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Quantitative approaches for decoding molecular and microenvironmental factors underlying tissue architecture

Multicellular organisation requires the coordination of multiple signalling pathways that regulate cell shape as well as cell-cell and cell-microenvironment interactions. Such coordination is often lost in cancer resulting in changes in tissue architecture, uncontrolled growth, and metastasis. Imaging technologies provide a powerful approach to simultaneously study the signalling and organisational state of cells. I will discuss the development of machine learning and computer vision methodologies for automated identification of genetic programmes underlying tissue organisation and how these approaches can be applied in computational pathology.