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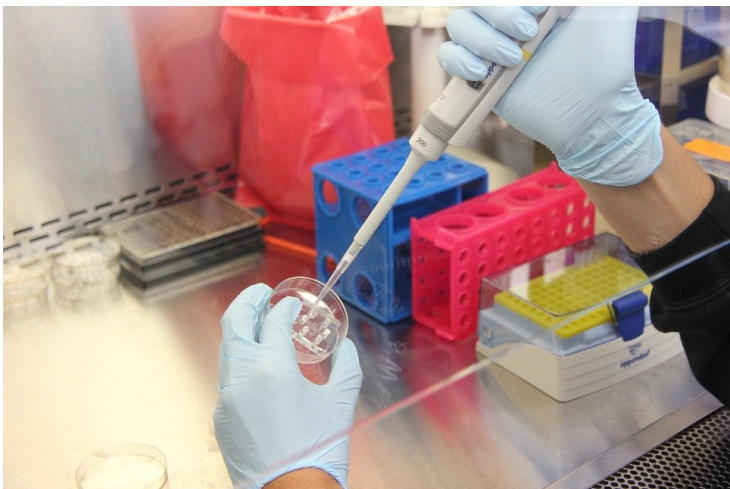
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Next Gen therapy for multiple sclerosis

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Researchers have developed a precision system using quantum dots for changing the way myelin is processed and presented to the immune system in order to drive tolerance instead of inflammation.



Researchers at the University of Maryland are using quantum dots that are tiny semiconductor particles commonly used in nanotechnology, to decipher the features needed to design specific and effective therapies for multiple sclerosis and other autoimmune diseases.

In multiple sclerosis, the immune system incorrectly recognizes components of the central nervous system, causing inflammation and destruction of myelin, the fatty substance that surrounds and protects nerve fibers. When this happens, nerve fibers and cells are damaged, leading to loss of motor function and other complications.

Researchers have developed a precision system using quantum dots for changing the way myelin is processed and presented to the immune system in order to drive tolerance instead of inflammation.

The team hypothesized that, by using quantum dots displaying defined densities of myelin peptides, they could reveal how the number or density of peptides alters the processing and trafficking of the peptide and, in turn, promotes regulatory T cells that control the disease.

The team observed that tolerance and elimination of paralysis in a pre-clinical mouse model was much better when myelin peptides were displayed on many quantum dots at a low density of 25 per dot, instead of fewer quantum dots displaying the same number of peptides but at a high density of 65 per dot. Developing specific knowledge or design guidelines such as these might enable more selective and effective therapies to treat MS and other diseases.