RAS, for rat sarcoma, is a family of genes whose proteins transmit signals that allow cells to grow and survive. Scientists hope to determine structures of various forms of RAS, build on new strategies for blocking the protein, and map the surface of cells with RAS mutations. The project will be led by Frank McCormick, who is stepping down as director of the cancer center at University of California, San Francisco. http://scim.ag/RASproject

London 5

U.K. Wants to Allow Mitochondrial Replacement

The U.K. government is moving toward approving a new type of in vitro fertilization that could enable patients with mitochondrial diseases to avoid passing the condition to their children. The technique is controversial, because it involves introducing new DNA into a human embryo. But the Department of Health announced on 28 June that it would draw up draft guidelines to permit the procedure. The proposal would be released for public comment later this year, and Parliament could vote on a final version next year. The procedure is not ready for human trials.

Mitochondria, the cell’s power generators, carry their own DNA, called mtDNA. Mutations in those genes cause mitochondrial diseases, and the diseases are passed from mother to child because the egg provides most of an embryo’s mtDNA. The new technique transfers the nuclear DNA from the sperm and egg of the potential parents into a second egg from a donor with healthy mitochondria. http://scim.ag/UKmito

NEWSMAKERS

Stapel Agrees to Community Service

Diederik Stapel, the former Tilburg University professor who fabricated dozens of research studies, has reached a settlement with Dutch prosecutors to do 120 hours of community service. He also will forgo benefits from his former employer that would have been equivalent to 18 months’ salary.

Stapel was a high-profile social psychologist whose career unraveled in 2011 when it was discovered that he had been fabricating data for more than a decade. Dutch prose-
cutors concluded that Stapel hadn’t defrauded the taxpayer, however, because he had used the grants he received for research, even though he manufactured the data. Much of the money from the grants was spent on salaries, the prosecutors’ statement says. Officials also took into consideration that Stapel had voluntarily returned his doctorate degree.

“I very much regret the mistakes I have made,” Stapel tells Science. “I am happy for my colleagues as well as for my family that, with this settlement, a court case has been avoided.” http://scim.ag/StapelCommSer

FINDINGS

Molecular Wires Show Strong Magnetic Potential

The capacity of computer hard drives has been skyrocketing for decades, thanks partly to improvements in the magnetic sensors used to read them. Published in Science this week, researchers led by Wilfred van der Wiel, a physicist at the University of Twente in the Netherlands, describe a new room-temperature magnetic sensor three times as sensitive as the previous champ.

The new material is made of dye molecules called DXP. Normally DXP is nonmagnetic. But when the researchers squeezed it into the pores of laticelike minerals called zeolites, DXP formed molecular wires in which a quantum effect called Pauli exclusion came into play. As a result, any electrons moving through the wire stopped in their tracks when the wire encountered a magnetic field. That electron-blocking property, called magnetoresistance, is the key to reading magnetic bits.

On the Way to Cleaner Power

The big news in President Barack Obama’s climate change speech last week at Georgetown University in Washington, D.C., was his promise that the Environmental Protection Agency would draw up regulations next year for limiting carbon emissions from existing power plants. The country is already headed down that road: Last year, the country’s total emissions from generating electricity dropped to their lowest level in 2 decades, thanks in large part to the switch from burning coal to natural gas. The global recession also helped in that regard: Emissions have dropped 24% since peaking in 2007.
Monarch butterflies lay eggs on milkweeds to medicate their young. "Just the idea that they are selecting plants to fight the parasites of their offspring is really cool," says evolutionary biologist Curtis Lively of Emory University in Atlanta.

De Roode discovered that different milkweed species reduce protozoan growth in caterpillars to varying degrees in proportion to the amount of toxin they produce. Caterpillars don’t seem to know this, but the adults do. De Roode reported last week at Evolution 2013 in Snowbird, Utah. By a 2-to-1 margin, infected adult butterflies choose to lay eggs on the milkweed that will most retard protozoan growth, thus medicating their young. “Just the idea that they are selecting plants to fight the parasites of their offspring is really cool,” says evolutionary biologist Curtis Lively of Indiana University, Bloomington.

Map Offers Millennium Of Earthquake Records

Researchers meeting last week in Pavia, Italy, were presented with a new worldwide seismic database based on tens of thousands of earthquake records stretching back more than 1000 years. The Global Earthquake Model (GEM) Foundation, which supported the research largely with contributions from insurance companies, says that the database is part of a push to make the long-fragmented field of earthquake forecasting more open and systematic.

“Everyone knew we needed to do this,” says GEM’s co-founder, Ross Stein, a seismologist with the U.S. Geological Survey. “No one was willing to put the money up.”

BY THE NUMBERS

32%  Fraction of global biodiversity in the 40 countries with the greatest shortfall in conservation funding, according to an analysis in the Proceedings of the National Academy of Sciences online this week that estimates the world spent about $21.5 billion a year on global biodiversity last decade.

$977 billion  The economic burden of childhood lead exposure in low- and middle-income countries. The toll represents 4% of the gross domestic product for African countries and nearly 2% for Asian nations, according to a paper by New York University researchers in Environmental Health Perspectives.

GEM did.” Other GEM projects include a global map of tectonic strain and socioeconomic studies aimed at estimating potential casualties and damage from future quakes.

While geoscientists welcomed the effort, some cautioned that no amount of data can overcome the deep uncertainties inherent in Earth faulting processes. http://scim.ag/GEMseismic

Random Sample

Wallpaper as Art and Science

The studio of Pittsburgh artist Natalie Settles is located in the lab of evolutionary geneticist Stephen Tonsor at the University of Pittsburgh in Pennsylvania. Her art—painting Victorian-era wallpaper—has also taken an unusual turn since she and Tonsor received $35,000 last year from the Heinz Endowments and Pittsburgh Foundation. The grant is spawning an interactive exhibit with a computer program that carries out digital evolution experiments.

Tonsor has modified her wallpaper approach to include motifs that, like organisms, evolve by changing in space and over time. The motifs have 80 genes that build upon simple geometric designs to create thousands of unique designs. If a viewer touches a motif, that motif’s “fitness” will increase; when it comes time to reproduce, the fitter motifs will generate more offspring. Over time, the wallpaper will take on ever more inviting motifs. In addition, Tonsor hopes that other researchers will use the program to explore additional parameters of evolution.

Settles discussed the project last week at Evolution 2013 in Snowbird, Utah, and art museum directors and potential funders will get a glimpse of it this fall. Tonsor and Settles hope to have the work on display by early 2014.

>>FINDINGS

The wires are still too small to be used in computers. But the scientists say that they may be useful for touch screens and novel magnetic sensing devices.

Monarchs Medicate Their Young

For the monarch butterfly, milkweeds are a multipurpose plant. When ingested, their toxins not only make the insect unpalatable to birds and other predators, but they also fight infection, says Jacobus de Roode, an evolutionary biologist from Emory University in Atlanta.

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