Extrachromosomal DNA (ecDNA) in glioblastoma (GBM)

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Extrachromosomal DNAs (ecDNAs) play an important role in tumor progression and drug resistance. Comprehensive genomic and transcriptomic analyses using glioblastoma (GBM) patient samples, in which short-survival and long-survival GBM patient groups were observed, have been performed. Advanced genome sequencing technology (Oxford Nanopore Longread technology, single cell multiome technology) and a newly developed algorithm, ecLego3, have been performed to compare the structural variants (SVs) of ecDNAs in longitudinal glioblastoma samples. Different SVs will be presented to reveal the biogenesis and evolution of ecDNAs in glioblastoma. In addition, myeloid heterogeneity that crosstalks with specific tumor subclusters through ligand-driven transcriptional regulation has been observed to promote GBM tumor progression and confer patients' poor prognosis. The above results will present a novel paradigm for studying cancer genome structural variation, ecDNA evolution, and tumor microenvironment-mediated tumor progression in GBM.