



EFFECTS MEDIATED BY ALPHA-7 NICOTINIC RECEPTOR IN RAT ADIPOSE MESENCHYMAL STEM CELLS

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Mesenchymal stem cells (MSCs) are multipotent cells present in several tissues and organs as bone marrow and adipose tissue. MSCs derived from Adipose tissue (ASCs) are an attractive source for regenerative medicine because they can be easily isolated, rapidly expandable in culture and show excellent differentiation potential.

Acetylcholine (ACh), the most important neurotransmitter in central (CNS) and peripheral nervous system (PNS), plays a key role in the control of physiological processes also in non-neural tissues. Previously we showed that M2 muscarinic receptors negatively modulate ASCs proliferation and migration. In the present work we demonstrate that rat ASCs also express $\alpha 7$ nAChR receptors.

By using the selective $\alpha 7$ nicotinic receptor agonist ICH-3, we demonstrated that $\alpha 7$ receptor activation causes a reduction of cell proliferation without affecting cell survival and morphology.

Moreover, by wound healing assay, we have also shown that $\alpha 7$ promotes cell migration with a significant upregulation of CXCR4 receptor. Interestingly the activation of $\alpha 7$ nAChR appears also up-regulate the expression of M2 acetylcholine receptor, suggesting a feedback positive loop between muscarinic and nicotinic receptors.

Our data suggest that ACh, via cholinergic receptors might contribute to modulate ASCs physiology and, in particular via nicotinic receptors, ACh might control ASCs migration.