

Prof. Giovanni Ciriello

Genetic and non-genetic mechanisms of cancer evolution

Tumor growth requires cancer cells to continuously change in order to avoid immune recognition, invade adjacent tissue, cope with nutrient scarcity and, ultimately, overcome treatment administration. This dynamic adaptation is what defines cancer evolution. Currently, our group is collaborating with oncologists and pathologists to collect human tumor samples at different stages of the disease and before and after treatment. We use cutting-edge single-cell and spatial -omics technologies to discover alterations occurring within single tumor cells and determine whether specific alterations occur through interactions with the local microenvironment. Projects in this area will include both the design and development of novel computational approaches to infer tumor evolution and cell plasticity from large datasets, as well as application of novel and existing tools to human tumor cohorts with a focus on lung, bladder, and prostate cancer.