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Pain and bladder dysfunction in an animal model of multiple sclerosis

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Aim: Here, we investigated if MS-induced pain and bladder dysfunction can be attenuated by TRPV1 desensitization with RTX.

Introduction: Multiple sclerosis (MS) is the most prevalent neurological disorder in young people, causing irreversible disability and producing substantial economic and social impact. Among the most incapacitating symptoms, neuropathic pain and bladder dysfunction are reported by the majority of patients. The transient receptor potential vanilloid 1 (TRPV1) is a receptor described to have an important role in neuropathic pain, bladder dysfunction and inflammation. TRPV1 desensitization with agonists, such as resiniferatoxin (RTX), has been shown to improve bladder function and reduce behavioural signs of pain in various animal models of disease. In the context of MS, a recent study showed that TRPV1 knockout mice were protected from disease progressions, presenting delayed disease onset, myelin preservation and reduced clinical scores.

Methods: Experimental Auto-immune Encephalitis (EAE) was induced by a single injection in the flank of a solution of myelin basic protein (MBP) in Complete Freund's adjuvant (CFA). Behavioural tests were performed to evaluate symptoms. One month after MS-induction, animals were anesthetized and cystometries performed. Two other groups of MS animals received intrathecal RTX or vehicle and also submitted to behavioural tests and cystometries. At end of experiments, tissue was collected and processed.

Results: EAE rats developed neuropathic pain, as shown by the presence of mechanical allodynia and hypersensitivity to thermal stimuli. Cystometries performed at this time point showed signs of neurogenic detrusor overactivity. These clinical signs were accompanied by decreased spinal expression of MBP and increased activity of astrocytes and microglia. Preliminary observations suggest that intrathecal RTX improved cutaneous hypersensitivity and bladder function. These results suggest that TRPV1 might be involved in pain bladder dysfunction accompanying MS and that its modulation could have therapeutic relevance.

Conclusion: These results suggest that TRPV1 might be involved in pain bladder dysfunction accompanying MS and that its modulation could have therapeutic relevance.

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PS227

Neurogenesis in a rat model of sporadic Alzheimer's disease

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Aim: Characterize adult hippocampal neurogenesis in a rat model of the initial stages of sporadic Alzheimer's disease (AD).

Introduction: Sporadic late-onset AD is the most common cause of dementia, that can be characterized by a progressive cognitive decline, with a noteworthy episodic long-term memory impairment at early stages, accompanied by an excess accumulation of amyloid beta (A β) peptide in the brain. Present treatment options are very limited, so understanding AD pathophysiology is essential for exploring efficient therapies. Adult hippocampal neurogenesis is thought to play a crucial role in hippocampus-dependent cognitive abilities, namely learning/memory, although how this process is modulated in AD remains unclear.

Methods: An A β 1–42 peptide solution was intracerebroventricularly injected into the rats' lateral ventricle (the same volume of vehicle was injected to controls). Moreover, rats were injected with 5-bromo-2'-deoxyuridine (BrdU) intraperitoneally to study cell proliferation and differentiation. Two weeks after A β 1–42 injection, the open field (OF) test and the novel object recognition (NOR) test were performed. Further behaviour tests are currently being performed, including the elevated plus maze (EPM), the Y-maze forced alternation test, and the Morris water maze (MWM) test. Focusing on the dentate gyrus, immunohistochemical analysis is presently being performed to investigate cell proliferation, neuronal differentiation and neuroblast/neuron morphology. Additionally, the presence of A β 1–42 monomers and oligomers will be assessed by western-blot and the eventual occurrence of A β 1–42 aggregates by histology.

Results: Our results show that the A β 1–42 injection did not affect locomotor activity, as assessed by the OF test. Furthermore, this injection did not affect exploratory drive or episodic long-term memory performance, as indicated by the NOR test.

Conclusion: Since the NOR test is dependent from several brain regions besides the hippocampus that might not be affected in our model, additional behaviour tests as well as cellular and molecular analysis are needed to further characterize this model.

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PS086

Hydroalcoholic extract of *Dorema aucheri* leaves prevents weakening of the brain antioxidant defense system and inhibits oxidative damage in rat model of ischemic stroke

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