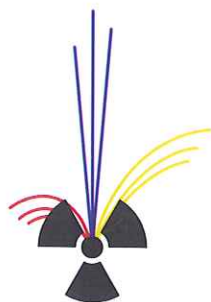


ACTA Oncologica Symposium on Particle Therapy
NACP 2011 Symposium

**Final Programme
Abstracts**



Uppsala April 13-15, 2011



SVENSK FÖRENING FÖR RADIOFYSIK
Swedish Society of Radiation Physics



**AKADEMISKA
SJUKHUSET**

SSFF

SVENSKA SJUKHUSFYSIKERFÖRBUNDET
Swedish Hospital Physicists Association

Dear colleagues and friends,

We welcome you to the 'ACTA Oncologica Symposium on Particle Therapy' and the 'NACP 2011 Symposium' at Norrlands Nation in Uppsala, Sweden.

The 'ACTA Oncologica Symposium on Particle Therapy' is one in a series of symposia organised by Acta Oncologica, the official journal of the five Nordic oncological societies and one of the leading journals in clinical oncology.

The Nordic Association for Clinical Physics (NACP) is the umbrella organisation for the Nordic medical physics societies and the 'NACP 2011 Symposium' in Uppsala is the second Nordic symposium following the first held in Aarhus in 2008.

The scientific program of the meeting consists of invited talks as well as paper presentations. The social program includes a banquet at the Uppsala castle and a dinner at the legendary restaurant Flustret with many possibilities for networking with colleagues.

Uppsala is the fourth largest city in Sweden, beautifully located by the river Fyris. Since 1164, Uppsala has been the ecclesiastical center of Sweden, with its magnificent medieval cathedral. Founded in 1477, Uppsala University is the oldest centre of higher education in Scandinavia. This combined symposium will be held at one of the ancient Student Nations in Uppsala, Norrlands nation. The nations are student clubs dating back to the 17th century. Each nation bears the name of a certain region in Sweden, in this case Northern Sweden.

We hope that you all will have a rewarding and stimulating meeting in Uppsala.

Cathrine Jonsson
Chairman of NACP

Bengt Glimelius
Editor in chief, Acta Oncologica



All photos by Uppsala Kommun

Chairpersons

Stefan Johnsson, SFfR
Cathrine Jonsson, NACP
Hans-Erik Källman, SSFF

NACP Advisory Board

Søren Baarsgaard Hansen, Aarhus, Denmark
Karsten Eilertsen, Oslo, Norway
Annette Fransson Andreo, Stockholm, Sweden
Kjell-Inge Gjesdal, Ålesund, Norway
Mari Gårseth, Levanger, Norway
Jolanta Hansen, Aarhus, Denmark
Simo Hyödynmaa, Tampere, Finland
Miiika Nieminen, Oulu, Finland
Kirsten Nygaard, Bergen, Norway
Mette Skovhus Thomsen, Aarhus, Denmark
Mika Teräs, Turku, Finland

Organising Committee

Henrik Båvenäs
Agneta Gustafsson
Ylva Larsson
Anders Montelius
Anna Olsson
Ylva Surac
Eleonor Vestergren

Scientific Committee Members

ACTA Symposium

Håkan Nyström (chair)
Erik Blomquist
Morten Høyer
Anders Montelius
Ludvig Paul Muren
Per Nilsson
Zahra Taheri-Kadkhoda

NACP Symposium

Michael Ljungberg (chair)
Stefan Johnsson
Per Nilsson
Håkan Nyström



Wednesday 13 April

Buffet lunch will be served from 11.00 and will be available to 13.00.
Exhibition open from 12.00 to 17.00

11:00 - 12:00 **Registration - ACTA Symposium**

12:00 - 12:10 **Opening and welcome**

12:10 - 13:50 **Session 1: Introduction to particle therapy and an overview**

Proton therapy - An Overview

Eugen Hug, Paul Sherrer Institute, Switzerland

Light ion therapy - an Overview

Klaus Herfarth, University Hospital, Heidelberg, Germany

Protons in Uppsala - Past and Present

Erik Blomquist, Uppsala University Hospital, Sweden

Protons in Uppsala - Plans for the Future

Håkan Nyström, Skandion Clinic, Uppsala, Sweden

13:50 - 14:10 **Coffee break, poster presentation and exhibition**

14:10 - 15:50 **Session 2: Tumours**

Status of particle therapy of lung tumours

Zhongxing Liao, MD Anderson Cancer Center, Houston, USA

Status of particle therapy of prostate tumours

Klaus Herfarth, University Hospital, Heidelberg, Germany

Status of particle therapy of head and neck tumours

Nancy Mendenhall, University of Florida, Proton Therapy Institute,
Jacksonville, USA

Scientific presentation RT-01: *Treatment planning comparison of photon and proton therapy for high grade glioma based on CT, FDG-PET and DTI-MR imaging and fiber-tracking* P Munck af Rosenschold, Rigshospitalet, Copenhagen, Denmark

Scientific presentation RT-02: *Comparison of proton and multifield x-ray techniques for SBRT of solitary liver metastases*
Morten Høyer, Aarhus University Hospital, Aarhus, Denmark

Scientific presentation RT-03: *Estimated risk of radiation pneumonitis after 3DCRT, IMRT and proton therapy after radiation therapy alone or combined with chemotherapy for lung cancer.*

IR Vogelius, Rigshospitalet, Copenhagen University Hospital, Denmark

15:50 - 16:00 **Short break**

16:00 - 17:00

Session 3: Paediatric treatments

The role of particles in paediatric treatments
Eugen Hug, Paul Sherrer Institute, Switzerland

Scientific presentation RT-04: *Quantifying patient benefit of proton therapy compared to modern photon treatment for children receiving craniospinal irradiation*
Patrik Brodin, the Finsen Centre, Rigshospitalet, Copenhagen, Denmark

Scientific presentation RT-05: *Does the need for plan adaptation in radiotherapy increase when using protons? – A case study of a child with a brain tumour*
Yasmin Lassen-Ramshad, Aarhus University Hospital, Aarhus, Denmark

19:00 -

Dinner party at restaurant Flustret, Svandammen 1

Thursday April 14th

Exhibition open from 08.00 to 17.00

08:30 - 10:00

Session 4: Radiation Biology in Particle Therapy

Radiation biology of heavy charged particles
Bo Stenerlöv, Uppsala University, Sweden

State-of-the-art overview of high-LET biology
Peter Peschke, German Cancer Research Center (DKFZ), Heidelberg, Germany

Scientific presentation RT-06: *A Review of the RBE-LET Dependence for Inactivation of V79, CHO and T1 Cells* Brita Singers Sørensen, Aarhus University Hospital, Aarhus, Denmark

Scientific presentation RT-07: *Radiobiological Modelling for Particle Therapy Treatment Planning*
Thilo Elsässer, Biophysics, Gesellschaft für Schwerionenforschung (GSI), Darmstadt, Germany

Scientific presentation RT-08: *Oxic and hypoxic cell survival modelling for light ions using the RCR damage model*
Laura Antonovic, Stockholm University, Stockholm, Sweden

10:00 - 10:30

Coffee break, poster presentation and exhibition

10:30 - 11:30

Session 5: Treatment Planning

Challenges in treatment planning for proton and light ion beam therapy
Oliver Jäkel, German Cancer Research Center (DKFZ), Heidelberg, Germany

Scientific presentation RT-09: *Frequency distribution of clusters of energy deposits generated by 60-Co photons, protons and other light ions in a cell-nucleus-sized target for an absorbed dose of 2 Gy* Gloria González-Muñoz, Uppsala University, Uppsala, Sweden

Scientific Presentation RT-10: *The impact of CT and cone-beam CT calibration and reconstruction methods on stopping power spectra within anatomical structures in the head and neck region* Ulrik V. Elstrøm, Aarhus University Hospital, Aarhus, Denmark

Scientific Presentation RT-11: *Tumour control probability modelling of hypoxia dose painting with heavy ions* E Malinen, the Norwegian Radium Hospital, Oslo University Hospital, Oslo, Norway

11:30 - 12:30

Session 6: Round table discussion

Participants from Denmark, Finland, Norway and Sweden

12:30 - 13:30

Lunch and registration for the NACP Symposium

13:30 - 15:30

NACP Symposium

Chairmen: Michael Ljungberg, Lund and Stefan Johnsson, Kalmar

Emerging technologies in Particle Therapy

Marco Shippers, Paul Sherrer Institute, Switzerland

Recent advances in Iterative Reconstruction for SPECT/PET and CT

Brian Hutton, UCL Division of medicine, University College of London, United Kingdom

Scientific Applications for a clinical 7T MRI system

Freddy Ståhlberg, Lund University, Lund, Sweden

*7T scanners på gång i
SVERIGE, DK och NO.*

15:30 - 16:45

Coffee Break, poster presentation and exhibition

*Du kan SE bara 3 min!
På vardagen.*

16:45 - 17:00

NACP Award presentation

Ditte Sloth Møller, Aarhus University Hospital, Aarhus, Denmark

17:00 - 18:00

Society meeting and workshops

Norsk Forening for Medisinsk Fysikk
Dansk Selskab for Medicinsk Fysik

19:00 -

Conference Dinner, Uppsala Castle

Friday April 15th

Exhibition open from 08.00 to 12.00

08:30 - 09:45

Session 7: Parallel moderated sessions - scientific papers I

Radiotherapy - I (RT 12-17)

Moderators: Stefan Johnsson, Kalmar and Joakim Medin, Lund

Monte Carlo simulation of secondary dose distributions in anthropomorphic phantoms undergoing brain tumour irradiation with light ions

Martha Hultqvist, Stockholm University, Stockholm, Sweden

Brachytherapy error detection in a phantom using online fiber-coupled luminescence dosimetry

Gustavo Kertzscher, Technical University of Denmark, Roskilde, Denmark

Quantification of local lung tissue expansion based on deformable image registration and 4D-CT scanning in stereotactic radiotherapy of lung cancer
Ludvig P. Muren, Aarhus University Hospital, Aarhus, Denmark

The dosimetric impact of the MLC modulation magnitude for real-time dynamic MLC tracking delivery of inversely optimized arc radiotherapy plans
Marianne Falk, Rigshospitalet, Copenhagen University Hospital, Denmark

Dosimetry simulations of irradiated alanine pellets and cell cultures with MCNP in Boron Neutron Capture Therapy (BNCT)
M. Ziegner, AIT Austrian Institute of Technology GmbH, Vienna, Austria

Dose Calculation in Mixed Neutron and Gamma Fields for Boron Neutron Capture Therapy of Liver Malignancies
T. Schmitz, Institute for Nuclear Chemistry, University of Mainz, Germany

MRI/Radiology (MR 1-3 & X-RAY 1-3)

Moderators: Jolanta Hansen, Aarhus and Hans-Erik Källman, Falun

Evaluation of prostate gold markers influence on 1.5T and 3.0T diffusion-weighted MR images based on intensity profiles

S. Rylander Aarhus University Hospital, Aarhus, Denmark

Diagnostic value of MRI and multi-slice CT in sterno-clavicular joint disorders - a comparative prospective study

Anna Zejden, Aarhus University Hospital, Aarhus, Denmark

MRI quality assurance in a hospital district: Method comparison and relation to clinical image quality

Toni Ihalainen, HUS Helsinki Medical Imaging Center University of Helsinki, Finland

Analysis of intratumoral pharmacokinetic parameter distributions derived from contrast enhanced dynamic CT

T Sollien, the Norwegian Radium Hospital, Oslo University Hospital, Oslo, Norway

Evaluation of image quality for different cone-beam CT acquisition and reconstruction methods towards radiotherapy planning in the head and neck region

Ulrik V. Elstrøm, Aarhus University Hospital, Aarhus, Denmark

Automated detection of changes in patient exposure in digital projection radiography using exposure index from DICOM header Meta data

Hans-Erik Källman, Radiology Dalarna, Falun, Sweden

09:45 - 10:30

Coffee break, poster presentation and exhibition

10:30 - 11:45

Session 8: Parallel moderated sessions - scientific papers II

Radiotherapy - II (RT 18-23)

Moderators: Per Nilsson, Lund and Anders Montelius, Uppsala

Pharmacokinetic analysis and k-means clustering of DCEMR images for radiotherapy outcome prediction of advanced cervical cancers

EKF Andersen, the Norwegian Radium Hospital, Oslo University Hospital, Oslo, Norway

Geometric accuracy of DMLC tracking with an implantable wired electromagnetic transponder

Thomas Ravkilde, Aarhus University Hospital, Aarhus, Denmark

Tracking latency in image-based dynamic MLC tracking with direct image access

Walther Fledelius, Aarhus University Hospital, Aarhus, Denmark

Towards more accurate dosimetry in proton, neutron and heavy ion exposures

T. Siiskonen, STUK – Radiation and Nuclear Safety Authority, Helsinki, Finland

Deformable image registration for contour propagation in radiotherapy of prostate cancer

Maria Thor, Aarhus University, Aarhus, Denmark

Parameters indicating target underdosage and benefit from plan adaptation in simulated integrated boost treatments of locally advanced prostate cancer

Sara Thörnqvist, Aarhus University Hospital, Aarhus, Denmark

Nuclear Medicine (NM 1-6)

Moderators: Mika Teräs, Turku and Sören Baardsgaard Hansen, Aarhus

Radiotherapy planning and tumour characterization of lung cancer using dynamic respiratory gated 18FDG-PET
IS Knudtsen, the Interventional Centre, Oslo University Hospital, Norway

Spatiotemporal analysis of tumour uptake patterns in dynamic contrast enhanced CT and dynamic 18FDG-PET

E Malinen, the Norwegian Radium Hospital, Oslo University Hospital, Oslo, Norway

Perfusion measurements in liver metastases using 15O-water PET – reproducibility and effect of imatinib
My Jonasson, PET Centre, Uppsala University Hospital, Uppsala, Sweden

Correlation between [18F] FDG PET and [11C]flumazenil parametric relative delivery (R1) images in epilepsy patients
Mark Lubberink, Uppsala University Hospital, Uppsala, Sweden

Tumour dosimetry in an anatomical realistic mouse phantom: A Monte Carlo study
Erik Larsson, Lund University, Lund, Sweden

Inter-observer variability of absorbed dose estimates to the kidney in patients with neuroendocrine tumours receiving 177Lu-Octreotate therapy
M. Sandström, Uppsala University, Uppsala, Sweden

12:00 - 12:30

Closing Lecture:

The future role of Hybrid Imaging Modalities

Brian Hutton, UCL Division of Medicine, University College London, United Kingdom

12:30 - 12:45

Conclusion and Farewell

12:45 -

Lunch