

Glioblastoma stem-like cells

Patient-derived [cancer cell lines](#) can be very useful to investigate genetic as well as [epigenetic](#) mechanisms of [transformation](#) and to test new [drugs](#). In a multi-centric study, Lazzarini et al. performed [genomic](#) and [transcriptomics](#) of a large set of patient-derived [glioblastoma](#) (GBM) [stem-like cells](#) (GSCs).

94 (80 I surgery/14 II surgery) and 53 (42 I surgery/11 II surgery) GSCs lines underwent [whole exome](#) and transcriptome analysis, respectively.

[Exome sequencing](#) revealed [TP53](#) as the main mutated gene (41/94 samples, 44%), followed by [PTEN](#) (33/94, 35%), [RB1](#) (16/94, 17%) and [NF1](#) (15/94, 16%), among other genes associated to brain tumors. One GSC sample bearing a [BRAF](#) p.V600E mutation showed sensitivity in vitro to a [BRAF inhibitor](#). [Gene Ontology](#) and [Reactome](#) analysis uncovered several biological processes mostly associated with [gliogenesis](#) and [glial cell](#) differentiation, S - adenosylmethionine metabolic process, mismatch repair, and [methylation](#). Comparison of I and II surgery samples disclosed a similar distribution of mutated genes, with an overrepresentation of mutations in [mismatch repair](#), [cell cycle](#), [p53](#), and methylation pathways in I surgery samples, and of mutations in receptor [tyrosine kinase](#) and [MAPK](#) signaling pathways in II surgery samples. Unsupervised hierarchical clustering of RNA-seq data produced 3 [clusters](#) characterized by distinctive sets of up-regulated genes and signaling pathways.

The availability of a large set of fully molecularly characterized [Glioblastoma stem-like cells](#) represents a valuable public [resource](#) to support the advancement of [precision oncology](#) for the [glioblastoma treatment](#) ¹⁾

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Lazzarini E, Silvestris DA, Benvenuto G, Osti D, Fattore L, Pattera R, Finocchiaro G, Malatesta P, Daga A, Gallotti AL, Galli R, Pelicci G, Tesei A, Bedeschi M, Pallini R, Pasqualini L, Romualdi C, Gallo A, Ricci-Vitiani L, Indraccolo S. Genome-wide profiling of patient-derived glioblastoma stem-like cells reveals recurrent genetic and transcriptomic signatures associated with brain tumors. J Neurooncol. 2023 May 4. doi: 10.1007/s11060-023-04287-6. Epub ahead of print. PMID: 37140883.

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