

DEBATE: MS – ENVIRONMENTAL OR GENETIC? - PRIMARILY AN ENVIRONMENTAL DISEASE

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According to one internationally renowned MS neurogeneticist, 'MS genetics is dead'. The arguments that have led to this statement are reviewed. Just because a disorder is found in multiple families, it is not necessarily genetically based. Although twin studies are claimed to show that MS is '30% genetically based' this concept derives from widely varying data that are basically uninterpretable. Although genome-wide association studies are claimed to show the presence of several MS-related genes, no mutations have been found so far. Conversely, the same technology has yielded several mutations in comparable disorders such as Parkinson's disease and Alzheimer's disease. Monozygotic twins discordant for MS should have a different genetic sequence if the disorder has a genetic basis but data so far suggest this is not correct. Epigenetics or epistasis are contentious topics and may not provide the answer. Conversely the evidence for environmental influence is strong. This includes the effect of latitude, cigarette smoking, vitamin D deficiency and exposure to the Epstein Barr virus. Furthermore, it is very difficult to explain the widely accepted migration studies of MS, whether from high to low-risk regions or vice versa, by any mechanism other than environmental, given that as far as known, moving from one country to another does not change an individual's DNA. It is concluded that the role of genetics in MS etiology is overstated and may have no more relevance than susceptibility to the common cold, pneumonia, influenza etc.