

NEWS, NEWS, NEWS!

Latest Research News on Preventative Gene Discovery

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Protective gene increases survival in motor neuron disease

A gene that significantly influences the survival rate of people living with motor neuron disease (MND) by 14 months has been identified by scientists in an international research collaboration - funded in part by the MND Association of England, Wales & NI.

Led by Prof Ammar Al-Chalabi at the Medical Research Centre for Neurodegeneration Research, King's College London, and Prof Robert Brown at the University of Massachusetts Medical School, the international research team looked at 300,000 genetic variants in 2,359 people with MND and 2,814 unaffected volunteers from six different countries.

The researchers aimed to narrow the search for genes involved in MND by identifying potential 'hot spots' linked to the disease which could then be carefully searched, letter by letter, for disease related 'spelling mistakes' in the human genetic code. Using the same methods, the researchers could also search for gene variants that alter the progression of the disease.

It is this latter approach that has thrown up an exciting result, by identifying a 'protective' gene that extends the life of people diagnosed with MND – the first in the history of MND research.

KIFAP3 gene – extending survival rate

Researchers have identified a genetic variation in the KIFAP3 gene which is important in determining the survival rate for people with MND.

People with two beneficial variants of KIFAP3 lived on average four years while those with only one or none lived on average for two years and eight months.

Significantly, this represents an improvement in survival of nearly 50% or over 14 months for patients with two beneficial variants. Life expectancy for most people with MND is just two to three years. However, the chances of surviving five years improved from about 10% to more than 30% for those carrying the 'good' variants of KIFAP3.

So far, only one drug called riluzole has been proven to have an impact on extending the life expectancy of people living with the disease. It has been shown to extend life expectancy by a few months.

What this means for MND research

Prof Al-Chalabi said: "Treatments can now be directly designed to exploit the effect of this gene variation. The more usual situation is for genetic risk factors for a disease to be identified rather than survival genes.

"Genetic risk factors are important but they have limited benefit for designing effective treatments because doctors only see people once they are already affected, so treatments need to be aimed at improving survival, not at reducing risk.

The research also has implications for the design of MND clinical trials. It is possible that an excess of people carrying the beneficial survival gene variants in one group in a clinical trial might make it look as if a drug is effective when it is not, or vice versa.

Dr Brian Dickie, director of research development at the MND Association, explained: "This is a significant finding, bearing in mind the speed with which MND can progress in patients.

"Just as there are genetic 'villains' that can cause or predispose people to disease, so there are undoubtedly 'hero' genes that help delay the onset of disease or slow its progression.

"This is the first gene to be associated with such a marked protective effect. Undoubtedly, this research will open up potential treatment strategies for the thousands of people living with MND in the UK and throughout the world."

The reasons why certain variants of the KIFAP3 gene can alter disease progression are still unclear.

Researchers know that the gene is involved in a number of cellular processes, most notably the transport of essential molecules throughout the nerve cell. This is an area of MND research that has attracted a lot of attention, as disruption of cellular transport appears to occur in the early stages of the disease.

Prof Brown who led the research in the USA said: "This has truly been a multinational collaboration, involving 19 groups from six countries. It illustrates how effectively an international consortium in MND research can help us understand why motor neurons degenerate in this disease. The challenge now is to turn this new knowledge into effective treatments; the KIFAP3 story provides a new target for therapy development."