Cover page for

Module 5: TRANSLATION

# Submission Details

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# Lesson Overview

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| Lesson abstract: | Translation of messenger RNA is required for synthesis of proteins. Students will learn to determine the codons for specific amino acids and identify reading frames by looking at the base position track in the genome browser, to assemble exons to maintain the open reading frame (ORF) for a given gene, define the phases of the splice donor and acceptor sites and describe how they impact the maintenance of the ORF, and identify start and stop codons of an assembled ORF. |
| Lesson keywords: | Amino Acids  Associated Protein Synthesis Factors  Codon  Genome Browser  Messenger RNA  Ribosomes  tRNAs |
| Organism(s) that are the focus of this lesson: | None |
| Type(s) of student learning assessments: | Short answer formative questions |
| Websites and online databases used: | GEP UCSC Genome Browser (<http://gander.wustl.edu>) |
| Resources in addition to the lesson instructions | YouTube videos |

# Learning Topics

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| Topics in scientific fields: | Genetics  Genomics  Molecular Biology |
| Topics in mathematics or statistics: | None |
| Topics in bioinformatics or data science: | GEP UCSC Genome Browser (<http://gander.wustl.edu>) |

# Student Prerequisites

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| Recommended prior course work: | High school level biology |
| Recommended computer skills: | Basic: Familiarity with web browsers, word processing |

# Instructor Prerequisites

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| Recommended computer skills: | Basic: Familiarity with web browsers, word processing |
| Instructional requirements: | Basic Computer Lab (Access to laptops/desktops, no large memory or CPU requirements) |

# Implementation Recommendations

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| Instructional time required: | 1 class period or less |
| Students work as individuals or teams? | Either individual or team work is possible |
| Number of students in a class: | More than 50 students (assume no TAs and one computer for each student) |

# Accessibility

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| Available languages: | English |
| Additional materials for students with disabilities: | None |