

Guided Notes

Antibodies and ELISA. Fill these in as we go, and label every diagram.

DATE Friday, September 18, 2026	COPY Student	DIAGRAMS Label all 4
EXAM Next week	USE Study from this	CLASSES All three

YOUR CHARGE TODAY

These notes are the exam. Everything a question can be built from is on these pages, and the four diagrams are the four most likely places a question starts.

YOU TURN IN

- Every blank filled.
- All four diagrams labelled in your own hand.

Time: During the lecture.

GREEN RULE You write here. Nothing else on the page is yours to fill in.	GOLD GROUND Given to you. Do not re-derive it. Controls and reference values live here.	GREY GROUND Instructions from Mr. Mendoza. Read before you start the step.	RED GROUND Safety. Read it before you touch any material.
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READ THIS

Fill each blank as we reach it. Do not write ahead; the order is the argument.

THE TWENTY LINES · YOU COMPLETE THESE

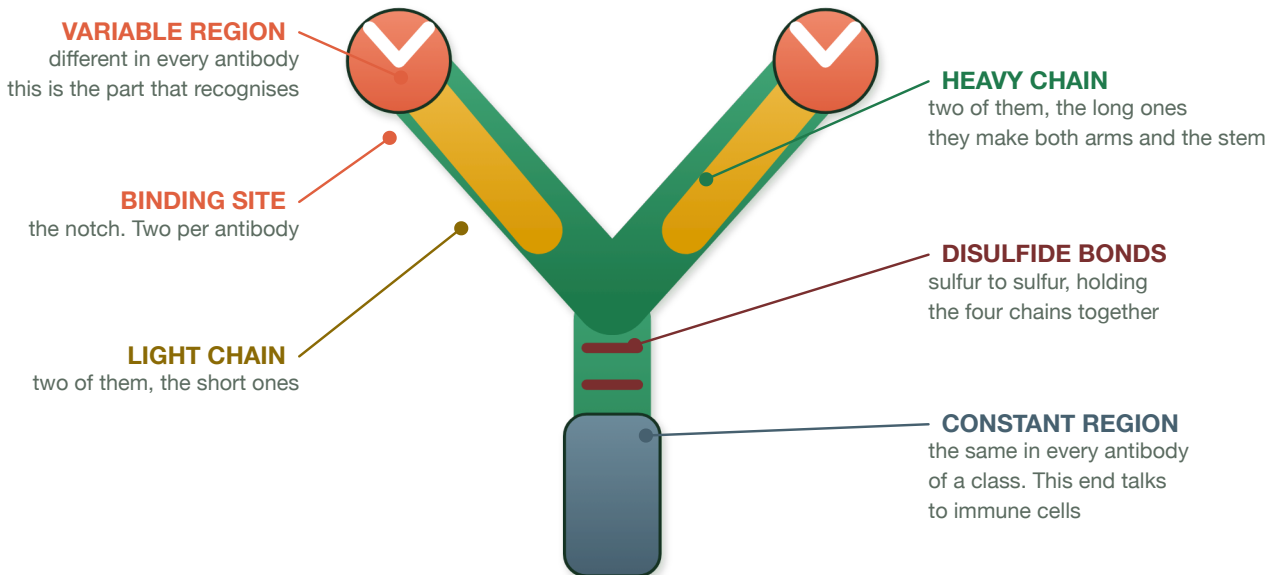
1. A protein's _____ decides what it can bind to.
2. A protein's shape comes from the _____ which a gene specifies.
3. An antibody is shaped like a _____ and is built from four chains.
4. The two long chains are the _____ and they form both arms and the stem.
5. The two short chains are the _____ and they sit on the outside of the arms.
6. The arm tips are the _____ which differs between antibodies and carries the binding site.
7. The stem is the _____ which immune cells read to know what to do.
8. The chains are held together by _____ which are sulfur to sulfur links.
9. The small patch an antibody recognises is called an _____ and one germ carries many of them.
10. A B cell displays _____ receptor shape on its surface.
11. When an invader seats into a receptor, that cell divides. This is called _____ .
12. A _____ cell makes antibody now. A _____ cell waits for next time.
13. Memory cells are the reason a _____ works.
14. The fast, general branch of the immune system is _____ immunity.
15. The slower, specific branch that remembers is _____ immunity.
16. ELISA stands for _____ .
17. In an ELISA the step that makes the result mean anything is the _____ .
18. More target in the sample means more _____ in the well.
19. Colour is turned into a concentration using a _____ .
20. A screening test is tuned to miss almost nothing, so it accepts _____ that a confirmatory test clears.

READ THIS

The antibody. Label: heavy chain, light chain, variable region, constant region, binding site, disulfide bond.

THE ANTIBODY, PART BY PART

Same colours on every diagram from here on. Learn them once.



TWO ENDS, TWO JOBS The top finds the invader. The bottom tells the rest of the immune system what to do about it.
That is why the top varies between antibodies and the bottom does not.

Label this diagram yourself. The printed labels are your check, not your answer; cover them and name the parts first.

YOU COMPLETE THIS

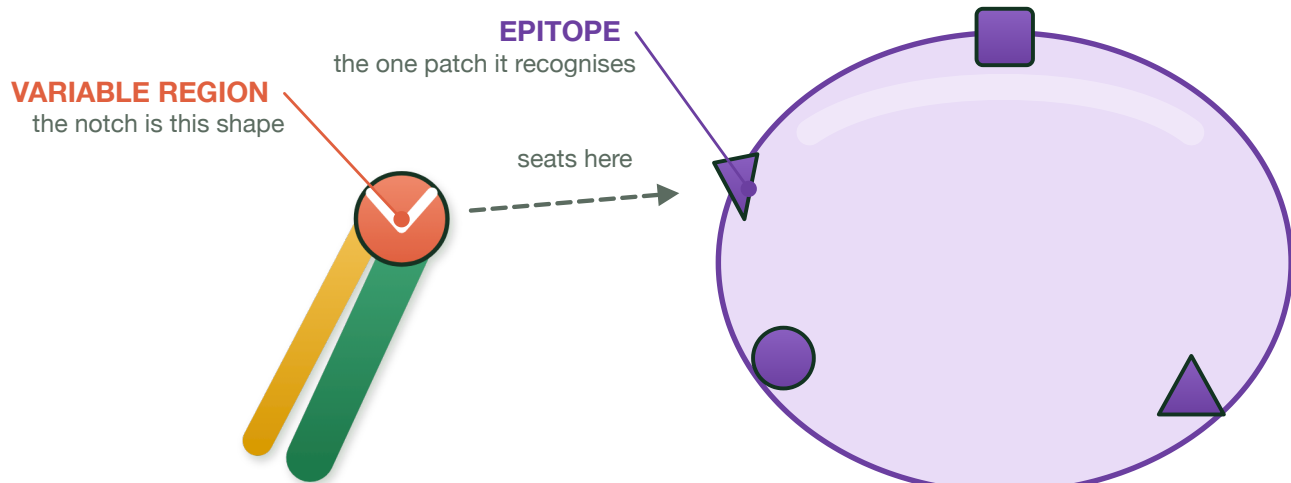
Write the sentence the task above asks for:

READ THIS

Binding. Label: epitope, variable region, and write one sentence on why the other three bumps do not bind here.

THE MOMENT OF BINDING, CLOSE UP

Two shapes meeting. No cutting, no killing, just holding on to one patch.



ONE GERM CARRIES MANY DIFFERENT EPITOPES, and your body makes a different antibody for each one.

Label this diagram yourself. The printed labels are your check, not your answer; cover them and name the parts first.

YOU COMPLETE THIS

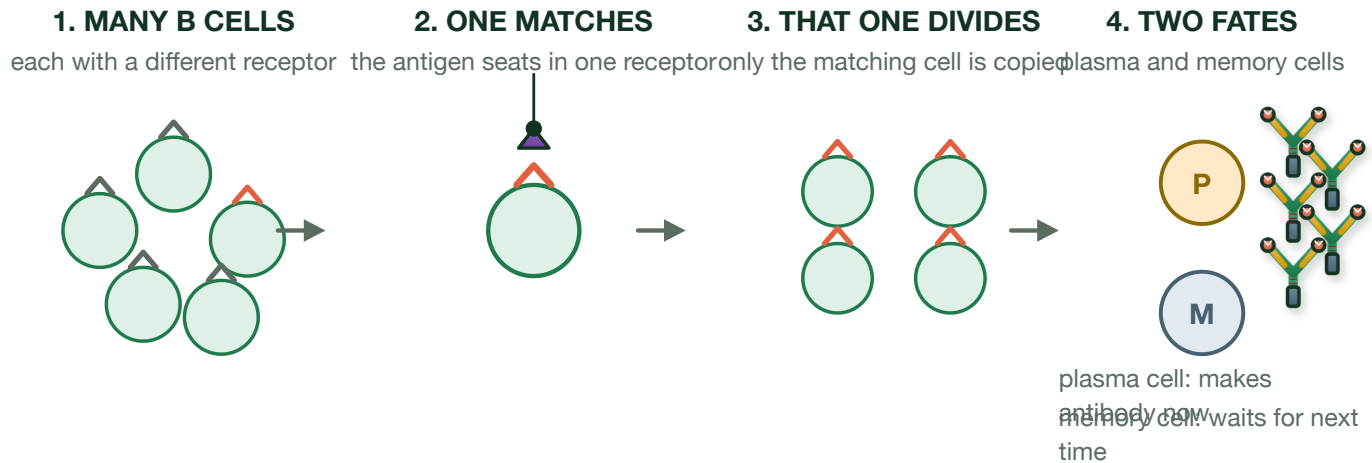
Write the sentence the task above asks for:

READ THIS

Making the right antibody. Label: B cell, antigen, plasma cell, memory cell. Then write what clonal selection means in one sentence.

HOW YOUR BODY MAKES THE RIGHT ANTIBODY

It does not design one to order. It already has millions, and the invader picks which one gets copied.

**THIS IS WHY A VACCINE WORKS, AND WHY YOU USUALLY GET CHICKENPOX ONCE.**

The memory cells from step 4 are still there years later, so the second meeting is answered in days instead of weeks.

THE NAME FOR THIS: clonal selection. The invader selects which B cell gets cloned.

Nothing designs the antibody. The right one already existed, and it got copied.

Label this diagram yourself. The printed labels are your check, not your answer; cover them and name the parts first.

YOU COMPLETE THIS

Write the sentence the task above asks for:

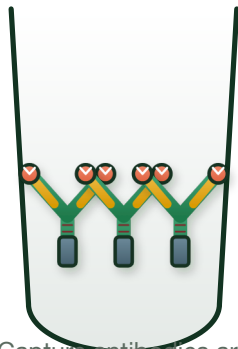
READ THIS

The ELISA. Label: capture antibody, target, detection antibody, enzyme, substrate. Then mark every place a wash happens.

HOW AN ELISA TURNS BINDING INTO A COLOUR YOU CAN MEASURE

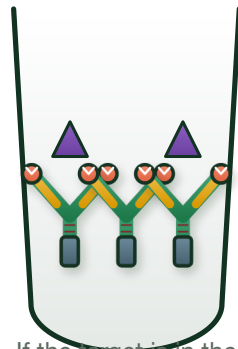
Read left to right. The wash step between each one is the step that makes the result mean anything.

1. COAT



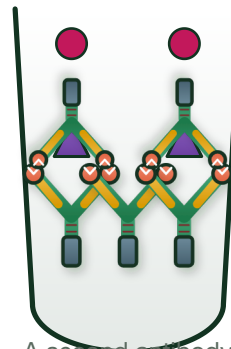
Capture antibodies are stuck to the bottom of the well.

2. ADD SAMPLE



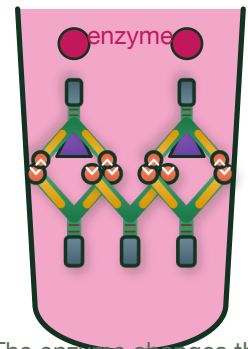
If the target is in the sample, it seats into a capture antibody. Then WASH.

3. ADD DETECTOR



A second antibody carrying an enzyme binds the other side. Then WASH.

4. ADD SUBSTRATE



The enzyme changes the substrate and the well turns colour.

THE WASH IS THE WHOLE TEST.

Anything that did not specifically bind gets washed away. What is left is only what bound, so the colour at the end is a measure of how much target was in the sample. No wash, no meaning.

WHAT AN ELISA IS USED FOR

Detecting an infection by finding either the germ's antigen or your antibodies against it. Screening donated blood. Allergy testing. Pregnancy tests. Any question shaped like: is this specific molecule here, and how much of it?

Label this diagram yourself. The printed labels are your check, not your answer; cover them and name the parts first.

YOU COMPLETE THIS

Write the sentence the task above asks for:
