Characterization of Patient-Derived Glioblastoma Cell Lines

Bharati, Ritika

Characterization of patient-derived glioblastoma-multiforme (GBM) cell lines uncover information on the disease's physiology and pathology. This, in extension, helps identify new therapeutic targets and perhaps lead to the development of more efficient therapies selectively targeting GBM through more specific experimentation. In this experiment, we phenotypically and molecularly characterized eleven patient-derived GBM cell lines (GB7, GB16, GB42, GB71, GB80, GB82, GB84, GB86, GB94, GB96, GB98). Western blotting, RNA sequencing, and temozolomide (TMZ) and radiation treatment (RT) combinations uncovered the variation of different markers and mutations seen throughout all patient-derived GBM cell lines as well as the response of GBM cell lines to the current standard of care treatment. Western blotting and RNA-sequencing revealed notable irregularities in expression of CD44, EGFR, Olig2, SOX2, and PDGFRA throughout the cell lines. These genes are commonly associated with the formation and progression of cancer. GB7 displayed notably high EGFR FPKM values, indicating that the gene is highly mutated in that cell line. Western blot results display the discontinuity between GBM markers expression, and the mutations seen within those markers (found from RNA sequencing). TMZ and RT treatment displayed heightened radioresistivity in GB94, suggesting that GB94 is an optimal candidate for glioblastoma radioresistance experiments. While these observations may seem topically insignificant, our results help us understand GBM physiology and can aid in creating experiments for varied GBM cell types.