

Research assessment
Research Institute Brain and Cognition
University Medical Center Groningen
2015-2021

19 April 2022

Summary SEP assessment of the Research Institute Brain and Cognition (B&C)

The committee finds B&C research to be at a very good to excellent level with many faculty members who are world-leading experts. The very high level of productivity, significant impact, international and interdisciplinary nature of the work are applauded, as are the warm environment and excellent infrastructure which facilitate these. The PRC praises B&C's mission to translate basic research to clinical results, the high number of clinical trials and commitment to involving patients, all of which have resulted in innovative work. The levels of funding, tenured staff and PhD students have been stable during the evaluation period, but encouraging investigator-led grants is advised. The committee finds PhD training and newly-initiated postdoc support to be excellent, and overall, the committee highly values that the focus is on the quality of PhD supervision rather than on unlimited growth. Though the institute has reframed its research aims and successfully restructured in order to deliver on its mission, this situation may not be viable given the UMCG's matrix structure. and the PRC advises to monitor this closely. A key element contributing to B&C's high viability is the quality of its leadership, the value that is placed on teamwork and mentoring, and strong and fair people management. Finally, the committee is very impressed with the cohorts and 'Benches-to-bedside' translational efforts which are extremely important for the Institute's future. As a result, further enhancing clinical-preclinical collaboration and making optimal use of cohorts should be a priority.

Research Quality

- Continue to develop new innovative projects and make the most of the prestigious funding opportunities available, using the cohort data to 'harvest' on.

Societal relevance

- Develop a clear vision, goals and expectations for societal impact, and install infrastructure to proactively support and manage the impact pipeline.
- Further enhance participation of patients and families.

Viability

- Work around thematic transdiagnostic topics to further tie up clinical-preclinical interaction and collaboration, and generally support opportunities for interaction.
- Make seed funding available to spark new areas of research and new collaborations particularly in areas involving clinical staff.
- Improve the network function of B&C for researchers at postdoc and assistant-professor level, broaden approaches to diversity to include neurodiversity and ethnicity, improve clarity of different career tracks and continue to work on shortening PhD duration.

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Assessment of the Research Institute Brain and Cognition (B&C)

1. Introduction to the Institute

The Research Institute Brain and Cognition (B&C - formerly known as BCN-BRAIN) was founded in 2005. It performs fundamental, translational and clinical neuroscience research. The Institute currently comprises four research programmes: Clinical Cognitive Neuropsychiatry Research programme (CCNP), Molecular Neuroscience and Ageing Research (MOLAR), Movement Disorders (MD), and Perceptual and Cognitive Neuroscience (PCN). It trains its own master's and PhD students, and is part of the Interfaculty Research School of Behavioral and Cognitive Neurosciences (BCN). B&C is directed by a management team (MT), consisting of a Scientific Director (prof. Iris Sommer), three B&C researchers (Prof. Joukje van der Naalt, Prof. Joke Spikman, and Marie-José van Tol, PhD), who represent clinical, translational and basic research, respectively, and a staff advisor of the UMCG. Each programme is led by two programme leaders. Together with the MT, they are responsible for the management and policy decisions involving research. In 2020, the research staff associated with B & C consisted of 58 tenured members of staff (19.0 FTE), 20 postdocs and 181 PhD students.

2. Aims and strategy

During the evaluation period, B&C's mission and vision have been to promote research aimed at understanding the function of the healthy brain and dysfunction of the brain and mind as it develops over lifetime (the 'Ageing Brain'). As such, B&C implements the Healthy Ageing focus of the UMCG and University of Groningen from a neuroscientific perspective.

As many aspects of brain function, perception and the psyche are still unknown, fundamental research is an integral part of B&C. In addition, developing new diagnostic and therapeutic tools is an important aim. With this goal in mind, translational collaborations between lab-based and hospital-based researchers integrate different levels of neuroscience research, including clinical research.

Following the comments of the former peer review committee (PRC, SEP 2009-2014) B&C formulated six strategic goals for the past review period:

1. Establish a new B&C programme structure to strengthen the position and increase the visibility of neurosciences research within the UMCG;
2. Stimulate translational and trans-diagnostic research, including clinical research
3. Improve the quality of neurosciences research proposals to strengthen the ability to acquire funding;
4. Maintain excellent quality of training and support for PhD students;
5. Improve communication with and involvement of patients, caregivers and the general public through the 'Marvelous Mind'-initiative;
6. Enhance accessibility and visibility of B&C researchers, their research projects and output.

For the next six years, a new mission has been developed ('understand better, treat better'). B&C aims to further improve its understanding of the brain, perception and mental functioning and use that knowledge to develop more effective treatments with the aim of offering tomorrow's patient more than the patient of today. In its vision, B&C emphasizes that research and care are inextricably linked. Fundamental research can contribute to prevention and treatment, thereby reducing the demand for care. B&C sees itself as a central part of the UMCG, as the care for the brain and its functions is an integral part of UMCG patient care.

Research within the UMCG is based on three pillars: prevention; mechanisms of disease; and innovative diagnostics and treatment. B&C focuses mainly on the latter two. The strategy is to acquire fundamental knowledge about the brain, to investigate mechanisms that lead to disease and its progression, which leads the way to the development and implementation of innovative and more effective interventions. This can then in turn also inform primary and secondary preventive approaches. At B&C disorders are treated as part of close collaborations between clinical and pre-clinical researchers. The focus is not on specific diagnoses or syndromes, but on mechanisms that transcend the diagnosis and the translation from pre-clinic to clinic.

3. Qualitative Evaluation

The well-prepared, comprehensive critical reflection and the open nature of the interviews allowed the committee to gain in-depth insight into the quality of research, the societal impact and viability of B&C. The committee was very much impressed with the constructive, inspiring and insightful conversations it had with all of the representatives of B&C.

Research quality

B&C has succeeded in creating a natural home for people interested in brain functioning, attracting researchers from different departments and disciplines across the clinical-preclinical spectrum. The committee considers B&C's warm, dynamic, and involved research environment as a key element contributing to this achievement. In speaking to the different groups of interviewees, the image clearly emerged of a leadership that embodies an atmosphere of sharing and collaboration, allowing the institute's community of researchers and its stakeholders to participate in developing the organization. By moreover ensuring that the infrastructure is available for conducting innovative neuroscience research and by attracting high-quality staff that fits B&C's culture, the stage has been set to perform research at the highest level.

The clinical-preclinical collaboration is key for B&C to be able to implement its strategy, which is why the committee addressed this topic with different groups of interviewees. It concludes that the reduction of the number of programmes from nine to four has been effective. B&C's researchers reported to be involved in B&C's community and explained that B&C's current structure provides ample opportunities for cross-fertilization of research efforts. In this sense, B&C seems to be successfully implementing its ambition to stimulate collaboration. The documentation clearly demonstrates that, as a result, very innovative work is being done across the continuum of preclinical-clinical research, often involving clinical trials. Examples include the single-cell level characterization multiple sclerosis from brain tissues by the Eggen-de Vries team; the use of psychedelics in treatment-resistant depression by the Schoeven's group; the development of a virtual reality tool to treat psychiatric symptoms and improve psychological well-being by the Veling Lab; professor Sommer's work on antipsychotic medication after the first episode of psychosis (as part of the HAMLETT network); the development of a multifaceted treatment protocol for impaired social cognition and social behavior by professor Spikman's team; and the GAME-project to improve hearing and functioning by professor Baskent's group. Another noteworthy example is the "No Guts No Glory" project that received a 1 million Euro award from the Dutch Brain Foundation. Such projects can only be achieved under a research institute organized and structured to foster transdisciplinary collaborations. In this context, B&C has been very successful. The committee considers B&C's work with deeply phenotyped clinical cohorts with longitudinal follow-up across several of the programmes as a real strength, with the Lifelines cohort as just one example.

B&C investigators moreover develop or utilize a wide range of cutting-edge, innovative research tools and methods (e.g. single-nuclei transcriptomics; the development of novel tools for ageing research, including iPSC cell systems; high resolution technologies for deep phenotyping of cells and systems in the context of disease processes; novel imaging techniques and PET ligands; neurogenetics and cell biology research). These efforts have resulted in innovative translational research that demonstrated the feasibility of going from preclinical labs to clinical trial stages.

The committee also noted that B&C's researchers are well linked up internationally. The programme leaders provided many and diverse examples of topics they collaborate on, explaining that there are varying roots for and forms of collaboration. Researchers are part of international research societies or find international partners that are working on specific topics. They then subsequently work towards acquiring large collaborative grants together, such as multiple Horizon2020 Innovative Training Networks, often leading to networks that last even beyond the collaborative grant. Importantly, all PI's of B&C have their own network.

Research at B&C continues to be performed at a very good to excellent level, and many faculty members of B&C are world-leading experts in their respective areas. Objective evidence for this high quality and international standing is the consistent performance of B&C at a very high level of productivity. B&C researchers have authored a high number of impactful peer-reviewed publications, many of which reflect the collaborative and interdisciplinary nature of the work conducted at B&C. The publications also show that B&C's researchers are part of productive international networks. The committee appreciates that B&C values a wide range of outputs, achievements, and measures of success, and does not limit itself to traditional quantitative measures. Instead of focusing on citation counts for impact, B&C values open access to disseminate knowledge widely. This is in line with B&C's mission to 'understand better, treat better'.

Indicative of B&C's standing and external visibility are moreover the marks of recognition by peers. Between 2015 and 2020, B&C members have received prestigious prizes in a wide range of disciplines. Notably, the Dutch Brain Foundation awarded a 1 million Euro award to B&C researchers for their proposal "No Guts No Glory". Other noteworthy examples include the Research Harmonisation Award, received by professor Wim Veling in 2020 by the Schizophrenia International Research Society; and the Young Heineken Prize 2018 and Early Career Award from the International Neuropsychological Society, both of which were awarded to Dr. Marie-José van Tol in 2018. It has to be noted that most of the awards and prizes that are listed in the self-evaluation report came from Dutch organizations and foundations. In the future, it would be strategic to aim for a broader international recognition. This might require a more proactive approach by B&C and the UMCG. Nominating colleagues more often, especially junior investigators and women, for prizes and awards, is an approach worth considering.

B&C has managed to keep the levels of funding stable during the evaluation period. In the review period, B&C received on average about 10 million Euros per year. Although the largest proportion of funds come from the university (between 44-50%), funds from individual research grants are also considerable. Notably, in 2017, four researchers received large grants, which boosted the funding level significantly. Nevertheless, the committee sees opportunities to encourage and enable B&C researchers with the right profile to apply for investigator-led prestigious funding opportunities available, such as ERC, NWO and Human Frontiers of Science. A potential pipeline towards obtaining these grants are the cohort data, which can now be harvested on. Building collaborations and consortia are also key in order to obtain large collaborative grants (e.g. the Innovative European Training Networks already mentioned above). The committee highly appreciates that support for grant writing, especially for junior staff, is available and is actively being used.

The committee noted that B&C provides excellent training for PhDs. It welcomes that postdoc-support has also been initiated in the review period. B&C management sees an optimum to the growth of the Institute, which implies that unlimited growth of the number of PhD students is not an ambition. The committee highly values this, as this will have a further positive impact on the quality of supervision. Levels of defended PhDs have also remained stable over the review period, yet the committee encourages B&C to continue to look for ways to ensure that more students finish in four years. This issue of long PhD duration in some cases is clearly on the radar and is also a priority in the UMGC-wide GSMS. The committee welcomes the plans to address this in interaction with PhD students and supervisors, and to add a mentor to the Student Advisory Committee. This member of the academic staff would be independent of the PhD project and help to adequately scope the PhD project. This will have a positive impact on the duration of the PhD.

Societal relevance

Societal relevance is key in B&C's mission, vision and strategy. The central research topics of healthy ageing and the brain are clearly societally relevant, and B&C's mission is to translate basic research to clinical results that impact the public directly and indirectly. As such, B & C clearly has considerable opportunity and potential for societal impact.

Overall, B&C has made a concerted effort to reach out to society on multiple levels. B&C researchers are invested in developing novel treatments. The Institute conducts translational research and clinical trials to improve the brain health of the public. The committee welcomes the high number of clinical trials compared to fte tenured staff. Clinical trials are required to improve treatments and diagnosis, yet they are effort-intensive and time consuming. The engagement in clinical trials, as described above ('Research quality') clearly shows B&C researchers are committed to developing more effective diagnostic tools and better treatments. Also, they have shown that they are able to recruit sufficient patients to run these studies.

B&C is also actively engaged in disseminating their scientific findings and educating the public, using a wide range of venues, events and methods. B&C researchers have authored several bestseller books. The committee highly appreciates that a lot of attention is given to publications in Dutch for practitioners, patients and families and other stakeholders to consult. The committee was especially impressed with the Marvelous Mind-initiative, which was recently awarded a KNAW grant to promote science communication. B&C has been recognized for their efforts by the Dutch Brain Foundation.

B&C has made concerted efforts to engage with relevant stakeholder groups in order to work with them on impact. The Institute is keen to bring people with lived experience into its research programme. Nevertheless, participation of patients and families in the Institute could be further enhanced to increase societal relevance.

In conclusion, B&C has access to extensive resources and pathways to societal impact. It has a considerable portfolio of assets including technologies, know-how, and patient cohort data. These assets are now being developed for societal impact. Early successes include improving hearing and functioning in children and adults; and the treatment protocol for impaired social cognition and social behavior. The quality and relevance of B&C research would benefit from putting in place pathways and support to nurture and proactively manage the impact pipeline. On an overarching level, B&C would benefit from an impact vision, defining more clearly the societal impact it aspires to, and setting clear goals and making explicit expectations. B&C is ideally situated to invest in long-term high impact projects that may not produce immediate results but are likely to lead to better brain health.

Viability

B&C has a strong mission statement, with clear purpose. Its viability largely depends on its ability to increase our understanding of the etiology, course and outcome of a wide range of brain disorders and to translate scientific discoveries to viable, effective treatments. The innovative work B&C is doing, the effective collaborations between preclinical and clinical units, and the investment in clinical trials in order to improve treatments for brain disorders support the viability of B&C. The committee was very impressed with the cohorts, which will yield important findings down the road. 'Benches-to-bedside' translational efforts are extremely important for the future viability of B&C, which is why the committee welcomes that further enhancing clinical-preclinical collaboration and making optimal use of the clinical cohorts is a priority in years to come. As is already on the radar of the B&C, working around thematic transdiagnostic topics (e.g. gut-brain, mental fatigue, motivation), rather than diseases, is a next step to further allow his collaboration to flourish.

Since the last site visit the Institute has reframed the research aims and has been able to successfully restructure in order to deliver on its mission. The committee appreciates that although B&C currently sees no need to further restructure, research programmes are dynamic in nature. This allows for proactive evolution, following the talents present at B&C on the one hand, and evolutions in science and society on the other. B&C's programme leaders are currently also heads of department. This means that the ambitions of B&C and the departments are well-aligned and that collaboration runs smoothly. Although the committee agrees that this reflects positively on B&C's viability, it also notes that the current situation is not guaranteed in the future. As a result of UMCG's matrix structure, goals might be less well-aligned in future. This should be monitored closely.

B&C has been successful in the review period in its ambition to serve as an interface for collaboration and interaction for people interested in brain research. However, going forward, the committee sees opportunities for improvement. First, whereas the network function of B&C seems to be in place and working well for PhD- and PI-level researchers, postdoc and assistant professor level staff are not as consistently supported or networked. Given that they are at a particularly difficult stage of their career, it would be important to strengthen B&C's commitment to this group. Second, there are opportunities to provide more incentives to tie clinical and preclinical research. Currently, the Institute does not have sufficient funding and structure to realize this. A budget for seed money made available to spark new areas of research and new collaborations, particularly in areas involving clinical staff, may be an important first step. Third, existing collaboration between institutes should be fostered and strengthened.

A key element contributing to B&C's high viability is the quality of its leadership and the value that is placed on teamwork and mentoring. The Institute's director is a role model in outreaching, gaining visibility, and mentoring, the importance of which cannot be overestimated. The committee was very positively impressed by B&C's focus on teamwork. This is where the future of science lies. The way the clinical cohorts, and the work behind them, are valued, fits perfectly with B&C's teamwork culture.

B&C shows strong and fair people management. The committee welcomes that B&C proactively approaches the balance between the different career levels. The management team pointed out that growth is not an aim in itself and that they aim to achieve the optimal balance between full, associate, assistant professors, postdocs, PhDs. B&C is constantly looking for equitable ways for funding distribution, which is especially important for early career researchers and clinicians. Postdocs and assistant professors feel supported, are mentored and are stimulated to establish their own research line. They feel well-supported in grant applications, both by the central UMCG-services

and by senior colleagues. The committee explored the new promotion system that is currently being deployed within the UMCG, and learned that the diversification of careers is widely appreciated by B&C staff. Nevertheless, the committee advises to provide more clarity and transparency concerning the different individual career tracks.

Gender diversity at B&C is improving, especially at the PhD and junior staff level. The committee is positively impressed by the fact that the MT consists of 80% women. However, in the programme leaders in charge of scientific programme direction this diversity is not yet present. The committee sees room for improvement in developing clear and dedicated B&C approaches to diversity, that go beyond individual PI efforts. B&C needs to take ownership of its own diversity policy, in addition to UMCG-wide initiatives to improve diversity. Also more variety in approaches to diversity (not only gender, but also ethnic diversity, neurodiversity etc.) could be considered.

The Institute is viable and stable in terms of funding, tenured staff and PhD students. Although B&C has managed to keep the funding levels stable in the past period, it would be ideal to acquire more research funding to enhance all the research efforts. Reflecting positively on viability, is furthermore that B&C is accessing UMCG central resources like the talent track and support for PhD training.

Throughout the site visit, the committee noted that potential points of improvement the committee identified are mostly firmly on the radar of B&C, which reflects very positively on the Institute's viability.

4. Recommendations

Quality

- Continue to develop and create optimal opportunities for new innovative projects.
- Make the most of the prestigious funding opportunities available, using the cohort data to 'harvest' on.

Societal relevance

- Develop a clear vision for societal impact, with clear goals and expectations.
- Put in place pathways and support towards societal impact and support in order to proactively manage the impact pipeline.
- Further enhance participation of patients and families.

Viability

- Work around thematic transdiagnostic topics to further tie up clinical-preclinical interaction and collaboration.
- Make seed funding available to spark new areas of research and new collaborations particularly in areas involving clinical staff.
- Support existing informal and formal opportunities that foster individual and group interactions in order to further enhance collaborative activities.
- Improve the network function of B&C for researchers at postdoc and assistant-professor level.
- Improve approaches to diversity, so as to include neurodiversity and ethnic diversity.
- Improve clarity and transparency of different career tracks.
- Continue to work on improving the duration of the PhD.