

# Using myelin antigen - coupled autologous cells for treatment of

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Madam, multiple sclerosis is an autoimmune disease in which auto reactive T cells mount an attack on the myelin peptide surrounding the neurons.<sup>1</sup> Loss of this insulating peptide, called demyelination, causes impairment in nerve function that leads to numbness in limbs, paralysis and visual disturbances. The disease affects around 400,000 individuals in the United States and 2.1 million people globally.<sup>1</sup> The disease is more common in females and starts at a young age.<sup>2</sup> Immunosuppression drugs are the primary approach for patients with multiple sclerosis.<sup>3</sup> These drugs include cyclophosphamide, interferon beta or glatiramer acetate and fingolimod. Infections due to nonspecific immune suppression is the most common side-effect of these drugs.<sup>4</sup>

Just recently, Miller and his colleagues discovered a more specific treatment that would only target auto reactive T cells directed against the myelin peptide.<sup>5</sup> This would not only curtail disease progression but would also reduce the incidence of infections. During a phase one clinical trial, nine multiple sclerosis patients were transfused with their own blood mononuclear cells that had been chemically tagged with seven different myelin antigens. The immune system was then able to recognise the antigens as innocuous and developed tolerance for them. Administration of such chemically modified autologous cells was feasible, had a good safety profile and was well tolerated by patients. The new treatment was able to reduce the body's attack on myelin peptide by 50 to 75%.<sup>5</sup> Moreover, patients who received highest doses of myelin antigen — coupled cells showed a remarkable decrease in myelin destruction by auto-reactive T cells. The treatment did not decrease the body's ability to fight infections. The patients also retained immunity to previous vaccinations like tetanus.

The process of collecting, purifying and chemically tagging the patients' mononuclear cells is relatively expensive, complex and time consuming. Researchers have now proposed an easier process that involves nanoparticles to deliver myelin specific antigens. Administration of either myelin peptide-coupled mononuclear cells or nanoparticles, to introduce myelin specific antigens, may also be used in developing tolerance in other autoimmune diseases which involve known antigens. It is believed that this new treatment could greatly stop the progression of autoimmune diseases, particularly in recently diagnosed cases.

## References

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