the country's richest state, is not the only destination for science talent. Most of Brazil's academic and private-sector life sciences research is concentrated in the richer areas such as São Paulo (see map).

Started in 2004, the programme has received $15 million in the past five years. It allows students to earn their degree after stints at multiple institutions. Four hundred students receive needs-based funding and scholarships from federal and state governments. Each student's thesis draws on the research of multiple groups. In principle, the poorest states benefit most as they often don't have the money to fund biotechnology PhD programmes. The government continues to evaluate the programmme's effectiveness says Barreto de Castro.

Happy returns

Many scientists who have returned to Brazil after an education or postdoc abroad have thrived. Armelin spent three years as a postdoc at the University of California, San Diego, before attending Harvard Medical School on a Guggenheim fellowship in 1982. But he decided to come back. "I realized I could be a nobody there or a somebody here," he says, laughing.

Mayana Zatz, now director of the human genome research centre at the University of São Paulo, did a postdoc at the University of California, Los Angeles. "I could have stayed," she says. "I'm glad I didn't." Zatz has had a hand in building a thriving human genetics community at São Paulo, and has probably had a much greater impact than she would have had in the United States. However, she says, there were drawbacks. Although funding has not been a problem, reagents, for example, are costly and slow to arrive, a challenge for a fast-moving, competitive field such as genetics.

The Brazilian government is also attempting to help spark private-sector science, although with mixed success. One federally funded programme offers money directly to fledgling businesses, including biotech firms. So far, the government has put up $200 million per year since 2006. Gerardo Mendoza, head of Bionext, a small biotech firm in São Paulo, says that this money, so far approximately $5.9 million for his firm, has been key to keeping his business afloat. Bionext develops biocellulose for potential use in surgical repair of the brain and heart. Most of Brazil's life-science companies focus on human health and agriculture (see graphic). Money might be available, says Mendoza, but the real problem is navigating the government bureaucracy to get approval for clinical trials. "It takes a very long time," he says — often more than a year in his experience.

Gerardo Mendoza: bureaucracy is hampering progress.

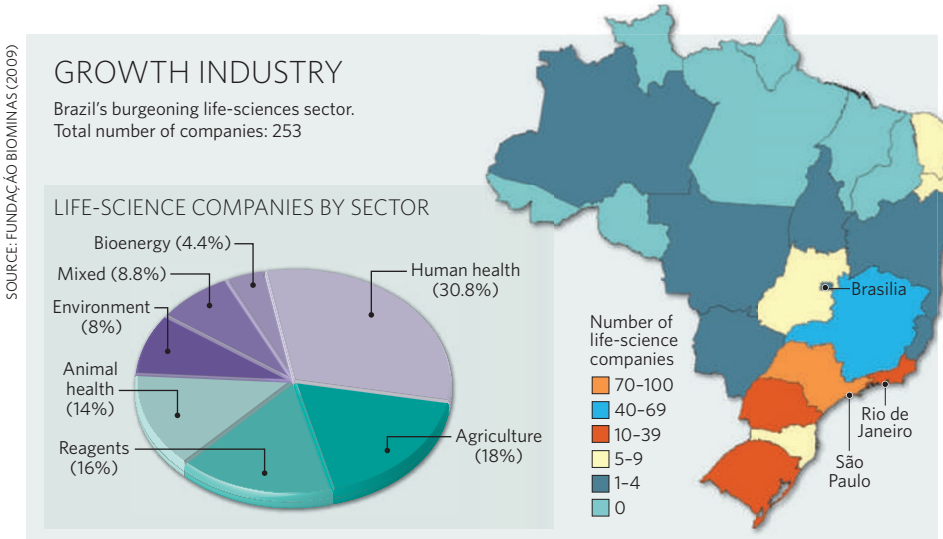
Yet another challenge across all life-science fields is moving university research into biotech spin-offs. "There are still some wrong views about venture capital and scientists and making money," says Dario Grattapaglia, a forestry researcher at the Brazilian agricultural research corporation Embrapa, the science arm of Brazil's Ministry of Agriculture. Grattapaglia, who develops molecular breeding techniques to speed tree growth and select for different wood characteristics, says that Embrapa works with companies more often than does the typical university. He often collaborates with former students who now work at forest product companies.

At Fiocruz, a centre for developing health technology has been established, with a new building slated for completion in 2011 or 2012. "We're looking to establish something like incubators," says Claude Pirmez, Fiocruz's vice-president for research and reference laboratories. She anticipates that this will mean new products or perhaps research leading to clinical trials. But bureaucracies persist, and negotiating intellectual-property transfer can be difficult even at Embrapa. Grattapaglia fondly recalls his days at North Carolina State University where he completed his PhD, acquiring two patents based on his thesis paper alone.

Nonetheless, university research can lead to promising biotech ventures. Alellyx Applied Genomics, for example, is a growing biotech born of successful genomics work in 2002. Alellyx co-founder Paulo Arruda had been a plant molecular biologist at São Paulo's University of Campinas for 30 years. His foray into biotech began in 2000 after co-authoring a paper on the first geonome sequence of a plant pathogen — which was also the first sequencing project led by Brazilian scientists (A. J. G. Simpson *et al. Nature* **406,** 151–157; 2000). A network of 25 labs sequenced the bacterium *Xylella fastidiosa,* which attacks citrus trees. Located in the suburb of Campinas outside São Paulo, Alellyx initially sprang up to find applications for the sequence. But, says Arruda, plans shifted in 2003 with the growing recognition of the opportunity presented by the rapidly expanding sugarcane-ethanol fuel industry. This, they calculated, was their route to profitability. Alellyx is hunting for genes to improve growth of different sugarcane varieties, and its next-door sister company, CanaVialis, breeds and markets different varieties. The two companies showed enough promise to catch the eye of US agribiotech giant Monsanto, which bought them in 2008 for $290 million. But Alellyx is a relatively rare case. "The problem is we don't have an entrepreneurship culture in students," says Arruda, who suggests that universities should offer more business courses for science students and more internships at companies.

But neither increasing the number of research opportunities nor boosting the role of the private sector seems an insurmountable obstacle for a country that just secured South America's first-ever Olympic Games. If the industry–academia stigma recedes and salaries ascend, and native talent returns home, Brazilian life sciences will have plenty of promise — and probably plenty more temples of science. ■

Gene Russo is Editor of *Naturejobs*.



Correction

The Feature 'Rising star?' (*Nature* **461,** 832–833; 2009) was incorrect in stating that the car-maker Toyota was named after its home city. In fact, the city was named after the car-maker. In addition, the photo on page 833 is of Yoshikazu Takeda not Keigo Takeda.