

Cornell Guided Notes

Genetics of Disease (Medical Interventions) | 2026-09-09

Name

Period

Date

Lesson

Lesson focus

E-value and query coverage

Key words and questions

Prepared details and student notes

Essential question
What is today's target?

Interpret E-value and query coverage to judge how trustworthy a BLAST match really is.
Big idea: What makes one database match more trustworthy than another with equal percent identity?

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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Cornell Notes - Continued

Key words and questions

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Must-know ideas

What should I understand by the end?

- E-value is the expected number of matches that random chance would produce; a smaller E-value means the match is less likely to be coincidence.
- Query coverage tells you what fraction of your sequence was aligned; low coverage means only a short region matched, which is unreliable.
- A trustworthy BLAST identification requires high percent identity, low E-value, AND high query coverage together.

My notes, examples, and questions

Process notes

What happens during class?

- 0-10 min: Reopen Wednesday's BLAST results; find and label E-value, query coverage, and percent identity for the top hit
- 10-25 min: Write plain definitions of E-value and query coverage in your notebook
- 25-40 min: Compare two hits from the results: rank them using all three numbers and explain which is stronger and why
- 40-55 min: Flag any hit with high identity but low coverage; write one sentence explaining the reliability risk
- 55-70 min: Revise your pathogen identification statement to cite E-value, query coverage, and percent identity
- 70-80 min: Share revised statement with a partner; check that all three numbers are cited correctly

My notes, examples, and questions

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Steps and evidence What do I do and turn in?

- Reopen your BLAST results and find the E-value and query coverage for your top hit.
- Write what each means: E-value as how likely the match is by chance, coverage as how much aligned.
- Compare two hits and decide which is stronger using both numbers.
- Note the rule: a smaller E-value and higher coverage mean a more reliable match.
- Flag any hit that looks high in identity but low in coverage and explain the risk.
- Revise your pathogen identification statement to cite E-value and coverage.

Evidence: Data table - Two-hit comparison table (E-value, query coverage, percent identity) and revised identification statement citing all three metrics.

My notes, examples, and questions

Checks for understanding How do I know I got it?

- You will be able to explain what E-value and query coverage measure.
- You will be able to rank two BLAST matches by reliability.
- You will be able to support an identification with match-quality numbers.

My notes, examples, and questions

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Cornell Notes - Continued

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Lab or safety notes
What must I handle carefully?

Supplies:

- Lab computers with internet access
- NCBI BLAST nucleotide tool
- Unknown pathogen DNA sequence file
- Known control sequence file
- Shared results spreadsheet
- Screenshot tool

My notes, examples, and questions

Summary

Today's lesson focused on E-value and query coverage. The main target was: Interpret E-value and query coverage to judge how trustworthy a BLAST match really is. The evidence of learning is Data table: Two-hit comparison table (E-value, query coverage, percent identity) and revised identification statement citing all three metrics.. In my own words, the most important idea from today is:

My summary

My final question or connection