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Assessment of Mitochondrial Condition in CD4⁺ and CD8⁺ T Cells from Healthy Subjects

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Despite the active study of T lymphocyte mitochondria under pathology, data on the organelles' condition in healthy people are not presented in the available literature. The aim of the present work was to assess mitochondrial condition in CD4⁺ and CD8⁺ T cells of healthy subjects. In CD4⁺ and CD8⁺ T lymphocytes, the mitochondrial mass and mitochondrial membrane potential, as well as the content of mitochondrial activity regulator (PGC-1 α) were determined by flow cytometry. Naive and memory cells, as well as resting and cycling lymphocytes were compared. It has been shown for the first time that in healthy subjects, mitochondrial condition differs between CD4⁺ and CD8⁺ T lymphocytes. Despite the cell maturation stage or resting/cycling status, the mass and membrane potential of mitochondria in CD4⁺ T lymphocytes significantly exceed those in CD8⁺ T cells. Both CD4⁺ and CD8⁺ T lymphocytes had higher mitochondrial mass, mitochondrial membrane potential, and PGC-1 α content in memory cells and cycling elements. Furthermore, the relationship between the level of the mitochondrial activity regulator and indices of mitochondrial condition differ significantly between CD4⁺ and CD8⁺ T lymphocytes: the PGC-1 α content in CD4⁺ T cells was directly related to the mitochondrial mass, but in CD8⁺ T lymphocytes it was correlated with the organelles' membrane potential.

Keywords: CD4⁺ T lymphocytes, CD8⁺ T lymphocytes, mitochondria, memory cells, cycling cells, healthy subjects