

Research Assessment
Cancer Research Center Groningen (CRCG)
University Medical Center Groningen
2015-2021

19 April 2015

Summary SEP assessment of the Cancer Research Center Groningen (CRCG)

Overall, the CRCG research aligns well with the UMCG research strategy, effectively integrates clinical and preclinical research, aligns with patient care through the UMCG Comprehensive Cancer Center, and a 'high value' patient cohort (OncoLifes) is well embedded within the research programs. There is excellent social cohesion within the institute, and the committee applauds the organizational focus on patient benefit, the large opportunity for societal impact and the support services which facilitated the increase in acquired grants. The specific research programmes are extremely productive and generate high quality basic and translational research.

Research Quality

- Clearly define success criteria and goals, and integrate these into reward programmes.
- Strategic development of new programmes based on needs, interest and competitive advantage nationally and internationally is recommended, along with greater participation, influence and leadership in consortia.

Societal relevance

- Ensure clear vision, goals and expectations on societal impact through shared reflection, and proactively nurture and manage the impact pipeline.

Viability

- In order to make more productive connections in priority strategic areas, improved strategic planning at central levels and further support from the UMCG is advised.
- The institute should strategically position its portfolio nationally and internationally, and work towards the consolidation and co-location of oncology research labs and groups.
- In the domain of academic culture and conduct, clearly communicate expectations and conflict resolution mechanisms; increase diversity efforts at institute level specifically.

CONTENTS

Assessment of the Cancer Research Center Groningen (CRCG) 3

- 1. Introduction to the Institute 3
- 2. Aims and strategy 3
- 3. Qualitative Evaluation 4
- 4. Recommendations 10

Assessment of the Cancer Research Center Groningen (CRCG)

1. Introduction to the Institute

The main research focus of the CRCG is around Innovative Diagnostics and Treatments. This aligns with the UMCG-wide theme of healthy ageing and contributes across the three UMCG Research Pillars of Region and Prevention; Mechanisms of Disease; and Innovative Diagnostics and Treatment. CRCG collaborates closely with the UMCG Comprehensive Cancer Center (the CCC provides most of the clinical care for cancer patients) from fundamental to translational and clinical oncology research.

The Cancer Research Center Groningen (CRCG) was founded in 2012 as an independent research Institute within the UMCG. This involved the establishment of four research programmes: DAmage and REpair in cancer development and cancer treatment (DARE), GUided Treatment in optimally Selected cancer patients: translational and clinical research in oncology (GUTS), Stem cells, Aging, Leukemia and Lymphoma (SALL), TARgeted Gynaecologic Oncology (TARGON). Areas of research interest include molecular imaging, proton therapy, CAR-T cell immunotherapy and late effects of cancer treatment. These areas of activity are underpinned by the high-value *Oncolifes* biobank of prospectively collected patient samples with associated clinical data. Strategic links to the European Institute for the Biology of Ageing (ERIBA) further enhances fundamental research capacity.

The previous evaluation period (SEP 2009-2014) was characterized by the founding of the CRCG in 2012 as a new research institute and the development of its research programmes. In the current evaluation period, the focus was on the successful continuation and further development without major changes to the programme lines and structure.

The CRCG is directed by a management team (MT), consisting of a scientific director (Prof. Marcel van Vugt), three CRCG researchers (Prof. Schelto Kruijff, MD, Marco Demaria, PhD and Prof. Jan Jacob Schuringa), who represent clinical, translational and basic research, and a staff advisor of the UMCG (Michiel Hooiveld, PhD). The CRCG MT members meet on a monthly basis and each of the MT members is commissioned with specific tasks. In 2020, the research staff of the various UMCG departments that were associated with the CRCG Institute comprised 94 tenured staff, 20 postdocs and 183 PhD students.

2. Aims and strategy

The overall mission of the CRCG is to contribute to 'healthier and longer lives of cancer patients through improved care'. The Institute aims to achieve this mission by organizing and facilitating high-quality, oncology-related research activities in a coherent and effective manner along with its key partner of the UMCG Comprehensive Cancer Center (CCC), ensuring scientifically, clinically- and societally relevant research output. This connection is formalized through membership of the CRCG director of the CCC-board. The CRCG strives for coherent and integrated research programmes inclusive of laboratory-based and hospital-based researchers, to achieve deep fundamental knowledge concerning cancer biology, progress translational research and improve diagnosis and treatment of cancer. Through this strategy, the CCRG aims to achieve broad societal impact and contribute to the overall goal of improved patient care.

The strategy of the CRCG consists of five interconnected goals:

1. Strengthen the quality of oncological research within the UMCG
2. Improve the prevention, detection and treatment of cancer, and increase the understanding of tumor biology

3. Train and support PhD and MD/PhD students
4. Expand and maintain a vibrant, UMCG oncological research community
5. Organize scientific and societal outreach activities

For the future, the CRCG aims to continue to build on these five objectives, further developing its basic and translational research lines committed to the improvement of the diagnosis and treatment of cancer. It strives to further capitalize on strategic opportunities for collaboration with centers and departments within UMCG and with external partners, while also strengthening its research infrastructure and increasing its participation in larger research consortia which play an important role in the acquisition of funding.

A main research focus within CRCG for the next 6 years will be on 'Innovative Diagnostics and treatments', translated into the following research lines: **Translational oncology** (involving the Departments of Medical Oncology, Pathology, Hematology, Radiotherapy Nuclear Medicine, Gastroenterology, Clinical Pharmacy and Pharmacology, and ERIBA); **Molecular imaging** (involving the Departments of Medical Oncology, Nuclear Medicine and Molecular Imaging, Gastroenterology, Clinical Pharmacy and Pharmacology, Oral and Maxillofacial Surgery); **CAR-T cell therapy** (involving the Departments of Hematology, Clinical Pharmacy and Pharmacology, Nuclear Medicine and Molecular Imaging); **Proton therapy** (involving the Departments of Radiotherapy, Cell Biology)

3. Qualitative Evaluation

The CRCG written report and virtual Site Visit provided a platform for a robust discussion around Institute aims, ambitions, direction of travel, strategies, organization, operation, careers and indicators of success now and in the future. The well-prepared, comprehensive critical reflection of the self-evaluation and the open and constructive nature of the interviews with involved researchers allowed the committee to gain in-depth insight into how the CRCG staff viewed the quality of their research, its societal impact and its viability.

Research quality

In its evaluation of CRCG, the committee encountered a dynamic, open and forward-looking research environment committed to the broad field of oncology research and representing a wide array of approaches and methodologies. The CRCG vision and activities embody the fundamental importance of partnership across the cancer continuum from preclinical to clinical research to advance cancer knowledge, know-how and patient benefit. The committee appreciates the Institute's ambitions to evolve and innovate beyond its historical boundaries to strengthen its position as a world-leading cancer organization.

The strategy of the Institute supports the vision of recognizing the fundamental importance of collaboration between preclinical and clinical researchers, both internally and externally, to advance cancer knowledge, know-how and patient benefit. Through the four component programmes, the CRCG has an excellent disciplinary breadth of expertise, access to a wide range and depth of technologies and a diverse network of high-value academic and external stakeholders. Importantly, patient benefit is consistent throughout the organizational thinking and opportunities for societal impact are significant.

In speaking to the different groups of interviewees, the image clearly emerged of a leadership that embodies an atmosphere of social cohesion, with researchers working for and with each other, allowing for sharing and collaboration and enabling the Institute's community and its stakeholders to participate in developing, adapting, and evolving the organization. CRCG researchers are clearly very

committed to and engaged with their science, and value being part of the CRCG community. The committee talked at length and with different groups of interviewees on the collaborations between the research groups and how the research environment supports and enables new and exciting directions in oncology research. It concludes that the structure of the Institute provides ample opportunities for cross-fertilization of research efforts and the documentation clearly demonstrates that very innovative work is being done across the continuum of preclinical-clinical research.

Overall, the specific research programmes of DARE, GUTS, SALL and TARGON are extremely productive and generate high quality basic and translational research. Currently, evidence of quality is largely derived from standard metrics around publications, income, awards of prestige and positions of influence.

During the period under review, many research grants were acquired by CRCG researchers, likely fostered by the process of internal review for grant applications (initiated in 2014), and a PhD Introduction Meeting for newly started PhD students (initiated in 2019). These ranged from individual or personal awards through to large governmental and EU consortium grants that have significant impact on training for young scientists (such as the ITN training programmes from the EU) or clinical-translational grants that lead directly to improved treatment of patients with cancer. Prestigious personal grants were obtained from the Dutch national funding agency (NWO), from ERC programmes, and 6 prestigious and competitive personal 'Bas Mulder' grants were awarded by charity funding (DCS/KWF).

Related to research evaluation, the committee welcomes the emergent CRCG position and positive attitude towards new and more progressive ways of recognizing innovative working practices, success and value. This includes working towards the principles outlined by DORA (Declaration on Research Assessment) and the NWO (Dutch Research Council) and being open to changes in evaluation ongoing internationally. The Institute has for example participated in a pilot to monitor joint publications by preclinical and clinical researchers as a performance indicator. Also, it has used data on clinical trials in which CRCG researchers were involved as an indicator for quality. Thus the CRCG has begun to value a wide range of outputs, ways of working and measures of success. This culture shift will enable the CRCG to work more effectively in its mission to generate wide societal impact and improve patient care in all its facets.

The output of the Institute reflects the collaborative, interdisciplinary and translational nature of the work conducted by CRCG researchers, with a productive network of collaborators within UMCG and RUG, as well as with regional, national and international partners. A growing number of the publications are co-authored by clinical and pre-clinical researchers, pointing towards increased translational and cross-disciplinary research activities and outputs. This is highly encouraging giving the complexity of the cancer problem and the real-world issues it causes.

The CRCG commitment to address real-world issues in cancer is highlighted by the investment in oncology-related clinical trials by their researchers. For example, the total number of patients included in OncoLifeS (founded in 2010), the prospective oncology cohort of the UMCG, grew to more than 5,400 patients in 2020. Furthermore, the number of tumor boards that participated in OncoLifes also grew in that period to 12 tumor boards in 2020, leading to the representation of all major tumor subtypes at UMCG.

Overall, CRCG has clearly succeeded in creating a strong and stimulating research community in which researchers are stimulated and supported to pursue their interests. The Institute structure is successful in bringing researchers together in a strategic manner enabling significant achievements in its research field. The committee sees the degree to which researchers succeed in collaborating across the clinical-preclinical spectrum as a real strength and considers the work with the clinical cohorts as a key asset of the Institute.

Early career researcher (ECR) development is an important part of Institute life. The Committee commends the CRCG on its approaches to ECR support and development through coaching, mentoring and training. For example, grant writing and the way ECRs are encouraged and supported to follow courses tailored to their interests and ambitions. The fact that many PhD students are jointly supported by a supervisory team from both clinical and laboratory settings underlines and contributes to the close interconnections between preclinical and clinical research at CRCG.

In order to keep developing and improving its quality of research, the committee encourages the Institute to create more clarity on its performance indicators and to arrive at a joint understanding of what is of value in oncology research. The Institute is already exploring new ways of defining research quality. The committee appreciates this and suggests that CRCG continue to work towards clearly defined performance indicators that go beyond classic output metrics, and to formulate concrete goals for each indicator, whether this applies to the nature and number of publications, to innovation, the quality of PhD students, societal impact or health benefit for oncology patients. Furthermore, the committee recommends the strategic development of new programmes based on justified needs, interest and likelihood of a competitive advantage in developing specialized expertise within the Netherlands, Europe, and internationally. Finally, a greater participation, influence and leadership in consortia is to be encouraged, including Oncode and other national and international consortia.

Societal relevance

Creating societal impact is integral to CRCG's mission, vision and strategic goals. The Institute is committed to improving the prevention, detection and treatment of cancer, thereby contributing to healthier and longer lives of cancer patients. The CRCG has an excellent disciplinary breadth of expertise. CRCG's interdisciplinary teams, the facilitation of knowledge-exchange and strong scientific connections between the lab and clinic create an outstanding environment for cultivating interdisciplinary, high-impact research. The CRCG has a wealth of resources, opportunity and potential to generate impact both directly and indirectly. Indeed, the programmes have been generating impactful research for many years and contributing to change in several areas including clinical practice, guideline development and governance. However, much of this remains underutilized, undocumented and unrecognized.

CRCG has access to extensive resources and pathways to societal impact. It has a considerable portfolio of assets including technologies, know-how, patient cohort data. During the site visit, the Institute presented excellent examples of societal impact. Overall, CRCG has made a concerted effort to communicate and engage with external stakeholders on multiple levels. This includes outreach activities, and importantly through productive collaborations with external stakeholders, such as industry and governmental organizations and through the investment in clinical trials. The engagement in clinical trials clearly shows CRCG researchers are committed to developing more effective diagnostic tools and better treatments.

The incorporation of patient participation and involvement (PPI) in the design and execution of clinical trials is evidence of its ambition to improve patient care through working together with patient and public representation. The importance of the patient's point of view and contribution has also resulted in the design of a specific module for students and PhD's who are specializing in oncology research. The embedding of PPI within the training programme is an example of good practice and commitment to changing attitudes and ethos around stakeholder involvement.

CRCG researchers are actively engaged in communicating and discussing their research with the public and policy makers using a range of venues, events and methods. A good example is the organization of a first dedicated meeting in September 2019 to showcase oncology research and its potential to a predefined target group of politicians from the national parliament, the province of

Groningen and the Groningen city council. The aim was to illustrate how research at CRCG can aid national policy decisions and improve healthcare, and how politicians can help through funding decisions and implementing clear regulations. The Committee looks forward to CRCG following up and building on this pilot event.

The committee acknowledges the Institute's considerable commitment and contribution to the development of national and international oncological treatment guidelines and to take part in numerous organizations related to health care and health care research in the Netherlands and globally. For example, a national study was initiated headed by GUTS investigators, to study the effects and efficacy of COVID vaccination in patients undergoing cancer treatment; TARGON researchers spearhead projects on regional oncology networks and have close working relationships with patient advocacy organizations on outreach activities and grant feedback. CRCG staff contribution to European Society of Medical Oncology (ESMO) Magnitude of Clinical Benefit Scale (MCBS) working group and contribution to the committee for the composition of the essential medicine list is evidence of using CRCG skill, knowledge, experience and influence for the benefit of cancer community at the highest level.

To further strengthen the structural and durable societal relevance of its research, the committee advises putting in place pathways and support to nurture and proactively manage the impact pipeline. On an overarching level, the Institute would benefit from an impact vision, making clear what it aspires to and setting clear goals and expectations.

Viability

CRCG's viability largely depends on its ability to differentiate itself and contribute meaningfully in a highly competitive global environment. The innovative research and effective collaborations between preclinical and clinical units, investment in clinical trials, its involvement in the development of health care guidelines and policies, as well as its connections with and in regional and national health care (research) organizations all contribute to the viability of the Institute. The committee notes that the Institute is carrying out progressive, high potential, societally relevant research and strongly encourages the CRCG to demonstrate this more internationally and importantly with a wider range of stakeholders, working with and for local to global needs.

The research programmes of CRCG have been building in strength and evolving since the founding of the Institute a decade ago. The previous evaluation committee was positive about the research portfolio and stimulated the Institute to continue on the path set out to achieve its goals. However, after 6 years, the Institute might be considering new questions and directions in oncology research which could lead to new research programmes. This reflection on how the CRCG positions and evolves its research in order to remain relevant and competitive is critical. It is clear from the site visit that the CRCG is actively engaged in an iterative process of redefining its future mission and position. The Institute is using a variety of instruments and approaches to identify new potential domains of inquiry, such as monitoring hubs of activity around a particular topic or approach, based on metrics of citations (for example, through PURE) and collaborations. Importantly, opinion is being sought from staff and students through structural meetings with PI's, the active involvement of PhD's and postdocs as well as actively identifying new researchers with innovative projects. The committee appreciates this approach and encourages the Institute to continue to allow for proactive evolution of mission, growing internal talents present at CRCG along with strategic hiring but with a clear understanding of what it needs to do to succeed in a competitive environment and emergent directives in societal impact. An external perspective, for example by way of a (formal or informal) advisory board, could be helpful in supporting the Institute in its evolution. The committee also encourages realistic strategic positioning of the CRCG portfolio in relation to other cancer organizations in the Netherlands (such as the national oncology network ONCODE) and international

consortia in order to maximize opportunities for collaboration, expansion and contribution of unique strengths, resources and assets.

The committee explored the relationship between CRCG and the departments it interfaces with. On the whole, the ambitions of the Institute and the UMCG-departments appear well-aligned, with a strong connection and interaction between CRCG, the Comprehensive Cancer Centre (CCC) and the tumor boards. Whilst there is good synergy between the various departments and the Institute, this alignment can be fragile and dependent on the investment of particular individuals. The committee recognizes that this potential fragility and risk factor may be due to the current organizational structure at UMCG. The committee recommends improved strategic planning, co-ordination and communication at a more central level to ensure alignment and transparency. This may also aid in guiding project development and personnel deployment. Feasibility and potential advantages to consolidation and co-location of oncology research labs and groups as much as possible should also be considered.

CRCG has been successful in the review period in its ambition to serve as a facilitator of collaborative opportunities in oncology research and patient care. For the committee, a consistent key to the success is the embedding of the post-graduate research community as high value partners that energize programme development. However, there are opportunities for improvement around staff development and research culture that would enhance viability.

The CRCG is clearly contributing to talent development through well-established career tracks centered on early career researchers (ECRs). Yet there is some concern around high numbers of PhD students, the long duration of the PhD trajectory and the potential inequality resulting from differences between employed PhD's and PhD's funded by bursaries. The committee was left with the impression that the UMCG-PhD system may require careful consideration and review in order to achieve its optimal balance and full potential within the UMCG as a whole.

There is also a clear need to consider the careers of all staff levels. The CRCG could consider developing a continuum of career support for postdoc and assistant/associate professor level staff, taking into account the realities, needs and tensions associated with specific career progression stages.

A key element contributing to CRCG's viability is the quality of its leadership and the value that is placed on teamwork. The committee is keen to highlight the CRCG's focus on shared values and teamwork, with researchers working for and with each other to achieve a common goal. The committee is of the opinion that this is where the future of science lies, so this sense of community is a strong feature guaranteeing the Institute's viability. The priority given to translational collaboration between lab-based and hospital-based researchers, including clinical research, is a very good fit with CRCG's culture of collaborative teamwork.

Creating a diverse and inclusive research environment is important for the Institute. The CRCG management is committed to creating an inclusive and safe work environment which offers equal opportunities for all its researchers. Overall, there is a commitment to creating balanced and diverse research groups when it comes to gender, nationality, and a balance between full, associate, assistant professors, postdocs, PhDs. The committee welcomes the open discussions around the value of different talents and diversifying career paths.

The committee observed that there is a good balance between genders within the research community, but that this balance is not yet visible in the composition of the management team and programme leaders. The Institute is aware of this, and indicated that efforts are being made to promote and improve gender diversity. Furthermore, the committee would like to encourage CRCG

to develop and apply a more rigorous and integral approach to diversity, taking into account diversity in for example age, ethnicity, social background, disability, and neurodiversity in addition to gender.

The committee observes that many individuals and groups within CRCG show elements of good practice around aspects of inclusion, diversity and integrity. However, the committee would like to stress that it is important to ensure that individuals at all levels are well informed about policies, procedures and expected behaviors across the organization and the mechanisms that exist issues of concern, including dispute resolution. It recommends stronger institution-level focus to minimize potential for heterogeneous implementation in individual research groups.

Of those interviewed, the value placed on collegiality and mutual support was clearly presented. Junior and senior researchers at the Institute feel supported by their peers and supervisors and that they receive personal mentoring and are stimulated to find their own research path. They feel well-supported in grant applications (support offered at UMCG-level and by colleagues). Mentoring schemes and role-models are present. With regard to postdocs, the committee would like to stress that mentorship should go beyond the individual supervisor and that it is important that postdocs receive the support they need to make the next step in their careers. Whilst individual cases of good practice around support are apparent, the Committee recommends that procedures and practices are put in place for all and that it is not dependent on individual good practice.

Related to good practice and transparency, the committee found it to be highly encouraging that promotion documents are clearly outlined and readily available, and that promotion evaluations are carried out by a central committee. This improves standardization and the objectivity of these procedures. Importantly, it helps generate a culture of trust. The committee commends the CRCG on alignment of the framework used for promotion with the principles outlined by the SEP and DORA. This includes for example the alignment of research with the Institute's priorities, focus on collaboration and team science, junior scientist support and societal relevance.

Viability also depends on the continued structural and financial support for the research efforts. Funding over the last six years has seen a significant increase at CRCG, staff has seen an increase of 11% with PhD numbers remaining more or less the same. The ratio between junior, mid-career and senior researchers within CRCG shows a relatively large fraction of senior researchers. The Institute is aware that a large number of senior researchers will be retiring in the near future, and supports and encourages proactive succession planning and change management.

Based on overall research funding, the viability of the CRCG is sound, with acquisition of substantial funding from a large variety of sources. Significant funding comes from charity as well as from grants received from industrial partners and governmental Institutes. This portfolio of funding sources helps mitigate policy changes in governmental programmes or economic changes that affect the industry of charity.

To conclude, the committee is keen to highlight that potential points of improvement identified during the site visit are in many cases already under consideration by the CRCG and that there are strategies under development to tackle potential challenges and observed threats. This indicates that the Institute is critical, reflective and agile, and willing to confront and embrace those aspects that require more attention and improvement in order to achieve its goals.

4. Recommendations

Research Quality

- The CRCG would benefit from a clarity of what they value. For example, is it volume of publications; graduate attributes; innovation; societal impact; health benefit. This could be reflected and consistent with recognition and reward programmes.
- Strategic development of new programmes based on justified needs, interest and likelihood of a competitive advantage in developing specialized expertise within the Netherlands, Europe, and internationally.
- A greater participation, influence and leadership in consortia is to be encouraged, including Oncode and other national and international consortia.

Societal relevance

- The CRCG would benefit from a clear vision for Societal Impact which makes clear what it aspires to and what its specific impact vision is (set goals and standards/expectations).
- The quality and relevance of CRCG research would benefit from putting in place pathways and support to nurture and proactively manage the impact pipeline.

Viability

- Improved strategic planning at more central levels to guide project development and potential personnel; need more support from UMCG so leadership can facilitate further connections in priority strategic areas
- CRCG is a relatively large institute and part of a very large organization (UMCG). Individuals and groups show elements of good practice and integrity. It is important to ensure that individuals at all levels are well informed about policies, procedures and expected behaviours across the organization and the mechanisms that exist issues of concern, including dispute resolution.
- Good recognition by CRCG leadership of importance of diversity, but current efforts on diversity/inclusion appear to be strongly centered locally, more harmonized at different levels and parts of the organisation. Recommend stronger institution level focus to minimize potential for heterogeneous implementation in individual research groups.
- Consolidation and co-location of oncology research labs and groups as much as possible is recommended.
- Realistic strategic positioning of the CRCG portfolio in relation to other Cancer organisations in the Netherlands and world-wide in order to maximise opportunities for collaboration, expansion and contribution of unique strengths, resources and assets.

