



**PADRES SALUTE  
TREVOR HOFFMAN**

**D1** • In a moving pregame ceremony, the Padres retire No. 51 in honor of the closer's brilliant career.

MONDAY • AUGUST 22, 2011

MORE THAN 1,000,000 READERS WEEKLY

SIGNONSANDIEGO.COM



# OFFICER WOUNDED, HOUSE SET ON FIRE

Police believe gunman may have died in El Cajon blaze; officer is awake and alert



Police wait to search an El Cajon home on Sunday night after a gunman opened fire on two police officers. JOHN R. MCCUTCHEM • U-T

PAULINE REPARD &  
JEN LEBRON KUHNEY • U-T

A gunman in a house opened fire on two El Cajon police officers Sunday, wounding one, and authorities believe the man set fire to the residence and may have died in the blaze.

Neighbors and authorities initially said two other people inside the house were shot and killed about 5 p.m., but authorities later said they had not confirmed that anyone other

than an El Cajon police officer was shot.

Officers cordoned off Prince Street off First Street, evacuated residents and sent them to a nearby high school, and blocked lanes of nearby Interstate 8 as they searched for the gunman.

Hours later, police Lt. Mark Coit said officers believed the gunman did not escape a tight police perimeter on the neighborhood.

SEE SHOOTING • A6



Sources: ESRI; TeleAtlas

AARON STECKELBERG • U-T

## Q&A ON GROCERY WORKERS' LABOR DISPUTE

ELIZABETH AGUILERA • U-T

With grocery workers at Ralphs, Vons and Albertsons in San Diego and across Southern California voting to authorize a strike, workers and consumers are weighing what the next steps will mean for them.

The union will report the ballot results to the dispute's federal mediator today and a union spokesman said Sunday that more negotiations would likely follow.

Here are questions and answers about the stand-off:

**Q** What did they vote on?

**A** In secret-ballot votes cast Friday and Saturday, an overwhelming majority of workers rejected the supermarket chains' health care package. The rejection granted union leaders authorization to call for a work stoppage.

**Q** Is a strike imminent?

**A** The union could call for a strike as soon as 72 hours after the voting period ends, but it is expected that union leaders and the supermarkets will return to the bargaining table to try to work out a compromise.

SEE GROCERY • A4

# REBELS ENTER TRIPOLI



Residents of Tripoli celebrate early today as rebels stream into the capital facing little or no resistance from government forces. Across the nation, expectations grew that Moammar Gadhafi's hold on power was slipping away. BRYAN DENTON • NYT NEWS SERVICE

## Gadhafi's regime crumbling as opposition forces face little resistance

KAREEM FAHIM & DAVID D. KIRKPATRICK  
NYT NEWS SERVICE

TRIPOLI, LIBYA

Moammar Gadhafi's grip on power dissolved with astonishing speed today as rebels marched into the capital and arrested two of his sons, while residents raucously celebrated the prospective end of his

four-decade-old rule.

The rebel leadership announced that the elite presidential guard protecting the Libyan leader had surrendered and that their forces controlled many parts of the city, but not Gadhafi's leadership compound.

The National Transitional Council, the rebel governing body, issued a mass text message saying, "We

congratulate the Libyan people for the fall of Moammar Gadhafi and call on the Libyan people to go into the street to protect the public property. Long live free Libya."

Officials loyal to Gadhafi insisted that the fight was not over and there were clashes between rebels and government troops this morning. But NATO and U.S. officials made clear that Gadhafi's control

of Tripoli, which had been his final stronghold, was now in doubt.

President Barack Obama said Sunday night that Gadhafi and his inner circle had "to recognize that their rule has come to an end" and called on Gadhafi "to relinquish power once and for all." He also called on the National Transitional Council to avoid civilian casualties

SEE LIBYA • A4

THE DAILY DEAL



Today's deal is brought to you by our paid advertising partner Invasion Laser Tag. Get 50 percent off a family four-pack or two games for two players. Only \$14 today at signondailydeal.com

THE WORLD

**SHOW OF SOLIDARITY:** Supporters of President Hugo Chávez shaved their heads in solidarity with their leader's struggle against cancer on Sunday as hundreds prayed and sang at a televised event.

**A4 • ASSAD HOLDS FIRM:** President Bashar Assad of Syria dismissed U.S. and European calls for him to step down as "meaningless" Sunday, and he

declared that Syria's ailing economy could withstand escalating international sanctions.

**A8 • BIDEN ASSURES CHINESE ON U.S. DEBT:** Vice President Joe Biden sought to assure a Chinese audience that the United States will come to grips with its debt problem.

**GERMANY REJECTS EURO BONDS:** German Chancellor Angela Merkel insisted Sunday that eurozone-wide government bonds wouldn't solve the current debt crisis.

THE NATION

**WING WALKER FALLS TO DEATH:** Officials say a stunt wing walker has died after falling about 200 feet at an air show in Michigan. Todd Green was trying to move from a plane to a helicopter when he fell.

**AIR SHOW RESUMES:** Kansas City's annual air show took to the skies again Sunday, a day after spectators were sent home when a stunt pilot was killed while performing loops and spirals in his plane.

FROM UNION-TRIBUNE NEWS SERVICE REPORTS

U-T INDEX

|             |    |
|-------------|----|
| Bridge      | C3 |
| Classifieds | C3 |
| Comics      | C6 |
| Crossword   | C5 |
| Dear Abby   | C5 |
| Editorials  | B5 |
| Horoscope   | C5 |
| Lottery     | A2 |
| Obituaries  | B4 |
| Science     | A2 |
| Television  | A9 |
| Weather     | B6 |



## INSTITUTE TARGETS MYSTERY OF GENES

Research at center in La Jolla could lead to new treatments, cures

KEITH DARCE • U-T

Coded in each one of us are the 26,000 or so genes that drive the functions of life.

The chunks of DNA determine everything from the color of eyes to whether a cell becomes muscle, bone, a neuron or another type of tissue.

Some genes, such as TP53 which helps to block the growth of tumors, are well known to researchers, but the job done by most of them remains a mystery.

Figuring that out could lead to new treatments and cures for many diseases. Scientists at La Jolla Institute for Allergy and Immunology have begun working on that challenge at one of only a handful of large-scale centers devoted to the study of RNA interference, a cellular process that serves as an off switch for genes.

The state-of-the-art facility, which opened last week, was built with a \$12.6 million grant from the National Institutes of Health.

The center represents "a milestone" in fueling the work needed to better understand the genetic mechanisms underlying diseases, said Mitchell Kronenberg, the institute's president and chief scientific officer.

Focus of research

The National Institutes of Health grant won by La Jolla Institute for Allergy and Immunology provides funding for experiments in three research areas:

- Two studies will look at how the immune system recognizes viruses and bacteria.
- One will study the way the immune system creates "memory" that keeps fighting targeted pathogens for long periods. The work could help with the improvement of existing vaccines and the creation of new vaccines for AIDS, malaria, tuberculosis and other infectious diseases.
- In the final project, a group from The Scripps Research Institute led by biochemist David Nemazee will look for the genes that cause the immune system to turn on the body and trigger diseases such as arthritis and lupus.

SEE RESEARCH • A3

## SCIENCE

## RESEARCH • New center has won praise from outside colleagues

FROM A1

"This is primarily a discovery tool, and we hope the discoveries can lead to therapeutics," he said.

The laboratory contains an impressive collection of high-tech devices that would make any biologist envious.

Genetic sequencing machines made by Life Technologies in Carlsbad. An automated microscope. A cell sorter and analyzer that can look at millions of cells per second. And a robot that can run up to 30,000 individual experiments at a time in a sea of tiny liquid wells.

Speed and volume are paramount.

Identifying the genes related to a particular trait, such as an immune system response, can require thousands of individual screenings that would take years if done by hand.

The computers and automated machines squeeze that time frame to days or weeks, allowing researchers to pursue "big science," said Stephen Wilson, executive director of the center and the institute's vice president and chief technology officer.

"The use of high-throughput screening technology revolutionizes how immunologists attack long-sought-after and complex problems in disease biology," he said. "Before these tools, many of these questions couldn't be properly investigated."

Another important feature is that the center is open to scientists from other research institutes on the Torrey Pines Mesa who want to design and run experiments on the facility's equipment.

"We're not looking at this as a fortress," Kronenberg said.

Money for the facility came from a final batch of federal economic stimulus funding that was earmarked for boosting the application of genomics in medicine and invigorating scientific communities.

Competition was fierce among the research institutions that submitted applications for the \$80 million in grants, Wilson said.

Part of the appeal of La Jolla Institute's proposal was that it laid out a plan for operating the facility beyond the grant's three-year life span, said Sonia Sharma, scientific director of the local center.

"Basically, it's the gift that keeps on giving," she said.

Already, the center has won praise from outside colleagues.

"This screening facility is a tremendous resource for scientists throughout the mesa in terms of raw discovery of new scientific principles, generating drug leads and validating therapeutic strategies," said Victor Nizet, a University of California San Diego professor whose research lab studies bacterial infections

and the immune system.

He imagines using the RNAi test to identify the genes that play a role in the growth of a disease-causing bacterium.

"Right now, a lot of (drug) discovery is based on chemistry," Nizet said. "You get a lot of novel chemicals from the rain forest or the bottom of the sea."

"This goes the entire opposite way," he said. "RNAi looks for functions of a cell that are good drug targets."

The effect of RNAi was first noticed in the early 1990s by a pair of Oakland scientists who found that purple petunias lost their pigment and turned white when a certain gene in the flower was purposefully overexpressed. However, they didn't know what caused the change.

In 1998, researchers at Stanford University and the University of Massachusetts finally identified the RNAi mechanism after inserting some of the special genetic strands into tiny worms. They received the 2006 Nobel Prize in physiology or medicine for the work.

RNAi works by shutting down, or interrupting, the proteins that serve as molecular workhorses, driving every aspect of a cell's function and purpose.

Scientists can determine what genes are responsible for a particular trait by inserting thousands of different RNAi molecules into specially engineered cells and watching to see which ones turn off the targeted behavior.

It's like figuring out what

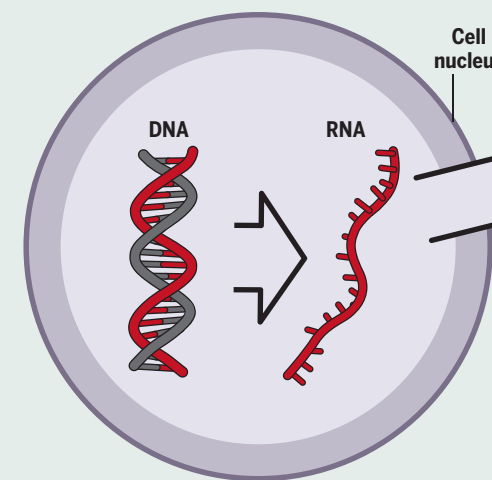
## Learning a gene's function using RNAi

Scientists can determine what genes are associated with a particular trait, such as hair color, by interrupting the creation of proteins in a cell.

1 DNA in the nucleus of a cell produces strands of RNA. Each type of RNA corresponds with a particular gene in the DNA.

2 The RNA produces proteins once it leaves the nucleus.

Proteins help determine traits such as hair color.



3 Researchers insert a synthetic RNAi molecule into the cell.

4 The RNAi binds with its corresponding strand of RNA, creating a mirror image molecule.

5 Recognizing the combined RNAi-RNA molecule as an invader, the cell detects the RNAi-RNA and prevents the RNA's protein from being produced.

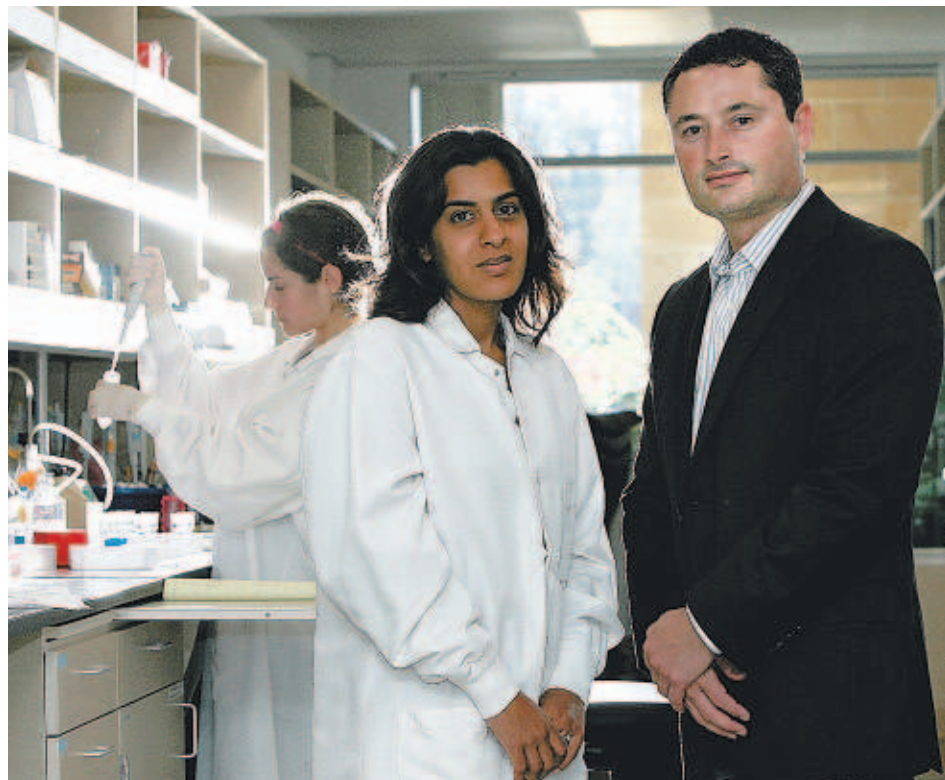
6 The missing protein tells researchers that the RNAi, RNA and corresponding gene play a direct role in that trait.

Missing proteins

KEITH DARCE & SHAFER GRUBB • U-T

RNAi looks for functions of a cell that are good drug targets."

Victor Nizet, a University of California San Diego professor



Sonia Sharma, scientific director of the La Jolla Institute for Allergy and Immunology, and Stephen Wilson, executive director of the center, in the institute's state-of-the-art laboratory. JOHN GASTALDO • U-T PHOTOS

makes a car's headlights work only with a list of all of the pieces in the vehicle, Kronenberg said.

"You start removing parts to see what makes the lights go off," he said.

As new as RNAi technology seems, scientists be-

lieve the powerful biological tool is an ancient one that developed millions of years ago among microbes as a defense mechanism against viruses before being passed through the evolutionary chain to humans.

To keep the La Jolla In-

stitute center open beyond the initial three years covered by the NIH grant, operators will have to attract additional work and funding from scientists throughout the area.

Some researchers already are imagining how



RNAi experiments might enhance their work.

Chris Benedict, a virologist at La Jolla Institute, hopes to use the center to learn more about the cytomegalovirus he studies.

The bug, which is part of the herpes virus family, infects nearly half of the human population. It goes unnoticed in most people but can be deadly in those with a compromised immune system or transplanted organs, and in newborn babies who pick up the infection from their mothers before birth.

The pathogen can survive in the body for decades because it shuts down parts of

the immune system, Benedict said.

"I'm interested in how the virus is able to find that niche, avoid clearance by the immune system and set up this stealthy environment," he said.

An RNAi project could reveal the genes that trigger the immune system's response to cytomegalovirus, Benedict said.

"It's great for searching for a needle, or several needles, in a haystack," he said.

keith.darce@uniontrib.com  
(619) 293-1020

Twitter: @KeithDarce  
Facebook: SDUT Biotech

## UCSD ENGINEERS TO TEST NEW BARRIER WITH BLAST SIMULATOR

Walls could be used to shield troops or civilians in key buildings

GARY ROBBINS • U-T

UC San Diego engineers will use the school's blast simulator at Scripps Ranch on Wednesday to stress-test a type of wall panel that might be useful for everything from protecting troops in combat zones to shielding civilian office workers during a terrorist attack.

The 10-foot-high barrier is composed of high-performance concrete and steel studs that will essentially be pushed and pulled by actuators at the Engelkirk Structural Engineering Center. The stress test takes three to five milliseconds, or less time than it takes a person to blink an eye. The pressure applied by the actuators will be roughly the equivalent to the blast from a car bomb 50

feet away.

"The test will emulate an explosion — without the fireball," said Gil Hegemier, chairman of the department of structural engineering at UCSD.

The research is being done on behalf of the Technical Support Working Group, which carries out studies for the U.S. departments of Defense and State.

The blast simulator was installed at UCSD after the terrorist attacks of 9/11 to improve the scientific community's ability to study the nature of explosions, and how to protect against them. It is large enough to simulate the sort of explosion that killed 168 people when Timothy McVeigh set off a truck bomb outside the

Murrah Building in Oklahoma City in 1995.

The work done at the simulator "has a lot of military applications, but we've found that they can also be applied to finding ways to mitigate damage at critical government and commercial buildings," said Hegemier, who went to ground zero shortly after the 9/11 attacks to help study why the World Trade Center buildings collapsed.

Engelkirk also features a large outdoor shake table that is regularly used to test how structures, from bridges to buildings, withstand various levels of seismic shaking.

gary.robbins@uniontrib.com  
(619) 291-1228  
Twitter: @grobbs

## GEOLOGISTS REPORT DISCOVERING OLDEST KNOWN FOSSILS ON EARTH

NYT NEWS SERVICE

A team of Australian and British geologists have discovered fossilized, single-celled organisms that are 3.4 billion years old, which they say are the oldest known fossils on Earth.

The claim, if sustained, confirms the view that life evolved on Earth surprisingly soon after the Late Heavy Bombardment, a reign of terror in which waves of asteroids slammed into the primitive Earth, heating the surface to molten rock and boiling the oceans into an incandescent mist. The bombardment, which ended around 3.85 billion years ago, would have sterilized the Earth's surface of any incipient life. It is also a new volley in a long-running conflict over who has found the oldest fossil.

The new microfossils are

described in Sunday's issue of Nature Geoscience by a team led by David Wacey of the University of Western Australia and Martin Brasier of the University of Oxford in England. They were found in sandstone at the base of the Strelley Pool rock formation in Western Australia.

The sandstone, 3.4 billion years ago, was a beach on one of the few islands that had started to appear above the ocean's surface. Conditions were very different from those of today. The moon orbited far closer to Earth, raising huge tides. The atmosphere was full of methane, since plants had not yet evolved to provide oxygen, and greenhouse warming from the methane heated the oceans to the temperature of a hot bath.

It was in these conditions that organisms resembling

today's bacteria lived in the crevices between the pebbles on the beach, the geologists believe. Examining thin slices of rock under the microscope, they have found structures that look like living cells, some in clusters that seem to show cell division.

Microfossils — the cell-like structures found in ancient rocks — have become a highly contentious field, both because of the pitfalls in proving the structures are truly biological, and because the scientific glory of having found the oldest known fossil has led to pitched battles between rival claimants.

The Nature Geoscience article published Sunday does not claim discovery of the Earth's oldest microfossils. That claim is made in a news release issued by Brasier's college, the University of Oxford.