

## MORE NEW MEDICAL BREAKTHROUGHS

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Smallpox Cure But wasn't that disease killed off a long time ago? While the smallpox virus was officially stamped out in 1980, unknown samples of the virus may still be out there. And if they ended up in terrorists' hands, the results could be devastating, infecting thousands, possibly millions, of people. Up to a third would die.

Now scientists may have found a cure for smallpox. The new drug, SIGA-246, currently in the final stages of development and testing, not only safely protects against the disease but also can treat it and stop an outbreak in its tracks. The drug would also work for relatives of the virus, like monkeypox and cowpox, which could someday mutate and become just as dangerous as smallpox.

Bone Builder? If Spider-Man had gone to medical school, he could have made a fortune in orthopedics. That's because new research by Tufts University bioengineers shows that spider silk, combined with tiny glass beads called silica, creates a new material that could one day be used in growing and repairing human bones. Spiders usually use their silk to make webs and catch prey, and scientists have long studied the benefits of the flexible, strong fibers. The new "fusion" material promises to improve the quality of bone implants in surgery. Earlier research on spider silk suggests it can be used in many products, including surgical sutures, body armor and even artificial ligaments for people with knee injuries.

Easier Heart Surgery Nearly 100,000 people undergo chest-cracking open-heart surgery to replace heart valves each year. But a less invasive technique may become the new standard. As with angioplasty, doctors enter the body through a groin vessel, thread tools and devices into the heart (the valve itself compresses to the diameter of a pencil), and operate while watching live images from an echocardiogram and x-ray machine. The procedure will make valve repair or replacement feasible for sick patients who can't handle the stress of open-heart surgery (as well as those reluctant to

undergo it the old-fashioned way), possibly doubling the number who can be helped. It will be less painful, and recovery time will be quicker. Investigational trials are under way.

**Better Breast Cancer Screening** A new ultrasound technique lets radiologists distinguish between malignant and benign breast lesions. By using elasticity imaging, researchers accurately identified harmless and cancerous lesions in almost all of the 80 cases studied. An estimated 213,000 women are diagnosed with breast cancer in the U.S. annually, and early detection is their best hope. “If our results can be reproduced in a large multicenter trial,” says Richard G. Barr, MD, of Northeastern Ohio Universities College of Medicine, “this technique could significantly reduce the number of breast biopsies required.”

**Medication Match Game** Scientists seeking new treatments for diseases can access an online tool developed by researchers at the Broad Institute of MIT and Harvard. The Connectivity Map matches diseases with compatible drugs, based on the genetic profiles of both. The creators relied on Human Genome Project data, and the results should help researchers discover new applications for existing medications. So far, about 160 drugs and compounds are cataloged, and a few new uses for existing drugs have been suggested. Eventually, all FDA-approved drugs should be included.

**Stop an Epidemic!** Soon there may be a way to fight a pandemic before it has time to spread. The Hemopurifier, designed by Aethlon Medical, a small biotech company in California, is a blood-filtering device that removes viruses and toxins before infection attacks organs, using a method similar to dialysis. The cool part: Treatment can begin without first identifying the infectious culprit. The blood cleaner comes in two sizes and is used with portable pumps or dialysis machines.

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