Orencia (abatacept)
Individuals with lupus treated with Orencia, a soluble fusion protein from Bristol-Meyers Squibb aimed at curtailing T cell activation, failed to show improvements in disease scores in a phase 2b clinical trial.

Semagacestat
Eli Lilly halted two phase 3 trials of this gamma-secretase inhibitor in Alzheimer's disease. It seemed to worsen cognition in affected individuals compared with placebo treatment.

Dimebon (latrepirdine)
This antihistamine drug was intended to treat Alzheimer's disease by an uncertain mechanism, but lack of efficacy observed in a phase 3 clinical trial led Pfizer to discontinue its development.

Flibanserin
Boehringer Ingelheim developed this serotonin receptor agonist to treat hypoactive sexual desire disorder, but an advisory panel to the FDA unanimously voted against its approval on 18 June.

Avandia (rosiglitazone)
Concerns about cardiovascular side effects of this widely prescribed antidiabetic agent from GlaxoSmithKline came to a head this year, as an FDA panel recommended that its use should be restricted, and the European Medicines Agency suspended its marketing authorization.

Bisphosphonates
The drug label for these compounds, which treat osteoporosis by slowing bone degradation by osteoclasts, will have to carry an added warning because of rare but serious femur fractures reported in people on these medications. Long-term treatment with oral bisphosphonates may also increase the risk for esophageal cancer, but no action has yet been taken to change the label or avoid this therapy in people at risk of Barret's esophagus.

Ocrelizumab
Roche has suspended clinical trails of ocrelizumab in patients with rheumatoid arthritis after an analysis revealed that some people developed serious and opportunistic infections when given the drug, an antibody against the CD20 molecule aimed at depleting mature B cells.

Qnexa, lorcaserin and Meridia
This trio of weight-loss drugs lost out this year. In October, the FDA declined to approve Qnexa (topiramate) and lorcaserin, developed by Vivus and Arena Pharmaceuticals, respectively. That same month, Abbott voluntarily withdrew Meridia (sibutramine) from the US market, owing to clinical trial data suggesting that the drug can, in rare cases, increase risk of heart attack and stroke.

Retractions of the year

Sometimes the retraction of a paper can be as noteworthy as the publication of one. Here we list some of the take-backs of 2010 that left the biomedical community most taken aback.

In February, days after the UK General Medical Council censured the unethical behavior of gastroenterologist Andrew Wakefield, *The Lancet* retracted his notorious 1998 paper that first linked **autism** with the measles, mumps and rubella vaccine.

In August, less than a month after *Virology Journal* first published an opinion paper speculating that a biblical woman supposedly **healed by Jesus** actually had influenza, the journal's editor apologized for running the article, noting the authors did not provide "robust supporting data" for their hypothesis. Researchers from the Chinese University of Hong Kong had used symptoms described in the gospels of Matthew, Mark and Luke to diagnose the mother-in-law of the apostle Simon Peter, who lay sick in bed before being miraculously "cured by our Lord Jesus Christ."

After being found guilty of eight counts of scientific misconduct by Harvard University in Cambridge, Massachusetts, Marc Hauser, a famed evolutionary psychologist, in August retracted a 2002 paper in *Cognition* reporting that **cotton-top tamarins can learn** to distinguish between different patterns of syllables just as human infants do. Problems were also found in two 2007 studies published in *Science* and the *Proceedings of the Royal Society B* that described the ability of various primate species to understand human gestures; the former was corrected with missing field notes, and the latter is under investigation.

In September, Savio Woo, a noted gene therapy researcher at Mount Sinai School of Medicine in New York, retracted six papers published from 2005 to 2009 in the journals *Proceedings of the National Academy of Sciences USA*, *Human Gene Therapy*, *Molecular Therapy* and the *Journal of the National Cancer Institute*. Two of papers focused on using genetically engineered **bacteria to target cancer**, and the other four described a method for using bacteriophage enzymes to introduce therapeutic genes. Two postdocs in Woo's lab were fired for committing scientific misconduct, but an internal investigation cleared Woo of any wrongdoing.

After failing to reproduce findings by her former postdoc Zhihua Zou, Nobel laureate Linda Buck, a neuroscientist at the Fred Hutchinson Cancer Research Center (FHCRC) in Seattle, retracted two papers in September that described how the **brain processes odor**. Zou was first author of both retracted papers, published in *Science* in 2006 and in the *Proceedings of the National Academy of Sciences USA* in 2005, as well as of a 2001 *Nature* paper that was retracted two years ago. The FHCRC is currently investigating whether Zou committed misconduct.

In October, Amy Wagers, a rising star at the Harvard Medical School's Joslin Diabetes Center in Boston, retracted a January 2010 paper she coauthored in *Nature* purporting to show that age-related changes in **blood stem cells** can be influenced and even reversed by environmental factors. The retraction, which was not signed by the study's lead author, postdoc Shane Mayack, did not specify whether the paper was flawed because of a mistake or scientific misconduct, nor did it assign blame. The journal *Blood* also posted a "notice of concern" regarding a 2008 study led by Mayack.