Extracellular DEK Treatment Increases Mitochondrial Dysfunction in the Mouse AML Cell line MLL-AF9

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Acute myeloid leukemia (AML) is the most common kind of acute leukemia and the second most common type of leukemia in adults. Poor outcomes resulting from AML are thought to occur due to the inability to target the small pool of cancer-initiating cells that develop from cells within hematopoietic stem (HSC) and progenitor (HPC) cell compartments in bone marrow. DEK, a nuclear protein that can be secreted under stress conditions, plays a role in regulating HSC and HPC function. Extracellular DEK has been found to improve functional HSC expansion in *in-vivo* and *ex-vivo* mouse studies. Moreover, RNAseq experiments suggest that recombinant human DEK treatment causes the upregulation of the antioxidant gene programs. Indeed, DEK treatment reduces total reactive oxygen species (ROS) in human umbilical cord blood HSCs and HPCs. Thus, extracellular DEK enhances normal HSC function through antioxidant programs, but the role of the extracellular DEK in AML is unclear. We hypothesized that recombinant mouse (rm)DEK treatment of the mouse-derived AML cell line MLL-AF9 would affect mitochondrial function since mitochondria are an important source of ROS production. Since ROS production can contribute to mitochondrial dysfunction by causing damage to the organelles, we investigated the effects of DEK signaling on mitochondrial metabolism in MLL-AF9 cells using the Seahorse XF instrument, which can measure changes in metabolic flux. Compared to vehicle-treated control, cells treated with DEK demonstrated a decrease in basal and maximal mitochondrial respiration, proton leak, and non-mitochondrial oxygen consumption. Experiments to explore the effects of DEK treatment on the glycolytic function of MLL-AF9 cells are ongoing. Our data shows DEK treatment of MLL-AF9 cells alters mitochondrial function. In the future, we wish to investigate DEK's effect on proliferation and colony formation.