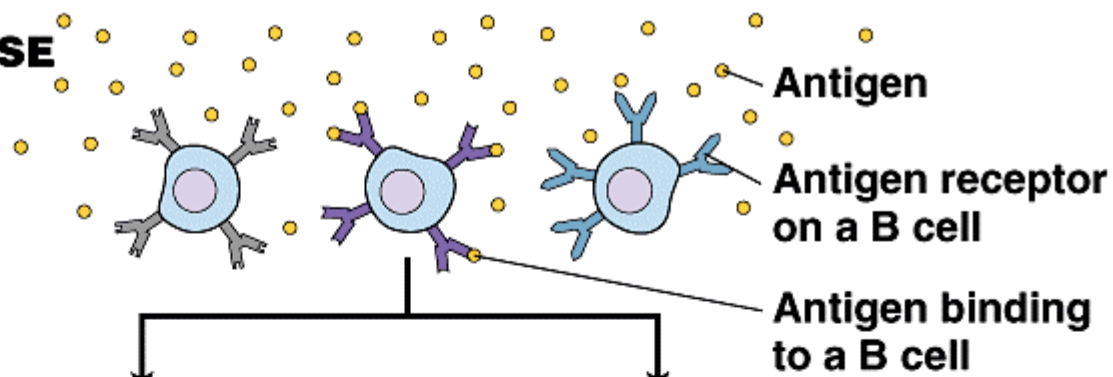
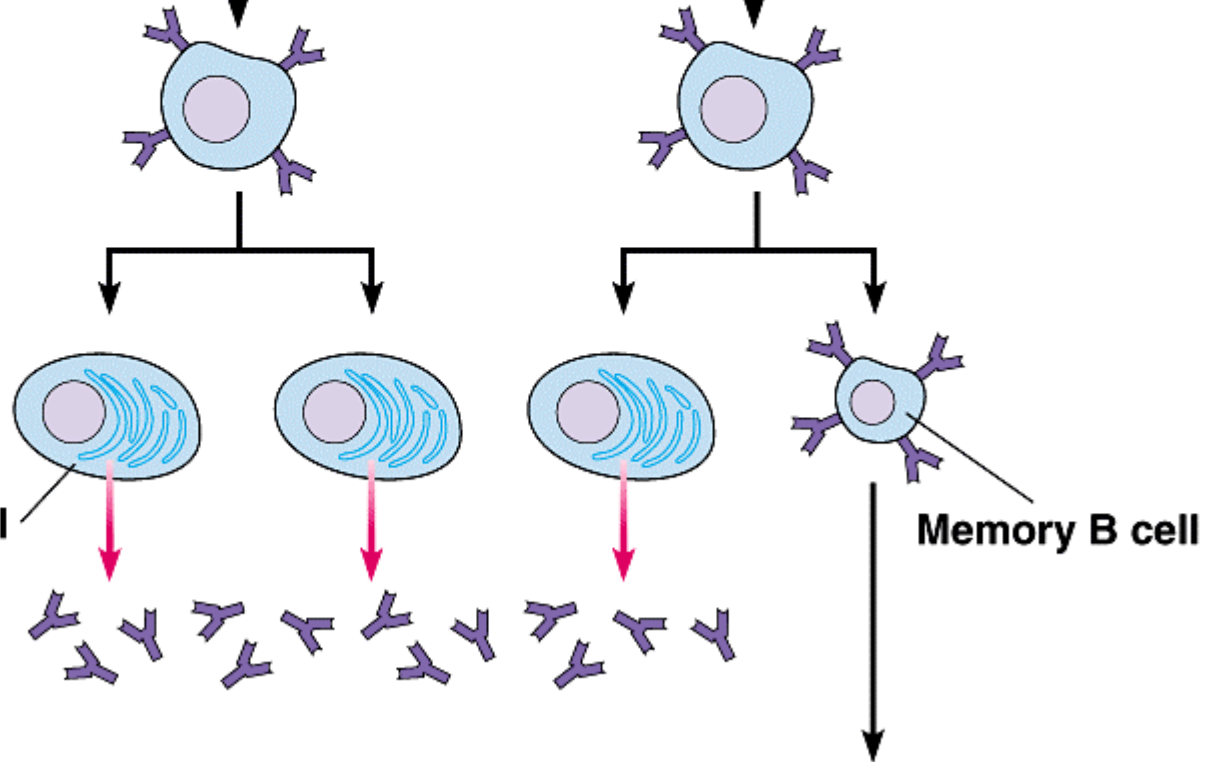


PRIMARY RESPONSE

(initial encounter with antigen)



Cell growth, division, and differentiation



SECONDARY RESPONSE (can be years later)

Cell growth,
division, and further
differentiation

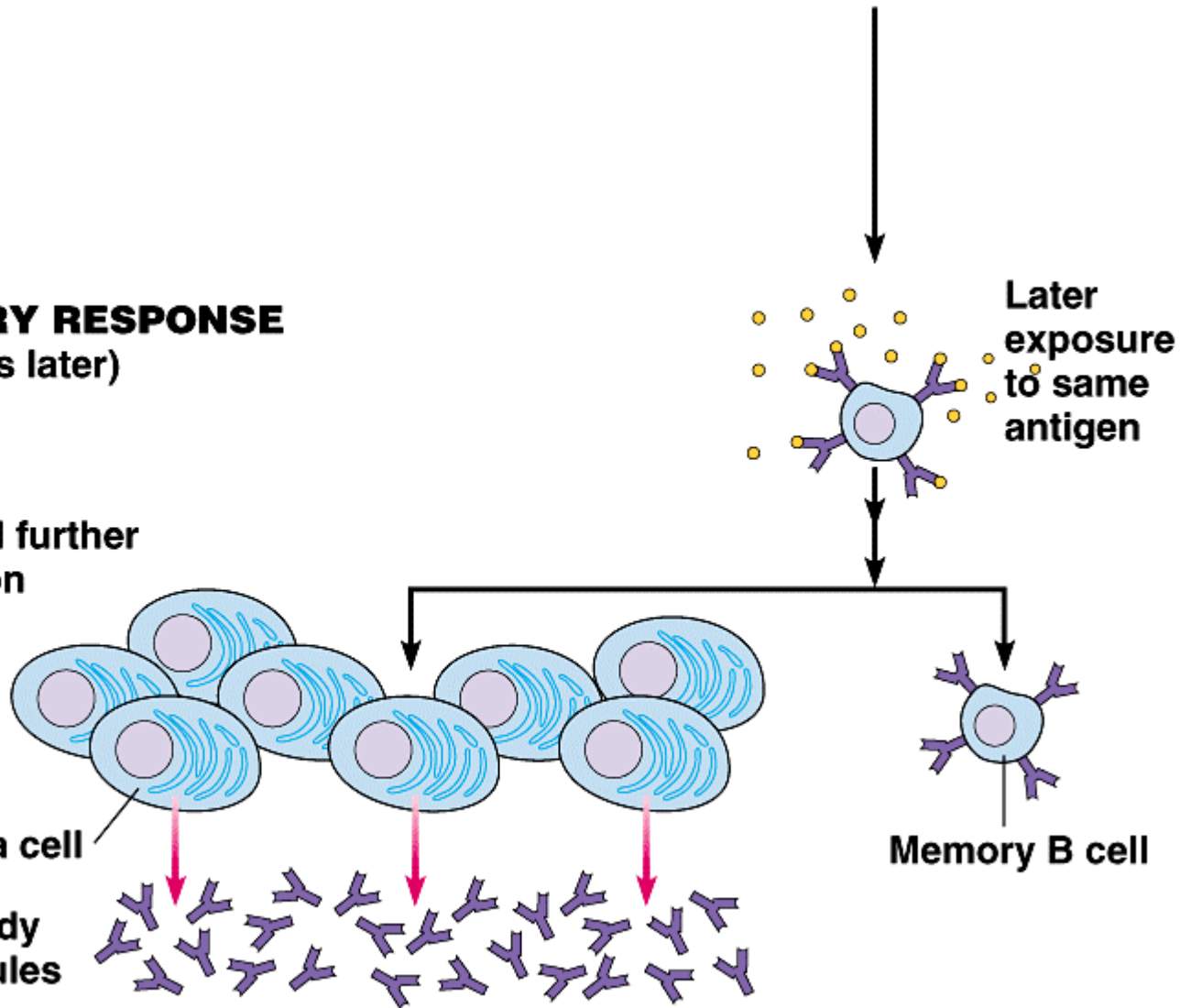
Larger clone
of cells

Plasma cell

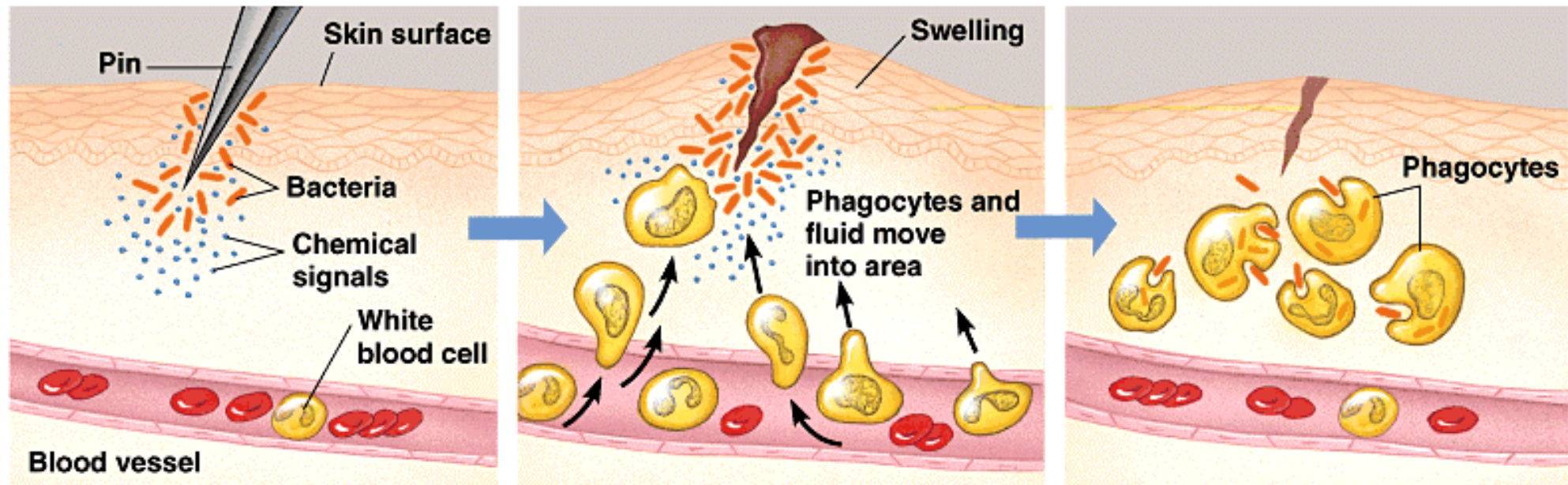
Antibody
molecules

Later
exposure
to same
antigen

Memory B cell



The Inflammatory Response



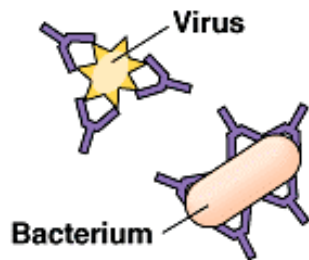
1 Tissue injury; release of chemical signals such as histamine

2 Dilation and increased leakiness of local blood vessels; migration of phagocytes to the area

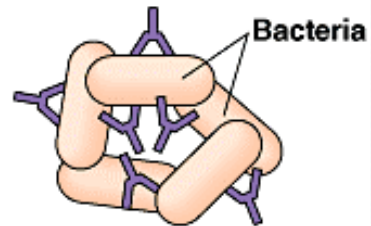
3 Phagocytes (macrophages and neutrophils) consume bacteria and cell debris; tissue heals

**Binding of antibodies to antigens
inactivates antigens by**

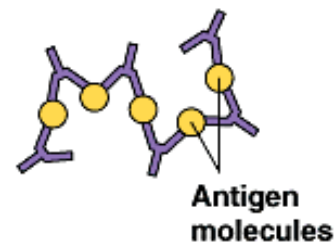
**Neutralization
(blocks viral binding sites;
coats bacterial toxins)**



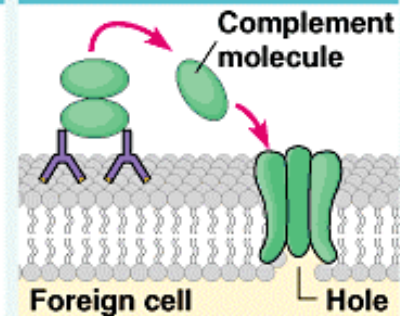
**Agglutination
of microbes**



**Precipitation of
dissolved antigens**

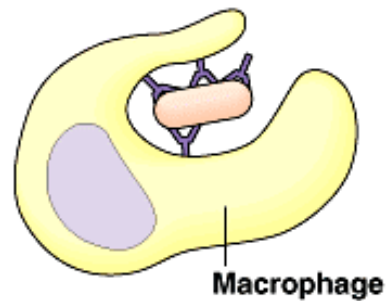


**Activation
of complement**



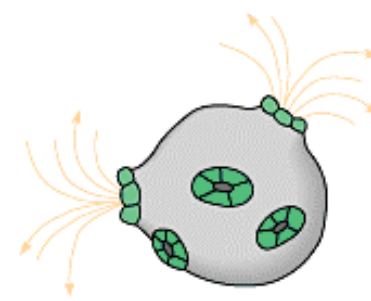
Enhances

Phagocytosis

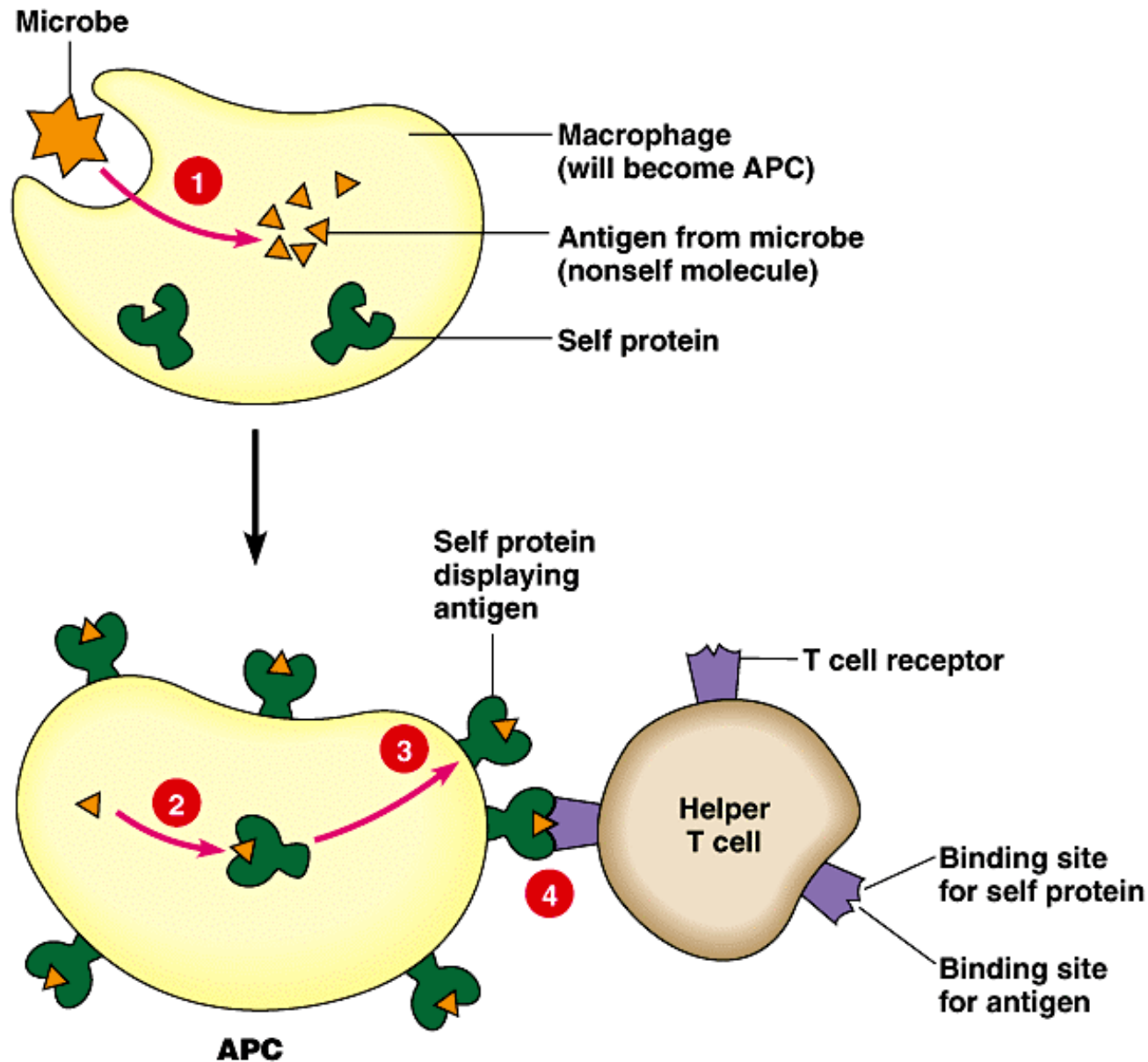


Leads to

Cell lysis

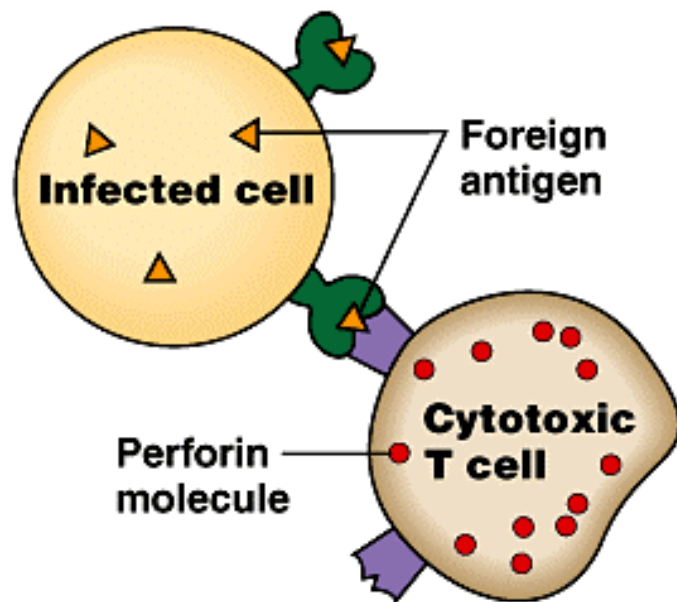


The Development of an Antigen-Presenting Cell and Its Interaction with a Helper T-cell

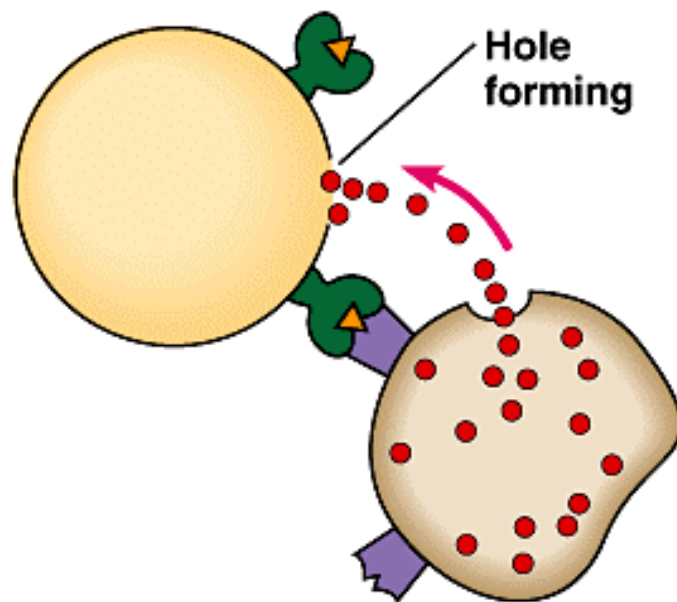


How a Cytotoxic T-cell Kills an Infected Cell

- 1** Cytotoxic T cell binds to infected cell



- 2** Perforin makes holes in infected cell's membrane



- 3** Infected cell is destroyed

