

Mayo Clinic uses new approach to reverse multiple sclerosis in mice models

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Mayo Clinic researchers have successfully used smaller, folded DNA molecules to stimulate regeneration and repair of nerve coatings in mice that mimic multiple sclerosis (MS). They say the finding, published today in the journal [PLoS ONE](#), suggests new possible therapies for MS patients.

Provided by Mayo Clinic

"The problem has been to find a way to encourage the nervous system to regenerate its own myelin (the coating on the nerves) so [nerve cells](#) can recover from an MS attack," says L. James Maher III, Ph.D., Mayo Clinic biochemist and senior author on the paper. "We show here that these small molecules, called aptamers, can stimulate repair in the mice we are studying."

More than 200,000 people have multiple sclerosis. There is no cure and no effective therapy to stop progression or repair damage to the [myelin sheath](#) that surrounds and protects the nerves. Without that protection, [nerve fibers](#) will be damaged, leading to declining mobility and cognitive function, and other debilitating complications.

MS researchers, including Mayo neurologist Moses Rodriguez, M.D., a co-author on this paper, have focused on monoclonal antibodies in mice to stimulate myelin repair. The Rodriguez and Maher teams, working together, have determined that the aptamers are not only effective, but they are easy and cheap to synthesize -- an important point for drug developers. They also are stable and not likely to cause an immune response. This new approach must be validated in other mouse models to see if it might be a candidate for human clinical trials.

The monoclonal antibodies used in earlier research are large and complex, but were shown to promote both cell signaling and remyelination of central nervous system lesions in mice. The aptamers used in this study are less than one-tenth the size of antibodies and are single-strands of DNA containing only 40 nucleotide units.

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