UMCG

RgC Radiogenomics Consortium

The Annual MEETING Of

THE INTERNATIONAL RADIOGENOMICS CONSORTIUM

Oct 06-07, 2022

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"Radiogenomics and Personalised Radiotherapy The Challenges and Promises"

Date: 06 -07 October 2022
Place: UMCG, Groningen, The Netherlands.
Location: nh Hotel, Groningen.

In Honorarium:
Prof. Dr. Catharine West, PhD

The Scientific Committee:

Prof. Dr. **Hans Langendijk**, MD PhD
Dep. of Radiation Oncology; University Medical Center Groningen. Groningen, the Netherlands.

Prof. Dr. **Catharina West**, MD, PhD
Institute of Cancer Sciences, University of Manchester, Manchester, England, UK.

Prof. Dr. **Sarah Kerns**, MPH, , PhD
Dep. of Radiation Oncology, Medical College of Wisconsin, Milwaukee, USA.

Prof. Dr. **Barry Rosenstein,** MD, PhD
Dep. of Radiation Oncology & Dep. Genetics and Genomic Sciences, Icahn School of Medicine at Mount Sinai, New York, USA.

Prof. Dr. **Christopher Talbot,** MD PhD
Leicester Cancer Research Centre, University of Leicester, Leicester, England, UK.

Dr. **Petra Seibold,** PhD
Division of Cancer Epidemiology, German Cancer Research Center (DKFZ), Heidelberg, Germany.

Dr. **Tiziana Rancati**, PhD
Prof. Dr. **Christopher Talbot**, MD PhD
Fondazione IRCCS Istituto Nazionale dei Tumori, Milan. Italy.

The scientific director:

Dr. **Behrooz Z. Alizadeh,** MD PhD
Department of Epidemiology, University Medical Center Groningen, Groningen, The Netherlands.

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INVITED SPEAKERS

Titel, full name, and University	Email.
Prof. Dr. Hans Langendijk; University Medical Center Groningen, The Netherlands.	j.a.langendijk@umcg.nl
Dr. Behrooz Z. Alizadeh; University Medical Center Groningen, The Netherlands.	b.z.alizadeh@umcg.nl
Prof. Dr. Alberto Traverso; Maastro Clinic, Maastricht, the Netherlands.	alberto.traverso@maastro.nl
Prof.dr. **Paul Krabbe,** University Medical Center Groningen, The Netherlands.	
Dr. Gill Barnett; Cambridge University Hospital, Cambridge, England, UK	gill.barnett@addenbrookes.nhs.uk
Dr. Petra Seibold; German Cancer Research Center (DKFZ), Heidelberg, Germany.	p.seibold@Dkfz-Heidelberg.de
Prof. Dr. Ana Vega; Fundación Pública Galega de Medicina Xenómica, Santiago de Compostela, Spain.	ana.vega@usc.es
Prof. Dr. Christopher Talbot; University of Leicester, Leicester, England, UK.	cjt14@leicester.ac.uk
Prof. Dr. Sarah Kerns, Medical College of Wisconsin, Milwaukee, USA.	<skerns@mcw.edu>
Prof. Dr. Paolo Zunino; University of Pittsburgh, Pittsburgh, USA.	paolo.zunino@polimi.it
Dr. Nicola-Rares Franco; University of Pittsburgh, Pittsburgh, USA.	nicolarares.franco@polimi.it
Prof. Dr. Jung Hun Oh, Memorial Sloan Ketterin cancer center, New York, USA.	OhJ@mskcc.org
Dr. Sane van Dijk, University Medical Center Groningen, Groningen, The Netherlands.	l.v.van.dijk@umcg.nl
Prof. Dr. Catharine West, University of Manchester, Manchester, England, UK.	Catharine.West@manchester.ac.uk
Prof. Dr. Christian Nicolaj Andreassen, Aarhus University Hospital, Aarhus, Denmark	nicolaj@oncology.au.dk
Dr. Lara Barazzuol, University Medical Center Groningen, Groningen, The Netherlands.	l.barazzuol@umcg.nl
Dr. Sangkyu Lee. Dept. of Medical Physics, Memorial Sloan Ketterin cancer center, New York, USA.	lee14@mskcc.org.
D**r. Alan Mcwilliam,** The University of Manchester, Manchester, England, UK.	alan.mcwilliam@manchester.ac.uk
D**r. Sara Gutiérrez-Enríquez,** Institute of Oncology (VHIO),Barcelona, Spain.	sgutierrez@vhio.net
Ester Aguado-Flor, Oncology (VHIO),Barcelona, Spain.	eaguado@vhio.net
Prof. Dr. Rob P Coppes, University Medical Center Groningen, Groningen, the Netherlands.	r.p.coppes@umcg.nl
Prof. Dr. Barry Rosenstein, Icahn School of Medicine at Mount Sinai, New York, USA.	Barry.Rosenstein@mssm.edu
Prof. Dr. Harry Ostrer, Albert Einstein College of Medicine, Bronx, New York, USA.	harry.ostrer@einsteinmed.edu
Dr. Miguel Aguado-Barrera, Fundación Pública Galega de Medicina Xenómica, Santiago de Compostela, Spain.	miguelelias.aguado@usc.es
Dr. Elnaz Naderi, Columbia University, New York, USA.	en2509@cumc.columbia.edu
Prof. Dr. Brian Marples, Rochester University, Rochester, USA.	Brian_Marples@URMC.Rochester.edu
Dr. Lindsay Morton, National Cancer Institute, National Institute of Health, Rockville, Maryland, USA.	mortonli@mail.nih.gov
Prof. Dr. Suzanne Leal, Columbia University, New York, USA.	sml3@cumc.columbia.edu

THE INTERNATIONAL RADIOGENOMICS CONSORTIUM

Background:

The Radiogenomics Consortium was established in November 2009. The scientific hypothesis underlying the development of the consortium is that a cancer patient's likelihood of developing toxicity to radiation therapy is influenced by common genetic variations, such as single nucleotide polymorphisms (SNPs).

Consortium members undertake collaborative projects to identify genetic variants associated with adverse effects following radiotherapy, share data and samples, perform meta-analyses, and work together to submit research grant applications.

Objectives:

The goals of the Radiogenomics Consortium are to expand knowledge of the genetic basis for differences in radiosensitivity and to develop assays to help predict the susceptibility of cancer patients for the development of adverse effects resulting from radiotherapy, through:

- Fostering international collaborative research projects in radiogenomics through sharing of biospecimens and data.
- Developing guidelines to improve the standardization of radiogenomics research.
- Providing a framework for the efficient conduct and publication of original data meta-analyses of relevant studies.
- Providing a forum and framework for discussion, development and pursuit of new research directions; and
- Supporting the development of early career researchers.

The 2020 MEETING:

The 2022 annual meeting includes invited presentations from leading international radiotherapists, oncologists, geneticists, epidemiologists, statisticians, and project leaders. A variety of presentations focusing on the most important and recent developments in Radiogenomics, and personalized radiotherapy will be presented, including basic and molecular genetics; concept of Radiogenomics, radiobiology, cancer genetics; new methods in radiotherapy, concept, and application of new methodologies of artificial intelligence, and machine learning techniques in radiogenomics.

Web: Radiogenomics Consortium (RGC) | EGRP/DCCPS/NCI/NIH (cancer.gov)

DAY 01: OCT 06, 2022

9:30: Registration – Reception.

9.50: Welcome speech –
   Prof. Dr. Hans Langendijk, MD, PhD
   Chair. Dep. of Radiation Oncology; University Medical Center Groningen. Groningen, the Netherlands.

Session 1: Concepts in radiotherapy and radiogenomics.
   Chair: Dr. **Behrooz Z Alizadeh,**

10:00: Opening Keynote lecture:
   Evidence-based individualized prevention of radiation-induced toxicity in head and neck
   By: **Prof. Dr. Hans Langendijk,** MD, PhD
   Chair. Dep. of Radiation Oncology; University Medical Center Groningen. Groningen, the Netherlands.

10:30: Radiogenomics: Concepts, and genetic measures of radiation-induced toxicities: can we help personalise radiotherapy?
   Host Speaker: **Dr. Behrooz Z. Alizadeh,** MD PhD
   Department of Epidemiology, University Medical Center Groningen, Groningen, The Netherlands.

11:00: AI: What it is and how it does it: opportunities and limitations in handling BIG genomics data.
   Invited Speaker: **Prof. Dr. Alberto Traverso,** PhD
   Department of Radiotherapy, Maastro Clinic, Maastricht, the Netherlands.

11:30: The concept: health technology assessment of individualized medical care.
   Invited Speaker**: Prof. Dr. Paul Krabbe.** PhD.
   Department of Epidemiology, University Medical Center Groningen, Groningen, The Netherlands

12:00: Lunch Break @ NH hotel:

Session 2: Achievements in Radiogenomics.
   Chair: **Prof. Catharine West**

13.10: The latest update from Radiogenomics: Assessment of Polymorphisms for Predicting the Effects of Radiotherapy: The RAPPER Study.
   Project leader: **Dr. Gill Barnett**, MD, PhD
   NHS, Cambridge University Hospital, Cambridge, England, UK.

13.30: REQUITE follow-up projects RADprecise + REQUITEplus on the prediction of late radiation toxicity.
   Project leader: **Dr. Petra Seibold,** PhD
   Division of Cancer Epidemiology, German Cancer Research Center (DKFZ), Heidelberg, Germany.

13:50: The latest international metaGWAS on radiation-induced toxicity in lung cancer.

Project leader: **Prof. Dr. Ana Vega,** MD, PhD
Fundación Pública Galega de Medicina Xenómica, Grupo de Medicina Xenómica, Santiago de Compostela, Spain.

14:15: The latest international metaGWAs on radiation-induced toxicity in breast cancer.
Project leader: **Prof. Dr. Christopher Talbot,** MD, PhD
Leicester Cancer Research Centre, University of Leicester, Leicester, England, UK.

14:35: Prostate Cancer Radiotoxicity GWAS – Initial Results of PRS Development.
Project leader: **Prof. Dr. Sarah Kerns,** MPH, PhD
Dep. of Radiation Oncology, Medical College of Wisconsin, Milwaukee, USA.

14:55: Coffee-break

Session 3: Application of artificial intelligence in radiogenomics.
Chair: **Dr. Gill Barnett,** MD, PhD

15:15: The PRE-ACT project: building and testing explainable AI prediction models for breast radiotoxicity.
Project leader: **Prof. Dr. Christopher Talbot,** MD PhD
Leicester Cancer Research Centre, University of Leicester, Leicester, England, UK.

15:35: Deep learning: A new approach for learning high-order Interactions for polygenic risk prediction. Application to prostate and breast cancer cohorts.
Invited Speaker: **Prof. Dr. Paolo Zunino,** PhD / **Dr. Nicola-Rares Franco,** PhD
Department of Mathematics, University of Pittsburgh, Pittsburgh, USA.

15:55: Interpretable convolutional neural networks for survival prediction and pathway analysis.
Invited Speaker: **Prof. Dr. Jung Hun Oh,** PhD
Dept. of Medical Physics, Memorial Sloan Kettering cancer center, New York, USA.

16:15: Short Coffee break.

Session 4: Radiogenomics in perspectives.

16:20: Keynote lecture:
Application of artificial intelligence to improve patient selection, toxicity prediction, and improvement of radiation treatment.
Invited Speaker**: Dr. Sane van Dijk,** PhD
Department Radiation Oncology, University Medical Center Groningen, Groningen, The Netherlands.

16:45: Keynote lecture:
A decade-long journey in radiogenomics: what is missing and why?
By: **Prof. Dr. Catharine West,** PhD
Institute of Cancer Sciences, University of Manchester, Manchester, England, UK.

17:15: Panel discussion: Radiogenomics: what is coming next?
17:45: Coffee break with stand-up discussions – networking.
18:00: Session ends.
DINNER: 18:30 - 22:00hh – Feith HUIS, @ Center of Groningen**.**

DAY 2: Oct 07, 2022

Session 5: Radiobiology and Radiogenomics.
　　　Chair: **Prof. Dr. Christopher Talbot,** MD PhD
　　　Leicester Cancer Research Centre, University of Leicester, Leicester, England, UK.

09:30 Comparative transcriptomic analysis of the neuroimmune response after photon and proton brain irradiation.
　　　Invited Speaker: **Lara Barazzuol, PhD**
　　　Dept. of Radiation Oncology, University Medical Center Groningen, Groningen, The Netherlands.

09:55: Prediction of secondary breast cancer after radiotherapy: the WECARE study.
　　　Invited Speaker: **Dr. Sangkyu Lee.** PhD
　　　Dept. of Medical Physics, Memorial Sloan Ketterin cancer center, New York, USA.

10:20: Prostate cancer patients with a high polygenic risk of rheumatoid arthritis have increased radiotherapy toxicity.
　　　Invited Speaker: D**r. Alan Mcwilliam,** PhD
　　　Division of Cancer Sciences, The University of Manchester, Manchester, England, UK.

10:45: Application of advanced AI in analyzing radiogenomics and radiomics data.
　　　Invited Speaker: **Prof. Dr. Alberto Traverso,** PhD
　　　Department of Radiotherapy, Maastro Clinic, Maastricht, the Netherlands.

11:15: Short Coffee Break

11:20: Role of non-coding genome in radiation-induced toxicity.
　　　Invited Speaker: **Dr. Sara Gutiérrez-Enríquez,** PhD / **Ester Aguado-**Flor, PhD
　　　Hereditary Cancer Genetics Group, Vall d'Hebron Institute of Oncology (VHIO),Barcelona, Spain.

11:50: Radiation-induced gene-expression differences between proton and photon irradiated salivary gland organoids.
　　　Invited Speaker: **Prof. Dr. Rob P Coppes,** MD, PhD
　　　Dep. of Radiation Oncology, University Medical Center Groningen, Groningen, the Netherlands.

12:15: Lunch Break @ NH hotel.

Session 6: Genome components of radiotoxicities in cancer.
　　　Chair: **Prof. Dr. Barry Rosenstein,** MD, PhD
　　　Dep. of Radiation Oncology & Dep. Genetics and Genomic Sciences, Icahn School of Medicine at Mount Sinai, New York, USA.

13:15: Where we started to build radiotoxicity Chip: The lesson earned from the SBIR assay.
　　　Invited Speaker: **Prof**. **Dr. Harry Ostrer,** MD, PhD
　　　Department of Pathology, Albert Einstein College of Medicine, Bronx, New York, USA.

DAY 2: Oct 07, 2022

13.35: Cox-GWAS of recurrence-free survival in patients treated with radiotherapy.
Invited Speaker: **Dr. Miguel Aguado-Barrera,** PhD
Fundación Pública Galega de Medicina Xenómica, Grupo de Medicina Xenómica, Santiago de Compostela, Spain.

14.00: Immunogenetic vs metabogenetics in acute radiation-induced radio toxicities in multiple cancers**.**
Invited Speaker: **Dr. Elnaz Naderi,** PhD
Unit of Statistical Genetics, Dep. Of Neurology, Columbia University, New York, USA.

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14.25: Rare variants and sequencing in Radiogenomics**:** findings from UK biobank.
Invited Speaker**: Prof. Dr. Sarah Kerns,** PhD
Dep. of Radiation Oncology, Medical College of Wisconsin, Milwaukee, USA.

14:50: Coffee break @ NH hotel

15:05: Preclinical functional analysis in prostate cancer.
Invited Speaker: **Prof. Dr. Brian Marples,** PhD
Department of Radiation Oncology, Rochester University, Rochester, USA.

15.30: Germline variants and radiation-related second cancers of childhood cancer survivors.
By Project leader: **Dr. Lindsay Morton,** PhD
Division of Cancer Epidemiology and Genetics, National Cancer Institute, National Institute of Health, Rockville, Maryland, USA.

15:55: Short Coffee break @ NH hotel

Session 7: application of AI and Genetics in studying radiogenomics outcomes.

16:05: Keynote lecture:
Use of federated databases and machine learning to identify predictors of radiotherapy responses: possibilities and challenges.
By**: TBD**

16:35: Keynote lecture.
Common and Rare variants in understanding genomics of complex outcomes. Which one does matter the most?
By: **Prof. Dr. Suzanne Leal**
Unit of Statistical Genetics, Dep. Of Neurology, Columbia University, New York, USA.

17:05: Panel discussion, – New discoveries: The Future of personalized radiotherapy?

17:35: Coffee break with stand-up discussions – networking.

DINNER: 18:30 - 21:00hh. @ nhHotel

Meeting metrics:

On the behalf of the international RgC we would like to thank the effort of the organization team @University Medical Center Groningen, Groningen, The Netherlands.

The Organising Team
Mr. Erwin Kort,
Mrs. Gerda Greets,
Mrs. Aukje van der Zee,
Mrs. Sanne van Dijk,
Mrs.Tamar Berkhuizen,
Dr. Noha Elbaz,
Dr. Elnaz Naderi,
Prof.dr. Truuske de Bock,
Prof. dr. Hans Langendijk.
Dr. Behrooz Z. Alizadeh,

Sponsors:
Unit of Personalized Medicine, Department of Epidemiology, Department of Epidemiology, University Medical Center Groningen, Groningen, The Netherlands.

Looking forward to meeting you @ Groningen or e-meet you on Collaborate.