Drug aids simultaneous allergy desensitization to several foods

By Erin Digitale

A n asthma drug accelerates the process of desensitizing patients with food allergies to several foods at the same time, a new study by researchers at the School of Medicine and Lucile Packard Children’s Hospital Stanford shows.

The findings come on the heels of a recent study by the same team showing evidence that a promising new method for treating people with multiple food allergies works.

Patients who took the asthma drug omalizumab became desensitized to multiple food allergens at a median of 18 weeks; those who did not take the drug became desensitized at a median of 85 weeks, the researchers found. The results of the new study were published online Feb. 27 in the journal Allergy, Asthma & Clinical Immunology.

In oral immunotherapy, the desensitization method used in both studies, allergic patients build up tolerance to a food by ingesting it in tiny, gradually increasing doses under a doctor’s supervision in a hospital setting. Over time, the body stops reacting, and the patient is able to eat the food safely.

Several researchers have shown that this therapy works on a single food allergen, but it had not been tested on multiple food allergens. The Stanford team tried the new technique because nearly 4 million Americans are allergic to more than one food.

“Parents came” See ALLERGIES, page 6

Hiding in plain sight: A high-cholesterol gene

By Ruthann Richter

Midway through the story of his heart troubles, Scott Radabaugh hesitated, gently placing a hand on his chest. He felt a twinge there, he said with a frown. He leaned in a bit over the table in the San Ramon, Calif., cafè and explained the questions flooding his mind: Could it just be a sore muscle from his workout? Or a sensitivity to the wires supporting his sternum — a remnant of his quadruple bypass surgery? Or was it a more ominous sign?

At 6 feet tall with a weightlifter’s physique and a ruddy complexion, Radabaugh appears to be the epitome of a healthy man. But he has what he calls a “sleeping giant” of a disease, a gene that makes him prone to blocking blood flow to his brain and his heart, and he is on the lookout for signs that he will need a third.

His condition, known as familial hypercholesterolemia, or FH, is a genetic

“Parents came” See ALLERGIES, page 6

Researchers track polio-like illness in kids

By Erin Digitale

Jessica Tomei remembers the exact moment her daughter’s arm stopped functioning.

It had been a rough week. Her daughter Sofia Jarvis, then 2, had been sick with a respiratory illness. Tomei and Sofia were leaving the pediatrician’s office with a pneumonia diagnosis and a prescription for antibiotics when, on the way out, Sofia reached for a toy.

“Her left arm, in midgrasp, stopped working,” Tomei recalled.

The next day, when Sofia was still not using her arm, Tomei and husband Jeff Jarvis took her back to the doctor. An MRI showed a lesion in Sofia’s spinal cord. At first, she was diagnosed with transverse myelitis, a form of paralysis from which some patients recover. But when the family eventually found their way to pediatric neurologist Keith Van Haren, MD, at Lucile Packard Children’s Hospital Stanford, he had bad news.

“Dr. Van Haren immediately said, ‘She probably will never get back the function of her arm,’” Tomei recalled.

Sofia’s case fit into a pattern that Van Haren, who also is an instructor of neurology and neurological sciences at the School of Medicine, and other neurologists around California had begun to observe: Since late 2012, about 20 children in the state have developed a form of sudden-onset, permanent paralysis that looks similar to polio.

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New gadgets turn smartphones into ‘eye phones’

By Rosanne Spector

Researchers at the School of Medicine have developed two inexpensive adapters that enable a smartphone to capture high-quality images of the front and back of the eye. The adapters make it easy for anyone with minimal training to take a picture of the eye and share it securely with other health practitioners or store it in the patient’s electronic record.

“The research is an opportunity to increase access to eye-care services as well as to improve the ability to advise on patient care remotely,” said Robert Chang, MD, lead author of two papers describing the development and clinical experience with the devices, began the project with Chang about two years ago, just before Myung began his residency at Stanford. The articles were published online March 7 in the Journal of Mobile Technology in Medicine.

The standard equipment used to photograph the eye is expensive — costing up to tens of thousands of dollars — and requires extensive training to use properly.

Primary care physicians and emergency department staff often lack this equipment, See EYE, page 7

See PARALYSIS, page 6

See CHOLESTEROL, page 4
Researchers identify cellular elastic that keeps nerves resilient

By Amy Adams

Researchers used tiny fluorescent proteins to see pain-producing nerves in normally elastic, cross-linked membrane proteins called spectrin. The results provide a new understanding of how the touch-sensing nervous system works. The discovery could aid in understanding pain and its treatment.

Researchers increase, decrease pain sensitivity using light

By Amy Adams

A new Stanford study indicates that light can modify how pain-sensitive nerves respond to mechanical stress from touch. The results suggest that one day, we may have a new approach to help people with chronic pain.

Optogenetics was developed by Delp's opsins that are inserted into the nerves. The opsins control the nerves in mice. Delp said, a student of his, mixed that floppy-nerved mutant with an- other mutant strain, and the finding was shone on the paws of mice through a Plexiglas bottom of the cage. The findings of the research were published online Feb. 16 in Nature Biotechnology.

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Robert Jackler discusses the rise of e-cigarettes

The use of electronic cigarettes has grown rapidly across the United States, prompting questions about their safety and whether they serve as a gateway to conventional cigarettes or a means of kicking the habit — or at least of sustaining a nicotine addiction without inhaling the carcinogens in smoke. Robert Jackler, MD, is professor and chair of otolaryn- gology and the Edward C. and Amy H. Sewall Professor in Otolaryngology. His research group, Stanford Research Into the Impact of Tobacco Advertising, has been closely follow- ing the e-cigarette industry. He recently spoke with Paul Costello, chief communications officer at the School of Medicine, for a 1-2-1 podcast (http://med.stanford.edu/121). Follow- ing is an edited transcript of their interview:

1. How were e-cigarettes developed? How did they come about?

Electronic cigarettes were developed by a Chinese inventor in 2004. They came on the market in Europe in 2005 and in the United States in 2007. They are a family of products that produce a water vapor mixed with substances that create a mist that looks like smoke — usually propylene glycol, variable doses of nicotine and, often, flavors. They come in various sizes, some the size of a cigarette, others like a pen, and a hose-and-tank style, to which a cigarette can be connected.

2. You’ve pointed out the similarity between the advertising of tobacco — how it used Hollywood and a wide range of marketing — and how e-cigarettes are now doing the same thing. Where is it most profound?

It’s basically the entire playbook that cigarette prod- ucts — Camel, Lucky Strike, Marlboro — used in the mid- to late-20th century but that has been outlawed by the Federal Trade Commission. All those styles of adver- tising have come back in the absolutely unregulated environment of e-cigarettes. So you have television, in- cluding on Superbowl, and radio ads. You have pic- tures of doctors enjoying e-cigarettes, connoting their healthfulness. You have flavors like chocolate, gummy bear and honey.

3. Those kinds of flavors are aimed at kids, right?

Well, the industry professes that it is targeting expe- rienced adult smokers of combustible tobacco to transi- tion them to the arguably healthier vapor products. But if that were the case, who would the campaign against Love as a spokesperson? Why would they sell cotton- candy-flavored cigarettes and beer-flavored e-cigarettes to allow a kid to break two adult taboos at once — al- cohol and smoking — in a single activity?

4. To discourage perpetuation of nicotine addiction through dual use of tobacco and vapor products, it will be important to extend place-of-smoking regulations presently in place for tobacco to e-cigarettes.

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5. Do this is a win-win for tobacco companies?

Right. The only win for public health would be if established tobacco smokers moved over en masse to vapor-based products and abandoned cigarettes, cigars and snuff.

Now, you might ask yourself, “How often does that happen?” There was a recent Lancet paper on cigarette addiction among smokers who wanted to quit. Are e-cigarettes better than the gums and the patches that are currently mar- keted as nicotine-replacement products? The answer is yes. They’re about twice as good. But in reality, fewer than one in 10 adult smokers that adopt electronic ciga- rettes do so to actually eliminate smoking combustible cigarettes. Most of them continue to use both.

Another issue is that e-cigarettes could lead to the renormalization of tobacco and smoking. If you look at the way it is with an e-cigarette, it absolutely repli- cates the hand-to-mouth ritual of smoking. It satisfies that primordial urge to suck on something, so a person who’s vaping looks like someone who’s smoking. The issue is all about young people. Young people want to do what’s cool. Young people want to do what other people are doing. If they see people smoking, or vaping, they don’t necessarily know the difference, so I think part of the motivation to limit electronic-cigarette use in public places is so that young people won’t see it as normal, ordinary, acceptable behavior once again.

To learn more about how cigarettes and e-cigarettes are advertised, marketed and promoted, visit http://tobacco. stanford.edu and http://erica.stanford.edu.

Robert Jackler, top, said that “to diminish the possibility that e-cigarettes will become a gateway product for teen nicotine addiction, flavors should be banned from nicotine-containing vapor.

A another problem is that e-cigarettes are not regu- lated in the United States, although the Food and Drug Administration has plans to do so. There is lit- tle research on the effects of propylene glycol on the lungs, and we know that nicotine and other heavy metals are a known concern. We don’t know the effect of inhaling these chemicals over time. The liquid could also be contaminated with bac- teria, or with cadmium or other heavy metals. Controls in the vapor/liquid industry are not very strong.

The market has been dominated by small compa- nies — startup companies like NJoy and Blu that have done very well. We are in the midst right now of a tran- sition. Blu was bought by Lorillard last year, and now we’re seeing the big boys, R.J. Reynolds, Altria and Lo- rillard, coming on very strong.

The major companies, within a few years, will buy up the small independents so they will own both end of the markets — cigarettes and e-cigarettes. Imagine Coca-Cola. You have sugary Coke and sugar-free Diet Coke, so you have obesity and anti-obesity. R.J. Re- oldys and Altria will have Camel and Marlboro, but they’ll also have their vapor product, so you can either have your nicotine addiction or have your nicotine ad- diction with cancer-causing chemicals.

What the industry would like to see is that you look at the point where you go to a place that you can’t smoke, you pick up y our e-cigarette and vape — the term for the equiva- lent of smoking with cigarettes — and that way you get your nicotine dose in the atmosphere or when you’re in your workplace, or even when you’re in school. And when you leave school or the workplace, you go back to the combustible tobacco products.

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Below, a man uses an e-cigarette.
Cholesterol
continued from page 1

Familial hypercholesterolemia often causes premature heart attacks in young people, including athletes who seemingly out of the blue drop dead on the field.

without functioning receptors, the cells can't latch on to the harmful protein, and that allows it to flood the bloodstream and accumulate in the artery walls. High-density lipoprotein, or HDL, on the other hand, is considered the "good" cholesterol because it helps remove these dangerous deposits.

An asymptomatic disease
FH is often the cause of premature heart attacks in young people, including athletes who seemingly out of the blue drop dead on the field. The disease is an underlying cause for some 24,000 heart attacks each year among people under age 60 in the United States, Knowles said. It often affects multiple family members; children have a 50 percent chance of inheriting it from their parents. In rare instances, children inherit two copies of the gene — one from each parent — making them unusually vulnerable, at risk for heart attack in childhood.

Because it's an asymptomatic disease, it often goes unnoticed by patients and their caregivers, said cardiologist Robert Harrington, MD, professor and chair of the School of Medicine, said FH is a condition that has been seriously neglected in this country — under-reported, under-treated and under-researched. Sadly, he said, many people don't learn about it until they have a heart attack.

"It's an invisible disease," Knowles said. "If you don't have your cholesterol checked and get treatment, you're at a ticking time bomb until something happens.

Though cholesterol is essential to body function, genetic changes can affect how people clear it from the blood. People with FH lack receptor proteins on the surfaces of their cells that help regulate the amount of circulating LDL.

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surgery — Radabaugh took them on a family outing to the lipid clinic at UC-San Francisco. His children proved to have high LDL numbers and were prescribed statins. For the first time, they were given a $3,100 annual charge for the familial hypercholesterolemia. There was some relief in knowing the source of his problem, but Radabaugh said, “I don’t think I had a name for this monster I was fighting. I felt empowered.” He resolved to become an informed, educated patient about the condition and encouraging them to go for testing.

FH may not be widely recognized today, but it is lurking in the population for decades. Its scientific roots go back to 1938, when a Norwegian scientist linked high cholesterol levels in a 16-year-old, odd, yellowish swells or bumps that appeared on patients’ limbs and around their eyes. Knowledge of the disease improved as scientists uncovered the eyes, arcus — these are often a hallmark of the condition: cholesterol-laden deposits that pillow under the skin and may pop up on the elbows, hands, feet, Achilles tendons or other body parts.

**Underlying biology**

In the 1970s, scientists began to explain some of the underlying biology of the disease. At that time, Michael Brown, MD, and Joseph Goldstein, MD, at the University of Texas Southwestern Medical Center, discovered that cells have surface receptors that regulate how much LDL circulates in the bloodstream. The cause of FH was a shortage, or complete absence, of these receptors. The finding earned them the Nobel Prize in 1985.

The following year, Thomas Südhof, MD, who then was working in their lab, succeeded in cloning the gene for the LDL receptor — a gene that when mutated is responsible for FH. The discoveries laid the groundwork for the development in the late 1980s and early 1990s of statin drugs, revolutionizing cardiovascular medicine and leading to what Südhof, who is now a Stanford professor and a 2013 Nobel Prize laureate in physiology and medicine, called “one of the major breakthroughs in cellular physiology and winner of a 2013 Nobel Prize, called ‘one of the major breakthroughs in medicine and co-director of the Preventive Cardiology Clinic at Stanford.”

Screening children

The American Academy of Pediatrics also recommends that all children between the ages of 9 and 11 get a cholesterol panel, but the guideline is not widely implemented, said Knowles. Some pediatricians may not be aware of the guidelines or are reluctant to draw blood in young kids. “If you did that, you’d pick up a lot of the FH cases,” he said. “It’s a great opportunity — a chance to do cholesterol testing unless they are prepared to give the child medication.

Knowles said that at the very least, a child found to have high cholesterol could benefit from diet and lifestyle changes, while knowing the child’s cholesterol status could help identify other family members at risk. “If you did that and screened a lot of kids at an early age, you’d pick up a lot of the FH cases,” he said.

One group of patients identified, he said, are those who might follow a particularly aggressive drug regimen, typically based on the use of a high-potency statin. The drug works by inhibiting an enzyme that is key to the liver’s production of cholesterol. Major studies from the Netherlands and Great Britain have shown that taking statins and controlling cholesterol are highly effective in reducing mortality among FH patients to levels similar to the general population, Knowles said.

The goal for FH patients is to bring their LDL down at least 50 percent and ideally even lower (perhaps as low as 70 mg/dl) to compensate for the body’s long-term cholesterol exposure. Knowles said that fewer than 20 percent of patients actually reach healthy cholesterol levels because doctors, often unaware of a patient’s FH status, may not pursue aggressive treatment, while patients don’t always take their pills. The drugs also may carry side effects, with up to 10 to 20 percent of patients experiencing problems such as muscle aches, which dissuade some from taking the drugs.

“Compliance is a challenge for everyone,” said Mary Ann Champagne, RN, a Stanford nurse who has worked with FH patients for 20 years. “It’s an asymptomatic disease, and people don’t see or feel an immediate benefit from taking the medicine.”

Statins have been the dominant treatment for decades and are among the country’s most prescribed drugs. Lipitor (atorvastatin) is the leading statin, commanding a market of $7.2 billion in 2010, according to the pharmaceutical researcher IMS Health. Most statins, including atorvastatin, are now generic, and as a result, inexpensive.

Most recently, a new statin has focused on an entirely new class of compounds that could have huge implications for FH treatment. These drugs target PCSK9, an enzyme that makes it difficult for the body to clear cholesterol. Early-stage trials have shown that when the enzyme is blocked, LDL levels drop to unprecedented levels. Several companies are sponsoring large-scale clinical trials with variants of the drug to assess their impact on heart disease. Results are expected in the next year.

Radabaugh clings to the promise of these potent new medications. Though he now manages the treatment of his children, he wishes for his children’s “vital signs” daily — he still struggles to bring his LDL into a low range, he said.

**Focusing on what’s important**

Much of his life these days revolves around managing his disease and his precondition with what the future will bring. In late 2012, a woman responsible for carrying the trait to his children had a heart attack. He underwent a procedure known as carotid endarterectomy, in which surgeons opened up the vessel to clear the deposits of cholesterol, but left him with a 3-inch scar on his neck and a slight swelling there that gives him a hoarse voice at times.

Then in the spring of 2013, he learned that two of his bypass grafts had failed — this is very uncommon, as about half of bypass grafts fail within 10 years because the substitute vessels, typically veins taken from the leg, are not equipped to deal with high arterial pressure. So Radabaugh faces the prospect of another procedure. A second bypass operation could be complex because doctors would have to steal arteries from another part of his body, likely his arms. They are hoping to avoid this procedure for as long as possible.

And so Radabaugh waits, as the prospect of yet another bypass operation looms in the background. “I’m waiting for chest pains and another bypass or, God forbid, I could have a massive heart attack,” he said.

In the meantime, he harks back to an experience in the hospital’s intensive care unit not long after he had his second heart attack, which was a bypass procedure. A woman in the next room suffered a fatal heart attack that morning. “I could hear him at serious family members swooning in grief. Watching the incident unfold, he said, gave him an entirely new perspective on the value of his own survival.

“I’ve had the chance to stand on the cliff with my toes on the edge, but thank God I didn’t fall in,” he said. “It’s given me a good perspective. I realize now it’s only our relationships in life that matter.”
Evidence that a promising new method for treating people for multiple food allergies works.

Allergies continued from page 1

up to me and said things like, ‘It’s great that you’re desensitizing children to their peanut or milk allergies, but my daughter is allergic to wheat, cashews, eggs and almonds. What can you do about that?’” said Kari Nadeau, MD, PhD, associate professor of pediatrics at the medical school and an immunologist at Stanford Hospital & Clinics and Lucile Packard Children’s Hospital Stanford. Nadeau is the senior author of the new study.

Patients’ options for dealing with food allergies are limited. Physicians advise them to avoid allergen triggers and carry injectable epinephrine at all times because they run a constant risk of anaphylactic shock from accidental consumption. On the other hand, oral immunotherapy is still experimental and quite slow: In prior studies, patients took as long as three years to become desensitized to one food. Being desensitized to several foods, one at a time, could prospectively take decades. Yet Stanford researchers succeeded in safely desensitizing patients to several food allergens at once and were able to speed up desensitization by supplementing oral immunotherapy with injections of omalizumab (brand name Xolair).

In the earlier study, in which patients were not given omalizumab, 25 children and adults with multiple allergies ate tiny doses of their allergens — as many as five — as highly purified food powders each day. The total dose was evenly divided between the allergens so that each subject got the same total quantity of food protein, regardless of the number of foods they were being desensitized to. The researchers monitored the treatment’s safety, noting some mild allergic reactions, such as itching in the mouth, and a small number of severe reactions that were treated with epinephrine. The food dose was gradually increased until subjects could eat 4 grams of each food protein, or up to 20 grams of the allergenic food proteins in total, without experiencing a reaction. This occurred at a median of 85 weeks after food doses began.

In the second and most recent study, 25 children and adults with multiple food allergies underwent a similar protocol — but with an additional step. Eight weeks before being introduced to food allergens, the patients began receiving injections of omalizumab. This drug reduces activity of the body’s IgE molecules, the antibodies involved in allergic responses, and had been shown in a previous Stanford study to speed the success of oral immunotherapy for children with milk allergies. Patients getting omalizumab tolerated larger initial doses of allergens than those in the non-omalizumab study, and desensitization progressed faster. (The drug was discontinued after eight weeks of oral immunotherapy; this discontinuation was not associated with additional allergic reactions.) The patients continued consuming food powders until they could safely eat 4 grams of each food protein. This occurred at a median of 18 weeks after the food doses began.

“It’s efficient,” said Philippe Bégin, MD, a visiting scientist at Stanford and the paper’s lead author. “It’s exciting that we could perhaps have a treatment that’s actually on a large scale.” However, the new experimental regimen will need further testing in randomized, blinded, controlled phase-2 studies before it is ready for widespread clinical use, he and Nadeau cautioned.

Many of the study subjects had more than five food allergies, the maximum number treated. However, the researchers saw something curious: Some people with nut allergies were desensitized to related tree nuts to which were also allergic but that were not included in their immunotherapy.

“We saw this ‘bystander effect’ in about 60 percent of patients, where, for example, we gave someone pecan powder and the person became desensitized to walnut, too,” said Nadeau, who is also a member of the Children’s Health Research Institute at Stanford. “In the future, we’ll be trying to understand why some people have the bystander effect during clinical trials and some don’t.”

Future research will also determine the most effective way to conduct the therapy. Nadeau’s team is now planning a phase-2 trial at Stanford and possibly four other research institutions across the country. Stanford has already begun recruiting subjects for that trial.

Other Stanford co-authors were Tina Dominguez, physician assistant; Shruti Wilson, MD, clinical instructor in immunology; Liane Bacal, MD, clinical instructor in immunology; Anjali Mehrotra, MD, clinical instructor in immunology; Bethany Kausch, RN, nurse researcher; Anthony Yeh, PhD, research nurse coordinator; Morvarid Tavassoli, research assistant; Elizabeth Hoyte, NP, research nurse; Gerri O’Riordan, RN, chief operating officer and senior director of regulatory compliance for the Stanford Food Allergy Center; Alanna Blakemore, manufacturing research assistant; and Scott Seki, research assistant. They also collaborated with researchers at Johns Hopkins University. Funding for this research was provided by Food Allergy Research and Education (for the phase-1 study without omalizumab) and the Fund for Food Allergy Research at Stanford (for both phase-1 studies). Begun was supported by AllerGen NCE Inc. (the Allergy, Gene and Environment Network, a member of the Networks of Centres of Excellence of Canada).

Paralysis continued from page 1

sudden-onset, permanent paralysis that looks similar to polio. Van Haren is the lead author of an abstract that describes five of the cases. The abstract will be presented during the annual meeting of the American Academy of Neurology.

Although poliovirus has been eradicated from most of the globe, other viruses can also injure the spine, leading to a polio-like syndrome,” Van Haren said in a news release from the academy. “In the past decade, newly identified strains of enterovirus have been linked to polio-like outbreaks among children in Asia and Australia. These five new cases highlight the possibility of an emerging infectious polio-like syndrome in California.”

All five of the children in the report, including Sofia, had been immunized against polio. In addition to Sofia, two others had respiratory symptoms before the paralysis began. In two of the children, the physicians found evidence of infection with enterovirus-68, which is from the same family as poliovirus. Although the team suspects this form of paralysis is infectious, they have not completely excluded other causes such as autoimmune disease. They are asking other physicians to report similar cases to the California Department of Public Health so that the cause of the disease can be pinpointed.

One concern, Van Haren added, is that physicians who have not heard of the new disease may make the same misdiagnosis of transverse myelitis that Sofia received, giving affected children and their families unrealistic expectations about the likelihood of recovery.

The MRI can look similar, but the clinical exam is very distinct,” he said. “There’s a knee-jerk reaction to just call it transverse myelitis. This is something else, and it’s quite bad.”

The good news is that the disease is very rare and likely to remain so. “There have been similar reports in Southeast Asia for many years, and the disease has rarely reached epidemic proportions there,” Van Haren said. “We want to temper the concern about this. It is not a massive epidemic.”

Meanwhile, families like Sofia’s will be watching closely to see what is uncovered by the upcoming research.

“We really want to know what caused this,” Jessica Tomei said, adding that the disease and a string of attempted treatments have been difficult for Sofia to go through. Now 4, Sofia is generally healthy, but her arm is still paralyzed, and the muscles have begun to atrophy. Still, the family is keeping a positive outlook. “We’re lucky it was just her left arm,” Tomei said.
The touch-evoked pain occurs as part of the neural pathway that manages pain. Researchers at the School of Medicine are exploring the potential of developing effective drugs for the condition.

**Touch-evoked pain occurs as part of the neural pathway that manages pain.** Researchers at the School of Medicine are exploring the potential of developing effective drugs for the condition.

Researchers at the School of Medicine have identified a subset of nerve cells that mediate a form of chronic, touch-evoked pain called tactile allodynia, a condition in which the slightest touch can be painful. A group at the Department of Anesthesia, the Department of Molecular and Cellular Pharmacology, and the Stanford Institute for Neuro-Innovation and Translational Neuroscience have been collaborating with researchers at several institutions, including AstraZeneca, another pharmaceutical company. The research team is working to identify a new drug target for chronic, touch-evoked pain.

### Key Findings
- The researchers have identified a subset of nerve cells that mediate a form of chronic, touch-evoked pain called tactile allodynia. This condition is characterized by the perception of pain from normally non-painful stimuli.
- Researchers have discovered that the neurotransmitter system on pain neurons contains mu opioid receptors, or MORs, and that these receptors play a crucial role in the perception of touch-evoked pain.
- The team is exploring the potential of developing drugs that target these MORs as a treatment for chronic, touch-evoked pain.
- The researchers are also investigating the potential of using these findings to develop new treatments for other painful conditions, such as osteoarthritis and fibromyalgia.

**Drugs have myriat deleterious side effects:** including addiction, respiratory depression, constipation, nausea and vomiting, but these drugs offer limited utility for chronic pain management.

- **Ranjini Raghunath** is a science-writing intern for the medical school's Office of Communication & Public Affairs.
Abraham Verghese, professor of medicine and best-selling author of the novel *Cutting for Stone*, will receive a Heinz Award.

**Abraham Verghese, MD, professor of medicine and best-selling author of the novel *Cutting for Stone*, has been selected to receive the $250,000 Heinz Award for Arts and Humanitie**

Dr. Verghese’s widely acclaimed writings touch the heart and inform the soul, giving people of all walks of life a true understanding of what it is to heal the whole person — not just physically, but emotionally,” Teresa Heinz, chair of the Heinz Family Foundation, said in a news release announcing the annual Heinz Award.

Verghese has written extensively on different categories and humanities, the environment, the human condition, public policy and technology, the economy and employment.

“Dr. Verghese is a truly unique expert in the practice and theory of medicine in the Department of Medicine and the Linda R. Meier and Joan F. Lane Professor, which earned him the Anna-Monika Foundation Award. He will accept the award in June during the Association for Advancement of Medical Instrumentation convention in Philadelphia. ALAN SCHATZBERG, MD, professor of psychiatry and the John A. Kriewall and Elizabeth A. Haehl Director of Pediatric Palliative Care, has received the 2014 Damon Runyon Fellowship. The three-year awards are given to postdoctoral scholars conducting basic and translational cancer research in the laboratories of leading senior investiga-

tors across the country. Srivas, with his sponsor Michael Snyder, PhD, is studying changes in the composition and function of the microbiome, bacteria inhabiting the human gut. ABRAHAM VERGHES...