Research assessment of the Maastricht School for Mental Health and Neuroscience MHeNs (2015-2020)

Report of the External Review Committee

Preface

November 15 and 16, 2021 an international external review committee visited MHeNs School for Mental Health and Neuroscience in Maastricht. Unfortunately, due to new COVID-19 measures introduced twenty-four hours before the site visit, a part of the program was canceled. Despite these last-minute adjustments, the committee got a warm welcome and experienced a well-organized site visit at the Faculty of Health, Medicine, and Life Sciences and at the Maastricht conference center MECC.

The committee wishes to thank the school's management, the board of the faculty, Ph.D. candidates, and all staff who were involved in the two-day evaluation of MHeNs. Having an inside look at the institute was of great added value to support the committee's findings in response to the school's self-evaluation report.

The committee has experienced the open and positive atmosphere within the school as pleasant and hopes that its recommendations can and will be supportive and useful to further improve the research and research strategy of MHeNs.

Professor Guillén Fernández,
Chair

February 2022

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1 EXECUTIVE SUMMARY

This report, based on the outcomes of an external review of the School of Mental Health and Neuroscience (MHeNs), presents the findings and recommendations by the external review committee (further to be mentioned 'the committee'). MHeNs is one of the six graduate schools of the Faculty of Health, Medicine, and Life Sciences (FHML). MHeNs covers mental health research and clinical neurosciences. The renewed Strategy Evaluation Protocol (2021-2027)[1] was the committee's guideline in assessing the performance based on three key assessment criteria; 1) research quality, 2) societal relevance, and 3) viability of the unit in qualitative terms. The assessment included both the school as a whole and its three research divisions. Furthermore, following the SEP, the committee incorporated four specific aspects in its assessment: a) open science, b) Ph.D. policy and training, c) academic culture, and d) human resources policy (e.g. diversity and talent management). The external committee consisted of seven members and was chaired by Professor Guillén Fernández. The review process included a self-evaluation report prepared by the school and a site visit by the committee on November 15 and 16 2021.

Conclusions

Over the past six years, MHeNs has developed impressively, with nearly doubling of grant revenue and an increase in permanent academic staff of almost 50%. Its strength lies in the close interaction between clinical and basic research. At the same time, organizing this interaction is also a challenge. Strategic alignment among many entities (university, faculty, MUMC+, BNC, departments, themes, pillars, and research groups) appears difficult. However, focusing all activities on themes and pillars has already led to a significant increase in the number of interdepartmental grants. It also provides graduate students with training opportunities outside their department. School staff may identify opportunities that can be used to reduce the fragmentation further. Also, better alignment with the departmental structure and this matrix could lead to a clearer structure with more focus. In general, the committee assessed the research quality of the MHeNs as being at the highest international level. The committee was impressed by the rigor with which the research presented was conducted, its originality, and the value created for science, but especially for healthcare and population health. Research at MHeNs appears to be an excellent example of how a university medical center can direct its research toward societal impact.

Recommendations

The committee makes several recommendations. Concerning **research quality**, the committee recommends that the university establishes clearer regulations and mechanisms for the supervision, training, mentoring, and monitoring of scholarly quality/integrity of external graduate students. Concerning **viability**, the committee recommends that optimal research infrastructure, or at least optimal use of existing infrastructure, is facilitated. In addition, the committee believes that the internal funding model could be optimized in terms of balancing base and external funding better. The **societal relevance** of its research is already excellent, though the school could involve patients better in strategy development. In terms of **human resource policy**, the school could be better prepared for senior staff succession. To reduce (financial) risks at the individual level, the school could guarantee full contracts for each applicant instead of pre-AIO contracts. Regarding equal opportunities and **diversity**, the committee recommends developing a program at the school level to include diversity in leadership positions rather than just following university policy. Another important human resources issue is that early and mid-career researchers have the opportunity to invest more time in developing their skills. In terms of **academic culture**, the school seems to be a psychologically safe environment, and the initiatives taken in Division 3 could be a good example for the other divisions.

[1] SEP: The Strategy Evaluation Protocol (SEP) describes the aims and methods used in order to assess research at Dutch universities as well as at NWO and KNAW institutes every six years.

2 GENERAL SECTION

2.1 Background and outline of the review process

This report is based on the outcomes of an external review of the School of Mental Health and Neuroscience at the request of the Executive Board of Maastricht University, and commissioned by an external review committee (further to be mentioned 'the committee'). The international committee was formally installed by the dean of the Faculty of Health, Medicine, and Life Sciences (FHML), Professor Annemie Schols, on November 15, 2021. The board of the faculty specified the objectives and criteria of the assessment, the schedule of the assessment procedure and reporting, and the responsibilities of the committee in the terms of reference. The terms of reference were sent to the committee on September 20, 2021.

In the terms of reference the committee was requested to assess the research quality, relevance to society, and strategic targets of both the school as a whole as well as its three research divisions. The evaluation is based on the research school's ambitions and strategy in the previous six years (from 2015 till 2020) as well as the strategy for the future six years. Specifically, the committee was asked to judge the performance of MHeNs based on the main assessment criteria in the Strategy Evaluation Protocol (2021-2027); 1) research quality, 2) societal relevance, and 3) viability of the unit. When evaluating these criteria, the committee was asked to incorporate four specific aspects: a) open science, b) Ph.D. policy and training, c) academic culture, and d) human resources policy (e.g. diversity and talent management).

2.2 The review committee and the procedures

The review committee was composed of the following members:
- Professor Guillén Fernández (chair)
- Professor Gré Luyten
- Professor Martin Korte
- Professor Alfons Schnitzler
- Ass. Professor Eirini Karyotaki
- Dominika Šulcová
- Petra Uittenbogaard (appointed secretary to the review committee)

All members of the committee signed a statement of impartiality. In this statement, the members declare that they have no direct relationship with MHeNs. Additional information and a short curriculum vitae of the committee members can be found in annex 1.

Before the two-day site visit, the committee received well-documented and well-presented information that meets the standards of the new Strategy Evaluation Protocol 2021-2027:

- Self-assessment MHeNs 2015-2020
- Terms of reference External Review MHeNs 2015 – 2020
- Statement of impartiality
- Self-evaluation Report 2015-2020
- Self-Evaluation Report 2009 – 2014
- Evaluation 2009 -2014; Report of the External Review Committee
- Annual report 2020 and other years
- Program of the site visit
- SEP protocol 2021-2027

The review process included a self-evaluation report prepared by the school and a site visit by the committee on November 15 and 16 2021. In its report, 'MHeNs Self-Assessment 2015-2020', the school presents its research strategy and strategic process over the past six years. Furthermore, the school reports on the accomplishments and results over the past six years, and the follow-up of the recommendations of the previous assessment. Finally, the school presents its strategy for the next six years period, based on a SWOT analysis. The committee received additional information during the site visit; all handouts of the presentations given by MHeNs researchers and an overview presenting the facts and figures of the school in a nutshell.

In preparation for the site visit, the committee had three online meetings. In their meetings, the committee agreed on a division of tasks for reading the report, for writing comments on it, and for the lab visits during the site visit (see below). The two-day visit was concluded with a feedback session of the preliminary findings and recommendations of the committee by Professor Fernandez, in the presence of the dean, the scientific director, and the management board of the school.

Role	**MHeNs**	**Division 1 Cognitive Neuropsychiatry and Clinical Neuroscience**	**Division 2 Mental Health**	**Division 3 Translational Neuroscience**
Rapporteur	Guillén Fernández	Alfons Schnitzler	Martin Korte	Gre Luyten
Reader	Petra Uittenbogaard	Gre Luyten	Alfons Schnitzler	Martin Korte
Special Rapporteurs	Eirini Karyotaki Dominika Šulcová	Eirini Karyotaki Dominika Šulcová	Eirini Karyotaki Dominika Šulcová	Eirini Karyotaki Dominika Šulcová
Research facilities		**Scannexus – 7T and 9.4T** Alfons Schnitzler Guillèn Fernandez		**Translational Neuroscience laboratory** Martin Korte Dominika Šulcova

The Eye Clinic, embedded in Maastricht UMC+, was visited by Gré Luyten, Eirini Karyotaki and Petra Uittenbogaard.

3 ASSESSMENT OF THE SCHOOL AND ITS DIVISIONS

3.1 Aims and strategy of the school

MHeNs is one of the six graduate schools of the Faculty of Health, Medicine, and Life Sciences (FHML). FHML is the largest faculty of Maastricht University (UM), comprising 65% of the total staff and budget of UM. MHeNs covers the full range of mental health research and clinical neurosciences. The school conducts its research mainly through its core departments; Psychiatry and Neuropsychology, Neurology, Neurosurgery, Clinical Neurophysiology, Anaesthesiology, Ophthalmology, Urology and Pharmacology, and Personalized Medicine.
These departments are embedded in Maastricht UMC+ (MUMC+), which is a partnership between Maastricht Academic Hospital and FHML. The core departments have most of their research labeling within the school of MHeNs, whereas the affiliate departments only have a small part of their research labeling within MHeNs.

The organizational structure of MHeNs remained the same as six years ago, although divisions 2 and 3 appointed new leaders. The three divisions of MHeNs are division 1. Cognitive Neuropsychiatry; division 2. Mental Health, and division 3. Translational Neuroscience. The school also had a change within the management board. In 2016 a new managing director and in September 2017 a new scientific director took over. Together with the division leaders, they form the Management Board of MHeNs. For the organizational structure of MHeNs, we refer to annex 4 of this report. Annex 5 contains an overview of the financial position of the school and the school's composition in terms of research staff. MHeNs describes its research strategy as follows:

> *'MHeNs' research traces the origin of cognitive, motor, sensory and behavioral dysfunction to interacting genetic and environmental influences. We focus on common biological pathways such as epigenetics, neuroplasticity, neuronal excitability, neurodegeneration, inflammation, and cerebrovascular regulation. Thereby, we are establishing the causes of central nervous system dysfunction (affecting, for example, cognition, emotion, incentive salience, movement, and pain perception), finally resulting in diagnosable neurological and psychiatric syndromes requiring treatment. The mechanistic understanding provided by our expertise in biological and behavioral techniques will also be brought to bear on diseases of the peripheral and autonomic nervous system, sensory systems (particularly vision, hearing, and balance) and neuromuscular diseases.'*

3.2 Qualitative evaluation of the school and findings

3.2.1 General remarks

The committee thanks the Maastricht School for Mental Health and Neuroscience (MHeNs) for the comprehensive and clearly written self-evaluation report. It is, next to the site visit with numerous in-depth interactions, the basis for our assessment and recommendations to develop the already very good school further. According to the renewed SEP protocol, the committee assessed the criteria 'research quality', 'societal relevance' and 'viability' exclusively in qualitative terms.

In the past six years, the school (MHeNs) has developed impressively with an almost twice as large grant income and an almost 50% increase in permanent academic staff. The strength lays in the close interaction between clinical and fundamental research, which may appear difficult because it crosses two legal entities; the Faculty of Health, Medicine and Life Sciences (FHML) of Maastricht University, and the Maastricht University Medical Hospital (Maastricht UMC+). MHeNs focused its strategy development on three general topics (a) increasing collaboration and alignment, both within MUMC+ and collaboration with regional and (inter)national partners, (b) focusing on expertise and resources

across individual research groups in themes and pillars (created in a new MHeNs matrix, see annex 4b), and (c) creating an academic culture enabling scientific exchange and individual development.

Ad a) The school is not operating in an ivory tower but a network of academic and non-academic partners. The development of existing and new collaborations and alignment has led to:

- internal MUMC+ alignment captured in a matrix structure (annex 4b), in collaboration with the main collaborating centers of the academic hospital, the Brain-Nerve-Center, and the Center for Ophthalmology.
- alignment within the university by strengthening the collaboration with the Faculty of Psychology and Neuroscience (FPN) through joint Ph.D.'s, joint grants, and joint seminar series.
- expanding collaboration with (EU)regional partners and beyond. This higher degree of alignment aims at increasing the critical mass in expertise and patient populations and exploring new joint funding opportunities.

Ad b) Focusing all activities on themes and pillars has already led to a substantial increase in the number of cross-departmental grants. Furthermore, it provides Ph.D. candidates with educational opportunities outside their department. Room for further development can be identified by consolidation and thus, a reduction in themes/pillars or focused investment/hiring can be used to reduce fragmentation. Also, a better alignment with the structure of the divisions and this matrix may lead to a clearer structure with more focus.

Ad c) The academic culture and life are characterized by psychological safety, diversity, and feeling for a common purpose. The atmosphere appears despite the effect of the pandemic as lively and inclusive. Internal and external perspectives of junior researchers appear well developed.

The strategy for the next six years has been established based on a thorough SWOT analysis. Strategic alignment between many entities (university, faculty, MUMC+, BNC, divisions, departments, themes, pillars, and research groups) appears difficult. The committee has its doubts about how to mitigate the difficulties of this complexity.

Open science and academic culture

It is positive to see that MHeNs has chosen open science as one of its strategic priorities. MHeNs started well their way into FAIR data in cohorts and the committee encourages to continue this initiative to all kinds of research, including public pre-registration. Developments regarding open science are now mainly focused on patient-related research and cohort data. Standard operating procedures are being developed at School and faculty level. MHeNs has installed a committee for data management. The centralization of several biobanks in Maastricht is a faculty effort that will take several years. The committee would like to see the school at the forefront of these developments.
Concerning the academic culture, the school appears to be a safe place and the initiatives taken in division 3 might be a good example for the other divisions.

Human resource policy and talent development

The committee is pleased to see that MHeNs encourages grant-writing, but also wonders how the school ensures that researchers have enough time to do so. Although the self-evaluation report is not clear at this point, the committee assumes that early career researchers spend most of their time in education (i.e. teaching), research, and probably daily supervision of Ph.D. candidates. The committee wonders whether these researchers have enough time to expand their knowledge by acquiring new skills. Young researchers within MHeNs can count on good support, but the workload appears critically high. Moreover, there appears a tendency for in-house promotions over hiring external mid-career researchers. Gender equality is not optimally safeguarded in the most senior positions. A large number of women in

junior faculty offers the opportunity to repair this imbalance, but this requires a fully integrated program where MHeNs takes the lead. This is also important for other dimensions of diversity.

Talent-support is focused on transition periods, which is good, but bears risks: too focused on academic careers (from Ph.D. to postdoc), too late (starting with a perspective to stay in the academic world, instead of having a broader perspective from the beginning of the Ph.D. or postdoc project).

Finally, in its self-evaluation MHeNs puts great emphasis on personal grants (e.g., Rubicon, Marie Curie, Veni, etc.) This focus might be shifted to more senior grants (e.g., Vidi, ERC) to have a better basis for a starting junior group. In addition, the institute has a good track record on consortium-based grants. The committee wonders if MHeNs includes early career researchers in this type of grant because this could be an essential aspect of talent development (i.e. expanding network of collaborations and working on grant proposals submitted by consortia).

3.2.2 Research quality

In general, the committee regards the research quality of MHeNs as of the highest international standards. The committee was impressed by the rigor of how the research presented was executed, the originality, and the value generated for science, but in particular for health care and population health. MHeNs scientists hold leading positions in international research networks, committees, professional organizations, and evaluation panels. In addition, they have received a variety of prestigious personal grants. Moreover, despite the pandemic and all measures that influenced scientific productivity, the scientific output of MHeNs was impressive, even in 2020.
The interaction, the spirit, and the motivation to work together between the three divisions are excellent. David Linden and the entire leadership make a major contribution to the integration as a role model and a leader with a vision. Linden is a true connective person for all the different interests of the different departments and schools.

MHeNs research is generally characterized by the rigorous application of scientific, ethical, and legal standards at all stages of the scientific process from the conceptual framing, over study design and execution to data analysis and reporting. The question posed and the insight delivered by MHeNs researchers produce professional/scientific value when it comes to changing how we think about a fundamental scientific concept, but also medical value or societal value (see below). Both are seen by the committee as equally important for an academic institution like MHeNs. Research at MHeNs is regularly based on scientific curiosity that comes with a question, design, technical and analytical approach, or interpretation that has not been used often before but appears optimal for solving the problem at hand. The balance between more risky and more applied research of the last mile to the clinical application appears well balanced. Examples are described below in the sections on the three divisions.

3.2.3 Societal relevance

Research at MHeNs appears an excellent example of how a university medical center can gear its research towards societal impact in terms of healthcare and population health. It is a broad spectrum of activities, from psycho-social programs using the latest digital technology (e.g., EMA, micro-interventions, tools based on network analyses, blended e-health) to high-tech interventions (e.g., neuromodulation using nanoparticles or iPSC derived cell therapy). The committee compliments the MHeNs staff for creating such impactful research. Further details are described in the sections on the three divisions below.

3.2.4 Viability

Resources
The budget of MHeNs showed an impressive increase in external funding, while the increase in internal funding lacks behind. This imbalance poses an increasing risk and puts unwanted pressure on individuals. The internal funding distinguishes between on one hand a part that is historically determined and fixed and on the other hand a variable part that is based on the number of Ph.D. graduations. The committee recommends the faculty to adjust the 'fixed' budget to the new reality of an increased total budget. Moreover, the committee appreciates the simplicity of linking the variable part of the internal funding with Ph.D. graduations but sees also strategic behavior and risks like pressure on supervision. The committee recommends considering a broader measure (KPI's) that also links to research quality, societal relevance, and grant income to the flexible budget section.

Organization and strategy
MHeNs has grown in the last six years and brought more structure by implementing the matrix structure and focusing on their fields of research. At the same time, other groups became stronger with improved quality and quantity of their research. For the coming 6 six years, the following fields of interest will get more focus:

1. Neurodegenerative disorders and dementia
2. Stroke and vascular cognitive impairment
3. Neuromuscular disease
4. Ophthalmology
5. Chronic pain, autonomic dysfunction, and spinal neuromodulation
6. Mental health innovation
7. Mitochondrial medicine: diagnostics and therapeutics
8. Regenerative medicine
9. Neurotechnology strategy

Although the strategic points are in the direction of further growth, the opportunities are limited and therefore they will strive for stability with a grant income between 8 and 10 million Euros.

The structure and governance remain complicated and it is not clear how this organizational structure is supportive for the research and the people involved. One should carefully assess and monitor the consequences of this complicated structure so that specific adjustments can be done. On the other hand, individuals appear adaptive by aligning strategic decisions and their implementation well, for instance between MHeNs and the Brain Nerve Center (BNC), or by creating new entities (@ease, ACL) that appear more independent from, and thus more agile than, the general organization.

However, the committee found that people have difficulties finding their place. The new matrix structure of research themes and clinical pillars appears helpful for orientation, but the committee recommends safeguarding continuous clarification and simplification. In this context, it is unclear why four clinical pillars are not mentioned in the strategic plans for the next six years (movement; mood, anxiety, and trauma; psychosis and neurodevelopment; eating disorders), but two new topics are introduced (mitochondrial medicine and regenerative medicine) that do not fit readily into the given matrix structure.

Research areas chosen for the upcoming six years are neurodegenerative diseases and dementia, stroke and vascular cognitive impairment, neuromuscular diseases, ophthalmology, chronic pain, autonomic dysfunction, spinal neuromodulation, mental health innovation, mitochondrial medicine, regenerative

medicine, neurotechnology. These nine topics appear not optimally aligned with the clinical pillars recently established. How will that be handled?

The committee observes that the departure of leading scientists of division 2 has led to a substantial decrease in research activity in that division. The committee sees a similar risk arising for division 1 when, in one year, the leading scientist is retiring. The committee was surprised to see that this retirement is not seen as a risk in the school's SWOT analysis and urges MHeNs management and the faculty to prepare for the succession optimally. One may consider a somewhat broader approach to increasing the search space for the best candidate.

The research infrastructure appears generally of optimal quality, but there are also critical points that need attention: the rebuilding of an animal facility is of crucial importance to increase behavioral analysis now and assuring the quality of animal research in the future. In addition, a centrally organized and financed biobank, and the long-term viability of the imaging center Scannexus is of critical importance. The committee also thinks that it is recommendable to consider a central stem cell/regenerative medicine facility with a role for MHeNs, which will be even more important in the future and needs additional recourses. In this context, the faculty and the school may consider clarifying how research priorities and infrastructural investments are managed given the complex structure. The committee wonders how the matrix structure of themes and pillars is helping to focus investments in research infrastructure. Strategic alignment between many entities (university, faculty, MUMC+, BNC, divisions, departments, themes, pillars, and research groups) appears difficult. It appears advisable to consider simplifications in the service of researchers and research.

3.2.5 Education and training

The Ph.D. program is very well managed by training and clear milestones. The school has implemented an impressive Ph.D. track system. The mentoring program for Ph.D./postdocs is excellent because it focuses on both internal and external mobility. However, some aspects of the Ph.D. supervision structure stay unclear. The self-assessment report says that Ph.D. candidates meet at least biweekly with their supervisors. The committee questions if all supervisors or only the daily supervisor are involved in these meetings? How often do they meet with the whole team? From the conversations with the Ph.D. candidates and Post-docs, it appears that the TRACK system is not used by all Ph.D. candidates. The school could think of an incentive for those who use the system properly. It is important to safeguard the full implementation of the mentoring system. Furthermore, the committee thinks that a low(er)-threshold contact person (buddy) should be implemented since the current Ph.D. coordinator is one of the senior staff members. A senior person in the role of a confidential advisor could be out of the comfort zone of young researchers. For both new Ph.D. candidates and Postdoc candidates, it is difficult to find their way when starting at MHeNs. The school is strongly recommended to organize introduction days regularly, to guide new employees. Moreover, MHeNs could also develop a '*MHeNs manual'* for all Ph.D. candidates or new employees at the start of their appointment. The committee also understood that there is no structural support for post-docs and that the workload for assistant professors is rather high. The institute should organize and guarantee that there is enough time for personal development.

A new bachelor program (Brain Science) with FPN and FSE is an excellent extension in terms of candidate inflow, and linking-up with both faculties. The master's program of MHeNs is excellent. With strong teaching, the program provides new talents for the Ph.D. programs. No recommendations are needed there. The committee strongly encourages the school to just keep going and innovate.

The school has managed to organize interesting joint Ph.D. programs, including EURON and other partnerships (40 Ph.D. candidates graduated, 59 in the pipeline). With a large number of external Ph.D.

candidates (about 35%) the committee has concerns about the quality of the research and supervision (a large proportion of external Ph.D. candidates, with a less optimal Ph.D./supervisor ratio). The committee recommends clearer plans for the supervision, training, mentoring, and monitoring of scientific quality/integrity for external Ph.D. candidates. Furthermore, the committee perceives that in the current situation pre-AIO contracts are too risky on the individual level, and recommends guaranteeing full contracts for every candidate to reduce individual (financial) risks or at least perceived risk.

3.3 Qualitative evaluation of division 1: Cognitive Neuropsychiatry and Clinical Neuroscience

For its larger part embedded within MUMC+, division 1 has an emphasis on clinical research and includes the departments of Psychiatry and Neuropsychology, Neurology, Radiology, Neurophysiology, General Practice, Internal Medicine, Health Ethics and Society, and Otorhinolaryngology. The mission of the division is to generate new insights into mechanisms of cognitive and other neurological or otorhinolaryngological disorders and to improve diagnosis and treatment. In the last five years, the division broadened its focus with more emphasis on prevention, e-health technology, data science, and ecological validity.

3.3.1 General remarks

Division 1 is led by Professor Frans Verhey, a professor of old age psychiatry with a longstanding excellent track record in the field of dementia research in clinical cohorts. It provides an interface with the clinical neuroscience disciplines at MUMC+ and beyond, comprising the Alzheimer Center Limburg, the Brain Injury Center Limburg, and the expert centers and clinics for neuromuscular diseases and hereditary movement disorders.

From 2015 to 2020 division 1 has almost doubled its total research staff of senior scientists, post-docs, and Ph.D. candidates from 31,8 FTE to 60,8 FTE comprising a total of 101 researchers in 2020. Direct funding and contract research have increased between 2015 and 2020 from 15% to 21% and 58% to 67%, respectively, while research funds have decreased from 27% in 2015 to 12% in 2020.

3.3.2 Research quality

The division is pursuing dementia research, in the areas of epidemiology and prevention, biomarkers, and psychosocial interventions. It has extended its research infrastructure, with the extension of the Maastricht Aging Study (MAAS), and the Biobank of the Alzheimer Center Limburg (BB-ACL) which has the critical mass to continue supporting the full range of dementia research. Additional relevant areas include cerebrovascular disease, epilepsy, neuromuscular disease, chronic pain, and multiple sclerosis.

Research quality and reputation are world-class in the area of clinical dementia research. As an example, the Amyloid Biomarker Study Group, initiated by Dr. Jansen and Professor Visser, has included data of more than 7500 participants from 55 studies, both clinical and population studies, and has led to several high impact publications, including publications in high-rank journals such as JAMA Psychiatry, on the prevalence and associations of cerebral amyloid depositions. In the last six years, the research focus has been expanded to work on translational models of dementia and clinical trials of new compounds in collaboration with division 3. The committee sees this as a great development and recommends that it should be further enhanced.

Interesting and important advancements have also been achieved in the small-vessel-disease research line led by Professor Robert van Oostenbrugge from the Neurology department. With a new technique of dynamic contrast-enhanced MRI, developed by Professor Backes, subtle blood-brain barrier leakage

effects were detected in patients with small-vessel disease. This is also a promising approach to study the contribution of vascular pathology in patients with neurodegenerative dementia. Continuing this road will also further foster interactions between the neurodegenerative and the vascular dementia research activities within division 1 and across divisions.

While these are only exemplary scientific highlights, the research quality of the division is acknowledged to be overall very high. This is also reflected in the scholarly impact analyses which identified a high number of publications and/or substantially higher than world average category normalized citation impact (CNCI) in micro topics covered by division 1 including dementia, stroke, chronic pain, multiple sclerosis, epilepsy. Concerning third-party funding, it is obvious that there is a considerable overall increase which is because the level of contract research has developed strongly. Reasons why, on the other hand, individual research grants have dropped should be identified to implement actions for improvement.

Research of Division 1 is well integrated into national and international research networks and has initiated or participated in several European consortia.

Some further indicators of successful research activities and recognition:

- Veni grant of Dr. Heidi Jacobs to study the role of locus coeruleus in cognitive decline using novel 7 Tesla MRI high-resolution sequences.
- Grants by NWO, the Health Foundation Limburg, the Alzheimer Foundation for BBB research on patients with small-vessel disease.
- EU Horizon 2020 project on the phenomenon of microvessel rarefaction.
- Alexander Margulis award of the Radiological Society of North America for the scientific excellence of the 2017 paper on the initial application of the BBB imaging technique to Prof Backes and his team.
- 2 editorials to the BBB work on small-vessel disease in high impact journal Neurology.
- National ZonMw Medical Inspirer Award 2018 for development of ACL eHealth module ‘Partner in Balance’ (PiB)
- The lead of Netherlands Consortium of Dementia Cohorts (NCDC) by Dr. Visser.

3.3.3 Societal relevance

The societal relevance of dementia research is already given per se because of its socio-economic and health care impact in an aging society. There are, however, several specific and important contributions in terms of research translation into prevention and treatment:

- MyBraincoach and LIBRA score (consisting of modifiable dementia risk factors that can be targeted by lifestyle interventions and primary prevention strategies) were used in a regional primary health campaign with 140 stakeholders from various societal sectors, and are being implemented for use in general practice.
- The ACL eHealth module ‘Partner in Balance’ (PiB) for caregivers of patients with dementia has been made available as a training program nationally and is being implemented internationally.
- “Keep your brain fit!”, an online psycho-education module (e-Health), developed as part of the FES-SOW program
- The research in neuromodulation, conducted across divisions 1 and 3, developed the Parkinson Anxiety Scale (PAS) has been translated into more than 15 languages and is extensively used in clinical trials.
- A cognitive-behavioral treatment module was developed to treat anxiety symptoms in patients with Parkinson’s disease and will be made available on the MHeNs website

3.3.4 Viability

The Division has shown considerable turnover and general growth in research staff. Both direct and indirect funding increased. The viability of this large division is excellent and no matter of concern at all. In addition, MHeNs has a culture of communication between and within all hierarchical levels. The discussion appeared to be open-minded and considerate.

3.4 Qualitative evaluation of division 2: Mental Health

Division 2 is fully embedded within the Department of Psychiatry and Neuropsychology. The research is characterized by both clinical and epidemiological research on mental health performed in affiliation with several regional health care organizations. The division's strategy is to carry out highly innovative clinical science involving both clinical and non-clinical populations across the lifespan and translate and implement its results to the broader community.

3.4.1 Research quality

One of the core research activities of Division II involves ecological momentary assessments through the experience sampling method (ESM) by using a tool that acquires data in real-life allowing the study of real-time and real-world person-environment interaction patterns. The Division has 30 years of ESM experience and has established a world-leading position in this field (www.esm-maastricht.nl), and the Psymate, the data collection tool, is freely downloadable from iTunes and Android Store. In the last 6 six years, Division II continued increasing the visibility of their ESM expertise in and outside MUMC+. The work is mostly represented in the 'monitoring' and 'prevention/ rehabilitation' section of the research matrix of MHeNs, and is led by the ESM experts of division II in collaboration with their colleagues from the other MHeNs divisions and NUTRIM.

Another good development key research activity is translational research in collaboration with division 3, which is aiming to understand the biological and molecular basis of psychopathology.

The mental health division has successfully implemented preclinical models of panic disorders and is well equipped to detect rare forms of psychosis by for example looking for auto-antibodies. Which is an expanding and often neglected research area, which is envisioned in the self-evaluation as an important point for the future. The reviewers would like to emphasize this important future research direction which includes the interaction of the immune system with the CNS. In this context also the start to develop research into gut-brain interaction (microbiome) is highly innovative and of high future importance. Also, an important research area that has developed well is the study of rare genetic disorders affecting the brain. Here the use of bioinformatics and also by using iPSCs of patients with genetic disorders is an important advancement that should be further fostered in the future.

The division was also very successful in acquiring fellowships: Two researchers started their VENI fellowships awarded by the NWO (Dutch Science Funding Organisation) at MHeNs. Willemijn Jansen (Division 1, Department of Psychiatry and Neuropsychology) is investigating the amyloid model of Alzheimer's disease using a range of biomarkers, with a particular focus on resilience against dementia. Mor Dickman from the Department of Ophthalmology/ University Eye Clinic (Division 3) is starting the project "Light for Sight", in which he will develop a novel treatment for progressive severe myopia.

It should also be acknowledged that a former VENI laureate, Ali Jahanshahi, received a VIDI fellowship that will enable him to develop a new semi-invasive neuromodulation technique for Parkinson's disease based on magneto-electrical nanoparticles. Two academic clinicians, Jacqueline Strik (Psychiatry) and Henny Beckers (Ophthalmology) received professorships. Professor Strik's research focuses on

delirium in small children and other aspects of child psychiatry, whereas Professor Beckers is advancing the surgical treatment of glaucoma.

Publication record: As an indicator that the Division of Mental Health reached its goals, the good publication record over the years is a good indicator with publications in JAMA, Psychiatry, Journal of Psychopharmacology, Molecular Psychiatry. And also success in acquiring funding is another indicator for a successful strategy and here, in particular, the NIH-funded international collaborative study on CNV disorders should be mentioned, which has been embedded in the Genes2Mental Health network (genes2mentalhealth.com). Here division II is the only Dutch partner in this consortium. Furthermore, OPHELIA, a Dutch consortium on the treatment of psychosis has a follow-up study to HAMLETT, with the GxE WP, which is being led by Division II.

3.4.2. Societal relevance

The development of Psymate, an integrated platform (free app, database, and reporting module) that uses the Experience Sampling Method (ESM) to gain insight into people's daily life functioning, the youth help facility @Ease, and the innovative TREAT application, are good examples of how research is translated into practical solutions for society.

3.4.3. Viability

The viability of the division is excellent, which can be seen in the fact two new clinical professors, Machteld Marcelis and Jacqueline Strik have been here and that Machteld Marcelis is a senior psychiatrist at GGZe, a large regional mental health care provider based in Eindhoven. Her professorship is focused on transdiagnostic psychiatry, and her research expertise includes neuroimaging, research in large patient cohorts, and ambulatory monitoring. Professor Strik new practice professor in Mental Healthcare for Children and Adolescents with Psychiatric Problems and Somatic Comorbidity.

3.5 Qualitative evaluation of division 3: Translational Neuroscience

Division 3 is home to fundamental and translational neuroscience research of scientists affiliated within the departments of Psychiatry and Neuropsychology, Neurosurgery, anesthesiology, Neurology, Ophthalmology, Paediatrics, Urology, Toxicogenomics, Clinical Neurophysiology, and Pharmacology and Personalized Medicine. Its strategy is to perform high-translational and back-translational neuroscience, with a bidirectional roadmap from fundamental via preclinical to clinical neurosciences, and in a life span perspective. The research lines of the scientific staff embody common scientific and methodological concepts that cut across clinical indications. Division 3 has a particular role within the school since it contains its core basic laboratory infrastructure.

3.5.1. General remarks

Division 3, Translational neuroscience, has a new leader. Professor Jos Prickaerts was appointed in 2018 and gave the division a push forward and engaged in clinical trials on pharmacological products. Professor Prickaerts is a neuroscientist with expertise in psychopharmacology and behavioral neuroscience with a strong track record. The division was reorganized by several expert groups.
The division holds several affiliated departments such as the Department of Psychiatry and Neuropsychology, Neurosurgery, Anesthesiology, Neurology, Ophthalmology, Pediatrics, Urology, Toxicogenomics, Clinical Neurophysiology, and Pharmacology and Personalized Medicine.

In the last six years, there was strong growth in scientific staff members of the MHeNs, although their research staff of the MUMC decreased. In division 3 there was a considerable increase in internal and

external Ph.D. candidates from 32 and 52 in 2015 to 49 and 118 in 2020 with only a small decrease in post-doc positions (from 23 to 17).

3.5.2. Research quality

The division focuses on the understanding of the mechanisms mediating normal and aberrant functioning of the nervous system, and innovating clinical care at the levels of prevention, diagnosis, and treatment for patients with disorders of the nervous system. In particular, the aim is to gain insight into the (epi)genetic, molecular and cellular mechanism in disease areas of the central nervous system including dementia, depression psychosis, post-traumatic stress disorder, epilepsy, movement disorders multiple sclerosis as well as mechanisms mediating central control of peripheral bodily functions like pain, (auto)immunity, ophthalmological and vestibular and neuro-urogenital functioning. Furthermore, there is interest in biomarker development as well as new therapeutic applications including lifestyle interventions, pharmacological and antibody-based therapies, or neuromodulatory treatments. The division has its expertise centralized in expert groups; molecular and cell biology, microscopy, and imaging, neuromodulation, and electrophysiology, in vivo and behavior, stem cells, and in silico and functional genomics. The strategic aims over the last 6 years were closer integration with the clinical services and clinical innovation at the MUMC+, to bundle the research themes, stimulate the academic culture and development plan through all career phases, and valorization and social impact.

The reorganization of division 3 gave a big improvement during the last 6 years including the quality and quantity of the research outcome. There is a positive collaboration with the clinical departments of the MUMC+ such as the Brain and Nerve Center (BNC) and Ophthalmology, which resulted in a large longitudinal cohort of specific patients of interest and biobanking. Biomaterials became available for research projects. Also, five research themes were formed to create cross-border collaboration with other groups in the matrix structure. These themes are neuroimaging, neuromodulation, monitoring, cell biology & genetics, and rehabilitation & prevention.

Examples of the division are the research on chronic postsurgical pain and neuropathic pain complex with a focus on modulation, genetics, and imaging. The finding of the genetic causes of monogenetic mitochondrial diseases using NGS led to studies on prevention and pathophysiology using stem cells and animal models. This research is strongly supported by the patient organizations (“Voor Sara”). Another excellent example of the theme of regenerative medicine is the research in Ophthalmology focusing on glaucoma, cornea, and refractive surgery. The research line on corneal limbal stem cell transplantation is of excellent quality. Division 3 is actively participating in the iPSC research in collaboration with the Institute for technology-inspired regeneration medicine (MERLN).

3.5.3. Societal relevance

To create value for society as a whole is the overall aim of the divisions. International guidelines and registry were initiated for outcomes of corneal stem cell transplantation (www.ecctr.org)(supported by the EU and ESCRS) and experimental autoimmune myasthenia gravis animal model. They received funding for an international consortium on the neural effects of deep brain stimulation for Parkinson’s disease. Collaborative links within the Euregio and the Netherlands resulted in several collaborations such as the SEAM study on glaucoma implants, the ACLSCT clinical trial, and the study on sequential bilateral cataract surgery. The latter will greatly influence the future practice of cataract surgery in the Netherlands and Europe. Dr. Schijns was appointed as chairman of the section functional neurosurgery at the EANS and Professor Nuijts became 2020 the prestigious president of the ESCRS and has great influence in the field of cataract and refractive surgery. Professor Prickaerts files 3 patents of which one entered the national phase and two have been approved in seven countries. Additionally, Professor Schmidt submitted 3 patents and Professor Beckers two.

In terms of the research outcome of division 3, some other examples of research that is relevant to society can be mentioned:

1. New treatment for tinnitus with deep brain stimulation of the medial geniculate body
2. Pharmacological neuromodulation with Roflumilast in the Romena phase 2 study with MCI patients.
3. Prediction model for post-surgical pain based on GWAS by the department of anesthesiology and pain management. Could it be an option to study cornea neuropathy after refractive surgery?
4. Autologous stem cell therapy for neuromuscular disorders with genetic mitochondrial disorders
5. Vestibular implant surgery.

3.5.4. Viability

The viability of the division is excellent. There is considerable growth in the number of internal and external Ph.D. candidates from 37,1 fte to 73,3 fte and significant growth in the total funding, with a slight growth in direct funding and research funding. The committee had some concerns about the supervision of the postdocs with the strong growth of the internal and external Ph.D. candidates and the available time.

In terms of talent policy, young talent and mid-career researchers are named and monitored. This includes sixteen Ph.D. candidates who received the Kootstra talent fellowship. Seven MHeNs members received a top talent position of which three received a professorship. There was an increase in the number of researchers who received a VENI (5), VIDI (2), and a ZonMW fellowship (1). There were no VICI or ERC grants.

4 RECOMMENDATIONS

According to the SEP protocol and as outlined above, the committee would like to make several recommendations on the organizational level, on both maintaining and improving research quality, on the viability, including both academic culture and open science, on societal relevance, and the research training.

Research quality

1. Provide clearer regulations and mechanisms for the supervision, training, mentoring, and monitoring of scientific quality/integrity for external Ph.D. candidates.

Viability

2. Enable an optimal research infrastructure or at least optimal use of existing ones (e.g., animal facility, biobank, neuroimaging. Increase the capacity of the central stem cell/regenerative medicine facility).
3. Strive for adjusting the internal financial model. We think that the basic versus external funding should be more balanced than it is now. The faculty may adjust the historically 'fixed' budget to the new reality and should consider a broader measure for the variable part so that it also links to research quality, societal relevance, and grant income.
4. Safeguard continuous clarification and simplification of the given organizational complexity.

Societal relevance

5. Build a more structural basis for patient cooperation in research strategy development and execution.

Human resource policy and talent development

6. Prepare for the succession of senior staff optimally. One may consider a somewhat broader approach to increasing the search space for the best candidate when it comes to the succession of a key researcher in Division 1.
7. Guarantee full contracts instead of pre-AIO contracts for every candidate to reduce individual (financial) risks.
8. Talk about equal opportunities instead of positive discrimination. Create awareness about the differences between men and women and educate all staff members at this point.
9. Develop a program at the school level to involve diversity in leading roles, rather than just following university policies on this topic.
10. Enable early and mid-career researchers to invest more time in their skill development.
11. Organize introduction days regularly, to guide new employees. Also, develop a 'MHeNs manual' for all Ph.D. candidates or new employees at the start of their appointment.
12. Investigate why the Ph.D. TRACK system does not work optimally for a substantial proportion of Ph.D. candidates, before further developing it into a mentoring system.

Academic culture and open science

13. Secure the leading role in open science by extending current practices of patient-related cohort research to all forms of research, including public pre-registration, etc.
14. Take advantage of the efforts that already have been taken in the development of the academic culture in division 3.

Annex 1 Biosketches members of the external review committee

Guillén Fernández
Professor Guillén Fernández (1964) is the director of the Donders Center for Medical Neuroscience and head of the Department of Cognitive Neuroscience at the Radboud University Medical Center in Nijmegen. He obtained his medical degree, doctorate, and habilitation at Bonn University. He received full training in clinical neurology and cognitive neurosciences at Bonn, Magdeburg, and Stanford. In 2002, he became a founding principal investigator of the Donders Institute in Nijmegen. His area of research is human cognitive neuroscience in which he studies the brain basis of memory, emotion, and their interaction. He applies an interdisciplinary approach to integrating cognitive neuroimaging, genetics, pharmacology, and diverse clinical disciplines. He served as member or chair on numerous committees and assessment panels including services for the Dutch Council for the Environment and Infrastructure, Dutch Organization for Scientific Research (ZONMW), German Federal Ministry of Education and Research, German Research Councils (Wissenschaftsrat, DFG), Organization of Human Brain Mapping, and Welcome Trust. Guillén Fernández is a fellow of the Royal Netherlands Academy of Arts and Sciences (KNAW), Academia Europaea, and the Memory Disorder Research Society. He received among others the Richard-Jung Award of the German Society for Clinical Neurophysiology, the Vici Award of the Dutch Organization for Scientific Research, the Radboud Science Award, and an Advanced Investigator Grant from the European Research Council.

Eirini Karyotaki
Dr. Eirini Karyotaki is an Assistant Professor in Clinical Psychology at the VU Amsterdam. Her research examines individual patient differences in response to psychological interventions for common mental disorders like depression and anxiety. Overall, her goal is to understand the profiles of individual patients and how these can be tailored to the best treatment options. During her Ph.D. trajectory, she specialized in conventional and individual patient data meta-analyses under prof. Pim Cuijpers at VU Amsterdam. After obtaining an NWO Rubicon grant, Dr. Karyotaki did her post-doc in Global Mental Health at Harvard Medical School under prof. Vikram Patel. During the past years, she has participated in several international projects, such as the E-Compared project, which aimed to examine the effects of blended e-health with face-to-face psychotherapy on major depression in primary care. Dr. Karyotaki has also worked for the development of treatment guidelines, such as the World Health Organization mental health gap program – IG Version 2 (2016). During 2016-2019, she coordinated a large-scale university project on college students' mental health in the Netherlands, namely the Caring Universities. This project involved epidemiological, effectiveness, and implementation research. Currently, she obtained an NWO Veni grant to examine individual differences in e-health interventions for depression and anxiety (precision medicine in e-health). Along with research, Dr. Karyotaki is the coordinator of the Research Master's program in Clinical and Development Psychopathology at the VU Amsterdam. She has been a lecturer in master's and bachelor's degree courses on depression, systematic reviews, scientific presenting, research skills, psychological assessment, and diagnostic interviewing. She has (co-) authored 94 peer-reviewed publications.

Martin Korte
Professor Martin Korte (1964) has already focused on synaptic plasticity during his Ph.D. projects "Signaling Systems at hippocampal synapses" at the Max Planck Institute (MPI) for Neurobiology in Martinsried and the MPI for Brain Research in Frankfurt. Afterward, he became a research group leader at the MPI of Neurobiology and habilitated at the LMU Munich. In 2004 he got the professorship at the Technische Universität Braunschweig. Since 2007 he is a professor of cellular neurobiology and the director of the Zoological Institute at the TU Braunschweig. He was for many years vice president of the TU Braunschweig, senate member, student dean, and director of the graduate school of the TU Braunschweig. He is a member of the BBAW Academy in Berlin, and since 2021, a board member. In

2012 he established the research group neuroinflammation and neurodegeneration at the Helmholtz Center for Infection Research. Thereby he connected with his experience in the fields of cellular neurobiology and neurophysiology, the areas of infection, and neurodegenerative diseases. On a regular basis, Korte is a reviewer for the German science foundation (DFG) as CRC and research group reviewer, ERC, INSERM, German Federal Ministry of Education (BMBF), Swiss National Science Foundation, and others. He has evaluated life sciences at different universities in Germany. He is the spokesperson of the research group "Homeohirn" at the TU Braunschweig.

Gre Luyten

Professor Gre Luyten (1960), an ophthalmologist, is professor and chair of the department of ophthalmology at the Leiden University Medical Center in Leiden since 2006. He received his medical degree in 1986 at the Erasmus University in Rotterdam. In 1992 he worked as a medical staff member at the Erasmus Medical Center with his research focus on ocular oncology and cataract and refractive surgery. In 1996, he received his Ph.D. with the subject "Primary and metastatic uveal melanoma". He was involved in the organization of the department and played an active role in the Dutch ophthalmological society, as president of the Dutch refractive surgery society and founder of the Dutch guidelines on refractive surgery. He leads the ocular oncology center in Leiden is the national referral center for ocular oncology (choroidal melanoma). The current focus of his research group at the LUMC is focused on ocular oncology and regenerative medicine with two professors, two assistant professors, and over 25 Ph.D. candidates. The oncology projects are focused on translational studies on diagnosis, prognosis, and therapy and high-resolution MR(eye) for image-guided non-invasive proton beam irradiation for uveal melanoma patients. The work of the regenerative group is focused on gene and cell therapy for inherited and acquired retinal diseases. We patented and licensed gene therapy for CRB1 and the first phase 1 clinical trial is currently under preparation. Through multidisciplinary collaboration with basic and clinical scientists, I strongly hope to give the patients better treatment options, survival, and future. International collaboration is essential for obtaining better results, by developing good guidelines and clinical trials for ocular conditions and diseases.

Alfons Schnitzler

Professor Alfons Schnitzler (1960) is the head of the institute of clinical neuroscience and medical psychology, and director of the center for movement disorders and neuromodulation, department of neurology, at Heinrich Heine University Düsseldorf. He obtained his medical degree and doctorate at the University of Kiel, and habilitation in neurology and neurophysiology at Düsseldorf University. He received full training in clinical psychiatry, neurology, and clinical neurophysiology in Düsseldorf. From 1998 to 2005 he was a principal investigator of an independent research group funded by the Volkswagen Foundation. In 2003 he became professor of neurology in Düsseldorf, and in 2007 he was appointed professor and chair in neurology and neuroscience at the University of Bangor/UK. At that time, he was offered a Canada chair in cognitive neuroscience in Vancouver, a chair in neurology at Ruhr University in Bochum, and the current positions in Düsseldorf which he holds since 2008.
His area of research is in clinical neurosciences and aims at exploring mechanisms of sensorimotor, cognitive, and emotional brain functions in healthy subjects and patients with basal ganglia disorders, such as Parkinson´s disease. He applies a variety of methodological approaches including non-invasive and invasive neural recordings, structural and functional neuroimaging, and non-invasive and deep brain stimulation techniques. A major focus of his research is directed towards investigating the role of pathological neural oscillations and synchronization in movement disorders and hepatic encephalopathy and unraveling the mechanisms of deep brain stimulation in Parkinson´s disease and other movement disorders. He is author of more than 420 research articles listed in PubMed. He received among others the Hans Jörg Weitbrecht Award for Clinical Neuroscience and the Heinrich Pette Award of the German Society for Neurology. Alfons Schnitzler served as vice-president of Heinrich Heine University, as president of the German Society for Clinical Neurophysiology and Functional Imaging, and as president

of the German Brain Council. He is a fellow of the European Academy of Neurology and a member of its scientific panels on clinical neurophysiology and movement disorders. He served as member or chair on national and international committees and assessment panels including services for the German Research Council, European Research Council, German Federal Ministry of Education and Research Wissenschaftsrat, Swiss National Science Foundation, Dutch Organization for Scientific Research, Medical Research Council, Wellcome Trust, INSERM.

Dominika Šulcová

Dominika Šulcova obtained her Master's degree in Neuroscience (2017) in parallel with a Bachelor's degree in Physiotherapy (2016) at Charles University in Prague. She was awarded the F.N.R.S. Research fellow grant in 2018 and is currently in her last year of the Ph.D. program at the Institute of Neuroscience (IoNS) at the UCLouvain in Brussels, where she works under the supervision of Profs. André Mouraux and Adrian Ivanoiu. In her research, she uses the combination of transcranial magnetic stimulation and EEG (TMS-EEG) to evaluate the state of inhibitory neurotransmission in various cortical areas in the brain of healthy subjects and patients diagnosed with early stages of Alzheimer's disease. She is generally interested in exploring the cortical excitability in the human brain, and in her side project, she focuses on TMS-EEG correlates of sustained pain perception. She also participates in a collaborative project that aims to assess motor awareness in humans in the state of microgravity during parabolic flights. Besides her research activities, Dominika has been the representative of Ph.D. candidates in the Bureau of IoNS since 2018, and she has been acting as the EURON Ph.D. representative of UCLouvain since 2019. From the beginning of her Ph.D. studies, she has also taken the leading part in organizing the annual Ph.D. conference of the institute, the IoNS Young Researcher Day.

Petra Uittenbogaard

In 2007 Petra Uittenbogaard (1974) received a Master's degree in Health Sciences at Maastricht University. After having worked as a quality manager in the Sint Antonius Hospital in Nieuwegein from 1997 till 2000, she moved back to Maastricht and worked as a policy advisor and organizational consultant in a large organization for elderly care in Heerlen, and as a strategic consultant in various health care organizations. In 2002 she was contracted as an advisor to the Executive Board of the academic hospital in Maastricht, nowadays Maastricht UMC+. Her project portfolio mainly consisted of projects in the field of strategic alliances, academic cooperation with other regional hospitals and care suppliers in the Maastricht region, organizational development, and projects shared by both hospital and the medical faculty on translational medicine and the development of a university medical center in Maastricht. From July 2011 she runs her own company. In February 2018 she started to obtain a Bachelor's degree in primary education at Inholland University of Applied Sciences in The Hague. In April 2020, she completed her aptitude test and bachelor's degree. Since then, she has been working as a primary school teacher and tries to combine her advisory skills and experience with meaningful work in primary education.

Annex 2 Site visit program external review MHeNs 2021

Important note
Due to new COVID-19 measures introduced before the site visit, the whole program of Sunday, November 14 was canceled. In addition, some minor changes were made to the program (location) and several presentations and interviews took place online. During the tour of research facilities on the first day, the committee was split into pairs.

Sunday 14 November 2021

Venue: Kruisherenhotel, Kruisherengang 19-23 Maastricht

Location: Leonardo's Boardroom

17.30 - 18.30	Closed meeting ERC members
	ERC members, Dean FHML, Board School (Management board)
18.30 - 19.30	Installation of the ERC by the Dean of the Faculty of Health, Medicine and Life Sciences (FHML)
	Presentation by Prof Annemie Schols (Dean FHML)
	Introduction School for Mental Health & Neuroscience by Prof David Linden (Scientific Director)
	Overview program ERC

Location: Restaurant Kruisherenhotel

19.30	Drinks and dinner with ERC members, Dean FHML - Professor Annemie Schols and Management Board School MHeNs members.

Monday 15 November 2021

Location: MECC – Lobby North

08.30 - 09.00	Welcome

Location: MECC – room Brussels 0.4 and room Paris 0.5

	Morning chair: Frans Verhey
09.00 - 09.30	Introduction MHeNs research program and organisational structure by Prof David Linden
09,30 - 10.00	Presentations
	Neuroimaging: *Walter Backes* | *Koy van Hooren*
10.00 - 10.15	Discussion about presentations and theme strategies
10.15 - 10.45	Presentations
	Monitoring: *Pieter Kubben* | *Machteld Marcelis*
10.45 - 11.00	Discussion about presentations and theme strategy
11,00 - 11.30	Coffee Break Lobby North
11.30 - 12.15	Presentations
	Rehabilitation & Prevention / Societal impact: *Thérèse van Amelsvoort (@ease)*
	Partner in Balans (HI): *Lizzy Boots*
	Limburg Brain Injury Center: *Caroline van Heugten*
12.15 - 12.30	Discussion over presentations and theme strategy

Location: MECC – room Berlin 0.2 and room Copenhagen 0.3

12.30 - 14.30	Working Lunch (ERC members and Management Board MHeNs / School Council representative of patient organisation
	Professor David Linden, Scientific director MHeNs
	Presentation & discussion
	1) Research quality
	2) Societal relevance
	3) Viability of the unit (MHeNs).
	Patient Organizations:
	• Stichting [illegible]: *Bram Verbrugge* [illegible]
	• Alzheimer Nederland: *Marco Blom*
	• Stout [illegible]: *Kim van Bekkum*
	Present: Raymond van de Berg | Bart Rutten | Govert van Koeveringe | Carroll Webers | Martin van Boxtel | Koen Schruers | Harald Schmidt | Caroline van Heugten | Wolfgang Viechtbauer | Mark Janssen | Sinan Gülöksüz | Wolfgang Buhre | Bert Smeets

Location: MECC – room Brussels 0.4 and room Paris 0.5

	Afternoon chair: Jos Prickaerts
14.30 - 15.00	Presentations
	Cell biology & Genetics: *Bart Smeets* | *Daniel van den Hove*
15.00 - 15.15	Discussion over presentations and theme strategy
15.15 - 15.45	Presentations
	Neuromodulation: *Yasin Temel* | *Andre Heymans*
15.45 - 16.00	Discussion over presentations and theme strategy
16.00 - 16.30	Coffee Break Lobby North
16.00 - 16.15	Walk to Research facilities
	Members ERC committee and invited staff members

16.15 - 17.15 Walking Tour of Research Facilities:
- **Translational Neuroscience laboratory**
  Jos Prickaerts and division 3 team
  (ERC members: Kenis, Bulanova)
- **Scannexus - 7T and 9.4T**
  Job van den Hurk, Scientific manager
  Gommert van Koeveringe, Mathijs de Rijk, Olaf Schijns, Stijn Michielse, Hakim Baazaoui
  (ERC members: Schnitzler, Fernandez)
- **Eye Clinic**
  Carroll Webers, Tos Berendschot
  (ERC members: Huyten, Karpatkin)

17.15 - 17.30 Walk MECC
ERC members

Location: MECC – room Berlin 0.2 (Closed)

17.30 - 18.00 Closed meeting ERC members

Location: 'De Gouverneur' | Boschstraat 105A, 6211 AW Maastricht

19.00 - 19.30 Welcome

19.30 - 22.00 Walking Dinner
Closed (Invited persons)

Tuesday 16 November 2021 (Only for invited persons)

[illegible] – room [illegible] and room Copenhagen 0.3

Morning chair: Thérèse van Amelsvoort

09.00 - 09.40 Presentation MHeNs Master and PhD education

09.00 - 09.10 Master Specialization Fundamental Neuroscience: *Daniel van den Hove*

09.10 - 09.20 FHML/MUMC+ PhD program, PhD Track System and Scientific Integrity: *Martin van Boxtel*

09.20 - 09.40 International programs: *Gunter Kenis / Melissa Schepers External PhD (Hasselt)*

09.40 - 09.50 Discussion

09.50 - 10.20 Coffee Break Lobby North

10.20 - 11.20 Interviews Staff members (Colleagues at turning points of their careers (Recent UD/top talent programme/ new professors/ new clinical academics)
(ERC members circulate around 6 coffee tables for informal discussions)
Staff members: Marlies Gijs *(Online via zoom)* | Christian Herff | Dennis Hernaus | Sebastian Koehler | Max Dickman | Mayke Oosterloo | Pieter-Jelle Visser | Kay Deckers

11.20 - 12.20 Interviews (ERC members circulate around 6 coffee tables for informal discussions)
Representatives PhD students per division:
- Div 1: Stevie Hendriks
- Div 2: Samantha Baldi
- Div 3: Daan van Kruining
- External PhD: Melissa Schepers

Representatives Postdocs per division
- Div 1: Gerald Drenthen
- Div 2: Lotta Pries
- Div 3: Marina Damas

12.20 - 13.20 Working Lunch with Management Board / School Council; Short Presentations and discussion over:
1) Open Science: *Rob Markus*
2) Academic Culture: *Jos Prickaerts*
3) Talent Policy & Diversity: *Thérèse van Amelsvoort*
Present: Bart Rutten | Bert Joosten | Gommert van Koeveringe | Yasin Temel | Carroll Webers | Jos Prickaerts | Frans Verhey | Thérèse van Amelsvoort | Harald Schmidt | Karin Faber | Marlon Jansen

13.20 - 14.20 Presentation
Embedding School MHeNs --> MUMC+: *Robert van Oostenbrugge*
Present: Jos Prickaerts | Thérèse van Amelsvoort | Bart Rutten | Bert Joosten | Gommert van Koeveringe | Yasin Temel | Carroll Webers | Harald Schmidt | Karin Faber

Location: MECC – room Berlin 0.2 (Closed)

14.20 - 16.00 Closed meeting ERC

16.00 - 17.00 Feedback to Management Board and Director School – Dean (Annemie Schols) + Els Zwelmer.

16.15 - 17.15 Walking Tour of Research Facilities:
- **Translational Neuroscience laboratory**
  Jos Prickaerts and division 3 team
  (ERC members: Kerr, Burova)
- **Scannexus - 7T and 9.4T**
  Job van den Hurk, Scientific manager
  Gommert van Koeveringe, Matthijs de Rijk, Olaf Schijns, Stijn Michielse, Hasim Baeepuri
  (ERC members: Schnitzler, Fernandez)
- **Eye Clinic**
  Carroll Webers, Tos Berendschot
  (ERC members: Luyten, Karyotaki)

17.15 - 17.30 Walk MECC
ERC members

Location: MECC – room Berlin 0.2 (Closed)

17.30 - 18.00 Closed meeting ERC members

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3) Talent Policy & Diversity: *Thérèse van Amelsvoort*
Present: Bart Rutten | Bert Jooren | Gommert van Koeveringe | Yasin Temel | Carroll Webers | Jos Prickaerts | Frans Verhey | Thérèse van Amelsvoort | Harald Schmidt | Karin Faber | Marlon Jones

13.20 - 14.20 Presentation
Embedding School MHeNs <-> MUMC+: *Robert van Oostenbrugge*
Present: Jos Prickaerts | Thérèse van Amelsvoort | Bart Rutten | Bert Jooster | Gommert van Koeveringe | Yasin Temel | Carroll Webers | Harald Schmidt | Karin Faber

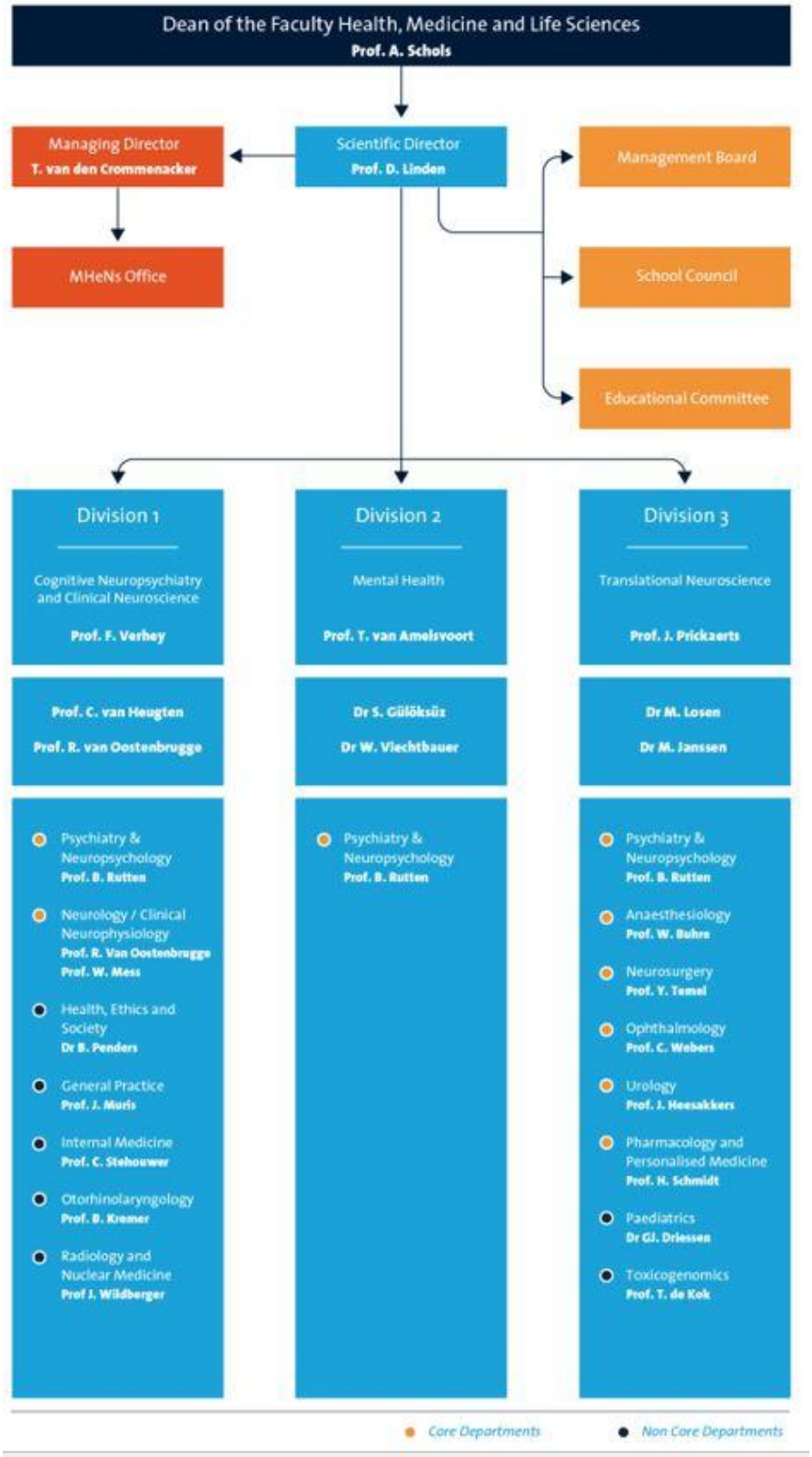
Location: MECC – room Berlin 0.2 (Closed)

14.20 - 16.00 Closed meeting ERC

16.00 - 17.00 Feedback to Management Board and Director School – Dean (Annemie Schols) + Els Evelo [illegible]

Annex 3 Organogram Faculty of Health, Medicine and Life Sciences

Annex 4a Organogram School of Mental Health and Neuroscience



Annex 4b Matrix structure of the MHeNs research

Annex 5a Composition of the school

	2015		2016		2017		2018		2019		2020	
School	Totaal fte	Totaal #	Totaal fte	Totaal #	Totaal fte	Totaal #	Totaal fte	Totaal #	Totaal fte	Totaal #	Totaal fte	Totaal #
Scientific Staff FHML[1]	12,6	43	14,9	50	16,7	54	20,2	65	20,3	66	22,2	70
Scientific Staff academic hospital	6,5	32	4,7	31	4,7	33	4,7	33	4,6	32	4,6	32
Post Docs[2]	23,3	45	20	35	23,9	39	27,5	45	25,7	41	27,7	42
Internal PhD-students[3]	54,9	61	62,7	70	75,5	83	84	94	92,5	101	97,2	106
Total Research Staff	**97,3**	**181**	**102,3**	**186**	**120,8**	**209**	**136,4**	**237**	**143,0**	**240**	**151,7**	**250**
Support staff (research)[4]	16,4	32	17,1	31	19,4	38	17	37	22,8	43	28,8	50
Support staff (managerial)[5]	4,2	7	5,2	8	5,7	8	5,5	8	6,3	10	6,9	11
Total Support Staff	**20,6**	**39**	**22,3**	**39**	**25,1**	**46**	**22,5**	**45**	**29,1**	**53**	**35,7**	**61**
Total Staff incl academic hospital	**117,9**	**220**	**124,6**	**225**	**145,9**	**255**	**158,9**	**282**	**172,1**	**293**	**187,4**	**311**
Total Staff excl academic hospital	**111,4**	**188**	**119,9**	**194**	**141,2**	**222**	**154,2**	**249**	**167,6**	**261**	**182,8**	**279**
External PhD students[6]	110		98		116		142		210		238	

Annex 5b Funding of the school

This table presents the funding and expenditures of the school. Funding has been described both as the number of fte and in percentages. The school depends financially on (1) direct funding as well as on additional funding generated by the acquisition of (2) research grants (obtained in national and international scientific competitions), (3) contract research (EU framework, INTERREG, industry, etc.) and (4) other funds from several sources such as sponsorships, revenues from course fees, workshops, training programs, the Health Foundation Limburg, and other industry-related revenues.

The table shows…

School	2015		2016		2017		2018		2019		2020	
	fte	%	fte	%	fte	%	fte	%	fte	%	fte	%
Funding												
-Direct funding[1]	12,9	17	11,8	13	20,7	18	34,3	27	35,8	26	37,2	25
-Research funds[2]	18,0	23	20,1	21	15,1	13	19,1	15	17,5	13	22,3	15
-Contract research[3]	47,1	60	62,4	66	77	68	73,9	58	83,9	61	88,1	60
-Other	0	0	0	0	0	0	0	0	0	0	0	0
Total funding (excl. hospital)[4]	**78,0**	**100**	**94,3**	**100**	**112,8**	**100**	**127,3**	**100**	**137,2**	**100**	**147,6**	**100**
	k€	%	k€	%	k€	%	k€	%	k€	%	k€	%
Expenditure												
-Personnel costs	6.859	72	6.268	69	7.759	72	9.151	73	10.199	73	11.974	72
-Other costs	2.675	28	2.784	31	3.014	28	3.338	27	3.844	27	4.677	28
Total expenditure	**9.534**	**100**	**9.052**	**100**	**10.773**	**100**	**12.489**	**100**	**14.043**	**100**	**16.651**	**100**

Glossary

ACL	Alzheimer Center Limburg
BNC	Brain Nerve Center
ERC	External Review Committee
ERC grant	Research funding by the European Research Council
ESM	Experience sampling method
FAIR data	Findable, Accessible, Interoperable and Reusable data
FHML	Faculty of Health, Medicine and Life sciences
FPN	Faculty of Psychology and Neuroscience
FSE	Faculty of Science and Engineering
FTE	Fulltime equivalents
MHeNs	School for Mental Health and Neuroscience
NUTRIM	School of Nutrition and Translational Research in Metabolism
NWO	Dutch Science Funding Foundation
SEP	Strategy Evaluation Protocol
SWOT analysis	Strengths, Weaknesses, Opportunities, and Threats
UM	Maastricht University

Colophon

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This report was finalized on 7 February 2022 by

Professor Guillén Fernández, chair
Petra Uittenbogaard, MSc, secretary to the external review committee