



THE UNIVERSITY *of* EDINBURGH



MS Society Edinburgh
Centre for MS Research

May 2023: Transcription of the summary video for the MS Society Edinburgh Centre for Multiple Sclerosis Research

[Anna Williams]

Hello, I'm Anna Williams and I'm the Professor of Regenerative Neurology here at the University of Edinburgh. I want to welcome you to the MS Society Edinburgh Centre for Multiple Sclerosis Research. Our main focus in the Centre is to research progressive multiple sclerosis. And we know that in progressive multiple sclerosis, we get nerve death, which we call neurodegeneration, and it would be good to prevent this.

So in our Centre, we have three main arms of the Centre, and the first arm is to discover how neurodegeneration happens in multiple sclerosis and how we can rescue that. The second is to test different drugs in different combinations to see whether we can find potential treatments for neurodegeneration. And then finally, in the third arm, we want to try and measure neurodegeneration or nerve death better in multiple sclerosis by using imaging techniques.

I'd like to introduce you to some of the people who are working on these different research themes.

[Luise Seeker]

My name's Luise Seeker and I'm a post-doctoral researcher working on the first Centre theme. That is to find out more about neurodegeneration in MS. This theme is led by Professor Anna Williams, whom you just met. We use a wide range of techniques to investigate why nerve cells die and how we might try to slow or stop this.

We can, for example, compare post mortem brain tissue from people who lived with MS against healthy controls. We do large scale experiments where we test hundreds of thousands of cells to see which genes are switched on or off in MS. We use this data to look for biological processes that can be targeted by new treatments. We then study brain tissue under high powered microscopes to see if we can confirm our results.

We have already found out that not all nerve cells are affected by neurodegeneration in the same way. We have identified specific types of nerve cells that are more vulnerable to damage.

[Katie Marshall-Phelps]

I'm Katie Marshall-Phelps. I'm also a post-doctoral researcher, and I'm working on the second theme of the Centre, which is led by Professors David Lyons, Siddharthan Chandran and Neil Carragher.

Our theme focuses on finding new treatments for people with MS. Today, there are no drug treatments to prevent disease progression in MS. To address this we are bringing together expertise in drug development to provide a state of the art drug

testing platform to prioritise drugs for clinical trials. We are testing medicines that the scientific literature and our own studies tell us are the best candidates.

At first these will likely be existing drugs that are already used to treat another condition. This is called drug repurposing. Later on we expect to identify designer molecules that we have shown in laboratory studies to directly affect the very specific processes that cause nerve cells to degenerate in MS. We use a whole battery of different tests from human cells, which we can grow in the lab from stem cells to imaging zebrafish and studying human brain bank tissue.

If a drug is beneficial across multiple experiments, then that's good evidence that it might also work in people.

[Rozanna Meijboom]

I am Rozanna Meijboom and I'm a postdoctoral researcher here at the Edinburgh MS Centre. My work focuses on the third theme of the Centre, which is to find better ways to measure neurodegeneration in MS. This theme is led by Professor Adam Waldman, and we use advanced MRI and PET brain imaging in animals and humans.

As Professor Williams said earlier neurodegeneration means the loss of nerve cells and their projections. This is one of the key changes in MS. Currently used imaging tools are not sensitive enough to detect all the brain changes that are caused by MS. In addition, we need to be able to detect these brain changes earlier. This could help people with MS and their doctors make more informed decisions about treatments, to find out whether a treatment is working, or what sort of MS a person is likely to have.

We are studying the brain scans of a group of people across Scotland who are participating in a research study called FutureMS. This is led by the Anne Rowling Regenerative Neurology Clinic here in Edinburgh. Using state of the art imaging techniques, we are able to measure microscopic changes in brain structure and function. This allows us to detect early and subtle neurodegenerative changes which we are not able to do with the standard imaging tools currently used in hospitals.

[David Lyons]

I'm David Lyons and I'm professor of Neurobiology here at the University of Edinburgh. Luise, Katie and Rozanna have given you a flavour of the work we're doing here at the MS Society Edinburgh Centre for MS Research. We're bringing together expertise in many different areas from across the University and through collaborations, including with our sister MS Society Centre in Cambridge.

We're working hard to find out more about neurodegeneration in MS, measure it better and identify potential new treatments. Over the next few years, we hope to identify candidate drugs that will feed into the MS Society Efficient Clinical Trials Platform, OCTOPUS, giving people with MS the very best chance of finding a beneficial medicine and fast. We're incredibly grateful to all those living with MS who help our research, whether that is discussing research priorities and helping us form proposals, participating in clinical research studies such as FutureMS, or even signing up to donate their brain after death.

We couldn't do this work without your involvement, so thank you. Finally, we'd also like to thank the MS Society UK who fund and support this work.

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