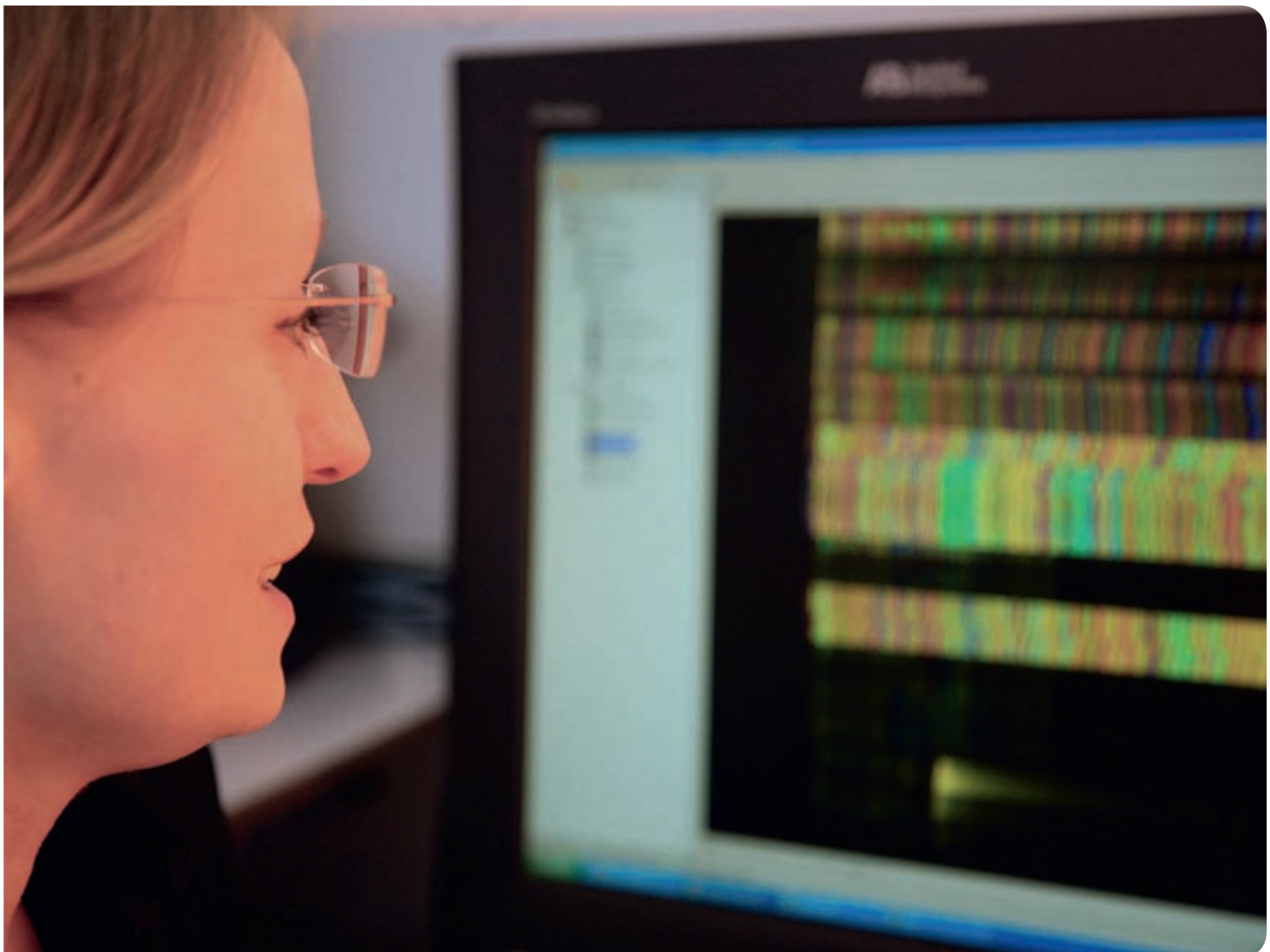


Pushing back

Wallonia is rapidly gaining a worldwide reputation for the development of innovative medical technologies

Denzil Walton



Thanks to the existence of high performing companies and a growing number of partnerships between them and university research centres, Wallonia is a European, if not a worldwide leader, in the field of medical technology.

It's a broad field, ranging from the development of medicines and vaccines to food supplements, dietary products and medical IT solutions, as well as newer fields such as genomics and proteomics, both of which are considered highly significant to the future of the human race.

Of the businesses currently active in this sector in Wallonia, those that stand out include the subsidiaries of major international US, UK and French companies. These companies have played an important role in creating jobs in Wallonia and have acted as excellent ambassadors for future investment in the region.

Jostling alongside these multinationals in the fast lane are indigenous Walloon businesses. Some of them have achieved a leading position on a global level, thanks to their work in high-value medical technology sectors. These include the

the barriers

development and manufacture of biochips, radio-therapeutic implants, *in vitro* diagnostic tools, reagents for use in medical laboratories and radio-isotopes for the nuclear medicine industry. Another specific technology in which Wallonia is strong is the custom synthesis of products in the fine organic chemistry sector, many of which are destined for the pharmaceutical industry.

Wallonia is flourishing in the medical device sector too, with companies making cardiac surgery devices, diagnostic kits for auto-immune diseases, surgical instruments, electro-surgical devices and surgical robots. Furthermore, Wallonia is well represented when it comes to the development of IT solutions for the healthcare industry. Areas include the generation of computerised medical records, electronic data input, and the development of telemedicine devices.

GIGA: Strength in numbers

The fast-moving evolution of the medical technology sector means that companies need to continuously adapt to changes and anticipate market demand. An excellent example of this is the recent formation of the GIGA Group.

GIGA (*Grappe Interdisciplinaire de Genoprotéomique Appliquée*, or the Interdisciplinary Cluster in Applied Genoproteomics) is located in the heart of the University of Liège and is a major pole of research and development for activities in the biotech area.

Incorporating academic research, collaborations with companies, technology transfer and vocational training facilities, GIGA's structure is unique in Belgium, and has few parallels in Europe. Its novel concept brings together researchers and companies under one roof. In other words, laboratories are open, equipment is shared, and collaboration between academia and industry is close.

GIGA's origins date back to the late 1990s, when a few professors of biology and genetics at the University of Liège, short of space and aware of the need to establish mutual collaboration, set out to merge their laboratories. GIGA was modelled on the Max Planck Institute of Molecular Cell Biology and Genetics in Dresden. "We held numerous discussions with its Director, Ivan Baines, as to how best to set up GIGA," says Joseph Martial, Chairman of the Board of Directors. "We may have gone a bit further than the Max Planck Institute in regard

to integrating companies but we are still very close to their ideals and structure."

Thanks to the support of university authorities and European and regional funding, this "multimodal" project slowly took shape. GIGA first saw the light of day in October 2003.

"At first people were hesitant to join, especially academics who thought that working openly and collaborating together was an impossible dream," recalls Martial. "So we started small, with just five labs joining at first. But growth has been extremely fast and we now have 25 labs in our academic centre of excellence. We are in a stage of consolidation now, to ensure we can put the proper processes in place to administer and manage such a large structure."

GIGA extends over various locations in the Sart Tilman area, but its heart is the GIGA tower within the Liège University Hospital complex. The GIGA "designers" had the opportunity to completely remodel this spacious building, thus maximising open space for laboratories, offices and common facilities to favour collaboration and communication. In addition, its location within the university hospital complex greatly facilitates interaction between clinicians and basic scientists.

GIGA is organised into a number of units aimed at boosting both scientific and economic endeavours. These are an academic research centre (GIGA-Research), a set of technology platforms (GIGA-Services), a technology transfer unit (GIGA-

TechTransfer), an industrial and business facility (GIGA-Business) and a biotechnology training centre (GIGA-Training).

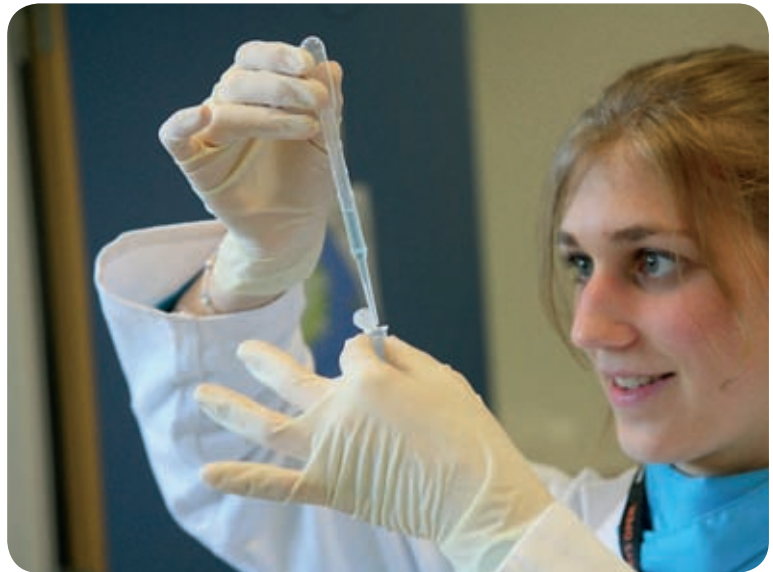
GIGA-Research was restructured in early 2007 around seven thematic research units involving more than 550 researchers from four different faculties (medicine, science, applied sciences and veterinary medicine). The seven areas of research are cancer; genetics; development, stem cells & regenerative medicine; infection, immunity & inflammation; neuroscience; signal transduction; and systems biology & chemical biology.

In the area of cancer research, GIGA's researchers have a special

interest in the study of angiogenesis. This is a physiological process involving the growth of new blood vessels from existing ones. It is a fundamental step in the transition of tumours from a dormant state to a malignant state. "One of the directions we are investigating is anti-angiogenesis, by looking at substances that block the blood supply going to a tumour,"

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TILT ULG DR. SUJET - GIGA RESEARCH

says Martial. “In effect we starve a tumour and promote its death. It’s not a new approach for cancer treatment but one of the more promising ones. We have a number of molecules entering pre-clinical trials, although there is still a long way to go yet.”

GIGA-Services encompasses technology platforms resulting from the pooling of technological and human resources. The objective is to offer state-of-the-art technology to researchers, both academic and industrial. Each technology platform is managed by a scientist and an academic researcher. This approach guarantees access to the latest equipment and means that experiments are performed by experts at an optimal cost.

Within GIGA-TechTransfer, the technology platforms available include proteomics (the large-scale study of the structures and functions of proteins); transgenics (genetically modified organisms); and transcriptomes (sets of messenger RNA molecules of particular interest to researchers seeking to understand the processes of cellular differentiation and carcinogenesis). The objective here is to transfer the commercial exploitation of research results to industrial partners.

Technology transfer relies on five processes: detecting technology, defining a protection strategy, defining the best way to transfer technology, identifying potential partners, and negotiating exploitation contracts.

Heading in the right direction

The aim of GIGA-Business is to offer a development opportunity for biotech companies (spin-offs, start-ups, subsidiary companies) within the GIGA building. Currently, eight companies are established in the GIGA tower:

- Arlenda – Solutions for analytical laboratories
- Diagenode – Equipment, reagents and kits for molecular biology research and diagnosis
- DNA Vision Agrifood – Services in genetics and genomics
- ITS – Integrated therapeutic systems
- Labage – Bioinformatics services
- OncoMethylome Sciences – Molecular tests for early detection of cancer
- ProbioX – Diagnostics and personalised medicine
- ProGenosis – The determination of protein interactions.

Finally, the GIGA-Training Centre occupies an area of 200 square metres and includes a molecular biology laboratory and a classroom, both fully equipped with scientific instrumentation and multimedia equipment. Topics in the comprehensive training programmes include cloning, cell culture, proteomics, molecular diagnostics, good laboratory practices, project management and biological safety. Its customers include workers in GIGA’s various sectors, higher education students, and job seekers wishing to improve their skills in advanced technologies.

GIGA is certainly getting noticed outside the borders of Wallonia. Every year the respected journal *The Scientist* publishes lists of the world’s top research institutions in life sciences. Martial was delighted to find that in the 2009 list, GIGA was ranked the ninth best research institution outside the United States. “We have never been in this list, and I don’t think any Belgian research institution has been rated so highly in it before,” he says. “We are very proud of this achievement, which clearly shows we are heading in the right direction.”

Collaboration in practice >

One of GIGA’s top researchers is Michel Georges, Director of the Animal Genomics Research Unit and winner of the prestigious Francqui Prize in 2008. Georges and his colleagues conducted one of the first genome-wide studies on Crohn’s disease, an extremely serious inflammatory disease of the gastrointestinal tract. The unit then worked with major groups in the US and UK, such as the Broad Institute and the

Welcome Trust Case Control Consortium.

“Collaboration was a key to Georges’ success,” says GIGA chairman Joseph Martial. “He is basically an animal geneticist, but thanks to GIGA’s open structure he could work closely with medical doctors and other faculties to make important breakthroughs. The result is that Crohn’s disease is the most genetically understood complex disease in humans.”

Polymedis: big in medical IT

Another medical technologies company creating a stir both in Wallonia and elsewhere is Polymedis. It's a spin-off company founded in 2003 by the research centre Multitel and three Belgian universities: the Université Catholique de Louvain, the Faculté Polytechnique de Mons and the Facultés Universitaires Notre-Dame de la Paix de Namur. It was established to market the results of university research in the field of medical information technology. Since its establishment the company has shown considerable growth both in terms of staff and turnover. Its team of 28 combines the enthusiasm and talent of young executives with the experience of seasoned engineers, who have extensive practical knowledge of hospital and IT environments and their particular challenges.

"Medical information technology is a key element in improving the quality of patient treatment, as well as enabling health-care costs to be optimised," says Managing Director Olivier



Lequenne. "Our flexible solutions are perfectly adapted to the IT challenges faced by modern-day hospitals."

Two of the company's best established products are Equafile URG, for managing a hospital's emergency department, and Equafile CNR, for managing a hospital's nursing records. Equafile URG is proving particularly popular in France in the regions of Franche-Comté, Champagne-Ardenne and Paris, as well as in hospitals in Namur and Mons in Belgium. Equafile CNR is used in over a third of all the hospitals in Brussels, as well as others in Liège, Mons and Namur. "We are exceptionally proud of our performance in France," says Lequenne, "as we are competing against major local suppliers of comparable products."

What makes Polymedis' products stand out in this crowded marketplace is that they are well structured, easy to adapt to a hospital's specific local requirements, and are available in multi-language versions. Currently a number of hospitals in Switzerland are trialling Equafile URG.

"All our products offer hospitals important benefits such as cost-efficiency, more effective administration, time-saving, statistical reporting, and better availability of information," explains Lequenne. "For the patient these translate into improved medical care, as medical staff have the real-time information they need at their fingertips."

Lequenne sees the company's location as key to its success. "We have access to excellent schools and universities in Wallonia, and are centrally located in Europe. We have also benefited from the subsidies that are available in this region."

One such subsidy is helping to construct a new office for Polymedis. Ready in 2010, it will house a staff of 50. Polymedis, it seems, is looking forward to further growth.

Enhancing nursing informatics

Just over a decade ago, the term nursing informatics would have drawn blank stares. Today, it just causes raised eyebrows.

The definition of nursing informatics adopted by the International Medical Informatics Association is "the integration of nursing, its information, and information management with information processing and communication technology, to support the health of people worldwide."

This burgeoning field has become an essential element of healthcare delivery. Catalysts include initiatives that encourage the adoption of Electronic Health Records (EHRs) and reports such as the Institute of Medicine's that claim clinical information systems improve processes and ultimately save patient lives. The movement toward evidence-based practice drives home the need for nurses to have the necessary information for decision making at the point of care.

Polymedis' solutions are right at the heart of this new technology. For example, at the Cliniques Universitaires Saint-Luc in Brussels, workflow management is provided through the computerised whiteboard developed by Polymedis. This software allows nurses to view a real-time interactive list of patients, which significantly contributes to improving the effectiveness of their healthcare.

"The whiteboard takes its name from the display board used in many emergency departments to show the patients present in the department and to give an overall view," says Managing Director Olivier Lequenne. "It makes use of this idea, adding functions that only a computerised solution can provide, such as the optimised

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**Managing Director
Olivier Lequenne**

management of tasks, timing and priorities."

In Namur, the nursing staff of the St. Elizabeth Maternity Clinic can manage all care provided to patients thanks to the Polymedis software package Equafile CNR (Computerised Nursing Records).

In the province of Hainaut, Polymedis is finalising the development of a medical records solution in partnership with Réseau Hospitalier de Médecine Sociale, a 450-bed hospital. This module will include the management of the clinical pathways for patients in chronic renal failure, which afflicts between 250,000 and 500,000 Belgians.