



 **CRIG**
CANCER RESEARCH INSTITUTE GHENT

ANNUAL REPORT

2019

Chairman's statement



Let me introduce rugby, a tough sport but with values of integrity, respect, passion, solidarity and discipline. CRIG aspires to excel in all these values. Acting with integrity, CRIG promotes an open and honest environment that gives credit and acknowledges mistakes. Valuing with respect the contribution of all people, helping them to reach their full potential. Working with passion to improve the lives of cancer patients through basic, translational and clinical research. Creating solidarity to foster collaboration with colleagues and partners to bring together interdisciplinary skills, resources and views. And yes, discipline to maintain integrity, respect, passion and solidarity.

In 2019, I observed with admiration the organization of very successful CRIG activities such as an industrial partnering event, a doctoral schools specialist course, the OncoPoint meeting, a team building 'kubb' tournament and lots of public outreach. With financial support from Ghent University, our International Thematic Network, 'PrIOMiC', started in 2019 to stimulate collaboration with internationally renowned partner institutes. Furthermore, CRIG increased the number of 'young investigator proof-of-concept projects' to support innovative cancer research by postdoctoral CRIG researchers. The 'Warmste Week' united Ghent University to raise funding to the benefit of CRIG's cancer research. CRIG is thankful for the passion, energy, time and skills of everyone that initiated or supported these actions and underlines that all benefits will be exclusively used to accelerate breakthrough cancer research by early career CRIG researchers.

In 2019, CRIG welcomed new steering committee members, vice chairs of clinical and fundamental cancer research, and most importantly many new CRIG group leaders and members from Ghent University, Ghent University Hospital and VIB-UGent that are committed to collaborate and accelerate cancer research.

CRIG is ready for the new decade to further forge a resilient cancer research ecosystem in the Ghent area. Our International Thematic Network 'PrIOMiC' enables the mutual exchange of CRIG PhD students, post-docs and principal investigators with our international partners to enrich CRIG's research environment and expertise. I am looking forward to the launch of new CRIG initiatives including keynote seminars and the establishment and support of broad platforms to boost basic, translational and clinical cancer research.

On behalf of the new steering committee I want to thank my predecessor, Prof. Jo Vandesompele, for his leadership over the past years as CRIG chairman. Also thank you to every single supporter, volunteer, donor and fundraiser to move CRIG forward. We are truly amazed and humbled by your generosity, and we would not be here without you.

Prof. Olivier De Wever
on behalf of the steering committee

CRIG in a nutshell



The Cancer Research Institute Ghent stimulates and accelerates cancer research in Ghent, and comprises over 400 researchers from more than 70 research groups at Ghent University, Ghent University Hospital and VIB-Ugent.

CRIG also joins forces with other research institutes, foundations & industrial partners, and reaches out to society. CRIG's mission is to stimulate fundamental, translational and clinical cancer research across expertise domains, towards more effective treatments and better survival of cancer patients.

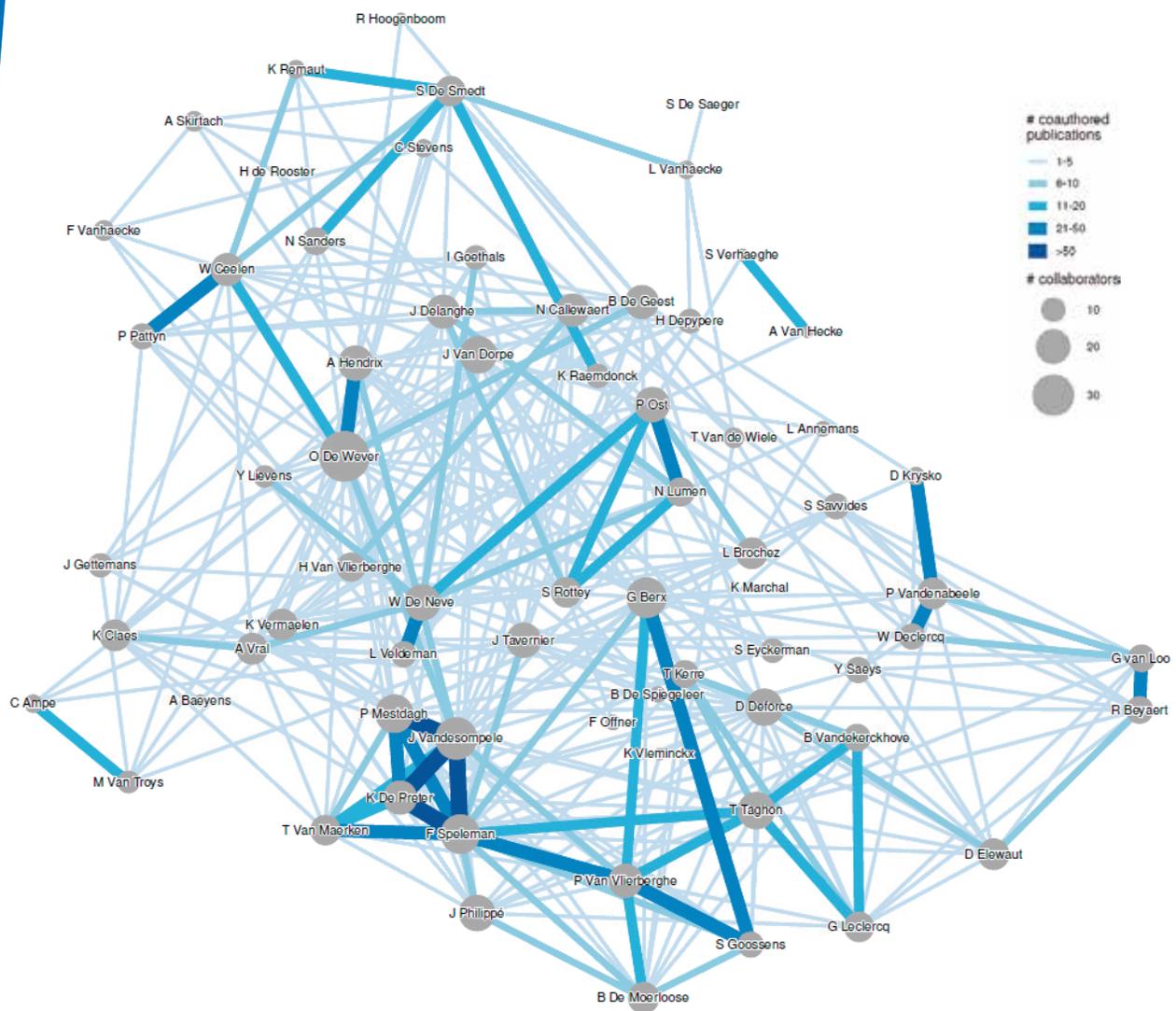


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“ CRIG teams join forces to accelerate cancer research in Ghent ”



Overview of collaborations between CRIG group leaders. In the figure, each individual CRIG group leader with collaborations is indicated as a circle, and the size of the circle reflects the number of collaborating group leaders (status end 2019). Collaborations between CRIG group leaders are defined as co-authorships on peer-reviewed publications in PubMed (last 10 years), and are indicated in the figure by connecting lines. Line thickness reflects the number of co-publications between group leaders.

CRIG 2019 in numbers



 400+
researchers

3 partner
institutions 

 research
groups 70+

3 FTE in
operational
team 

 PhD theses 29

250 
A1 publications

young investigator
proof-of-concept
projects granted (>159K €)  11

>253K € donations and
legacies received 

 granted via UGent
industrial research
fund (IOF) projects 560K €

 external project
funding acquired
by CRIG researchers
>8M €

 valorization
project income 2.6M €

36 bilateral
contracts 

 3
licenses

1  spin-off
launched

--- CRIG unites 70+ research groups, 400+ researchers (~10% growth in 2019) from 3 partner institutions (UGent, UZ Gent and VIB-UGent) ---
3 full-time equivalents in operational committee at start 2019 --- 29 PhD theses defended by CRIG doctoral fellows --- 250 A1 publications (co-)authored
by CRIG group leaders --- 11 young investigator proof-of-concept projects granted by CRIG for a total of >159 K EUR --- >253 K EUR donations and legacies
received --- 16 cancer research projects (personal mandates excluded) – for >8 M EUR in total - have been granted to CRIG researchers by Kom op tegen
Kanker (9 projects, >4.8 M EUR) and Fund for Scientific Research (FWO Vlaanderen: 6 research projects & 1 SBO project, >3.2 M EUR) --- 2.6 M EUR of
valorization project income obtained; 560 K EUR granted by UGent industrial research fund (IOF) for projects aiming to bring new technologies/products
further to market; 3 licenses and 36 bilateral contracts with companies realized, one spin-off launched, 6 spin-off projects in the pipeline --- 5120 mentions
in Altmetrics of CRIG publications in social and other media (of which the majority on Twitter)

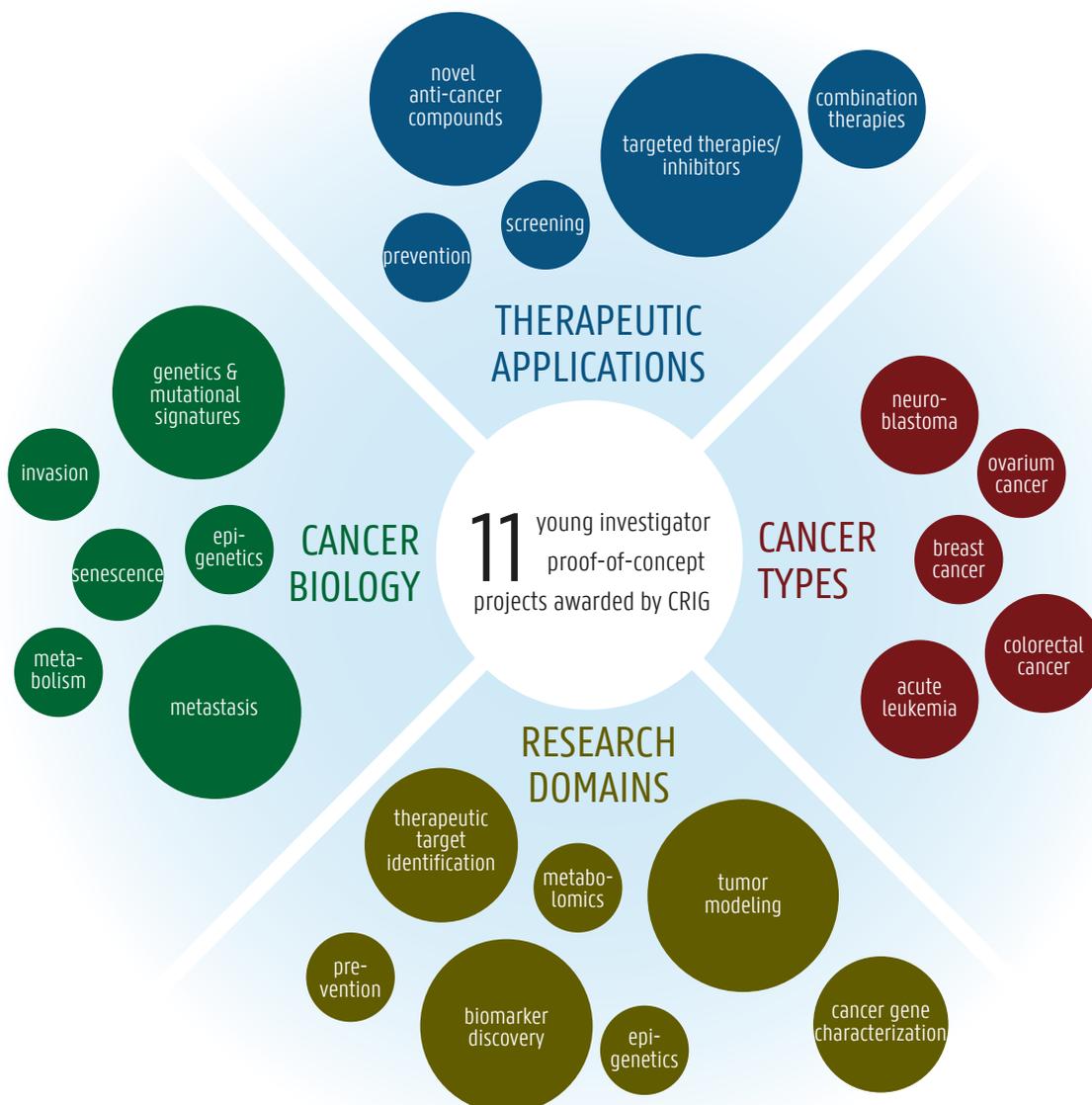
Achievements in 2019



Supporting innovative research projects by young investigators.

CRIG actively supports innovative cancer research in Ghent by awarding young investigator proof-of-concept (YIPOC) projects to postdoctoral fellows. The funding allocated for these projects is co-financed by CRIG and by vzw Kinderkankerfonds via a strategic partnership.

In 2019, CRIG awarded 11 projects, for more than 159 000 EUR in total. With this funding, the awarded postdoctoral researchers are able to generate proof-of-concept results to increase the success rate of future external grant applications. Reports from the proof-of-concepts projects awarded by CRIG in the last three years have demonstrated a clear output and lever effect, including the acquisition of postdoctoral fellow mandates, research projects (awarded by FWO and Kom op tegen Kanker), and several high impact publications, in which data from CRIG proof-of-concept grants were included.



Awarded young investigator proof-of-concept projects



Dr. Inna Afonina

Functional characterization of CARD14 and its regulation by PLK1 in the context of carcinoma



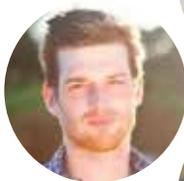
Dr. Marthe De Boevre

Chronic multi-mycotoxin exposure & human colorectal cancer risk: verification of genome-wide mutational signatures using next-generation sequencing



Dr. Eric de Bony de Lavergne

Implementation of a high-throughput CRISPR-interference screening platform for the identification of therapeutic lncRNAs in neuroblastoma



Dr. Elly De Vlieghere

Tumor engineered model for low-grade serous ovarian carcinoma (LGSOC)



Dr. Lieselot Hemeryck

Screening of colorectal cancer by means of Fecal Rapid Evaporative Ionization Mass Spectrometry (CRC-FREIMS)



Dr. Fabian Hulpia

Enabling AXL kinase degradation by PROTACS as a new pharmacological tool to investigate EMT and reverse tumour resistance to existing kinase-inhibitor treatment



Dr. Anna Kuchmiy

Genome-wide histone modifications profiling for the studies of T-cell Acute Lymphoblastic Leukemia pathogenesis



Dr. Filip Matthijssens

Validation of an AlphaScreen platform to identify novel compounds targeting dependency factors in acute leukemia



Dr. Bart Roman

Characterization and testing of a spheroid confrontation model with fundamental and translational application potential



Dr. Suzanne Vanhauwaert

A new model for the study of MYCN induced senescence: a pilot single cell transcriptome analysis



Dr. Evelien Wynendaele

The in vivo role of quorum sensing peptides in metastatic breast cancer



“My CRIG grant enabled us to generate the necessary proof-of-concept results on a novel technological platform for cancer diagnosis. These data were helpful to convince other funding agencies to help us bring this novel technology to the clinic.”

Dr. Bram De Wilde - laureate CRIG grant 2018

“I was privileged to be awarded the CRIG proof-of-concept grant. It enabled me to investigate crucial aspects of our project related to the involvement of the intestinal microbiome in colorectal cancer. Soon, this work will be published in a journal with high impact!”

Dr. Ioanna Petta - laureate CRIG grant 2018



Organizing symposia and providing education for researchers

Through the organization of various symposia, CRIG provides an opportunity for cancer researchers to present their latest discoveries, to meet fellow researchers and to start multi- and interdisciplinary collaborations to accelerate research.

20.03.2019

OncoPoint symposium - 7th edition

CRIG's OncoPoint symposium is a yearly forum for cross-fertilization of cancer research at UGent, UZ Gent and VIB-UGent. We welcomed over 200 participants and 13 sponsoring companies at the 2019 edition, that was co-organized by CRIG and GGIG (Ghent Gut Inflammation Group), and with part of the program focusing on the role of the microbiome in cancer. Next to invited international speakers, CRIG researchers shared their work via selected 7 abstract presentations, 24 pitches, and 58 poster presentations.

25.10.2019

CRIG's industrial partnering event - 2nd edition

CRIG successfully hosted its 2nd industrial partnering event, and showcased expertise from CRIG and its partners to connect academic teams and companies that want to innovate and bring new technologies/products to the market. Over 180 delegates (90 delegates from 47 life science companies and 90 academic delegates) joined to discover the latest innovations in cancer research, and networked towards creating new, synergistic collaborations in oncology.



Spring 2019

Doctoral Schools specialist course on cancer - 2nd edition

In 2019, CRIG organized for the second time its Doctoral Schools specialist course on cancer. The program is targeted to Ghent University doctoral fellows with different educational backgrounds and active in distinct cancer research disciplines. This educational course, lectured by CRIG experts, covers a broad variety of fundamental, translational and clinical cancer research insights, technologies and applications. As the course is very well-received by the attendants, the third edition is organized in 2020.

CRIG further supports the advanced education of young cancer researchers and specialists by stimulating participation in educational events that are organized by individual CRIG research groups or partner organizations. Amongst others, CRIG hosted JAX (Jackson Laboratory) educational seminars and the TakaraBio Next-Generation Sequencing Roadshow in Ghent. In general, CRIG promoted more than 50 symposia, workshops and invited speaker seminars in 2019. Finally, the program 'Major in Cancer' within the Master of Sciences in Biomedical Sciences at Ghent University is lectured by various CRIG group leaders and coordinated by CRIG chairman Prof. Olivier De Wever.





Valorizing and partnering with industry

The CRIG business unit facilitates the translation of research findings into valorization. Supported by a dedicated project manager, the CRIG business unit is composed by business developers of UGent (of the Flemish Industrial Research Fund (IOF) consortia Biomarked, DISCOVERE, ChemTech Life Sciences), HIRUZ (Health, Innovation and Research Institute of Ghent University hospital), and the VIB-UGent.

CRIG successfully hosted its 2nd industrial partnering event in Ghent, and connected academic teams and companies to create synergistic collaborations in oncology (see previous section p. 8).

In 2019, a total valorization income of 2.6 million EUR was granted to CRIG teams thanks to bilateral collaborations and valorization projects. We highlight here the FWO-SBO project EV-Trace (1.1 M EUR), coordinated by CRIG group leader Prof. An Hendrix, which aims at developing extracellular vesicles-based diagnostics for early diagnosis or stratification of therapy for breast cancer, and the 'individualized Paediatric Cure' (iPC) project funded by the European Commission under the H2020 program for which CRIG group leader Prof. Pieter Mestdagh is one of the partners.

Starting from Oct 2019, IOF is financing CRIG platform collaborator (project manager) Dr. Cristina Pintucci for a total period of 5 years. The CRIG platform aims at strengthening CRIG's position in personalized medicine, AI, digital health and MedTech. The CRIG business unit thus welcomed 3 additional UGent business developers (from the IOF consortia Medteg, Protein Technologies and e-Poly), the research coordinators of (University College) HoWest and the head of HIRUZ. The CRIG platform lead business developer is Dr. Daisy Flamez.

With support from the CRIG business unit and the CRIG platform collaborator, UGent IOF granted 560 K EUR in valorization projects to enhance innovation in oncology projects with industrial trajectory:

- An improved cultivation method for natural killer (NK) immune cells for use in adoptive cell therapy strategies (Prof. Georges Leclercq)
- A new manufacturing process for dendritic cell immunotherapy in lung cancer (Prof. Karim Vermaelen)
- The 2nd phase of development of a property gel for fat crafting, which could be used in reconstruction after breast cancer surgery (Prof. Sandra Van Vlierberghe and Prof. Phillip Blondeel, in collaboration with GATE - the Ghent Alliance for Tissue Engineering)
- A new method using bacterial extracellular vesicles as biomarker for identification of intestinal barrier dysfunction and microbial dysbiosis and stratification of patients towards therapy (Prof. An Hendrix)
- Business case analysis for the development of a platform for cancer patients empowerment (Prof. Tessa Kerre)

In 2019, 36 bilateral contracts, 2 exclusive license agreements (EMD Millipore Corporation, OhmX.bio) and one non-exclusive license were signed. With regards to IPR, 2 PRIO patent applications were filed, 4 technologies were under evaluation (IDF) for filing, and 1 patent (on reference extracellular vesicles) was granted.

In September 2019, OhmX.bio, a Ghent-based company, was officially launched. The company offers multi-omics expertise services including ribosome profiling (with applications in broad research domains including oncology). A second spin-off was incorporated July 2019 and obtained an exclusive license on CRIG/VIB/UGent technology early 2020. Five other projects with a potential spin-off finality were in the pipeline end of 2019.



CRIG research(ers) in the spotlight

Numerous scientific studies on fundamental, translational and clinical cancer research are published each year by CRIG research teams in peer-reviewed international - and often top ranked - journals. For example, about 250 A1 articles in the field of oncology were (co-)authored in 2019 by CRIG group leaders (detailed overview on <https://www.crig.ugent.be/en/publications>). As demonstrated by significant research funding that was obtained by CRIG teams in 2019 (including > 8 M EUR granted by FWO & Kom op tegen Kanker for over 16 cancer research projects - personal mandates excluded), innovative and exciting future cancer research is warranted.

Several CRIG researchers were awarded in 2019 for their excellent research, and we will highlight a few. Amongst others, the prestigious Antoine Faes prize for biomedical research (2016-2018) was awarded for CRIG research on precision oncology biomarkers for children with neuroblastoma to the teams of Prof. **Jo Vandesompele**, Prof. **Katleen De Preter** and Prof. **Pieter Mestdagh** (picture). Prof. **An Hendrix** received the Frans Van Cauwelaert Award for her research on extracellular vesicles that has important implications for the prevention, diagnostics and treatment of several diseases, including cancer. The Pfizer Oncology Award was awarded to **Eva Pape** and Prof. **Yves Van Nieuwenhove** for research to improve the care for - and quality of life of - rectal cancer patients. The Belgian Royal Academy of Medicine (KAGB) awarded two CRIG researchers for their work in the field of oncology: (1) Dr. **Lieselot Hemeryck** was awarded the prize for veterinary medicine research for her doctoral thesis on the mechanisms behind the correlation between eating red & processed meat and the risk of colorectal cancer; (2) Prof. **Dmitri Krysko** received the 'GSK Vaccines prize' for his innovative research in immunogenic cell death and its importance for novel cancer treatments such as immunotherapy. Earlier, Prof. Krysko was also awarded by the AstraZeneca Foundation for his work.

Finally, we want to congratulate all CRIG researchers for their valuable contributions to cancer research in 2019, and their continuous efforts in the battle against cancer.



Outreach to the patients and the general public

CRIG engages in providing the public with relevant communication about cancer and the latest breakthroughs in cancer research. In 2019, CRIG organized and participated in diverse events to communicate and interact with patients and the general public about cancer research and therapies.

RUNNING AGAINST CANCER 27-28.04.2019

CRIG team at 'Levensloop'

CRIG joined 'Levensloop', an initiative by the Foundation against Cancer focusing on solidarity and fundraising in the battle against cancer. The CRIG team counted 100 enthusiastic runners, enabling us to span the whole 24 hours with at least one CRIG runner on track! At the CRIG booth, fun and educational games for children were organized and short educational movies about CRIG research were shown.

KANKERCONGRES 23.11.2019

'Kanker, van onderzoek tot hoop'

Our unique concept – a conference on cancer, accessible for everyone – brought together almost 400 professionals, students, patients and their relatives, and delegates from foundations, companies and patient organizations. Expert speakers, using lay language, shared their knowledge on cancer research, prevention, diagnosis, treatment, and patient participation. Meet-the-expert sessions allowed the exchange of information on various aspects of cancer research, treatment and care. The event provided a unique opportunity to learn about cancer research and to interact with scientists, clinicians, health professionals and other advocates. The organizers as well as several foundations, patient organizations and companies also provided relevant information for the participants at information stands. During the panel debate - strongly moderated by journalist Ivan De Vadder and featuring an impressive line-up of relevant opinion makers - the different stakeholders discussed about whether we sufficiently fund cancer research. Visit our website to watch the aftermovie and pictures.

Kankercongres 2019 was an initiative by 'Cancer Research Institute Ghent', 'Kankercentrum UZ Gent', 'Beautiful After Breast Cancer', 'Stop Darmkanker', and 'Center for Oncological Research' (UAntwerpen).

Next to these big full-day events, CRIG researchers also participated in science communication initiatives like 'Dag van de Wetenschap' (with educational games and lab tours), 'Pint of Science' (scientific presentations in a bar context) and 'Wetenschap Uitgedokterd' (initiative to train researchers to explain their projects to a broad audience in short movies). Also, together with a small filming company, we made 8 educational movies about cancer research at CRIG with some of our researchers. As these movies were enthusiastically received, we decided to make such movies with all young investigators who receive a CRIG grant from 2020 on. All movies can be found on our website (CRIG research @ the movies page).

Furthermore, CRIG aims to help researchers in communicating their research to a broad audience, by putting their work in the spotlight via our website, newsletters and social media channels.



vzw CRIG-fonds raises funds for cancer research @ CRIG

End of 2018, the vzw CRIG-fonds was founded as a separate entity next to the CRIG consortium to raise funds for cancer research at Ghent University and Ghent University Hospital. Therefore, in 2019, we could for the first time participate in 'De Warmste Week' of Studio Brussels. **Fifty** different actions -ranging from cake, candy & chocolate sales, over film & game evenings to several sporty actions and a real auction of UGent professors- in total raised **69 851 EUR**, making our first 'Warmste Week' a huge success. This really exceeded all our expectations, and will enable us to support more research projects. As such, we will invest 50% more funding in CRIG's young investigator proof-of-concept projects in 2020.

So all we can say is **thank you** to all who organized and took part in actions for CRIG, and a special thank you to Ghent University for stimulating personnel, students and alumni to support CRIG. For the people who are looking for a charity to support during 'De Warmste Week 2020', we would like to note that vzw CRIG-fonds will participate again for sure and that all proceeds of all actions go entirely to promising cancer research.





CRIG management

CRIG management consists of 3 committees in close contact with each other, to translate CRIG's mission into concrete action points.

CRIG STEERING COMMITTEE

UGent • medicine & health sciences	Prof. Olivier De Wever
	Prof. Wim Ceelen
	Prof. Katleen De Preter
UGent • sciences	Prof. Geert Berx
UGent • pharmaceutical sciences	Prof. Katrien Remaut
UGent • veterinary medicine	Prof. Niek Sanders
UZ Gent delegate	Prof. Lieve Brochez
VIB delegate	Prof. Peter Vandenabeele

CRIG OPERATIONAL COMMITTEE

Coordinator	Dr. Pieter Rondou
Project and communication manager	Dr. Eva De Smedt
Administrative assistant	An Rose

KNOWLEDGE TRANSFER COMMITTEE

UGent	Dr. Daisy Flamez
	Dr. An Van Den Bulcke
	Dr. Dominic De Groote
	Dr. Cristina Pintucci
VIB	Dr. Griet Verhaegen
UZ Gent	Prof. Catherine Van Der Straeten
(Health, innovation and research institute)	Dr. Lieve Nuytinck



The **steering committee**, consisting of 8 elected CRIG group leaders is responsible for the strategic and financial plan, and monitors all CRIG related initiatives.



The **CRIG knowledge transfer committee** supports CRIG researchers and their partners in setting up and managing collaborative innovation projects in oncology, and assists in intellectual property rights management, business development, R&D partnering, licensing & venturing and strategic research funding.



Under the direct supervision of the CRIG steering committee and its chairman, the **operational committee** is responsible for the daily management and the implementation of the strategic plan, such as the coordination and organization of CRIG events, follow up of cancer research activities and initiation of new projects within CRIG, as well as collaboration and communication with different stakeholders.

INCOME

donations and legacies ⁽¹⁾	253 292 EUR
UGent funding for CRIG's International Thematic Network ⁽²⁾	60 000 EUR
vzw Kinderkankerfonds (to support young investigator proof-of-concept projects)	50 000 EUR
sponsoring for CRIG events ⁽³⁾	40 722 EUR
registration fees CRIG industrial partnering event	12 709 EUR
UGent Doctoral Schools & lecturing fees	3685 EUR

EXPENSES

young investigator proof-of-concept grants	159 145 EUR
personnel ⁽⁴⁾	174 922 EUR
organization of meetings, symposia, events, education, mobility grants ⁽⁵⁾	41 077 EUR
website, IT, hardware, office, promo	10 795 EUR

(1) all donations are integrally used for cancer research, including the support of the young investigator proof-of-concept research projects **(2)** funding by Ghent University to support 'PrIOMiC', CRIG's International Thematic Network on cancer (60 K EUR/year during 2019-2023) **(3)** sponsoring by companies for OncoPoint & Industrial partnering event (for the latter also sponsoring by UGent IOF) **(4)** CRIG personnel was co-financed by a granted UGent project in the context of a university-wide expertise center to finance the CRIG coordinator (full-time) for 2 years (project ended June 30, 2019) **(5)** indicated expenses do not include co-financing by individual CRIG teams for specific events or mobility



www.crig.ugent.be



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Special thanks to all our supporters

We wish to cordially thank all our supporters for the donations and warm actions that were organized for the benefit of CRIG! We wish to explicitly state that every single euro of each donation will only be used to support cancer research by CRIG researchers. Non-research activities are never paid by donations.

Finally, we also would like to thank our partners and sponsors for financial and other support that enabled us to realize CRIG's objectives in 2019.

You can **donate to CRIG** (with possible tax reduction) via transfer on "Fondsenwerving UGent" - **IBAN: BE26 3900 9658 0329** (BIC: BBRUBEBB) with reference "CRIG". End of 2018, vzw CRIG-fonds was founded to further support cancer research at Ghent University and Ghent University Hospital. Actions in the context of 'De Warmste Week' can be registered for vzw CRIG-fonds (without tax reduction). More information and possible ways to support cancer research at CRIG: <https://www.crig.ugent.be/en/donate>.