Pre-lab: Intro to RNA-seq

Purpose

In this pre-lab, students learn about RNA-sequencing so that we can take a closer look at some RNA-seq data in class.

Learning Objectives

1. Compare and contrast the genome and the transcriptome
2. Describe the steps involved in RNA-seq
3. Define bioinformatics and its role in biology

Introduction

Next-generation DNA sequencing has revolutionized biological research. This tutorial will explain the basic process of next-gen sequencing and will discuss some of the ways it is used in research.

Activity 1 - Biotechnology: Next-Gen Sequencing

Estimated time: 20 min

Instructions

1. Access the C-MOOR Tutorials
   - If you are using SciServer, log into SciServer, click on compute and open your "C-MOOR LearnR" container. Visit SciServer Guides and FAQs if you need to jog your memory on how to do this.
   - If you are using AnVIL, log into AnVIL, navigate to your class Workspace, start up an RStudio Cloud Environment, and open RStudio. Visit the AnVIL Guides and FAQs if you need to jog your memory on how to do this. This module can be found in the "6-biotech-ngs" folder of the "rnaseq" curriculum folder.
   - If you are using an alternative setup, follow the instructions provided by your instructor.
2. Start the "Biotechnology: Next-Gen Sequencing" tutorial. Visit SciServer Guides and FAQs. if you need to jog your memory on how to do this.
3. To move through the activities click "Continue" at the bottom of the screen. When you are done with a topic, click "Next Topic" to move on.

Questions

What is Bioinformatics?

Briefly describe each of the following steps of next-gen sequencing:
in vivo:
in vitro:
in silico:

Activity 2 - Biotechnology: RNA-Seq

Estimated time: 10 min

Instructions

1. Start the "Biotechnology: RNA-Seq" tutorial. On AnVIL, this module can be found in the "7-biotech-rnaseq" folder of the "rnaseq" curriculum folder.
2. To move through the activities click "Continue" at the bottom of the screen. When you are done with a topic, click "Next Topic" to move on.

Questions

What is Differential Gene Expression?

What feature of mRNA allows scientists to specifically isolate mRNA for RNA-seq?

Describe the steps in making cDNA from an mRNA.

Explain how the number of reads related to gene expression.

Footnotes

Resources

*   [Google Doc](#)

Contributions and Affiliations

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