

BY THE NUMBERS

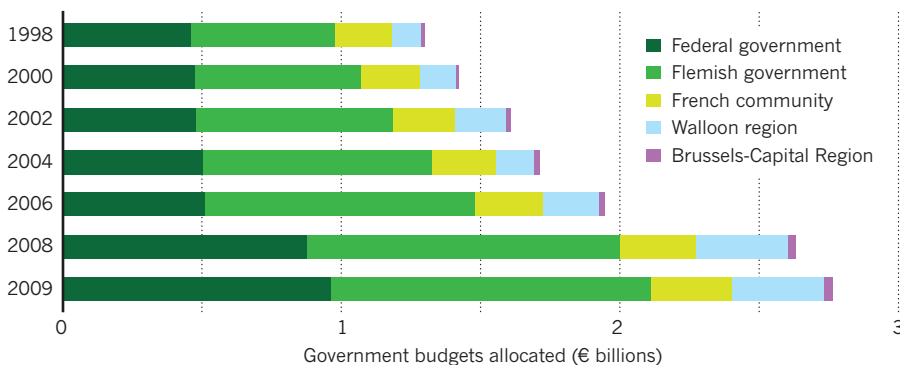
Belgium

BY KATHARINE SANDERSON

Famed for its beer, chocolate and the statue of a urinating boy in its capital, Belgium also has a well established scientific heritage. The country excels in biotechnology and space science, and has a world-leading nanotechnology research centre, the Interuniversity Microelectronics Centre in Leuven. Belgium also has the world's highest number of clinical trials per capita; this has been attributed to the nation's research capacity and very short time to approval for Phase I trials, compared with other European nations. The science budgets of Flemish-speaking Flanders and French-speaking Wallonia are administered separately, as is that of the small Brussels-Capital Region. Collaboration between individual researchers is not unusual, but there are few formal mechanisms to promote cross-region collaboration.

GOVERNMENT BUDGETS ALLOCATED TO RESEARCH AND DEVELOPMENT

Belgium's research funding has increased in general over the last 12 years, both regionally and country-wide.



Flanders has **61.7%** of Belgium's **36,318** researchers. Its government funds **6** research centres, with a total budget of **€150 million**.



Wallonia has **21%** of Belgium's researchers. **1,400** biotechnology researchers, in **300** research centres and **6** university science parks. It generates **79%** of Belgium's biotech revenue.

UNIVERSITY SPIN-OFFS

CATHOLIC UNIVERSITY OF LEUVEN

- Belgium's oldest university; Flemish-speaking.
- Second institution in Europe with a technology-transfer office.
- Created **90** firms since 1979.
- Attracted **€325 million** in investment to the region.

CATHOLIC UNIVERSITY OF LOUVAIN

- French-speaking; split from the Flemish university in 1968.
- Generated **45** spin-off companies between 1980 and 2008.
- The combined revenue from these companies was **€380 million**, and they have created **2,434** jobs.

EMPLOYMENT IN THE CAPITAL

- The remaining 16.6% of researchers are in the Brussels-Capital Region.
- Brussels-based biopharmaceutical company UCB (Union Chimique Belge) is building a biotechnology plant at its Braine-l'Alleud site. The plant, which will produce drugs for clinical trials in nervous system and immunological diseases, is scheduled to open in 2012 and will employ 100 professionals.

Q&A

Elisabeth Monard



The secretary-general of the Research Foundation — Flanders (FWO) in Brussels, which is responsible for much of the region's science funding, discusses its scientific research prospects.

What is the FWO's budget?

Since the mid-1990s, the Flemish government's budget for science has doubled. The FWO's budget for this year is almost €195 million (US\$268 million). For 2011 there could be a 5% cut, but we are optimistic, because the government has said that it has a plan for 2012 onwards, to invest more in science.

Is Belgium a good place for young scientists?

I think so. At the FWO we have fellowships for PhD students and postdocs. Only those with a master's from a European university can apply for the PhD fellowship. Our postdoc fellowships are open to all nationalities. We get more applications each year.

What opportunities exist in Belgium for foreign researchers?

We have a programme, Odysseus, to attract top senior and mid-career researchers. A university offers a position, and we offer funding, up to €1.5 million a year for five years. From 2011 onwards we will start a new programme, co-funded with the European Commission's Marie Curie Actions scheme, to attract more postdocs from other countries.

How international are Belgian scientists?

We have programmes to help our researchers move to other research groups all over the world. FWO fellows get a bench fee, which gives them mobility. And researchers can apply for grants to go abroad for up to a year. We are a bit afraid that our good researchers will go elsewhere because of the shrinking budget. I'm not worried that they are leaving, rather that they won't come back. **K.S.**

► and Oxfords of the global science community. So does the Free University of Berlin — one of nine German ‘elite’ universities, which each receive €50 million a year in extra support from the federal science ministry’s ‘excellence initiative’. It did not even make the *THE* list.

And there are few tenure-track positions, meaning little long-term security for researchers. Until recently, Germany had no tenure-track system at all. It has become an option in the past decade, but remains rare. Advancement in German universities often comes by a complicated procedure that lacks transparency.

Meanwhile, public debts and budget constraints continue to plague Berlin. Perhaps the biggest challenge is the precarious institutional funding situation in medical science. On the basis of the government’s own funding standards for medical science, Berlin has not fared well. The Charité, a multi-campus medical school for both Humboldt and the Free University, had to cut almost €250 million from its budget for 2005–10. This means that overdue investments in building and renovation had to be repeatedly postponed. It hasn’t yet hampered the science much, says Ganten, who’s also the former head of the Charité, but he fears it might in the long term. To make the most of its strong points and to continue to attract talent, Berlin will have to sustain financial support, overcome some political wrangling and create more tenure-track positions to convince more young scientists to stay in the city.

POLITICAL SUPPORT

Members of several political parties in Berlin’s senate, including the Christian Democrats, the Greens and the Free Democrats, are keen to establish Berlin as a major force in the European science landscape. This year, the Berlin senate eventually approved €330 million for the Charité, but renovations of the rundown main Charité clinic in Berlin–Mitte alone would cost some €600 million. The main issue is whether the city can afford to maintain all three Charité sites. In June, Jürgen Zöllner, the Social Democrat science senator, said that all three campuses will remain open. But the number of patient beds in the main clinic in Berlin–Mitte will be cut by 500, starting in 2012.

Nonetheless, Berlin policy-makers and university administrators understand how important science is for its future development, says Ganten. “What’s lacking here,” he says, “is a smart one-stop science marketing scheme of the kind that our Asian competitors master so well.” Ganten would like to see lasting financial support, including a targeted programme to attract high-profile foreign scientists to Berlin — something akin to the success at Singapore’s Biopolis. One problem, he says, is that the Max Planck institutes, Berlin’s universities and the Helmholtz centres rarely collaborate.

The Einstein Foundation, established in 2009, could help to remedy that lack of cross-talk. As a sort of umbrella organization for

Berlin science, it aims to support the state’s research both financially and structurally. But the foundation is already troubled by political infighting. In July, Berlin’s senate criticized its managers’ high salaries. The foundation is to provide more than €40 million for selected science projects in Berlin, but it is not yet clear where the money will come from.

EARLY-CAREER ASPIRATIONS

Like Spagnoli, Berlin’s many young scientists enjoy the capital’s lifestyle and reasonable cost of living, and are so far unhampered by the political disputes in the state’s science ministry over budgets and priorities. “Berlin makes it easy for newcomers,” says Spagnoli. “Language is no barrier, my husband has found a nice job, and renting an apartment was no problem at all.”

“Attracting foreign talent to Berlin has become easy,” says Leif Schröder, a group leader at the Leibniz Institute for Molecular Pharmacology. Schröder, who this year also received a €1.5-million ERC starting grant, is developing magnetic resonance imaging techniques for biomarkers in different diseases. His new group comprises Australian, Italian and German postdocs and PhD students. “People started approaching me and suggesting research ideas



“Berlin need not fear comparison with emerging science cities such as Singapore or Shanghai.”

Detlev Ganten

and collaborations as soon as I arrived. It’s pleasing to see what’s happening here.”

“Berlin hosts a huge pool of scientists from which to choose potential collaborators,” says Ingrid Hotz, an expert on data analysis and visualization at the state-funded Zuse Institute Berlin, which provides advanced computing services for many scientific applications. Hotz leads an independent junior research group funded by the DFG, Germany’s main grant-giving agency. She came to Berlin in 2006, after a three-year stint at the University of California, Davis, and maintains collaborations with groups in hydrodynamics, medicine, geology and gravitational physics at local institutions such as the Max Planck Institute for Gravitational Physics and the Charité. “I am turning other people’s data and experiments into images, so teaming up is everything for me,” she says. “Not all collaborations bear fruit, but fortunately there are more than enough potential research partners around here.”

This is equally true in Potsdam, located less than an hour’s train ride from Berlin Zoo. Potsdam complements the capital’s science base. With around 6,000 academic scientists working at Potsdam’s universities, along with the Max

Planck, Helmholtz and Fraunhofer institutes and the Potsdam Institute for Climate Impact Research, Potsdam has the highest density of researchers anywhere in Germany.

FUTURE GROWTH

Despite some funding problems, notably the case of the Charité, there are signs that the Berlin–Brandenburg research base will continue to grow in the next few years. The Berlin Institute for Medical Systems Biology, now on the MDC’s Berlin–Buch campus, will relocate in 2015 to the Humboldt University’s main campus in Berlin–Mitte. The move will substantially expand the MDC’s — and Berlin’s — systems-biology capacities. More than 20 new research groups totalling about 100 scientists, jointly funded by Berlin and the federal government, are to be recruited over the next few years.

The MDC will also become the hub of the planned German centre for cardiovascular research, a mostly federal-government-funded programme involving universities and research institutes across the country. The Berlin School of Public Health, a joint programme by Berlin’s universities aimed at midcareer health professionals, mainly focuses on master’s students with degrees in public health and epidemiology. Students often go on to leadership positions in government, research and non-profit agencies. Ganten hopes that the city can build a reputation as a global ‘public-health capital’.

Growth is less certain within the Berlin–Brandenburg biotech cluster, which, with 82 biotech companies, is the largest in Germany. The sector is in a consolidation phase. In 2009, for example, the US laboratory giant Thermo Fisher acquired the diagnostics firm Brahms in Hennigsdorf near Berlin for €330 million.

Although the climate for new jobs in the biopharmaceutical field has cooled down, some biotechs are still offering attractive jobs, says Steffen Goletz, chief executive and founder of Glycotope, a biotech company based in Berlin and Heidelberg. Glycotope, which specializes in therapeutic antibodies and non-antibody proteins, has hired more than 100 researchers, engineers and technicians in the past few years, many from Berlin research institutes, says Goletz.

Spagnoli is mindful of such local opportunities, but has not decided what her next career step will be. “I will probably move, but who knows?” she says, adding that she hopes excelling in her science will open multiple doors. ■

Quirin Schiermeier is *Nature’s Germany* correspondent.

CORRECTION

In the ‘By The Numbers’ on Belgium (*Nature* **467**, 876; 2010), the Catholic University of Louvain was wrongly depicted as being in Flanders. It is actually in Wallonia.