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Estrogen based hormonal therapy to modulate the intestinal innate immune response in Parkinson's disease

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Parkinson's disease (PD) is a neurological disorder characterized by motor symptoms which are often preceded by non-motor symptoms, including gastrointestinal dysfunctions. Common treatments are only symptomatic; there is still no disease modifying drug available to cure patients. Since numerous pro-inflammatory markers have been measured in the central and peripheral nervous system, this deleterious immune response seems to be a potential target to develop new therapeutic strategies. Therefore, a better understanding of the role of the immune response in the etiology and progression of PD is essential. During my talk, I will present original data about the impact of the innate immune response on enteric neuronal damage in PD models. At first, we characterized the immune response induced by the neurotoxin MPTP in the enteric nervous system of partially immunodeficient mice. We demonstrated the timeline of inflammatory events occurring prior to the neuronal demise and the critical role of monocytes and macrophages in the gut. Thereafter, we tested various estrogenic compounds for their immunomodulatory and neuroprotective properties in PD models both *in vivo* and *in vitro*, delineating the major contribution of various estrogenic receptors, mainly the G Protein-coupled Estrogen Receptor 1 (GPER1). More recently, we successfully explored the therapeutic potential of a clinically approved selective estrogen receptor modulator, Raloxifene, for drug repurposing in PD. In conclusion, our data highlight the critical role of the immune response at early stages of PD and the immunomodulatory and neuroprotective potential of estrogen-based hormone therapy at the pre-clinical level.

Biography

Denis Soulet has completed his PhD in Neuroimmunology from Laval University, Canada and Postdoctoral studies from Ycee Claude Bernard, Sweden. He is an Associate Professor at the Medicine Faculty of Laval University, Canada. He has published more than 40 papers in reputed journals and has been serving as an Editorial Board Member of *SM Journal of Gastroenterology and Hepatology*. He is leading a research team dedicated to study the role of peripheral inflammation in the enteric nervous system and its contribution to Parkinson's disease. The ultimate goal of his research program is to design immunomodulatory based disease modifying drugs for PD.

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