U87

In cell biology, U87 is a human primary glioblastoma cell line formally known as U-87 MG. It has epithelial morphology, and was obtained from a stage four 44 year-old cancer patient.

U-87 MG can be obtained from the American Type Culture Collection (ATCC) where it is known by the accession number HTB-14.

The entire sequence of the genome of U-87 MG has been published in PLoS Genetics, 2010 January; 6(1): e1000832.

Growth conditions U87 growth media is generally made with Eagle's minimum essential medium + 10% FBS + 100 U/ml penicillin + 100 ug/ml streptomycin.

It is propagated at 37 degrees Celsius in a 5% carbon dioxide atmosphere.

DNA profile of the widely used glioma cell line U87MG is different from that of the original cells and that it is likely to be a bona fide human glioblastoma cell line of unknown origin [1)].

Human Glioblastoma cell line, U87 MG, was cultured on a series of HMC-agarose based culture system. Cell aggregation and spheroids formation were investigated after 4 days of culture, and 2.5% HMC-agarose based culture system demonstrated the largest spheroids number and size. Moreover, CD133 marker expression of Glioblastoma cells after 6 days of culture in 2.5% HMC-agarose based culture system was 60%, relatively higher than the control group at only 15%. Additionally, cells on 2.5% HMC-agarose based culture system show the highest chemoresistance, even at the high dose of 500 μM temozolomide for 72 h, the live cell ratio was still > 80%. Furthermore, the results also indicate that the expression of ABCG2 gene was up-regulated after culture in 2.5% HMC-agarose based culture system. Therefore, our results demonstrated that biomimetic brain tumor microenvironment may regulate Glioblastoma cells towards the CSC phenotype and expression of CSC characteristics. The microenvironment selection and spheroids formation in HMC-agarose based culture system may provide a label-free CSC selection strategy and drug testing model for future biomedical applications [2)].

The malignant glioma cell line U-87MG was used for 1,3-bis(2-chloroethyl)-1-nitrosourea (BCNU), aziridinylbenzoquinone (AZQ), cis-diaminodichloroplatinum (II) (cis-DDP), and spirohydantoin mustard (SHM) treatments at 37 degrees and 42 degrees C. With the exception of SHM, all drugs killed a greater proportion of cells at the higher temperature, as assessed by the colony-formation assay. Drug-dose enhancement ratios were 1.6, 2.8, 2, and 1:1 for BCNU, AZQ, cis-DDP, and SHM, respectively. Because methods to heat discrete volumes of brain are now available, we conclude that hyperthermic increase of BCNU, AZQ, and cis-DDP cytotoxicity might have therapeutic application for malignant gliomas [3)].

1)
Allen M, Bjerke M, Edlund H, Nelander S, Westermark B. Origin of the U87MG glioma cell line: Good news and bad news. Sci Transl Med. 2016 Aug 31;8(354):354re3. doi: 10.1126/scitranslmed.aaf6853. PubMed PMID: 27582061.
2)

Liu YC, Lee IC, Chen PY. Biomimetic brain tumor niche regulates glioblastoma cells towards a cancer stem cell phenotype. J Neurooncol. 2018 Jan 22. doi: 10.1007/s11060-018-2763-2. [Epub ahead of print] PubMed PMID: 29357090.

3)

Da Silva VF, Raaphorst GP, Goyal R, Feeley M. Drug cytotoxicity at elevated temperature. In vitro study on the U-87MG glioma cell line. J Neurosurg. 1987 Dec;67(6):885-8. PubMed PMID: 3681426.