Altered Oxygen Metabolism Associated to Neurogenesis of Induced Pluripotent Stem Cells Derived from a Schizophrenic Patient

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Schizophrenia has been defined as a neurodevelopmental disease that causes changes in the process of thoughts, perceptions and emotions, usually leading to a mental deterioration and affective blunting. Studies have shown altered cell respiration and oxidative stress response in schizophrenia; however, most of the knowledge has been acquired from post-mortem brain analyses or from non-neural cells. Because of that, the establishment of complementary experimental models are crucial to the development of new treatments and studies. Hence, the objective of this work was to develop a new model using neural progenitors from induced pluripotent stem (iPS) cell derived from a schizophrenic patient. We describe that neural cells, derived from iPS cells generated from skin fibroblasts of a schizophrenic patient, presented a 2-fold increase in extra-mitochondrial oxygen consumption as well as elevated levels of reactive oxygen species (ROS), when compared to control. This difference in ROS levels was reverted by the mood stabilizer valproic acid. Our model shows evidence that metabolic changes occurring during neurogenesis are associated with schizophrenia, contributing to a better understanding of the development of the disease and highlighting potential targets for treatment and drug screening.

Word Keys: Schizophrenia; Induced Pluripotent Stem Cells; ROS production

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