In the Global Competition For Smart Minds, Germany Grows Its Catch

Ever since the European Council’s decision in 2000 to transform the European Union into “a competitive and dynamic knowledge-based economy,” Germany’s federal government has been pumping money into research and development through various mechanisms. As a result, not only are German research institutions forging major changes in the way that researchers teach, collaborate, and advance in their careers, they are also creating more jobs. These jobs run the gamut from junior and senior researchers to support staff. With good long-term funding prospects and attractive salaries, Germany has become a major contender in the global competition among nations to draw in top talent. 

By Gunjan Sinha

In 2003, Barbara Conradt left the Max Planck Institute for Neurobiology in Martinsried, Germany to take a job in the United States—she thought it was for good. She had accepted a tenure-track position at the Geisel School of Medicine (formerly Dartmouth Medical School), in Hanover, New Hampshire. Not only did the position offer better long-term job prospects and a supportive research community, she much preferred the openness and diversity of the American academic environment.

“I was excited about the U.S. system,” says Conradt, which she had experienced first-hand having finished both her Ph.D. and a postdoc in the United States. “I thought I would never move back to Germany,” she recalls. So it was no wonder that when a recruiter approached her in 2010 with a job opportunity at the Center for Integrated Protein Science in Munich (CIPSM), Germany, she balked. But she soon reconsidered. If she were offered the job, she thought, she would merely use it as leverage to boost her standing at Dartmouth.

Things turned out quite differently, however. “I realized that a lot had happened in Munich,” Conradt explains. The campus had grown, the university environment had become more diverse, and there were more women. “I really felt like this was a place I wanted to come back to and make a difference,” she says. CIPSM offered her a full professorship and also offered to move her entire lab over. She accepted the offer with open arms.

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CIPSM was established in 2006 through Germany’s Excellence Initiative—a program that invites institutes of higher education to apply for federal grant money to fund growth in three areas: graduate programs, clusters of excellence that focus on and accelerate hot research topics, and institutional strategies (also called future concepts) that improve the institution’s quality of research and teaching. Launched in 2005, the Excellence Initiative was a bold plan to push innovation at what was seen as Germany’s inertial university system. In addition to receiving lump sum state funding, universities could now compete for additional federal funding by submitting ideas for new educational strategies, research initiatives, or collaborations that span multiple research institutes. By fostering innovation, the goal was to create “elite universities” that could compete with the world’s best universities in drawing in top talent. The first and second rounds of the initiative doled out €1.9 billion to universities between 2007 and 2012. The third and final round will award €2.7 billion to universities through 2017—a total of €4.6 billion to a total of 39 universities across 13 states.

The Excellence Initiative isn’t the only mechanism by which Continued>
money is flowing into the sciences. Since the European Council’s decision in 2000 to transform the European Union into “a competitive and dynamic knowledge-based economy” by 2010, Germany has increased spending on research and development dramatically—the results of which are already tangible. Between 2005 and 2010, the number of jobs in research and development grew by 15%.

Not only has industry contributed to this growth by increasing research and development expenditure by 21% during the same period, the federal government upped research and development investment from €9 billion in 2005 to approximately €13.8 billion in 2012—an increase of 53%, according to the Federal Ministry of Education and Research (Bundesministerium für Bildung und Forschung, or BMBF).

The result has been that regions around the country that have traditionally been hubs of research and development are expanding and innovating and in the process creating new job opportunities.

The South: Bavaria

Not only can the state of Bavaria lay claim to hosting two elite universities, the Technische Universität München (TUM) and the Ludwig-Maximilians-Universität München (LMU), it can also boast winning the second highest share of award money through both Excellence Initiative rounds for a total of €370 million.

At the CIPSM—an excellence cluster set up by the TUM, the LMU, and the Max Planck Institutes of Neurobiology and Biochemistry—the focus is on protein science. The CIPSM includes three locations on the outskirts of the city of Munich—Großhadern/Martinsried, Garching, and Weihenstephan—and university physics and medicine departments in downtown Munich. The center enables scientists from LMU and TUM, as well as scientists from the neighboring Max Planck Institutes and the Helmholtz institutes, to come together and work on common research goals. Since 2007, CIPSM has received about €45 million from the Excellence Initiative and funding of the cluster has been renewed for 2012 through 2017, with a budget of approximately €7 million per year.

“I have not regretted [leaving Dartmouth] at all,” says Conradt, who studies cell apoptosis and mitochondrial dynamics in Caenorhabditis elegans. Conradt moved to CISPM at a time when NIH funding had “really dropped,” she says. Meanwhile in Germany, the federal and state governments continue to prioritize funding of research and development over the long-term, which is vital for scientific progress, she adds. Just as appealing, the academic environment in and around Munich continues to change in ways that promote diversity. For example, like most excellence clusters, CISPM’s official language is English. Teaching of the sciences at the Master’s level at CISPM’s host universities is also now conducted in English, which has really helped draw people from all over the world, she says.

Baden-Württemberg

To the west, the state of Baden-Württemberg has been the most successful state in the Excellence Initiative competition. The state’s universities garnered a total of €545 million—the most of any state.

In 2008, Virginie Lecaudey became the first junior professor at the Centre for Biological Signalling Studies (BIOS)—a cluster of excellence at the University of Freiburg. At BIOS the focus is on combining analytical methods with synthetic biology approaches to characterize complex signaling pathways—a field of study that is unique in Germany. In landing the job, Lecaudey feels “quite lucky,” she says, because it is a tenure-track position. Once nonexistent in Germany, tenured-track positions are now being created by universities as part of the wave of ongoing changes brought on by the Excellence Initiative.

Traditionally, universities have offered tenured professor positions only to academics outside of their institution; so junior researchers have had no path towards advancing their careers within the same institution. That’s because to become a tenured professor an academic must also earn Habilitation—a second more rigorous dissertation that qualifies academics to supervise dissertations and teach junior scholars. (While Habilitation is no longer required, it is still considered important.) At the same time, the university rule of Hausberufungsverbot prohibits academics from becoming professors at the same university at which they have earned Habilitation. This restriction combined with the fact that job openings are rare because turnover can...
be slow, have made it difficult for junior researchers to advance. Therefore, the creation of tenure-track positions reflect a major change in the system.

Last year, the TUM established the Faculty Tenure-Track System, for example, that aims to create the first 100 tenure-track professorships between now and the year 2020. The plan is to recruit young researchers who have international experience and have demonstrated recognition in their fields, such as by publishing in high-impact journals or winning early-career prizes. Researchers can be hired as assistant professors on a six-year contract that lead to a tenure evaluation.

While the Excellence Initiative has helped forge change at universities, the government’s commitment to research and development in Germany isn’t stopping there. Just north of Freiburg, in the city of Heidelberg, the German Cancer Research Center (Deutsches Krebsforschungszentrum or DKFZ) has been awarded government money to create additional comprehensive cancer care centers across Germany, says Otmar Wiestler, chairman and scientific director of the DKFZ. Last year, the DKFZ announced the launch of the German Consortium for Translational Cancer Research. DKFZ will partner with seven university hospitals to create translational centers at each university site. The consortium is a joint initiative of the Federal Ministry of Education and Research, German Cancer Aid (Deutsche Krebshilfe), and the DKFZ. The BMBF and the participating states provided approximately €12 million for the consortium last year. The annual budget will be gradually raised to reach about €28 million by 2014. German Cancer Aid will provide additional funding upon request for defined research projects and after an evaluation.

To get the project running, DKFZ will be recruiting 21 physician scientists for full professorship positions. This is no easy task, Wiestler says. “People with medical training have lots of job options,” he says. “These people are precious. It is very important to provide attractive packages.” To that end, DKFZ offers competitive salaries and long-term funding, Wiestler adds.

The North: Berlin

While Baden-Württemberg is certainly the leader in terms of cash flowing into research, Berlin can now boast claiming to be the only other German city, next to Munich, to host two “elite universities.” Early in 2012, Humboldt University became the second university in Berlin (after Freie University) to claim the “elite university” title. In addition to winning funding for three of its graduate schools and a strategy to strengthen its overall standing, Humboldt University’s NeuroCure Cluster of Excellence won follow-on funding.

NeuroCure’s aim is to boost the prominence of neuroscience research in Berlin by forging collaboration among university scientists and researchers from the Max Delbrück Center for Molecular Medicine (MDC) in Berlin Buch, the Deutsche Rheuma-Forschungszentrum (German Rheumatic Disease Research Center), and the Leibniz-Institute for Molecular Pharmacology. The interdisciplinary research projects focus on the functions of the nervous system.

“What is special about NeuroCure isn’t the direction of the research but rather what we are doing with the money,” says Christian Rosenmund, coordinator of the cluster. Universities in Germany’s poorer states, such as Berlin, have been suffering from budget cuts for years (universities receive the bulk of their funding from state governments), he explains. Many professorships in Berlin have simply been left vacant. Under the previous coordinator, Dietmar Schmitz, NeuroCure spent a majority of the €5.4 million annual Excellence Initiative funding to establish new professorships and provide them with appropriate equipment, says Rosenmund. Since 2006, NeuroCure has recruited 20 new researchers. “This is unheard of,” says Rosenmund, “you’re lucky if you get three or four into a single department.”

With the additional funds, universities are also able to offer attractive financial packages, an important factor when recruiting scientists from the U.S. where salaries are typically higher. Schmitz recruited Rosenmund in 2009 from the Baylor College of Medicine in Houston, Texas, U.S. In taking the job, Rosenmund accepted a salary cut. But after seeing his budget remain flat for five years in the U.S. and having to face the constant threat of cuts, the opportunity to build something new from the ground up and better long-term funding continued>
prospects in Germany were enough compensation, he says.

Further north in the Berlin suburb of Buch, an even larger influx of new talent will soon be moving in. In November of last year, the federal and state government of Berlin announced support for a cooperative venture between MDC and the Charité University Hospital to establish the Berlin Institute of Health (BIH). The aim is to quickly translate basic research into clinical applications. The MDC is one of 18 research institutions of the Helmholtz Association, all of which are funded 90% by the federal government and 10% by the states.

A major emphasis at the MDC is on systems medicine whereby researchers focus on characterizing molecules and biochemical pathways that are similar among different diseases. For example, certain proteins, such as NF-kappaB, are highly active at sites of inflammation. Since inflammation is involved in many diseases, these proteins can serve as a common therapeutic target. The BIH will function as a place for physicians and researchers to come together to study and correlate the clinical aspects of diseases with the molecular aspects and vice versa, says Walter Rosenthal, scientific director of the MDC. Beginning in 2013, the federal and state government will provide €300 million to the BIH over the next five years. An additional €40 million over a period of 10 years will also be donated by a private foundation. The BIH will ultimately occupy its own physical space and is expected to be fully operational by 2018 with an annual budget of €80 million. New hires will have joint appointments at either the Charité or MDC and the BIH.

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Funding Isn’t Everything

But while the money is certainly flowing, some scientists continue to be frustrated by obstacles that money alone can’t overcome. Language, for example, can still be a barrier. While many institutions hold English as the official language, life outside of the academic environment can be challenging without basic German skills, says Lecaudey, a native of France. And while institutions have made huge strides in recruiting female scientists and in supporting families, the culture at large hasn’t kept pace. It can be difficult to place children under three years of age in daycare in West Germany, for example, in part because it has been culturally frowned upon for mothers to leave care of such young children to someone else. Schools have also traditionally only been open until early afternoon. However, these aspects are slowly changing. There are major government efforts towards keeping schools open for full days and towards building more daycare centers with guaranteed availability, regardless of a child’s age.

More pressing is the question of whether the funding flood will last, particularly for those supported by the Excellence Initiative, which ends in 2017. State governments and universities are expected to pick up the tab, but in poorer states, such as Berlin, junior researchers may lose their jobs and support staff and core facilities may wither. For his part, Rosenmund encourages all researchers at NeuroCure to seek out as much third-party funding as possible; this sentiment was echoed by Conradt and Lecaudey.

There is one change that might help, however. Last year, Germany’s constitutional law was amended to allow the federal government to help finance universities, not only on a project basis, but also over the long-term.

In the meantime, one thing is clear: the work environment for scientists in Germany has changed and is still changing. The last 10 years has seen a switching of the guard, says Conradt, as younger scientists with international experience come to occupy positions of power. They are bringing back ideas and making the system more open and diverse, she says. Indeed, between 2005 and 2009 alone the number of non-German scientists working in Germany increased by one-third, according to the BMBF. The increase in government spending on research and development which, at 2.88% of GDP, is the highest percentage of any EU member state, combined with the political push from the very top to move science forward promise to continue to make Germany an enticing place for scientists to work and live.

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