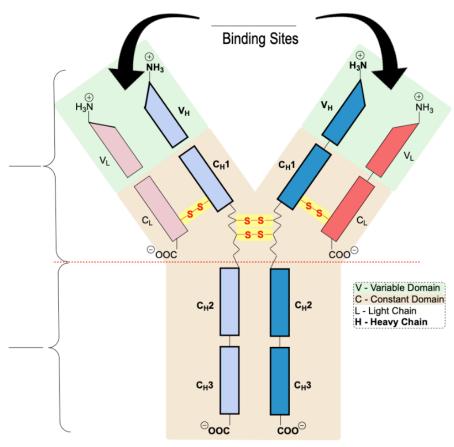
# **CONCEPT:** ANTIBODIES

- •Antibodies: "\_\_\_\_\_"-shaped proteins produced by *plasma* cells that can bind antigens & generate an immune response.
  - □ Antibodies are also called *immunoglobulins* (or *Ig*) & they typically have the same general structure.

### **Antibody Structure**

●Antibodies consist of polypeptide chains: two <i>identical</i> (L) chains & two	o identical (H) chains.
□ These 4 chains are <i>covalently</i> linked together via bonds.	
●Each light & heavy chain has a <i>variable</i> region ( domain) and a <i>constant</i> region (	domain).
$\ \square$ V domain: located at the tip (N-terminal) of each prong of the "Y" and contains the	he binding site.
□ C domain: located at the hinge & stem of the "Y" and is recognized by	system cells.
□ If antibody is broken at the hinge of the "Y", it leaves the prongs () and the	e stem ().

## **EXAMPLE:** Antibody Structure:



**PRACTICE:** \_\_\_\_\_ is another name for antibodies.

a) Epitope.

c) Antigen.

b) Immune protein.

d) Immunoglobulin.

### **CONCEPT: ANTIBODIES**

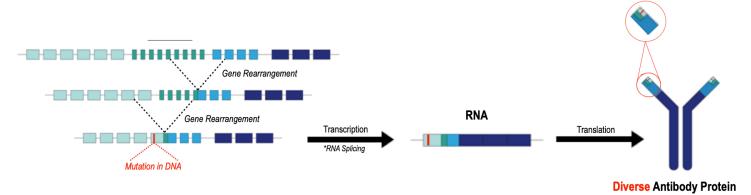
**PRACTICE:** An antibody's variable region:

- 1. Varies in amino acid sequence to allow different antibodies to bind different antigens.
- 2. Is located in the hinge and stem regions of an antibody.
- 3. Is a portion of the light chain of an antibody.
- 4. Is a portion of the heavy chain of an antibody.
  - a) 1 & 2.
- d) 1, 2, & 3.
- b) 1 & 3.
- e) 1, 3, & 4.
- c) 3 & 4.
- f) 1, 2, 3, & 4.

### **Antibody Diversity**

- Our immune system has potential to produce an \_\_\_\_\_ number of different antibodies (perhaps > 10<sup>18</sup>).
  - □ So many potential antibody possibilities that they all cannot be produced in one lifetime.
- Question: how is antibody diversity SO LARGE if humans only have ~25,000 genes?
  - □ Antibody diversity results from significant amounts of *gene* \_\_\_\_\_\_\_, *splicing*, & *mutations*.

**EXAMPLE:** Antibody diversity.



**PRACTICE:** Genetic recombination frequently occurs in the body's B cell population. Why is this advantageous to the immune system?

- a) More genetic diversity in antibody genes creates more diversity in antibodies.
- b) Having the ability to produce more diverse antibodies allows B cells to respond to a larger number of pathogens.
- c) More genetic diversity allows CD8 effector cells to be able to recognize and kill more endogenous pathogens.
- d) A and B.
- e) B and C.
- f) All of the above.