

# Primary immune response

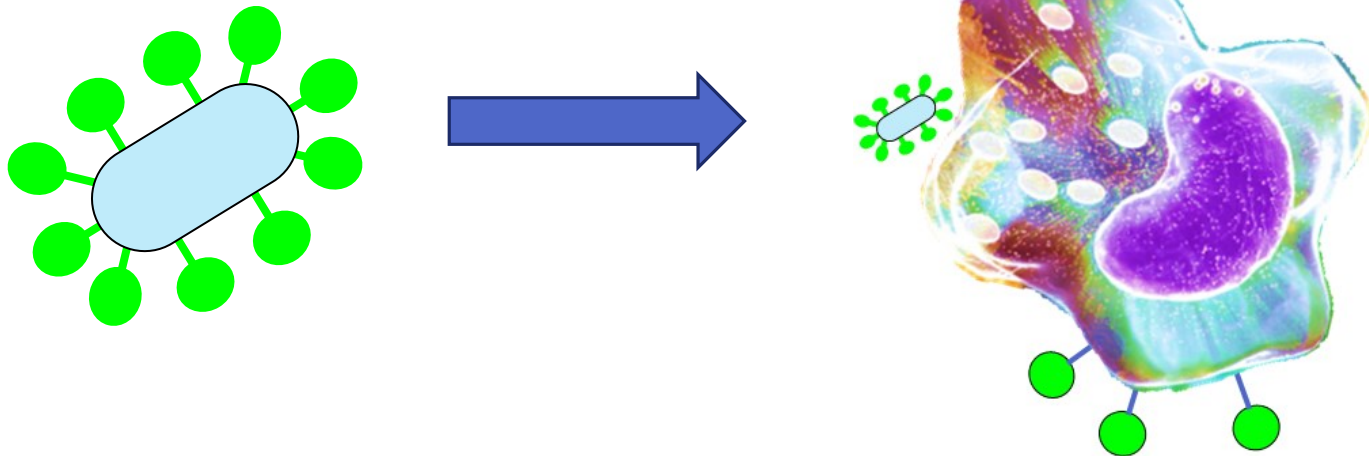
What happens is the immune system has never encountered the antigen before?



# Macrophages

A macrophage is a type of phagocyte.

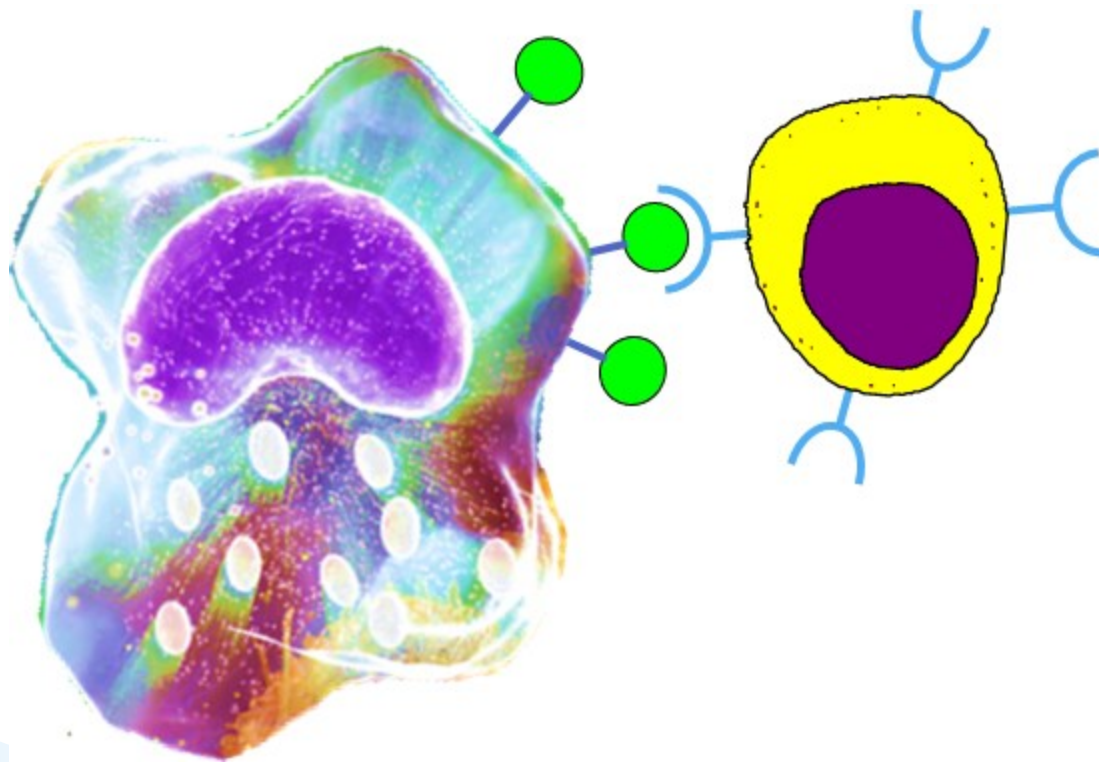
Pathogens are engulfed by macrophages.



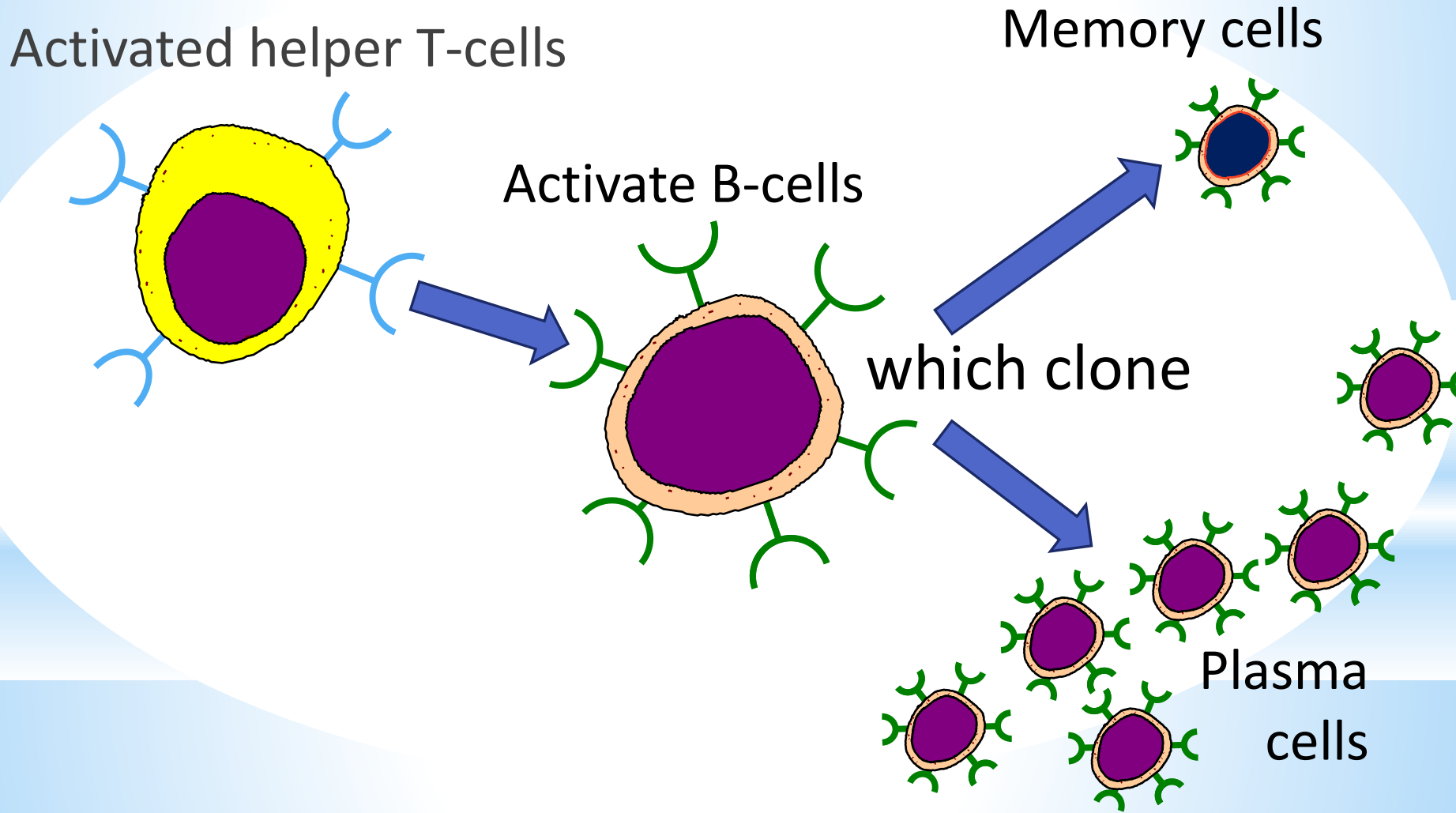
The macrophage displays the antigens from the surface of the pathogen on the outside of the macrophage membrane

# Helper T-cells

helper T-cells bind to antigen (on macrophage)  
and helper T-cells are activated

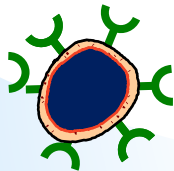
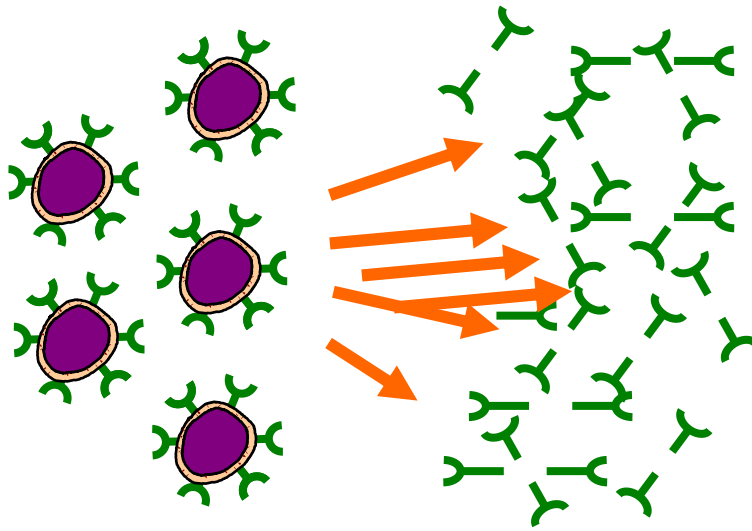


# Activation of B-lymphocytes



# Plasma cells and memory cells

plasma cells produce specific antibodies to the antigen



Memory cells give immunity

# Primary and secondary immune response

