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## Pro-inflammatory cytokine IL-1 in central nervous and reproductive systems in multiple sclerosis female patients: Communication between nervous, endocrine and immune systems

**Ana Frances**

Institut d'Investigació Sanitària Pere Virgili (IISPV), Spain

Multiple Sclerosis (MS) is a complex disorder of the central nervous system (CNS) characterized by inflammation, demyelination, and axonal degeneration. The concept that sex hormones may play a role in MS pathogenesis and disease activity is based on two well-established clinical observations: a higher prevalence of MS in females compared to males and a decrease in disease activity during pregnancy, in particular, in the third trimester. In the literature, studies demonstrate significant differences between female and male brain, at molecular and cellular levels as well as its structure. All these features have been called Dimorphism (two forms in the same specie). The *Sry* gene (sex determining region of the Y chromosome) is responsible of sexual differentiation of the brain and is originated from work on the hypothalamus once the fetal testes have been formed, releasing 17  $\beta$ -estradiol. IL-1 gene family has been implicated in the pathophysiology of multiple sclerosis (MS), where IL-1 $\alpha$  and IL-1 $\beta$  has been found in MS lesions, as well as increased serum interleukin-1 receptor antagonist (IL-1ra). Estrogens act as protective hormones in neurons, in several models of neurodegeneration, including disorders caused by excitotoxicity and oxidative stress. It is relevant to notice the communication between nervous, endocrine and immune systems. The principal link between the endocrine system and CNS is the hypothalamic-pituitary-adrenal gland (HPA) axis.

### Biography

Ana Frances is an Associated Editor of *International Journal of Psychology and Neuroscience*. She is an Assistant Professor at Valencia University. She is a Cytokines specialist and studied about IL-1 in the reproductive system in implantation and female patients with multiple sclerosis. She did her Master's in Preimplantatory Diagnosis (PDG) from Barcelona University. She has several publications in journals such as *JCEM*, *Fertility and Sterility*, *Journal of Reproductive Immunology*, *Human Reproduction*, and *Endocrinology*. She has got three academic awards from Society for Gynecological Investigation and American Society for Reproductive Immunology. She has several chapter books in Oxford University Press and Editorial Médica Panamericana. She is the Laboratory Director of Hospital Joan XXIII - Ob/Gyn Dept.

anaf09064@gmail.com

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