

An issue whose time has come: Sex/gender influences on nervous system function

7 November 2016

Following decades of clinical research largely excluding females, scientists are finding that there are large differences in men and women that go well beyond their reproductive systems. Now, the *Journal of Neuroscience Research* is dedicating an issue entirely to sex differences at all levels of the brain, from the genetic and epigenetic level, to the synaptic, cellular, and systems levels.

In one study in the issue, researchers examined how variants in the gene that codes for a protein called galanin might influence susceptibility to [multiple sclerosis](#) (MS) in males compared with females. Recent studies have found elevated levels of this protein in post-mortem brain samples of patients with MS. In this latest work, investigators compared the frequencies of "more active" and "less active" variants of the DNA sequences that control expression of the galanin gene between healthy controls and MS patients. Initially they found no difference between the two groups; however, when considering gender, there was a more than twofold decrease in a "less active" genetic variant in healthy men compared with healthy women. Moreover, the presence of this variant increased susceptibility to MS in men but not in women. The presence of this variant in men was also associated with delayed onset of MS. Interestingly, the progression rate of MS was significantly accelerated in women if they carried the variant.

"We hope that our findings will foster development of a personalized strategy for the prevention and treatment of multiple sclerosis, one that takes into account the gender-specific contribution of galanin gene variants to susceptibility and disease progression," said Dr. Victoria Lioudyno, lead author of the study.

"Neuroscience today is at a crossroads. Do we continue the status quo and ignore sex as a biological variable, or do we acknowledge that sex influences the brain at all levels and address the

major gaps in knowledge?" asked Dr Eric M Prager, Editor-in-Chief of the *Journal of Neuroscience Research*. "The work published in this issue unequivocally concludes that sex matters and that researchers can no longer allow for the over-reliance on male animals and cells, which obscure key differences that might influence clinical studies."

More information: Victoria Lioudyno et al, Single-nucleotide polymorphism rs948854 in human galanin gene and multiple sclerosis: a gender-specific risk factor, *Journal of Neuroscience Research* (2017). [DOI: 10.1002/jnr.23887](https://doi.org/10.1002/jnr.23887)

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