Spring 2018

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Natural killer (NK) cells are cytotoxic lymphocytes in the innate immune system. NK cells play a key role in early response to virally infected cells and tumor cells. As such, NK cells serve as an important potential form of cellular immunotherapy for patients with acute myeloid leukemia (AML). During an immune response, the cells of the immune system undergo changes in their cellular metabolism. Immunometabolism studies have shown that many cell types alter their use of cellular metabolic pathways to initiate an immune response. Since metabolism is an important regulator of immune cell differentiation and effector functions, in this study, we sought to determine what metabolic pathways were important for NK cell activation and production of the immunostimulatory cytokine, interferon-gamma (IFN-γ). NK cells cultured for seven days in lipid-supplemented media, in the absence of any other stimulus, showed enhanced IFN-γ production following a six-hour cytokine activation. Additionally, treatment with metformin, an enhancer of fatty acid oxidation (FAO), further increased NK cell activation, especially when combined with lipid supplementation. These findings suggest the importance of lipid metabolism for NK cell activation. Further work is being done to investigate the mechanism by which lipids and metformin enhance NK cell activation, using techniques including cell culture with the FAO inhibitor etomoxir, extracellular flux assays, and gene expression analysis. These discoveries may aid the activation of NK cells for use in cellular immunotherapy in AML patients.