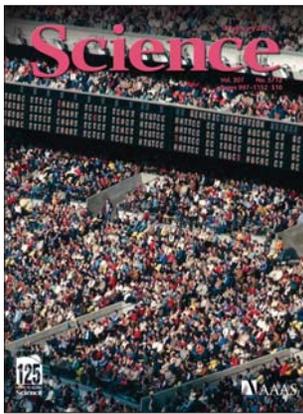


# Science Breakthroughs

*Science* continued in 2005 to publish ground-breaking research with important social implications. Infectious disease and environmental change, for example, were the topics of some of the year's most talked-about papers. The journal's family of Web sites also underwent a sweeping redesign, with improved navigation and access for scientists, students, career-seekers, teachers, policy-makers, and others.

In 2005, *Science* highlights included these and other breakthroughs:



- ▶ **Mapping Human Genetic Variation** — A new map of key genetic signposts across three human populations could help speed efforts to pinpoint disease-related DNA variations and may ultimately promise personalized treatments.
- ▶ **Soft Tissues from *T. Rex*** — Unusual new evidence from a *Tyrannosaurus rex* fossil showed preserved elastic soft tissues, blood vessels and cells.
- ▶ **Human Migrations Etched in Leprosy Genome** — A genetics study revealed surprises about how the leprosy-causing bacteria spread across the continents during human migrations.
- ▶ **Violence Begets Violence** — New research suggested that taking part in or witnessing gun violence in person more than doubles the chances that a teenager will commit a violent or aggressive act within the following two years.
- ▶ **Science's 125th Birthday** — In July 2005, friends of AAAS gathered in London for an evening of festivities and in Washington D.C. for a symposium pondering the 125 greatest unsolved mysteries in science, as featured in a special issue of the journal. *Science's* anniversary edition was covered by the *Washington Post*, *Boston Globe*, BBC, and other media outlets.
- ▶ **Large Ocean Predators Disappearing** — A study of the open oceans revealed “hotspots” where tuna, billfishes, and other predators congregate, and it showed that there has been a decline in species diversity over the past 50 years.
- ▶ **Containing a Flu Outbreak** — While emphasizing the many things that could go wrong, researchers showed how it might be possible to contain a Southeast Asian outbreak of avian influenza in humans.
- ▶ **Energy-Harvesting Backpack** — A new, energy-harvesting backpack generated useful amounts of electricity from the up and down movements of its cargo compartment, potentially allowing disaster relief workers, explorers, or soldiers to go into the field with fewer batteries.
- ▶ **Hurricanes Stronger Now** — A global study showed that hurricanes' strength has increased during the past 35 years, even though storm frequency and duration have generally stayed about the same.
- ▶ **Mouse Model for Down Syndrome** — New insights into Down Syndrome may be possible now that researchers have finally managed to develop a line of mice showing some of the disorder's typical traits.

## Career Support and News for All

*Science* merged its two careers-related Web sites, *ScienceCareers.org* and *Science's Next Wave*, to create a comprehensive, freely accessible source of online science-career support and job opportunities. See [www.sciencecareers.org](http://www.sciencecareers.org). Newly published content on the *ScienceNOW* daily news site also became freely accessible to the public. Go to [www.sciencenow.org](http://www.sciencenow.org).



## Stem Cells — Holding Out Hope

Two studies published in 2004 and 2005, describing the cloning of human embryonic stem cells, were found to contain fabricated data and were retracted. “Despite this setback,” said *Science* Editor-in-Chief Donald Kennedy, “scientists of integrity are continuing to investigate the field’s potential to benefit human health and to advance our understanding of biology.”

- ▶ **Flu Virus Jumps from Horses to Dogs** — Scientists reported that an influenza virus had jumped from horses to dogs, causing outbreaks in racing greyhounds and pet dogs in the United States.
- ▶ **Cracking Spanish Flu’s Genetic Code** — By partially reconstructing the Spanish flu virus, researchers discovered at least part of what made the virus so lethal.
- ▶ **Logging Doubles Threat to Amazon** — Considering the effects of logging and clear-cutting together, researchers showed that human activities are degrading the Amazonian forest at twice the rate previously estimated.
- ▶ **Ice Core Record Extended** — The air bubbles trapped in an Antarctic ice core allowed researchers to stretch the known greenhouse gas record by 50 percent, all the way to 650,000 years ago, providing a fundamental new tool for understanding climate change.
- ▶ **The Genetics of Skin Color** — Scientists studying lightly pigmented zebrafish identified a gene that may play a key role in human skin color.
- ▶ **Breakthrough of the Year** — Darwin probably never dreamed that researchers in 2005 would still be uncovering new details about the nuts and bolts of his theory or that this work would be hailed as the Breakthrough of the Year for 2005.

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