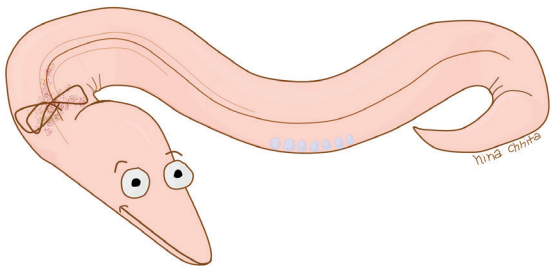
MRC Laboratory of Molecular Biology

What happens when worms get old?

Just like people, worms change as they get older. But worms live for a much shorter time than we do – only 17 days!

Young worm



Old worm

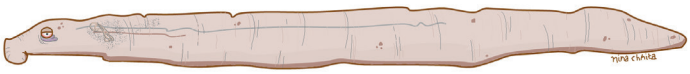


Illustration credits: Jennina Chhita **www.scienceunhinged.com**

- Look at the video of the **young** worms, then the video of the **old** worms. What differences can you see?

  Do the old worms move differently?

  Are they a different size or shape?

- Now look at the third video. **What do you notice about these old worms?**

We can change genes in the worm to make them age faster or slower. Some of these gene changes can make animals live for a very long time. A worm with a change in a gene called *daf-2* can live more than twice as long as wild type.

That's like a human living to over 170 years old!!!

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Disease experiment

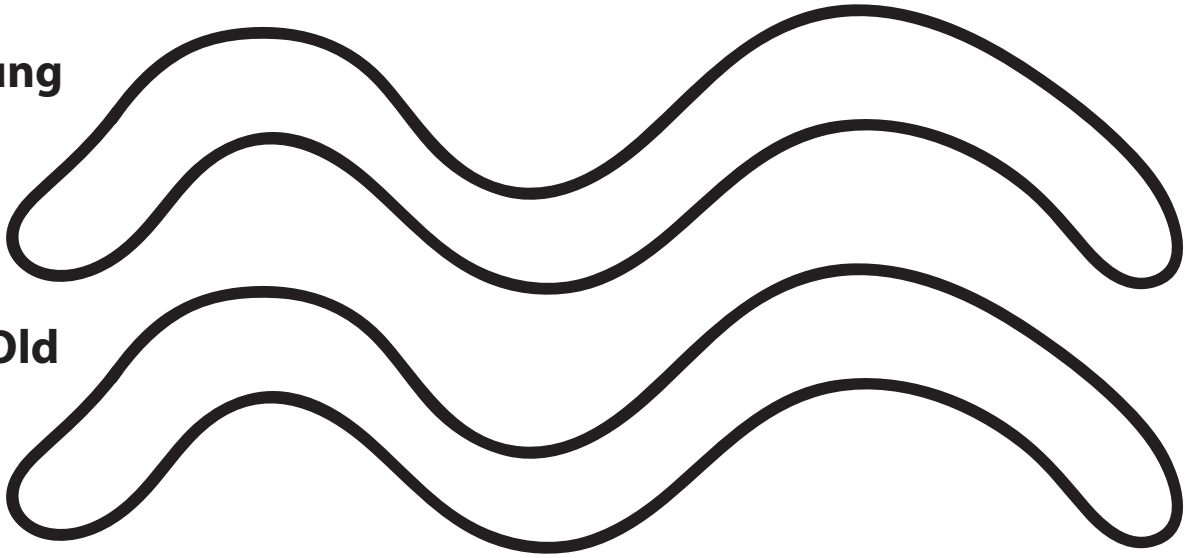
When people get old, they are more likely to get ill. Some of these illnesses affect our brains. We can make worms that get sick when they're old, so we can study why it happens, and how to help people stay healthy as they get older.

Our cells are built of proteins, and some of these proteins can cause illness as we get older. We can make these disease proteins green so we can study them in our worms! Can you see them in the video?

What is different about the green protein in young and old worms? Can you draw it?

Young

Old



Watch the third video. **Does the *daf-2* mutant gene make the sick worms move differently?**

The detail

Worm cells change in similar ways to human cells as they get older. This means that we can put genes and proteins that cause human age-associated illnesses into worms, including those that cause Alzheimer's, Huntington's and Parkinson's diseases, and study why they lead to disease as animals get older. We can also genetically manipulate worms so that they become less susceptible to illness, and then investigate the reasons why. For example, studies of disease proteins in worms have shown that changing the action of insulin in the body, through mutations in the worm's *daf-2* gene, can influence how we age, and how likely we are to develop diseases of ageing.