A safer vaccination for Alzheimer's disease?

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The research shows that in addition to the major histocompatibility complex (MHC) molecules, which present the antigen vaccine to the immune cells, genetic factors, that control some immune cells, influence the quality of response to vaccinations. The results could make it possible to prevent neuroinflammatory reactions, which are major obstacles preventing the use of the vaccination in humans. This study has just been published in the *Journal of Immunology*.

Since the beginning of the 2000s, research into Alzheimer's disease has partly focussed on studying a vaccination composed of amyloid-β peptide (Aß), the accumulation of which in the brain is thought to trigger the disease. Vaccinations with this peptide caused serious neuroinflammatory reactions in 6% of patients. To develop a safer and more effective treatment, it is therefore essential to understand the factors that influence the body's responses to peptide Aß.

The joint Inserm/UPMC research team, led by Pierre Aucouturier, with Cécile Toly-Ndour and Guillaume Dorothée, conducted its research on mice with different forms of major histocompatibility complex (MHC). The role of these molecules is to present the antigens to the immune cells and they have a wide genetic diversity, which could explain the different responses. Indeed, after vaccination with the peptide Aß, mice with different MHC had different immune cell reactions. Researchers then pushed their studies further. By expressing the MHC from one line of mice to another, they demonstrated that factors in independent from MHC, but related to the genetic background, have a massive influence on the anti-Aß response. They then proved that these factors involve a

sub-population of white blood cells (regulatory T cells).

These results provide a new direction to orientate immune cells advantageously, thus improving the immunotherapeutic approach, which remains one of the major hopes in the fight against Alzheimer's. However, these observations made on mice still require validation on human patients.

More information: The Journal of Immunology, September 26, 2011 MHC-Independent Genetic Factors Control the Magnitude of CD4+ T Cell Responses to Amyloid-ß Peptide in Mice through Regulatory T Cell-Mediated Inhibition

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