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Phenocycler Imaging of the Murine Tumour Microenvironment

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Phenocycler-Fusion is an ultrahigh-plex imaging platform that is used for immunofluorescence visualization of tissues stained with oligonucleotide-conjugated antibodies, enabling simultaneous detection of up to 103 proteins in a single tissue. This new technology is more flexible and accessible than other high-plex imaging platforms and thus, has been used to generate exciting data profiling tissue architecture in normal and disease states. In particular, Phenocycler-Fusion can be used to characterize the tumour microenvironment (TME), which consists of the normal non-transformed cells that surround and support malignant tumour cells. The TME varies between tumour type and between patient sample, and its composition can be prognostic to disease outcome and clinical response to various therapeutic agents. To this end, it is of critical importance to understand how the TME evolves around the tumour and how it mediates therapeutic responses. Towards this goal, our lab has developed Phenocycler antibody panels that are capable of imaging tissue from human and murine cancers in order to spatially immunophenotype the TME. We show that Phenocycler-Fusion can be used to characterize the tumour cells, immune cells, endothelial cells, and fibroblasts in lymphoma, breast cancer, and melanoma murine cancer models. Our results allow us to answer complex questions in the fields of oncology and immunology and allow us to better understand how pre-clinical mouse models recapitulate human disease.