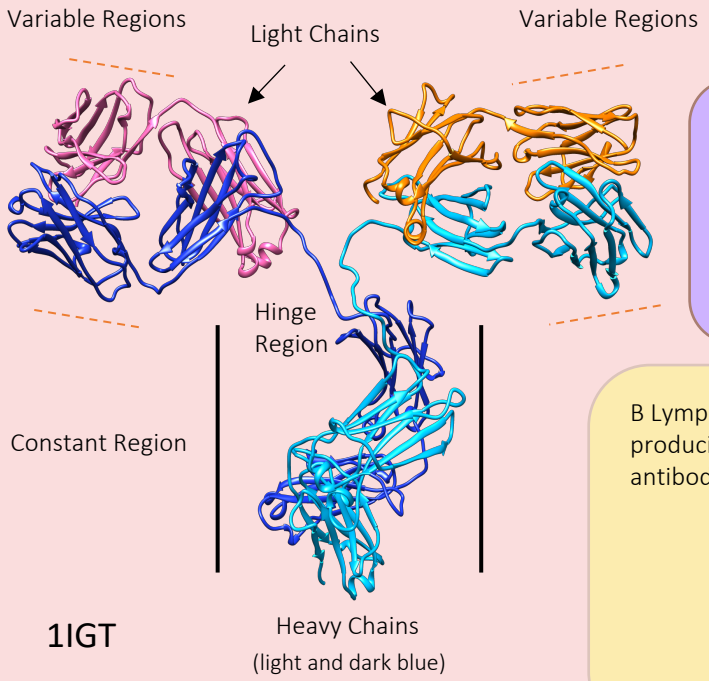
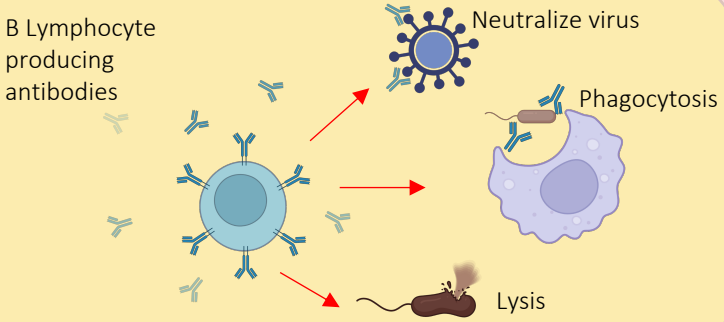
PROTEINS OF IMMUNITY



Antibodies
Immunoglobulins

- proteins made specifically to recognize foreign bodies within an organism
- attach to foreign bodies and recruit components of the immune system to combat infection and disease



STRUCTURE

- consist of two **light chains** and two larger **heavy chains**
- both light and heavy chains have a constant region and a variable region
- the **variable regions** differ in sequence and contribute to **antigen** (foreign body) specific recognition
- **constant regions** have little variance in sequence
- hinge region linked by **disulfide bonds**

LOCATION

- distributed throughout the lymph system in response to infection
- produced by **B lymphocytes** in lymph nodes
- activated B lymphocytes produce a **unique** antibody corresponding to a specific antigen
- bacteria and yeast can be engineered to produce antibodies, but do not naturally make them

FUNCTION

- essential for **adaptive immunity** – recognition of **pathogens** (bacteria, viruses, parasites) and initiation of defense mechanisms
- can induce a variety of immune responses:
  - neutralize viral surface proteins
  - recruit phagocytes for removal of antigens
  - induce inflammation
  - trigger microbe lysis

Autoimmune Disorders and Allergies[1]:

- **autoimmune disorders** result from antibodies mistakenly recognizing benign cells as foreign
  - *systemic*: lupus, rheumatoid arthritis, scleroderma
  - *organ specific*: Graves' disease (thyroid), type 1 diabetes (pancreas), vitiligo (skin)
- **allergies** result from the body's overreaction to allergens (pollen, dust, mites, etc.) and production of immunoglobulins (IgE) that travel to tissues and cause allergic reactions

[1] Pathology.jhu.edu/autoimmune/classification; Figure made in BioRender.com; Model made in UCSF Chimera