Myelin Repair Foundation

Collaboration. Acceleration. Results.

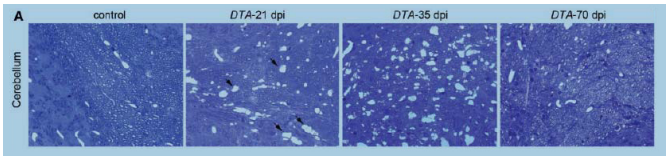
DTA MOUSE MODEL

Investing in New Models for Measuring Remyelination in Demyelinating Disorders

Animal models are important tools in the search for new therapies for Multiple Sclerosis and other demyelinating disorders. The most commonly used models, including the EAE model, developed more than 60 years ago, were designed to mimic the hyperactive inflammatory process in MS patients. However, they have certain limitations with respect to measuring the demyelination and remyelination that takes place during these disruptions.

For this reason, the MRF supports the development of new, more focused animal models and assays, or tests, for measuring the rate of remyelination. Since 2004, MRF investigators have developed 24 tools, including the DTA mouse model. Today the MRF holds two patents on work related to the DTA mouse.

In the DTA mouse, MRF scientists use Diptheria Toxin subunit A as a demyelinating agent. After triggering complete demyelination in the animal, scientists are able to observe a more natural rate of remyelination and determine at what rate various test compounds can accelerate that process.



Progression of the myelin defects in the CNS of DTA mice. The scattered light blue spots at 21 and 35 days show progressive damage. By 70 days, the damage has been repaired.

Specifically, DTA mice begin to display symptoms of demyelination at 14 days. By 35 days, the animals begin to gradually recover until around day 70, when myelin-producing cells are replenished and remyelination has occurred.

The DTA model provides a valuable way to test potential drug treatments because:

- Demyelination and remyelination events can be reproduced.
- These events occur at distinct, measurable time points.
- The effects of age on the body's response to the loss of myelin-producing cells can be measured.

The DTA mouse is of considerable interest to industry for its potential in studying a wide range of neurological diseases.

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Further investigations on the DTA Mouse Model are being conducted in the labs of MRF Principal Investigators **Dr. Stephen D. Miller** (L) at Northwestern University, Chicago, Illinois, and **Dr. Brian Popko** (R) at the University of Chicago.