School of Nutrition and Translational Research in Metabolism

Assessment report

EXTERNAL PEER REVIEW

2015 - 2020

December 2021

Preface

This report summarises the findings of the external Review Committee of NUTRIM School of Nutrition and Translational Research in Metabolism at the Faculty of Health Medicine and Life Sciences, Maastricht University, which was carried out on November 24th and 25th 2021. The full visit was held online by Zoom because of COVID regulations.

In addition to discussions with colleagues from the university, the review process benefited greatly from the extensive preparation undertaken by NUTRIM and from the provision of information in a standardised and digestible format. The Review Committee appreciates the professional assistance provided by the whole NUTRIM team. We also thank Maastricht University and NUTRIM administration, staff and PhD candidates for their contributions in making the review an interesting, informative and rewarding process.

December, 2021

Index

Preface 2

1. Introduction 5

2. The Review Committee 6

2.1 Scope of the assessment and documentation 6

2.2 Working procedure of the Review Committee 7

3. Brief description of NUTRIM 8

4. Organization 9

Infrastructure 9

Financial position 9

Position within Maastricht University/FHML 9

Governance 9

Academic Culture 9

5. Strategy 11

6. Personnel policy 13

Diversity 13

Talent management 13

PhD Policy and training 13

PhD Council 13

PhD success rate 14

7. Research assessment of the whole of NUTRIM 15

Research quality 15

Open science 15

Societal relevance and knowledge dissemination 15

8. Research assessment of individual divisions 17

8.1 Division 1: Obesity, diabetes & cardiovascular health 17

Research Quality 17

Societal relevance 17

Viability of the unit 17

8.2 Division 2: Liver & digestive health 18

Research Quality 18

Societal relevance 18

Viability of the unit 18

8.3 Division 3: Respiratory & Age-related Health 19

Research quality 19

Societal relevance 19

Viability of the unit 19
9. Viability of NUTRIM 20
10. Recommendations for improvement 21
11. Annexes 23
11.1 Annex 1: Members of the External Review Committee 23
Prof. Nick Wareham, FMedSci, PhD (chair) 23
Prof. Ian Macdonald, PhD 23
Prof. Helen Roche, PhD 23
Prof. Gerjan Navis, MD 24
Dr. Alessandro Laviano, MD 24
Marie-Luise Puhlmann (PhD candidate) 24
Roelinka Broekhuizen, PhD, secretary 24
11.2 Annex 2: criteria of SEP 25
Research quality 25
Societal relevance 25
Viability 25
11.3 Annex 3: programme NUTRIM review 2021 26

1. Introduction

This report presents the results of the assessment of the research and educational programmes of NUTRIM over the period 2014-2020, conducted in November 2021 by an external Review Committee. NUTRIM is a research school at the Faculty of Health, Medicine and Life Sciences (FHML) at Maastricht University and part of the Maastricht University Medical Centre+ (MUMC+).

2. The Review Committee

To assess the research and education conducted at NUTRIM, an international external Review Committee was appointed by the Executive Board of Maastricht University on May 25th 2021. The Review Committee consisted of the following members:

- Prof. Nick Wareham, FMed Sci, PhD (chair)
- Prof. Ian MacDonald, PhD
- Prof. Helen Roche, PhD
- Prof. Gerjan Navis, MD
- Prof. Alessandro Laviano, MD
- Marie-Luise Puhlmann (PhD candidate)
- Roelinka Broekhuizen, PhD (secretary)

All members of the Review Committee signed a statement of impartiality and confidentiality. Additional information on the Review Committee members and their brief curriculum vitae can be found in Annex 1.

2.1 Scope of the assessment and documentation

The Review Committee used the methods described in the Strategy Evaluation Protocol 2021-2027 (SEP). This protocol aims to ensure a transparent and independent assessment process (see Annex 2: Criteria of national protocol SEP).

The Dean asked the Review Committee to

1) Assess NUTRIM and its three research divisions
   a) By judging the performance of NUTRIM on the three SEP assessment criteria below:
      i) Research quality
      ii) Relevance to society
      iii) Viability
   b) By incorporating four specific aspects:
      i) Open Science: availability of research output, reuse of data, involvement of societal stakeholders;
      ii) PhD Policy and Training: supervision and instruction of PhD candidates;
      iii) Academic Culture: openness, (social) safety and inclusivity; and research integrity;
      iv) Human Resources Policy: diversity and talent management.

2.2 Working procedure of the Review Committee

The assessment was based on and supported by two main components of evidence:

- self-evaluation reports detailing the operation, management, research activities, outputs, and SWOT analysis of the research institute; the self-evaluation report was written in the format prescribed in the national Strategy Evaluation Protocol;
- discussions with boards, managers, principal investigators, heads of department, PhD council, postdocs and junior and senior academic staff about the information provided.

The site visit was undertaken online on November 24th and 25th 2021 and consisted of a number of components, which can be summarised as follows (full programme in Annex 3):

- An introduction to FHML and MUMC+ by the Dean of the Faculty of Health Medicine and Life Sciences Prof. Annemie Schols and to NUTRIM by the Scientific Director of NUTRIM Prof. Daisy Jonkers
- Introduction to the three divisions
- A virtual tour of the NUTRIM infrastructure
- 5 poster pitches per division
- Meetings with
    - management team
    - PhD coordinator and PhD council
    - junior and senior investigators
    - two MSc students
    - employees on grants, scientific integrity and valorisation
    - Clinical researchers
- Closing meeting with Scientific Director and Managing Director
- Final meeting with the Dean of FHML

The draft report was presented to the Dean of the Faculty of Health, Medicine and Life Sciences to redress any (factual) errors.

3. Brief description of NUTRIM

The NUTRIM school of Nutrition and Translational Research in Metabolism is one of the graduate schools of the Faculty of Health Medicine and Life Sciences (FHML) of Maastricht University (UM). As such, NUTRIM is also a part of Maastricht University Medical Center Plus (MUMC+), a partnership between FHML and Maastricht University Medical Center+. NUTRIM aims to contribute to health maintenance and personalised medicine by unravelling lifestyle and disease-induced derangements in metabolism and by developing targeted nutritional, exercise and drug interventions. This is facilitated by a state-of-the-art research infrastructure and close interaction between scientists, clinicians, PhD and master students.

4. Organization

Infrastructure

During the review period (2014-2020), NUTRIM has taken advantage of the close collaborations established between the clinical and research communities and with societal stakeholders more generally, in order to finance considerable improvements of its facilities, accommodating state of the art technologies to boost nutrition and metabolic research. In particular, the recent completion of the NUTRIM Clinical Research Unit within the academic hospital highlights NUTRIM's mission to bring basic scientists and clinical researchers under the same roof to enhance collaboration. The new infrastructure includes social areas to enhance opportunities for collaborative interactions between scientists and clinicians. NUTRIM's infrastructure represents a model of integration and a stimulating work environment, which is internationally competitive.

Financial position

NUTRIM has developed an efficient strategy to attract funds to support further expansion of its research activities, increasing the number of high-quality studies that are undertaken by NUTRIM and making the school highly attractive to external researchers, with whom collaborative studies can be undertaken. NUTRIM has research officers who proactively identify private and public research funding opportunities for both clinical and basic science questions.

Position within Maastricht University/FHML

NUTRIM is a graduate school embedded within the FHML and UM. The way in which NUTRIM is positioned favours internationalisation of its research activities and offers a wide range of research opportunities for talented students. It also enables the integration of biological and clinical research with expertise from other disciplines, including engineering and computer sciences.

Governance

NUTRIM is organised in three divisions: i) obesity, diabetes & cardiovascular health; ii) liver & digestive health, and iii) respiratory & age-related health. There is a considerable potential for overlap between the three different divisions and thus there is a key role for strategic management of the activities and goals of NUTRIM, in order to avoid duplication of research or missed scientific opportunities. The organogram of NUTRIM appears appropriate to face the daily challenges of governing an ambitious graduate school and includes senior researchers with relevant experience in basic and clinical research, as well in managing the administrative issues, including financing, recruitment and academic promotion. However, it is a little unclear how the overall scientific strategy of NUTRIM as a whole is formulated and delivered as opposed to the research programmes of the specific divisions which are driven by the vision of individual research leaders. Whilst the senior management team of NUTRIM has a reporting line from the Education Committee which addresses the needs of PhD candidates, it is unclear how much the activities of the Educational Committee are shaped by the PhD council and how much by the PhD coordinator.

Academic Culture

NUTRIM's aims are consistent with the general aims of UM and FHML and thus NUTRIM supports open science, making research as open as possible. Research at NUTRIM is made accessible as much as possible in order to share knowledge within the graduate school and beyond that to the wider scientific community to promote international collaboration. NUTRIM stimulates open access publication by taking advantage of specific contracts between publishers and the UM library. Beyond the scientific community, research activities are made accessible to strengthen engagement with the public, a process which in turn helps support NUTRIM research activities.

NUTRIM actively engages with the policy and procedures of UM in relation to scientific integrity and with FHML/MUMC+ has a platform to promote a culture of awareness about this topic. For PhD candidates measures to raise awareness on scientific integrity are integrated at the beginning and end of the PhD trajectory. The Review Committee was informed that a more general course on scientific integrity is under

development. No details were available to the committee about the number of scientific integrity complaints during the review period. Such information would have been helpful since the absence of complaints (if that were the case) cannot be taken as evidence of absence of a problem but may reflect challenges in how issues are raised and recorded. Each faculty within UM has a confidential advisor for PhD candidates who can provide advice on a “wide range of issues, problems and conflicts, including but not limited to scientific integrity”. It may be sensible to consider the appointment of a separate individual to this position as the current dual role of the PhD coordinator as the confidential advisor does not create a strong sense of an independent route to raising possible concerns.

In NUTRIM as in all research organisations in the Netherlands and internationally, there is a need to prioritise efforts to encourage inclusivity. The Review Committee concluded that much more could be done by NUTRIM to address the issue of minorities, which should be more proactively included in NUTRIM as PhD candidates, researchers and managers.

5. Strategy

The vision of NUTRIM is focused on health and personalised medicine, specifically addressing the impact of lifestyle, particularly nutrition and physical activity, and disease-induced derangements on metabolism, with a view to developing targeted nutritional exercise and drug interventions. NUTRIM is split within three disease-driven multidisciplinary divisions: 1) Obesity, diabetes & cardiovascular health; 2) Liver & digestive health; 3) Respiratory & Age-related Health.

The strategic focus and performance of Division 1 (Obesity, diabetes & cardiovascular health) is very strong and maps very well to the core mission of the organisation. Given the projected health impacts of obesity, the plans of this division are highly relevant and topical and there are many opportunities in the field of personalised health and nutrition that can be addressed with the core skills that are in place. Division I has demonstrated excellent productivity in terms of high-quality publications, with excellent citations. The principal investigators (PIs) are well integrated in the international arena, participating as both leaders and partners in key EU projects.

Division 2 (Liver and digestive health) is of key strategic importance to NUTRIM, acting as the interface been the environment and health. The research that has been conducted to date has been very disease orientated, reflecting the skill sets of the leading medics and scientists. The real challenge and potential dividend will stem from moving the focus of the division closer to nutrition and health, capturing and integrating the knowledge based in Divisions 1 and 3. For example there are major scientific opportunities that could flow from an enhanced focus on studying the impact of diet on gut health and/or hepatic dysfunction on skeletal biology. Research on the gut microbiome has been very successful for NUTRIM to date, but moving forwards an enhanced focus of the division on next generation metagenomics and health would be required. The self-evaluation report refers to opportunities to study the crosstalk between organs. The Review Committee agrees that these opportunities are considerable and are unique for NUTRIM as few other international institutions have the critical infrastructure that is in place at NUTRIM. Therefore, we recommend that this opportunity is seized in a timely way with the establishment of ambitious projects in this research area.

There is a wealth of expertise in the different research areas that are included in Division 3 (Respiratory & Age-related Health) and the division clearly conducts some very good work, although the choice of publications and outputs in the self-evaluation report did not perhaps show that work in its best light. However, overall the research output profile of Division 3 is weaker than Divisions 1 and 2, which is a concern. The division does not seem to be integrated at the senior PI level and has not dealt with some of the challenges that were identified in the last review. Fundamentally there is a lack of clarity about the strategic goals of the division, which is a missed opportunity given the different strengths in the division in cancer, pulmonary health, skeletal biology and kidney disease. What is lacking is a clear sense of the commonality of approach to studying age-related diseases in general. Some of the posters based on seed grant funding illustrated the potential of a more unified theme in the division. However, it needs to be agreed, articulated and built into a shared mission and vision of the Division 3 Senior PI team.

NUTRIM as a whole has established good links with and involvement of societal stakeholders. This is particularly relevant for Division 1, but perhaps less so for the remaining divisions which are more disease focused. In general, the societal relevance of NUTRIM's work is very high and the institute, for the most part, is actively addressing key issues to human health and personalised medicine or in the case of Division 3, has the capability to do so.

There are considerable opportunities in NUTRIM for projects that span medicine and nutrition with clinical care and nutrition support. In the Netherlands the focus of NUTRIM on the integration of in-depth nutritional science with clinical medicine is unrivalled, and it is a national strategic asset which can help address the health challenges of an ageing society. The divisional structure of NUTRIM allows the simultaneous consideration of nutritional science from the different perspectives of being "disease-agnostic", investigating the relationship between single organs or systems and specific diseases and also a

more holistic “multiple organ systems to multiple disease” perspective. This structure provides unique opportunities that should allow NUTRIM to contribute to the establishment of a comprehensive strategy that will drive science on nutrition and medicine to the next level, which is an urgent and unmet need. However, the achievement of this potential needs a much better recognition, articulation, and operationalisation of an overall NUTRIM-wide strategy. As an organisation, NUTRIM can play an important role in the Netherlands in establishing and driving forward this agenda with the Dutch Government but needs more demonstrably to step up into this leadership role, which will help the Netherlands maintain and sustain its standing in the European Nutrition Research arena. This opportunity is further enhanced by the strong clinical nutrition industry in The Netherlands, and the government focus on lifestyle as a strategic health target, which creates considerable opportunities for strategic partnerships.

6. Personnel policy

NUTRIM is an impressive research unit with a strong community of PhD candidates, post-docs and Assistant, Associate and full professors. Different opportunities are offered to researchers at different stages in their careers to develop themselves within NUTRIM and FHML. Within the framework of these offered opportunities researchers can create a training/education program that is tailored to their needs.

Diversity

Maastricht University is an international university attracting students from all over the world. As a topic for undergraduate and post-graduate study, nutrition also attracts a very high proportion of female students. However, this ethnic and gender diversity among students is not currently carried forward to all career stages in the research unit. NUTRIM should not only recognise this problem but take active steps to promote greater ethnic and gender diversity at all levels in the research unit within a wider strategy for inclusion in the university as a whole. In turn this will intensify the vibrant research culture and continue to create an open, inclusive and safe environment.

Talent management

NUTRIM has unique and inspiring programmes for supporting excellent researchers from the post-doc level onwards, but PhD candidates might also benefit from individual talent development. The link to the Masters level degree programme is strong, for home and international students alike, and creates a fruitful recruitment ground for motivated and appropriately trained PhD candidates. Early career researchers are attracted by the unique culture of NUTRIM but have an unclear pathway to longer term opportunities within the research unit. One issue that the Review Committee identified was that there is no limit on the number of PhD candidates that a supervisor can have. This, coupled with the financial incentives linked to PhD numbers, creates an uncomfortable combination of high work pressure among supervisors and potential dilution of research output quality. There is also a tension between general teaching responsibilities and research. It was unclear to the Review Committee whether finding a solution to this lay with NUTRIM itself or more widely in FHML or UM. Either way, consideration should be given to sustainable solutions that allow the institution as whole to deliver on its research, teaching and supervisory responsibilities without overburdening individuals. This may require funds to be used centrally to create specific teaching positions, strategies to establish limits to PhD numbers per supervisor and the development of more individualised tracks for academic staff allowing some to focus more on teaching and supervision and others on research.

PhD Policy and training

NUTRIM has a strong community of PhD candidates, who are distinguished by their ability to perform in an interdisciplinary research setting and their willingness to collaborate with each other. The extent of that collaboration is partly determined by the network of PhD supervisors. Efforts to nurture collaborations beyond these existing networks would stimulate cross-disciplinary innovation.

Supervising students and assisting in teaching courses is part of the PhD process to which PhD candidates can devote up to 10% of their contracted time. It is an important opportunity to enhance skills that PhD candidates can employ in their future careers. The Review Committee was informed that the contractual 10% rule lacks uniform interpretation, an issue that needs to be addressed. The focus should be on ensuring that the identification of supervisory opportunities is tailored to the personal interests and talents of each PhD candidate, so that this becomes a rewarding and optimal educational experience.

PhD Council

NUTRIM has a vibrant PhD Council that participates via the PhD coordinator in the School Council and actively organises social events for fellow PhD candidates. The PhD Council receives an annual budget for these activities, but members are not reimbursed for their time and efforts. This structure allows PhD-related issues to be aired in the School Council, but is limited by their presentation by a senior research unit member. Positioning the PhD council more directly in an advisory role to the School Council might

enhance communication. The PhD Council is aware that it would benefit from greater diversity to ensure it adequately represents all individuals within the PhD community. Reimbursement for active PhD Council membership might be considered by NUTRIM.

PhD success rate

There has been an overall rise in PhD candidate numbers in NUTRIM, driven by an increase in external PhD candidates which has more than compensated for a decrease in internal PhD candidates. In Division 1 the overall increase in PhD numbers is commensurate with the growth in scientific and support staff. However, this is not the case for the other divisions, which is a concern for the workload of staff and for maintenance of the quality of research outputs.

The overall PhD success rate for NUTRIM is good but the major issue is the long duration of most PhDs. For the majority of internal PhD candidates, the PhD take five years or more. The duration of PhDs is longer still for external candidates, perhaps because of the number of those candidates who have to combine completion of a PhD with clinical training. The combination of increasing numbers of PhD candidates, particularly those who are external, with very long durations of PhD training and high levels of workload concerns among supervisors is a major issue. The PhD-TRACK system is an important initiative to help ensure that the progress of PhD candidates is more closely monitored. However, this alone will not solve the challenges and a more radical examination of the whole PhD training system is required.

NUTRIM uses a PhD-TRACK system to follow PhD candidates during their PhD trajectory and to monitor their progress, which the PhD candidate's supervisor is responsible for reporting on every six months. However, there is always a possibility of discrepancies between progress on paper and real-life personal progress and mental well-being. The risk of that discrepancy may rise with increased number of students without a commensurate increase in scientific and support staff. A system focussing on these aspects of young researchers' lives already exists in the mentoring system for MSc students but could usefully be broadened to PhD candidates.

7. Research assessment of the whole of NUTRIM

Research quality

Overall, the research quality of NUTRIM is of a high standard with some outstanding, internationally leading components. However, some others are less competitive. Publication rates are generally very good with high quality outputs across NUTRIM, but again there is some variability in these characteristics between the research divisions.

Open science

Within the self-evaluation report there are clear statements about having a philosophy of Open Science which fits with the university's aims, but it would have been helpful to have data as to what proportion of the primary publications (i.e. original articles rather than reviews and position statements) fall into the Gold, Green or 'not Openly available' categories. There was mention of re-use of data in the presentations and reading material provided but it was not possible to see how extensive this was and what steps were taken in the participant recruitment and consent to ensure that approval had been obtained for such re-use. There is a clear strategy to improve the utilisation of 'big data' approaches, with acknowledgement that the expertise in this area is spread across research groups and that linking this expertise is an important step towards enhancing such use of the data already stored and to be generated in the future. There was some evidence of involvement of stakeholders in research planning and dissemination, but it is not clear whether this was opportunistic or part of a clear, NUTRIM-wide strategy to have a close involvement of stakeholders in the research programme.

Societal relevance and knowledge dissemination

It is very clear that the research areas covered by NUTRIM are of major societal relevance. NUTRIM has the opportunity to make major contributions to society in the Netherlands and beyond, an opportunity which could be realised more fully over the next 5 years.

The reviewers identified opportunities for enhancing the dissemination of the knowledge developed by NUTRIM to the wider population. It is acknowledged that some areas are already strongly communicated to the public, but greater use of novel media and clarification of the impact NUTRIM's research findings have had to clinical care protocols are opportunities that should be explored further.

Involving patients and public in research as recipients of the knowledge that is created by NUTRIM is important but needs to be part of a broader strategy. In general the Review Committee identified a need for greater and more explicit inclusion of patient and population perspectives in setting the research agenda of NUTRIM. This needs to be a holistic approach that spans the entire research process from informing research priorities through to highlighting patient priorities for clinical outcomes.

The strategy of NUTRIM is focused on individual-level approaches to prevention and care, a focus that the Review Committee considered to be appropriate given the expertise and background of the research teams in the Unit. However, it would be possible for NUTRIM to play a more explicit collaborative role, within Maastricht University and beyond, in research that is aimed at developing population-level approaches to nutrition-related health conditions such as changes to the built environment and societal-level fiscal interventions. This research agenda is very relevant to societal concerns and is a complement to the more individual and clinical approaches that NUTRIM majors on. The Review Committee agrees that it would not be appropriate for NUTRIM to try to lead in this area of research, but the research strategy of the Unit could more clearly articulate how NUTRIM seeks to contribute to it, through collaboration with others who have complementary methodological skills like the Care and Public Health Research Institute (CAHPRI).

NUTRIM has a presence on national bodies, making contributions to professional bodies and to patient organisations. In the context of medical education, Maastricht University has provided leadership on the national stage in developing problem-based learning. There is a unique opportunity for Maastricht

University, and for NUTRIM in particular, to play a similar leadership role in developing nutrition in medicine and prevention.

8. Research assessment of individual divisions

8.1 Division 1: Obesity, diabetes & cardiovascular health

Research Quality

Division 1 is the flagship research pillar within NUTRIM, demonstrating consistent and very strong research outputs in their core areas of expertise over the last 6 years. The range and quality of publications are very high. There is a good balance and dynamic between senior and emerging PIs. The team should be congratulated in performing very highly in a very competitive environment. The number of PhDs is a little lower in this division than in others. This may relate to the nature of the complex mechanistic studies that have underpinned the prestigious publications that the division has produced. Division 1 and the Director need to work out a system to balance the Graduate School PhD needs, as well as the research project requirements.

Societal relevance

The societal relevance of the research undertaken is high for this Division. The key challenges including the variable efficacy of diet and lifestyle interventions are still major research issues.

Viability of the unit

Researching the health impacts of obesity-related health, poor nutrition and physical inactivity are still highly relevant and topical. Thus, this Division is highly viable. The Maastricht team are very well respected in the international research arena. Therefore, the Review Committee would anticipate that they would be successful in leading, and contributing as key partners, to forthcoming HORIZON Europe projects.

8.2 Division 2: Liver & digestive health

Research Quality

The academic excellence of the research of Division 2 is demonstrated by the number and the quality of the papers produced and by the division's success in securing competitive grant funding. In relation to the outputs, it might have been helpful to dissect the overall figures into original papers, reviews and commentaries and guidelines.

The growing interest of Division 2 in the gut microbiome reflects the preparedness of the leaders of this division to tackle the most recent challenges in basic and clinical research. The expertise of the investigators in Division 2, perhaps coupled with that of UM engineers and computer scientists, could result in NUTRIM being one of the top centres in the world in the field of gut physiology and medicine.

Societal relevance

Although the division has produced a large number of scientific papers, how that research understanding is translated into societal relevance is unclear. The Review Committee noted the role of members of Division 2 in regional, national and international organisations, in developing clinical guidelines and in communicating their research findings through classical and new media. However, it will be important in the future to go further than this and to show how the Division 2 research outputs have influenced clinical protocols and have impacted on the lives of patients and people in the general population. There is an on-going international debate on appropriate outcome measures for the assessment of efficacy and effectiveness clinical therapies, particularly for chronic diseases in which clinical perspectives on hard outcomes such as survival need to be better balanced by patient perspectives on the importance of quality of life. In that regard, it would also be important for the research of Division 2 to be more explicitly informed by the views of patients about their priorities and needs.

Viability of the unit

The aims of Division 2 span a large area of basic and clinical research, from non-alcoholic fatty liver disease to irritable bowel syndrome to liver failure during long-term parenteral nutrition. The division is well funded and is likely to remain so in the future. However, it may be necessary for the division to prioritise its goals in order to be able to maintain a focus on the impact of diet and nutrition on relevant basic and clinical issues, rather than adopt a strategy of producing piecemeal evidence opportunistically on many different syndromes. The high number of PhD candidates per supervisor in this division is a challenge to this focused strategy and could work against the goal of enhancing scientific excellence. The strong leadership of Division 2 will doubtless ensure that high standards of scientific research will be maintained and that the reputation of NUTRIM nationally and internationally will be enhanced. However, greater efforts should be made to outline the future health needs of society and to use these needs to inform the setting of the division's research agenda.

8.3 Division 3: Respiratory & Age-related Health

Research quality

Within Division 3 there are unique lines of research, such as the systematic assessment of muscle pathophysiology in different disease conditions across the translational pipeline. Unfortunately, this has not resulted in a balanced profile of scientific quality across the division as a whole, possibly due to the absence of an effective overall scientific strategy. The division has an implicit unarticulated matrix-like structure of expertise which brings together a focus on risk factors and pathophysiological process with a range of different diseases. While this results in effective cross-fertilisation of interests at particular knots such as where expertise and interest in muscle pathophysiology and respiratory medicine coincide, the strategy for taking forward particular areas of scientific enquiry is unclear. The overall impression is that the work is not strategically coordinated and is not optimally delivering on what is possible given the intrinsic qualities present in the division.

Societal relevance

The societal relevance of studying the impact of lifestyle and nutrition on the pathophysiology of age-related disorders is large, and is one of the greatest challenges in current medicine. Better fundamental insights and effective translation of nutrition to clinical practice and public health are urgently needed. Thus, the potential societal relevance of the work of Division 3 is considerable.

Viability of the unit

Division 3 has strong foundations in studying the pathophysiological basis of age-related disease with unique high quality expertise, has high potential societal relevance, and is strongly linked to relevant clinical disciplines. However, there are substantial challenges in relation to the coherence of its overall scientific strategy, which is a threat to the viability of the division. A strong overall coherent strategy is required, which will need to include a critical reappraisal of the range of disorders covered.

9. Viability of NUTRIM

Overall, NUTRIM has done well in the past six years and has produced an impressive number of scientific publications and developed its research infrastructure. The strengthening of the links with the hospital and the location of some research technologies within the clinical environment provides major opportunities for developing further translational research and enhancing clinical care in the future. The Review Committee identified clear strengths within NUTRIM but also some areas that need some attention and the development of a more strategic approach. NUTRIM has recognised the potential problems of diminishing PhD candidate numbers, and the variation in contributions to the overall research effort by PhD candidates and postdoctoral scientists may need further consideration. One issue is balancing the aims of postgraduate training with those of a research institute, as these do not always fit together effectively. There are clear plans for addressing the development of academic talent and tenure track positions. The specific issue of ensuring the continuation of a presence in NUTRIM of clinicians with patient care responsibilities as well as research activities is critical for the future viability of NUTRIM and will obviously need a continuing close relationship between the University, School and Hospital. The Review Committee identified the burden of provision of patient care during the pandemic as a threat to clinical academic careers. This issue may need explicit attention during the post-pandemic recovery phase. The current structure of NUTRIM is viable going forward, but there are major opportunities to develop and strengthen it so that it is not just viable but that it improves its position as a Centre of Excellence in Medically Applied Nutrition and Metabolism research, both within the Netherlands and internationally.

The SWOT analysis which precedes the strategic plan for the next six years is generally clear and appropriate, except that some thought could be given to the importance of collaboration across the research divisions as well as the cross-disciplinary interactions which exist at present. The strategic plan for the next six years is very high level with little indication of the specific strategies within and between the three divisions. The review identified a need for Division 3 to develop a clear strategic plan, and also suggested that the other two divisions would benefit from a longer term plan which the specific research projects were a clear part of, rather than what seems more like a bottom-up approach from specific research groups which is not always part of a forward strategy.

10. Recommendations for improvement

Strategy

- The Review Committee suggests that NUTRIM would benefit from more continuous independent strategic advice in addition to the current SEP process. NUTRIM should consider the **establishment of an independent International Strategic Advisory Board** which could meet at least once a year to help the development of a more holistic strategy for NUTRIM and all of its divisions.
- The Review Committee would suggest that the **perspectives of patients and representatives of the general population should be more demonstrable** in how the research priorities of NUTRIM are established and in how its research is planned and delivered.
- The Review Committee agrees that **the focus of NUTRIM should remain on individual-level approaches to prevention and care** since these are based on the strengths of NUTRIM in understanding mechanisms. However, there is an opportunity for NUTRIM to play a **more explicitly articulated collaborative role in developing and evaluating population-level approaches to prevention**, perhaps through a strategic alliance with other groups with complementary disciplinary skills such as the Maastricht Care and Public Health Research Institute (CAPHRI).
- The Review Committee recommends that NUTRIM gives more thought to **collaboration across the research divisions** as there is a considerable potential for overlap. There is a key role for **strategic management of the activities and goals** of NUTRIM, in order to avoid duplication of research or missed scientific opportunities.
- The **three divisions of NUTRIM have different strengths** and there may well be opportunities for future developments which enable the three divisions to develop in areas that they are individually weaker in, but which are stronger in other divisions. Divisions 2 and 3, for example, have very strong clinical relevance for their research but this is less the case for Division 1. This could be developed further. Conversely Division 1 has a greater focus on the pre-clinical processes, which could be strengthened in Divisions 2 and 3.
- The Review Committee agrees that studying the crosstalk between organs is an **opportunity to stand out internationally, as is the field of gut physiology and medicine at which NUTRIM could be one of the top centres in the world when** perhaps coupled with that of UM engineers and computer scientists.
- The review identified a need for Division 3 to **develop a clear strategic plan**, which will need to include a critical reappraisal of the range of disorders covered.
- The specific issue of ensuring the continuation of a presence in NUTRIM of clinicians with patient care responsibilities as well as research activities is critical for the future viability of NUTRIM and will obviously need a continuing close relationship between the University, School and Hospital. The current structure of NUTRIM is viable going forward, but there are major opportunities to develop and strengthen it so that it is not just viable but that it **improves its position as a Centre of Excellence in Medically Applied Nutrition and Metabolism research, both within the Netherlands and internationally**.

HR

- In NUTRIM as in all research organisations in the Netherlands and internationally, there is a need to prioritise efforts to encourage **inclusivity**. The Review Committee concluded that much more could be done by NUTRIM to address the issue of **minorities**, which should be more proactively included in NUTRIM as PhD candidates, researchers and managers.
- In relation to talent management, there a **tension between general teaching responsibilities and research.** Consideration should be given to sustainable solutions that allow the institution as a whole to deliver on its research, teaching and supervisory responsibilities without overburdening individuals.

This may require funds to be used centrally to create specific teaching positions, strategies to establish limits to PhD numbers per supervisor and the development of more individualised tracks for academic staff allowing some to focus more on teaching and supervision and others on research.

- Greater consideration should be given to institutional strategies to **ensure that PhDs are completed in a timely fashion** since at the moment most PhDs in NUTRIM are too long. A more uniform interpretation should be adapted of the 10% contractual time assigned to teaching and student supervision.
- The **nomenclature for classifying PhD candidates needs to be reconsidered** as it was not clear to the Review Committee what was implied by the terms "internal" and "external". More precise terminology is important to reinforce the perspective that all PhD candidates receive equivalent and optimal opportunities for training. This may necessitate use of terms to describe how the PhD is funded, whether it is undertaken full or part-time etc.

Knowledge translation

- NUTRIM has a **presence on national bodies**, making contributions to professional bodies and to patient organisations.
- There are considerable opportunities in NUTRIM for projects that span medicine and nutrition with clinical care and nutrition support. In the Netherlands the focus of NUTRIM on the **integration of in-depth nutritional science with clinical medicine** is unrivalled, and it is a national strategic asset which can help address the health challenges of an ageing society.
- The reviewers identified **opportunities for enhancing the dissemination of knowledge** developed by NUTRIM to the wider population. It is acknowledged that some areas are already strongly communicated to the public, but greater use of novel media and clarification of the impact NUTRIM's research findings have had to clinical care protocols are opportunities that should be explored further.

11. Annexes

11.1 Annex 1: Members of the External Review Committee

Prof. Nick Wareham, FMedSci, PhD (chair)

Nick Wareham is the Director of the MRC Epidemiology Unit, Co-Director of the Institute of Metabolic Science, Honorary Consultant at Addenbrooke's Hospital and Professor of Epidemiology at the University of Cambridge, England. He studied Medicine at St Thomas' Hospital Medical School and Epidemiology at the London School of Hygiene and Tropical Medicine and Cambridge University, England. He was a Harkness Fellow at the Harvard School of Public Health and after research fellowships at the University of Cambridge, he took up the Directorship of the MRC Epidemiology Unit when it was founded in 2003. He is principal investigator of the EPIC-Norfolk study, the EPIC-InterAct project, the Fenland cohort and the ADDITION trial. His main research interests are in understanding the aetiology of type 2 diabetes, particularly in generating understanding about the interplay between genetic, developmental and behavioural risk factors. He also researches strategies for the early detection and prevention of diabetes, including individual and societal level interventions. He is the Director of the UKCRC Centre for Diet and Activity Research (CEDAR) and the NIHR Global Health Group on Diet and Activity Research (GDAR).

Prof. Ian Macdonald, PhD

Ian Macdonald did his PhD in Physiology at the University of London and then joined the Academic staff of the University of Nottingham Medical School – initially in the Department of Physiology and Pharmacology and later in the School of Biomedical Sciences and then the School of Life Sciences as restructuring occurred in the University. He was promoted to a Chair in Metabolic Physiology in 1991, was Head of the School of Biomedical Sciences from 1997-2002 and then Head of the School of Life Sciences from 2013 to 2017. He has supervised 25 MD/PhD students and over 30 PhD students and examined PhD candidates in the UK and Ireland, Sweden, the Netherlands, Canada, Australia, Thailand, and Spain. He retired from the University and was appointed as Emeritus Professor of Metabolic Physiology in August 2000, and is now the Scientific Director of the Nestle Institute of Health Sciences, which is part of Nestle Research, in Lausanne, Switzerland. He is a Fellow of the Royal Society of Biology, of the Association for Nutrition, the Physiological Society and the International Union of Nutritional Sciences, and a past-President of the Nutrition Society of the UK and Ireland. He was a member of the UK Government's Scientific Advisory Committee on Nutrition and was joint Editor in Chief of the International Journal of Obesity from 2000 to 2021. He has been a member of International Advisory Boards and Review Boards for Governments and Universities including VLAG at Wageningen University, NUTRIM in Maastricht, BMBF and DFG in Germany, IFB in Adipositas Diseases in Leipzig, Germany.

Prof. Helen Roche, PhD

Director UCD Conway Institute, Full Professor of Nutrition / Nutrigenomics @ UCD Conway Institute & UCD Institute of Food & Health, University College Dublin & Visiting Professor of Nutrition at Queen's University Belfast.

Helen trained in Human Nutrition, Dietetics and Molecular Nutrition. Her Nutrigenomics team focus on Precision Nutrition – specifically the impact of diet on metabolism and inflammation, in obesity, type 2 diabetes (T2D), non-alcoholic fatty liver disease (NAFLD) and obesity related cancer. She has supervised more than 30 PhD scientists and a similar number of post-doctoral researchers.

In Europe, Prof Roche has led several initiatives relating to Food, Nutrition and Health. She chaired the Scientific Advisory Board of the European Healthy Life Healthy Diet Joint Programming Initiative (2015-2019). Advises UK and US grant agencies, including Crohn's and Colitis Foundation and UK Nutrition Research Partnership. She is a board member of the RCSI Hospital Group in Ireland.

Prof. Gerjan Navis, MD

Gerjan Navis is an internist-nephrologist at the UMCG. She is professor of Experimental Nephrology (2000) and holds an endowed chair Nutrition in Medicine (2015). She has a long standing track record on research on pharmacological and non-pharmacological strategies for prevention and management of kidney disease and its complications. She currently works on innovation of lifestyle management in routine care and public health by smart use of objective lifestyle data, thus empowering patients, professionals and policy makers. She was among the founding members of the Lifelines cohort, and currently is an ambassador of the Aletta Jacobs School for Public Health. She is former chair of the Scientific Board of the Dutch Kidney Foundation and current member of the Dutch Health Council and of the permanent advisory board on prevention of the Ministry of Health.

Dr. Alessandro Laviano, MD

Alessandro Laviano, MD, is associate professor of Internal Medicine at Sapienza University, Rome, Italy. Dr. Laviano received his MD diploma at Sapienza University, where he also completed the residency programs in Internal Medicine and in Nephrology. In 1994-1995, Dr. Laviano served as visiting Research Assistant Professor at State University of New York, Syracuse, NY, USA. In 1998, Dr. Laviano joined the Faculty of Medicine at Sapienza University, and he is now head of the Clinical Nutrition Unit at Sapienza University Hospital "Sant'Andrea". Dr. Laviano's research interest focuses on cancer-associated malnutrition, as well as on successful ageing. Dr. Laviano has served as an expert reviewer for the European Union, the Italian Ministry of Research, as well as public and private European fondina agencies. Dr. Laviano is editor in Chief of "Nutrition", and has >250 publications indexed in Pubmed.

Marie-Luise Puhlmann (PhD candidate)

Marie-Luise Puhlmann is currently PhD candidate at the Laboratory of Microbiology and the Division of Human Nutrition & Health at Wageningen University & Research. She has a double MSc in Nutrition and in Food Technology. Next to her PhD research, Marie-Luise has been member and later co-chair of VLAG PhD Council. She has also been part of the Wageningen PhD Council in the role of a secretary. In both councils she worked on numerous PhD related topics that either concerned her graduate school, all PhD's at Wageningen University & Research or all PhD's in the Netherlands.

Roelinka Broekhuizen, PhD, secretary

Roelinka Broekhuizen did her PhD in Maastricht at the school NUTRIM. She works as an independent consultant, now working for the Dutch Society of Nutritional Sciences (NAV), SMBWO, Nutritional Science Days and Louis Bolk Institute. She has been hired as an independent Secretary of the Review Committees of NUTRIM/VLAG in 2015, for CAPHRI in 2017, for CARIM in 2019 and now for NUTRIM.

11.2 Annex 2: criteria of SEP

The main goal of an SEP evaluation is to evaluate a research unit in light of its own aims and strategy

Research quality

The quality of the unit's research over the past six-year period is assessed in its international, national or – where appropriate – regional context. The Review Committee does so by assessing a research unit in light of its own aims and strategy. Central in this assessment are the contributions to the body of scientific knowledge. The Review Committee reflects on the quality and scientific relevance of the research. Moreover, the academic reputation and leadership within the field is assessed. The committee's assessment is grounded in a narrative argument and supported by evidence of the scientific achievements of the unit in the context of the national or international research field, as appropriate to the specific claims made in the narrative. The protocol explicitly follows the guidelines of the San Francisco Declaration on Research Assessment (DORA)2 adopted by KNAW, VSNU and NWO.

Societal relevance

The societal relevance of the unit's research in terms of impact, public engagement and uptake of the unit's research is assessed in economic, social, cultural, educational or any other terms that may be relevant. Societal impact may often take longer to become apparent. Societal impact that became evident in the past six years may therefore well be due to research done by the unit long before. The Review Committee reflects on societal relevance by assessing a research unit's accomplishments in light of its own aims and strategy. The Review Committee also reflects, where applicable, on the teaching-research nexus. The assessment is grounded in a narrative argument that describes the key research findings and their implications, while it also includes evidence for the societal relevance in terms of impact and engagement of the research unit.

Viability

The extent to which the research unit's goals for the coming six-year period remain scientifically and societally relevant is assessed. It is also assessed whether its aims and strategy as well as the foresight of its leadership and its overall management are optimal to attain these goals. Finally, it is assessed whether the plans and resources are adequate to implement this strategy. The Review Committee also reflects on the viability of the research unit in relation to the expected developments in the field and societal developments as well as on the wider institutional context of the research unit.

The three main assessment criteria 1) research quality, 2) societal relevance and 3) viability are central in the assessment of the research unit. These three criteria include several aspects depending on the aims and strategy of the research unit. Among all relevant aspects, the research unit addresses at least the following four specific aspects: 1) Open Science, 2) PhD Policy and Training, 3) Academic Culture and 4) Human Resources Policy in concert with the main assessment criteria. The Review Committee should also take these into account.

11.3 Annex 3: programme NUTRIM review 2021

9.00-9.45	Closed session ERC on working procedures and reporting
NL time	*Chair: Prof. N. Wareham*
9.45-9.55	*Break (10 min)*
Public morning session	
Chair: Prof. D. Jonkers	
09.55-10.00	Welcome and introduction External Review Committee
	Committee Members:
	• Prof. Nick Wareham, University of Cambridge (chair)
	• Dr. Alessandro Laviano, Sapienza University Rome
	• Prof. Ian MacDonald, University of Nottingham
	• Prof. Helen Roche, University College Dublin
	• Prof. Gerjan Navis, University Medical Center Groningen
	• Drs. Marie-Luise Puhlmann, PhD-student Wageningen University
	• Dr. Roelinka Broekhuizen (secretary)
10.00-10.15	Introduction to FHML and MUMC+ by Prof. A. Schols
10.15-10.30	Introduction to NUTRIM by Prof. D. Jonkers
10.30-10.45	Discussion
10.45-11.15	*Coffee break (30 min)*
11.15-11.45	Short introduction to Division 1 and Discussion
11.45-12.15	Short introduction to Division 2 and Discussion
12.15-12.45	Short introduction to Division 3 and Discussion
12.45-13.45	*Lunchbreak (60 min)*
13.45-14.15	Closed session ERC
14.15-15.00	NUTRIM infrastructure (mix of slides, short movies, visual tour)
	• Metabolic Research Unit Maastricht
	• NUTRIM Clinical Research Unit / metabolic imaging unit
	• Analytical infrastructure
15.00-15.30	*Coffee break (30 min)*
15.30-16.30	Poster discussion: short pitches by junior investigators
	• Division 1 (5x 2 min pitches; 10 min combined discussion)
	• Division 2 (5x 2 min pitches; 10 min combined discussion)
	• Division 3 (5x 2 min pitches; 10 min combined discussion)
16.30-16.45	*Coffee break (15 min)*
16.45-17.30	Meeting with MT
17.30-18.30	Closed session ERC
	Reflection and preliminary conclusions

Thursday, November 25, 2021

Online via Zoom *Morning session (closed sessions)*
Training, education and career opportunities

9.00-9.30 NL time	Meeting with PhD coordinator and PhD-council
9.30-10.00	Meeting with junior investigators (PhD-student, postdocs)
10.00-10.30	Meeting with senior investigators (assistant and associate professors)
10.30-11.00	*Coffee break (30 min)*
11.00-11.15	Bachelor and Master programmes FHML • Short pitches of 2 students and 1 mentor
11.15-11.45	Grants office, scientific integrity and valorization • Meeting with respective officers
11.45-12.15	Meeting with clinical researchers • Surgery, Pulmonology, Gastroenterology, Nephrology
12.15-13.15	*Lunchbreak (60 min)*
13.15-14.00	Closed session of External Review Committee
14.00-14.30	Meeting with Scientific Director & Managing Director NUTRIM
14.30-15.00	Meeting with the MUMC+ board. Prof. Annemie Schols (dean FHML)
15.00-15.30	*Coffee break*
15.30-16.30	Closed session of External Review Committee
16.30-17.00	Presentation of preliminary conclusions of External Review Committee by *Public session:* Prof. Nick Wareham
17.00	End of program