Cornell Guided Notes

Genetics of Disease (Medical Interventions) | 2027-03-19

Name	Period	Date	Lesson
		2027-03-19	

Lesson focus

Gel electrophoresis lab

Key words and questions	Prepared details and student notes

Essential question
What is today's target?

Run or model gel electrophoresis and interpret band positions to compare DNA fragments.
Big idea: How does an electric field turn invisible DNA fragments into a readable size map?

My notes, examples, and questions

Key words
What vocabulary unlocks the lesson?

- primer
- restriction enzyme
- gel electrophoresis
- microarray
- hybridization
- marker

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?**	- DNA is negatively charged at neutral pH; an electric field pulls fragments toward the positive pole. - Agarose acts as a molecular sieve: smaller fragments thread through faster and travel farther. - A DNA ladder is a mix of fragments of known size; aligning unknown bands to ladder bands gives a size estimate in base pairs. **My notes, examples, and questions**
Process notes **What happens during class?**	- 0-8: Safety and equipment orientation; review PCR pre-lab connection - 8-25: Load wells (or annotate gel diagram); identify ladder lane - 25-45: Record migration distances; rank all bands from largest to smallest - 45-60: Estimate sizes of two unknown bands using ladder; write values in data table - 60-72: Write explanation sentence for size-vs.-migration relationship - 72-80: Submit data table and interpretation; clean up workspace **My notes, examples, and questions**

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Steps and evidence **What do I do and turn in?**	- Load the gel diagram or wet gel with the sample wells and a size ladder labeled. - Record how far each band travels and rank fragments from largest to smallest. - Use the ladder to estimate the size of two unknown bands in base pairs. - Write one sentence explaining why smaller fragments travel farther through the gel. - Submit your banding interpretation with estimated sizes as your lab evidence. Evidence: Lab report - Gel banding data table with migration distances, largest-to-smallest ranking, two size estimates against the ladder, and an explanation of the size-migration relationship. **My notes, examples, and questions**
Checks for understanding **How do I know I got it?**	- You'll be able to read band positions on a gel. - You'll be able to estimate fragment sizes using a ladder. **My notes, examples, and questions**

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Lab or safety notes
What must I handle carefully?

Safety:
- Wear nitrile gloves when handling the gel, loading dye, or stain; wash hands after gloves are removed.
- If using a UV transilluminator, do not look directly at the UV light without proper UV-blocking safety glasses.
- Keep liquids away from the power supply; confirm the chamber lid is closed before turning on current.
- Ethidium bromide is a mutagen; only use pre-stained or EtBr-free alternatives (GelRed, SYBR Safe) unless teacher specifically directs otherwise.
- Discard gel fragments and tips in the designated waste container, not the regular trash.

Supplies:
- Agarose gel (pre-poured, 1%) or printed gel diagram for modeling
- DNA size ladder (e.g., 1 kb ladder) or printed ladder reference
- Loading dye mixed with PCR samples or simulated colored dye solutions
- Micropipettes (2-20 uL) and tips, or transfer pipettes if using colored dye model
- Electrophoresis chamber and power supply (or gel image printout for modeling)
- Ruler or printed scale bar for migration distance measurement
- Lab notebook or data-table template (paper or digital)

My notes, examples, and questions

Summary

Today's lesson focused on Gel electrophoresis lab. The main target was: Run or model gel electrophoresis and interpret band positions to compare DNA fragments. The evidence of learning is Lab report: Gel banding data table with migration distances, largest-to-smallest ranking, two size estimates against the ladder, and an explanation of the size-migration relationship.. In my own words, the most important idea from today is:

My summary

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My final question or connection