Cornell Guided Notes

Genetics of Disease (Medical Interventions) | 2027-02-10

Name	Period	Date	Lesson
		2027-02-10	

Lesson focus

Antigen-antibody and ELISA model

Key words and questions	Prepared details and student notes

Essential question
What is today's target?

Explain how antigens and antibodies bind and run a model ELISA to see how that binding produces a signal. Big idea: How does the specificity of antibody-antigen binding make an ELISA a reliable diagnostic tool?

My notes, examples, and questions

Key words
What vocabulary unlocks the lesson?

- antigen
- antibody
- ELISA
- serial dilution
- standard curve
- substrate
- absorbance

My notes, examples, and questions

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Cornell Notes - Continued

Key words and questions	Prepared details and student notes
Must-know ideas **What should I understand by the end?**	- Antibodies bind only to their specific antigen at the binding site; this lock-and-key specificity prevents cross-reactions. - In an ELISA, binding is coupled to an enzyme-linked color reaction: more antigen bound means stronger color signal. - The standard curve converts a color intensity reading into a quantitative concentration. **My notes, examples, and questions**
Process notes **What happens during class?**	- 0-10 min: Draw antigen-antibody diagram in notebook; label antigen, antibody, and specific binding site - 10-20 min: Read the ELISA mechanism: binding, enzyme link, color reaction; summarize in two sentences - 20-55 min: Run the model ELISA: apply dilution series to labeled wells; record color in each well as it develops - 55-65 min: Use the standard curve to assign a concentration to each well color; record in data table - 65-73 min: Identify the positive result well and explain why it represents a positive in writing - 73-80 min: Write the specificity sentence; compare data table with a partner and resolve any discrepancies **My notes, examples, and questions**

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Steps and evidence **What do I do and turn in?**	- Draw an antigen and its matching antibody and label the specific binding site. - Read how an ELISA uses that binding plus a color reaction to detect a target. - Run the ELISA model with your dilution series, recording color at each well. - Match each well's color to a concentration using your standard curve. - Identify which model well represents a positive result and explain why. - Write one sentence on how antibody specificity makes the test trustworthy. Evidence: Data table - Model ELISA data table: well ID, observed color, and assigned concentration from standard curve; positive result identified and explained. **My notes, examples, and questions**
Checks for understanding **How do I know I got it?**	- You will be able to explain antigen-antibody specific binding. - You will be able to describe how an ELISA turns binding into a signal. - You will be able to read a model ELISA against a standard curve. **My notes, examples, and questions**

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Lab or safety notes
What must I handle carefully?

Safety:
- Goggles and gloves required for the full model run even with food-coloring solutions.
- Students must follow the labeled well layout exactly; switching wells invalidates the standard curve comparison.
- Dispose of used pipette tips in the designated waste container, not loose in the trash.
- Any spill on skin or eyes: rinse immediately with water; report to teacher.

Supplies:
- ELISA model kit or equivalent (labeled microwell strip, food-coloring solutions at known dilutions)
- Pipettes or dropper bottles calibrated for volume accuracy
- Standard curve graph from Wednesday (one per student)
- Pre-labeled well layout from Wednesday
- Nitrile gloves and safety goggles
- Timer for incubation steps
- Notebook and colored pencils or pens for recording well colors

My notes, examples, and questions

Summary

Today's lesson focused on Antigen-antibody and ELISA model. The main target was: Explain how antigens and antibodies bind and run a model ELISA to see how that binding produces a signal. The evidence of learning is Data table: Model ELISA data table: well ID, observed color, and assigned concentration from standard curve; positive result identified and explained.. In my own words, the most important idea from today is:

My summary

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My final question or connection