The Annual MEETING Of
THE INTERNATIONAL RADIOGENOMICS CONSORTIUM

Oct 06-07, 2022

“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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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.

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 – FeithHUIS, @ Center of Groningen.
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.

Invited Speaker: Dr. Sangkyu Lee, PhD
Dept. of Medical Physics, Memorial Sloan Kettering cancer center, New York, USA.

10:20: Prostate cancer patients with a high polygenic risk of rheumatoid arthritis have increased radiotherapy toxicity.
Invited Speaker: Dr. 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.

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
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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.