Most physicians would forgo aggressive end-of-life care

By Patricia Waldron

Most physicians would choose a do-not-resuscitate order for themselves when they are terminally ill, yet they tend to pursue aggressive, life-prolonging treatment for patients facing the same prognosis, according to the study. It’s a disconnect that needs to be better understood, said VJ Periyakoil, MD, clinical associate professor of medicine and lead author of the study, which was published May 28 in PLOS ONE.

“Why do we physicians choose to pursue such aggressive treatment for our patients when we wouldn’t choose it for ourselves?” said Periyakoil, director of the Stanford Palliative Care Education and Training Program. “The reasons likely are multifaceted and complex.”

In the study, Periyakoil and her colleagues set out to determine how physicians’ attitudes have changed toward advance directives for themselves when they are terminally ill. Yet doctors tend to pursue aggressive, life-prolonging treatments for patients facing the same prognosis, according to the study.

Subtle difference in DNA separates blonds, brunettes

By Krista Conger

A molecule critical to stem cell function plays a major role in determining human hair color, according to a study from the School of Medicine.

The study describes for the first time the molecular basis for one of our most noticeable traits. It also outlines how tiny changes in DNA can reverberate through our genome in ways that may affect visible traits. It also outlines how tiny DNA changes can reverberate through our genome in ways that may affect noticeable traits. It also outlines how tiny DNA changes can reverberate through our genome in ways that may affect noticeable traits.

The researchers found that the blond hair commonly seen in Northern Europeans is caused by a single change in the DNA that affects how T cells, the immune system’s foot soldiers, respond to an enormous number of potential health threats.
Mothers with history of eating disorders sought for Stanford study

By Erin Digitaile

Women who have previously had an eating disorder often struggle to teach their children healthy eating habits, research has shown.

Now, scientists at the School of Medicine are testing a new method to help these mothers form good eating patterns in their young children. The researchers are recruiting volunteer families with a child age 1 to 5 whose mother has had anorexia nervosa, bulimia nervosa, or binge-eating disorder in the past. In the 16-week study, the researchers will help both the mother and her partner build healthy family interactions around food.

“Mothers of children with mothers who have had eating disorders are more likely than other kids to be dissatisfied with their bodies and engage in emotional eating, binge eating or restrictive eating behaviors,” said Shiri Sadeh-Sharvit, PhD, a visiting scholar at Stanford who is leading the new study. “These mothers are good parents who simply don’t know how to help their children, but they struggle with eating-disorder thinking. It’s something that comes and blurs their parenting.”

Prior research has shown that mealtime conflict is more common in families in which the mother has had an eating disorder. These mothers may overfeed or underfeed their children, underfeeding being more predominant. They also have more difficulty recognizing hunger and fullness cues in themselves and their children, which makes it harder for them to respond to these sensations. Children whose mothers have had eating disorders are more likely than other kids to be dissatisfied with their bodies and engage in emotional eating, binge eating or restrictive eating behaviors. In the new study, the Stanford researchers will meet with families 12 times during a 16-week period. The project aims to improve communication about food and healthy eating between the women who have had eating disorders and their nonaffected partners so that both parents can play a positive role in teaching their young children to eat. The researchers will help each family identify specific, individualized ways that the mother’s eating-disorder history might affect family interactions and develop a counterpoint possible approach.

“For one mom, this might mean adding another slice of bread at dinner,” said Sadeh-Sharvit. “For one mom, this might mean adding another slice of bread at dinner. For another, it might mean practicing her ability to not say anything to her child about her fears that the child might become overweight.”

The researchers hypothesize that the study will help parents avoid pressuring their children to eat too little or too much and that children will take more responsibility for regulating their own hunger and fullness, and that parents will communicate better about eating patterns. The study’s principal investigator is James Lock, MD, PhD, professor of psychiatry and behavioral sciences at Stanford and a clinician who treats eating disorders at Lucile Packard Children’s Hospital Stanford.

Families who are interested in participating in the research can contact Sadeh-Sharvit at 497.4949 or shiri_sadeh@yahoo.com for more information.

The O'Connor- Stanford residency program wins national award

The O'Connor- Stanford residency program received the 2014 National Innovative Program Award from the Society of Teachers of Family Medicine.

The program — a joint initiative of the O’Connor Family Medicine Residency Program, in San Jose, and the Stanford Department of Family Medicine — provides graduate medical education training opportunities to physicians interested in primary care family medicine residents at O’Connor Hospital the opportunity to develop leadership skills in the area of primary care. In addition, Stanford medical students benefit from teaching and learning opportunities by the residents. By teaching alongside master clinician educators at the School of Medicine, O’Connor faculty residents will complete a curriculum that mirrors many elements of a faculty development fellowship during residency.
Coaxing iPS cells to specialize prior to transplant cuts rejection risk

By Krista Conger

For many scientists, the clinical promise of stem cells has been dampened by very real concerns that the immune system will reject the transplanted cells before they could render any long-term benefit. Previous research in mice has suggested that upon transplantation into a host, undifferentiated iPS cells are rejected by the immune system without the need for acceptance and tolerance by the host cell that the virus needs to copy the genes needed to infect and kill the host. Instead of finding drugs that target the virus, a common strategy in antiviral therapy, says Jeffrey Glenn, the co-lead authors decided to look for another pathway they can use when another is blocked. Viruses, which rely on human cells to provide the machinery and raw materials they need to replicate, may not be as vulnerable to antiviral therapies as previously thought if the virus has a backup pathway they can use when another is blocked. Viruses, which rely on human cells to provide the machinery and raw materials they need to replicate, may not be as vulnerable to antiviral therapies as previously thought if the virus has a backup pathway they can use when another is blocked. Viruses, which rely on human cells to provide the machinery and raw materials they need to replicate, may not be as vulnerable to antiviral therapies as previously thought if the virus has a backup pathway they can use when another is blocked. Viruses, which rely on human cells to provide the machinery and raw materials they need to replicate, may not be as vulnerable to antiviral therapies as previously thought if the virus has a backup pathway they can use when another is blocked. Viruses, which rely on human cells to provide the machinery and raw materials they need to replicate, may not be as vulnerable to antiviral therapies as previously thought if the virus has a backup pathway they can use when another is blocked. 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Lloyd Minor, dean of the medical school, gave introductory remarks at the conference, held May 21-23.

Audience members, above, at the Big Data in Biomedicine Conference. Jim Davies, right, a professor of software engineering at Oxford, spoke during a session called Big Data in Health Care.

"We're all here because we believe in the vast potential of technology, data and biomedicine to transform human health for the 21st century," Lloyd Minor, MD, dean of the School of Medicine, told an audience of close to 500 health for the 21st century," Lloyd Minor, MD, dean of the School of Medicine, told an audience of close to 500 people at Stanford's Li Ka Shing Center for Learning and Knowledge and more than 1,000 virtual attendees who live-streamed the event. Presented by Stanford Medicine and the University of Oxford and sponsored by the Li Ka Shing Foundation, the conference featured more than 60 speakers and panelists, including Stanford biologists and data scientists, researchers from universities around the world, and government and industry professionals.

Minor challenged the audience to rise to the challenge of harnessing computer technology, biomedical informatics and social media — referred to collectively as big data — to benefit clinical practice.

"Data is not just numbers," he said. "It is also clinical notes and MRI scans. Gather as much data as you can, and let the data find patterns for you, before you instruct it on what patterns to look for." David Glazer, director of engineering at Google and one of several keynote speakers at the conference, made the pattern-recognition capabilities of computers palpable by describing how computers, which in the human sense understand absolutely nothing, can fish out recurring patterns from oceans of raw data.

When Glazer and his colleagues feed raw data into a computer network and output it in list form, they look for patterns, the network compiled with one: a rendering of a generic human protein, the most commonly occurring sequence of 1s and 0s in the cacoophony the network scanned. (The second-most frequent DNA pattern? Why, the face of a cat, of course.) When you add a few zeroes to the computer power you're willing to throw at a problem, "a simple, boring algorithm starts to work pretty well," Glazer said.

But it isn't just the ability of machines to find patterns. Several generalists throughout the three-day conference showed how computers had led them down unexpected paths.

Stanford assistant professor of biochemistry Julia Salzman, PhD, described her discovery of a new and probably significant biological entity by giving her computers a long leash. "A huge amount of data is being thrown in the trash because the data don't fit our sense of what they should look like," she said.

For instance, RNA is best known as a lengthy, linear, information-coding, intermediary substance that is analogous to DNA but unlike its nucleus-bound counterpart is free to float throughout the cell, where it can interact with molecules, such as DNA, to assemble specific sequences of raw material into one of that cell's myriad proteins. Other, profoundly different functions have also been identified for RNA in recent years. But still, Salzman said, a substantial portion of all RNA is ignored in most analyses.

"We looked more carefully at the data that was being thrown into the trash," she said.

Using computational pattern-recognition software, her team discovered numerous instances in which pieces of RNA that normally are stitched together in a particular linear sequence were, instead, assembled in the "wrong" order (with what's normally the final piece in the sequence preceding what's normally the first piece, for example). The anomaly was resolved with the realization that what Salzman and her group were seeing were breakdown products of circular RNA — a novel conformation of the molecule.

"This has been overlooked. The textbooks are incomplete," Salzman said.

In its circular form, she noted, an RNA molecule is much more impervious to degradation by ubiquitous RNA-nibbling enzymes, so it is more likely than its linear RNA counterparts to persist in a person's body. Every cell in the body pows circular RNA, she said, but it seems to be produced at greater levels in many human cancer cells. While its detailed function is unclear, these features of circular RNA may position it as an excellent target for a blood test, she said.

Another keynote speaker was Taher Kass-Houri, MD, chief health informatics officer at the Food and Drug Administration. The FDA, he said, is "unilocal" in how it works. If you eat a salad, you're pretty much a global citizen," said Kass-Houri, noting that the ingredients of a typical salad may travel halfway around the world to get to our table. Unfortunately, the well-traveled salad can pick up a host of microbial free-riders en route. Over the last year the FDA has assembled a publicly accessible database holding the genomic sequences of more than 5,000 food-poisoning culprits such as Salmonella and listeria, he said.

For his part, Snyder offered a new twist on his interest in big data. "In my world, there would be a telescope that measures everything that comes out of you. It's harder to track everything that goes into you, but we have ways of approaching that, too," he said.
Discovery could pave way to new treatment for rare jaw tumor

By Patricia Waldron

Researchers at the School of Medicine have identified the mutations underlying a rare, understudied type of jaw tumor called ameloblastoma.

In a paper published online May 25 in *Nature Genetics*, the researchers identify mutations in two genes that are associated with 80 percent of ameloblastoma cases. The Food and Drug Administration has already approved drugs for other cancers caused by these mutations. Now, the paper’s authors are pursuing funding for a pilot study to use one of these drugs to treat ameloblastoma.

Doctors diagnose about 300 to 600 cases of ameloblastoma in the United States each year. Neither drugs nor radiation have been successful at eradicating the cancer, leaving surgery as the only option. Though the tumors are considered benign, surgeons must cut away large margins around the growths to try to ensure that it will not recurr. Because the operation removes a portion of the jaw as well as arteries and facial nerves, the patients require extensive reconstructive surgeries and rehabilitation to regain the ability to smile and chew.

“They require quite a disfiguring surgery to treat,” said Andrew McClary, MD, chief pathology resident at Stanford Hospital & Clinics. Patients often lose a large section of their jaw, he said. McClary shares lead authorship of the paper with postdoctoral scholars Robert Sweeney, MD, and Benjamin Myers, PhD, and with research assistant Jewison Bischoff.

**Quest to find underlying mutations**

McClary first became interested in this rare disease when he examined a slide from a patient’s tumor. He often uses a mnemonic trick to remember a disease by associating its name with the gene mutations that cause it. But he found that ameloblastomas had no known gene abnormalities.

To find the underlying mutations causing these tumors, McClary worked with colleagues at the University of British Columbia in Vancouver, the Cleveland Clinic in Ohio and the Oregon Health Sciences University in Portland to collect tumor samples. Because the disease is so rare, they only had older bits of tissue that had been preserved for microscopy work, not genetic studies.

Fortunately, the researchers still were able to sequence the mRNA — copies of genes that tell the cell how to make specific proteins — even when the mRNA was old and degraded. The researchers then embarked on what McClary called a “fishing expedition” to find the mRNAs with the mutations that caused the tumors.

**Possible therapies**

Perhaps most promising, researchers found that there are already FDA-approved drugs for cancers with mutations in the same developmental pathway. A drug called vemurafenib is specific to ameloblastoma cell cultures that harbor a BRAF mutation, they found. This drug is effective against melanomas that carry the same mutant gene. Researchers also found that a compound called arnécic trisiodide, an approved anti-leukemia drug, is effective at blocking the mutant SMO protein.

In April, West and McClary began collaborating with Dimitrios Colevas, MD, associate professor of oncology at Stanford, to plan a small pilot study to assess whether vemurafenib can shrink ameloblastoma tumors that have a BRAF mutation.

In future work, the researchers plan to conduct more fishing expeditions to look for these mutations in other types of tumors, cysts and lesions in the jaw.

“These are findings you can hang your hat on.”

— Patricia Waldron

**System defenders bind to disease-causing invaders**

Researchers at the School of Medicine have identified the mutations underlying a rare, understudied type of jaw tumor called ameloblastoma.

Researchers also checked the sequencing of the peptides that were known to bind with a given T cell and found striking similarities there, too. They were not “cross-reactive,” but in fairly limited ways. Like a multilingual person who can speak Spanish and French but can’t understand Japanese, a receptor can engage with a broad set of peptides related to one another,” Bernbaum said.

**Impact on biomedical science**

Finding out whether a given peptide activates a specific T-cell receptor has been a historically piece-meal process with a 20 to 30 percent success rate, involving hundreds of studies of biological samples. “This latest research provides a framework that can improve the success rate to as high as 90 percent,” Bernbaum said.

“T-cell receptors bind to peptides that were known to bind with a given T cell and found striking similarities there, too. They were not ‘cross-reactive,’ but in fairly limited ways. Like a multilingual person who can speak Spanish and French but can’t understand Japanese, a receptor can engage with a broad set of peptides related to one another,” Bernbaum said.

This is an important illustration of how SSRL’s X-ray-imaging capabilities allow researchers to get detailed structural information on technically very challenging systems,” said Birnbaum. “This is a great motivator,” he said about his involvement with the group. “Our face is a special place. I couldn’t imagine not smiling.”

Jonathan Pollack, MD, PhD, associate professor of pathology at Stanford, and Philip Beachy, PhD, professor of biochemistry and of developmental biology, are also senior authors of the paper. Other Stanford co-authors are postdoctoral scholar Xue Gong, PhD; pathology instructor and resident Justin Olegario, MD, PhD; professor of pathology and of medicine James Zehnder, MD; research assistants Carol Jones and Sushama Varma; and undergraduate Lila Neahring.

Stanford’s Department of Pathology also supported this work.

From left: Robert West, Andrew McClary, Robert Sweeney and Jonathan Pollack are among the authors of a study identifying the mutations responsible for most cases of a rare type of jaw tumor, ameloblastoma.

**Researcher make discoveries about the ways in which T-cell receptors, shown in bright red, recognize invaders in the body.**

**An illustration in the study depicts the distribution of ameloblastoma tumors associated with their respective gene mutations. SMO mutations are most often found in the upper jaw, while BRAF mutations occur predominantly in the lower jaw, the study says.**

**“These are findings you can hang your hat on.”** — Patricia Waldron is a science-writing intern for the medical school’s Office of Communication & Public Affairs.
since passage of the Self-Determination Act in 1990, a law designed to give patients more control over determining their end-of-life care. Advance directives are documents that patients can use to indicate end-of-life care preferences.

The study involved two sets of subjects: One comprised 1,081 physicians who in 2013 completed a web-based advance directive form and a 14-item attitude survey at Stanford Hospital & Clinics and the Veterans Affairs Palo Alto Health Care System; the other comprised 790 physicians from Arkansas who were asked the same 14 survey questions but did not complete an advance directive form — in a 1989 study published in the Journal of the American Medical Association.

Surprisingly, results showed that doctors’ attitudes toward advance directives have changed little in 25 years. “The news has not moved very much,” said Periyakoil, who is also associate director of palliative care services at the Palo Alto VA center.

**The wish to die at home**

The lack of change in physicians’ attitudes toward advance directives mirrors what the study describes as the medical system’s continued focus on aggressive treatment at the end of life, despite the fact that most Americans now say they would prefer to die at home, without aggressive life-prolonging interventions.

“A big disparity exists between what Americans say they want at the end of life and the care they actually receive,” the study said. “More than 80 percent of patients say that they wish to avoid hospitalizations and high-intensity care at the end of life, but their wishes are often overridden.”

As part of the study, doctors were asked when they would choose “no-code” or do-not-resuscitate orders for their patients. “It’s tricky, but physicians don’t actually do for their patients. It’s not because doctors are trying to make more money or because they are intentionally insensitive to their patients’ desires. As the more obvious problem is a biomedical system that rewards doctors for taking action, not for talking with their patients.”

“Our current default is ‘doing,’ but in any serious illness there comes a tipping point where the high-intensity treatment becomes more of a burden than the disease itself,” said Periyakoil, who trains physicians on their ethnicity and radiation oncologists were less favorable. Caucasian and African American doctors were the most favorable; Latino physicians were the least favorable.

An overwhelming percentage of the 2013 doctors surveyed — 88.3 percent said they would choose “no-code” or do-not-resuscitate orders for their patients.

**Actions, not words, rewarded**

As a geriatrics and palliative care physician who sits at the bedside of sick patients herself, Periyakoil said she understands the disconnect between the type of care doctors want for themselves at the end of life and what they actually do for their patients. “It’s not because doctors are trying to make more money or because they are intentionally insensitive to their patients’ desires. As the more obvious problem is a biomedical system that rewards doctors for taking action, not for talking with their patients.”

“Our current default is ‘doing,’ but in any serious illness there comes a tipping point where the high-intensity treatment becomes more of a burden than the disease itself,” said Periyakoil, who trains physicians on how to talk with patients about these complex and sensitive topics,” said Harrington, who was not involved in the study.

Other Stanford authors of the study are Eric Neri; Ann Fong, critical care physician at Stanford Hospital & Clinics; and Helena Karter, PhD, professor emerita of psychiatry and behavioral sciences.

The research was supported by the National Institutes of Health and the Department of Veterans Affairs.

The Department of Medicine also supported the work.

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**Flu**

Organization declared the H1N1 virus a pandemic in June 2009, large-scale vaccination did not occur until January 2010. By then, many people had already contracted the virus, recovered and developed immunity. The delay spurred the researchers to ask when would be the best time to vaccinate, and how many people should receive the vaccine.

The new study, published online May 19 in Annals of Internal Medicine, also looked at the economic impacts of the flu, which previous models had not quantified. The model simulates how a more severe flu virus would spread through a densely populated metropolitan area such as New York City. It considered the deadliness of the virus, whether the population had immunity from a similar strain and how easily the virus spreads between people.

By adding a vaccination campaign into the model at different times, the researchers could predict the best time to vaccinate for a future pandemic. Vaccinating six months after the start of the outbreak instead of nine (the timing of vaccination for the 2009 H1N1 pandemic) would prevent more than 200,000 infections and almost 6,000 additional deaths in a city of 8.3 million people.

The city would save $51 million.

**Production bottleneck**

The bottleneck is the flu at the Veterans Affairs Palo Alto Health Care System. Owens is the senior author of the paper. “Delays of a few weeks or months can make an enormous difference in the number of people who are infected. If you had a bad pandemic flu, it can have an enormous impact on the number of people who die.”

**Possible threats**

Though it’s impossible to predict which flu virus will become the next deadly pandemic — and when it will strike — two specific viruses are on epidemiologists’ radars: H5N1, a virus in Southeast Asia contracted from birds, and H7N9, a new flu virus strain to which humans have no natural immunity. Both strains have a high mortality rate but cannot yet spread from human to human.

“I don’t know that we can predict what the virus is going to be, but I do think it’s possible to say that there might be a pandemic,” said Khazeni. “There are some similarities in the viruses and the way we prepare that are generalizable. It doesn’t actually matter what virus it is.”

Researchers from the University of Michigan, Community Health Councils and Harvard University also are co-authors of the study.

The work was supported by the Agency for Healthcare Research, National Institutes of Health and the Veterans Affairs Palo Alto Health Care System.

**Inside Stanford Medicine**

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Patricia Weldon is a science-writing intern for the medical school’s Office of Communication & Public Affairs.

JUNE 9, 2014

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**Terminal**

continued from page 1

“Why do we physicians choose to pursue such aggressive treatment for our patients when we wouldn’t choose it for ourselves?”

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**Flu continued from page 1**

Early vaccination could save both lives and money during the next flu pandemic, a new study says.

The researchers to ask when would be the best time to vaccinate, and how many people should receive the vaccine.

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The city would save $51 million.

**Production bottleneck**

The bottleneck is the flu at the Veterans Affairs Palo Alto Health Care System. Owens is the senior author of the paper. “Delays of a few weeks or months can make an enormous difference in the number of people who are infected. If you had a bad pandemic flu, it can have an enormous impact on the number of people who die.”

**Possible threats**

Though it’s impossible to predict which flu virus will become the next deadly pandemic — and when it will strike — two specific viruses are on epidemiologists’ radars: H5N1, a virus in Southeast Asia contracted from birds, and H7N9, a new flu virus strain to which humans have no natural immunity. Both strains have a high mortality rate but cannot yet spread from human to human.

“I don’t know that we can predict what the virus is going to be, but I do think it’s possible to say that there might be a pandemic,” said Khazeni. “There are some similarities in the viruses and the way we prepare that are generalizable. It doesn’t actually matter what virus it is.”

Researchers from the University of Michigan, Community Health Councils and Harvard University also are co-authors of the study.

The work was supported by the Agency for Healthcare Research, National Institutes of Health and the Veterans Affairs Palo Alto Health Care System.

**Inside Stanford Medicine**

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Patricia Weldon is a science-writing intern for the medical school’s Office of Communication & Public Affairs.
Sugar
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Jay Bhattacharya, an associate professor of medicine and an economist at Stanford’s Center for Health Policy, was the senior author.

The researchers also simulated giving a 30-cent reward to food stamp participants for every dollar they spent on fruits and vegetables. The simulation’s estimates matched the results of the U.S. Department of Agriculture’s Healthy Incentives pilot study, which was conducted in a single county in Massachusetts. The reward program would be expected to double the number of people who met the daily recommendation for fruits and vegetables.

The simulation allowed the researchers to check their model against real results, and to predict the effects of the Healthy Incentives program nationwide.

“This is a rigorous and well-conducted study,” said David Stuckler, PhD, a senior research scientist in the Department of Sociology at the University of Oxford, in an email. “It reminds us of the critical importance of addressing the root financial causes of rising obesity and diabetes in the United States. (Stuckler, who studies social and economic determinants of health, was not involved in the research.)

But because these findings challenge the subsidies received by the processed-food industry, they are likely to be challenged by lobbying groups, he cautioned. Other government assistance programs, such as the Special Supplemental Nutrition Program for Women, Infants and Children, do not allow the purchase of sugary drinks and limit purchases to only healthy foods, such as fruits, vegetables, dairy products and whole-grain items.

SNAP restricts only the purchase of alcohol, tobacco and hot foods prepared in the store. Soda, salty snacks and junk food are all eligible for SNAP benefits.

Because tax dollars fund SNAP, some groups are concerned that taxing sugary beverages is a subsidy for unhealthy diets that will result in more spending on the health-care costs associated with diabetes and heart disease down the road. These costs will largely be borne by Medicare in older individuals and Medicaid in low-income Americans.

In June 2013, a bipartisan group of 18 mayors of major U.S. cities signed a letter addressed to U.S. House Speaker John Boehner and House Minority Leader Nancy Pelosi asking them to add soda and sugary drinks such as fruit juice, which is high in sugar.

The simulation found that a ban on sugar-sweetened beverages would result in 1.12 percent fewer adults and 0.41 percent fewer children becoming obese. These numbers represent about 281,000 adults and 141,000 children. Diagnosis of adults with type-2 diabetes would decline by 2.3 percent.

The study was careful to make conservative estimates of the effects of a ban, Basu said, and some researchers think that making sugary drinks ineligible for food stamps would have an even greater improvement in recipients’ health.

“I feel this paper even underplays the significant effect of changing the SNAP benefits to ban sugar-sweetened beverages, as this would not affect all participants equally and would truly impact lower income consumers, who tend to be more obese and more likely to be diabetic,” said Barry Popkin, PhD, professor of nutrition at the University of North Carolina-Chapel Hill, in an email. (Popkin was not involved in the research.)

When researchers looked only at the effects of the 30-cent reimbursement, they found that it would reduce the number of adults who met the federal guidelines for fruit and vegetable consumption.

“It’s really hard to get people to eat their broccoli,” Basu said. “You have to make it really cheap, and even then, sometimes people don’t know what to do with it.”

Price isn’t the only factor. A person’s cultural background, proximity to a grocery store, ability to cook and access to a kitchen can all affect how many servings of fruits and vegetables a person consumes.

Though the reduction in obesity and type-2 diabetes and increase in fruit and vegetable consumption is small, with 46 million Americans receiving SNAP benefits, they represent hundreds of thousands of individuals, Basu said.

“It’s very rare that we can reach that many people with one policy change and just one program,” he said.

The other Stanford co-author of the study was professor of medicine Christopher Gardner, PhD. A researcher at the University of California-San Francisco was also a co-author.

The work was funded by the Robert Wood Johnson Foundation as part of its Healthy Eating Research Program and by the IRP RIDGE Center for National Food and Nutrition Assistance Research.

The Department of Medicine also supported the work.

Blond
continued from page 1
regulates the expression of a gene that encodes a protein called KITLG, also known as stem cell factor. This protein regulates the expression of a gene that encodes a protein called KITLG, also known as stem cell factor.

The study was designed to determine how much DNA changes correlated with blond hair color in Northern Europeans. It was also a co-author.

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Patricia Wilder stalks a science-writing in- tern for the medical school’s Office of Communication & Public Affairs.

"Now that we know one of the most crucial signaling molecules in mammalian development also affects hair color," said Kingsley. "In another situation — perhaps under the influence of a different regulatory region — it probably controls stem cell division. Dialing up and down the expression of an essential growth factor in this manner could be a common mechanism that underlies many different traits."

Kingsley is known for his studies of the evolution of a tiny fish called the threespine stickleback. The stick- leback adapts quickly to changes in its environment. It becomes darker in murky lakes, and develops modified spine, fin and armor structures in response to different types of predators. Kingsley has shown that these adaptive changes are often driven by changes in the regulatory regions that surround and control gene expression, and that these regions themselves are also involved in the evolution of new traits.

In the current study, the researchers had a couple of clues as to why these regulatory regions might be important in hair color. One was the fact that the adenine- to-guanine nucleotide change had been previously associated with a mouse model of human blond hair color in Northern Europeans in a genome-wide association study. The other was the evidence in laboratory mice of a large mutation called an inversion that affects several million bases and then estimated how their eating habits would change if the benefits of a tax were no longer paid for sugar-sweetened bev- erages. The simulation considered that some people would likely continue to buy sweetened beverages, but with their own money, while others would sub- stitute drinks such as fruit juice, which is also high in sugar.

The simulation found that a ban on sugar-sweetened beverages would result in 1.12 percent fewer adults and 0.41 percent fewer children becoming obese. These numbers represent about 281,000 adults and 141,000 children. Diagnosis of adults with type-2 diabetes would decline by 2.3 percent.

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Leading stem cell expert to join School of Medicine faculty

By Erin Digita1e

Maria Grazia Roncarolo, MD, a stem cell and gene therapy expert and researcher for the San Raffaele Scientific Institute in Milan, Italy, is joining the Stanford University School of Medicine as a professor of developmental biology and regenerative medicine.

Roncarolo has been recruited to lead the school’s efforts to translate basic scientific discoveries in the field of regenerative medicine into novel patient therapies, including treatments based on stem cells and gene therapy.

“I am deeply grateful to the collegiality and excitement that Maria Grazia is bringing to our faculty,” said Lloyd Minor, MD, dean of the School of Medicine. “She is an outstanding basic scientist and translational researcher, and a highly knowledgeable institutional leader. She will be a tremendous asset to our team.”

Bone marrow transplants have been used since the 1960s to treat cancers and inherited diseases of blood and immune cells. Modern stem-cell and gene-therapy research is making such transplants safer and expanding the scope of diseases that can be treated. One important refinement, which Roncarolo will help to develop at Stanford, will be the ability to give patients highly purified immune cells that can be transplanted back to the patient.

“I am very excited about the new opportunity, but of course closing my emotions,” said Scott. “In undertaking this wonderful university brings strong institutional support and I will benefit greatly from the experience as the chair of Stanford Bio-X immersed him in the type of interdisciplinary research and, like Roncarolo, his experience as the chair of Stanford Bio-X immersed him in the type of interdisciplinary research and, like Roncarolo, his experience as the chair of Stanford Bio-X immersed him in the type of interdisciplinary work being carried out at Stanford.”

Matthew Scott, PhD, professor of developmental biology, of genetics and of bioengineering, has been at Stanford since 1990. Scott has been an invaluable leader, scientist and colleague during his years at Stanford, said Lloyd Minor, MD, dean of the School of Medicine. “His early studies of the regulators of early embryonic patterning set the stage for many groundbreaking studies in the field of developmental biology, and his experience as the chair of Stanford Bio-X immersed him in the type of interdisciplinary work being carried out at Stanford.”

Matthew Scott, PhD, professor of developmental biology, of genetics and of bioengineering, has been at Stanford since 1990. Scott is known for his discovery in 1960s to treat cancers and inherited diseases of blood and immune cells. Modern stem-cell and gene-therapy research is making such transplants safer and expanding the scope of diseases that can be treated. One important refinement, which Roncarolo will help to develop at Stanford, will be the ability to give patients highly purified immune cells that can be transplanted back to the patient. Roncarolo led a trial of gene therapy for adenosine deaminase deficiency that was considered the gold standard for gene therapy when results on the first 10 patients were published in 2009. Today, Roncarolo is excited by the possibility of bringing stem-cell and gene therapies to greater patient populations. “At Stanford, there are really fantastic discoveries that can be translated into therapies that make a real difference for people,” she said. “I hope to measure my success at Stanford by the number of diseases we can cure.”

Matthew Scott, professor of developmental biology, of genetics and of bioengineering, will become the president of the Carnegie Institution of Science in September. Scott, who is also the Howard H. and Jessie W. Watkins University Professor, has been at Stanford since 1990. Scott will return to Palo Alto on weekends to be with his family and friends. And part of his heart will always remain at Stanford, he said.

“I am deeply grateful to the colleagues, students and postdocs who have made my research and teaching experiences at Stanford so rewarding,” Scott said. “I have loved every minute of it.”

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