

Lundbeck Foundation's Danish Neuroscience Initiative

Based on a survey of Danish Neuroscience

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As part of the launch of the Lundbeck Foundation's new grants strategy, this document has been updated with specific recommendations and our comments in September 2018.

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Background

The Lundbeck Foundation (the Foundation) has always placed an emphasis in its funding schemes on neuroscience and related fields. Against the background of a revised strategy for the charitable activities where 'The Brain Comes First', the success of The Brain Prize and the associated outreach programmes, and an ambition to make Denmark a world leader in neuroscience, the Foundation is considering making a more substantial investment in neuroscience research.

In order to establish a solid basis for the future investments in Danish neuroscience at Danish universities and university hospitals the foundation asked:

Sir Colin Blakemore, Professor of Neuroscience & Philosophy, School of Advanced Study, University of London

Emeritus Professor of Neuroscience, University of Oxford and

Martin Rossor NIHR National Director for Dementia Research, Emeritus Professor of Clinical Neurology at UCL Institute of Neurology and Hon Consultant Neurologist, National Hospital for Neurology and Neurosurgery, London

to survey Danish neuroscience and to write a report based upon their observations and analyses.

Guiding principles

Before commencement of the survey, it was decided to adopt the following principles:

- Whatever the outcome of the exercise, it should benefit neuroscience across the whole of Denmark
- It should balance support for researchers currently in Denmark and those who might be attracted from abroad
- It would be good to strengthen neuroscience widely, and not to neglect the links between neuroscience and other sciences
- There is a need to address the issue of neuroscience education and career progression
- It is important to consider the adequacy of infrastructure (including technical support)
- There is a need for the Lundbeck Foundation to develop partnerships with universities and to stimulate strategic commitment
- The working group must think about impact – whatever is recommended must have the potential to benefit society
- Public engagement must be considered

Methods

The survey, which took place in the Spring of 2017, involved presentations and discussions at meetings hosted by Rigshospitalet, University of Copenhagen, University of Southern Denmark, Aarhus University and Aalborg University, as well as responses to a pre-circulated questionnaire.

Sir Colin Blakemore and Martin Rossor visited hospital and university facilities in Copenhagen, Odense, Aarhus and Aalborg, and heard presentations about research, clinical activity, training and funding from senior researchers and academic leaders of Rigshospitalet Copenhagen, Rigshospitalet Glostrup, Bispebjerg Hospital, Hvidovre Hospital, the Mental Health Services of the Capital Region; the Departments of Psychology and of Media, Cognition & Communication at Copenhagen University; the Centre for Neuroscience in the Faculty of Health and Medical Sciences at the University of Copenhagen; the Centre for Applied Neuroscience (BRIDGE) of the Region of Southern Denmark, Odense University Hospital, Mental Health Services of the Region of Southern Denmark, the University of Southern Denmark, Odense; the Technical University of Denmark; NeuroCampus at Aarhus (including the Centre of Functionally Integrative Neuroscience, the MIND Centre, Centre for Interacting Minds, DANDRITE etc); the Faculty of Medicine, Aalborg University and Aalborg University Hospital. They also received information about BrainStem, the Stem Cell Centre of Excellence in Neurology, established by Innovation Denmark and coordinated by Professor Poul Hyttel, University of Copenhagen.

The authors' general impressions

The breadth and quality of neuroscience research in Denmark are impressive, with internationally competitive work in many fields. Productivity is high, in terms of the number of PhDs awarded in neuroscience, and the rates of publication and citation. Denmark has attracted a number of leading researchers from outside the country, not only returning Danish scientists but also senior foreign scientists and talented young researchers. Public and especially private funding, has provided good research infrastructure. Support from the Lundbeck Foundation has already had a major impact on the range and quality of neuroscience research at Danish Universities and university hospitals. The large strategic grants (e.g iPsych and DANDRITE) are all supporting work of high quality and are encouraging collaboration within Denmark and internationally.

No university in Denmark offers a degree in neuroscience, whereas in North America, the UK, and many other countries, undergraduate courses and degrees in neuroscience were introduced decades ago and are popular with students. A degree in neuroscience is seen as a gateway to a wide range of careers – in industry, publishing, business, marketing, management, psychotherapy, neuropsychology etc, as well as in academic or applied research.

Neuroscience research in Denmark has been nurtured in clinical departments in the major university hospitals, especially in Copenhagen and Aarhus. Not surprisingly, research in clinical departments is largely organised around disease topics and it tends to be focused on answering questions of direct

clinical relevance. A PhD degree is considered a valuable part of training for young clinicians, and a large fraction of PhD positions in neuroscience are taken by trainee clinicians.

Interest in neuroscience has been growing in non-clinical departments in the five universities that presented information for this survey, mainly in the area of biosciences, but also in technical departments (information sciences, engineering etc), departments of psychology, social sciences and even philosophy.

The nature of neuroscience in Denmark has created a good environment for potential application of translational research. However, novel and effective translation builds on a foundation of innovative discovery. A vibrant research 'ecosystem' depends on a good balance between unfettered fundamental research, a receptive clinical environment with a strong commitment to research and innovation, and agile mechanisms for linking basic researchers and clinicians, and for seizing opportunities for translation. There are two other reasons for believing that it would be beneficial to increase support for basic neuroscience in the universities:

Advances in the biosciences in general, and neuroscience in particular, are often technology-led, relying on close collaboration with physics, engineering, molecular biology, chemistry and computation. While such interactions can occur in hospital settings, they are more likely in the multi-disciplinary environment of a research-active university.

The boundaries of neuroscience are expanding rapidly from medical, natural and technical sciences, now embracing economics, marketing, education, the law, social science, philosophy, and other areas of the humanities and creative arts. The efforts of the Foundation to make Denmark a world leader in neuroscience should recognise opportunities for new forms of interaction, translation and application in the future.

The Report enthusiastically supports the Foundation's plan to focus its funding on neuroscience, which is likely to have a dramatic impact. It recommends that increased funding should be used to strengthen neuroscience across the whole spectrum, from basic to clinical, with particular attention to the need to nurture and sustain a strong foundation of discovery research, and to facilitate interaction not only between basic neuroscientists and clinicians, but also between neuroscientists and researchers in related disciplines.

The Report recommends funding schemes for networks of collaboration in specific areas of research; post-doctoral fellowships; workshops to maximise the use of the remarkable registers of public medical data and disease-related cohorts; clinical research facilities to promote experimental medicine; work on applications of digital technology in research and neurorehabilitation; tissue banks; disease-specific Research Consortia; and various schemes to enhance opportunities for clinical translation.

The Report emphasizes the importance of creating a national neuroscience community, so as to ensure that the benefits of this initiative are felt throughout Denmark.

Recommendations, status on implementation and general reflections

The report comprises specific recommendations, each of them being based upon an analysis of a number of factors, including but not limited to strongholds, established expertise, gaps, weaknesses and opportunities.

The Foundation welcomes the report's recommendation of 'thinking of neuroscience broadly' and will emphasize increasing interaction between neuroscience and adjacent research disciplines.

The Foundation acknowledges the importance of strengthening translational research and will encourage the exchange of researchers between clinical and basic research as well as further internationalization of Danish neuroscience research.

September 2018:

The report and its recommendations have formed an integral part of the development of the new strategy for grants and prizes in the Lundbeck Foundation, launched in September 2018.

The specific recommendations and our comments to them can be read in the following:

1. The focus of the Lundbeck Foundation/Lundbeckfonden (the Foundation in the following) funding should be defined sufficiently widely to include interaction and collaboration between neuroscientists and researchers in adjacent and related disciplines (including economics, social sciences, cognitive science, education and the humanities).

Included in the new PPP programme.

2. The Foundation should consider establishing a small Strategic Advisory Group, with experts from outside Denmark, to review progress in implementing funding programmes, in recruitment, and in the provision of infrastructure.

The funding strategy will be reviewed every 3-5 years by an international advisory group.

3. The Foundation should continue to devote a significant proportion of its funding to open calls for proposals in any area of neuroscience, from basic to clinical, and associated disciplines.

As part of the new PPP strategy, the foundation welcomes project proposals within all fields of neuroscience including development of new technologies.

4. The Foundation should establish mechanisms to learn from experience elsewhere about the potential difficulties created by increases in research funding

The foundation will actively seek inspiration from other foundations and organisations.

5. The Foundation should communicate informally with other major funders in the hope of obtaining assurances that funding for neuroscience from other sources will not be reduced as a consequence of Foundation's new strategy.

The new funding strategy will be communicated to private and public foundations, with whom there is already a substantial contact.

6. Provide funding for Networks for collaboration to build a sense of national coherence. Such networks should not be restricted to clinical topics but should include collaboration between basic neuroscience and other disciplines.

As part of the new PPP strategy, the foundation welcomes project proposals for networks within all fields of neuroscience.

7. Encourage increased activity in under-represented topics when these are of central importance within neuroscience, especially in developmental and sensory neuroscience.

As part of the new PPP strategy, the foundation welcomes project proposals within these research fields.

8. The Foundation should consider the establishment of an annual Training School in techniques, where graduate students, post-docs and young faculty members could learn advanced techniques.

This initiative is being considered in collaboration with DSfN.

9. Cognitive and behavioural neuroscience, and their interactions with psychiatry, neurology and neuropsychology, and with other non-clinical disciplines, deserve encouragement, perhaps through the establishment of earmarked PhD Studentships, Post-Doctoral Fellowships and grant support.

As part of the new PPP strategy, the foundation welcomes project proposals within these research fields.

10. The Foundation should encourage national discussion about training in neuroscience: 1) expansion of undergraduate teaching in neuroscience; 2) introduction of full undergraduate degrees in Neuroscience; 3) introduction of Master's courses in neuroscience; 4) consideration of the re-introduction of a single year of research for trainee clinicians, leading to an appropriate professional qualification; stricter allocation of full PhD training to those young clinicians who are most likely to continue in clinical research; 4) relaxation of the normal 3-year limit on PhD training in neuroscience.

This is already an ongoing activity.

11. The Foundation could fund a number of 4-year PhD Studentships in Neuroscience, allocated to universities on the basis of proposals for the way in which the additional year would be used constructively to widen the candidates' training.

The foundation is open to proposals from relevant collaborators.

12. Introduce a competitive scheme for post-doctoral appointments for non-clinicians and for clinicians who wish to devote themselves to full-time research for a period after the PhD.

This is a part of the new implemented PPP funding strategy.

13. Organise workshops to explore opportunities to maximise the use of data from the Danish National Registry and other clinical cohorts.

The foundation welcomes proposals for workshops.

14. The Foundation might, together with hospitals, co-fund Clinical Research Facilities (CRFs).

The foundation welcomes proposals for CRFs as part of "Projects" under the new PPP strategy.

15. The Foundation should offer support, on a competitive basis, to establish and maintain tissue banks in association with cohort studies.

The foundation welcomes proposals for establishing tissue banks and has already received one application.

16. Establish a Translational Research Programme, with funding schemes specifically aimed at encouraging basic/clinical interaction: 1) a mini sabbatical scheme to support the interaction between hospital clinical staff and basic research labs; 2) collaborative grants with joint applications from basic and clinical researchers; 3) contributing to the salaries of clinician scientists in order to release time for research.

Already implemented.

17. Issue a call for proposals for disease-specific Research Consortia

Already implemented.

18. Consider issuing a call for proposals under the Network grant scheme (Recommendation 5) specifically for work on applications of digital technology in neuroscience research and clinical application.

The foundation welcomes project proposals within this research fields under "Projects" of the new PPP strategy.

19. Negotiate with XX University about the establishment of a Lundbeck Foundation Neuroscience Institute. The Institute should be quite small, with perhaps 7 research groups. The Foundation should aim to commit no more than about 10% of its annual expenditure to the Institute.

Communicated as an open call under “Projects” in the new PPP implementation. Universities and university hospitals will be invited to send proposals.

20. Allow more freedom for the inclusion of foreign partners or Co-Investigators in applications for existing Lundbeckfonden grant schemes. Establish Lundbeckfonden Visiting Fellowships (junior and senior) to encourage exceptional foreign researchers to come to work in Danish universities and hospitals.

Implemented in the “People” part of the new strategy.

21. The Foundation should enhance its already active programme of communication and engagement and sponsor public debates and discussions in informal settings about ethical questions raised by brain research.

Under consideration.

22. Negotiate with the Danish Neuroscience Society about ways of creating a strong sense of community among Danish neuroscientists.

Has already been (partly) implemented.