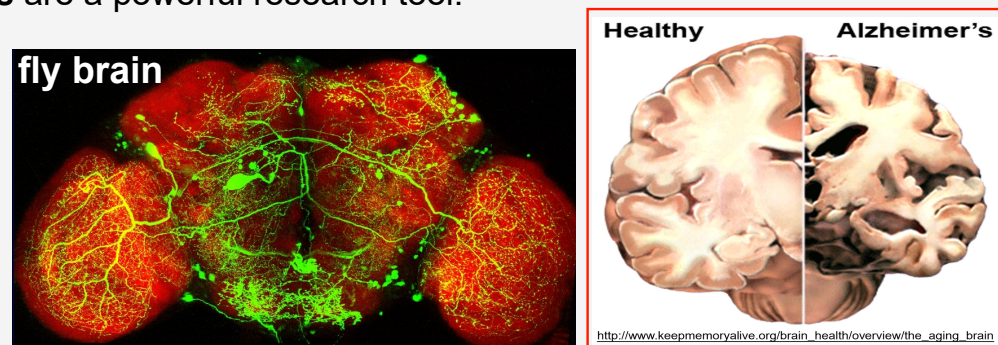


## Fruit Flies & Neurodegenerative Disease

### What is Neurodegenerative Disease?

- **Neurons** are the specialised cells that form long cable-like processes (**axons**) that wire the nervous system and **transmit messages** in the brain, spinal cord and nerves and have to be **maintained for life**.
- Neurodegenerative diseases (ND) cause **early** progressive **loss of axons or neurons**.
- NDs include Alzheimer's, Parkinson's, Huntington's and Motor Neurone disease.
- NDs **cost the UK** far more than £20 billion each year.
- However, the **mechanisms** behind ND are **poorly understood**. To increase our knowledge about them and therefore aid the development of new effective treatments, **fruit flies** are a powerful research tool.



### Using fruit flies to study human neurodegenerative disease

- Despite their differing appearance, man and fly have much in common: they share **evolutionary conserved genes** and **neurons**. Many lessons learned in fruit flies translate to humans.
- Neurodegeneration usually becomes manifest in the elderly and symptoms worsen with age. Fruit **flies** have a **short life span** (3 months) but **age much quicker** showing very **similar symptoms**: they get wrinkles, sleep less, become slow and their neurons die.
- Modern genetic tools have allowed us to exploit fruit flies as a model for ND. For example, Alzheimer's disease is caused by the deposition of certain proteins within nerve cells leading to neuronal death. Fruit flies can be made to express these same human proteins, allowing us to study how they cause neuron degeneration and therefore disease.
- These experiments are much faster because flies breed rapidly, are cheap to maintain and therefore large-scale experiments examining huge libraries of potential drugs can be performed.

For more information, please visit the "neuro & ageing", "definitions" and "neuro & flies" sections on our dedicated website:

[droso4schools.wordpress.com/l2-climbing-assay](http://droso4schools.wordpress.com/l2-climbing-assay)

## Fruit Flies & Neurodegenerative Disease

### How much do you know?

1. How long must neurons be maintained for?

2. What is the binomial name of the fruit fly?

3. What is the name of the specialised cell that transmits messages?

4. What is the life span of flies?

5. Give an example of neurodegenerative disease

6. Fruit flies and humans share similar genes. These genes are ....

7. What age group is typically affected by neurodegenerative disease?

8. Name a practical advantage of using fruit flies in research

9. Flies are used for ND research. They are used as (*plural*)...

10. What can flies help scientists find to treat diseases? (*plural*)

Use the highlighted letters from the answers above to work out the word below

How does this term relate to ND? Look it up in Wikipedia!