Higher Oxygen Levels Could Increase Effectiveness of New Line of Brain Cancer-Killing Drugs

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DURHAM, N.C. (PRWEB) April 11, 2019 -- A study released today in STEM CELLS shows how a new class of cancer drugs, called Smac mimetics, is effective in killing off the stem cells that lead to glioblastoma (GBM) depending on oxygen level. This might help pave the way to a new, more efficient method for treating the most common and aggressive form of brain cancer in adults.

Researchers have long known that GBMs are derived from cancer stem cells and for a treatment to be successful it is essential to get rid of them. However, they faced a major challenge: The GBM stem cells are often located near or in low oxygen (hypoxic) areas. This environment maintains the cells’ self-renewal properties and heightens their resistance to treatment, too.

A previous study by the research team, led by Aurélie Tchoghandjian, Ph.D., and Aurélie Soubéran, Ph.D., of Aix-Marseille University, revealed that the Smac mimetics compound GDC-0152 increased the survival of mice with GBM.

“It does this by triggering the programmed death of the cancer cells — a process known as apoptosis,” Dr. Tchoghandjian explained. “GDC-0152 binds to a group of proteins often expressed in cancer cells called ‘inhibitor of apoptosis proteins’ (IAPs), blocking the signaling that helps tumor cells survive and sensitizing them to various therapies such as chemotherapy and radiation.”

The present study was designed to learn how altering the oxygen level might affect GDC-0152’s efficiency. The team ran their test using a 3D glioblastoma spherical model and several glioblastoma cell lines collected from donated human tissue. The results showed that high oxygen levels caused the GBM stem-like cells to lose their stem cell properties.

“We also found that the pharmacological inhibition of IAPs by GDC-0152 was able to decrease glioblastoma stem-like cells viability in hypoxia by decreasing cell proliferation and increasing apoptosis,” Dr. Soubéran said. “As such, we believe this study provides some new insights into a problem of profound clinical significance.”

Dr. Jan Nolta, Editor-in-Chief of STEM CELLS, noted, “We are excited to publish this study that provides a new mechanism for attacking and killing glioblastoma stem cells. GBM is a difficult disease to treat and new approaches are truly important.”

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About the Journal: STEM CELLS, a peer reviewed journal published monthly, provides a forum for prompt publication of original investigative papers and concise reviews. The journal covers all aspects of stem cells: embryonic stem cells/induced pluripotent stem cells; tissue-specific stem cells; cancer stem cells; the stem cell niche; stem cell epigenetics, genomics and proteomics; and translational and clinical research. STEM CELLS is co-published by AlphaMed Press and Wiley.

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