Microglia interactions with Aβ plaques
CNS: Neurons and Neuroglia

**NEUROGLIA**

- Satellite cells
  - Surround neuron cell bodies in ganglia
  - Regulate O₂, CO₂, nutrient, and neurotransmitter levels around neurons in ganglia
- Schwann cells
  - Surround axons in PNS
  - Are responsible for myelination of peripheral axons
  - Participate in repair process after injury
- Oligodendrocytes
  - Myelinate CNS axons
  - Provide structural framework
- Astrocytes
  - Maintain blood-brain barrier
  - Provide structural support
  - Regulate ion, nutrient, and dissolved gas concentrations
  - Absorb and recycle neurotransmitters
  - Form scar tissue after injury
- Ependymal cells
  - Line ventricles (brain) and central canal (spinal cord)
  - Assist in producing, circulating, and monitoring of cerebrospinal fluid
- Microglia
  - Remove cell debris, wastes, and pathogens by phagocytosis
What is Microglia?

- Two states with conformational changes
  - **Active** – phagocytic properties, large
  - **Inactive** – Natural resting state
- Functions:
  - Dispose of cellular debris
  - Maintain homeostasis in the brain
- Pathogenesis
Alzheimer’s Disease

• Dementia – memory loss
• Gradually worsens
• Mostly affects ages 65 and up
• Brain changes occur before visible signs
PET Scans use Pittsburgh Compound B as a radioactive tracer for $A\beta$ plaques.
Amyloid $\beta$ plaques cause neuronal cell death
Goals

• Manipulate microglia
• Speculate for other forces involved in neuronal regulation
• Understand causes of neurodegenerative diseases and possibly provide treatment
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