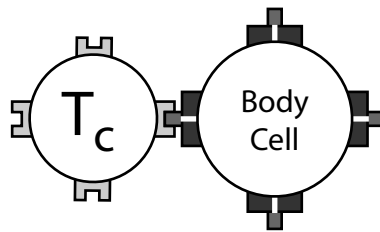




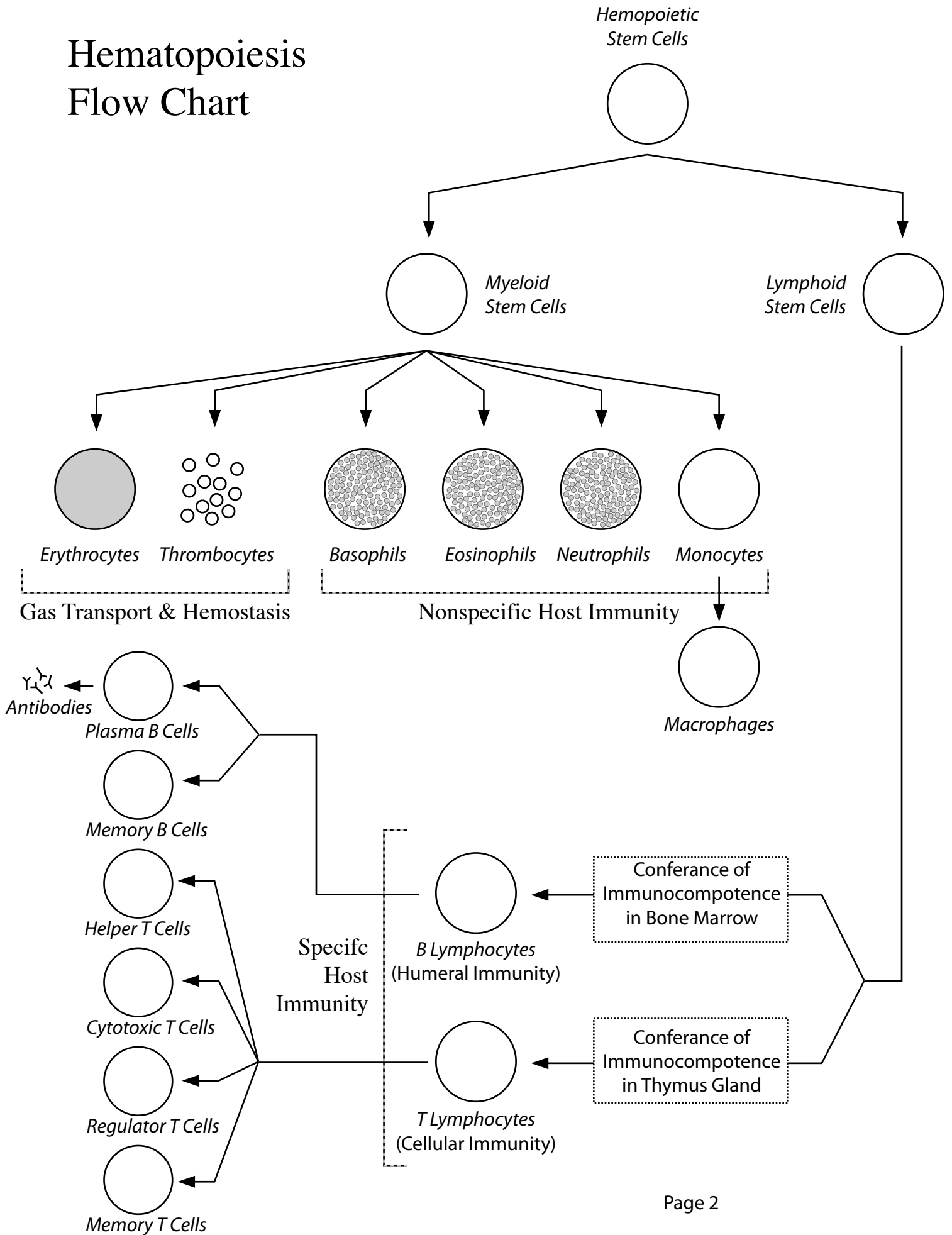
# Concepts in Specific Host Immunity

A preparatory guide to  
concepts in  
*Adaptive Immunity*  
to accompany the lecture sequence



*By Noel Ways*

# Hematopoiesis Flow Chart



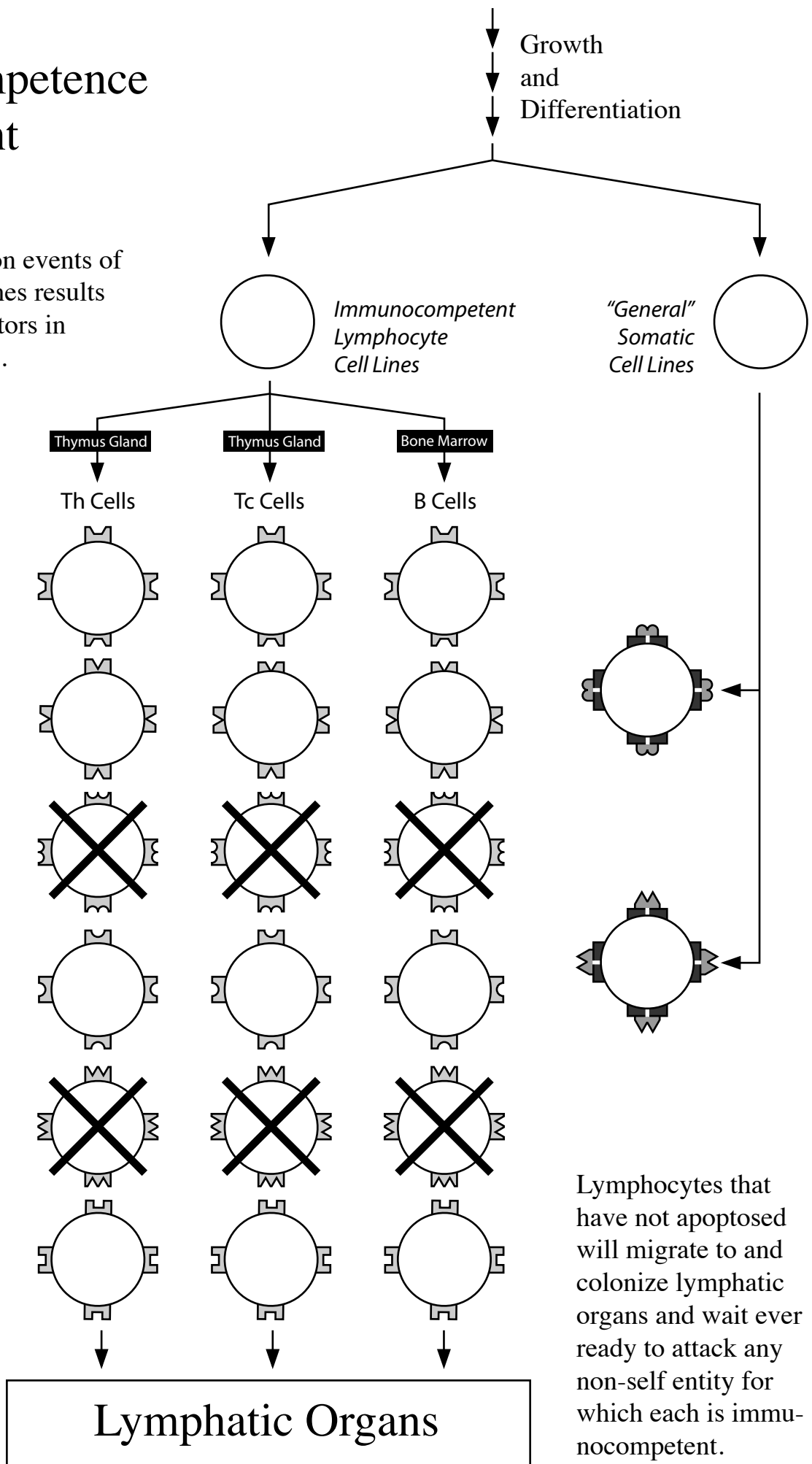
# Immunocompetence Development

Genetic recombination events of approximately 60 genes results in vast array of receptors in lymphocyte cell lines.

This "Oxford Dictionary" of receptors are competent to recognize huge numbers of cell surface structures including many "self" molecular structures.

However, lymphocytes competent to recognize "self" molecular structures instructed to apoptose.

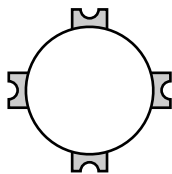
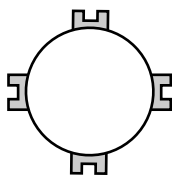
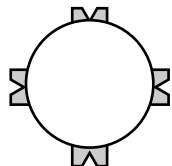
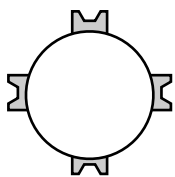
With their elimination complete, an autoimmune response / disease is not possible.



Lymphocytes that have not apoptosed will migrate to and colonize lymphatic organs and wait ever ready to attack any non-self entity for which each is immunocompetent.

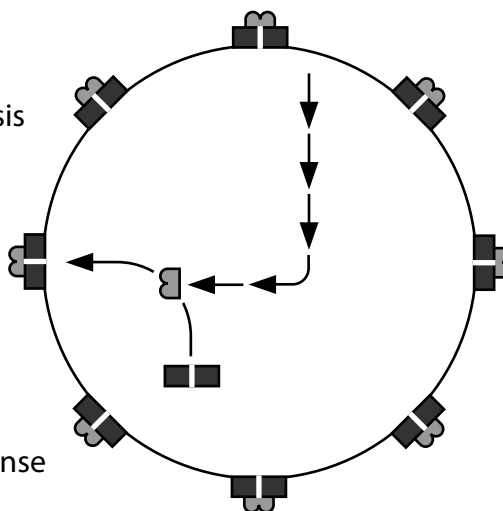
# Endogenous Antigen Display

Immunocompetent Tc Cells



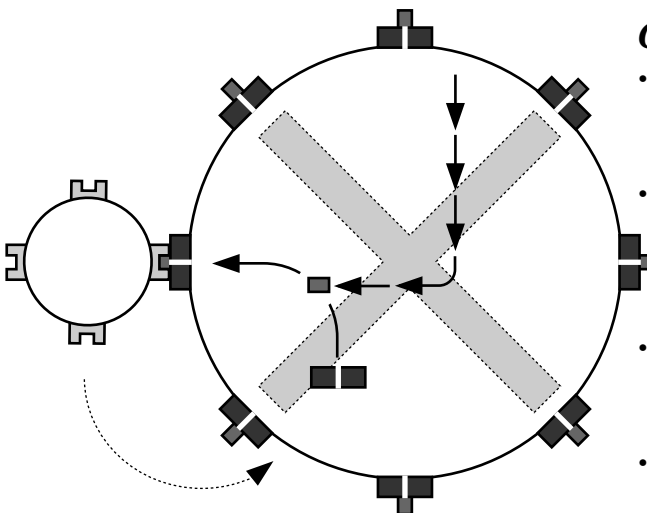
## Healthy Cell:

- Normal protein synthesis
- Normal protein ( ◻ ) displayed with Class I MHC ( ■■ )
- No Tc Cell is immunocompetent against it
- No autoimmune response



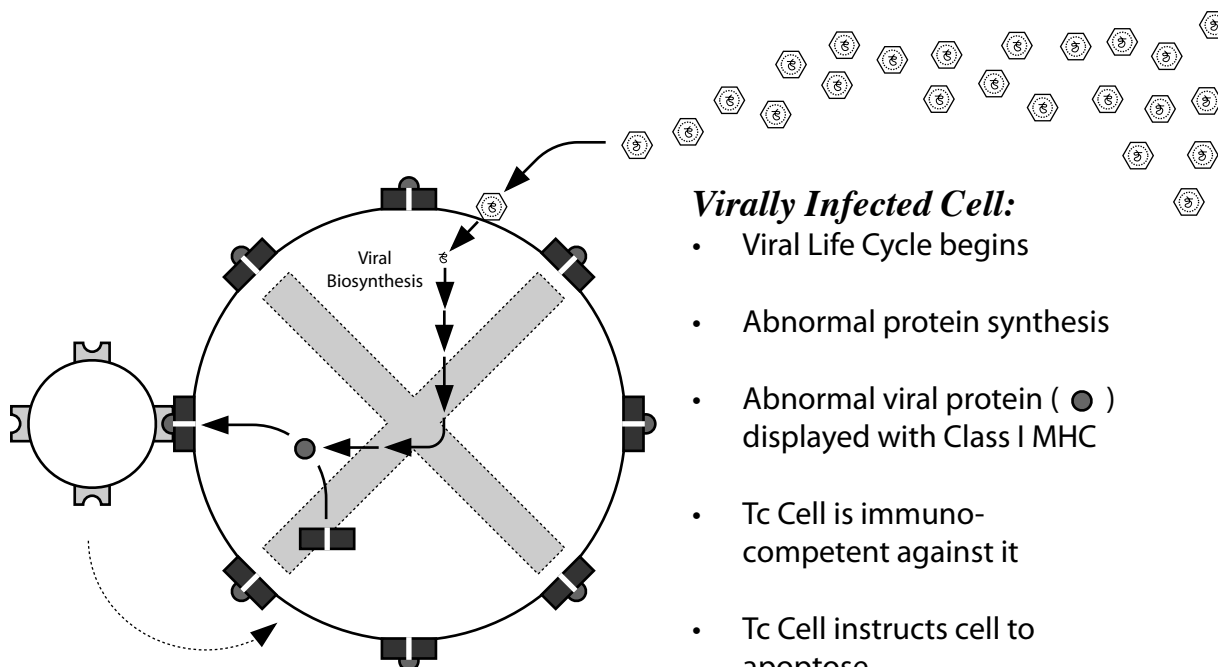
## Cancer Cell:

- Abnormal protein synthesis
- Abnormal protein ( ◼ ) displayed with Class I MHC
- Tc Cell is immunocompetent against it
- Tc Cell instructs cell to apoptose



## Virally Infected Cell:

- Viral Life Cycle begins
- Abnormal protein synthesis
- Abnormal viral protein ( ● ) displayed with Class I MHC
- Tc Cell is immunocompetent against it
- Tc Cell instructs cell to apoptose

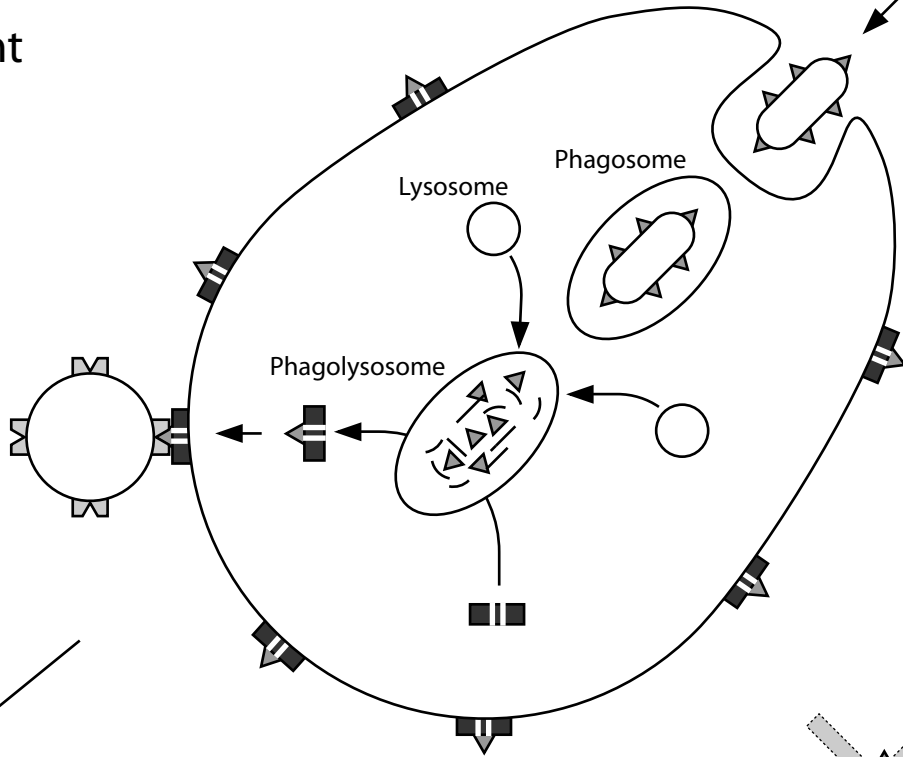
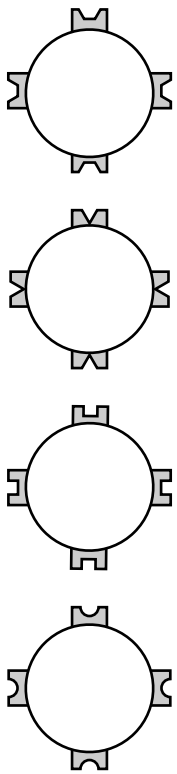


# Exogenous Antigen Display

- Phagocytosis
- Antigen processing within phagolysosome
- Antigen (  $\Delta$  ) displayed in conjunction with Class II MHC ( ■■■ )
- Cell is now an "Antigen Presenting Cell"

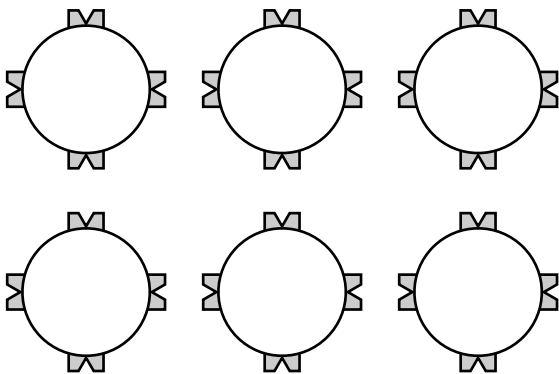
Examples: Macrophages, Dendritic Cells, B Cells

## Immunocompetent Th Cells



- Immunocompetent Th Cell binds to Class II MHC / Antigen complex
- If the APC is a B Cell, Th cell will induce B cell differentiation into Plasma B cells, which then clonally proliferate and produce antibodies.

Clonal Proliferation

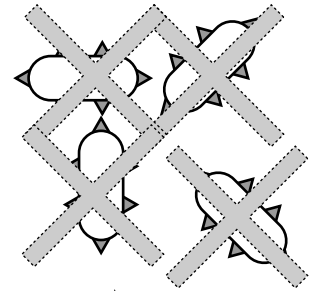


Plasma Cells



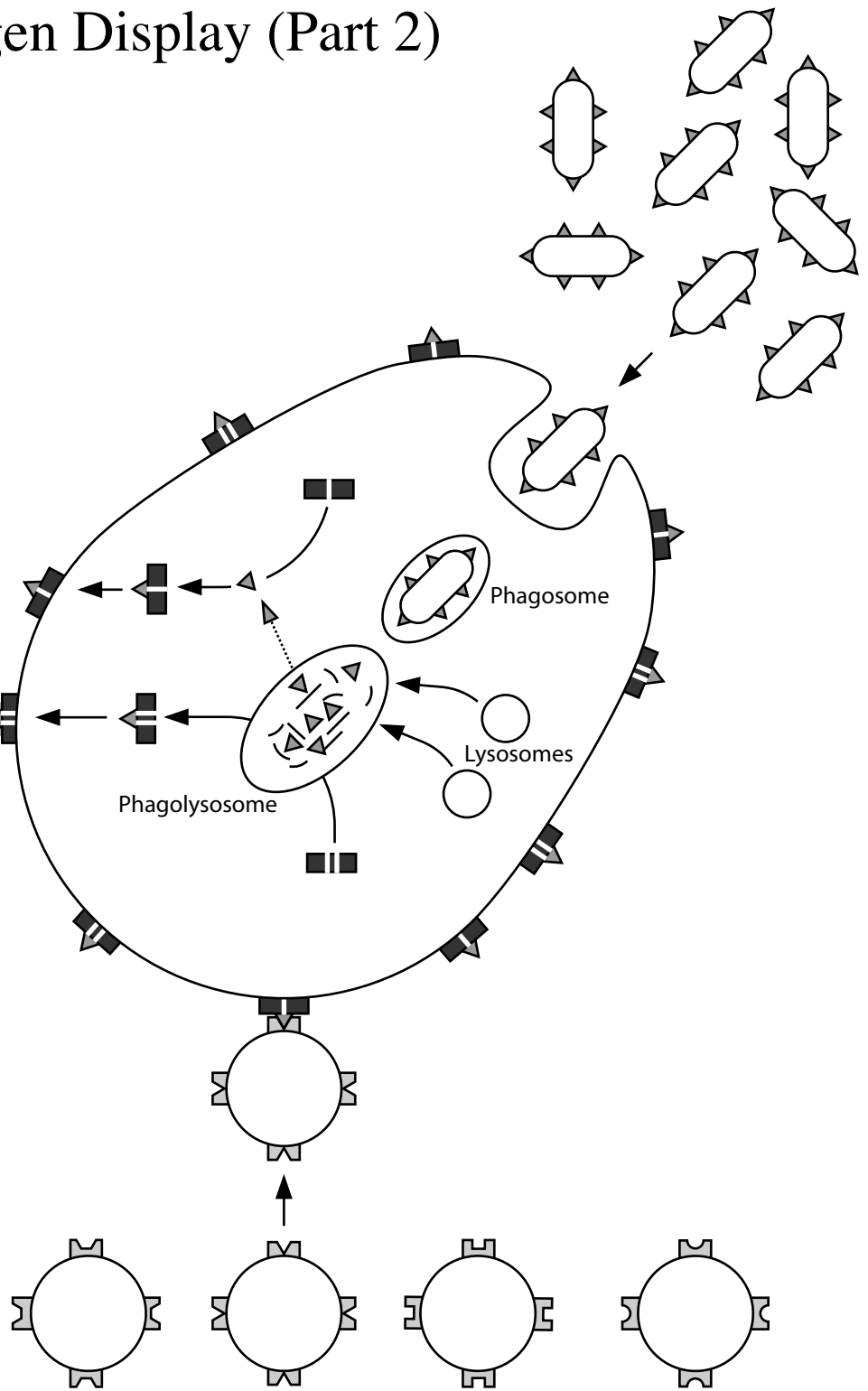
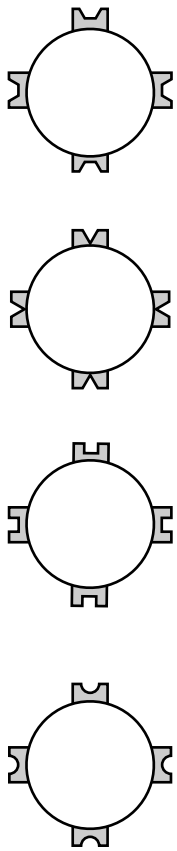
Antibodies

Antibody-antigen complexes form



# Exogenous Antigen Display (Part 2)

Immunocompetent Th Cells



Immunocompetent Tc Cells

# “Cast of Characters in the Immune Drama”

*\*\* In Progress \*\**

