Using radiomics and deep learning-based imaging biomarkers to predict radiotherapy outcomes and toxicity

Propositions accompanying the thesis

Using radiomics and deep learning-based imaging biomarkers to predict radiotherapy outcomes and toxicity

by

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1. The high quality of radiomics studies should be ensured and good guidelines are important to design and conduct radiomics studies and should be followed. (*this thesis*)

2. Metabolic and anatomical images are both valuable for building radiomics models, and multi-modality models have the potential to deliver a good performance. (*this thesis*)

3. In addition to the tumor itself, the characterization of the tissue surrounding the tumor should not be neglected, and the environment in which the tumor grows deserves to be studied. (*this thesis*)

4. For radiation therapy-related toxicity, dosiomics is a good source of information to mine and can be paired with image-based information. (*this thesis*)

5. Deep learning methods have higher predictive power than traditional methods in predicting radiation pneumonitis. (*this thesis*)

6. Biological interpretation of radiomics features can be accomplished by laboratory experiments.

7. Radiomics models or deep learning models can be integrated into radiotherapy treatment systems to assist in daily clinical work.

8. Federated learning is a good avenue for conducting collaborative cross-national research, overcoming administrative barriers and effectively increasing the size of the research sample.

9. Research on artificial intelligence in medicine should be conducted through interdisciplinary collaboration, where close collaboration of researchers from different disciplines can increase the efficiency of research and focus on pressing clinical issues.