

# Towards diagnostic and therapeutic integration of advanced MR imaging in thoracic and neuro-oncology

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## **Towards diagnostic and therapeutic integration of advanced MR imaging in thoracic and neuro-oncology**

Jurgen Peerlings

1. Thoracic MR imaging has additional value over PET-CT imaging for the clinical diagnosis and selective radiation treatment of regional lymph node metastasis in patients with non-small cell lung cancer  
– This thesis
2. The spatial integrity of clinically optimized high-resolution 7 Tesla MR imaging is adequate to be used for radiation treatment planning of central brain regions  
– This thesis
3. Multiparametric <sup>18</sup>F-HX4-PET/MR imaging can visualize oesophageal cancer with high soft-tissue contrast, quantify intra-tumoral hypoxia, and detect early radiation treatment response prior to the occurrence of anatomical changes  
– This thesis
4. Stable radiomics features can be extracted from ADC maps within a multicentre, multi-vendor clinical trial and used to complement assessment of treatment-related changes in absolute ADC metrics  
– This thesis
5. Beyond stand-alone MR imaging, the future of cancer imaging lies in smartly combining multimodality parametric imaging techniques to gain comprehensive insights in tumour biology  
– Valorisation addendum
6. Hypoxia PET imaging can be used in window-of-opportunity trials to assess the efficacy of new hypoxia targeting drugs, speeding-up future drug development
7. Although hybrid MR-Linac systems demonstrate an outstanding level of dosimetric and geometric accuracy of the radiation beam, their value in terms of improved treatment outcome needs to be established by clinical trials
8. Body diffusion-weighted imaging should not be a *copy-paste* of methods used in brain imaging but need to be adapted for specific imaging of extracranial anatomies and pathologies
9. Life is not measured by the number of breaths we take, but by the moments that take our breath away  
– George Carlin, Comedian
10. It is not the mountain we conquer but ourselves  
– Sir Edmund Hillary, Explorer