

The cause of multiple sclerosis is not yet known, but thousands of researchers all over the world are meticulously putting the pieces of this complicated puzzle together.

The damage to myelin in MS may be due to an abnormal response of the body's immune system, which normally defends the body against invading organisms (bacteria and viruses). Many of the characteristics of MS suggest an 'auto-immune' disease whereby the body attacks its own cells and tissues, which in the case of MS is myelin. Researchers do not know what triggers the immune system to attack myelin, but it is thought to be a combination of several factors.

One theory is that a virus, possibly lying dormant in the body, may play a major role in the development of the disease and may disturb the immune system or indirectly instigate the auto-immune process. A great deal of research has taken place in trying to identify an MS virus. It is probable that there is no one MS virus, but that a common virus, such as measles or herpes, may act as a trigger for MS. This trigger activates white blood cells (lymphocytes) in the blood stream, which enter the brain by making vulnerable the brain's defence mechanisms (i.e. the blood/brain barrier). Once inside the brain these cells activate other elements of the immune system in such a way that they attack and destroy myelin.

Demyelination is the term used for a loss of myelin, a substance in the white matter that insulates nerve endings. Myelin helps the nerves receive and interpret messages from the brain at maximum speed. When nerve endings lose this substance they can not function properly, leading to patches of scarring, or 'sclerosis', occurring where nerve endings have lost myelin. It is these areas of scarring that give Multiple Sclerosis its name.

Demyelination is the root cause of the symptoms that people with MS experience. When it occurs the speed at which messages pass along the nerves is slower than normal. Even when the patches of scarring caused by demyelination have healed and re-myelination has occurred, the response time of the nerve endings tends to remain slower.