

CancerGPT: Few-shot Drug Pair Synergy Prediction using Large Pre-trained Language Models

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Abstract: Large pre-trained language models (LLMs) have been shown to have significant potential in few-shot learning across various fields, even with minimal training data. However, their ability to generalize to unseen tasks in more complex fields, such as biology, has yet to be fully evaluated. LLMs can offer a promising alternative approach for biological inference, particularly in cases where structured data and sample size are limited, by extracting prior knowledge from text corpora. Our proposed few-shot learning approach uses LLMs to predict the synergy of drug pairs in rare tissues that lack structured data and features. Our experiments, which involved seven rare tissues from different cancer types, demonstrated that the LLM-based prediction model achieved significant accuracy with very few or zero samples. This talk highlights several research efforts to tackle drug pair synergy prediction in rare tissues with limited data.

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