Cover page for Module 4: SPLICING

# Submission Details

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# Lesson Overview

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| Lesson abstract: | All RNAs in the cell are collectively known as the “transcriptome,” as almost all RNA is produced by transcription from a DNA template. (In some cases, RNA is made from an RNA template.) The transcriptome includes messenger RNAs, ribosomal RNAs, transfer RNAs, and other RNAs that have specialized functions in the cell. Here, we will investigate how mRNA specifically is modified. Students will learn to identify splice donor and acceptor sites that are best supported by RNA-Seq and TopHat splice junction predictions and use the canonical splice donor and splice acceptor sequences to identify intron-exon boundaries. |
| Lesson keywords: | Exon  Intron  Splicing  RNA Maturation |
| 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: | Similarity searches (BLAST, Multiple Sequence Alignment)  Data visualization |

# 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) |

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# Implementation Recommendations

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| Instructional time required: | 1 class period |
| 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 |