

Astrocyte

Systems and Asset Lists

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Neurological Functions

Inside the neuron's soma (body),^① electrical impulses are created or carried along (from other neurons' dendrite connections^②) to the axon^③ where they are transmitted to other neurons.^④

③ The axon is coated in fatty insulators called the Myelin Sheath. Action Potential 'hops' quickly inside these insulated sections between unsheathed sections called Nodes of Ranvier.^⑤

⑤ These Nodes of Ranvier, created by gaps of myelin sheathes, allow for the 'hopping' to occur. Without the myelin sheathes and the nodes, action potential propagates smoothly.

Fry, C (2007). "Cell physiology I". Surgery (Oxford) 25: 425-429. doi:10.1016/j.mpsur.2007.07.007.

Neurological Disease Functions

Multiple sclerosis is a disease that damages the insulating covering of neurons, the myelin sheathes.^⑥ This slows the action potential of each synaptic fire and eventually destroys the axon entirely. This kills the action potential.

Compston A, Coles A (April 2002). "Multiple sclerosis". Lancet 359 (9313): 1221-31. doi:10.1016/S0140-6736(02)08220-X. PMID 11955556.

These NPCs do not have to aggress the player, but they will need to be killed to heal the sheath.

Astrocyte Functions

After nerves are damaged sufficiently,^⑦ astrocyte cells 'fill the gap' and create glial scars.^⑧ After a time, the astrocytes themselves will transform into new neurons.

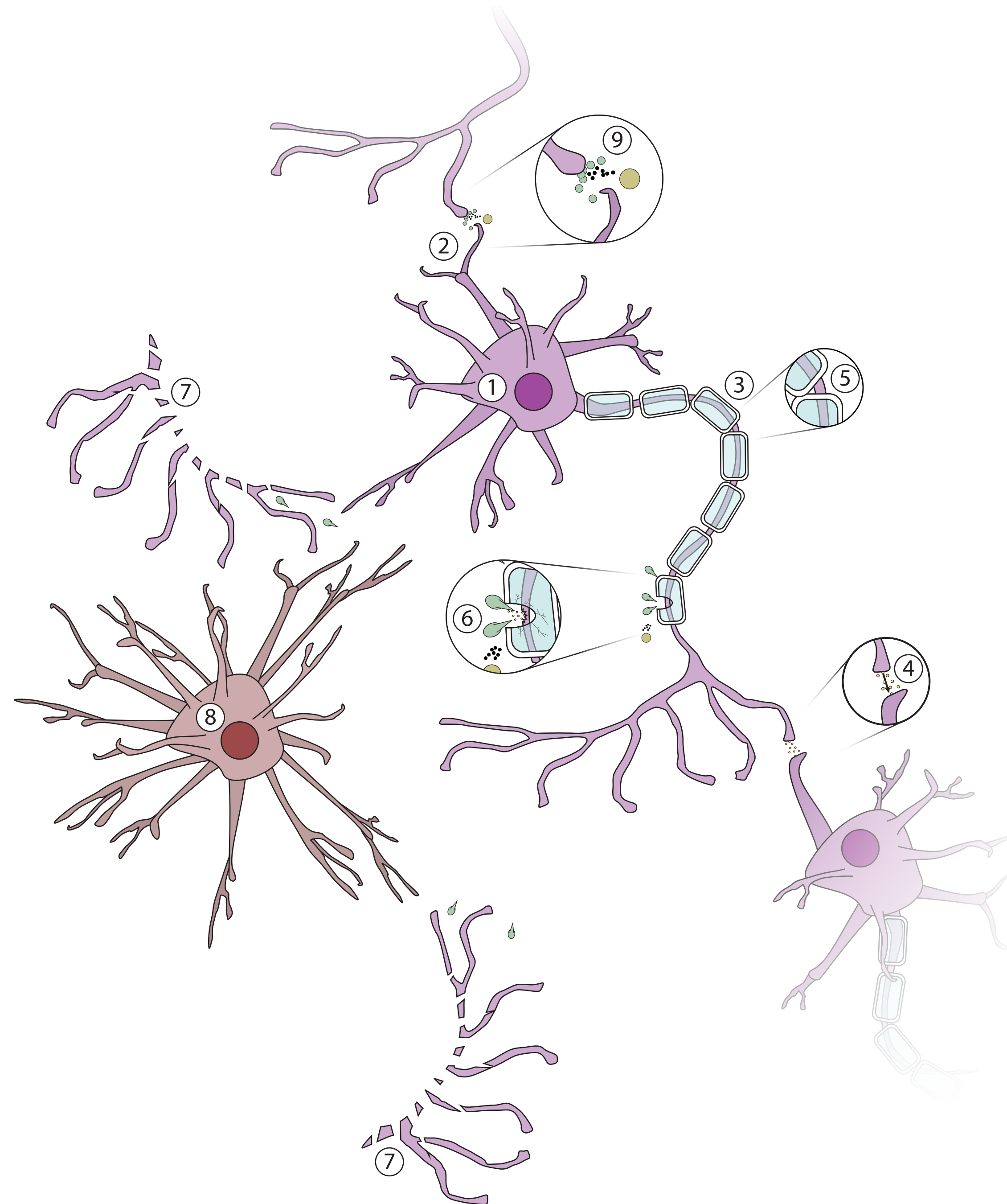
http://lenta.ru/news/2014/10/12/cvi/

They are not quite neurons yet and must develop an axon in order to become a neuron.

Player Functions

The player acts as a benign catalyst for healing. This process includes the following potential actions.

- Repairing Myelin Sheath damage
- Driving away harmful organisms ⑨
- Clear away points of infection ⑨
- Aid in a neuron being formed from an astrocyte



Asset List

- Neuron
 - 3 dendrite permutations
 - 3 roughly spherical cell bodies
 - 3 irregularly shaped axon
 - Myelin sheath (to be put around axon)
 - dynamic blocks for membrane?
 - Synapse
 - neurotransmitters (perhaps just spheres)

- Astrocyte
 - 3 dendrite-like protrusions

NOTE FOR SCALE: The dendrite, axon, etc. will be accessible by the player. They should fit inside with roughly their own size free on any given side.

- MS 'enemies'
 - should look biological
 - perhaps a cross between bio and mech?

NOTE FOR SCALE: Enemies should be roughly half the size of the player.

- Infection pieces
 - same as the MS enemies, should be able to be grouped together.

- Player Character
 - at least conceptualized.

New Systems List

- MS 'enemies'
 - Should seek out myelin sheath asset and attack.
 - When axon is filled, move on to next sheath.
 - Take damage and are eventually killed by orbs.
 - Velocity effects damage?

- Myelin Sheath
 - On contact with enemies, sheath blocks break.
 - Once gone, enemies will attack axon underneath.

- Axon
 - On contact with enemies, fill locally with infection.
 - This will halt synaptic firing.
 - When entire axon is filled, kill neuron.