Research assessment

University Medical Center Groningen

2015-2021

19 April 2022

Summary UMCG- concern evaluation, including special aspects

General - With "Healthy Ageing (or More Healthy Years)" UMCG has chosen an important overarching research theme, which ties together the research of its five research Institutes. The three research pillars are linked to UMCG's strategic priorities.
The committee believes that, taken together, the pillars provide the basis for a continuum of preclinical, population, and clinical work. Moreover, the planned advancement in data science/AI/machine learning in the form of DASH serves all research pillars.

Research Quality - The three research pillars build on the UMCG's clinical strengths, are appropriately linked to the UMCG's strategic priorities and driven by the ambition to promote societal relevance. In particular, the collaboration of UMCG with FSE (e.g. between GUIDE and GRIP), or in the context of HTRIC, is of great added value as are the cohorts and data research.
- Develop the full potential for genuine interdisciplinary research, through adjusting or reforming existing organizational mechanisms.
- Ensure good management and access to technologies and central services.
- Include and embed diversity as a driver to promote better problem-solving and decision-making in research.

Societal relevance - The UMCG's mission, vision and strategy are clearly societally relevant and geared towards societal impact. The Outreach and Societal Impact Support (OASIS) Project, now the Impact team, provides expert support. The network of regional partners, involvement in the Aletta Jacobs School of Public Health (AJSPH), and priority given to stakeholder involvement all generate important impact. Although applied research is carried out, the number of patents and spinoffs is relatively low.
- Develop a clear vision for societal impact that can be operationalized, and formalize knowledge exchange, innovation, and entrepreneurship.
- Fuel the talent pipeline for impact awareness by developing training and career development for PhD students and ECRs.
- Continue reforming the promotion system so that societal impact is rewarded.

Viability - UMCG's overarching theme of Healthy Ageing and the research foci established in 2018 are sustainable and relevant for the near future, while the vision on preclinical and clinical research collaboration is persuasive and valuable. Research support at all levels is of very high quality and a great asset to the faculty - the research professionals that develop it are of an exceptionally high standard and should be nurtured. At the same time, the potential for genuine interdisciplinary research remains underdeveloped and should be improved through organizational mechanisms.
- Simplify the organization (regarding both structures and procedures) and work towards a functional integration of central services so that they are more visible.
- Develop central policies to fully integrate clinicians in the research environment.
- Develop a comprehensive policy for obtaining collaborative and personal grants.
- Organize a long-term risk analysis of the COVID pandemic.

Special aspects - The committee welcomes the diversification of promotion profiles (e.g. the Talent Track and the Regular Academic Track) and of research impact and career profiles (Research, Education, Health Care and Society & Valorization). The dedicated talent track for physician-scientists is impressive and provides a crucial continuum from preclinical research to application. The GSMS has developed a well-functioning system to support and train PhD students, however additional mechanisms should be installed to decrease their work-stress.
- In the domain of PhD training and support, further empowering the Graduate School, improving supervision via formal, mandatory training, improving the work environment for PhD students through mentorship, installing supervisory team meetings and communicating conflict-resolution procedures more clearly are recommended..
- In the domain of other special aspects, informing researchers on public-private partnerships and developing citizen science initiatives, structurally ensuring academic integrity (e.g. mandatory training, documentation and communication of cases, establishing a network of trust persons), and redefining and supporting diversity in more broad terms are advised.

CONTENTS

Research Assessment of the University Medical Center Groningen

1. Introduction to the UMCG

The University Medical Center Groningen (UMCG) is both an academic hospital and the Faculty of Medical Sciences (FMW) of the University of Groningen (UG). Its organization is based on a matrix structure. The backbone of the organizational structure consists of departments, clustered in six sectors. The departments are accountable for all primary tasks and managerial aspects, including finance and human resource management (HRM). Regarding these primary tasks, the departments report directly to the UMCG Board of Directors. The Board of Directors is collectively responsible for all core tasks of the UMCG: patient care, research and its application, education and training. The Dean of FMW is part of the Board.

UMCG research areas often involve many departments across multiple sectors, which is why UMCG research is organized orthogonally to the departments in five research Institutes: (1) The Cancer Research Center Groningen (CRCG); (2) The Groningen University Institute for Drug Exploration (GUIDE); (3) The Research Institute Brain and Cognition (B&C); (4) The Research Institute Science in Healthy Ageing and HealthcaRE (SHARE); and (5) The W.J. Kolff Institute for Biomedical Engineering and Materials Science (KOLFF). All UMCG research Institutes have management teams (MT) of three to five members, headed by a Director. The tasks of the Institutes include (1) advising on promotions and appointing/promoting research staff; (2) training and support of PhD and MD/PhD candidates; (3) formulation of research policy and quality control/improvement; (4) improvement of the quality of proposals for research grants; (5) detection and signaling needs for infrastructural improvements; (6) promoting scientific and societal outreach activities; and (7) reporting for evaluations and discussions. Institutes have a budget to organize events and fulfill their role. This budget lies between €10.000 and €33.000 per year and is roughly related to the size of the Institute. The Director receives a compensation for his/her time and every Institute has a 0.2 FTE policy advisor and secretarial support. 0nce a year, the Dean and Dean of Research hold a 'State of- the-Union' meeting with every research Institute during which strategy, performance and progress of the Institute is discussed and priorities and goals for the coming year are formulated.

The European Institute for the Biology of Ageing (ERIBA, founded in 2012) and the Aletta Jacobs School of Public Health (AJSPH, founded in 2018) assume a specific position within this structure. ERIBA, on the one hand, is a department in the UMCG. It is a separate entity for researchers sharing an interest in ageing research, yet it does not have the status of a research Institute. Its researchers are part of one of the five research Institutes, depending on their research interest. AJSPH, on the other hand, is a joint structure in which the UG, the UMCG and the Hanze University of Applied Sciences share responsibility and supply the resources. AJSPH combines multidisciplinary investigator-driven and problem-based research with education and outreach. At the UMCG, the most intensive collaboration is with SHARE.

At the UG, graduate education is administered by the ten Faculty Graduate Schools. At the UMCG, the PhD training is provided by the Graduate School of Medical Sciences (GSMS), which was established in 2009. The Director of the GSMS reports to the Dean and the Dean of Research of FMW and the Dean of the Graduate Schools of the UG, who in turn reports to the UG Board of Directors.

2. Aims and strategy

UMCG's mission, which was formulated in 2014, is 'To build the future of health, patient care, scientific research, and its application education and training'. Healthy Ageing (or More Healthy Years), approached from the perspective of the entire lifespan, is the overarching aim of UMCG's research strategy. Within this overarching theme, research is based on three pillars: Mechanisms of Disease; Region and Prevention; and Innovative Diagnostics and Treatment. The strategy is to develop an infrastructure to support the creation of 'development loops', starting with the clinical need, to innovative solutions and finally to implementation for patients. UMCG aims to promote and invest in several technologies across the three pillars, e.g., molecular imaging and big data, data science, artificial intelligence, and machine learning. To support this ambition, the UMCG established its Data Science Center in Health (DASH) in 2018. AJSPH is part of the UMCG strategy to increase the empowerment of the region, and can be seen as an initiative in the 'Region and Prevention' pillar. ERIBA can be considered the flagship of the strategic pillar Mechanisms of Disease.

In 2021, both the UG and the UMCG approved a new strategic plan, with an increased focus on regional collaboration and data science. UMCG will focus in the coming years on patient care and research, from very fundamental to first-in-human applications, and work synergistically and in a coordinated manner. The ultimate goal is to apply knowledge and innovations in practice. A dedicated effort will be made to close the gap between clinical, preclinical and lab-based research.

3. Qualitative Evaluation

Research Quality

With "Healthy Ageing (or More Healthy Years)" UMCG has chosen an important overarching research theme, which ties together the research of its five research Institutes. The three research pillars are linked to UMCG's strategic priorities. Based on the documentation provided beforehand, and the presentations and discussions during the site visit, the committee concludes that
UMCG has a strong case for each of the pillars. The first pillar, 'Mechanisms of Disease', provides the input for new developments in prevention, diagnostics, and therapies. It is also the basis for medical technology research collaboration between the faculty of Science & Engineering and the clinical departments of the UMCG. The second pillar, 'Region and Prevention', builds on UMCG's strong local network in the Northern Provinces in primary care, in public health, and in health institutions in general: it focuses on prevention. Based on research with large population cohorts (e.g. Lifelines), UMCG hopes to learn more about factors predisposing to disease. These results should subsequently allow UMCG to pursue research into delaying and/or preventing disease onset. The third pillar, 'Innovative Diagnostics & Treatment', aims to push the borders of diagnostics and treatments. It embodies UMCG's ambition to develop a niche close to the patient, further building on current strengths in the use of novel compounds for diagnostics or treatments (such as nanomedicines, proton therapy and CART cells) or in medical technology (in line with the current national MedTech initiative). The committee believes that, taken together, the pillars provide the basis for a continuum of preclinical, population, and clinical work. Moreover, the planned advancement in data science/AI/machine learning in the form of DASH serves all research pillars.

The three research foci are based on UMCG's (clinical) strengths and their environment, which is why they form an umbrella under which the research of the research Institutes can gather. Based on the preparatory documents, the discussions during the UMCG-wide visit as well as the site visits of the individual research Institutes, the committee concludes that UMCG's current research organization, which revolves around institutes, fosters collaboration and momentum around a set of core missions. Overall, it provides a platform from which the Institutes operate. Researchers appear able

to navigate and interact with the UMCG's current matrix structure, and see clear added value in the organization around an Institute. However, the past decade has seen the global research landscape shift from discipline-led exploration to challenge-based, interdisciplinary values and ways of working. Whilst the UMCG and its constituent Institutes acknowledge this, the potential for genuine interdisciplinary research remains underdeveloped. This could be improved through organizational mechanisms (see 2.2.3., 'Viability').

The wide range of expertise, knowledge domains, and spheres of influence brought together by UMCG-staff have a positive impact on the quality of research. In its dialogues with both Institute- and UMCG-representatives, the committee met with committed research staff, driven by curiosity and the potential for discovery of new knowledge and understanding along the continuum from basic mechanisms to clinical relevance. UMCG's impressive talent management policy and its supportive, inclusive and collaborative academic culture (see 2.2.4., 'Special Aspects') set the stage to perform research at the highest level.

UMCG offers state-of-the-art opportunities for research. It diligently invests in research infrastructure and facilities. UMCG reportedly provides an annual budget of between €1.3 million and €1.5 million ('Small equipment requirement plan') for the acquisition and replacement of relatively small research equipment. In addition, as part of the latest research strategy, the UMCG started an extensive 'Large equipment investment program' (€20 million over a 5-year period). The Board of the UMCG, the Heads of departments and the Institutes jointly evaluate past and future expenditures on a yearly basis, monitoring the changing demands of the UMCG research community. This policy clearly yields positive results, as the technological capacity of the UMCG is of a high level, wide-ranging and continually improving. The facilities (e.g. animal imaging center, functional genomics center, …) are effective, are suited to bundle expertise, and geared towards making equipment available to the entire UMCG. The committee commends that ensuring good, fair management and equitable access to these technologies across all Institutes is a high priority.

Within the UMCG staff, several teams provide support on various aspects of research, including publishing and outreach; grant support and career/personal development; ethical boards; a center for development and innovation; data management and research IT. These central services, and importantly the research professionals that develop and run them, are of an exceptionally high standard, impacting research quality in a very positive way. The UMCG is building considerable expertise and assets in these areas. These high value assets should be further nurtured and recognized in years to come (see 2.2.3., 'Viability').

Taken together, UMCG's research environment provides the necessary platform to generate excellent research outcomes. Indeed, the quality of research at UMCG is very high, and has been improving over the review period. The Institutes all show elements of excellence and innovation, which are discussed in the individual Institute reports.

Societal relevance

UMCG's mission, vision and strategy are clearly societally relevant and geared towards societal impact. From the discussions with UMCG the committee learned that the choice of the strategic pillars is driven by the ambition to promote societal relevance. The Outreach and Societal Impact Support (OASIS) Project, which was installed in 2019-2020, provides the necessary support to the UMCG research community for achieving even greater societal relevance. In 2021, the project has developed into a dedicated impact team that informs, educates and creates awareness about the impact of research and collaborations beyond academia. UMCG's investment in long-term projects such as developing and maintaining clinical cohorts shows that it is committed to strengthening the

impact pipeline, as the road from basic research in the lab to clinical trials is difficult, costly, and time-intensive. As cohorts yield extremely valuable data that can lead to new discoveries and strategies for prevention and treatment, the potential for future societal impact at UMCG is considerable.

The committee highly values that UMCG has made integrating research into the needs of the regional environment a strategic priority (pillar 'Region and Prevention'). UMCG's link to the region and its network of regional partners in a unique region, is a clear strength. Its involvement in the Aletta Jacobs School of Public Health and the priority that is given to stakeholder involvement (see also 2.2.4., 'Special Aspects – Open Science'), are important steps towards performing societally relevant research, and generating impact.

All this shows that the UMCG management has recognized its responsibility to more fully engage in contributing to societal impact with all the attendant prospects this brings for widening research opportunities and partnerships, and for increasing research quality and relevance. However, there appears to be a strategic, organizational and cultural disconnect between UMCG central level-policies and what is actually happening within the Institutes. The Institutes have significant potential for societal impact and are already generating a substantial body of impactful research. Yet much of it remains hidden from view and is underutilized. Moreover, some staff seem unclear as to expectations of them, and their roles in the delivery of societal impact. The committee concludes that UMCG would benefit from strong, informed leadership on societal impact. The UMCG is encouraged to develop a clear vision for societal impact that connects with the hearts and minds of UMCG staff, that can be operationalized and so harmonizes strategic, organizational and cultural aspects of impact across the organization.

Other steps to be taken are the formalization of knowledge exchange, innovation and entrepreneurship through, for example, the creation of specific roles, committees, training schemes and stakeholder events. While a considerable amount of applied research is carried out at UMCG, the number of patents and spinoffs is relatively low (as pointed out in the SWOT analysis). The committee learned that lack of awareness of researchers on application procedures for patents lies at the origin of the low number of patents per FTE staff. The committee highly appreciates the initiative to provide business development support to help researchers apply for patents in a very early stage. Fostering entrepreneurship/supporting a culture of entrepreneurship and enhancing awareness of its importance might increase the societal impact made by the research carried out at UMCG further.

The committee also sees great opportunities in nurturing and proactively managing the talent pipeline for impact awareness. In this regard, more emphasis could be given to training of PhD students and early-stage researchers on how to work towards societal impact. The committee welcomes that UMCG is increasingly recognizing outreach and impact work in its promotion system (see also 2.2.4., Special Aspects). The quality and relevance of the constituent Institute research will benefit greatly from these kinds of initiatives.

Outreach efforts such as media appearances, organizing events, publishing popular science books are also important initiatives. The committee applauds the efforts that have been taken in this regard, as a knowledgeable public can lead to more successful prevention campaigns and change in behaviors that promote health. In this sense, the committee values that effort is made to also publish in Dutch, so that clinicians, patients and their families are able to access the research findings to inform their practice. The committee welcomes that outreach actions are supported and initiated by the UMCG in the form of initiatives such as the 'Publieks academie' or 'Kennis in Zicht'.

Viability

UMCG's overarching theme of "Healthy Ageing (or More Healthy Years)" and the research foci established in 2018 are sustainable and relevant for the near future. To succeed in this competitive, dynamic environment, the UMCG will need to anticipate opportunities and be agile in its responses. The three strategic pillars show that the UMCG is forward-looking. This structure provides a focus for the UMCG's current clinical strengths in epidemiology, research on population level, diagnostics and innovative treatment. It also generates a platform to further build the preclinical to clinical continuum that UMCG is creating around patient-related topics. The interviews during the site visit highlighted that UMCG management is extremely well-informed, has a sharp view on what is required in years to come to allow the research foci to come to fruition. First of all, further growth is required in the pillar 'Region and Prevention'. Secondly, more expertise in data science and AI needs to be developed in order to be able to assume a leadership role in these topics. Thirdly, there is a need to build resource (people and infrastructure) to facilitate translation of findings from the fundamental research to the application in the patient. This could range, for example, from reviewing and re-configuring staff deployment to considering new job roles and categories as well as centralized management of technologies. The committee fully endorses these important priorities.

The UMCG's strong link to the local region, and its engagement to further develop and prioritize this, impacts its viability in a very positive way. The committee recognizes that UMCG has a clear vision on the potential of the cohort data, and invests heavily in order to realize this vision. The cohort data resource places the UMCG in a unique position and is of high value. This shows that the patient population is an extremely valuable partner of the UMCG. Getting collaboration with stakeholders up to speed in coming years will be crucial (see 2.2.4., 'Special aspects – Open Science').

The Institutes make both unique and shared contributions to UMCG's research mission, vision and strategy. This clearly impacts UMCG's viability in a positive way. Yet, although the current organization in five Institutes seems to be working well for UMCG's researchers, the committee also noted that other avenues may need to be explored to truly stimulate interdisciplinary research and grow the necessary research strengths to tackle bigger challenges. This issue is already clearly identified by the UMCG's management. The UMCG has been organizing consultation rounds with its researchers, on the viability of its research structure.

The SEP review is an ideal trigger to further explore and reimagine UMCG organizational structure and operation. The committee would like to commend the UMCG in making full use of the SEP process to extend its internal reflections and evaluations. The committee was invited to discuss with the MT to what extent the current organizational structure of the UMCG, with Institutes feeding into the three research pillars, is viable and advantageous. Based on this preliminary discussion, the committee agrees that evolving the UMCG's research organization around three research pillars has considerable potential, could be highly advantageous, and should be further explored. The past decade has seen the global research landscape shift from discipline-led exploration to challenge-based with interdisciplinary values and ways of working. A restructuring along the three-pillar model could drive interdisciplinary and translational research, leading to a greater critical mass and capability to address major research challenges. However, for this structure to work, and to deliver on the potential benefits, there is a need to decrease the complexity of the organization, both in terms of structures and of systems/procedures. The committee strongly recommends approaching this exercise in a participatory way. The aim should be that the new structure is developed bottom-up and supported by the people working in that structure.

The committee perceived UMCG as a highly dynamic organization, which is working hard towards shifting organizational culture to a vital, collegiate, supportive, safe and inclusive environment for research (see 2.2.4., 'Special aspects'). There is an underlying sense of social cohesion with staff working with - and for - each other. UMCG's thoughtful, self-reflective, and transparent leadership plays a crucial role in guiding the academic community through this change process. The management team's focus on mission and its drive towards creating an effective and powerful workplace for its researchers were tangible throughout the interviews. All this puts UMCG in an excellent position to deliver on its ambitions and aspirations.

While the development of an open academic culture geared towards cooperation should be a goal of any research Institute, it is especially important at an UMC. Collaborations that involve clinical and preclinical researchers are necessary to advance science and clinical care, and the success of clinical-preclinical collaboration depends partly on the academic culture and atmosphere. The committee finds the UMCG vision on the fundamental importance of collaboration between preclinical and clinical researchers to be persuasive and of high value. The committee sees opportunities to further strengthen the potential for collaboration by developing a clear and centralized strategy and policy to support clinicians for research.

During the site visit, the committee noted that the PhD students and the GSMS were forward-looking and progressive on many of the core issues of the cultural transformation, like integrity, diversity, inclusiveness, and mental wellbeing (see 2.2.4., 'Special aspects'). In this sense, they are agents of change that could be used for the benefit of the transformation process that the UMCG is currently going through. The committee sees room for improvement for the UMCG to further empower the GSMS, so that it can be a powerful part and even driver of the envisioned cultural change.

Research funding at UMCG has remained stable over the past six years. However, a shift of funding can be observed, with EU funding declining and national/local funding increasing. The fact that a diverse set of funders continues to support UMCG at a high level is, on the one hand, a sign of an overall robust enterprise. On the other hand, the committee sees opportunities for the UMCG to invest in becoming more competitive in obtaining large collaborative and personal grants, as this would positively impact its viability. The cohorts and the initiatives to unlock the cohort data so that they can be used by internal and external stakeholders (see also 2.2.4. 'Special aspects - Open Science') should provide an excellent starting point to obtain both personal and collaborative grants. Current efforts to support early-stage researchers and junior group leaders could be further intensified in order to achieve this goal.

The central services and importantly the research professionals that develop and run these are of an exceptionally high standard (see also 2.2.1., 'Research Quality'). These resources, both in people and infrastructure, are key to the future success of the UMCG. The committee observed that they are early adopters and a conduit to integration of new research ideas, expectations, and standards such as open science and societal impact. These central resources are also important in the development of partnerships and collaborations within the UMCG and with external partners. Nevertheless, the committee noted that UMCG central services are slightly hidden from view, and therefore underutilized and perhaps undervalued. The UMCG research, reputation, and influence would benefit from a greater prominence and functional integration of these services and these staff members into full Institute life and management.

The committee explored how the COVID pandemic was handled. It concludes that the UMCG has provided excellent support for its research staff during the pandemic. However, there seems little attention paid to long-term effects of the pandemic on the viability (including financial and human resource) and ways of working (including remote/hybrid/flexible/part-time) of the UMCG. Funding landscapes have changed as have ways of working and it is a risk to assume these will revert to pre-

pandemic levels. A formal risk assessment would be of benefit as would a formal in-depth evaluation of how new ways of working could be adopted as beneficial (beyond now standard online teaching).

4. Special aspects

- Special aspect Human Resources Policy -

Diversity

The committee highly values that a variety of actions has been taken in the review period to improve diversity and inclusion, including the establishment of an Ambassadors Group for Diversity and Inclusion; the implementation of bilingual communication; training on 'inclusive selection'; and webinars on unconscious bias, diversity and inclusiveness.

Recruiting and promoting more female professors has been a priority for Groningen University for twenty years. Scholarship programmes like the Rosalind Franklin and Aletta Jacobs schemes provide a pipeline towards full professorship for talented female researchers. These policies have started to bear fruit. For example, the percentage of female full professors has gradually risen from 24% in 2016 to 30% in 2020. Currently women are well-represented at the PhD and postdoc level, but still underrepresented at the professorial level. The UMCG is exploring mechanisms such as 'zip merging' for assessing job applications (first best woman, first best man, second best woman, second best man and so on) and how it could be used in practice for the selection of full professors and newly hired staff in the talent/tenure track.

Building on these early successes and proactive policy development, the committee encourages the UMCG to continue to improve its equality, diversity and inclusivity (EDI) practices, implementation and support. Whilst there has been good progress along basic gender diversity, the UMCG could take a more progressive approach and indeed leadership in EDI to explicitly develop policies more in keeping with current thinking on EDI, addressing, for example, gender, sexual orientation, age, ethnicity, faith, social background, disability, and neurodiversity. There are already indicators of culture change. The case studies presented in the self-evaluation report illustrate how diversity of the research and clinical team is important for scientific discoveries and for improving clinical care and outcome. In particular, the committee was very impressed with the PhD students' maturity on the topic of diversity. They reflected on diversity from multiple perspectives, e.g. gender, ethnicity, religion, LGBT, neurodiversity, and physical disabilities, and were forthright and passionate on the benefits of creating a diverse and inclusive environment.

There is an opportunity here for the UMCG to demonstrate leadership in fostering a culture change that would enhance all aspects of academic life and endeavors and help create a vital and safe environment for widening talent recruitment, development and retention.

Talent selection and development

UMCG considers effective talent recruitment to be absolutely crucial to its viability, as recruiting sufficient talent is not always easy due to the remote location in the northern region of the country. The committee welcomes that in the review period, UMCG has started working towards diverse career trajectories. In 2018, a new UMCG-wide procedure for academic career development was implemented ('Academic Leadership'), offering two academic tracks: the Talent Track for "top-talents" (top 5% in their field), which can lead to full professorship; and the Regular Academic Track,

which can lead to the rank of UHD-1 through internal promotion. Moreover, differentiated research impact profiles for all academic positions were developed, viz., Research, Education, Health Care and Society & Valorization. This has led to differentiated and quality-oriented criteria for promotion. The committee explored the new career development policy in depth, during the UMCG- and Institute interviews, as well as in the documents received. It concludes that the promotion pathways are well developed. The promotion criteria are inclusive and reflect that a holistic and rounded approach is taken to defining success profiles (including societal impact and team spirit). Commendably, they take into account the complexities of the range and variety of job roles, entry points, and funding mechanisms, and are well-received by the UMCG's academic community. As with any complex system, areas of issue have been identified and are being examined so that they can be further developed. The committee trusts that the system will be further fine-tuned in years to come.

The committee explored how the career tracks are managed and nurtured in order to install a talent pipeline. It learned that talents are actively scouted, both by monitoring PhD students with personal grants and through the midterm talks with the departments. The Dean and other Board members show great leadership in taking the time to talk to and mentor exceptional talents personally. Importantly, UMCG provides intensive support to early-stage researchers who want to apply for prestigious grants. This strategy has borne fruit: at the moment of the site visit, six Veni grants had just been awarded.

The committee was impressed with the dedicated talent development track available for physician-scientists. This track is key to achieving UMCG-mission to provide a continuum from preclinical research to application. In a first stage of the track, medical students can apply for a MD/PhD program, which offers them the opportunity to combine their Master phase with PhD training, and allows students to obtain their PhD in two years instead of four. At the postdoc level, the Mandema fellows receive support to combine research with their medical residency. After their postdoc, Mandema fellows then have access to the entire talent programme. Once they have entered the talent track, UMCG pays for one day of dedicated research time per week.

The committee applauds that UMCG has recently started to focus on the sustainable employability of postdocs. Focus groups revealed that postdocs feel underrepresented in the academic staff system, which led to the establishment of a Postdoctoral Council, which is facilitated by UMCG, both financially and by means of a Postdoc Officer. A comprehensive postdoc policy and support plan is in the process of being implemented. Policies that are already in place include introductory meetings, organized for new postdocs; peer-support (intervision) groups; adding the topic of postdoctoral supervision and career counseling to training courses for senior supervisors; support for clinical postdocs; career course for postdocs and CV and job application training; and support in preparing for a scientific career.

The well-being of staff deservedly is high on the UMCG's strategic agenda. Staff questionnaires are sent out twice a year, and extra questions on wellbeing and social safety were asked, with results expected in January 2022. The committee recommends that the UMCG acts on the preliminary findings and implement policies such as installing systematic support and training of mentors for early-stage researchers or gender-specific mentoring schemes. The committee also encourages the UMCG to consider engaging with its staff more deeply and gathering opinion through multiple routes and methods and not just by remote questionnaires. This could also include the use of external expert consultancies and agencies or internal university expertise.

The GSMS has succeeded in developing a well-functioning system to support and train PhD students. Significant changes were implemented during the review period, such as the implementation of the monitoring system *Hora Finita*, improvements in the supervision and guidance of PhD students, the appointment of a PhD Councilor, and the introduction of the Career Perspective Series, to help PhD students discover and develop their soft skills as researchers. The interviews revealed that GSMS management has future points firmly on the radar. It holds a clear and progressive view of its position in the UMCG, and its potential to act as a lever for cultural change.

The number of PhD students has been constantly growing and there is a low dropout rate. Nevertheless, the committee shares the UMCG's concern that with an average of five years, PhD trajectories are taking too long. The awareness that action is needed is shared broadly within UMCG and the Graduate School, yet it is a complicated matter, with different contributing causes. The committee supports the UMCG in taking more, and concerted measures with the aim of shortening the PhD trajectory. Also, the committee notes that there has been a further increase of an already high number of PhD students. It advises to define the optimal size (faculty/student ratio) of the graduate school to improve the quality of teaching, mentoring, and training, especially for those areas where there are many PhD students and little staff.

The implementation of *Hora Finita* is promising. This online platform, in which all PhD candidates are registered, enables PhD candidates, their supervisors, and Graduate School staff to keep track of activities and planning from the start of the research project through the defense ceremony. Yet the monitoring of PhD students through this system needs further improvement, as is also pointed out in UMCG's self-evaluation report.

The teaching and supervision plan (TSP) written by the PhD candidates is another adequate tool to follow PhD students' progress. Still, the TSP is only described to be mandatory for the first phase of the program, and its follow-up is not formally checked afterwards. This leads to a situation where the follow-up provided for PhD students differs according to the initiatives taken by individual supervisors. A lot could be gained from formalized annual supervisory team meetings, guided by and organized by the Graduate School, at set periods every year, the results of which need to carry some weight. The committee agrees with the PhD students and the Graduate School representatives that this would have a positive impact on the duration of the PhD.

The UMCG/GSMS has identified supervisor training as an area of need and has initiated action plans around this. This is a major, high value commitment and the committee acknowledges the initial progress. This should be developed and implemented as a matter of urgency. The PhD students welcome the GSMS initiative to organize supervision training, which addresses how to optimally supervise and how to approach mental health. Yet it was also mentioned that the PI's that may need this course the most, don't enroll. UMCG-management was open about the fact that it has indeed been hard to motivate all supervisors to enroll. Moreover, the course only lasts one day. The GSMS Director mentioned to be currently working towards more differentiation in the topics offered (e.g. how to work with cultural differences, how to handle conflicts, how to work on PhD students' talent development), and to switch to blended approaches. The committee fully supports this initiative and also strongly advises the UMCG to make repeated training mandatory for all supervisors.

A plan is moreover on the table to implement a formal mentorship program for PhD students. The mentor is a member of the academic staff that is independent of the PhD project. He or she will be a sounding board for the PhD student, next to the supervisor, who the student can turn to for those topics that are sensitive to discussion with the supervisor/promoter. An important role for the

mentor would also be to be part of the Student Advisory Committee. In this committee, the mentor would act as a guard of the adequate scope of the PhD project, which should positively impact the duration of the PhD. The committee joins the PhD students in their support of this initiative and strongly recommends the UMCG leadership to implement this at short notice. A point of attention is that the staff will need to be trained as mentors for the initiative to be successful.

The committee learned that GSMS has several procedures to select, prioritize, and approve study trajectories, and to fund PhD projects for talented students. First, students from the UMCG can compete annually for PhD positions based on a project designed by themselves (approximately 30% of those students are granted such a position). Secondly, medical students can apply to the MD/PhD program. Thirdly, students from international strategic partners can apply for so-called sandwich constructions, with 2 years research at their home university and 2 years at the UMCG as part of the international program of the GSMS. The committee explored whether the different types of scholarships and employment contracts do not 'yield' two classes of PhD students in research groups. PhD students explained that regarding the daily work, no difference is perceived between the different types of PhD students. However, PhD students with a scholarship have fewer benefits than student-employees, but also have fewer obligations, e.g. in terms of teaching. UMCG management explained that due to this inequality, it was decided in 2020 to only allow PhDs to work as employees (with the exception of international PhD students who bring their own scholarships). However, some PhD students remain in the old system. The committee values that the latter group is phasing out due to the move from student-based positions to employee-positions.

The different statutes of PhD students also mean that there are many different paths of selection. However, the process of selecting PhD candidates, which should be done by the supervisor, is not separated from formally allowing them into the Graduate School. The committee suggests separating the two processes. The formal entry into the Graduate School could then also be used as a control point for the formal requirements to be a supervisor, like the mandatory supervision training.

The self-evaluation report mentions a high level of (di)stress among PhD students, which is why the committee discussed this topic at length. The committee noted that the wellbeing of PhD students is firmly on the radar, and that various actions have been taken in recent years to tackle this issue. An evaluation of the effect of the measures taken has been delayed due to the covid epidemic. The Graduate School representatives explained that the main reasons for stress are well-known, but hard to tackle as they are related to the academic work culture, and the high pressure to not only produce a PhD thesis but also peer-reviewed articles. Although the thesis guidelines drawn up in 2020 clearly state that it is not an absolute requirement to publish to obtain a PhD, the reality is that the necessity to include five publications as part of the dissertation remains the unwritten rule. PhD students mentioned that this not only contributes to the high levels of distress, but also to the extension of the duration of the PhD. The committee sees opportunities in the implementation of the mentoring system to tackle this issue.

The PhD students were appreciative of the initiatives that are taken to improve their wellbeing, and welcomed the efforts to make the support more structured, and more available to everyone. A PhD Counselor is in place, who acts as an ombudsperson and confidential advisor, to whom PhD students can turn. Still, the PhD students mentioned that they were not always aware of whom they can turn to in case of a conflict with their supervisor. The committee advises the Graduate School to put extra effort into communicating procedures and contact persons. Moreover, it should be taken into account that addressing the PhD Counselor might be too big a first step for PhD students. Implementing a system of 'trust persons', who are colleagues that have received special training, could be taken into consideration.

PhD students explained being satisfied with the courses offered and the freedom that is given to choose courses. All PhD students are expected to follow a balanced mix of courses and activities within seven core competencies in the PhD Development Training and earn 30 ECTS during a four-year PhD study for which they receive a certificate. There are three compulsory courses: Research Data Management, Scientific Integrity, and Project Management.

The GSMS keeps track of where its graduates end up. It found that many are still working in science and publishing. In the review period, initiatives have been taken to orient PhD students better towards further careers. Since 2017 the career perspective series has helped PhD students discover and develop their soft skills as researchers. The GSMS PhD council holds sessions several times per year called 'Growing up in Science', in which speakers with a background in science talk about their career paths and the choices they had to make. The committee welcomes these initiatives, yet it also noted that the transition from PhD to postdoc path is not clear. It advises the GSMS to address this point of improvement.

– Special aspect Open Science –

Stakeholder engagement is high on UMCG's strategic agenda, as can be derived from its ambition to play a leading role in its environment by connecting stakeholders and instigating innovation in health care. Most stakeholder involvement is present in the 'Region and Prevention' pillar, but it is becoming increasingly important in the other pillars as well. The committee noted that the UMCG has made concerted efforts in the review period to engage with relevant stakeholder groups. It welcomes that patient-centered thinking and ways of working are emerging, as is clear from the installation of an institution-wide committee on patient participation. This has led to training sessions on patient participation for researchers and a handbook on patient participation that is currently being developed with a patient organization. The committee sees room for improvement around citizen science initiatives.

When it comes to Open Science, a clear strength is UMCG's vision and strategy on clinical cohorts. The cohorts justifiably receive a central place in UMCG's future strategy. The plan is to make the cohort data broadly available for UMCG staff as well as for the outside world. The committee learned that UMCG has already proceeded far in building a catalog of the clinical cohorts, which will then also be used to generate partnerships so that the cohorts can be used to leverage innovation.

In talking to the UMCG-representatives, it became clear that open access is not only high on the strategic agenda, but that UMCG really strives towards living open science. This implies not only open access publishing, but also internal and external availability of data (FAIR principle). The committee noted that there is very good central support available for open access publications, which ensures that there are no economic hurdles to publishing open access.

– Special aspect Academic culture -

The UMGC has set high standards and major goals to develop its academic culture. The committee commends the UMCG for the initiatives described in the self-evaluation report. The UMCG Research Code formally defines open and safe behavior. Additionally, there are several facilities from which employees can get support in social safety issues. UMCG offers leadership programmes in which social safety is an important topic. Sustainable employability is a recurrent topic in meetings between the UMCG Board and the departments. The Board evaluates the annual report of the confidential counselors and takes action where necessary. These initiatives are to be applauded.

The Dean and HR Policy Advisor were compelling and persuasive in their discussion of how they will bring transformative change to the academic culture of the UMCG in order to empower staff and PhD students to achieve excellence. They presented the UMCG as a dynamic organization, shifting its organizational culture to a vital, collegiate, supportive, safe and inclusive environment. It also fully embraces the new and more holistic ways of working and of evidencing success and excellence. Importantly, it places HR and policy development as a key driver and enabler of change and makes full use of the exceptional skills, knowledge and understanding of the HR and Policy team. Change is about hearts and minds and this understanding was displayed throughout the discussions. The strong sense of intergenerational care and legacy that the committee perceived throughout the site visits, is a real strength. The PhD students who the committee talked with valued the inclusiveness of the working environment at UMCG.

As regards research integrity, UMCG's policies are clearly described in its Research Code, which addresses topics like regulation of research not involving human subjects, data protection and privacy, Research Data Management, Open Science /Access, and FAIR data. Rules and regulations concerning ethical reviews are clear and transparent, and support is provided. Also, the committee learned that the UMCG has appointed two confidential advisors specifically for issues regarding scientific integrity.

Although all this shows that the UMCG takes research integrity seriously, the committee also noted that there is room for improvement. While the committee values that all PhD students have to follow a mandatory scientific integrity course, this is not the case for other academic staff. More effort should be put in prevention and thus integrity training. The committee is convinced that all academic staff would benefit from formal active training in research integrity with refresher courses at regular intervals, as part of their continuous professional development. Also, a more transparent approach to documenting and communicating integrity cases internally and importantly, externally, would show UMGC's leadership and would be seen as good progressive practice.

The committee welcomes that two integrity counselors were appointed. However, the step towards going to an integrity counselor is quite a big one. As an organization, the UMCG may wish to consider a network of academics within each Institute who have formal identified roles in integrity and who then work together as a network across the Institutes and with relevant sections of HR and other policy sections (see also above, 'Special aspect PhD training and policy').

5. Developments and positioning of the European Institute for the Biology of Ageing (ERIBA) and the Aletta Jacobs School of Public Health (AJSPH)

The committee was also requested to assess the developments within the European Institute for the Biology of Ageing (ERIBA) and the Aletta Jacobs School of Public Health (AJSPH).

On the basis of the preparatory documents and the discussions during the site visit, the committee concludes that AJSPH is a high value expert partner, with a clear route towards societal impact. There appear to be true synergies and joint aspirations between AJSPH partners that underpin the functional collaborative activities. These points of resonance could be strengthened and developed, as together, new areas of growth can be envisioned. With careful management, the desire to work in partnership could lead to increased opportunities in research, teaching and career development.

ERIBA is well-established and participates in joint research with UMCG Institute staff. The relationship between ERIBA and UMCG still appears to be evolving and leadership at ERIBA is in transition. Discussions around the relationship would appear timely.

Taken together, the actual nature of the relationships between UMCG and ERIBA/AJSPH remained unclear to the committee. The UMCG could better articulate what the nature and form of the relationship is, and what it aims to achieve from the relationship (individually or collectively).

6. Recommendations

Research Quality
- Develop the full potential for genuine interdisciplinary research. This could be improved through adjusting or reforming existing organizational mechanisms.
- Ensure good, fair management and equitable access to technologies and central services.
- Include and embed diversity as a driver to promote better problem-solving and decision-making in research

Societal relevance
- Develop a clear vision for societal impact that can be operationalized.
- Formalize knowledge exchange, innovation, and entrepreneurship
- Fuel the talent pipeline for impact awareness, by developing training and career development for PhD students and for early-stage researchers that enhance societal relevance.
- Continue reforming the promotion system so that work with societal impact is recognized and rewarded.

Viability
- Simplify the organization (regarding both structures and procedures).
- Work towards a functional integration of the UMCG central services so that they are more visible.
- Develop policies at the central level that more fully integrate clinicians in the research environment and take into consideration the realities and complexities of employment contracts and career pathways.
- Develop a comprehensive policy in order to become more competitive at obtaining large collaborative and personal grants.
- Organize a long-term risk analysis of the COVID pandemic.

PhD-policy and training
- Empower the Graduate School: its leadership is very knowledgeable and progressive.
- Make repeated training for supervisory roles mandatory to facilitate more effective doctoral supervision.
- Implement at short notice the plan to establish formal mentorship programmes for PhD students.
- Add the PhD students' mentor to the Student Advisory Committee.
- Install formalized supervisory team meetings (guided by and organized by the Graduate School) at set periods every year, so that every student is treated in the same way.
- Separate selecting a PhD candidate from formally allowing them into the Graduate School: the formal entry in the Graduate School can be used as a control point.
- Communicate more clearly and repeatedly to PhD students what procedures they can follow or who they can turn to in case of a conflict with their supervisor (mentor, 'trust person', ombud).
- Continue to explore policy development around PhD employment and contract status that takes into account the rich diversity of backgrounds and qualifications of this community.

Other special aspects
- Improve the infrastructure to inform researchers on public-private partnerships.
- Develop citizen science initiatives.
- Make integrity training mandatory for all research staff.
- Develop a more transparent approach to documenting and communicating integrity cases.
- Consider organizing a network of 'trust persons', e.g. a network of academics within each Institute who have formally identified roles in Integrity and who then work together as a network across the Institutes, and with relevant sections of HR and policy.
- Work towards a broader interpretation and understanding of what the term diversity means, and develop supportive policies.