

# SCIENTIFIC AMERICAN

## Deep Frog Voice Signals His Chromosome Number

Two related frog species differ by chromosome number, which deepened one species' calls and tells the females who's who.

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The eastern grey tree frog [sound] looks exactly like the closely related Cope's grey tree frog [sound]. The big difference between the two species is beneath the surface—the eastern has twice the number of chromosomes as does the Cope's.

Having more sets of chromosomes makes the cells of the eastern frog larger than the cells found in the Cope's. And those bigger cells makes the eastern's song just a little deeper.

Now University of Missouri researcher Carl Gerhardt and his student Mitch Tucker have determined that the slight difference in the calls—here's the eastern again [sound] and here's the Cope's [sound]—is how the females know which species' males to buddy up with: the ones with the same chromosome number that they have. The work is in the *Proceedings of the Royal Society B-Biological Sciences*. [Mitch A. Tucker and H.C. Gerhardt, Parallel changes in mate-attracting calls and female preferences in autotriploid tree frogs]

Speciation is often caused by a geographic barrier that keeps populations from mating. But the tree frog situation may be a rare case in which chromosome duplication, and its subsequent effects, presented a reproductive barrier. As in humans, it comes down to whether he calls.

—Steve Mirsky



## MU researchers to test pain-free tooth fillings

By Janese Silvey, Tuesday, December 27, 2011

University of Missouri researchers have developed a pain-free way to fill tooth cavities, technology that could be on the market in two years.

The so-called "plasma brush" uses chemical reactions to disinfect and clean out cavities, then uses fluorescent light and electrodes to form a "cool flame" that delivers and bonds dental sealer, Meng Chen said.

Chen is chief scientist at Nanova Inc., a company formed by faculty members that now holds a co-patent for the brush with MU.

The research involves professors from MU's College of Engineering, UM-Kansas City's School of Dentistry and the University of Tennessee-Memphis.

Human clinical trials are expected to begin early next year in Memphis. The device will need approval from the Food and Drug Administration, but the team hopes the plasma brush will be available to dentists in late 2013.

Based on results from a survey of Mid-Missouri dentists two years ago, Chen said the plasma brush could sell for \$10,000 to \$15,000 per unit.

"Most of the dentists who participated in the survey believed that price would be acceptable to them," he said. But because the brush would deliver stronger fillings that would last longer, using the plasma brush is expected to reduce the amount Americans spend each year to replace fillings, said Hao Li, an associate professor of mechanical and aerospace engineering in the MU College of Engineering. He said 200 million tooth restorations cost Americans \$50 billion annually, and replacement fillings make up a large portion of a dentist's work.

The plasma brush would reduce those costs, Li said in a statement. A tooth can support two or three restorations before it must be pulled, he added, but studies show fillings are 60 percent stronger with the plasma brush. That would increase the filling lifespan — benefiting patients, dentists and insurers, he said.

Data from the human trials should help Nanova find investors to help move the product to the market. News of the product that has appeared around the world, including in Popular Science magazine, already has generated interest.

"It's really great," Chen said, adding that he has heard from interested investors. "If we want to move forward with the FDA application and to sell this product, we do need investments, so it's exciting some people are aware of this because of the news."



## Schools object to NCAA multi-year scholarship plan

ALAN SCHER ZAGIER

### MU MENTION ON P. 3

COLUMBIA, Mo. For the second time in less than two weeks, schools are objecting to a reform measure sought by university presidents and endorsed by NCAA president Mark Emmert.

More than 75 schools are asking to override a plan approved in October to allow multi-year athletic scholarships rather than the one-year renewable awards schools currently provide. That's the minimum number of dissenters needed for reconsideration by the Division I Board of Directors when it meets next month in Indianapolis at the annual NCAA convention. The NCAA announced the change the Friday before Christmas.

On Dec. 15, the NCAA suspended plans to give athletes a \$2,000 stipend for living costs not covered by scholarships after at least 125 schools objected. The higher number of protests allows the organization to immediately put the change on hold.

Both measures were pushed by Emmert and adopted as emergency legislation after a presidential summit in August."

The NCAA and presidents step up with this legislation and then the universities want to vote it down," said Christian Dennie, a former compliance officer at Missouri and Oklahoma who now practices sports law in Fort Worth, Texas, and writes an NCAA oversight blog."

They say, 'We don't have enough money,' and then the coach gets a \$2 million raise," Dennie added, speaking in general terms rather than about a specific school. "It's really a resource allocation issue."

The Division I Board of Directors now faces three options: scrap the two reform measures and operate under previous NCAA rules; modify the rule or create a new proposal that would go back to the schools for another 60-day comment period; or allow members to vote on the override, which needs a 5/8ths majority of the roughly 350 Division I members to pass.

A permanent reversal could force the NCAA and its schools to have two sets of standards, with an obligation to honor multi-year scholarship offers and stipend payments for some students but not others.

David Berst, the NCAA's vice president of governance for Division I, said that most schools support the concept of multi-year scholarships but have concerns about how to enact such a change."

The overriding concern had to do with the time to prepare and plan (for a change) rather than objecting to the concept," he said. "I'm anticipating the rule will still be in effect (after the next board meeting)."The list of schools objecting to the multi-year scholarship plan, obtained by Dennie and provided to The Associated Press, includes Boise State, Boston University, Indiana State, Marquette, Marshall, Rutgers, Utah, Vermont and Wyoming.

Boise State called the move a "recruiting disaster" that would encourage a "culture of brokering" and pit wealthy schools with larger recruiting budgets against their less well-heeled brethren, while also obligating schools to long-term commitments that may not make competitive sense."

There is never a guarantee that the incoming student-athlete will be a good fit for the program and the institution," the school wrote in its override request. "If it is a poor fit, the program is put in a difficult situation to continue to keep a student-athlete on scholarship."

Indiana State offered a more blunt assessment, suggesting the change could "create some real nightmares."

The "problem is, many coaches, especially at the (Football Championship Subdivision) level, in all sports, are usually not around for five years and when the coach leaves, the new coach and institution may be 'stuck' with a student-athlete they no longer want (conduct issues, grades, etc.) or the new coach may have a completely different style of offense/defense that the student-athlete no longer fits into," the school wrote. "Yet, the institution is 'locked in' to a five-year contract potentially with someone that is of no athletic usefulness to the program.""

The current system works. We don't need to get into bidding wars where one school offers a 75 percent (scholarship) for two years and the other school then offers 85 percent for three years, etc., etc. This puts the kid into a situation where they almost need an agent/advisor just to determine the best "deal." Again, if it isn't broke, don't fix it."Berst, who collects the complaints, has previously said the opposition to the stipend is coming primarily from FCS schools and those that do not play football. Most of the Football Bowl Subdivision conferences, he said, have informed the NCAA they plan to expand their scholarship limits.

The one-year renewable scholarship, with a limit of five years of athletic aid, has been in place since 1973. And while the National Letter of Intent signed by most top recruits includes that caveat, some athletes say coaches on the recruiting trail routinely make more grandiose promises they know they can't fulfill.

In October 2010, former Rice University football player Joseph Agnew sued the NCAA over its one-year athletic scholarship policy. Agnew played two seasons for the private Houston school before coaches told him in 2007 his scholarship would not be renewed. He appealed the university's decision and

received a scholarship his junior year but did not receive any tuition money as a senior. A federal judge in Indiana dismissed that complaint in September.

**Earlier this month, former Missouri women's soccer player Ann Alexandra Charlebois sued coach Brian Blitz and the university's governing board, claiming that she agreed to attend Missouri only after Blitz vowed in writing to provide more than \$106,000 in support through 2015, with the player and her family needing to contribute only half of her college costs in her first year.**

Charlebois received a 50 percent partial scholarship in 2010 as a freshman. After complaining about receiving a similar amount of financial aid this year, she was kicked off the team in September, her attorney said.



## TEDx event coming to MU campus

By Janese Silvey

Tuesday, December 27, 2011

An international forum that aims to spark and spread new ideas is coming to Columbia this spring.

It's called TEDx, and it's an offshoot of the international conference TED, held twice a year in California and Scotland. TED started 26 years ago to bring together those involved in technology, engineering and design, but today it solicits speakers from a wide range of backgrounds.

Aamer Trambu, who is pursuing his master's degree in business administration at the University of Missouri, obtained a license to sponsor a TEDx event at MU when he realized one did not already exist. The event is slated for April 14 at the Reynolds Journalism Institute on campus.

Trambu is soliciting applications for speakers who will share ideas during the conference. He hopes to get about 40 applications that organizers can whittle down to 12 final speakers who will be announced in late February. The presenters, who will come from a variety of backgrounds, each will have 15 minutes to talk at the conference.

"The idea is that speakers give the talk of their lives in that short time," Trambu said. "They're always very moving, very inspiring — sometimes awe inspiring." The talks are streamed live and are archived in a TED.com collection that now boasts more than 1,100 online videos. Topics include science, global and social issues, entertainment, business, and consciousness and self-discovery. Curtis Roller, also an MBA student who is helping organize the event, watches a couple Ted Talks online every day.

"It's an amazing way to get ideas I otherwise couldn't be exposed to," he said.

Roller said he recently watched a talk given by a man who retraced Abraham's steps from the Old Testament. Walking through areas now viewed as political hot spots, the man talked about meeting people along the way, creating an avenue for communication that didn't exist before.

"I never thought about the Old Testament being that relative to political discourse today," Roller said. Although MU faculty and students are welcome to apply to speak or nominate a speaker, Trambu also is inviting the community to get involved.

"Anyone with a great story, who has gone through an obstacle or has something really worth sharing," he said. "The background doesn't matter." Those wanting to attend also will have to apply for a seat: The conference is capped at 100, and Trambu wants the audience to reflect a well-rounded mix of people.

To nominate a speaker or apply to speak or attend the event, visit <http://tedxmizzou.com>.

# ST. LOUIS POST-DISPATCH

## Measure aims to require reporting of sexual abuse in Missouri

BY JASON HANCOCK [jhancock@post-dispatch.com](mailto:jhancock@post-dispatch.com) > 573-635-6178 | Posted:  
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**JEFFERSON CITY** • Responding to the sexual abuse scandal at Penn State University, a St. Louis County lawmaker has drafted legislation that would require anyone who witnesses sexual abuse to report it to authorities.

Current state law requires members of professions that deal directly with children — such as teachers, physicians and clergy — to report suspected abuse. State Sen. Eric Schmitt, R-Glendale, plans to push for passage of a bill that would expand the so-called "mandated reporter" law to include any person — regardless of profession — who observes a child being subjected to sexual abuse.

The key to the change, Schmitt said, is that it focuses only on those who witness sexual abuse firsthand.

"This is a very measured approach," Schmitt said. "This doesn't deal with suspected abuse. It is tailored only to actual sexual abuse that is witnessed, just like the situation at Penn State."

The idea to expand the mandated reporter law was first floated this month by Attorney General Chris Koster. He said the incidents at Penn State, where former assistant football coach Jerry Sandusky is charged with molesting young boys over a number of years, highlight the disparities across the country in how state laws handle reporting sexual abuse of children. A Penn State assistant football coach testified that in 2002, he witnessed Sandusky molesting a young boy in the shower and that it was reported to school officials.

The incident was never reported to law enforcement.

"This is a very reasonable proposal that was sparked by what happened at Penn State," Koster said. "That incident began a national conversation about mandated reporter laws."

Koster praised Schmitt for taking the initiative to sponsor the bill. The two have not yet discussed the proposed legislation, but a meeting has been scheduled, Schmitt said.

**But some critics say the idea amounts to a knee-jerk reaction to the Penn State scandal that may not be needed. Clark Peters, an assistant professor in the University of Missouri's**

**School of Social Work, said Koster and Schmitt's idea to change the mandated reporter law focuses on a situation that is incredibly rare.**

**"You're basically putting together a law that mandates people to do the right thing," he said. "But if you look at the Penn State situation, even if a law like this existed in Pennsylvania, it would not have compelled the actors to do anything differently."**

Anyone can already report abuse of a child by using the state's child abuse and neglect hotline, Peters said.

"And those who would see a child being sexually abused and decide not to report it won't be compelled to do so just because of a new state law," he said.

Additionally, expanding the law could lead to confusion about what people are mandated to report, Peters said, creating a situation where individuals believe they are legally compelled to report any suspicion of abuse of a child. Those reports would lead to an incredibly invasive investigation, even if the suspicion of abuse proves to be untrue. Those unwarranted investigations could lead to legitimate reports of abuse getting overlooked.

"Solutions to rare problems often cause unintended harms, no matter how well-intended," he said.

This is just a matter of elected officials wanting to act in the face of a tragedy, Peters said. "I can appreciate that."

David Clohessy, the director of the Survivors Network of those Abused by Priests — or SNAP — said he believes changing the law wouldn't have much impact.

"It's rare that someone actually witnesses a predator assaulting a child, so we're not confident this proposal would make much difference," said Clohessy, who lives in St. Louis. "Also, sadly, it's very rare that people are actually charged with failing to report suspected abuse. And when they are, the penalties are usually paltry."

A much better reform, Clohessy said, would be for lawmakers to toughen the state's "predator-friendly statute of limitations, which prevents most child sex victims from ever being able to expose predators in court."

Koster said a report released by the U.S. Department of Health and Human Services found that 18 states require all individuals to report the suspected abuse or neglect of children.

"If a citizen walks in on the sexual abuse of a child, his duty as a citizen should be clear. We are all mandatory reporters," he said. "When it comes to protecting children, passing the buck should not be an option in our state."

Schmitt said anyone convicted of violating the new law would be guilty of a Class A misdemeanor, punishable by up to a year in prison and a \$1,000 fine.

"I think that because this is such a narrowly focused bill, we will be able to get this done pretty quickly during the session," Schmitt said.