
The MS Lesion Project

**This project may get us to
the core of finding better
ways to treat MS**

The hallmark of MS is its unpredictability. Scientists have wondered for years why multiple sclerosis affects people in different ways. For example, the disease affects some people's vision, while others experience disability primarily in moving their legs. A related question is why do individuals respond differently to specific treatments, even when they have similar symptoms?

In this stage of the study, scientists' understanding of the pathology underlying MS will be greatly enhanced, and should ultimately lead to different treatment regimens for people with specific subtypes of MS.



Research suggests answers may come from studying the underlying pathology, or the cause of the tissue damage in MS. New laboratory tools are available to examine MS lesions – areas of brain and spinal cord where the insulating myelin and



the underlying nerve fibers have been destroyed. For the first time, scientists are beginning to piece together evidence of actual lesion patterns that may help distinguish between what might be different underlying pathologies in people with MS. If lesion patterns can be discerned in a non-invasive way, such as using MRI, it would enable doctors to make more accurate diagnoses and prescribe appropriate treatments for individual patients.

The largest study of its kind

Several years before a National Institute of Health recommendation urging the initiation of large-scale international collaborations of specialists, the National MS Society launched the MS Lesion Project, the most extensive effort ever undertaken to find patterns in the MS damage seen in brain tissue and to correlate those findings with actual clinical symptoms, MRI scans and responses to therapy.

Collaborators led by investigators at the Mayo Clinic, and including groups in Vienna, Berlin, and elsewhere, are painstakingly amassing hundreds of MS brain tissue samples from around the world for analysis.

Using breakthrough technology to study MS

In the past, lesions could only be studied during autopsy. Researchers could not accurately chart the course of the disease because most brain examinations were postmortem. Now, MRI technology allows medical specialists to non-invasively view lesions in living people. For the first time in history, a person can be evaluated, and then reassessed following treatment to see its effects, even on specific lesions, without dangerous invasive procedures.

Using MRI scans correlated with brain tissue samples from biopsies and autopsies, scientists working on the Lesion Project identified four types or patterns of lesions, indicating that MS may in fact be a family of diseases, or even a “syndrome” of several diseases. The existence of subtypes may explain why the immune system attacks the brain in a number of ways, and also why people – perhaps with different disease pathologies – respond to treatments differently. These breakthroughs came in the early phases of a project brimming with promise.

Early Progress

The Lesion Project team recently reported that persons with one type of lesion pattern are more responsive to a blood-cleansing technique that has been used for a severely progressive form of MS, while those without such a lesion pattern were less responsive. This demonstrates the potential of this project to improve the treatment of MS. In addition, a preliminary analysis has revealed that persons with a specific pattern of brain lesion, which involves immune cells known as macrophages, showed findings on MRI that were distinct from other participants. This suggests that the team may indeed be able to find non-invasive ways of detecting lesion patterns in individuals who have MS.

The Future

The next challenge members of the Lesion Project face are to discover the basis for the subtypes they have identified. In this stage of the study, scientists’ understanding of the pathology underlying MS will be greatly enhanced, and should ultimately lead to different treatment regimens for people with specific subtypes of MS.

The MS Lesion Project continues to prove its worth with an outpouring of new data fueling even more discoveries. Continued funding is crucial to understanding the differences in MS subtypes and their causes. As the Lesion Project’s lead investigator, Dr. Claudia F. Lucchinetti writes, “This project may get us to the core of finding better ways to treat MS.”

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