Cornell Guided Notes

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

Name	Period	Date	Lesson
		2027-02-02	

Lesson focus

BLAST computer lab

Key words and questions	Prepared details and student notes
Essential question **What is today's target?**	Use nucleotide BLAST to compare an unknown DNA sequence against a database and read the hit table. Big idea: How does comparing a DNA sequence to a database of known sequences reveal the identity of an unknown organism? **My notes, examples, and questions**
Key words **What vocabulary unlocks the lesson?**	- DNA sequence - PCR - Sanger sequencing - BLAST - E-value - query coverage - control **My notes, examples, and questions**

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Must-know ideas **What should I understand by the end?**	- BLAST (Basic Local Alignment Search Tool) aligns a query sequence against millions of known sequences and returns the closest matches. - The hit table shows organism name, percent identity, and E-value; the top hit with the highest identity and lowest E-value is the best match. - Running a known control sequence confirms the tool and your workflow are working correctly before trusting an unknown result. **My notes, examples, and questions**
Process notes **What happens during class?**	- 0-8 min: Open NCBI BLAST; review the interface and identify the query box, database selector, and results area - 8-20 min: Copy unknown sequence from case file into a scratch doc; paste into BLAST query box and run search - 20-35 min: Read the hit table: find top organism name and percent identity; screenshot and save to portfolio folder - 35-50 min: Run the teacher-provided control sequence; compare results to expected organism to validate workflow - 50-65 min: Write one sentence naming the likely organism and citing the percent identity as evidence - 65-80 min: Share results with a partner; compare top hits and discuss any discrepancies **My notes, examples, and questions**

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Steps and evidence **What do I do and turn in?**	- Copy the unknown DNA sequence from the case file into a scratch document so you do not lose it. - Go to NCBI BLAST, choose nucleotide BLAST, and paste your sequence into the query box. - Run the search, then read the top hit's organism name and percent identity. - Take a screenshot of the hit table for your portfolio. - Run a control sequence the teacher provides to confirm the workflow behaves. - Write one sentence naming the likely organism and the evidence behind it. Evidence: Lab report - BLAST hit table screenshot with top organism name and percent identity annotated; one-sentence identification statement; control run result. **My notes, examples, and questions**
Checks for understanding **How do I know I got it?**	- You will be able to run a nucleotide BLAST search. - You will be able to read an organism name and percent identity from a hit table. - You will be able to use a control to check your workflow. **My notes, examples, and questions**

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Lab or safety notes
What must I handle carefully?

Safety:
- No biological materials in this session; standard computer lab rules apply.
- Remind students not to close the BLAST results page before screenshotting; use Ctrl+S or Cmd+Shift+4 to capture.
- Students should save the screenshot immediately to a portfolio folder, not just the desktop.

Supplies:
- Student computers or tablets with internet access (one per student or per pair)
- Printed or digital case file with the unknown DNA sequence
- Teacher-provided control sequence (known organism)
- Screenshot or snipping tool accessible on student devices
- Notebook and pen for written identification sentence

My notes, examples, and questions

Summary

Today's lesson focused on BLAST computer lab. The main target was: Use nucleotide BLAST to compare an unknown DNA sequence against a database and read the hit table. The evidence of learning is Lab report: BLAST hit table screenshot with top organism name and percent identity annotated; one-sentence identification statement; control run result.. In my own words, the most important idea from today is:

My summary

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My final question or connection