Heterogeneity in tumors: a real-time and single-cell perspective

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Cells within a cancer are highly heterogeneous with respect to their phenotype and can manifest distinct morphological, molecular and functional features. As a consequence, it is challenging to design treatment therapies that target all cancer cells as effectively.

Using human samples of colorectal cancers, the Snippert lab studies the causes and consequences of heterogeneity in cellular behavior during tumor growth, tumor evolution and the emergence of therapy resistance.

Primarily, we study tumor cells using cancer organoids and live-cell imaging experiments to assess changing cell states, real-time signaling dynamics and evolving genomes, all with single-cell resolution. From a cancer cell signaling point of view, I will discuss our work on drug response measurements in patient-derived organoids where real-time and single-cell resolution helps us to understand their mode of response and our drug screen efforts to improve therapies.