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## 60-SECOND SCIENCE

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# 60





## DNA Testing to Help Sharks Keep Fins

**In a study in the journal *Endangered Species Research*, shark fins on sale were shown to be from a specific region in which shark populations have collapsed, evidence that may help change fishing regulations. Cynthia Graber reports**

I should start this podcast off with an admission—I have a serious problem with shark fin soup. Fishermen slice the fin off the shark and toss the creature back into the water to die. This happens to millions of sharks around the world, and some of those shark populations are endangered. Scientists have been trying to figure out which shark populations are most at risk by the slash-and-toss. Now there's new DNA evidence that's aiding the effort.

Researchers used a tool called “genetic stock identification” to test samples of 62 scalloped hammerhead shark fins—an endangered species—from the Hong Kong fin market. They analyzed the mitochondrial DNA, which is passed down from the mother and is traceable to the sharks' birth waters. Fifty-seven of those sharks came from Atlantic and Indo-Pacific waters, and 21 percent live in the western atlantic, where sharks' numbers have now collapsed. The results were published online in the journal *Endangered Species Research*.

Scientists will bring these results to the 2010 Convention on International Trade in Endangered Species meeting. A change in the sharks designation at that meeting could lead to better protection from commercial exploitation.

—Cynthia Graber



## Fitness Linked to Smartness

**A study in the Proceedings of the National Academy of Sciences finds that men's cardiovascular fitness at the age of 18 is a marker for later academic achievement. Karen Hopkin reports**

Any school kid can tell you: nerds are not usually the most athletic specimens. But a new study suggests that young men who are physically fit tend to be more intelligent. The results appear in the *Proceedings of the National Academy of Sciences*.

Animal studies have long shown a link between physical activity and better memory. And in humans, aerobic exercise has been found to boost cognitive function in the elderly. But studies in young adults have yielded conflicting results. Strenuous physical activity in adolescents actually seemed to make mind matters worse.

To try to settle the issue, scientists in Sweden reviewed the records of more than a million men who enlisted for military service at the age of 18. And they found that cardiovascular fitness, but not muscle strength, was associated with overall intelligence (at least as measured by the Swedish army). And when they consulted additional national databases, they found that physical fitness at the age of 18 also foreshadowed greater academic achievement later in life. Even among the twin pairs, the fitter brother tended to be the smarter.

So remember, a nerd may not be athletic. But a lot of athletes may be harboring an inner nerd.

—Karen Hopkin



December 3, 2009

## Black Hole Quasar Building Galaxy

**A study in the journal *Astronomy & Astrophysics* finds that a distant quasar, powered by a black hole, is building a galaxy that will eventually surround the black hole.**

**Cynthia Graber reports**

Which came first, black holes or galaxies? It's been a bit of a conundrum for astrophysicists. Black holes are known to devour matter, but did they arise before or after, the galaxies in which they exist? Now, scientists say it looks like the black holes build their own galaxies. The research was published in the journal *Astronomy & Astrophysics*.

Scientists were checking out a quasar, an incredibly distant, incredibly bright object. This quasar was the only one without a known host galaxy. Researchers thought the galaxy must be hidden behind some dust. But they didn't find one. What they did find is a nearby galaxy that's producing stars at a rapid pace—the equivalent of about 350 suns per year, a hundred times faster than typical galaxies.

Scientists observed that the quasar is shooting out highly energetic particles and fast-moving gas in the direction of the galaxy. It looks as if that's inducing the creation of those stars. So the galaxy will keep growing until it envelops the quasar itself. The researchers conclude that galaxies may thus be formed by clouds of gas that are bombarded by streams of matter and energy from black holes—which are building their own homes.

—Cynthia Graber





## Backyard Feeders Driving Bird Evolution

**A study in the journal *Current Biology* finds that backyard bird feeders in Britain are responsible for splitting central European blackcap warblers into two distinct populations that may be on their way to becoming separate species. Karen Hopkin reports**

We usually think of evolution as something that happens over eons, in remote places where people rarely venture. Not something that happens around the backyard birdfeeder in just a few decades. But a study in the journal *Current Biology* suggests that feeding birds in winter can influence their course of evolution.

The birds in this study were central European blackcaps, a common kind of warbler. In spring, they breed in southern Germany. And when winter comes, they all fly south to the Mediterranean. At least they used to. In the 1960s, folks in Britain started putting out seed in winter. And the blackcaps split into two distinct groups. One goes to Spain to nosh on fruits and olives, the other heads north to take advantage of the easy English pickin's.

The two populations may even be splitting into two species. The blackcaps that winter in England tend to mate with each other when they return to Germany. So they're starting to look different from the birds that go south. Their beaks are longer and narrower, less suited to supping on Spanish olives. As birds of a feather, they definitely flock together. And to some degree, they have a bunch of bird-feeding Brits to thank.

—Karen Hopkin



December 7, 2009

## Newspapers Worldwide Call for Climate Change Action

**On the first day of the Copenhagen climate conference, 56 newspapers publishing in 20 languages in 45 countries publish an unprecedented joint editorial calling for meaningful action to face the threat posed by climate change. Steve Mirsky reports.**

**The editorial:** <http://bit.ly/71ut8f>

It's like the publishing version of one of those scenes from a sci-fi movie where an alien invasion impels traditional adversaries to join together to face their larger, common threat. Today 56 newspapers, in Pakistan and India, in Israel and Lebanon, in Taiwan and China, in Greece and Turkey, in Africa and in North, South and Central America are publishing an unprecedented joint editorial calling for meaningful action to face the threat posed by climate change. The editorial, published in 45 countries in 20 different languages, appears on this first day of the Copenhagen climate conference. The British paper the *Guardian* led the effort, which involved weeks of negotiations to reach a final version.

The editorial notes that "the science is complex but the facts are clear. The world needs to take steps to limit temperature rises to 2 degrees C...a bigger rise of 3 to 4 degrees C would parch continents, turning farmland into desert. Half of all species could become extinct, untold millions of people would be displaced, whole nations drowned by the sea. The controversy over emails by British researchers that suggest they tried to suppress inconvenient data has muddied the waters but failed to dent the mass of evidence on which these predictions are based."

The editorial recognized that "the shift to a low-carbon society holds out the prospect of more opportunity than sacrifice. Already some countries have recognized that embracing the transformation can bring growth, jobs and better quality lives. The flow of capital tells its own story: last year for the first time more was invested in renewable forms of energy than producing electricity from fossil fuels."

So while gleeful anarchists like Oklahoma Senator James Inhofe go to Copenhagen to try to sabotage the proceedings, the worldwide array of newspapers attempts to remind the conference participants and the people they represent to keep their eye on the ball—the ball in this case being an oblate spheroid with almost seven billion human inhabitants and a fever that desperately needs to be treated. As the *Guardian's* editor in chief, Alan Rusbridger, said, "Newspapers have never done anything like this before but they have never had to cover a story like this before."

—Steve Mirsky



## Caffeine Merely Masks Alcohol's Effect

**An animal study in the journal *Behavioral Neuroscience* finds that coffee after alcohol consumption might merely make the drinker feel more capable, which could lead to bad decision making. Steve Mirsky reports**

Cup of coffee after a night on the town to sober up? Well, a mouse study finds that caffeine does not counter the intoxicating effects of alcohol. It merely masks the inebriation, which could lead to poor decisions. Because drinkers might think they've sobered up, whereas they could just be more wired. The study is in the journal *Behavioral Neuroscience*.

Researchers gave mice doses, separately and together, of caffeine and alcohol. Tests then gauged how well the mice learned how to avoid part of a maze that appeared dangerous because of bright lights or loud sounds. And mouse anxiety was tested, through their willingness to be in an open area.

No surprise, drunk animals were more relaxed and had less anxiety, and had trouble learning to avoid possible danger. Then the mice got alcohol and caffeine together. And the caffeine did not improve a drunk animal's ability to learn. So the mouse is more relaxed but less able to avoid threats—if it had a tiny car available it probably would have thought it was “fine, I'm fine enough to drive it.”

—Steve Mirsky



December 9, 2009

## Stradivari's Violin Secret? His Talent

**A study in the journal *Angewandte Chemie* that looked at the varnish used in Stradivarius instruments found nothing unusual, leading the researchers to conclude that Stradivari was just a master craftsman who had no secret ingredients unknown to other instrument-makers. Steve Mirsky reports**

Almost three centuries after his death, Antonio Stradivari is still a legend for the sound of his instruments, from the rich depths of his cellos [cello sound] to the soaring clarity of his violins [violin sound]. Theories are often put forth that Stradivari must have used a secret ingredient that made his instruments special, perhaps in the varnish.

Now researchers have performed spectroscopic and microscopic examinations on the wood and varnish of five Stradivarius violins and think they have uncovered Stradivari's secret. The study appears in the German chemistry journal *Angewandte Chemie*. The first layer of varnish is an oil comparable to that used by painters of the era. The next layer is a tinted oil and common resin mix. The researchers found no unusual proteins or gums. And they found no mineral-rich layer, which some earlier examiners thought might be there. So Stradivari employed common materials in broad use in his time. Which leads the researchers to conclude that Stradivari's true secret?: his incredible artistry as an instrument builder.

—Steve Mirsky



## Gene Stops Ovaries from Testifying

**A mouse study in the journal *Cell* finds that a gene in females must remain active throughout her life to keep her ovaries from turning into testes. Karen Hopkin reports**

Little girls are made of sugar and spice and, according to a study published in the journal *Cell*, a fierce determination to maintain their girlishness. Because it seems that a single gene keeps their ovaries from turning into testes.

Scientists have long thought that the ovary is the default setting for developing sex organs. That's because the male Y chromosome comes equipped with a so-called sex determination gene called *SRY*. If *SRY* is missing, the gonad develops into an ovary, even if the embryo is male. Add *SRY* to a female embryo, it'll make testes. But the new work implies that sex determination is not that simple.

Okay, buckle up. See, the *SRY* gene makes a male by turning on another gene called *Sox9*. But it turns out that females have a trump card called *FOX L2*. *FOX L2* switches off *Sox9*, which lets ovaries be ovaries. The surprise is that girls have to keep the *FOX L2* gene active forever. In studies of mice, if *FOX L2* gets shut off, even in an adult, the ovaries will turn into testes. Which for a girl means ball game over.

—Karen Hopkin



December 11, 2009

## Call Me Melville, Based on New Word Use

**A study in the *New Journal of Physics* finds that writers leave a regular, distinct pattern of how frequently they use new words. Cynthia Graber reports**

Thieves may leave fingerprints at the scene of a crime. But does an author leave a metaphorical fingerprint on the book? The answer may be yes, according to a study published in the *New Journal of Physics*.

Swedish physicists investigated how frequently authors use new words in their writing. This, they say, offers clearly identifiable patterns. The research goes against a belief held for more than 75 years that there's a sort of universality to how frequently authors use new words.

Researchers analyzed books by Thomas Hardy, D. H. Lawrence and Herman Melville. They looked at full novels, parts of novels, and a mishmash of an author's work. In each case, they found a regular, and distinct, pattern of how frequently each writer used new words.

Of course, the frequency of new words used drops off in longer novels, but the patterns of the drop-off differed and were specific to each of the three authors. The researchers call this concept a "meta-book"—a kind of personal code that would fit any book or any work an author ever writes. Seems like to understand writers' complete works, you have to analyze their complete words.

—Cynthia Graber



December 14, 2009

## Gene for Disease Has Healthy Flip Side

**A study in the journal *Science* finds that the gene for anemia-causing G6PD deficiency also protects against malaria, thereby keeping the gene active in populations. Cynthia Graber reports**

Sickle cell disease is a blood disorder due to a single genetic mutation. It remains in populations because the mutation has a flip side—it helps to protect against malaria. Now another mutation has been shown to afford similar protection. Deficiency in the enzyme glucose-6-phosphate-dehydrogenase, known as G6PD deficiency, leads to anemia and jaundice. The condition affects more than 400 million people.

Scientists had thought that the prevalence of the deficiency might also be linked to protection against malaria, but they weren't able to find a connection in Africa. Now a study in Asia shows how the gene for G6PD-deficiency can indeed help. It appeared in the December 11th edition of the journal *Science*. The deficiency is particularly common in Myanmar and Thailand. So researchers spent eight years studying the Karen people in Thailand, who live near the Myanmar border. They showed that the mutation definitely reduces the number of malaria-causing *Plasmodium vivax* parasites, lessening the severity of the disease.

This protective effect has kept the genetic condition active in the population. Researchers hope that the good side of the mutation can be exploited to develop new and better ways to fight malaria.

—Cynthia Graber



December 15, 2009

## If Time Flew, You Had Fun

**A study in the journal *Psychological Science* finds that if people believe that time has flown, they think they had more fun. Karen Hopkin reports**

As we all know, time flies when you're having fun. But according to a study in the journal *Psychological Science*, the reverse is just as true: we enjoy ourselves more when we think time passes quickly.

Time is a tough thing to keep track of. Sometimes it zooms, other times it drags. And psychologists got to wondering, as psychologists often do: how does that make you feel?

So they asked people to take a 10-minute test. And then they pulled a fast one: For half the volunteers, they called "time's up" when only five minutes had passed. The other half had to labor for 20 minutes before their 10-minute test was done. The result? Compared with the folks for whom time stood still, the finished-in-five team said they had more fun.

—Karen Hopkin





December 16, 2009

## Mercury Fillings Seem Safer over Time

**A study in the journal *Chemical Research in Toxicology* finds that mercury on the surface of dental fillings slowly turns to an inert sulfide compound, which should keep the mercury from harming the nervous system. Molly Webster reports**

The element mercury has been shown to damage the human nervous system. Yet, since 1856, mercury amalgam is “the” filling dentists have used to repair our teeth. Now a study in the journal *Chemical Research in Toxicology* indicates that mercury fillings actually lose their toxic potential over time.

Canadian scientists used x-ray spectroscopy to compare new mercury amalgams to those about 20 years old. After two decades, 95 percent of the elemental mercury on the surface of a filling had gone through a chemical reaction. It became beta-mercury sulfide, a black-colored solid. Which explains why fillings dull with age. And the compound isn’t absorbed by the body, which means it can’t affect the body the way elemental mercury can.

Of course, this study does not settle the question of how potentially harmful a new mercury filling is. But sulfide-rich foods, such as coffee, garlic and onions, may accelerate the change from metallic mercury into the safer sulfide. So if you have a new mercury filling, an odiferous chili dog with a cup of coffee may be just what the doctor ordered.

—Molly Webster



December 17, 2009

## Smaller Fingers Mean More Sensitive Fingertips

**A study in the *Journal of Neuroscience* finds that people with smaller fingers have more sensitive fingertips, probably due to a higher concentration of touch receptors in a given area. Cynthia Graber reports.**

Smaller can sometimes be better, at least when it comes to fingers. It turns out that people with smaller fingers have more sensitive fingertips, according to a study in the *Journal of Neuroscience*.

Researchers at Canada's McMaster University enlisted 100 volunteers, and measured each study subject's index fingertip. The researchers pressed parallel grooves against the subjects' fingertips. If they could feel those grooves, then the next set got narrower and narrower. Scientists compare it to an eye test, where you attempt to recognize progressively smaller letters until they're no longer distinguishable.

Well, people with the smallest fingertips felt the narrowest grooves. The scientists postulated that this might be because they have a higher density of receptors crowded together and sending signals to the brain. It would be like a larger pixel count that makes up a clearer digital image.

To test the idea, the researchers measured the density of sweat pores. Because they knew that touch receptor cells cluster around sweat pores. And people with smaller and more sensitive fingers did have a higher concentration of sweat pores. Which means more receptors. And for their discovery, the researchers get a big hand.

—Cynthia Graber



December 18, 2009

## Grain Use Well before Modern Agriculture

**A study in the journal *Science* finds evidence that early modern humans were making use of grains, which required significant processing before eating, 100,000 years ago. Cynthia Graber reports**

Some of our early ancestors weren't just scavenging fruit and nuts and hunting animals. That's the conclusion of scientists who discovered evidence of the grain sorghum on hundred-thousand-year-old stone tools. The tools were discovered deep in a cave in northwest Mozambique. The research appears in the December 18th issue of the journal *Science*.

The general belief had been that these ancient people in southern Africa preferred to concentrate on more accessible foods, such as fruit, nuts and roots. They wouldn't have bothered with seeds and starchy grains, it was thought, because those foods were too difficult to get and prepare. In this scenario, grains would become a regular part of the diet much later in history.

But a researcher [Julio Mercader], from the University of Calgary, decided to survey 70 stone tools found in one of the deep chambers of a long cave. And about 80 percent of the tools contained residues of grains. Grinding and scraping tools showed the most grain evidence. And the grains appear to have been highly processed: boiled, fermented or ground.

Sorghum is still used widely today in Africa. Now it looks as if it might be part of the original family recipe.

—Cynthia Graber



December 19, 2009

## Accord of Sorts in Copenhagen

**Working late into the night, negotiators from the world's nations agreed in principle to attempt to limit the global postindustrial temperature rise to 2 degrees Celsius. Steve Mirsky reports, with Christina Reed in Copenhagen**

An accord, of sorts, in Copenhagen. UNESCO's Christina Reed:

"So it got really tense, [Danish prime minister Lars Loekke] Rasmussen had the gavel in the air and said, 'It looks like we don't have a consensus, I hate to do this but,' and as he was about to pound, the U.K.'s Ed Miliband, negotiator, said, 'I call for an adjournment,' and so they adjourned, and everyone broke and they adjourned. This short adjournment lasted about two hours, they met off the floor to discuss this a little bit more in person. It was face-to-face arm wringing, it was 'let's get this done, let's move this ahead.' Ultimately it was Ban Ki-moon of the United Nations working very diligently."

The world's nations will try to limit postindustrial temperature rise to 2 degrees Celsius. [Reed:] "It's not perfect, it's not a perfect document, several things that they wanted are left out, but they believe it's a process that's going to help them move forward, it's going to start mobilizing the financial agreements, it's providing a small architecture that can be built."

—Steve Mirsky



December 21, 2009

## Lighter Drinks Avoid Heavy Head

**A study in the journal *Alcoholism: Clinical and Experimental Research* finds that lighter colored spirits, such as vodka, may cause lesser hangovers than darker drinks, such as bourbon. Cynthia Graber reports**

It's the season for celebrating – and many of those celebrations include imbibing alcohol. Which sometimes leaves us the next morning with uncomfortable reminders of our excesses. But does what we drink—say bourbon versus vodka—make a difference? Apparently so, according to a study in the journal *Alcoholism: Clinical and Experimental Research*.

Researchers enlisted 95 volunteers. Their sleep patterns were measured to make sure that lack of rest didn't distort the results. Those who got drunk on bourbon reported worse hangovers—headaches, nausea and general discomfort. And they performed worse on tasks that required careful attention for decision-making. They didn't sleep any worse than vodka drinkers, though.

Here's why bourbon might hurt more: many alcoholic beverages contain byproducts of fermentation called congeners, complex organic compounds that in large doses can have toxic effects. And darker distilled drinks and wines generally have more of these congeners than do lighter ones. Bourbon, in fact, has 37 times more than vodka does. Which, the researchers note, may add to the hangover effect. So if you're worried about a dark hangover cloud in the morning, maybe stick to lighter drinks tonight.

—Cynthia Graber



December 22, 2009

## Water Blankets Forming Planets

**A study in the journal *Science* finds much more molecular water in regions where planets are forming around young stars. The mechanism to keep the water from being destroyed by UV radiation appears to involve some of the water molecules shielding the rest. Cynthia Graber reports**

In 2008 astronomers discovered surprising amounts of water molecules where planets were forming near young stars. But how, they wondered, could those molecules survive? They should have been destroyed by ultraviolet radiation. In theory, planetary dust could block out UV rays, but the dust was bound up in the creation of those young planets. So what's protecting the water? Now researchers at the University of Michigan believe they have the answer, which they published in the December 18th edition of the journal *Science*.

The regions where planets are being created are incredibly chemically productive, rapidly generating new compounds. According to the researchers, some water molecules surround the almost-planet dust and act as almost a sacrificial layer. The water molecules absorb the ultraviolet rays—and, though those molecules are destroyed, the embryonic planet is shielded. And the region is producing water faster than the protective layer is being destroyed.

The scientists say this action is similar to our ozone layer, which blankets us with protective shielding from UV radiation. They tested this idea in computer models and found that the results mirrored the observations. Seems that having water when a planet's finished requires sacrificing some in the process.

—Cynthia Graber



December 23, 2009

## Gal Gamers Geekier Than Guys

**A study in the *Journal of Communication* found that women who engage in a role-playing game online actually spend more time in the alternate reality than the guy players do. Karen Hopkin reports.**

Picture a gamer, someone who spends countless hours immersed in one of those online role-playing alternate realities. And what do you see? Is it a physically fit female closer to 40 than 14? If not, you may need to rethink your assumptions about geekdom. Because a study in the *Journal of Communication* shows that when it comes to dominating the virtual world, women are actually more hardcore than men.

Scientists conducted a survey of some 7,000 players who were logged on to a game called EverQuest II. And they discovered some interesting things. First off, the average age of the gamers surveyed was 31. And that playing time tended to increase with age. Which is also where the sex differences come in. The female gamers actually logged more time online: an average of 29 hours a week, versus 25 for the males, with the top players putting in 57 hours a week on the girl's side, and 51 for the guys. What's more, it looks like women are more likely to lie about how much they really play. The researchers found that the gals tended to lowball how long they spend glued to the screen.

So, never ask a women her age. Or how much time she spends defeating the dark elves to rebuild the world of Norrath.

—Karen Hopkin



December 24, 2009

## Fog Found on Saturn's Moon Titan

**A study in *Astrophysical Journal Letters* reveals that Titan may be home to the familiar atmospheric condition known as fog—but made out of methane. Karen Hopkin reports**

The northeast just had its first big snow of the season. Meanwhile, on Titan, it was foggy. That weather report brought to you by researchers publishing in the journal *Astrophysical Journal Letters*. The scientists found that Titan, Saturn's largest moon, is covered with puddles of liquid methane, which give rise to a fog that's as thick as pea soup—and smells a whole lot worse.

To make fog, you need lots of liquid. Here on earth, we use water. We've got water on the ground and in the air. And when the air can't hold any more moisture because it's totally saturated or it cools down, you get condensation. So the morning fog, and the dew on your windshield, comes from air that's cooled enough that it can't hang onto its water.

Titan fog, on the other hand, comes from methane. Like water, methane can be a solid, liquid, or gas. On Titan, methane forms clouds and maybe even rain. And, when atmospheric methane condenses, it makes fog. That fog then sticks around because it's in contact with the methane puddles, which keeps everything cool enough to keep the methane condensing.

So next time you visit Titan, don't expect to get any great pictures of Saturn. And drive with your low beams on.

—Karen Hopkin





December 28, 2009

## Find X and Say Your Work

**A study in the *Electronic Journal of Research In Educational Psychology* found that students who worked out math problems out loud got more accurate results, and faster. Karen Hopkin reports.**

Did you ever sit down to take a test and discover that the person next to you mumbles his way through the whole thing. You probably thought, “What kind of doofus can’t add a few numbers without moving his mouth?” Turns out the answer may be: a very clever doofus. Because a study published in the *Electronic Journal of Research In Educational Psychology* suggests that students who think out loud while taking a math test are more likely to get the right answer.

Counting things out on fingers is a time-honored tradition. But this study looked at what happens when students bring their lips in on the action.

A handful of mathematics students were ushered into separate rooms and given some problems to solve. The researchers videotaped their efforts and graded their exams. And they found that the students who reasoned through their thinking out loud, or who drew out pictures that represented the problem, were able to answer the questions more quickly—and more accurately—than students who were quiet and didn’t doodle.

How these sketches and monologues can help with your calculations remains a statement waiting for a proof. Until then, remember: sound it out; show your work; and when you run out of fingers, you can always count on your toes.

—Karen Hopkin



## Natural Pot-Like Compound Could Fight Obesity

**A study in the *Proceedings of the National Academy of Sciences* finds that endocannabinoids, compounds naturally found in the body related to pot's active ingredient, could inform the effort to control appetite. Cynthia Graber reports.**

Could there be a substance that both gives us the munchies and can help combat obesity? There may indeed be, according to research published in the *Proceedings of the National Academy of Sciences*.

The Monell Center in Pennsylvania partnered with Kyushu University in Japan to study compounds called endocannabinoids. These occur naturally in our body and are similar to THC, the compound primarily responsible for marijuana's psychoactive effects.

Researchers studied endocannabinoids in mice, and they say that the chemicals have a one-two punch—in your brain, they increase your appetite. And on your tongue, they enhance the response to sweet flavors. The compounds had no effect on salty, sour, bitter or umami tasting.

It turns out that sweetness receptors are present in the same cells as cannabinoid receptors on our tongues. But how could such an effect contribute to combating obesity? According to the scientists, there are similar sweet receptors in hormone-producing cells in the intestine and pancreas. There, they affect metabolism and the absorption of nutrients. Scientists say that if endocannabinoids also act on those receptors it could lead to new compounds to moderate metabolism. Which might stop the development of the pot belly.

—Cynthia Graber



December 30, 2009

## NYC High Schoolers Find Fake Food Labeling With DNA

**Working with professional gene sequencers, high school students Brenda Tan and Matt Cost identified food frauds and unusual animal species in the city. The research will appear in the journal *BioScience*. Adam Hinterthuer reports.**

Before you pay big money for caviar, check with two New York City high school students. Brenda Tan and Matt Cost worked with DNA barcoding experts at Rockefeller University and other researchers at the American Museum of Natural History to identify hundreds of food samples, assorted hairs and animal bits in their neighborhood. The Trinity School seniors discovered 95 different species of animal and 11 cases of fraudulent food labeling. Their findings appear in the January issue of the journal *BioScience*.

The professional researchers provided DNA sequences for the samples the students collected. The kids then checked the sequences against the database at [barcodinglife.org](http://barcodinglife.org)

The high schoolers found everything from pigeons and Pomeranians to an invasive latrine fly and what looks to be at least a new subspecies of cockroach. A supposed sheep's milk cheese was actually from cows. And alleged sturgeon caviar was just cheap Mississippi paddlefish eggs. But there was good news: all eight classmates who provided hair for the study turned out to be human.

—Adam Hinterthuer



## Restoring Cells' Potential is Method of the Year

**The journal *Nature Methods* is calling its "Method of the Year" the technique that now allows researchers to take an adult cell and make it behave as a pluripotent stem cell, which can become any kind of differentiated body cell. Cynthia Graber reports.**

The journal *Nature Methods* recently announced their method of the year, and it is: induced pluripotency. Embryonic stem cells have the potential to be any type of cells, a characteristic known as pluripotency. In 2006, a researcher in Japan announced that he'd genetically reprogrammed mouse fibroblasts—a type of skin cell—to make them pluripotent. These so-called induced pluripotent stem cells, or IPS cells, could now become any cell.

This news was met with shocked skepticism. But since then, scientists have replicated his results. And induced pluripotency has now become common enough that it's allowing us to study basic biology and disease development and drug screening. This year, for the first time, scientists published studies on human diseases and drug responses using IPS cells.

The techniques still need to be refined, say commentators in the journal. And the availability of IPS cells neither obviates the need for embryonic stem cell research nor replaces human subjects. Still, the *Nature Methods* article concludes, "The use of these cells will prove only as limited as researchers' rigorously guided creativity."

—Cynthia Graber