IRE1 KNOCKDOWN MODIFIES GLUCOSE AND GLUTAMINE DEPRIVATION EFFECTS ON THE EXPRESSION OF PROLIFERATION RELATED GENES IN U87 GLIOMA CELLS


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We have studied the expression of genes encoding proliferation related factors and enzymes such as IL13RA2, KRT18, CD24, ING1, ING2, MYL9, BET1, TRAPPC3, ENDOG, POLG, TSFM
in U87 glioma cells upon glucose and glutamine deprivation in relation to inhibition of inositol requiring enzyme 1, a central mediator of endoplasmic reticulum stress. It was shown that glutamine deprivation leads to up-regulation of the expression of 
BET1, MYL9, and MTIF2
genes and down-regulation of 
CD24, ING2, ENDOG, POLG, and TSFM
genes in control (with native IRE1) glioma cells. At the same time, glucose deprivation enhances the expression of 
MYL9
gene only and decreases –
ING1, ING2, and MTIF2
genes in control glioma cells. Thus, effect of glucose and glutamine deprivation on gene expressions in glioma cells is gene-specific. Inhibition of inositol requiring enzyme 1 by 
\textit{dnIRE1}
significantly modifies the effect of both glutamine and glucose deprivation on the expression of most studied genes with different direction and magnitude, especially for 
ING2, CD2, 4, and MTIF2
genes. Present study demonstrates that IRE1 knockdown modifies glucose and glutamine deprivation effects on the expression of proliferation related genes and possibly contributes to slower tumor growth of these glioma cells after inhibition of IRE1 signaling enzyme.

\textbf{Key words}: proliferation related genes expression, IRE1 inhibition, glucose and glutamine deprivation, glioma cells

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Inositol-requiring enzyme 1alpha is a key regulator of angiogenesis and invasion in malignant glioma. 


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