CHARACTERIZATION OF 2-DEOXY-D-GLUCOSE UPTAKE IN FIBROBLAST CULTURES DERIVED FROM PATIENTS WITH A3243G MITOCHONDRIAL DNA MUTATION

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Abstract. We investigated cellular glucose uptake of fibroblast cultures derived from seven patients with mitochondrial DNA (mtDNA) A3243G mutation and from six healthy controls with no mtDNA mutations. Heteroplasmy of fibroblast cultures were shifted by culturing for 5 days in galactose-containing medium. The proportion of mutant mtDNA decreased by 7.7% to 10% in three patient fibroblast cultures, whereas 2-deoxy-D-glucose uptake increased 1.8-2.1-fold at basal state, 1.9-2.3-fold in the presence of 60 ng/ml of insulin, and 1.8-2.1-fold in 100 ng/ml of insulin. No significant changes in level of heteroplasmy or glucose uptake were observed in the other patients samples and control samples. This study showed that alteration in the proportion of fibroblast mtDNA A3243G mutation content directly affected basal and insulin-stimulated glucose uptake.

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