Instructions: Use the resources provided to answer these questions as you work through the case study. Type them out on a separate piece of paper and hand them in on the due date.

The Causative Agent (1 pts)
1—Middle Ear infections are commonly caused by 3 bacteria: Haemophilus influenzae, Streptococcus pneumoniae or Moraxella catarrhalis. To find the cause of the recent outbreak, you streaked middle ear fluid from some patients onto different selective growth media:
   - Chocolate Agar with Vancomycin,
   - Blood Agar with Gentamicin
   - Blood Agar with Acetazolamide
What does it mean for a medium to be selective? What makes these media selective?

Treatment (1 pt)
2—For some reason, the typical antibiotic treatment is not working. So you run a Minimum Inhibitory Concentration (MIC) assay
What is the MIC of this bacterium growing in broth? What does this indicate about whether the bacterium is sensitive or resistant to amoxicillin?

DFA & Microscopy (2 pts)
3—You decide to examine swab samples taken from infected ears using a direct fluorescent antibody (DFA) assay against the pathogen.
Briefly describe the DFA method— How does DFA allow you to look specifically at one kind of bacterium, even when there may be different kinds of bacteria in your sample?

Your Conclusion (6 pts)
4—The question is: what is causing the outbreak, and why aren't antibiotics working?
Look at all the data together to write your conclusion. We will be looking for the following information:
   - What conclusion can you make from the selective agar results about what is likely causing the infections? Support your conclusion with evidence or observations.
   - What conclusion can you make from the MIC results about whether the bacterium is sensitive or resistant to amoxicillin? Support your conclusion with evidence or observations.
   - What did the direct fluorescent antibody results indicate about the ear infections? Support your conclusion with evidence or observations.
   - Why was the treatment not affective?
   - What other treatment options are available? What would you recommend to your benefactor?

Your answers should be thoughtful and well-organized and must incorporate the results you obtained in this case study. That is, use the information from your results and in the references to support your final conclusion.