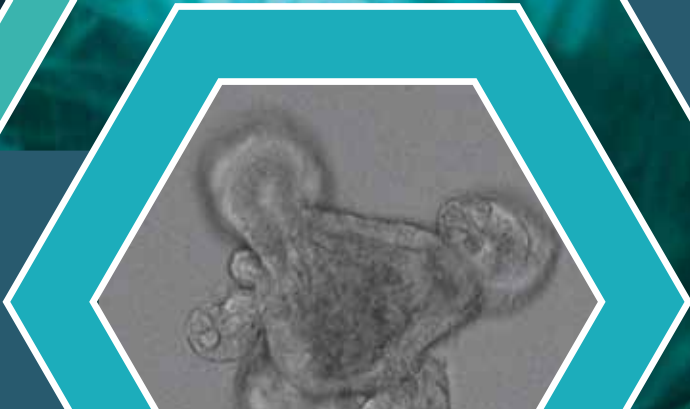
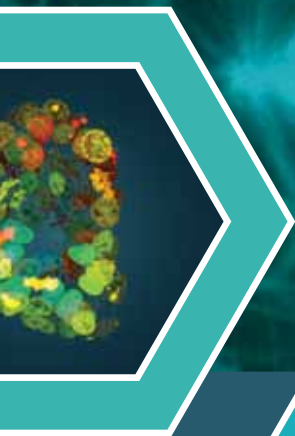




CancerGenomiCs.nl

# Identifying new approaches for cancer treatment



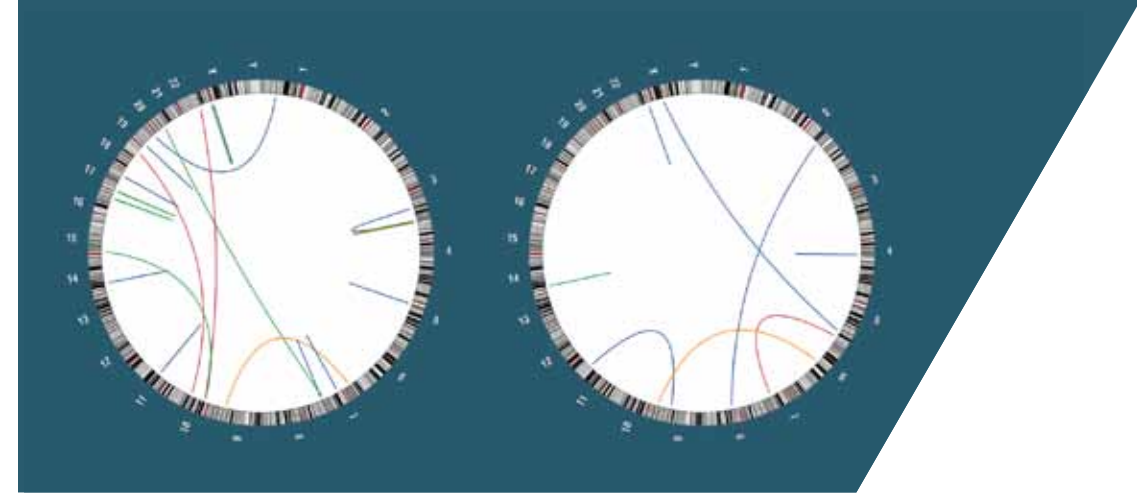
Extensive genetic and molecular research into the origins of cancer has made it clear that cancer results from multiple genetic defects and that these defects show great variation between patients. Even between patients that suffer from the same type of cancer. It appears that a patient's response to cancer drugs is more determined by the specific genetic defects in the patient's tumor than by the organ in which this tumor is located. This notion is the driver behind the aim of CancerGenomiCs.nl to determine and understand the genetic alterations in the tumors of individual patients in order to select the right drug for that particular patient, or to determine the right drug target for which drugs need to be developed.

## Unique approach

Cancer is an extremely complex disease. To tackle this complexity and unravel the disease process to develop better treatment strategies, we apply the latest technological possibilities and bring together different disciplines within cancer research.

What makes CancerGenomiCs.nl stand out from other cancer research initiatives is the use of *in vitro* cultures of human tumors, derived from the 'living biobank'. This is a collection

of human tumor and healthy tissue samples derived during surgery to remove the tumor. Using a revolutionary technology developed by the group of Hans Clevers at the Hubrecht Institute, these tissue samples can be 'grown' into mini-tumors and mini-organs – called organoids. These organoids provide a perfect opportunity to study the behaviour of human tumors outside the body, including their response to cancer drugs. CancerGenomiCs.nl has adopted this technology as its core model system and many aspects will be studied. In addition to the analysis of the genome and for determining drug sensitivity, we will use the organoids for synthetic lethality screens to identify causes of resistance, for the analysis of signaling pathways and (epi)genetic changes that may be altered in tumors, and for consequences of aneuploidy and DNA repair defects. Taken together, this will enable us to identify leads for new approaches to cancer treatment. Ultimately this should lead to novel strategies for interference, which will be tested in patients by our clinical partners. We are confident that the organoid technology will have a dramatic effect on the speed by which new drugs can be developed and personalized cancer treatment can be implemented to benefit more patients.



## Combining expertise, training the next generation

The CancerGenomiCs.nl consortium brings together internationally well-established cancer research groups and very promising junior groups. The funds for the CGC.nl research program provide a unique opportunity to implement a large-scale and long-term focused strategy to combat cancer by staying at the forefront of new developments in cancer research and their implications for the treatment of cancer patients.

We will invest in and share expensive equipment necessary for analyzing individual organoids. This will have

an impact beyond the individual participating groups and will benefit the broader community of cancer researchers. Also we heavily invest in the training of the next generation of cancer researchers. In each participating group, a PhD student or postdoc will be employed using the CGC.nl funds, which will advance the careers of young promising scientists. The participants of the consortium combine interdisciplinary expertise and knowledge covering a wide range of topics in cancer genomics research, which is essential for the training of young, upcoming researchers. Master students, PhD students and postdocs in the consortium receive their training in one of the five research schools of the participating universities and research institutes.

## Benefit for society

We are convinced that the outcomes of our research program will lead to a better treatment of cancer patients. Particularly by providing the tools to determine beforehand which drug will be most effective in an individual patient and by saving patients exposure to unnecessary treatment and associated severe side-effects.



**René Bernards**



**Hans Bos**



**Hans Clevers**



**Roland Kanaar**



**René Medema**



**Alexander van Oudenaarden**

## About CancerGenomiCs.nl

CancerGenomiCs.nl was founded in 2013 and largely builds on the research program of the Cancer Genomics Centre of the Netherlands Genomics Initiative. CancerGenomiCs.nl has been granted a budget of €30.7 million for 10 years by the Netherlands Ministry of Education, Culture and Science. The 26 participants that collaborate in the CGC.nl consortium are internationally renowned scientists from eight research institutes in the Netherlands. They are leading members of international research programs and bring together unparalleled expertise, advanced technology and infrastructure. The consortium is led by the

CancerGenomiCs.nl board consisting of René Bernards, Hans Bos, Hans Clevers, Roland Kanaar, René Medema and Alexander van Oudenaarden. All of the participating scientists and groups have extensive international networks and seeking further international collaborations is high on the CGC.nl agenda. With the expertise combined within our consortium and the excellent track records of the participants, we anticipate CancerGenomiCs.nl to become an attractive partner for international collaborations within and outside Europe.

## Participating institutes and scientists

### **Netherlands Cancer Institute**

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René Medema  
Jan Schellens  
Titia Sixma  
Maarten van Lohuizen  
Jos Jonkers  
Lodewyk Wessels  
Tijn Brummelkamp

### **Hubrecht Institute**

Hans Clevers  
Alexander van Oudenaarden  
Edwin Cuppen  
Puck Knipscheer  
Jacco van Rheenen

### **University Medical Center Utrecht**

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Emile Voest  
Boudewijn Burgering  
Geert Kops  
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### **Erasmus Medical Center Rotterdam**

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Wim Vermeulen  
Stefan Sleijfer  
John Martens

### **Academic Medical Center Amsterdam**

Jan Paul Medema

### **Leiden University Medical Center**

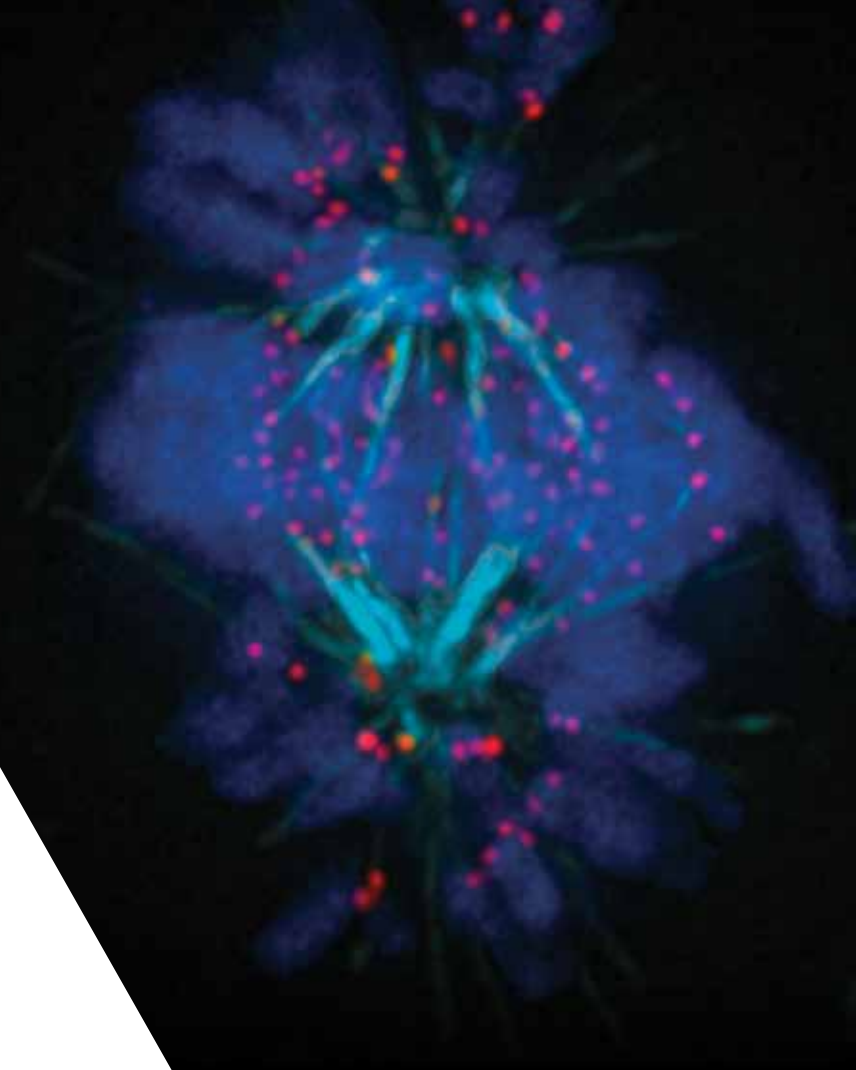
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### **Radboud University Medical Center Nijmegen**

Peter Friedl

### **Utrecht University**

Albert Heck



## Colophon

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[www.cancergenomics.nl](http://www.cancergenomics.nl)

