Small Organic Molecules for use in the treatment neuroinflammatory disorders, in particular multiple sclerosis

Principal Investigator:
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Background:

Multiple sclerosis (MS) is a chronic disease of the central nervous system (CNS). It is the major disabling disease of young individuals. MS evolves with the appearance of inflammatory lesions in the CNS that include demyelination, axonal loss and eventually neuronal death. Neural stem cells (NSCs) were observed in MS lesions. However, their differentiation into remyelinating oligodendrocytes or neurons is generally blocked, concomitant with high extent of astrogliosis, suggests that mechanisms governing fate specification of neuronal precursor cells (NPCs) towards mature neurons and oligodendrocytes are defective in MS.

Current Treatment:

Today there is no known cure for multiple sclerosis. The existing therapies for MS, as well as those that will be introduced in the near future, all aim to target the postulated immune mechanism of the disease. However, since the recovery of CNS tissue is limited, the repair and recovery of the affected patients is also limited.

The Invention:

Blockage of BMP-2 Signaling as Therapeutic Strategy for Multiple Sclerosis

A combination of therapies targeting both the inflammatory mechanism and enhancing favorable repair (neurogenesis and oligodendrogenesis at the expense of astrogenesis) are required for optimized treatment of MS. Our therapy is based on bone morphogenetic protein 2 (BMP2) inhibition. The BMPs are multi-functional growth factors. BMPs signaling pathways are important in the peripheral and central nervous system (CNS). Blockage of BMP signaling is required for both neurogenesis and oligodendrogenesis processes. This combined therapy is enhancing a better repair of MS lesions and therefore better recovery, decreasing the disability resulting from the disease. This is a new approach for treating MS.

Status & Achievements:

Patent Status: Patents pending.
Development Stage: Proof of concept was established in several MS animal models.
Additional applications: Treatment of various neurodegenerative diseases**.**

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