

Cornell Guided Notes

Principles of Biomedical Technology (Principles of Biomedical Science) | 2026-10-16

Name

Period

Date

Lesson

Lesson focus

DNA and protein modeling

Key words and questions

Prepared details and student notes

Essential question
What is today's target?

Model transcription and translation following an SOP and introduce a mutation to observe its effect. Big idea: Modeling transcription and translation with physical materials makes the abstract central dogma concrete and reveals exactly where a point mutation disrupts protein production.

My notes, examples, and questions

Key words
What vocabulary unlocks the lesson?

- DNA
- chromosome
- gene
- allele
- protein
- transcription
- translation
- mutation

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?

- In transcription, the template strand is read 3' to 5' and the mRNA is synthesized 5' to 3'; each DNA base pairs with its RNA complement (A with U, T with A, G with C, C with G).
- In translation, each mRNA codon (triplet of bases) specifies one amino acid using the codon chart; a stop codon (UAA, UAG, UGA) terminates the chain.
- A silent mutation changes the DNA but produces the same amino acid (due to codon degeneracy); a missense mutation changes one amino acid; a nonsense mutation introduces a premature stop codon.

My notes, examples, and questions

Process notes
What happens during class?

- 0:00: Quick review of Tuesday's pre-lab: confirm template sequences; check codon chart is accessible
- 0:10: Transcription: write the mRNA sequence complementary to the template; verify against a partner before proceeding
- 0:22: Translation: use the codon chart to identify each amino acid; write the full original amino acid sequence
- 0:38: Mutation: change one specified base in the DNA template; re-transcribe and re-translate; record the new amino acid sequence
- 0:56: Classify the mutation type (silent, missense, or nonsense) and record in the notebook with justification
- 1:05: Record one model limitation and one source of error; preview Thursday analysis

My notes, examples, and questions

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Steps and evidence What do I do and turn in?

- Read the modeling SOP and set up a DNA template strand.
- Transcribe the template into mRNA, recording each base pair.
- Translate the mRNA into an amino acid sequence using a codon chart.
- Introduce a point mutation and re-translate to compare the protein.
- Record one limitation of the model and one source of error.

Evidence: Lab report - Lab notebook entry: original DNA template strand, mRNA transcription, original amino acid sequence (with codon chart citations), mutated sequence after the point mutation, mutation type classification with justification, and one model limitation.

My notes, examples, and questions

Checks for understanding How do I know I got it?

- I can model transcription and translation accurately.
- I can show how a mutation alters a protein.

My notes, examples, and questions

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Lab or safety notes
What must I handle carefully?

Safety:

- This is a paper/physical modeling activity; standard classroom safety applies.
- If using plastic model kit pieces, do not put small pieces in your mouth and store all pieces in their labeled bag at the end of class.
- Handle scissors with care; pass them closed, handle-first.
- Return all model materials to the designated storage location at the end of class so they are available for subsequent periods.

Supplies:

- Printed codon charts (one per student)
- DNA model kits or paper cut-out base-pair strips (A, T, G, C and U sets)
- Colored pencils or markers (four colors: one per base)
- Lab notebooks or printed modeling worksheets
- Rulers for drawing the double-helix template strand neatly
- Scissors if using paper strip models

My notes, examples, and questions

Summary

Today's lesson focused on DNA and protein modeling. The main target was: Model transcription and translation following an SOP and introduce a mutation to observe its effect. The evidence of learning is Lab report: Lab notebook entry: original DNA template strand, mRNA transcription, original amino acid sequence (with codon chart citations), mutated sequence after the point mutation, mutation type classification with justification, and one model limitation.. In my own words, the most important idea from today is:

My summary

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My final question or connection