

SigN SEMINAR

Hosted by Dr. Bernett Lee



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AI-enabled spatial immunology and multi-omics integrated studies

Increasing evidence indicates the important role of immune contexture, i.e., spatial organization of immune cells within the tumor microenvironment, in cancer development, therapeutic resistance, cancer metastasis, and survivals. A representative study is the international immunoscore project which put forward a spatially-aware CD3+/CD8+ lymphocyte-scoring system that surpassed the classical TNM system for colorectal cancer in predicting survivals. Recent advancement in digital imaging and spatial omics technologies opens new opportunities for intricate investigation of the complex tumor microenvironment through deep phenotyping and/or unbiased profiling of whole-transcriptomics of cells, along with providing spatial information. However, due to the high dimensionality of these data which often consists of tens of thousands of cells, effective data analytics becomes one of the key challenges facing the spatial immunology field. In this presentation, I will first discuss the application of AI-enabled bioinformatics in discovering novel spatial immune patterns with clinical significance. I will then describe a multi-omics integrated study on a phase II clinical trial hepatocellular carcinoma cohort, demonstrating the use of different data modalities to interrogate the immunomodulation effect induced by the Y90-radioembolization treatment. Despite the advantages of the advanced spatial technologies, there is limited clinical feasibility because of cost and accessibility. To address this issue, we have been actively developing AI prediction models that uses spatial omics data as the ground truth, as I will discuss. These AI models, once trained, can predict spatial proteomics/ transcriptomics signals from H&E-stained images which are marker-free, low-cost, well established, and widely accessible.



9 September 2022 (Friday)

3 PM – 4 PM (Singapore Time)

SigN Seminar Room, Immunos, Level 4



8A Biomedical Grove, Immunos, #04-06, Singapore 138648

Seminar is open for all to attend.

Registration is not required.

