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Cancer stem cell resistance against temozolomide in glioblastoma multiforma treatment

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Glioblastoma multiforme (GBM) is the most common and aggressive form of malignant brain tumour. GBM patient lifespan is extend upto 24 months. Treatment of this disease become the greatest challenge due to complexity of tumour and numerous mechanisms involving drug resistance. Magnetic resonance imaging (MRI) demonstrates that remaining few cancer cells were not affected by the aggressive treatment which implicates heterogenousity of cancer cell population in GBM. During routine patient follow-up, MRI showed survival of cancer cells after treatments. TMZ- resistant cells have different characteristics from cancer cells in the heterogeneous cell population. Further analysis indicates some physiological and biological proporties of stem cells such as markers and symmetrical/asymmetrical proliferative capacity. Temozolomide (TMZ) in Glioblastoma chemotherapy cause DNA damage by adding the methyl group to DNA bases which stall damaged cells at G2 / M cell cycle and consequently result in apoptosis. Damage is repaired by O6-methylguanine methyltransferase (MGMT) enzyme. In GBM patients, high expression of enzyme is associated with resistance. Other mechanism causing TMZ cytotoxicity could be due to cancer stem cells (CSC). In this study, our aim is to make GBM therapy more effective by investigating the role of GBM stem cells in drug resistance. Firstly,characterization of CSC are determined with CD133 and Sox1 protein expressions. Additionally, cytotoxicity of TMZ is compared between CSC and differentiated cancer cells. The results showed higher resistance of CSC to temozolomide. The results of this study suggest that to improve parient's outcome, CSC resistance needs to be targeted for more effective treatment.

Speaker Biography

Meryem Alagoz completed her BSc studies in Medical Biology at Cerrahpasa Medical School, and pursued her MSc studies in Molecular Biology and Genetic Engineering at University of Sussex. She attained her PhD from University of Sussex. Her PhD project work involved the investigation of genetic alterations in human breast and ovarian cancer. She had worked as a Post-doctoral research fellow at Kings College and Imperial College. She worked at Sussex University for 7 years as a research fellow and still collaborating with them for my research. She have been investigating the molecular mechanisms involved in the development of human diseases such as cancer and brain. She has been working as an assistant professor at Molecular Biology and Genetics department of Biruni University since February 2017. She have been setting up the research and diagnostic laboratories at the Genome centre..In near future, she would like to focus on DNA damage and repair field where I gained extensive experience during my studies and research. She will employ these experiences to research into broader area of genetic disorders.

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