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MRI radiogenomics for intelligent diagnosis of breast tumors and accurate prediction of neoadjuvant chemotherapy responses

Xiaoxia Yin

Guangzhou University, China

Neoadjuvant Chemotherapy (NAC) in breast cancer patients has considerable prognostic and treatment potential and can be tailored to individual patients as part of precision medicine protocols. This work reviews recent advances in artificial intelligence so as to enable the use of radiogenomics for the accurate NAC analysis and prediction. The work addresses a new problem in radiogenomics mining: How to combine structural radiomics information and non-structural genomics information for accurate NAC prediction. This requires the automated extraction of parameters from structural breast radiomics data and finding non-structural feature vectors with diagnostic value, which then are combined with genomics data acquired from exocrine bodies in blood samples from a cohort of cancer patients to enable accurate NAC prediction. A self-attention-based deep learning approach along with an effective multi-channel tumour image reconstruction algorithm of high dimensionality is proposed. The aim is to generate non-structural feature vectors for accurate prediction of the NAC responses by combining imaging datasets with exocrine body related genomics analysis.

Biography

Xiaoxia Yin is doing PhD in Guangzhou University, China. He published more than 5 articles in international journals.

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