

## **The role of inflammation in MND**

Although MND is a disease that specifically effects the motor neurones in the brain and spinal cord, immune cells are thought to play a role in the rate in which the disease progresses. A type of immune cells, called "[microglia](#)", act as a surveillance system in the central nervous system, restoring injured cells in response to stress or short-term injury and clearing away cellular debris. In this regard, microglia are beneficial and protective towards motor neurones. However, in response to ongoing stress, such as the cellular stress in motor neurones in MND, microglia become activated and can become harmful. In MND patients and animal models of MND, large increases in the numbers of activated microglia can be seen, especially around motor neurones in the areas of the brain (motor cortex) and spinal cord that are most affected in the disease, suggesting that these cells are contributing to the disease and the loss of motor neurones. Microglia also interact T cells, the immune cells from the periphery and trigger protective or harmful response from these cells, depending on their activation state. Research in MND cell and animal models has shown that therapies that target microglia to dampen their activation response can slow disease progression. Therefore treatments that target these immune cells may also help slow disease in MND patients.

## **Why IC14 may help people with MND**

The breakdown of motor neurones by microglia is controlled by a number of different molecules interacting together. In the centre of these molecules is CD14, a master regulator of immune cell activation that has been implicated in inflammation of brain cells that are important in MND. IC14 is a type of drug called an "immunotherapeutic monoclonal antibody" which acts to blocks a target molecule.

IC14 targets and blocks CD14, which may reduce the activation of microglia and keep peripheral immune cells in the protective state.

IC14 has been tested in patients with a number of other diseases and so has a good safety profile and an established manufacturing system. The emphasis of this study is to determine the safety of administering IC14 in MND patients.

### Phase 1b trial of IC14

The trial has been successfully conducted in 10 MND with the following demographics.

	MND
Gender (male:female)	7:3
Mean age (years)	55.1 ± 10.47

While the trial outcome is still being assessed, IC14 appears to be safe and the information generated from this trial will likely be used to design a follow-on study to measure the effect of IC14 on disease progression in MND patients.

Further details can be found by clicking on this

link <https://clinicaltrials.gov/ct2/show/NCT03487263>

### References

1. [Boillée S et al., \(2006\) Onset and Progression in Inherited ALS Determined by Motor Neurons and Microglia. Science. Jun 2;312\(5778\):1389-92.](#)
2. [McCombe PA & Henderson RD \(2011\) The Role of immune and inflammatory mechanisms in ALS. Curr Mol Med. Apr;11\(3\):246-54.](#)