

Knowledge on the market

Companies seek out universities in a bid to create more competitive products

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University-designed innovations are becoming increasingly common on the Brazilian market. These innovations are one of the possible alternatives for companies in search of additional technology for their products and processes, as shown by the growing number of intellectual property licenses that have been transforming the knowledge of universities into innovative products. One example of these promising technologies, on the market since late 2012, is a fuel-analyzing photometer developed by the Institute of Chemistry at the University of Campinas (Unicamp) and licensed to Tech Chrom, a company born at the university's Technology Business Incubator (Incamp). The tests conventionally performed by gas stations to check for fuel adulteration are multi-step processes whose results must be interpreted by qualified personnel, whereas the photometer – which measures near infrared radiation – displays the results directly on the device's screen after about seven seconds. In addition, the traditional tests for gasoline and ethanol require 50 milliliters (ml) and one liter of the tested fuels, respectively. However,

the photometer needs just 5 ml of fuel, which is inserted into a designated container. “You just need to indicate whether the analysis will be for ethanol or gasoline,” says Ismael Pereira Chagas, who developed the prototype of the fuel analyzer during his doctorate and who currently works as a researcher at Tech Chrom.

An investment by FAPESP's Innovative Research in Small Businesses Program (Pipe) allowed Chagas to continue his research at the company and turn the prototype into a product. “The biggest challenge was creating a small, robust device that anyone can operate,” says Valter Matos, company director. The instrument, called Xerloq, has enough memory capacity to store the results of up to 98 analyses. “We also developed a software that prints out the fuel analysis results for gas station customers,” says Chagas. With the Pipe project, Tech Chrom was able to lower the device's selling price from R\$6,800.00 to R\$4,950.00. So far, more than 50 Xerloq devices have been sold to fuel retailers and distributors. “There is a potential market to explore, as there are about 39,000 gas stations across Brazil,” says Matos.



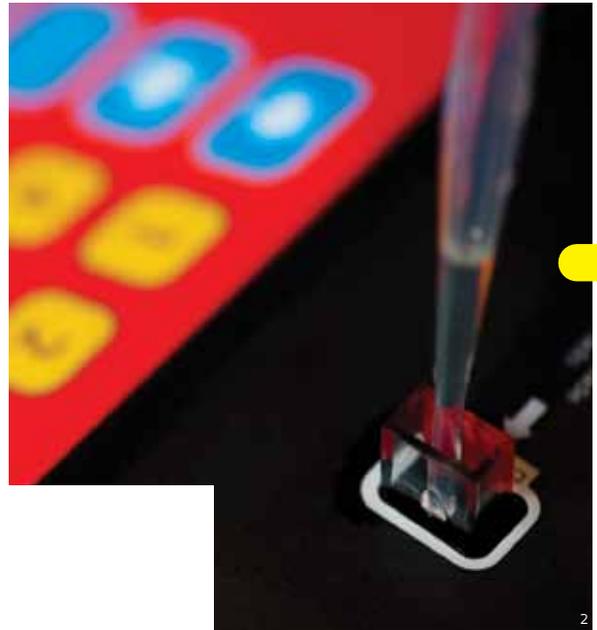
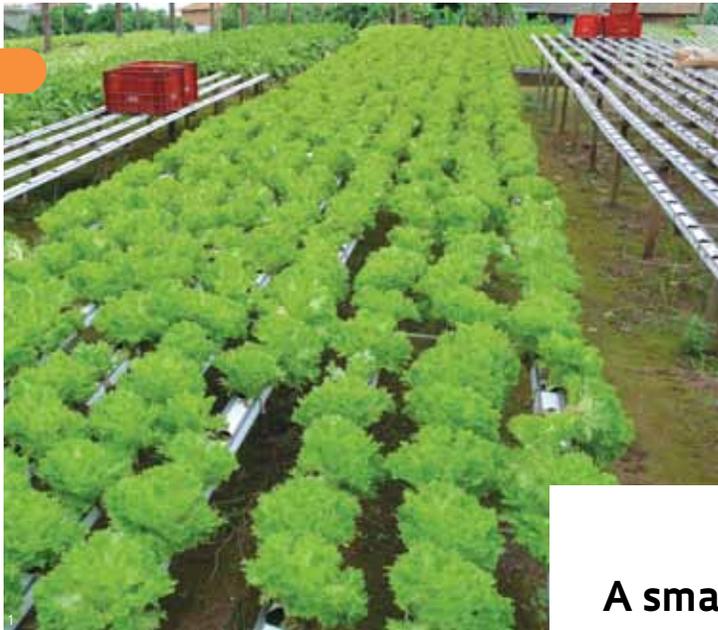


By licensing a fat with low levels of saturated fatty acids and no trans fats, which was developed at the Unicamp School of Food Engineering in partnership with Cargill Agrícola (see Pesquisa FAPESP Issue N° 182), the university earned a record-breaking R\$724,000 in royalties in 2011. The product is used in cookie fillings and other applications. The research that resulted in the new fat was started at Unicamp in the 1990s, but only in 2008 did effective results begin to appear and catch the eye of the food industry.

Since the creation of the Unicamp Innovation Agency (Inova) in 2004, this agency has filed a growing number of patents as well as technology licenses, an indication that companies want these innovations. In 2012, Unicamp filed 73 patents, signed 13 licensing agreements, and registered 29 computer programs – the highest numbers for a single year since the university filed its first patent in 1984. A total of 63 licensing agreements are now in effect.

To delve deeper into advanced innovation systems, the agency entered into a partnership with the University of Cambridge in 2009. Cambridge Enterprise is a subsidiary of the British university in charge of patents and technology transfers. “After more than 20 years working as an innovation agency for the university, in 2006 we became a company that can invest in other businesses. We invest resources and hold shares in 63 companies already,” said Cambridge Enterprise marketing director Shirley Jamieson at the XIII National Conference hosted by the Association for Research and Development at Innovative Companies (Anpei) in the city of Vitória (state of Espírito Santo) in June 2013.

Brazilian companies in search of technology have also been approaching universities. A special outfit that corrects a wearer’s posture was created at the School of Physical Education, Physical Therapy and Occupational Therapy (EEFFTO) of the Federal University of Minas Gerais (UFMG). The suit was developed at the request of physical therapist Renato Loffi, owner of Treini Biotecnologia, and this garment will be released to the market in approximately 12 months. “A web of interconnected elastic straps tightens the outfit, correcting posture and preventing injuries,” says Professor Pedro Vidigal, director of the Innovation and Technology Transfer Office (CTIT), UFMG’s innovation agen-



A small manufacturer of sports shoes contacted UFMG to develop a line of shock-absorbing sneakers

cy. After working for more than eight years in Brazil's National Healthcare System (SUS), Loffi decided to seek out Professor Sérgio Fonseca, an EEFFTO professor and expert on human movement, to create an outfit that could be worn both by people with functional difficulties and by athletes. Treini, the company that licensed the technology, is thinking of offering the outfit in four different versions: therapeutic, occupational, military, and sports.

A vaccine against canine visceral leishmaniasis is the result of the most noteworthy licensing agreement by UFMG, and this product is already available on the Brazilian market. The product, called Leish-Tec, was developed by the School of Pharmacy and the Institute of Biological Sciences, in collaboration with the Spanish laboratory Her-tape Calier. The vaccine is expected to arrive on European shores by 2014. Vidigal mentions one more example of company-university cooperation that he considers emblematic. More specifically, Crômico is a small company in the sports shoes manufacturing complex of Nova Serrana, near the Minas Gerais State capital of Belo Horizonte. The company was looking for an innovative product that would enable the company to stand out in the market and compete with Chinese imports. "They wanted to develop an innovative line of sports shoes," says Vidigal. Nobody at the university was working on this problem at the time, so a group

of researchers from EEFFTO began working with researchers at the Bioengineering laboratory at UFMG's School of Engineering. The goal of the group, coordinated by CTIT, was to develop a shock-absorbing system to be used in the soles of sports shoes. The research from this partnership was incorporated into a line of sneakers called Aerobase, which is now Crômico's second highest-grossing product. In 2012, CTIT was the owner of 661 intellectual property assets – including patents, trademarks, industrial designs, and computer programs. Of that total, patents singlehandedly accounted for 547 assets. By May 2013, the office had 43 technology licensing agreements in effect, with 101 technologies licensed.

Much of that technology is licensed by university researchers, such as an innovative, faster fermentation process for beer production designed by Éverton Estracanholti during his doctorate at the University of São Paulo's São Carlos Institute of Physics (IFSC-USP). Estracanholti got the idea of using LED lights (light emitting diodes) during fermentation, and this enabled him to shorten the total time the process takes by 15% to 20%, with no change in final product quality (see *Pesquisa FAPESP Issue N° 204*). The results drove the researcher to transform his artisanal-scale beer brewing hobby into the Kirchen microbrewery in São Carlos. "It's a small business that is going to grow, since it's also attracting major brewers," says Professor

R\$724,000
Royalties paid
to Unicamp
in 2011

Physicist invents non-invasive stomach diagnostic instrument during doctorate at Unesp

Vanderlei Bagnato, director of USP's innovation agency and advisor to Estracanholti. "We have been observing that students who participate in research are potentially interested in licensing their own patents, by such means as opening a company and getting support from Pipe," he says. An average of 100 patent applications are filed every year by the USP Innovation Agency, and 80 licensing agreements have been completed so far.

Physicist Fabiano Carlos Paixão is another example of a student who converted knowledge into a product. During his doctorate at the Institute of Biosciences at Universidade Estadual Paulista (Unesp) in the city of Botucatu, he devised a non-invasive stomach diagnostic instrument that is about to be released in the U.S. market. "In partnership with other researchers, Paixão organized a start-up in the United States to develop the equipment," says Professor Vanderlan Bolzani, director of the Unesp Innovation Agency. A portion of Paixão's doctorate on biomagnetism, as applied to gastroenterology, was completed at Vanderbilt University with financial support

from FAPESP. As soon as he returned to Brazil, the researcher filed a patent application for a device that employs a biomagnetic technique called BAC, which is used for gastrointestinal tract imaging with no need for radioactive contrast dyes. Paixão's invention allows BAC to be incorporated into medical equipment at a lower cost. Established only four years ago, the Unesp Innovation Agency has already licensed 51 technologies. In 2012, the agency held 133 patents,

six industrial designs, and 53 software programs.

Sugarcane cultivars are a prominent part of the research conducted at the Federal University of São Carlos (UFSCar). "We have 16 cultivars licensed to more than 150 sugarcane mills," says Professor Ana Lúcia Vitale Torkomian, UFSCar Innovation Agency director. "Their distinguishing feature is a higher production of ethanol and sugar, in addition to being more resistant to pests and better adapted to our climate." The university recently debuted a lettuce cultivar called Brunela, whose leaves are curly like the Brazilian variety of the plant and crunchy like American iceberg lettuce, and this plant is adapted to grow under very hot, very rainy conditions.

Agribusiness is not the only area in which UFSCar's projects have met with success. One of these projects in particular drew a lot of attention when the product became available on the market: synthetic paper made from post-consumer plastic waste, developed under the leadership of Professor Sati Manrich and produced by Vitopel since 2010 (*see Pesquisa FAPESP Issue N° 155*). Released under the trade name Vitopaper, the synthetic paper does not tear or get wet, and the paper absorbs 20% less printer ink. After a little more than five years in operation, UFSCar's innovation agency owns 93 patents (12 of these patents are licensed), one trademark, and one computer program, in addition to the university's sugarcane cultivars. ■

1 Brunela lettuce from UFSCar

2 Fuel analyzer from Unicamp

3 Special suit created at UFMG



Projects

1. Low trans fat production and applications in food (2005/54796-4); **Grant Mechanism** Regular Line of Research Project Award; **Coordinator** Lireny Guaraldo Gonçalves – Unicamp; **Investment** R\$267,760.00 (FAPESP).

2. Enabling large-scale production of a photometer for ethanol content measurement in fuel ethanol and gasoline (2011/51061-4 and 2011/52004-4); **Grant Mechanism** Innovative Research in Small Businesses Program (Pipe) and Program to Support Research in Small Business (Pappe); **Coordinator** Ismael Pereira Chagas – Tech Chrom; **Investment** R\$205,667.29 (FAPESP) and R\$195,930.00 (Finep).

3. Studies on multilayer films of virgin and recycled thermoplastic composites for writing and printing applications (2003/06113-0); **Grant Mechanism** Regular Line of Research Project Award; **Coordinator** Sati Manrich – UFSCar; **Investment** R\$69,518.53 (FAPESP).