Therapeutic effects of thiadiazole derivatives on glioblastoma cell lines.

Monika Szeliga (Polish Cancer Consortium, Mossakowski Medical Research Centre PAS, Poland), Małgorzata Bogacińska-Karaś (Polish Cancer Consortium, Mossakowski Medical Research Centre PAS, Poland), Monika Karpińska (Institute of Industrial Organic Chemistry, Poland), Andrzej Niewiadomy (Institute of Industrial Organic Chemistry, Poland; University of Life Sciences in Lublin, Poland), Jan Albrecht (Polish Cancer Consortium, Mossakowski Medical Research Centre PAS, Poland)

BACKGROUND: In spite of progress in understanding the biology of malignant gliomas, they are still among the deadliest human tumors. Side effects of the current treatment options cause significant decrease in quality of life. Therefore, continuous efforts should be made to find new molecular targets and effective therapies of glioblastoma. Thiadiazole derivatives present anticancer activity in a wide range of tumor cell lines and *in vivo.* The molecular mechanism underlying this activity most likely depends on the type of modification of the thiadiazole ring.
HYPOTHESIS: In this study, we tested the hypothesis that thiadiazole derivatives could exert inhibitory effects on glioblastoma cell growth.
METHODS: Three human glioblastoma cell lines, T98G, U251 and U87-MG were treated with six thiadiazole derivatives. The antitumor efficacy was evaluated with MTT, BrdU and colony forming assays. The influence of tested compounds on cultured rat astrocytes and neurons was assessed by MTT assay.
RESULTS: Treatment with thiadiazole derivatives containing different substitutes in the ring, inhibited viability, proliferation and ability to form colonies of all glioblastoma cell lines in a dose-dependent manner. Each of the tested compounds applied at its highest concentration of 25 uM, reduced the cell viability by approx. 70%, and caused a 60% decrease of cell proliferation and 80% decrease in the ability of the cells to form colonies. By contrast, only slight - if any - decrease of viability of non-transformed cells to either of the compounds was observed. These results may constitute a robust basis for the design of the new anti-glioma compounds with improved therapeutic potential.