

SYLVESTER SHARED RESOURCES INTEGRATED SUPPORT FOR SPATIAL MULTI-OMICS RESEARCH

Other

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Spatial multi-omics correlates gene and/or protein expression with morphological position in a tissue. The Sylvester Comprehensive Cancer Center Shared Resources provide coordinated multidisciplinary support for spatial multi-omics research. Services that span multiple Shared Resources include (1) sample preparation, including tissue acquisition, processing, and embedding; (2) microarray generation, including tissue sectioning, automated immunostaining, and antibody panel validation; (3) data generation using one or more platforms; and (4) data integration, analysis and visualization. Complementary tissue sample preparation services, microarrays generation, and immunostaining services are offered by the Biospecimen Shared Resource (BSSR) and Cancer Modeling Shared Resource (CMSR). The Onco-Genomics Shared Resource (OGSR) offers spatial genomics services with the NanoString GeoMX DSP for formalin-fixed paraffin-embedded (FFPE) tissue, and the 10X Genomics Visium combined with Illumina next generation sequencing for fresh-frozen tissue. For projects where fresh tissue can be collected for companion studies, dissociated samples can be used for single cell genomics studies on the 10X Chromium platform to inform GeoMX panel design and Visium data analysis. The Flow Cytometry Shared Resource (FCSR) offers spatial multi-omics services using a CyTOF mass imaging cytometry system that can generate highly multiplexed (30+ parameters) images of tissue microarrays at single cell resolution. The FCSR also offers a repository of validated antibodies to human markers and a heavy metal-antibody custom conjugation service. The affiliated DRI Analytical Imaging Shared Resource (AISR) offers a Leica laser microdissection instrument that can isolate regions of interest from tissues at single cell or subcellular resolution. The Biostatistics and Bioinformatics Shared Resource (BBSR), in close collaboration with the BSSR, CMSR, OGSR, FCSR, and/or AISR, can offer spatial multi-omics project design and can build analysis pipelines to integrate data from different platforms. We provide examples of how this team science approach can be used to compare spatial multi-omics platforms and to significantly advance oncology research.