

Human aging gene found in flies

Scientists funded by the Biotechnology and Biological Sciences Research Council (BBSRC) have found a fast and effective way to investigate important aspects of human ageing. Working at the University of Oxford and The Open University, Dr Lynne Cox and Dr Robert Saunders have discovered a gene in fruit flies that means flies can now be used to study the effects ageing has on DNA.

In new work published today in the journal *Aging Cell*, the researchers demonstrate the value of this model in helping us to understand the ageing process. This exciting study demonstrates that fruit flies can be used to study critical aspects of human ageing at cellular, genetic and biochemical levels.

Dr Lynne Cox from the University of Oxford said: “We study a premature human ageing disease called Werner syndrome to help us understand normal ageing. The key to this disease is that changes in a single gene (called WRN) mean that patients age very quickly. Scientists have made great progress in working out what this gene does in the test tube, but until now we haven’t been able to investigate the gene to look at its effect on development and the whole body. By working on this gene in fruit flies, we can model human ageing in a powerful experimental system.”

Dr Robert Saunders from The Open University added: “This work shows for the first time that we can use the short-lived fruit fly to investigate the function of an important human ageing gene. We have opened up the exciting possibility of using this model system to analyse the way that such genes work in a whole organism, not just in single cells.”

Dr Saunders, Dr Cox and colleagues have identified the fruit fly equivalent of the key human ageing gene known as WRN. They find that flies with damage to this gene share important features with people suffering from the rapid ageing condition Werner syndrome, who also have damage to the WRN gene. In particular, the DNA, or genetic blueprint, is unstable in the flies that have the damaged version of the gene and the chromosomes are often altered.

The researchers show that the fly’s DNA becomes rearranged, with genes being swapped between chromosomes. In patients with Werner syndrome, this genome instability leads to cancer. Cells derived from Werner syndrome patients are extremely sensitive to a drug often used to treat cancers: the researchers show that the flies that have the damaged gene are killed by even very low doses of the drug.

Professor Nigel Brown, Director of Science and Technology, Biotechnology and Biological Sciences Research Council said: “The ageing population presents a major research challenge to the UK and we need effort to understand normal ageing and the characteristics that accompany it.”

“Fruit flies are already used as a model for the genetics behind mechanisms that underlie normal functioning of the human body and it is great news that this powerful research tool can be applied to such an important area of study into human health.”

Source: Biotechnology and Biological Sciences Research Council

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