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| **Activity 1.1.6: The Final Diagnosis**  |

Introduction

As you wrap up your investigation and begin to treat those who are infected, you still want to provide a diagnosis for all of the patients who did not test positive for bacterial meningitis. You will analyze additional patient information as well as the available molecular data to provide diagnoses and treatment to the remaining patients. You will need to identify any links between these infected individuals and devise a plan for treatment.

Equipment

* Computer with Internet access
* Activity 1.1.6 Student Resource Sheet
* Laboratory journal

Procedure

1. Obtain a Student Resource Sheet from your teacher.
2. Read the information presented about the patients who did not test positive for bacterial meningitis.
3. Highlight or underline important information in the case history of each patient that appears to relate to a possible diagnosis.
4. Use the NCBI BLAST website at <http://blast.ncbi.nlm.nih.gov/Blast.cgi> to analyze provided sequence data and the Internet to research your results. Follow the directions listed below to enter data into the BLAST site.
* From the menu under *Basic BLAST*, choose *nucleotide blast*.
* Wait for the query page to open. Cut and paste the sequence data from the Student Resource Sheet into the *Enter Query Sequence* box.
* Locate the heading *Choose Search Set*. Click on the down arrow to reveal more choices.
* Under *Other Databases*, choose *Nucleotide Collection (nr/nt)*.
* Locate the heading *Program Selection*. Choose *somewhat similar sequences –blastn*.
* Once all the parameters are set, click the large blue BLAST button at the bottom of the page to search the genetic database for the entered sequence. This search may take a few moments.
* Scroll down the results page to view the matches that are found. The descriptions of organisms or genes found at the top of the list have the most in common with the sequence that was entered.
1. Use information provided on the resource sheet about patient symptoms and lab tests, and molecular data from your BLAST searches to provide a diagnosis for each patient. Describe how you came to your conclusions in your laboratory journal.
2. Research and describe a possible treatment for each patient.
3. Use the information provided in Activity 1.1.2 and Activity 1.1.3 to deduce the connections between infected patients. Refer to your web or flow chart. Document these connections in your laboratory journal.
4. Write a final report that summarizes your entire case (starting at Activity 1.1.2). Clearly show how you came to a final conclusion about the illness of each patient. Make sure to reference symptoms, molecular data, and laboratory tests. Your report should clearly and succinctly explain how all of the available data led to your solving the case at the college and should include a summary of how this outbreak should be handled on campus.

Conclusion

1. Describe an additional laboratory test that could be used to confirm the diagnosis of one of the patients who is not infected with meningitis.
2. Anthony still insists that he needs an antibiotic to treat his viral infection. Explain to him why an antibiotic will not help him get better.
3. What precautions could students on a college campus take to prevent getting sick and to protect themselves from passing illnesses back and forth?