IMMUNE CELLS HELP OUT

The cells of the mammalian immune system do more than just fight off pathogens; they are also important players in stem cell function and are thus crucial for maintaining homeostasis and recovering from injury. Here are a few examples.

**Homeostatic Neurogenesis**

As new neurons differentiate from neural stem cells in the hippocampus, T cells and microglia are recruited to the neurogenic site. Following injury, macrophages stimulate remyelination of neurons.

**Brain**

- M1 macrophages help clear debris after a brain injury. They then transition into M2 macrophages, which secrete a protein called activin-A, which facilitates the differentiation of oligodendrocyte progenitor cells (OPCs) into oligodendrocytes, neural-support cells that are responsible for myelination of neural cell axons.
- Mast cells secrete serine proteases, which stimulate duct branching.
- Macrophages enhance the formation of collagen fibrils that support duct growth.

**Mammary Glands**

- During puberty, as hormones trigger the maturation of the rudimentary mammary ducts, macrophages and other immune cells migrate to the ducts’ tips, where they support rapid proliferation and duct branching.
- Macrophages and fibro/adipocyte progenitors (FAPs) clear damaged muscle fibers.
- M1 macrophages also spur the proliferation of muscle progenitor cells called myoblasts.

**Muscle**

- Following an acute injury to the skeletal muscle, local and infiltrating immune cells remove damaged tissue, while T cells help spur the generation of new muscle cells.
- T cells secrete a protein called amphiregulin that stimulates muscle stem cells called satellite cells to differentiate into myoblasts.