

Strategic Research Agenda 2012-2013

NevroNor
– a national strategic initiative for neurosciences research

SUMMARY

Since it was launched in 2006, the primary objective of the NevroNor initiative has been to provide support for Norwegian neuroscience research of top international calibre. To be eligible for funding under the initiative, research must be of relevance to human health and disease. The initiative is designed to facilitate the coordination of funding for research in the neurosciences as well as to strengthen national activities in the field. The initiative will also promote neuroscience research via national meetings and by disseminating information to the research community, research funders and the public at large. Key areas of focus include innovation relating to neuroscience research and the major challenges relating to ageing and health, where dementia and other neurodegenerative diseases, stroke and psychiatric disorders represent the most pressing problems. Efforts are being made to develop the coordinating role of the NevroNor initiative in order to enhance Norwegian neuroscience research activity in the context of international cooperation, both at the project level and through participation in the EU Joint Programme – Neurodegenerative Disease Research (JPND).

The NevroNor initiative is a national strategic initiative for research in the neurosciences. The primary objective of the initiative is to develop knowledge as a basis for improving the prevention, diagnosis and treatment of diseases affecting the brain and other parts of the nervous system. The initiative seeks to enhance the understanding of the aetiology of neurological and mental health disorders and to gain deeper insight into the functions of the brain.

The NevroNor initiative will:

- generate greater insight into the functions of the nervous system in healthy and disease;
- enhance cooperation between clinical, basic and epidemiological research groups in Norway and between Norwegian and international research groups;
- strengthen the ability of Norwegian research groups to succeed in the international competition for participation in multinational projects under Joint Programme Initiatives (JPIs);
- promote networking and help to create meeting-places for Norwegian researchers in the neurosciences;
- enhance value creation through innovation and the development of methods and products for commercial use;
- provide support to research projects that use methodology platforms established in connection with neuroscience research groups;
- provide support to multidisciplinary projects that incorporate research methods from several natural science, mathematics and/or technology disciplines;
- provide support to research projects that further develop and make use of national health registries and biobanks;
- work to ensure that studies incorporate gender and age perspectives;
- work to increase overall allocations to research in the neurosciences.

National initiative

The NevroNor initiative was first proposed at the 2001 national meeting of deans of the faculties of medicine in Norway. The proposal was supported by the Research Council and the regional health authorities. In 2006 the initiative was formally launched by the Research Council with an annual budget of NOK 10-15 million. The faculties of medicine and the regional health authorities have together taken steps to prioritise research on diseases affecting the brain and the nervous system. The national working group for medical and health science research (*Nasjonalt samarbeidsgruppe for medisinsk og helsefaglig forskning (NSG)*) has also assigned high strategic priority to research in this field. The Ministry of Education and Research and the Ministry of Health and Care Services have both given their support to prioritisation of such activities. In 2011 the standing parliamentary committee on health made special mention of the NevroNor initiative. The committee pointed out that neuroscience is a field of medicine in which Norway has particular competitive advantages, although there is a need for further development. The committee stated that research in this field must continue to be given priority.

Needs

Diseases of the brain and nervous system account for one-third of all illness in Norway, and cost Norwegian society some NOK 80 billion annually. These diseases cause suffering and place burdens on patients and their families. Approximately 60 000 Norwegians today are

suffering from dementia, with Alzheimer's disease as the most common form. Approximately 15 000 people suffer a stroke each year in Norway, and 70 000 people are living with significant after-effects of stroke. The occurrence of multiple sclerosis (MS) in the Norwegian population is just over 150 cases per 100 000 inhabitants. There are some 7 500 individuals with MS in Norway, of which a large proportion are under the age of 50. In addition, a large number of individuals suffer from epilepsy, Parkinson's disease, cerebral palsy, traumatic brain injury, and brain tumours.

Mental health disorders are widespread. Anxiety disorders affect around 11 per cent of the population, while several hundred thousand Norwegians suffer from mild depression. The occurrence is higher among women than men. It is estimated that 13 per cent of the population has a personality disorder. Serious mental health disorders such as schizophrenia and bipolar disorder affect 1-2 per cent of the population. The occurrence of anorexia nervosa is relatively rare among all age groups, but has a high mortality rate among young people. The prevalence of depression in the total population is estimated at 5-8 per cent, with this figure doubled (15 per cent) in the elderly. There is a high risk of suicide associated with depression.

Depression and dementia comprise a pressing public health problem at the global level, as they are among the most common mental disorders affecting the elderly. One-half of all individuals suffering from Alzheimer's disease or vascular dementia have symptoms of depression. The situation is complicated even further by multiple morbidity in the elderly.

At present, treatment of the disorders described above is incomplete, and a better research base is needed in order to develop new and study existing treatment methods. It is also crucial to learn more about the significance of early intervention.

The brain is the most complex human organ. Studying the normal function of the brain, brain development and the structure of the brain is a major challenge research-wise. Better mapping and a deeper understanding of the anatomical and functional plasticity of the brain will pave the way for new treatment principles.

Social challenges

An ageing population poses health-related and economic challenges. Brain health is the most critical factor for functionality and activity level in the later years of life. Research activities targeting the elderly must incorporate a significant focus on the ageing of the brain and the nervous system, and on diseases of the brain.

Children and adolescents represent the future. Diseases affecting the developing brain can have a major impact on the subsequent development of mental health and somatic disorders among these age groups. Therefore, neuroscience research targeting children and adolescents, as well as foetal development, is vital.

Achieving medical research of high international calibre is dependent on organised cooperation in the form of larger research groups and networks that employ a wide range of methods. Clinical research must be carried out in close, binding cooperation with researchers in other bioscience disciplines. Norway's national health registries are a unique resource that must be updated, further developed and utilised in research.

Neuroscience research must promote value creation in society. The potential for innovation inherent in new research findings must be assessed by organisations with close links to the research community and research institutions. In this context, the Nansen Neuroscience Network represents a national resource for the field.

It is essential to focus adequate attention on the ethical aspects of neuroscience research. This applies to issues such as the creation of data linkages between an individual's health data, information on future health risks, genetic data, choices associated with therapeutic opportunities, cost-benefit analyses and global challenges.

Expertise

Evaluations carried out by the Research Council show that Norway has neuroscience research groups at the international forefront. This applies in particular to clinical environments in the fields of neurology, neurosurgery, psychiatry and psychology, research groups specialising in imaging techniques, and basic neuroscience research groups that collaborate with research groups in the fields of physics, chemistry and informatics. Health and disease registries comprise a unique resource, and there is top expertise in utilising these registries in relation to neuroscience research.

The overall level of expertise in Norway is reflected in the high representation of neuroscience research centres in various specialist schemes, such as the Centres of Excellence (SFF) and Centres of Research-based Innovation (SFI) schemes, the Kristian Gerhard Jebsen Foundation and the Kavli Foundation, and as national competence centres and centres affiliated with EU networks. Several neuroscience centres are closely affiliated with national methodology platforms. For example, the NORBRAIN methodology platform (Norwegian Brain Initiative: A Large-scale Infrastructure for 21st Century Neuroscience) links together two SFF centres and one SFI centre in the neurosciences.

Strategic perspectives

- The Strategy for the Research Council of Norway 2009-2012: *In the Vanguard of Research* [1] states that research must seek to respond more directly to social challenges and that international cooperation must be further developed. The Research Council places priority on funding national and international research projects that generate new knowledge about prevention and treatment of illnesses with major negative impacts for society.
- The Research Council of Norway's *Policy for Medical and Health Science Research 2007-2012* [2] emphasises the importance of enhancing quality in research, expanding dialogue between research and society, and increasing internationalisation of Norwegian research.
- *Nevroplan 2015* [3] points out that relatively modest investment in research and development activities in the field of neurology has generated new insight into neurological disorders and enhanced understanding of the regenerative capacity of the brain and nerve cells. The plan also underlines the need for much greater investment in research and scientific development in order to acquire new knowledge to improve the health services available to individuals suffering from neurological damage and disease and their families.
- In the Research Council's *Evaluation of Biology, Medicine and Health Research in Norway (2011)* [4] the three panels that evaluated Norwegian neuroscience research groups all emphasise the strength of this field. The panel on physiology-related disciplines states that there are several outstanding research groups at the international forefront of

neuroscience. The panel on clinical research disciplines points to neurology as an area in which excellent research is being conducted. The panel on psychology and psychiatry concludes:

The successful area in Norwegian research in psychology and psychiatry lies within neuroscience, with a special focus on cognition or psychiatric disease presentation, studied with brain imaging methods in normal and psychiatric populations. Thus, the world-wide interest and expansion of neuroscience, with brain imaging techniques becoming increasingly available to researchers, allowing research questions previously not investigated to be studied, is also evident in Norway. These factors have contributed to attracting young researchers, facilitating competition, and, in turn, to excellent scientific quality. To maintain the high scientific quality is not only important from a scientific viewpoint, but also from a practical perspective as it generates critical clinical knowledge concerning brain function, plasticity, and rehabilitation. The future should also be bright for research units utilising the impressive longitudinal population-based databases and biobanks, which together with national health population registries provide possibilities to do research not possible to do elsewhere. It is important that these assets are fully utilised, maintained, and protected.

- “Active and healthy for many years” [5] is the largest of the five priority areas in the Research Council’s input to the 2013 national budget. The proportion of elderly people in the population is growing, and more and more individuals will need health and care services. This in turn means there is a need to keep people in working life for longer. Research activities in this priority area are intended to provide knowledge for solving these social challenges by promoting the achievement of two of the five strategic goals set out in the government white paper on research (Report No. 30 (2008-2009) to the Storting: *Climate for Research*): *Better health and health services* and *Addressing social challenges and providing research-based practice in the relevant professions*. The objective is to ensure that as many people as possible live longer healthy lives and participate in the workforce for as long as possible. An increase in research on illnesses that primarily affect the elderly is recommended, specifically research in geriatric medicine with special focus on dementia disorders and mental health problems. Research that addresses the challenges arising from these changes in demographics, both in terms of the illness panorama and cost-effectiveness, is to be strengthened at the national level as well as through participation in relevant pan-European initiatives such as JPIs. The NevroNor initiative and participation in the EU Joint Programme – Neurodegenerative Disease Research (JPND, described below) [6] fall under the priority area “Active and healthy for many years”.

International initiatives

The Research Council of Norway’s Strategy on International Cooperation 2010-2020 [7] states that all national research programmes must include clearly-defined objectives and plans for international cooperation, that Norway should participate in joint programmes across national boundaries, and that the Research Council will focus greater attention on international cooperation and researcher mobility in its internal grant application review processes.

Focus on neuroscience research under EU research programmes is growing. The amount of research in the neurosciences has increased more than in any other type of medical research under the EU Seventh Framework Programme. There have been targeted initiatives in the other Nordic countries to strengthen neuroscience networks and research clusters. Diseases

affecting the brain and nervous system constitute one-third of the disease burden in wealthy and poor countries alike, although the illness panorama varies. The NevroNor initiative has international contacts and seeks to serve as a link between national and international research initiatives.

Norwegian researchers in the neurosciences and psychiatry engage in extensive international cooperation; there is, however, potential to boost such cooperation considerably. Allocations from the NevroNor initiative to Norwegian researchers under joint calls for proposals under the JPND [6] will be increased (for a larger number of projects and/or a larger Norwegian share in projects) as a means of enhancing collaboration between Norwegian and international researchers in the area of neurodegenerative diseases.

The JPND is a European-wide initiative designed to address one of Europe's most pressing social challenges, i.e. neurodegenerative diseases. A common JPND Research Strategy [8] has been drawn up, the ultimate goal of which is to find a cure for neurodegenerative diseases. One of the secondary goals is to achieve early detection and effective therapies. Norway is participating in one of the first four JPND projects, organised under the auspices of the NevroNor initiative.

The *International Neuroinformatics Coordinating Facility* (INCF) [9] was established to develop an international neuroinformatics infrastructure to promote research in the field. Norway established an INCF National Node in 2006. Membership fees and operating costs are covered over the budget of the NevroNor initiative. The NevroNor management board is responsible for following up the National Node.

The role of the management board – quality assurance of grant awards

The Research Council, via the NevroNor management board and administration, is responsible for administering the NevroNor initiative. The management board is responsible for ensuring that the initiative achieves its stipulated objectives, and that its activities are implemented in a scientifically justifiable manner and as efficiently as possible. As the allocating body, it is the management board's responsibility to issue funding announcements, process grant applications, allocate grant awards, and follow up and review annual progress reports and final reports submitted by the research projects.

Research projects must be of high scientific quality if they are to help to reduce the prevalence of disease and promote good health. The Research Council ensures that the research projects awarded funding are of high scientific merit by allocating funding in a national competitive arena and employing well-established procedures for processing and assessment of grant applications. In addition to focusing on the quality of the research projects, the management board will also implement any strategic actions needed.

The Research Council attaches great importance to openness and transparency in the grant application review process. Information on all assessment criteria to be employed and any requirements of a strategic nature is provided to applicants in the funding announcement. It is essential that the research community has confidence in the fairness of the funding decisions. The Research Council strives to instil confidence by implementing stringent regulations and exercising discretion when handling issues relating to impartiality in application assessment.

Detailed regulations on impartiality and confidence in the Research Council of Norway may be found on the Research Council website [10].

Cooperation and dialogue

The NevroNor initiative will cultivate close dialogue with the other health science research programmes at the Research Council, primarily the *Research Programme on Mental Health (PSYKISKHELSE)* [11]. In addition to addressing thematic areas of overlap with the PSYKISKHELSE programme, the NevroNor initiative may share an interface with the *Research Programme on Health and Care Services (HELSEOMSORG)* [12], the *Research Programme on Clinical Research (KLINISKFORSKNING)* [13], the *Research Programme on Public Health (FOLKEHELSE)* [14], and the *Research Programme on Human Biobanks and Health Data (BIOBANK)* [15]. The *funding scheme for independent projects (FRIPRO)* [16] may also award funding to projects that lie within the thematic scope of the NevroNor initiative.

The NevroNor initiative will actively seek cooperation with the Nansen Neuroscience Network (NNN) [17] and Hjernerådet (Norwegian Brain Council) [18]. One of the primary objectives of the Norwegian Brain Council is to promote research on the brain and diseases of the brain. The council consists of patient organisations, professional organisations and leading research groups, and has roughly 100 000 members. The Nansen Neuroscience Network was founded to promote innovation and commercialisation in the neurosciences. Its members include researchers and industry players.

References

- [1] Strategy for the Research Council of Norway 2009-2012, *In the Vanguard of Research*;
<http://www.forskingsradet.no/servlet/Satellite?c=Page&cid=1185261825635&pagename=ForskingsradetEngelsk%2FHovedsidemal>
- [2] The Research Council of Norway's Policy for Medical and Health Science Research 2007-2012;
<http://www.forskingsradet.no/servlet/Satellite?c=Page&cid=1185261825639&pagename=ForskingsradetEngelsk%2FHovedsidemal>
- [3] Nevroplan 2015 (Norwegian only) (Sub-plan of Report No. 25 to the Storting (2005-2006): *Long Term Care – Future Challenges*. Care Plan 2015);
www.regjeringen.no/nb/dep/hod/dok/rapporter_planer/planer/2011/nevroplan-2015.html?id=666747
- [4] The Research Council of Norway's Evaluation of Biology, Medicine and Health Research in Norway (2011);
http://www.forskingsradet.no/en/Article/Evaluation_of_biology_medicine_and_health_research_in_Norway_2011/1253973428815
- [5] The Research Council proposed priority area "Active and healthy for many years";
<http://www.forskingsradet.no/servlet/Satellite?c=Page&cid=1185261825666&pagename=ForskingsradetEngelsk%2FHovedsidemal>
- [6] EU Joint Programme – Neurodegenerative Disease Research (JPND);
www.neurodegenerationresearch.eu
- [7] The Research Council of Norway's Strategy on International Cooperation 2010-2020;
http://www.forskingsradet.no/en/International_strategy/1253964686548
- [8] The JPND Research Strategy;
www.neurodegenerationresearch.eu/news-events/general-news-events/news-article/?no_cache=1&tx_ttnews%5Btt_news%5D=62&cHash=423ff02e25b1700250f211a8bcc85227
- [9] International Neuroinformatics Coordinating Facility (INCF);
www.incf.org
- [10] The Research Council of Norway's Regulations on Impartiality and Confidence;
<http://www.forskingsradet.no/servlet/Satellite?c=Page&cid=1138882216256&pagename=ForskingsradetEngelsk%2FHovedsidemal>
- [11] *Research Programme on Mental Health (PSYKISKHELSE)*;
http://www.forskingsradet.no/prognett-psykiskhelse/Home_page/1228296355762
- [12] *Research Programme on Health and Care Services (HELSEOMSORG)*;
http://www.forskingsradet.no/prognett-helseomsorg/Home_page/1226994198614
- [13] *Research Programme on Clinical Research (KLINISKFORSKNING)*;
http://www.forskingsradet.no/prognett-kliniskforskning/Home_page/1228296189408
- [14] *Research Programme on Public Health (FOLKEHELSE)*;
http://www.forskingsradet.no/prognett-folkehelse/Home_page/1222932153091
- [15] *Programme on Human Biobanks and Health Data (BIOBANK)*;
http://www.forskingsradet.no/prognett-biobank/Home_page/1253972329995
- [16] *The funding scheme for independent projects (FRIPRO)*;
http://www.forskingsradet.no/prognett-fripro/Home_page/1226994096426
- [17] Nansen Neuroscience Network (NNN);
www.nansenneuro.net

[18] Hjernerådet (Norwegian only) (Norwegian Brain Council);
www.hjerneradet.no