Tell me about your research

I study fruit flies, using them as a model to research frontotemporal dementia and motor neuron disease. The most common cause for both these diseases is a particular mutation, a mistake in the genetic code which tells our cells what to do. A piece of the code which usually has tens of repeats ends up with thousands of repeats instead. From the code, five different large sticky proteins are produced in cells. We don’t yet know why this causes frontotemporal dementia and motor neurone disease.

We work with flies because you can study a very large population in a very small space. They also have similar structures and cells in their brains to humans, and the same proteins are involved in cell death in flies and humans.

I look at four different types of fruit flies which each have a different genetic code, producing one of these unusual proteins in their brain cells. I film them climbing in order to measure their movement and we’ve found their ability to move declines with age, and that this decline is fastest in flies with certain proteins compared to others.

What motivates you?
Dementia can be horrible and it’s heartbreakingly that there is so little we can do. I’m also fascinated by the complexity of the brain and find fly genetics really interesting.

Are there any myths about your work which bother you?
Flies aren’t valued enough in research and there can be some snobbishness about working with them instead of other animals or cells. However, you can get much better data because you’re working with a larger number of animals. 70% of the genes which cause disease in humans are also found in flies!

In an ideal world, where do you see your work in the future?
I would work out which pathways are affected and be able to test drugs which might help. The flies can be used to screen different drugs to narrow down which are most likely to work.

About the artwork
Jo’s page is both a literal illustration of her research as well as an illustration of her love for working with flies. The border is based on some beautiful images of cells taken by her colleague, Dr Ines Hahn - Hana

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