

11th Acta Oncologica Symposium
BiGART2013

Biology-Guided Adaptive Radiotherapy

Aarhus
Denmark
June 11-13, 2013



Final programme

Scientific Programme

Tuesday June 11, 2013

- 13.00-13.20 **Opening of the Symposium**
Cai Grau, Aarhus: Welcome to BiGART2013 and Aarhus. Practical information
Bengt Glimelius, Uppsala: Past achievements and future directions of Acta Oncologica
- 13.20-14.50 **Session 1: The biological basis for adaptive radiotherapy**
Chairs: Philippe Lambin and Jan Alsner
- Keynote lectures*
- 13.20 **Harry Bartelink, Amsterdam:** Biology - The basis for personalized radiotherapy in breast cancer?
- 13.40 **Rob Bristow, Toronto:** Tumor Hypoxia and Genetic Instability in Prostate Cancer Progression and Treatment Response: Pre-Clinical and Clinical Approaches
- 14.00 **Mechthild Krause, Dresden:** Importance of hypoxia for adaptive radiotherapy
- 14.20 **Michael Baumann, Dresden:** Importance of cancer stem cells for adaptive radiotherapy
- Proffered paper*
- 14.40 **Trine Tramm, Aarhus:** Identification of a gene profile predicting benefit of postmastectomy radiotherapy irrespective of clinico-pathological variables in high risk breast cancer
- 14.50-15.20 **Coffee break**
- 15.20-17.00 **Session 2: Biological imaging developments**
Chairs: Vincent Gregoire and Mike Horsman
- Keynote lectures*
- 15.20 **Bettina Beuthien-Baumann, Dresden:** Molecular imaging with PET-MR in the oncologic setting

- 15.40 **Jan Henrik Ardenkjær-Larsen, Copenhagen:** Magnetic resonance imaging of tumor oxygenation and metabolic profile
- 16.00 **Eirik Malinen, Oslo:** Imaging phenotype vs. genotype
- Proffered papers*
- 16.20 **Morten Busk, Aarhus:** PET imaging of tumor hypoxia using 18F labelled pi-monidazole
- 16.30 **David Mönnich, Tübingen:** Correlation between tumor oxygenation and FMISO PET data simulated based on microvasculature images
- 16.40 **Alexandr Kristian, Oslo:** Dynamic 18FDG-PET for monitoring treatment effect following antiangiogenic therapy in triple-negative breast cancer xenografts
- 16.50 **Faisal Mahmood, Herlev:** MRI based evaluation of immediate tissue response after ionising radiation exposure modelled by tissue permeabilization
- 17.00-18.15 **Poster viewing, including poster discussion groups**
- 19.00 **Welcome reception and dinner**
Your Rainbow Panorama, AROS Art Museum, City Center (see map).
Reception 19.00, Dinner 20.00. Please remember your ticket!



Wednesday June 12, 2013

8.00 – 10.05 **Session 3: Clinical functional imaging**

Chairs: Vincenzo Valentini and Kari Tanderup

Keynote lectures

08.00 **Daniela Thorwarth, Tübingen:** First clinical experience with FMISO dose painting and PET/MR in head and neck patients

08.20 **Perry Grigsby, St. Louis:** Evaluation of simultaneous PET/MRI and PET/CT in cervical cancer

08.40 **Mischa Hoogeman, Rotterdam:** Deformable image registration for adaptive radiotherapy: opportunities and pitfalls

09.00 **Tufve Nyholm, Umeå:** MR based treatment planning

Proffered papers

09.20 **Karen Zegers, Maastricht:** Optimal acquisition parameters for hypoxia PET imaging with [18F]HX4 in NSCLC patients

09.30 **Sara Leibfarth, Tübingen:** A strategy for multimodal deformable image registration to integrate PET/MR into radiotherapy treatment planning

09.40 **Eva Serup-Hansen, Herlev:** Correlations between diffusion weighted MRI and dynamic contrast enhanced MRI in anal cancer

09.50 **Maximilian Schmid, Vienna:** Magnetic resonance imaging for assessment of parametrial tumor spread and regression patterns in adaptive cervical cancer radiochemotherapy

10.00 **Jesper Kallehauge, Aarhus:** Comparative study of DCE-CT and DCE-MR in advanced cervical cancer

10.10 - 10.40 Coffee break

10.40 - 12.30 **Session 4: Response evaluation and prediction**

Chairs: Dag Rune Olsen and Markus Alber

Keynote lectures

10.40 **Philippe Lambin, Maastricht:** Do we need Decision Support Systems? What is the next step? The example of lung cancer

- 11.00 **Joe Deasy, New York:** Biologically guided therapy: foundations of tumor treatment optimization based on imaging parameters, clinical data analysis, and mathematical modeling
- 11.20 **Di Yan, Michigan:** Clinical translational study and implementation of dynamic 18F-FDG PET imaging in biological adaptive radiotherapy of H&N Cancer
- Proffered papers*
- 11.40 **Sean Walsh, Maastricht:** A Tumor Control Probability model for low, intermediate and high-risk prostate cancer patients; treated by photon, proton or carbon-ion external beam radiotherapy
- 11.50 **Anni Jørgensen, Copenhagen:** the effect on esophagus after different highly conformal radiotherapy techniques for early stage Hodgkin lymphoma
- 12.00 **Stine Elleberg Petersen, Aarhus:** Evaluation of functional and structural ano-rectal changes following radiotherapy for prostate cancer
- 12.10 **Lotte Sander, Aalborg:** Clinical risk factors for rectal bleeding after radical radiotherapy for prostate cancer
- 12.20 **Maria Thor, Aarhus:** Prediction of normal tissue morbidity in radiotherapy of prostate cancer using motion-inclusive dose distributions
- 12.30-13.30 Lunch
- 13.30 - 15.10 **Session 5: Treatment planning and dose painting**
Chairs: Karin Haustermans and Ludvig Muren
- Keynote lectures*
- 13.30 **Vincent Gregoire, Brussels:** Dose painting - dose escalation in head and neck tumors: are we ready to go?
- 13.50 **Wilfried de Neve, Gent:** Adaptive dose-painting for head and neck cancer: how avoiding mucosal ulcers?
- 14.10 **Markus Alber, Aarhus:** Multi-parametric functional image guided dose-escalation under consideration of classification uncertainties

Proffered papers

- 14.30 **Sara Thörnqvist, Aarhus:** A method of adaptive radiotherapy in locally advanced prostate cancer using a statistical deformable motion model
- 14.40 **Annika Jakobi, Dresden:** Biologically-adapted radiotherapy for head and neck cancer patients – a dose escalation planning study
- 14.50 **Niels Bassler, Aarhus:** LET-painting demonstrated on a head and neck cancer case
- 15.00 **Espen Rusten, Oslo:** Variations in biologic targets and implications for image guided radiotherapy
- 15.10 - 15.40 Coffee break - Poster viewing
- 15.40 -17.00 **Session 6: Treatment delivery**
Chairs: Marianne Aznar and Per Poulsen
- Keynote lectures*
- 15.40 **Ben Heijmen, Rotterdam:** Automated plan generation for high quality adaptive treatments at acceptable cost
- 16.00 **Mikko Tenhunen, Helsinki:** Clinical implementation of adaptive radiotherapy for urinary bladder carcinoma: imaging, planning and image guidance
- Proffered papers*
- 16.20 **Sidsel Damkjær, Copenhagen:** Reduced lung dose and improved inspiration level reproducibility in visually guided deep inspiration breath hold compared to enhanced inspiration gated radiotherapy for breast cancer patients
- 16.30 **Esben Worm, Aarhus:** Magnitude and directionality of respiratory target motion throughout full treatment courses of stereotactic body radiotherapy for tumors in the liver
- 16.40 **Markus Stock, Vienna:** Ultrafast 2D/3D registration using kV-MV image pairs for tumor motion tracking in image guided radiotherapy
- 16.50 **Thomas Ravkilde, Aarhus:** Time-resolved measurements and reconstruction of delivered target dose in VMAT treatments with and without dynamic MLC tracking: predicting treatment delivery success

17.00 **Sculpture by the Sea**

19.30 **Conference dinner – Varna Mansion (next to Hotel Marselis)**



Phil Price Morpheus. From Sculpture by the Sea 2009. Foto Peter Jensen



BiGART2010 participants outside Varna Mansion

Thursday June 13, 2013

8.00 – 9.50 **Session 7: Clinical experience I**

Chairs: Olfred Hansen and Jens Overgaard

Keynote lectures

08.00 **Dirk de Ruyscher, Maastricht:** Stereotactic body radiotherapy-induced lung density changes: Evidence of biological effects at low doses

08.20 **Hans Kaanders, Nijmegen:** PET imaging for early response assessment

08.40 **Jürgen Debus, Heidelberg:** Treatment with heavy charged particles: results of comparative studies

Proffered papers

09.00 **Ditte Møller, Aarhus:** Lung cancer patients with atelectasis, pleural effusion, pneumonia and deviations of tumor and lymph node position: When do we need to adapt the treatment plan?

09.10 **Tine Schytte, Odense:** Pattern of local failure after definitive radiotherapy for NSCLC

09.20 **Stephanie Combs, Heidelberg:** Individualized treatment concepts in brain- and skull base tumors – clinical results after photon, proton and carbon ion radiotherapy

09.30 **Bianca Hoeben, Maastricht:** 18FLT-PET for early treatment adaptation and outcome prediction in head and neck tumors

09.40 **Trine Grantzau, Aarhus:** Second lung cancer and radiation dose after breast cancer irradiation

9.50 - 10.15 Coffee break

10.15 - 11.45 **Session 8: Clinical experience II**

Chairs: Joe Deasy and Morten Høyer

Keynote lectures

10.15 **Vincenzo Valentini, Rome:** Imaged guided treatment in the perspective of multidimensional databases for rectal cancer

- 10.35 **Karin Haustermans, Leuven:** Identification and characterization of nodal metastases in prostate cancer patients at high risk for lymph node involvement
- 10.55 **Richard Pötter, Vienna:** Image Guided Adaptive Brachytherapy following EBRT ±cisplatin in locally advanced cervical cancer: patient, tumour and treatment characteristics and clinical outcome in 698 patients treated in 12 institutions before 2008 based on the Retro-EMBRACE database
- Proffered papers*
- 11.15 **Anne Vestergaard, Aarhus:** Early clinical outcome following adaptive radiotherapy for muscle invasive bladder cancer
- 11.25 **Francesco Cellini, Rome:** FDG-PET can Predict Clinical Response after Definitive Irradiation and MRI-Guided Adaptive Brachytherapy in Uterine Cervix Cancer
- 11.35 **Jacob Lindegaard, Aarhus:** Adaptive radiotherapy in locally advanced cervical cancer from a Nordic perspective
- 11.45 - 12.00 **Closing session**
Chair: Ludvig Muren
- Keynote lecture*
- 11.45 **Dag Rune Olsen, Bergen:** BiGART2013, impressions and future aspects
- 11.55 Closing remarks



Schæffergården, Copenhagen, September 3-5, 2013
www.cancer.dk/actaoncologica50

Posters

on display throughout the meeting

Poster discussion group 1 (Biology and pre-clinical imaging)

1. Plasma markers in head and neck cancer in correlation to FAZA PET CT and a hypoxic gene profile. Line Brøndum, Aarhus, Denmark
2. Hypoxia and microRNAs as predictors of outcome after preoperative chemo-radiotherapy in esophageal squamous cell carcinomas. Mette Winther, Aarhus, Denmark
3. Imaging acute hypoxia: In vivo ultra-high-field MRI in nicotinamide treated murine tumours. Thomas Nielsen, Aarhus, Denmark
4. Functional imaging to monitor vascular and metabolic response in canine head and neck tumors during fractionated radiotherapy. Jan Rødal, Oslo, Norway

Poster discussion group 2 (Clinical imaging)

5. Differences in supratentorial white matter diffusion after radiotherapy – new biomarker of normal brain tissue damage? Søren Ravn, Aalborg, Denmark
6. Diffusion Weighted MRI acquisition with high acceleration factor for improving accuracy for use in radiotherapy planning. Søren Haack, Aarhus, Denmark
7. The use of an active appearance model for prostate segmentation in MR in image-guided radiotherapy of prostate cancer. Anne Sofie Korsager, Denmark
8. Potential position errors using fiducial markers for gated Image Guided Radiotherapy. Martin Nielsen, Aalborg, Denmark
9. Impact of Ultrasound Probe Pressure on Uterine Positional Displacement of Gynecological Cancer Patients. Mariwan Baker, Herlev, Denmark
10. The impact of adding image sequences in creating a pseudo CT scan for MRI based radiotherapy using a regression model. Daniel Andreasen, Lyngby, Denmark
11. Segmentation strategies in the generation of a pseudo CT for MRI only radiotherapy. Jens Edmund, Herlev, Denmark

Poster discussion group 3 (Clinical response assessment and prediction)

12. Perfusion SPECT used to measure pulmonary function before and after curative radiotherapy in patients with non-small-cell lung cancer. Katherina Farr, Aarhus, Denmark
13. Variation of estimated normal tissue complication probability of hypothyroidism (HT) due to intra- and inter-observer variation of delineation of the thyroid gland. Jørgen Johansen, Odense, DK
14. Late dysphagia after treatment with IMRT for head and neck cancer and correlation with dose-volume parameters. Hanna Mortensen, Aarhus, Denmark
15. Hypofractionation schemes and rectal toxicity in prostate cancer: a patient-specific risk comparison. Marianne Aznar, Copenhagen, Denmark
16. Comparing IMAT and 3D-CRT treatment plans for Locally Advanced Pancreatic Cancer (LAPC) using dose-volume metrics and radiobiologic endpoints. Samantha Warren, Oxford, UK
17. It's the radiobiology stupid! Model calculations and clinical outcomes for total body irradiation. Lotte Fog, Copenhagen

Poster discussion group 4 (Treatment planning)

18. Adaptive RT for H&N cancer: the usefulness of deformable image registration. Claus F. Behrens, Herlev, Denmark
19. An evaluation concept for clinical acceptance of MRI-only radiotherapy. Marie Nielsen, Herlev, Denmark
20. PET-guided simultaneous integrated boost of lung tumors: Alanine/EPR dosimetry in an anthropomorphic phantom. Ingerid Knudtsen, Norway
21. Dosimetric verification of complex radiotherapy with a three dimensional optically based dosimetry system: Dose painting and target tracking. Peter Sandegaard Skyt, Aarhus, Denmark
22. Hypoxia guided brachytherapy of cervical cancers using dynamic contrast enhanced MRI. Taran Hellebust, Oslo, Norway
23. Assessment of doses to the para-aortic, pelvic, and inguinal lymph nodes delivered by image guided adaptive pulsed dose rate brachytherapy in locally advanced cervical cancer. Sandy Mohamed, Aarhus, Denmark

Poster discussion group 5 (Treatment delivery)

24. Dosimetric impact of intra- and interfraction tumor motion and anatomical changes in radiotherapy of NSCLC. Mai Lykkegaard Schmidt, Aarhus, Denmark
25. Deep inspiration breath hold radiotherapy for locally advanced lung cancer: comparison of different treatment techniques on target coverage, lung dose and treatment delivery time. Mirjana Josipovic, Copenhagen, Denmark
26. Potential clinical benefit of Deep-Inspiration-Breath-Hold (DIBH) for locally advanced NSCLC lung cancer patients. Wiviann Ottosson, Roskilde, Denmark
27. Inter- and intra-fraction geometric errors in daily image guided radiotherapy of breast cancer patients. Mette Skovhus Thomsen, Aarhus, Denmark
28. Setup accuracy and residual motion in daily image-guided gated radiotherapy of left sided breast cancer. Christina Maria Lutz, Aarhus, Denmark
29. Assessing the stability of fiducial markers as tumor surrogates in stereotactic radiotherapy for tumors in the liver. Walther Fledelius, Aarhus, Denmark
30. Dosimetric benefit of kV image-based dynamic MLC tracking for liver SBRT delivered by VMAT: a simulation study. Per Poulsen, Aarhus, Denmark

Poster discussion group 6 (Clinical studies)

31. Factors of importance for the need for adaptive re-planning in head and neck IMRT. Annette Schouboe, Aarhus, Denmark
32. CBCT based off-line adaptive radiotherapy released by action level for H&N patients. Áshildur Logadóttir, Copenhagen, Denmark
33. The pattern of loco-regional failure after radical radiotherapy of NSCLC in relation to the pre-therapeutic PET/CT. Azza Khalil, Aarhus, Denmark
34. Small cell lung cancer (SCLC) patients undergoing chemo-radiotherapy: Inter-tester reproducibility of tumour-change across three methods. Mai-Britt Bjørklund Ellegaard, Aarhus; Denmark
35. First clinical results of adaptive radiotherapy for lung cancer patients with atelectasis based on 3D portal dosimetry treated with Volumetric Modulated Arc Therapy (VMAT). Sean Walsh, The Netherlands

- 36. Clinical implementation of adaptive radiotherapy for lung cancer patients. Lone Hoffmann, Aarhus, Denmark
- 37. Changes in the position of uterus in patients with cervical cancer visualized on ConeBeamCT. Kirsten Legård Jakobsen, Herlev, Denmark
- 38. A strategy for education and training - in daily online adaptive radiation therapy. Annette Boejen, Aarhus, Denmark

Other posters on display

- 39. Comparison of the measured relative backscatter contribution to the monitor chamber in two medical linear accelerators. Patrik Andersson, Herlev, Denmark
- 40. Progressive resistance training rebuilds lean body mass in radiotherapy treated head and neck cancer patients: results from the randomized DAHANCA 25B trial. Simon Lønbro, Aarhus, Denmark
- 41. Patient specific scatter correction in clinical CBCT imaging made possible by the combination of Monte Carlo simulations and a ray tracing algorithm. Rune Thing, Odense, Denmark
- 42. Quality assurance: Evaluation of conventional non-CT-based internal mammary lymph node irradiation in a prospective DBCG study. Lise Bech Jellesmark Thorsen, Aarhus, Denmark
- 43. Dose calculation for linac bunkers. Thyge Holten Sørensen, Herlev, Denmark
- 44. IAEA-HypoX: a randomized multicenter study of accelerated radiotherapy (RT) with and without the hypoxic radiosensitizer nimorazole in head and neck squamous cell carcinoma (HNSCC). Mohamed Hassan, Aarhus, Denmark
- 45. Evaluation of MIP or midvent target and normal tissue delineations. Tine Bisballe Nyeng, Aarhus, Denmark
- 46. The possibility to reduce rectal dose by removing the ultrasound probe prior to delivery of High-Dose-Rate brachytherapy in prostate cancer patients. Susanne Rylander, Aarhus, Denmark
- 47. Retrospective analysis of 4 DCT images –Comparing image quality on clinical 4DCT images reconstructed using both phase and amplitude binned algorithms. Peter Pagh Schultz, Denmark
- 48. Assessment of kV cone-beam CT dose, for children undergoing image-guided radiotherapy. Jolanta Hansen, Aarhus, Denmark
- 49. Intensity modulated arc therapy using flattening filter free beam to multiple brain metastases compared to flattening filter beam treatments. Torbjørn Haskå, Denmark
- 50. Pretreatment verification of volumetric modulated arc therapy with flattening filter free beams for various treatment sites. Inge L Rasmussen, Copenhagen, Denmark
- 51. Quantitative image quality evaluation of pelvic CT-based imaging systems: a novel concept in radiotherapy. Claus F. Behrens, Herlev, Denmark
- 52. Locally advanced Head and Neck cancer treated with accelerated radiotherapy, nimorazol and weekly cisplatin. Results from the Dahanca 18 phase II study. Jens Bentzen, Denmark
- 53. Stereotactic Body Radiation Therapy vs. Conventional Radiation Therapy in patients with early stage NSCLC: An updated retrospective Study on Local Failure and Survival Rates. Stefan Jeppesen, Odense, Denmark
- 54. Dose escalation to high-risk sub-volumes based on non-invasive imaging of hypoxia and glycolytic activity in canine solid tumors. Malene Martini Clausen, Copenhagen, Denmark
- 55. Age dependent prognosis in concurrent chemo-radiotherapy of locally advanced NSCLC. Olfred Hansen, Odense, Denmark
- 56. False warning filter: a method to substantiate potential treatment errors detected with real-time in-vivo point dosimetry during adaptive image guided brachytherapy. Gustavo Kertzscher, Roskilde, Denmark
- 57. Immobilisation systems for radiation therapy in Head and Neck Cancer. Christian Rønn Hansen, Odense, Denmark

- 58. FDG-PET can Predict Overall Recurrence after Definitive Irradiation and MRI-Guided Adaptive Brachytherapy in Uterine Cervix Cancer. Francesco Cellini, Rome, Italy
- 59. Acute Esophagitis and concomittant Chemoradiotherapy with Navelbine. Results from NARLAL, a Phase II randomized Trial. Tine Schytte, Odense, Denmark
- 60. Prognostic value of metabolic metrics extracted from baseline PET images in NSCLC. Sara Carvalho, Maastricht, The Netherlands

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