Cornell Guided Notes

Genetics of Disease (Medical Interventions) | 2026-12-03

Name	Period	Date	Lesson
		2026-12-03	

Lesson focus

Protein-purification lab

Key words and questions	Prepared details and student notes
Essential question **What is today's target?**	Run a protein-purification procedure and collect fractions to isolate the target protein. Big idea: Column chromatography physically separates proteins by exploiting molecular differences in binding affinity. **My notes, examples, and questions**
Key words **What vocabulary unlocks the lesson?**	- GFP - chromatography - elution - protein marker - purity - QC **My notes, examples, and questions**

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Cornell Notes - Continued

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Must-know ideas **What should I understand by the end?**	- Loading the lysate applies all proteins to the resin; only the target binds with high affinity. - Wash steps remove loosely bound contaminants before elution begins. - GFP fluorescence under UV is the qualitative signal that confirms the target protein is in a fraction. **My notes, examples, and questions**
Process notes **What happens during class?**	- 0-10: Read protocol; set up column and label collection tubes - 10-25: Load protein mixture; begin collecting fractions as wash proceeds - 25-45: Add elution buffer; collect elution fractions in order - 45-58: Check fractions under UV; record which fractions glow - 58-70: Label target fractions; note source of error and control - 70-80: Clean up column and bench; submit fraction-collection data sheet **My notes, examples, and questions**

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Steps and evidence **What do I do and turn in?**	- Read the lab protocol in the PLTW course shell and set up your column and tubes. - Load the protein mixture and begin collecting numbered fractions. - Add buffer to elute the bound protein and watch for the GFP signal under UV. - Record which fractions glow and label them as your target collection. - Note one source of error and how you controlled for it. - Submit your fraction-collection data sheet. Evidence: Data table - Fraction-collection data sheet recording tube number, buffer applied, GFP signal (yes/no), and target-fraction labels plus one error-control note. **My notes, examples, and questions**
Checks for understanding **How do I know I got it?**	- You'll be able to run a column purification and collect fractions. - You'll be able to identify target fractions using the GFP signal. **My notes, examples, and questions**

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Lab or safety notes
What must I handle carefully?

Safety:
- Wear nitrile gloves and safety goggles throughout the procedure.
- UV light is harmful to eyes and skin; never look directly into the UV lamp and minimize exposure to skin.
- Treat all protein samples as potential allergens; avoid contact with eyes and mouth.
- Dispose of all biological waste in designated containers per lab protocol.
- Wipe the bench with 70% ethanol before and after the procedure.

Supplies:
- Affinity chromatography column (pre-packed resin per PLTW kit or equivalent)
- Cell lysate containing GFP-tagged recombinant protein
- Wash buffer (appropriate for resin type)
- Elution buffer
- Numbered microcentrifuge collection tubes (1.5 mL, at least 8)
- Micropipettes and sterile tips (100 uL, 1000 uL)
- UV lamp or handheld UV light source (365 nm)

My notes, examples, and questions

Summary

Today's lesson focused on Protein-purification lab. The main target was: Run a protein-purification procedure and collect fractions to isolate the target protein. The evidence of learning is Data table: Fraction-collection data sheet recording tube number, buffer applied, GFP signal (yes/no), and target-fraction labels plus one error-control note.. In my own words, the most important idea from today is:

My summary

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My final question or connection