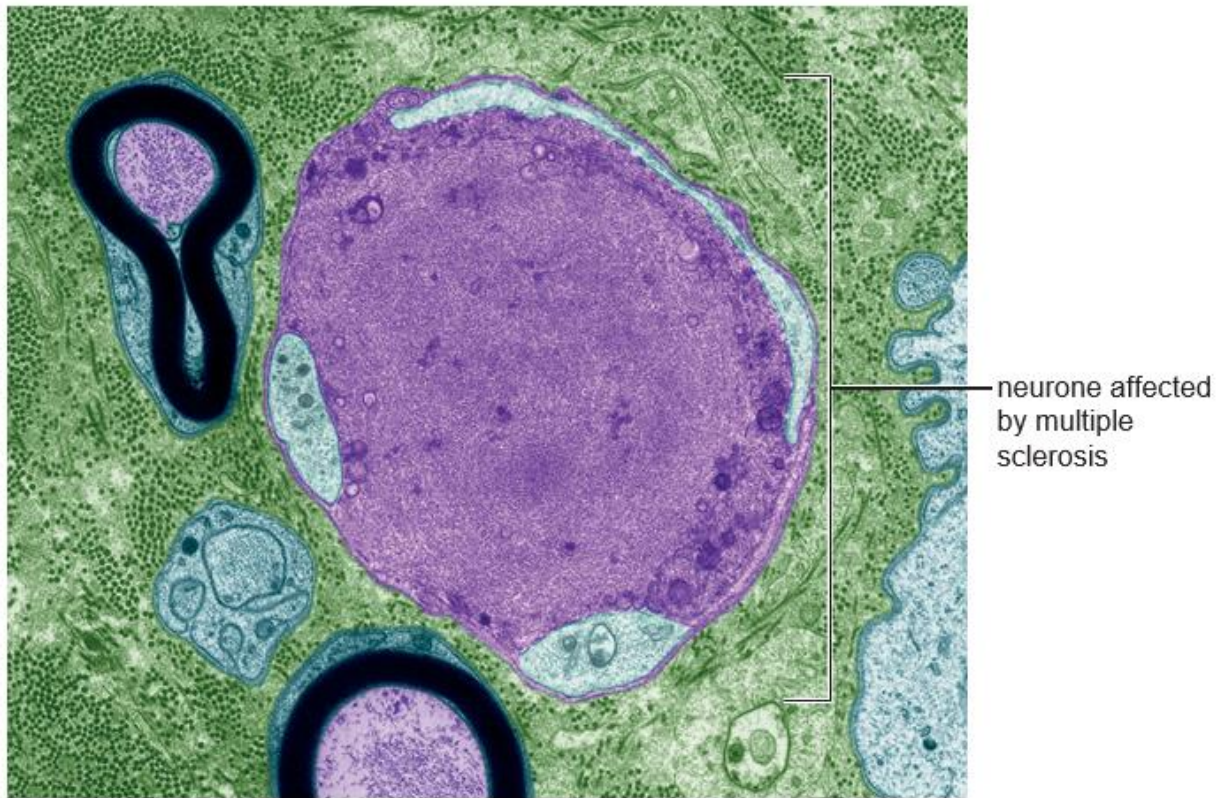


**A level Biology A**  
**H420/03** Unified biology

**Question Set 5**

1 Multiple sclerosis (MS) is an autoimmune disease that damages the nervous system.

- (a) (i) Suggest how the immune system causes damage to the nervous system. [2]  
- antigens on neurones - antibodies against neurones produced  
- phagocytes attack & break down neurones
- (ii) Fig. 5 shows three neurones of different sizes from a person with MS.



**Key**  
purple = axon  
light blue = Schwann cells  
black = myelin sheath

**Fig. 5**

One of the neurones has been affected by MS.

MS causes changes to neurones, which reduce the speed at which nervous impulses are conducted.

Using information from Fig. 5, what can you conclude about how MS causes a reduction in the speed of nervous impulses? [2]

- fewer Schwann cells - less myelin sheath  
- no saltatory conduction

- (b) Guillain-Barré syndrome is another autoimmune condition in which neurones are damaged and the rate of nervous impulses is reduced.

MS affects the central nervous system.

Guillain-Barré syndrome affects the peripheral nervous system.

- (i) Suggest **two** symptoms of MS that might **not** be present in people with Guillain-Barré

syndrome.

Explain your answers.

- damage to cerebral cortex so greater loss of memory
  - damage to cerebellum so greater loss of balance
- [2]

- (ii) Multiple sclerosis and Guillain–Barré syndrome both cause muscle weakness and loss of muscle function.

Suggest and describe how the function of neuromuscular junctions will be affected by multiple sclerosis and Guillain–Barré syndrome. [2]

- lower frequency of impulses reaching neuromuscular junction
- less acetylcholine released
- less neurotransmitter bind to sarcolemma receptors
- less depolarisation of post-synaptic membrane

**Total Mark for Questions Set 5: 8**

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