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EB101 vaccine as a dual immunotherapy for preventing and treating Alzheimer's disease

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Amyloid-β immunization has become one of the most promising immunotherapeutic approaches in the prevention and treatment of Alzheimer's disease (AD) hallmarks, especially the use of active immunization strategies with specific conformations of these proteins has yielded promising results in animal models. However, these prototypes have been clinically unsuccessful when preventing neuroinflammation. Therefore, a new paradigm is needed by using new immune-agents against AD-like pathology, a notion supported by our recent successful active immunotherapy results with adjuvant that induce Th2-only while inhibiting without abrogating Th1 immunity. Here, we discuss the obstacles to Aβ 1-42 vaccine (EB101) development and the potential benefits of Aβ 1-42 delivered in a novel immunogen-adjuvant composed of niosomes-containing sphingosine-1-phosphate (S1P) that induces regardless of the antigen a safe and effective antibody response, while preventing damaging neuroinflammation and ameliorating pathological degeneration. Chronic administration of EB101 to AD transgenic mice led to a dual immunotherapeutical effect as preventive, before Aβ plaques development and treatment action by the significant reduction in amyloid-β accumulation in both cortical and hippocampal regions when measured by confocal imaging and immunohistochemistry. Therefore, immunization with EB101 has proven neuroprotective effect to prevent and reverse AD-like neuropathology in a significant manner by halting disease progression without developing behavioral deficits in transgenic mice.

Biography

Ivan Carrera has focused his scientific research on the development and degeneration of the central nervous systems of vertebrates. He has more than 30 papers published in peer-reviewed journals, apart from books edited and several invitations to neuroscience meetings.

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