



Title: OLFACTORY ENSHEATHING GLIA/CELLS AFTER 25 YEARS

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Abstract:

Olfactory ensheathing cells (OECs) are glial cells of the olfactory bulb and mucosa first identified by Golgi (1875) and Blanes (1898). However, their ability to repair injured neural structures in animal models was described a century later. Since the first studies in the nineties, these unique cells have been the aim of hundreds scientific and clinical studies. The primary objective was to use OEC transplants to promote axonal regeneration within the injured CNS. The second, to test whether these cells were capable of promoting improvement of sensory and motor functions. Spinal cord injury was the first model to benefit from OEC grafting with striking histological and functional positive results. Then, this repair ability was extended to other neural lesions: optic nerve, brain ischemia, peripheral nerve, demyelinating, among others. Concomitantly, OECs from different species were studied at the molecular level to better understand their biochemical, proteomic and genetic profile. Once pre-clinical studies corroborated the robustness of the findings and safety in different species, OECs commenced to be used in humans. Bulb OECs were first transplanted into humans in China (Huang, 2002); autologous cells were first used three years later in Australia (2005) by Mackay-Sim's group demonstrating the feasibility and safety of adult OECs. Since these pioneer trials thousands of patients mainly with spinal injury were grafted with OEC grafted with positive results. In a striking study in Poland, Tabakow and Raisman (2014) showed the effectiveness of autologous bulbar OEC transplantation after complete spinal injury. Therefore, scientific and clinical evidence of the past 25 years, robustly support the candidacy of olfactory ensheathing glia as a tool for neural repair.