Biological Databases

Purpose

In this activity, students will learn to search the same online databases used by scientists to collect information about a set of genes and present them. This will be an opportunity to engage in inquiry-based learning and apply the concepts in molecular biology and genetics from this course.

Learning Objectives

1. Use online databases to look up information about a gene.

Activity 1 - Databases

Estimated time: 15 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 the 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 "3-intro-db" folder of the "rnaseq" curriculum folder.
   - If you are using an alternative setup, follow the instructions provided by your instructor.
2. Start the “Introduction to Biological Databases” Tutorial.
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.
4. As you complete the tutorial, fill in the table below. This will help you know which database to go back to later on.

Questions

Table 1. Databases

Database	Description
GenBank	
OMIM	
Human Protein Atlas	
PDB	

Activity 2 - FlyBase

Estimated time: 15 min

Instructions

1. Work through the FlyBase Tutorial. On AnVIL, this module can be found in the "4-db-flybase" 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

2A. What is one question you have about using FlyBase?

2B. What is something that surprised you or that you found interesting about using FlyBase?

Activity 3 - Human Protein Atlas

Estimated time: 15 min

Instructions

1. Work through the Human Protein Atlas Tutorial. On AnVIL, this module can be found in the "5-db-hpa" 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

3A. What is one question you have about using HPA?

3B. What is something that surprised you or that you found interesting about using HPA?

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Activity 4 - Research a Gene!

Estimated time: 45 min

Instructions

1. Before getting started on this activity, your instructor will assign your group a letter that corresponds to a group of 4 genes.

Group Assigned Letter

2. Look up your letter here and write the names of the four genes your group is assigned at the top of each column in the table below.
3. In your group, assign each student one of the four genes to research.

Individual Assigned Gene

4. Use FlyBase to look up the information in Table 2 below.
5. Use HPA to look up the information in Table 3 below.

Table 2. FlyBase Information

Category	Information
General Information	
Full Gene Name	
FlyBase ID	
Sequence Location	
Function	
Biological Process	
Cellular Component	
Expression Data	
Anatomical Expression	

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Developmental Stage	
Orthologs	
Orthologs in other species	
Human Orthologs	

Table 3. Human Protein Atlas

Category	Information
Function	
Is the gene tissue specific? Which tissue?	
Where is it localized in cells?	

Activity 5 - Present to your Group

Estimated time: 15 min

Instructions

1. Present your gene to your group.
2. Take turns presenting your genes amongst your group and decide on one gene that you think is the most interesting.

Activity 6 - Class Presentation

Estimated time:30 mins

Instructions

1. With your group, create a short presentation to present your chosen gene to the class.
2. Your presentation should have about four slides and be thorough:
    1. Slide 1: The GENE you picked to share with your group, your name and date
    2. Slide 2 - 4: Present the information you collected about the gene. For full credit, include relevant images/ diagrams on your slides.
3. One student in the group should post your slides to the discussion board. Make sure you mention everyone in your group by name so they also get credit for the presentation.

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Footnotes

Resources

- Google Doc
- Activity 4 Biological Databases Genes

Contributions and Affiliations

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