

CD38 Plays critical and differential roles in mediating the intracellular ATP levels of C6 glioma cells and BV2 microglial cells

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CD38 is a multifunctional enzyme that can act as a NADase, generate cyclic adenosine diphosphate-ribose (cADPR) - a key Ca^{2+} mobilizing second messenger, and transport cADPR into cells. There have been only a small number of studies on the functions of CD38 in the CNS. In this study, we applied CD38 siRNA to determine the effects of decreased CD38 on the intracellular ATP levels of C6 glioma cells and BV2 microglial cells. Our study showed that CD38 reductions led to a significant increase in the intracellular ATP levels of C6 glioma cells. In contrast, CD38 reductions produced a significant decrease in the intracellular ATP levels of BV2 microglial cells. We further found that the siRNA-induced CD38 reductions did not affect the intracellular NAD^+ levels of C6 glioma cells, while the CD38 reductions significantly decreased the intracellular NAD^+ levels of BV2 microglial cells. In summary, our study has provided the first evidence suggesting that CD38 plays critical, but differential roles in mediating the intracellular ATP levels of C6 glioma cells and BV2 microglial cells. Due to the critical roles of intracellular ATP in numerous biological functions and cell survival, CD38 may modulate multiple biological functions and cell survival by its effects on intracellular ATP levels.

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