

SPOTLIGHT ON DENMARK

Going global

Research leaders in Denmark are pushing for a stronger international presence.

"We all know each other. It's the secret to our country's collaborative spirit."

Poul Nissen, DANDRITE

FIVE RESEARCHERS, fresh from completing outstanding postdoctoral work in the US and Europe, sit around a table at Aarhus University in Denmark, discussing what brought them there. Mark Denham, Duda Kvitsiani, Sadegh Nabavi, Anne von Philipsborn, and Keisuke Yonehara are group leaders at the Danish Research Institute of Translational Neuroscience (DANDRITE). Poul Nissen, DANDRITE's director since its establishment in 2013, says the institute's goals are scientific excellence, original research, and leadership training. "We're creating an environment to develop promising young scientists into international research leaders," he says. The five researchers are all new to Denmark. "It was a risk coming here and we still feel a little isolated," says von Philipsborn. But Denham notes, "we're quickly building a more international community."

DANDRITE, part of the Nordic-European Molecular Biology Laboratory Partnership for Molecular Medicine, is possible because of three features of Danish science: a tight network, a collective focus on internationalisation and impressive funding from



American students visited Aarhus University to hear about research done in DANDRITE in February 2015.

KAREN BECH, DANDRITE

industry foundations. For example, DANDRITE is jointly funded by Aarhus University and the Lundbeck Foundation, the largest shareholder of the Lundbeck pharmaceutical company.

The extensive, interdisciplinary scientific network is the backbone of Danish research. People who were educated together maintain relationships as they take jobs in industry, academia, or government. "We all know each other. It's the secret to our country's collaborative spirit," says Nissen. The sense of connectivity extends to the public, explains Aarhus University biomedicine professor Mogens Kilian, creating an exceptional environment for research.

Diversifying science

But the close-knit Danish scientific community wants to become more international. Research leaders tell students and postdocs that to become world-class scientists, they need to experience a range of working styles, methods and environments. In search of this exposure, young scientists are pushed to train in, or at least visit, research groups in other countries. "We are a small country, so mobility is important" says Daniel Otzen, professor of protein

biophysics at Aarhus University. "We're also very keen on having excellent young scientists come here from other countries."

Thomas Vorup-Jensen, head of the biomedicine graduate programme at Aarhus University, is working behind the scenes to diversify the Danish scientific network. He promotes the benefit of face-to-face conversations between people in academia and business, and encourages international collaborations, for example with China, to bring the best students and postdocs to Denmark.

Achieving the country's goals of research globalisation will take time, says Vorup-Jensen. But Denmark is known for achievements that require time, long-term vision and sustained effort. Becoming a global leader in sustainable energy didn't happen overnight, for example. (See **Impressive prospects.**)

Vorup-Jensen believes that business and academia are collaborating in a push to open the Danish scientific network to the world. He points to a 2015 newspaper feature by a Novo Nordisk executive calling for an improvement in science education, recruiting the highest-quality students from Denmark and abroad. "When an industry



leader makes a statement like that," says Vorup-Jensen, "we all pay attention." Several funding agencies across the country support the mobility of young scientists, for example, the Danish Council for Independent Research (DFR), and the Danish National Research Foundation (DNRF).

Money and mobility

Mobility is particularly important for postdocs seeking DFR fellowships, says Otzen, a DFR member. DFR's Sapere Aude funding is open to any scientist whose work benefits Danish research, regardless of their country of origin. The DFR-MOBILEX grants, co-financed by the European Union, are for non-Danish researchers in Denmark or Danish postdocs working abroad. More experienced scientists can visit the country on DNRF Niels Bohr professorships.

Jesper Andersen's laboratory exemplifies the environment Danish funding agencies are seeking. Andersen is a group leader at the

University of Copenhagen Biotech Research and Innovation Centre (BRIC). His researchers come from Asia, Europe, and South America and this is typical of BRIC, he says. Andersen's team were partly attracted by the chance to do translational science, meaning basic research that might lead to clinical trials, patents, or spinoff companies.

Porous borders

For scientists interested in translation and applications, Denmark has always had a porous border between academia and industry. "We have no stigma about an industry career," says Morten Pejrup, University of Copenhagen vice dean of research. "We acknowledge that most students won't go into academia." The Danish government recently merged funding pathways for industry-academic partnerships into Innovation Fund Denmark, which supports research with industrial partners, from PhD projects to multisite collaborations.

The University of Copenhagen even offers an annual prize for

research that benefits Danish business. The 2015 award went to Renate Müller, professor of horticultural science and biotechnology at the University of Copenhagen, for a natural, bacteria-based transformation method that helps plant breeders control growth with fewer chemicals. The project started as basic research, says Müller, but when the commercial applications became clear, she and collaborators in the horticultural industry extended the work, supported by Danish industry-academic partnership grants. "In these projects, both partners move the science and innovations forward to create new jobs and products," says Müller.

In addition, Danish science and engineering-based industries extensively support research through their foundations. The Maersk, Velux, and Carlsberg groups are just a few examples. Arguably the most prominent is the Novo Nordisk Foundation (NNF), which launched several research centres and supports the national biobank. Naomi Geshi is the laboratory manager for the NNF Section for Basic Stem Cell Biology at the Danish Stem Cell Center (DanStem). After earning a Master's degree in Japan, she came to Denmark for her PhD and postdoctoral work so has experienced diverse research settings. At DanStem, she's noticed benefits to basic research supported by an industry foundation. Core funding that covers infrastructure, as well as investigator and administrator salaries "creates an environment in which people can really concentrate on their research," she says.

Next steps

Scientists considering working in Denmark should be aware of the strengths of the country's unique research infrastructure and mindful of some potential obstacles. "Foundation funding is fantastic for research and job opportunities," says Kilian. "But universities must pay for the grant administration, which takes funds from other areas." This means the foundations are driving research directions and academic leaders must ensure that physicians and scientists get a rounded education, even in underfunded topics.

The renowned Danish work-life balance also requires compromise.

Kvitsiani and Yonehara, who are building up their labs, have found that adequate stipends allow graduate students and postdocs to live reasonably well. The work culture is relaxed, says Nabavi. "There's more collaboration and less aggressive competition with outside labs than in the US." Language is rarely an issue. Anne von Philipsborn notes that everyone knows English and doesn't mind speaking it.

However, the more relaxed atmosphere means researchers from highly driven environments need to adjust to a different pace, including holiday schedules that make labs feel empty in July and December.

Academic leaders and funders are addressing several other commonly raised concerns over Danish science that might affect researchers considering moving there to work. Completing a meaningful project within the short three-year Danish PhD programme is challenging. Another difficulty is that universities have traditionally not had a tenure system. The University of Copenhagen started a five-year undergraduate-to-PhD programme to strengthen the training of young scientists, says Pejrup, and now offers some tenure-track positions.

Another area in which Denmark is striving to improve is in the promotion of female scientists.

A 2014 DFR report noted that Denmark lags behind northern European countries in the proportion of female professors and institute leaders. The report recommended intensifying efforts to bring women into science leadership. A grant programme was set up in 2014 to provide research funding specifically for women, but is not likely to be continued after this year. Research leaders are now discussing the next steps toward gender equality in science.

Pejrup notes that foreign researchers bring valuable resources to his university, including European Union funding. "These researchers often go on to apply for other international grants." Pejrup believes internationalization also has long-term advantages. "It creates a vibrant research environment," he adds, "and students retain lifelong collaborative ties with their mentors, even when they go to work in another country." ■

This content was commissioned and edited by the Naturejobs editor

Impressive prospects

Pierre Pinson grew up in France, but now calls Denmark home. An electrical engineering professor at the Technical University of Denmark (DTU), 15 km north of Copenhagen, he conducts data-driven research on the integration of renewable energy in power systems and electricity markets.

He first visited Denmark as part of his PhD work on wind-power forecasting, and returned in 2006 for his postdoctoral research "because it was the best place to study wind energy," he says. "The knowledge development in the field was incredible. There was a whole generation of scientists who made wind energy a central focus in Denmark."

In 2013, Pinson became one of the youngest full professors at DTU. One of the reasons he stayed was that in Denmark, his ideas mattered more than his age to his students, colleagues and the university administration. "I was impressed with the research prospects for young scientists in Denmark," he says.

His adopted country is internationally known in his field of sustainable energy. Becoming a member of a global network of collaborators was easy. Pinson has been a consultant or visiting scientist in the UK, the US, and Spain." He says that although Copenhagen is in a fairly remote corner of Europe, it's easy to connect to other places. "In just a few hours you can be in another city. And visitors from all over the world come to Scandinavia to learn about sustainability."

Yet newcomers to Denmark should be patient, advises Pinson. It takes time to learn the culture and get socially integrated. Danes don't rush into friendship, he says, but they have a strong sense of social connectivity and responsibility that makes research particularly meaningful: "There's a feeling that your science should contribute something to society."



Pierre Pinson became one of the youngest professors at the Technical University of Denmark in 2013.

LUNDBECK FOUNDATION FELLOWSHIPS

The Lundbeck Foundation hereby invites applications for fellowships within biomedicine, including science projects with a clear biomedical angle and research plans, which will be granted to especially promising young researchers and their research groups.

The fellowships are awarded for five years and each fellowship amounts to DKK 10 million (approx. Euro 1,3 million).

The subject area should be frontline basic- or applied research within the scope of the Foundation's grant strategy, which can be seen at www.lundbeckfonden.com

The call invites Danish or foreign researchers from abroad, who wish to move to Denmark and continue their research here. The call is also open for applicants from Danish universities and university hospitals.

The fellowships are intended for researchers who are qualified to establish or develop their own research groups within biomedicine and who have received their PhD degree within the last 5-7 years.

The application should include an account of the research plan, collaborators, budget and how the research group is envisioned to be placed within a Danish research institution. In addition, it should include a letter of intent from a resident researcher at the host institution, who makes him- or herself available as a mentor to facilitate the applicant's establishment of the research group as an integral part of the host institution. Further guidance is provided in the application form.

The application, written in English, should be sent via the Foundation's Electronic Application System for fellowships at www.lundbeckfonden.com no later than December 14, 2015. Interviews will take place during the weeks of April 18-21 or 25-29, 2016 at the Lundbeck Foundation.

For further information please contact Ulla Jakobsen, Science Manager, phone: 39 12 80 11 or email: application@lundbeckfonden.com



Lundbeck Foundation is an active industrial foundation with controlling shareholdings in H. Lundbeck, ALK and Falck. In addition, the Foundation manages financial investments of approximately € 1.3 billion. The Foundation supports biomedical research of the highest international quality. In 2014, the Foundation had a profit after tax of approx. € 217 million and made research grants of approx. € 64 million.

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