

Fruit Flies and Neurodegenerative Disease - How much do you know?

1. How long must neurons be maintained for?

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

[illegible]

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

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4. What is the life span of flies?

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5. Give an example of neurodegenerative disease.

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6. Fruit flies and humans share many genes. What is this called?

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

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

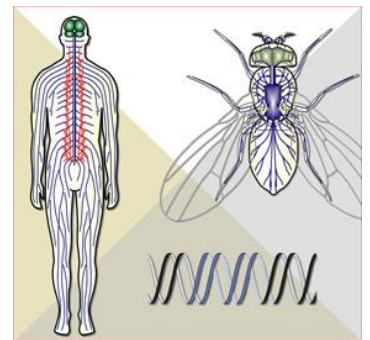
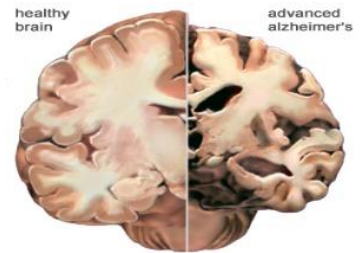
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9. Aging causes pace to change. It becomes ...

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10. What can flies help scientists find to treat diseases?

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Use the highlighted letters from the answers above to work out the word below (the number in the box corresponds to the question).

Hint: Syndrome associated with an ongoing decline of the brain and its abilities

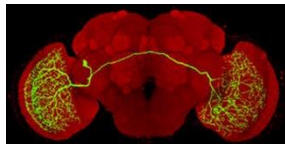
10	4	5	7	6	2	1	8
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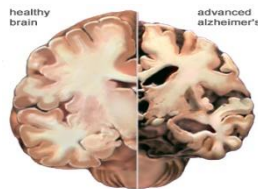
Fruit Flies and Neurodegenerative Disease

What is Neurodegenerative Disease?

- **Neurons** are the specialised cells that transmit messages from and within the brain and spinal cord and have to be maintained for life.
- **Neurodegenerative diseases** (ND) cause the progressive death of neurons.
- NDs include **Alzheimer's, Parkinson's, Huntington's** and **Motor Neurone Disease**.
- NDs cost the country £112 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.



Fly Brain Neuron



How can the Fruit Fly help us understand Human Neurodegenerative Disease?

- Despite their differing appearance, Man and Fly have much in common: they share the same genes (**genetic homology**) and fly neurons are highly similar to human neurons. Lessons learned in the Fruit Fly therefore translate to Humans.
- Neurodegeneration typically **occurs in the elderly** and symptoms worsen with age. Fruit Flies have a short life span (3 months) and age much quicker, but they show very similar symptoms: they get wrinkles, sleep less, become slow and their neurons die.
- Modern **genetic tools** have allowed us to exploit the Fruit Fly 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.
- Flies breed rapidly, are cheap to maintain and therefore large-scale experiments **examining huge libraries of potential drugs** can be performed.