

Everybody Into the Research Pool

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[Electric Genetics](#), the only genomics company in the country, and the [South African National Bioinformatics Institute](#) are promoting bioinformatics in Africa. And they are making it a priority to give blacks in the country a chance to become influential scientists.

Many of these people are earning Ph.Ds when they probably never even considered that before," said Tania Broveak, managing director and co-founder of Electric Genetics. "As a result, they will be more successful and that will come back into the community very quickly."

The company and the institute began on the grounds of the [University of the Western Cape](#), a mostly black institution in Capetown that is officially a "historically disadvantaged university" -- the politically correct term used locally.

The campus is located in a neighborhood where black people were forced to relocate during the days when apartheid was officially sanctioned by the government.

"The land is so sandy you can't grow vegetables in your backyard," Broveak said.

But Broveak and her husband, Winston Hide, who persuaded her to come to South Africa in 1996, hope to uplift both blacks and bioinformatics in South Africa -- a country where there are so many "people who were never given the opportunity to express or challenge themselves, but have excellent raw material," Broveak said.

"We're sitting in a black university struggling against apartheid," she said. "So it's our duty to bring the country up, not just by taking people who have an advantaged background, but from all walks of life."

Put simply, bioinformatics is biology set to information technology to find answers about genes, proteins, and other biological entities and functions.

Hide, a native South African, is the director of SANBI, co-founder of Electric Genetics and a faculty member at the University of the Western Cape. The couple met while working for now-defunct supercomputer companies in Silicon Valley, Hide at [MasPar](#) and Broveak at IntelliGenetics.

Hide says the first four black students will graduate from the bioinformatics institute Ph.D. program in a few months. While their best choice may have once been to seek jobs in the United States, they now have a strong incentive to stay in their homeland.

Junaid Gameldien is one of the four students, and plans to take a position in database production at SANBI. His focus will be on generating indexes for the genomes of all organisms available, including human, fruit fly, nemotode worm, and E. Coli.

"If this opportunity didn't come up I would have gone to the U.S.," Gameldien said.

But after speaking with Hide about possible opportunities in Capetown, he was eager to stay.

"The speed potential (in bioinformatics) is the most powerful thing right now. A large project doesn't take too much time," Gameldien said. "I had been working in labs for a long time and progress was very slow."

SANBI and Electric Genetics opened in 1996 and 1997 respectively, with the help of an \$800,000 grant from the South African Government's Department of Arts, Culture, Science, and Technology.

"The government was interested in developing black expertise in science to dispel the myths of apartheid," Hide said.

Broveak added that when evaluating research for grants, the government is insistent the project will somehow give back to the country.

"They love to see sales, but even if there will be big sales, you probably wouldn't receive funding if you won't be helping locally," she said.

To date, SANBI and Electric Genetics have developed two technologies: the Stack database and StackPack.

Stack database gives users access to over a million so-called "expressed sequence tags," or ESTs, which are bits of genes that give a significant amount of information about a gene's function. StackPack allows researchers to cluster their own proprietary EST data.

ESTs contain enough information to allow investigators to search databases for similar genes -- the standard method used by researchers to get a better idea of what type of gene they've found.

By studying and comparing these pieces of genetic sequence, researchers can eventually learn which tissues in the body the gene controls.

Hide says the Electric Genetics products are much like a core technology at , a much-hyped genomics company in Oakland, California that recently filed for an IPO. But while DoubleTwist acts as a portal that customers must go to use the technology, Electric Genetics ships out a modular and scalable technology for customers to use however they see fit.

"The database and software is in one ball -- you put it on your laptop and work on your own data," Hide said. "It gives freedom to users."

Hide and one of DoubleTwist's earliest employees, John Burke, worked together to develop the code, but eventually went their separate ways.

Sophie Yazdi, vice president of marketing at DoubleTwist, confirmed that the code to one of DoubleTwist's products is the same as that of the Stack technologies, but what the two companies have done with the code is quite different.

"There was a divergence and we each developed our own versions," Yazdi said. "Everything else between the two companies is apples and oranges," Yazdi said.

Electric Genetics gives away its database technology for free to academic researchers, and so far they have over 100 takers all over the world, including the [Sanger Center](#), the [Wellcome Trust](#), the [Baylor College of Medicine](#) in Houston, the [National Cancer Institute](#), [Stanford University](#), [Yale University](#), and the [European Bioinformatics Institute](#).

The science of bioinformatics is in its youth, according to Temple Smith, director of the [BioMolecular Engineering Research Center](#) at Boston University. Companies like DoubleTwist and Electric Genetics are just the beginning, he said. The marriage of biology and informatics still has a lot of work to do.

Smith, who wanted to hire Hide before he made the difficult decision to go back to South Africa and start his own thing, says he's waiting for the bioinformatics killer app.

"Basically there aren't any new technologies," Smith said. "What (most researchers) are trying to do is to integrate all the current computational tools. Multiple analysis is not a technology, it's a concept."

"Some people think DoubleTwist has done all right, but I'm not that impressed," he said. "They haven't done anything particularly novel."

But clearly many companies are finding the technologies useful, at least for now.

DoubleTwist has about 25 customers, and Electric Genetics has nine commercial customers. Earlier this month researchers at [Lion Bioscience](#), a genomics company in Heidelberg, Germany, and a distributor for Electric Genetics' products, said they would use StackPack to more quickly identify genes responsible for disease.

Lion will incorporate StackPack into its data integration platform to more quickly identify genes responsible for disease. The president of the company touted the modular aspect of the technology.

"I think the real challenge in these days is not to come up with stand-alone eclectic solutions, because there is such diversity and such a tremendous amount of data -- think of the [Human Genome Project](#) and the overwhelming amount of data," said Dr. Friedrich Von Bohlen, chairman and CEO of Lion.

That's why -- in addition to wanting his talent and skill -- they hired Jonathan Niekerk, who has only a high school education, as a database production specialist.

Niekerk started his professional career about nine years ago as a janitor at Woolworth's, the largest upscale department store in South Africa.

One day he was sent downstairs to the computer room to do some cleaning.

"I was totally amazed," Niekerk said. "For the first time in my life I saw a computer."

He became fascinated with computers, and persuaded the company to transfer him into the computer room. The job was small -- distributing reports and other administrative duties -- but Niekerk used it as an opportunity to learn.

"I spent most of my free time and my lunch downstairs in the computer room trying to put as much information as possible into my brain," he said. "I knew it would help in forwarding my career."

Eventually Niekerk was given a position on the computer staff, although he had never before touched a keyboard; he had only seen them on TV. Over the next four years he worked his way up to shift manager, running the computer database systems department.

Soon, Niekerk was comfortable with computers and systems, and was looking for a new challenge. He saw an Internet ad for the job at Electric Genetics, and although he had no experience in biology, he figured he could translate his skills into the context of a genomics company.

"Obviously they could have gotten someone more familiar with biology, but I said, 'I'm good.'"

Niekerk got the job a week later, and was thrust into the whole new world of biology.

"The language of biology was totally new to me and I've basically spent the past three months trying to get my brain around thinking like a biologist would," he said.

And by giving bioinformatics visibility, other life-scientists in South Africa who knew nothing about the field are getting training and focusing on therapies and cures for local diseases, Broveak said.

"It will come back around and result in better health for the entire country," Broveak said.