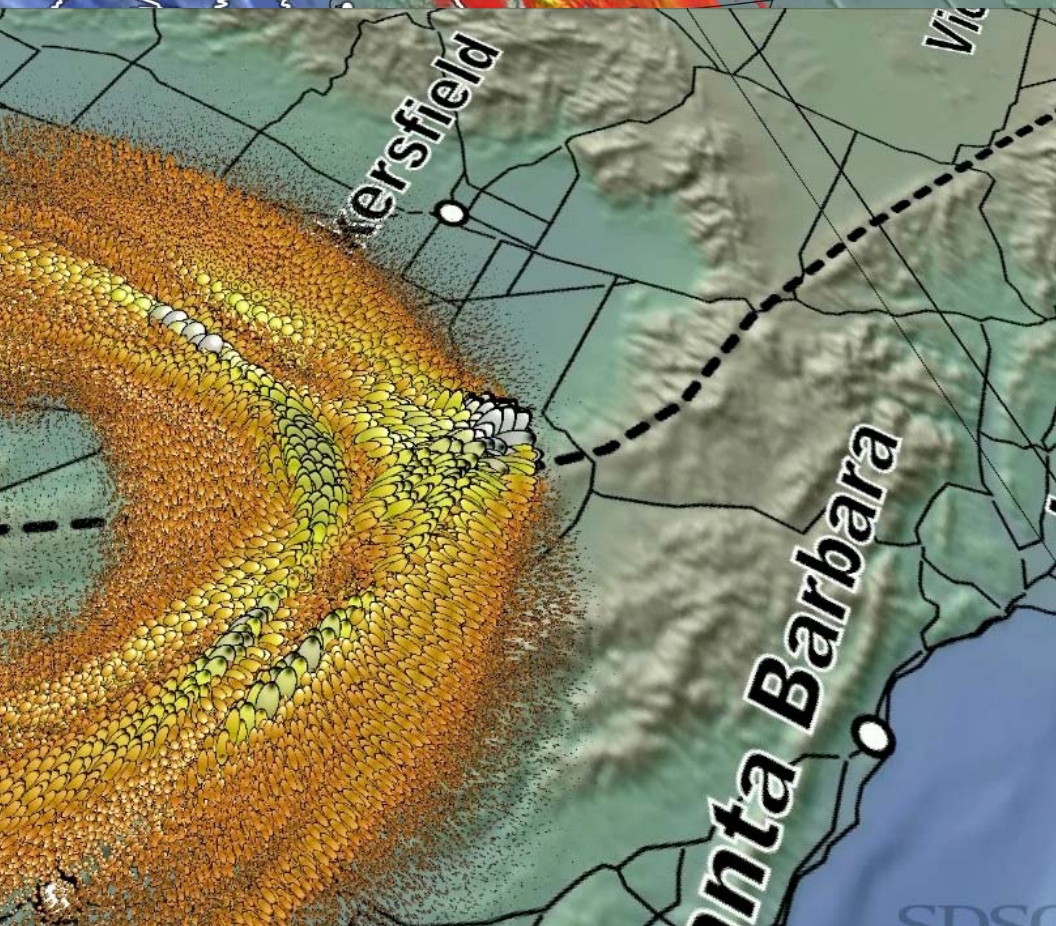
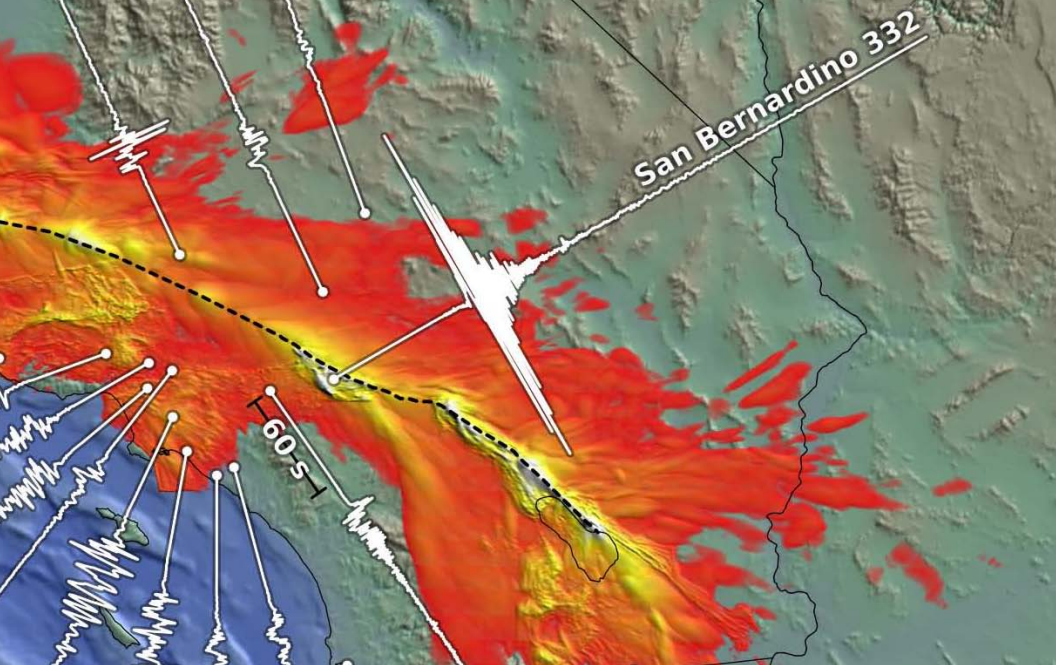
Seismologist Kim Olsen and UCSD colleagues have created the largest-ever simulation of a magnitude 8.0 earthquake - helping to prepare our state's emergency responders to better cope with this type of disaster.

Top right: Horizontal Peak Ground Velocities derived from M8 superimposed on the regional topography. N46E component seismograms are added at selected locations, with their peak velocities (cm/s) listed along the traces.

Bottom right: Snapshot of the vector wavefield generated by the simulation of a magnitude 8 earthquake on the southern San Andreas fault (M8), visualized by ellipsoids to show the shaking magnitude (by the length of their semi-axes) and direction (black to white points). The M8 rupture is just starting out north of Santa Barbara and propagating southeastward along the San Andreas fault (dashed line), with a characteristic 'Mach' (triangular) cone-shaped front of the emerging wavefield, rapidly approaching Bakersfield and the greater Los Angeles area. This visualization technique was developed as part of the 'GlyphSea' project at UCSD, and shows promise for a better understanding of the rupture and wave phenomena from earthquake simulations.

The scientific development of the M8 simulation was led by Kim Olsen, SDSU. The image is by courtesy of Amit Chourasia, San Diego Supercomputer Center, UC San Diego.





What Coral Reefs Teach Us About Human Diseases

FOREST ROHWER

AAAS Fellow and creator of the field he dubbed “Viromics,” Forest Rohwer uses metagenomics to study ocean viruses in coral reefs, an important ecosystem. Metagenomics is the study of the structure and function of DNA within an entire ecosystem. Viromics is the study of viral reproduction at both the specific and ecosystem levels. Dr. Rohwer’s work is helping to better understand the healthy and disease interactions between humans and viruses.

Top: Soft coral from the central Pacific.

Middle: Two morphs and colors of the coral *Diploria*.

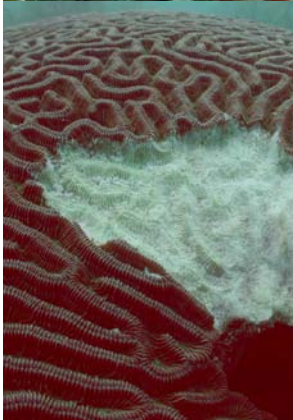
Middle left: Brittle star from the Caribbean.

Middle right: Sea Urchin.

Bottom left: Coral that has been grazed by a parrot fish.

Bottom right: Acroporid corals and sponges from the Caribbean.

Photos: Forest Rohwer





Using Brain-Controlled Bionics to Help the Disabled

KEE MOON

Dr. Kee Moon leads the National Science Foundation Engineering Research Center for Sensorimotor Neural Engineering at SDSU. The SDSU research team and partners at the University of Washington and MIT are developing new technologies that repair and improve human body parts by integrating robots controlled by the human brain.

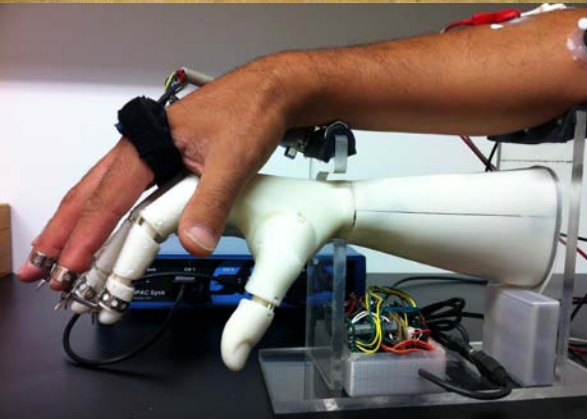
The goal is to use implantable, wearable, and interactive neural interfaces to drive a prosthetic device in such a way that the information flows from the brain to the device and the device to the brain and gives the user the ability to make complex and delicate movements.

The researchers hope their work will lead to commercial products that can help disabled veterans, people with spinal cord injuries and those with neurological disorders.

Top: wearable walking robot.

Bottom: hand (finger) motion rehabilitation device.

Photos: Kee Moon



How the Brain Reacts to Sign, Pantomime, and Spoken Language

KAREN EMMOREY

Karen Emmorey is an AAAS Fellow and the director of SDSU's Laboratory for Language & Cognitive Neuroscience, home to one of the most comprehensive signed language research programs in the nation.

Her work focuses on what sign languages reveal about the nature of human language, cognition, and the brain.

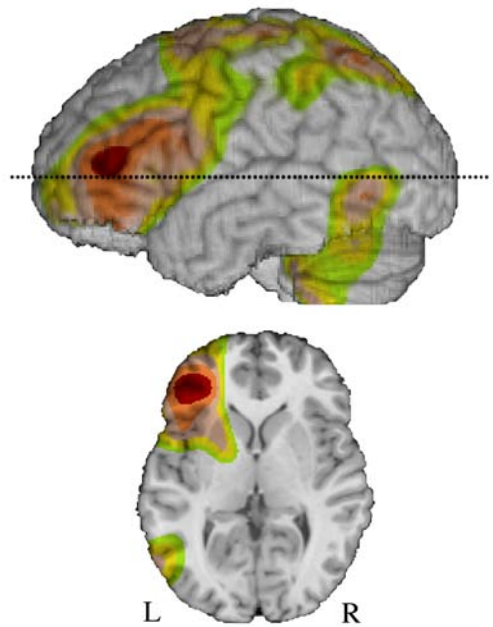
Top: The brain knows the difference between signs and gestures.

Sign language activates a different part of the brain than hand gestures used for pantomime, even when signs look like pantomimes. These discoveries prove that signed and spoken languages are more similar than previously thought.

The production of “pantomime-like” signs activates language areas (left inferior frontal gyrus), but the production of true pantomimes does not.

Bottom: The American Sign Language verb TO-HAMMER looks like a pantomime of hammering.

Images adapted from Emmorey et al. (2011)





Tracking Alabama's State Amphibian

RULON CLARK

The Red Hills Salamander is a federally threatened species that occurs only in a small portion of the Red Hills region of Alabama. Little is known about the basic biology of this species, because it is rare, active only at night, and lives in burrows dug into inaccessible cliffs. Even though it may be very difficult to conduct detailed studies on the behavior and ecology of this animal in the wild, molecular genetics can be used to fill in some of those gaps in our knowledge.

The research team has isolated DNA from individual salamanders collected in the field, and uses molecular tools to examine genetic diversity, population genetic structure and the level of genetic relatedness between different individuals. This allows them to infer the degree to which individuals disperse among populations, the level of connectivity between neighboring populations, and the impact human developments may have on that connectivity.

The Red Hills Salamander is the official state amphibian of Alabama. It's entire geographic range is restricted to 13 known populations occupying two hillsides in Alabama in the Red Hills region, an area about 60 miles long and 20 miles wide. It is the only species in the genus *Phaeognathus*, and wasn't discovered by science until 1965.

Left: Red Hills Salamanders, and Alabama hillside with flagging marking individual salamander burrows.

Photos: Shannon Hoss

Discovering Strange New Worlds

WILLIAM WELSH AND JEROME OROSZ

SDSU astronomers Welsh and Orosz are part of NASA's Kepler Mission to find Earth-like planets. Kepler finds planets by measuring 'transits', which are mini-eclipses that occur when the planet orbits in front of the star. While searching and analyzing the data, Welsh and Orosz discovered several 'circumbinary planets' - a new class of planet that orbits two stars, not just one. Reminiscent of the fictional planet 'Tatooine', these planets would have two suns in their sky. So far, Welsh and Orosz have discovered four circumbinary planet systems, Kepler-34, 35, 38 and 47. The planets are gas-giant planets similar in size to Saturn and Neptune, and not likely able to harbor life. But the multiplanet Kepler-47 system has a planet in the 'habitable zone', giving it an Earthlike temperature, making it a particularly interesting discovery.

Right: This artist's concept illustrates Kepler-47, the first transiting circumbinary multiplanet system. Located 4,900 light years from Earth in the constellation Cygnus, the system was detected by NASA's Kepler space telescope, which measures miniscule changes in the brightness of more than 160,000 stars to search for planets. *Credit: NASA/JPL Caltech/T. Pyle.*





Musical Mending

MARIAN LIEBOWITZ

Dr. Marian Liebowitz's Heartpower Performances program showcases SDSU students who serve as role models to at-risk populations. The program illustrates that music is a vehicle for redirecting energy toward positive change. This outreach program serves veterans, youth in the juvenile justice system, and other populations not normally reached by arts organizations.

Music is believed to have beneficial effects for those suffering from Post-traumatic Stress Disorder and Traumatic Brain Injury, two conditions common among veterans who have served in Iraq and Afghanistan.

San Diego State University's Heartpower Performances maintains that performing music involves many aspects of brain function and is believed to recruit uninjured parts of the brain to compensate for parts that have been injured, and help those parts that are injured recover.

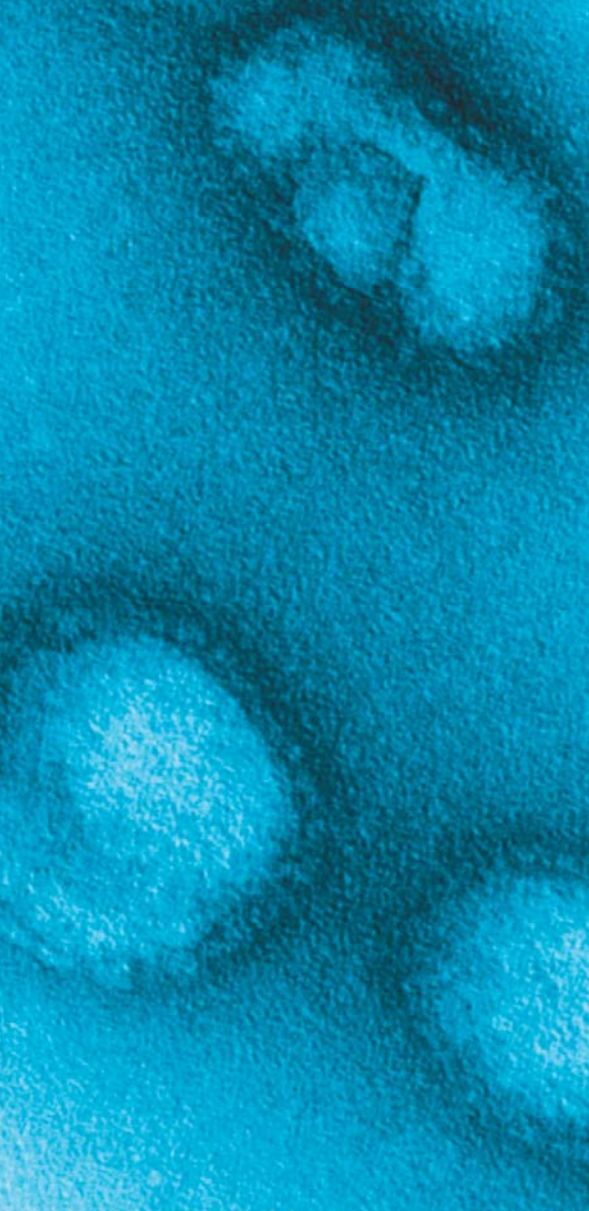
San Diego State University's Heartpower Performances is engaged in a long-term partnership with Veterans Village San Diego, to build a comprehensive program of concerts and classes to enhance treatment of veterans.

Above and middle: Heartpower Performances events at Veterans Village San Diego.

Bottom: Veterans Choir.

Photos: Julie Schlossberg





Stopping the Flu

JOY PHILLIPS

Dr. Joy Phillips has found that a powerful synthetic protein, EP67, can rapidly activate the innate immune system. When EP67 is delivered to the lungs within 24 hours of influenza exposure, the resulting immune response can prevent illness or death. This work has great potential for diverse respiratory diseases, including viral, bacterial, and fungal infections, as an emergency therapeutic for both human and veterinary applications.

Top, left: Colorized influenza A/H1N1 virus images courtesy of SDSU Electron Microscope Facility.

Bottom, left: Dr. Joy Phillips, Research Professor, The Donald P. Shiley BioScience Center.
Photo: Lorena Nava Ruggero



Big Mouths: Feeding Anatomy of Whales

ANNALISA BERTA

Dr. Annalisa Berta's NSF-funded research over the last 25 years focuses on the anatomy and evolution of various modern and extinct marine mammals (especially seals, sea lions, and whales). Her lab is currently investigating the anatomy of the feeding apparatus of baleen whales (i.e. baleen, palate, lower jaws, and jaw musculature) which provides crucial evidence for understanding the evolution of the unique batch filter feeding behavior of these whales.

Above: Dr. Berta and SDSU students, and personnel at Southwest Fisheries Science Center (NOAA), San Diego Natural History Museum, and Sea World dissect a fin whale that stranded off Point Loma in November, 2011.

Photo: Susan Chivers

Bottom: Dr. Berta and students preparing a rack of fin whale baleen in Dec, 2011 at SDSU.

Photo: Tom Deméré

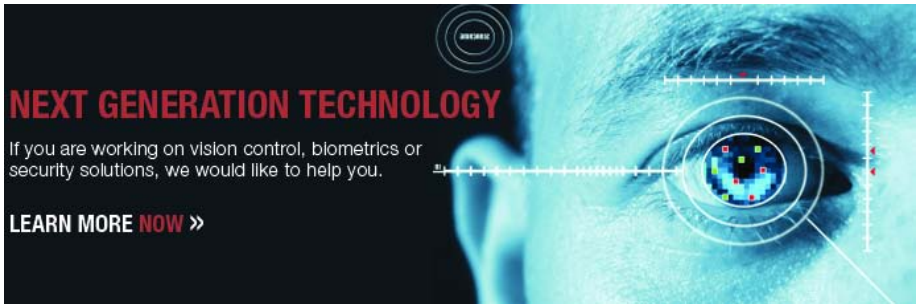




Advancing the Competitiveness of San Diego's Small Businesses

ALEX DENOBLE

Alex DeNoble, executive director of SDSU's Entrepreneurial Management Center, leads the San Diego Advanced Defense Technology Cluster which creates opportunities for local small businesses in the defense industry. SDSU provides customized business support and services to help small innovative companies expand their business into the defense market place. NEST, a partnership of academia, industry, and non-profits teaches local companies how to team up to secure more business locally and with the U.S. government. These efforts result in job growth, increased sales, and capital investments for these small companies.



NEXT GENERATION TECHNOLOGY

If you are working on vision control, biometrics or security solutions, we would like to help you.

LEARN MORE NOW »



ADVANCED DEFENSE TECHNOLOGY

Working with surveillance, remote monitoring or autonomous systems solutions?

LET US HELP YOU »



Preparing our Troops

MARY ANN LYMAN-HAGER

Where does a U.S. Marine go to learn the Afghan language and culture? Dr. Mary Ann Lyman-Hager's program creates customized language and culture training for the military. Arabic, Iraqi, Persian, and Pashto, the official language of Afghanistan, are taught to military personnel pre-deployment.

During his deployment in Afghanistan, Cpl. Simon Butusov served as a translator between the Marines and the local nationals, translating for village elders and leaders and improving security, saving lives and increasing the effectiveness of his platoon. The training he received at SDSU helped him resolve conflicts and misunderstandings without the threat of violence. Cpl Butusov earned a Navy-Marine Corps Commendation Medal for his efforts.

Top: Marine Advisory Team members practice their new Dari language skills in LARC's state of the art language labs. *Photo: Breshna Aziz*

Middle: Instructors at the LARC-Afghan Language Culture Program create course material. *Photo: Lamba Aziz*

Middle: Marine Cpl. Simon Butusov meets with Afghan locals.

Bottom: Marine students practice writing the Dari script in small groups with ample teacher feedback. *Photo: Breshna Aziz*

"This training is a critical component of our overall readiness...."

Congresswoman Susan Davis, ranking member of the Military Personnel Subcommittee

"The skill set I learned was one of the most useful things I had in both my training before deployment and as a tool while I was actually in country."

Corporal M.J. Navarijo



Preventing Cell Death

MARK SUSSMAN

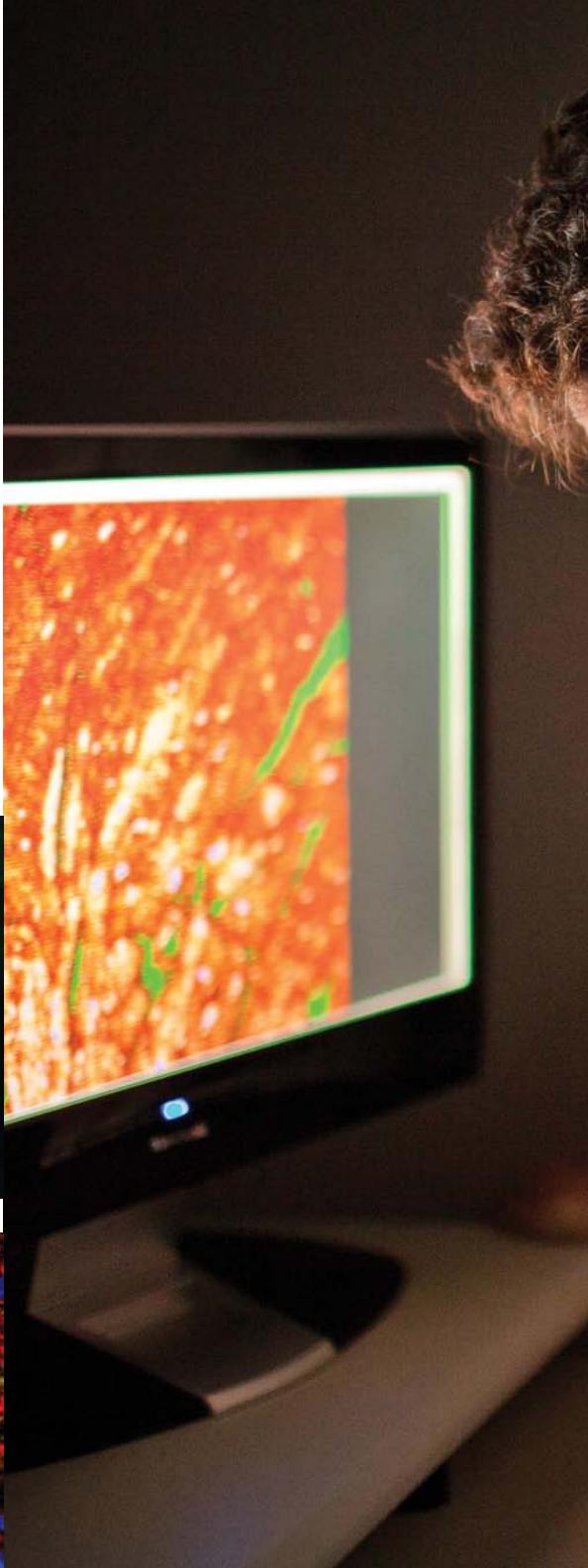
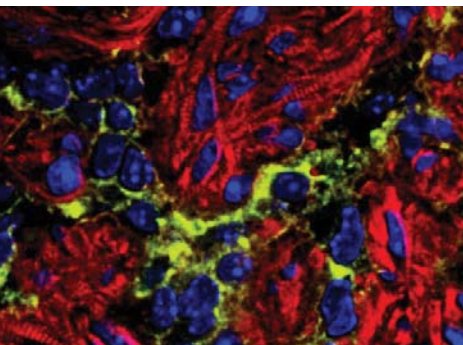
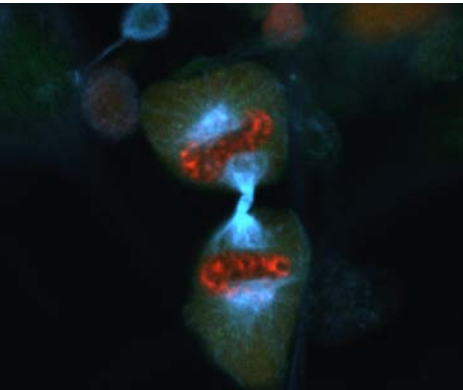
Dr. Mark Sussman has discovered a protein in the heart that helps cells survive injury and regenerate after damage. His work with stem cells to repair the heart after trauma will help improve current approaches in the treatment of heart failure.

Right: Dr. Mark Sussman

Below: Mouse cardiac stem cells undergoing division to create two new identical daughter cells. The chromosomal DNA (red) is being held by a tubulin spindle network (blue).

Mouse heart tissue showing muscle cells (red), nuclei (blue) and matrix protein (yellow).

*Photos: Jeffrey Lamont Brown/
Tallgrass Pictures*





**SDSU is a national leader
in training teachers to
support students with
autism.**

**LAURA HALL
BONNIE KRAEMER**

The Centers for Disease Control and Prevention estimate that one out of 88 children falls in the autism spectrum. While the incidence of autism is rising, school districts face a shortage of teachers trained to support students with autism spectrum disorders.

Dr. Laura Hall and Dr. Bonnie Kraemer created SDSU's master's degree in autism program to meet this need. The program prepares graduate students to work with children and youth with ASD and their families and fosters the sustained employment/retention of these special educators. Their current research focuses on early intervention and effective education including a parent-assisted intervention which helps adolescents with ASD with such things as entering and exiting conversations, choosing appropriate friends, handling teasing and bullying, and resolving disagreements.

Top right: Dr. Laura Hall

Bottom right: Dr. Bonnie Kraemer

Photos: Yasemin Turan Qian



Developing Hypersonic Engines: Speeding to Solutions

DR. GUSTAAF JACOBS

The development of hypersonic vehicles, such as the X-51 has surged the development of scramjet technology by the Air Force. Fuel injectors play a decisive role in the performance of scramjets but offer some design challenges related to the complex flow structures and consequent mixing levels close to the injector (See Figure 3).

Dr. Gustaaf Jacobs' recent theories seek to control these flow structures using plasma heating. He is using high-fidelity flow solvers to perform detailed studies of air and fuel mixing to obtain desired fuel-air ratios and ignition temperatures. Hypersonic air vehicles will reach enemy territory in a matter of hours from the U.S. mainland, reducing reliance on foreign bases.

Image courtesy of Antonio de Gregorio, Jean-Piero Suarez, and Wai-Sun Don.

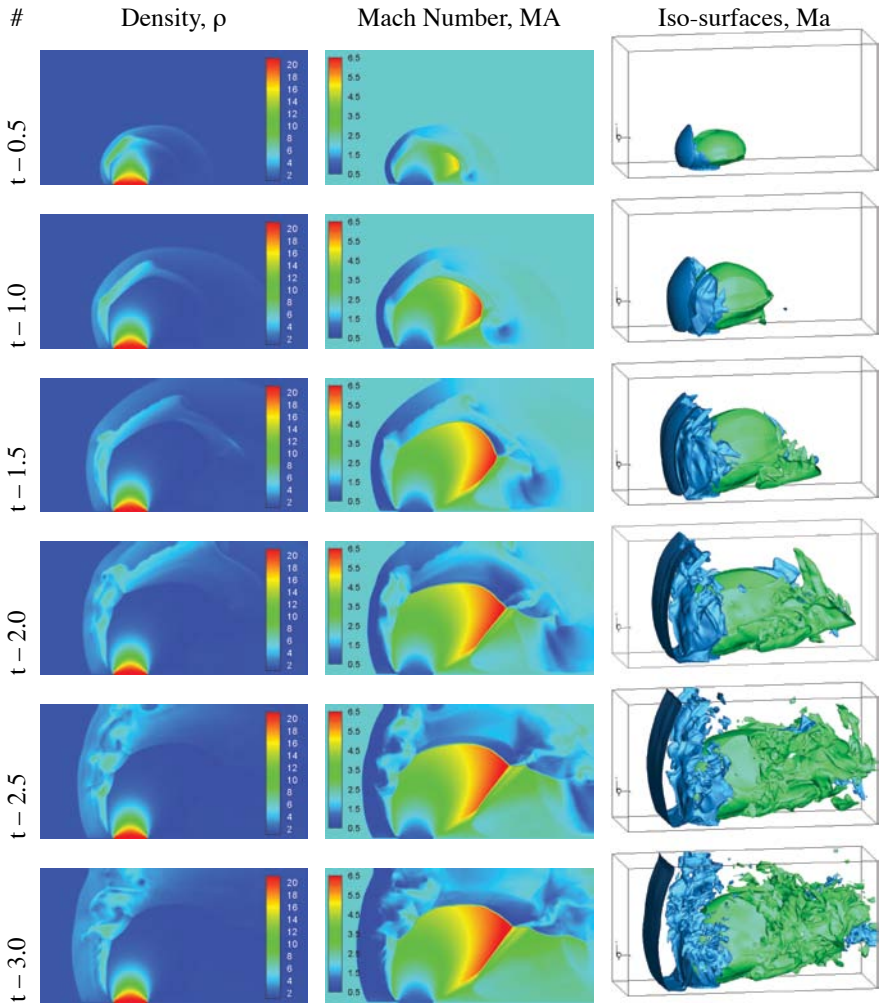


Figure 3

Fruit for Fractures: Reversing Bone Loss

SHIRIN HOOSHMAND

Dr. Shirin Hooshmand is examining the unique bioactive properties of dried plums which have been found to be effective in the reversal of bone loss.

Millions of Americans suffer from osteoporosis, especially postmenopausal women who are highly susceptible to fractures. Aside from drug therapies, there is an interest in treating osteoporosis using alternative or adjunctive therapies such as consumption of functional foods and dietary supplements.

Dr. Hooshmand's work provides a safe, practical and effective alternative in increasing bone mass in a vulnerable population.

Top: Positioning subject for hip bone density DXA measurements.

Middle: Reading bone density DXA results.

Bottom: Preparing dried plums.

Photos: Sofia Garcia





Improving Achievement and Offering Opportunities in Math and Science

CYNTHIA PARK

Dr. Cynthia Park is executive director of the Pre-College Institute, which oversees a variety of programs designed to enhance literacy, math and science skills. Her work helps address the academic needs of low-income 7th-to 12th-grade students and prepares them for college study.

Top: Talent Search participant and Crawford High grad, Jenny Kim, is currently attending San Diego State University.

Bottom: Castle Park High and Talent Search student, Beligca Uribe, participated in the San Diego Science Festival. Beligca, along with her classmates demonstrated how using biodiesel fuel can be used in growing and harvesting.

Photos: Michelle Cadena



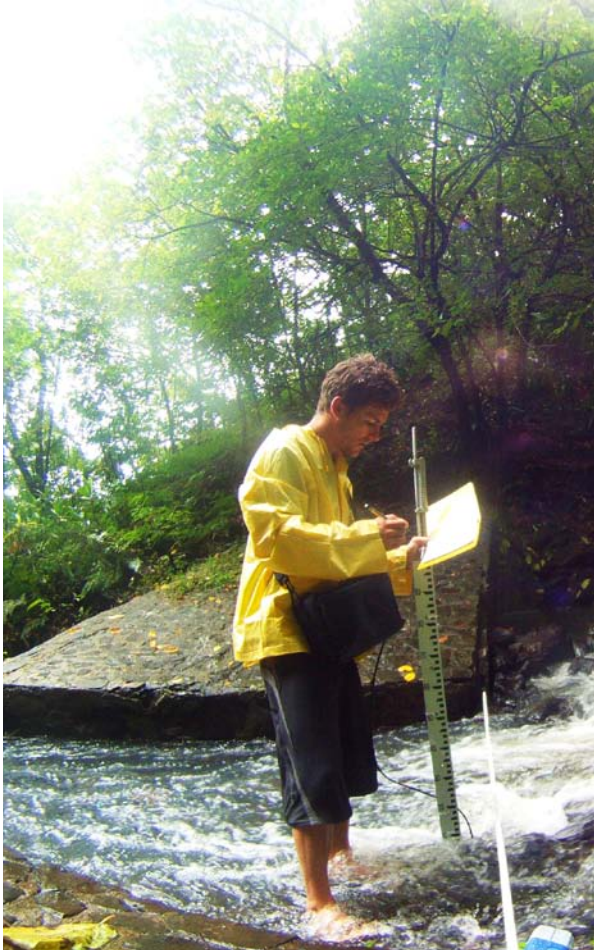
Measuring Human Impacts to Streams and Coral Reefs in American Samoa

TRENT BIGGS

Watersheds are the source and transport mechanism for sediments, nutrients, and pollutants to aquatic ecosystems including lakes, oceans, and coral reef ecosystems. Dr. Trent Biggs and Ph.D. student Alex Messina are analyzing a watershed in a village in American Samoa to identify human sources and amounts of sediment and nutrient pollution to a fragile coral reef. Their work will help the village and local agencies understand and protect their natural resources by identifying problem areas and suggesting targeted solutions.

Top: Ph.D. student, Alex Messina, “downloading” samples for further analysis from an ISCO Autosampler that automatically collects water samples at intervals during storms.

Bottom: Measuring streamflow in the forest above Faga’alu village during a storm.





Top: Faga'alu stream is usually clear during dry periods, but has high concentrations of sediment following a large rain event due to erosion upstream.

Bottom: Turbid stream discharge flows into the ocean following a large rain event in Faga'alu, American Samoa.

Photos: Alex Messina



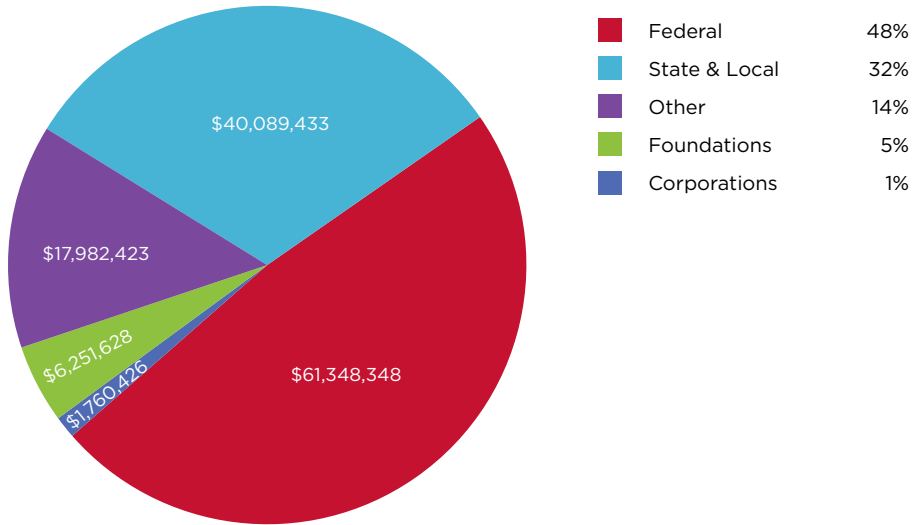
FY 2011-12 “Millionaires”*

Principal Investigator(s)	Department	Total Budget
Melbourne Hovell	Graduate School of Public Health	\$10,662,202
Anita Harbert	Social Work	\$7,793,171
Alan Sweedler	Physics	\$5,749,925
John Clapp	Social Work	\$3,369,493
Guadalupe X. Ayala	Graduate School of Public Health	\$3,149,385
Thomas Reilly	Social Work	\$3,075,727
Caren Sax	Administration, Rehabilitation	\$3,063,303
Mary Ann Lyman-Hager	Language Acquisition Resource Center	\$2,856,856
Elizabeth Klonoff	Psychology	\$2,638,796
Ethan Singer	Academic Affairs	\$2,612,109
John Elder	Graduate School of Public Health	\$2,610,819
Thomas L. Karlo	KPBS	\$2,610,006
Suzanne Lindsay	Graduate School of Public Health	\$1,255,500
Alex DeNoble	Management	\$1,644,704
Forest Rohwer	Biology	\$1,606,224
Joseph Shapiro	College of Extended Studies	\$1,562,114
David Pearson	Imperial Valley Campus	\$1,549,999
Mark Sussman	Biology	\$1,491,263
Karen Emmorey	Speech Language and Hearing Sciences	\$1,427,115
Edward Riley	Psychology	\$1,356,882
Gregory Talavera	Graduate School of Public Health	\$1,294,444
Cynthia Park	Teacher Education	\$1,151,030
Sarah Mattson	Psychology	\$1,131,422
Joseph Johnson	Educational Leadership	\$1,028,890
Ian Pumpian	Educational Leadership	\$1,023,206
Nancy Farnan	Teacher Education	\$1,000,000

* Recipients of one award or multiple awards totaling \$1 million or more.

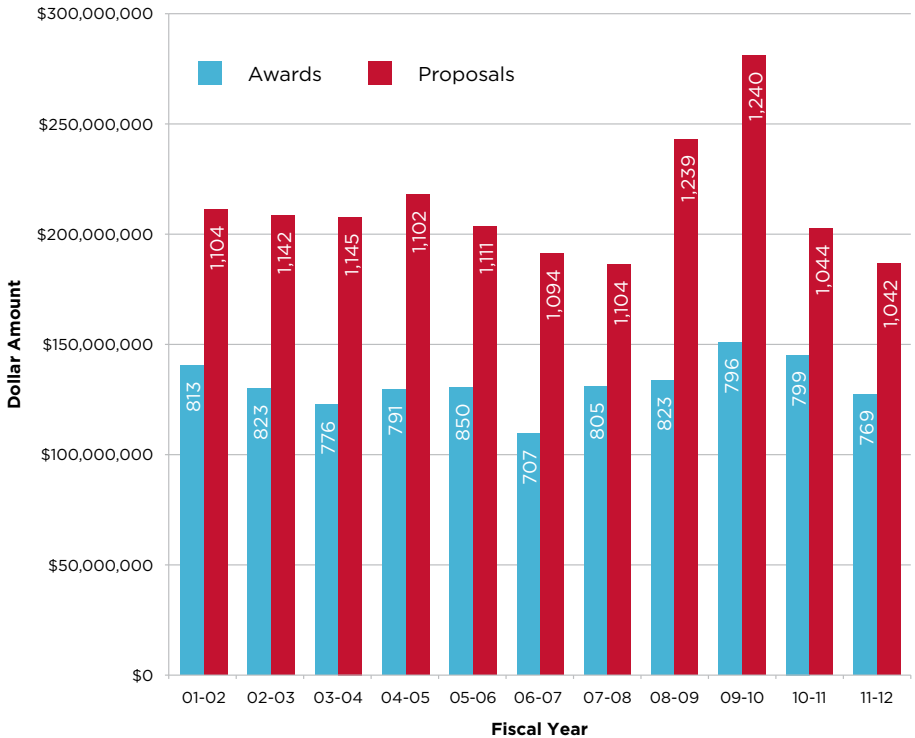
Awards by Sponsor Type Fiscal Year 2011-2012

Total Awards = \$127,432,258



Ten Year Proposal/Award Data

(Numbers and Dollars)



SDSU is proud to offer these joint doctoral programs:

SDSU Joint Doctoral Programs

MAJOR/CONCENTRATION	PARTNER UNIVERSITY
Audiology (Au.D.)	UC San Diego
Biology	UC San Diego
Chemistry	UC San Diego
Clinical Psychology	UC San Diego
Computational Science	Claremont Graduate University
Computational Science: Statistics	Claremont Graduate University
Ecology	UC Davis
Education	Claremont Graduate University
Education Leadership: Pre K-12 School Leadership	Independent
Education Leadership: Community College/Post-Secondary Leadership	Independent
Engineering Sciences: Bioengineering	UC San Diego
Engineering Sciences: Electrical & Computer Engineering	UC San Diego
Engineering Sciences: Mechanical & Aerospace Engineering	UC San Diego
Engineering Sciences: Structural Engineering	UC San Diego
Evolutionary Biology	UC Riverside
Geography	UC Santa Barbara
Geophysics	Scripps Institution of Oceanography/UCSD
Language & Communicative Disorders	UC San Diego
Math & Science Education	UC San Diego
Physical Therapy (DPT)	Independent
Public Health: Epidemiology	UC San Diego
Public Health: Global Health	UC San Diego
Public Health: Health Behavioral Sciences	UC San Diego

Other Distinctions

- SDSU faculty and staff garnered 100 awards and \$27.8 million from the National Institutes of Health.
- SDSU is in the top 13% of all universities receiving funding from the National Heart, Lung and Blood Institute.
- SDSU faculty and staff received 58 awards and \$8.2 million from the National Science Foundation.
- SDSU's Technology Transfer Office executed 27 licenses, and 50 disclosures.
- SDSU was designated a Hispanic Serving Institution by the U.S. Department of Education.
- A National Science Foundation Field Stations and Marine Laboratories award enabled completion of upgrades to the seawater system at SDSU's Coastal & Marine Institute Laboratory.
- The BioScience Center welcomed Expression Drug Designs to their building, another step in advancing this public/private partnership through which researchers study the role of infection and inflammation in heart disease.
- KPBS, owned and operated by SDSU, is rated among the top 10 public broadcasting stations in the U.S.
- SDSU is ranked among the nation's best national universities according to U.S. News and World Report's "America's Best Colleges 2012 Guide."
- SDSU is classified as a research university with "high" research activity by The Carnegie Foundation.
- SDSU is a leading producer of U.S. Fulbright Scholars.
- SDSU is ranked among the most military-friendly campuses in the nation by Military Times Edge. SDSU educates more than 1,200 student veterans through a combination of classroom and online degree programs, including Troops to Engineers.
- SDSU's programs in business, public health, rehabilitation counseling, fine arts and speech, language and hearing sciences are ranked among the top graduate programs in the country by U.S. News & World Report. Also nationally ranked are SDSU's undergraduate programs in biological sciences and international business.
- SDSU offers 335 international education programs in 52 countries. Of the university's academic programs or majors, 31 now require a study abroad component for graduation.
- SDSU's joint doctoral programs in clinical psychology and language and communicative disorders are ranked among the nation's top 10 by The National Research Council.
- SDSU serves as host institution for CSUPERB, which is designed to channel resources from the entire California State University system and catalyze interdisciplinary, inter-campus, synergistic endeavors involving biology and chemistry departments (including biotechnology research and applications), as well as engineering, agriculture and computer science.
- Last year's Student Research Symposium showcased the work of 399 SDSU graduate and undergraduate students in posters and oral presentations in each of these categories: physical sciences; health studies and life sciences; engineering; information and business; humanities; creativity and the arts; and social, behavioral and educational studies.



SAN DIEGO STATE UNIVERSITY

5500 Campanile Drive
San Diego, CA 92182-8220
619 594-5213
gra@mail.sdsu.edu
gra.sdsu.edu