# Pre-Lab Questions

1. What is the difference between chemically defined and chemically complex media? Give either a clinical or environmental research example for which each media type would be the most appropriate choice for culturing microorganisms.
2. Why is differential media typically inoculated with isolated colonies that have been previously cultured on general growth media?
3. Use a textbook or a reputable internet source (such as www.cdc.gov) to research and describe a scenario in a lab or clinical setting in which a selective and/or differential test would be necessary.

**Experiment 1: Bioprospecting for Starch Degrading Bacteria**

## Data Tables

Table 3: Starch Agar and Gram Iodine Results

| Sample | Growth on Starch Agar? (Yes or No) | Clear area around colonies? | Do these bacteria contain amylase? |
| --- | --- | --- | --- |
| A |  |  |  |
| B |  |  |  |
| C |  |  |  |
| D |  |  |  |

## Post-Lab Questions

1. Why is cow manure used as a potential source of starch-degrading bacteria? (If you are not familiar with the process of digestion in cows, use a reputable internet source to inform your answer.)
2. What are some other potential sources of starch-degrading bacteria?
3. What component makes starch agar selective for starch-degrading bacteria?
4. Why were each of the following steps performed in this experiment?
   1. Serial dilution:
   2. Growth on the nutrient agar plates:
   3. Streak on the starch agar plates:

**Experiment 2: Selection and Differentiation of Body Inhabiting Gram-Positive Bacteria**

## Data Tables

Table 4: Experiment 2 MSA Growth Observations

| Surface Tested | Growth (Yes or No) – Nutrient Agar | Growth (Yes or No) – MSA Agar | MSA color around colonies (Red or Yellow) | Other Observations |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

## Post-Lab Questions

1. What chemical in MSA confers selectivity? How?
2. What chemical makes MSA differential? How?
3. Why are the nutrient agar plates used in this experiment?
4. Was there any growth on you MSA plates? Did any of the colonies change the color of the MSA? What does this tell you about the bacteria taken from each area of your body?

**Experiment 3: Selection and Differentiation of Body Inhabiting Gram-Negative Bacteria from Liquid Samples**

## Data Tables

Table 5: MacConkey Agar Results

| Sample | Growth? (Yes or No) | Colony Color (Clear or Red) | Analysis |
| --- | --- | --- | --- |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

## Experiment 3 Post-Lab Questions

1. What types of bacteria are inhibited on MacConkey agar? What ingredient(s) in MacConkey agar selects against those bacteria?
2. What ingredient(s) makes MacConkey agar differential?
3. Using a textbook and a reputable online source (such as [the CDC](http://www.cdc.gov)), research and describe some potentially pathogenic members of the intestinal bacteria family *Enterobacteriaceae*. Which pathogenic species are lactose fermenters that will grow on MacConkey agar?
4. Use a reputable internet source to research and describe some potentially pathogenic intestinal bacteria that do not ferment lactose that will grow on MacConkey agar.
5. Use a reputable internet source to research and describe what variations of MacConkey agar can be used to detect other species of bacteria.
6. How would you verify that the colonies that grew on a MacConkey agar plate were Gram-negative?
7. Look up the formula for MacConkey agar either in a microbiology textbook or [online](http://www.bd.com/ds/productCenter/221172.asp). Is this a chemically defined or a chemically complex media? Why is that important?