BIOTECH COMPUTING OPENS UP
An African firm turns to open-source programming

SOFTWARE Open-source programming created a revolution in operating systems, making Linux a popular alternative to Microsoft's Windows. The idea—to make software source code open for modification by anyone—has caught on in large part because more eyes on the software means rapid improvements and fewer bugs; companies like Red Hat have turned the idea into profits by selling easily installed, well-supported versions of Linux. Now Cape Town, South Africa-based Electric Genetics is, for the first time, applying that business model to biomedical software.

In June, Electric Genetics plans to launch its first open-source product, a package of programs that link human DNA sequence data to information about how and when genes are turned on, and about the proteins encoded by those genes. “The science behind genomics is changing weekly,” says cofounder Tania Broveak Hide. “A commercial software company, with your typical 12- to 18-month development cycle—I really don’t think that works for a fast-moving scientific discipline.”

Broveak Hide and her husband Winston Hide—the University of the Western Cape bioinformaticist with whom she cofounded the company in 1997—reached that conclusion after first selling proprietary software—and after their own programmers suggested that open-source development would yield better software faster. “I think it’ll make a huge difference for the scientific discoveries,” says Broveak Hide. “If we can push out better technology to the pharmaceutical companies, they’re going to be able to make their discoveries faster.”

Though others have yet to follow Electric Genetics’ lead, industry observers say open-source development will be critical to improving the quality of bioinformatics software and, ultimately, biomedical research. —Erika Jonietz

A BETTER VIEW FOR ADVANCED SURGERY

MEDICINE The advent of “minimally invasive” surgery, performed with slender instruments through tiny incisions, has meant less trauma and faster healing for patients. But the technique requires surgeons to watch a video or ultrasound screen while operating to see what’s going on underneath the skin—an awkward proposition for the surgeon. A head-mounted virtual-reality apparatus, developed at the University of North Carolina and now in clinical trials, could offer doctors a more natural view and allow for faster, safer operations.

The trial—the first conducted with such a device—will involve 24 women undergoing breast tissue biopsies. A surgeon dons headgear incorporating glasses-like displays and two cameras mounted in front of her eyes. A computer merges ultrasound information flowing from a probe held to the patient’s skin with video taken by the cameras, showing the operation site. This combination gives the surgeon a view into the body that corresponds with her natural perspective. What’s more, the system tracks every twist and turn of the surgeon’s head using ceiling-mounted cameras. Software adjusts for these movements to keep the ultrasound and video components of the surgeon’s view in sync.

Harvard Medical School’s Ferenc Jolesz, director of image-guided therapy at Boston’s Brigham and Women’s Hospital, says the North Carolina device “may lead to fundamental change in surgical visualization.” The technology does, however, have competition. Siemens is developing a similar device and is now seeking an appropriate clinical trial.

The North Carolina device might take a decade to reach operating rooms, says computer scientist Henry Fuchs, who led the team that developed it. So far, a surgeon working with Fuchs has performed four operations; Fuchs hopes that others will be completed this year. After that, he aims to seek an industrial partner to further develop the technology.

Eventually, head-mounted devices could be used for more challenging procedures like liver biopsies, which would become less awkward for surgeons—and safer for patients. —David Talbot