Genetic clues into the link between vitamin D and MS

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Professor David Booth

It has long been known that vitamin D deficiency is associated with increased MS risk, and researchers around the world have been working to uncover the exact mechanisms for this association.

New findings published in the journal *Genes and Immunity* by Australian researchers, have built on existing knowledge of the genes associated with MS, to identify how immune cells are controlled by vitamin D.

Led by Professor David Booth from The Westmead Institute's Centre for Immunology and Allergy Research, these findings shed new light on the role of genetics in determining how vitamin D may be exerting protective effects against MS.

Using genetic discoveries from a worldwide collaboration called the International MS Genetics Consortium, which includes the MS Research Australia ANZgene collaboration, Professor Booth and his team have discovered that three known MS-risk genes which control vitamin D activation are turned on in specific immune cells called myeloid cells. Until now, nobody has looked at these cells in relation to MS and vitamin D. In this study, Professor Booth used a novel analysis technique called ChIP-Seq, which analyses protein interactions with DNA, to specifically test vitamin D activity in three types of myeloid cells.

This finding is important because it shows, for the first time, a potential genetic mechanism for how vitamin D might be exerting an influence over the immune system to result in a protective effect against MS.

MS Research Australia is currently funding the vitamin D MS Prevention Trial, PrevANZ, a clinical trial testing whether vitamin D supplements can help to prevent MS in people at high risk. This is just one avenue of research into vitamin D, and Professor Booth's research suggests that there may also be other methods for more directly targeting specific immune cells or genes that interact with vitamin D to also achieve protection against MS. Professor Booth says that 'By manipulating this genetic process we may be better able to use vitamin D and its many analogues in therapy, and also identify new therapeutic approaches, such as methods to control immune cell activation for cell-mediated therapy.'