Allowing an élite

Dropping the dogma that all are equal is letting Germany's centres of excellence flourish. **Quirin Schiermeier** meets the new leaders.

October brought a rich harvest for science in Germany. Two Nobel prizes went there, to physicist Peter Grünberg and chemist Gerhard Ertl. Champagne corks were also popping in the universities of Aachen, Freiburg, Heidelberg, Göttingen and Konstanz, and the Free University of Berlin, after they won the second round of the 'excellence initiative', a federal competition that has radically changed Germany's academic landscape. Present and future scientists stand to gain.

The €1.9-billion (US$2.7-billion) competition, launched in 2005 by then science minister Edelgard Bulmahn, marks a move away from the doctrine that all German universities have similar strengths — upheld since the student revolts of the 1960s. The initiative, say researchers and administrators, implicitly recognizes that some universities may have more to offer than others, especially in certain fields. Now the chosen few must prove that the quality of their research matches that of their award-winning proposals.

The two rounds of the excellence initiative will create at least 3,000 new jobs in science at all levels of experience, according to the DFG, Germany's main funding agency for university research — which received a 20% budget increase to fund the initiative. Given that several thousand academics employed in the 1970s will soon reach retirement age, this means that up to 10,000 positions in science will probably be available by the end of the decade.

But the competition has created more winners than just the nine universities, which can now call themselves 'élite'. Numerous new graduate schools and large-scale research collaborations — known as 'excellence clusters' — have been created, from Kiel in the north all the way to Konstanz in the south.

Sea change

Marine science, for example, has become a strategic priority at the University of Kiel, on Germany's Baltic coast — and is now clearly recognizable as the field in which Kiel has more to offer than other German universities with different strengths. "In the old days of egalitarianism nobody would have dared to say this so clearly," says Martin Visbeck, an oceanographer at Kiel. He coordinates an excellence cluster on the 'future ocean', one of 17 such clusters chosen last year for funding. Physical and marine oceanographers cooperate with climate modellers and economists to study the impact of climate change on the oceans, and to evaluate the consequences for fisheries, coastal protection and human health.

There was, of course, some disappointment. Several universities in Berlin and eastern Germany failed to make the cut. But the initiative has created a palpable spirit of optimism among most of Germany's academic community. It has been prone to despondency in the past, with academics and politicians unsure about the country's science standing (see *Nature* **447,** 630–633; 2007). No German university, for example, has a top ranking internationally — something the excellence initiative is meant to help change.

Last year's winners — Ludwig Maximilian University (LMU) in Munich, and the Technical Universities of Munich and Karlsruhe — are using the award to expand on their strengths, from the life sciences and nanotechnology to the humanities.

H. SPICHTINGER/ZEFA/CORBIS

PHILIP MORRIS FOUNDATION

Martin Visbeck (top) and Patrick Cramer: excellence is now being recognized.

"There's great excitement here," says Patrick Cramer, director of the LMU's Gene Centre. Traditionally, even researchers who successfully attracted grant money and published got little recognition from their home university, he notes. "Formerly you would sweat and slave without ever being rewarded much for your efforts. Now we see that developing good ideas and doing hard work does make a difference."

Cramer is an executive board member of the centre for integrated protein science, one of the LMU's three excellence clusters, each of which receives €32.5 million plus overheads for five years. He has set up a new group for computational biology and is recruiting an independent group leader for a second group that will start work in January. Thanks to the extra money, he can offer excellent conditions, such as a €1.2-million starting grant and freedom from teaching obligations. Plans to expand the Gene Centre further to become an institute for systems biology are looking good, he says.

"We have finally abandoned egalitarianism in favour of a more differentiated university system," says economist Bernd Huber, president of the LMU. "This makes us much more attractive for foreign scientists. But clearly it does also matter a lot more now where in Germany you work as a researcher or a professor."

Researchers and policy-makers must be careful to ensure that the new system does not lead to funding monopolies, warns Matthias König, a sociologist at the University of Göttingen and spokesman for the Junge Akademie, which promotes the interests of young German scientists and scholars.

T. NAESER

History of success: Munich is home to the LMU's Gene Centre (above) and many strong biotech start-ups.

Never have opportunities for young scientists in Germany been better, representatives of Germany's science organizations told a meeting of about 100 US-based German scientists in San Francisco last month. Attracting foreign talent, and luring German scientists back from abroad, is becoming vital for research institutes, they emphasized.

Lukas Schmidt-Mende, a materials scientist who left his native Germany for the University of Cambridge, UK, in 1999, is one expatriate who has jumped at the opportunity to return. This month he began his new job as an associate professor in the LMU's nano initiative, where he will develop hybrid solar cells made of polymers and metal oxides. "It's good to be back again, but I would not have applied just anywhere in Germany," he says. "Munich has a strong nanoscience base, and they have offered me excellent conditions and career prospects." The 35-year-old is now in a tenure-track position that will probably lead to permanent employment.

BIOM

Matthias König (top) and Horst Domdey have concerns about the future.

Cash incentives

But for many other young scientists, the absence of long-term career prospects is still a big concern.

"There's currently a lot of grant money available for young scientists, but the needle-eye to permanent employment is as narrow as before," says König. "Let's face it — the majority of PhD students and postdocs now on fixed-term contracts will never find a permanent job in academic science."

Tenure track was non-existent in Germany until a few years ago when the *Habilitation*, a qualification beyond the doctorate that requires a second dissertation, ceased to be mandatory for promotion to faculty member. The excellence initiative, aiming not least at promoting the careers of promising young scientists, has persuaded universities to rethink antiquated career structures and introduce tenure track more widely.

At the LMU, some 350 assistant and associate professors are now employed on a tenure-track model, and many other universities are following suit. In Kiel, for example, all 14 independent group leaders being recruited for the 'future ocean' project will be offered tenure track, alongside an €800,000 starting grant.

Scientific salaries in Germany have increased and become more flexible, but are still lower than in other top science nations. The basic salary for a 35-year-old associate professor in Germany is around €4,000 per month. Including bonuses, they can expect 20% or so more, but on average academic scientists in Germany are paid almost 50% less than in the United States.

On the pro side, the success rate for grant applications at the DFG is substantially higher than at US grant agencies. As pressure grows on scientists everywhere to attract grant money early in their careers, this could make academic life in Germany easier than in the hyper-competitive US research system. Additional funding opportunities are now also becoming available from the new European Research Council.

Commercial moves

It is too early to tell whether the success of the excellence initiative will help to commercialize research ideas, says Horst Domdey, managing director of BioM, which supports biotechnology start-ups in the Munich region. In the past 10 years, some 100 biotech firms have spun off from research at universities and Max Planck institutes around the area, making the Bavarian capital the largest biotech region in Germany and one of the largest in Europe. Companies such as MorphoSys, MediGene and Bavarian Nordic are some of the success stories.

But Domdey is concerned about the low number of new start-ups in the past couple of years, and the increasing difficulties young German biotechs face in getting adequate funding. "The upswing in academic research is important, in that we're very much a science-driven cluster," he says. "But you really need to sensitize scientists to commercial opportunities." Otherwise, he says, technology transfer is unlikely.

The excellence initiative has put fresh money and a new drive into German science. The challenge now will be keeping up the momentum. "If the show is over in five years, then it was but a flash in the pan," says Huber. ■

Quirin Schiermeier is *Nature*'s German correspondent.