26: Catalase Test

Objectives

• Test for the enzyme catalase on your unknown isolates

Hydrogen peroxide \( \text{H}_2\text{O}_2 \) is a by-product of respiration and is lethal if it accumulates in the cell. The enzyme catalase degrades the hydrogen peroxide in the cell before it can do any cell damage. It splits the \( \text{H}_2\text{O}_2 \) to free oxygen (bubbles) and water. Generally, the test reaction is very fast and obvious bubbles will be seen. Catalase is made by your own cells, as well as a variety of other cells, including many bacteria. This test is particularly important for the gram + bacteria. For example, the genus *Staphylococcus* is a + catalase reaction, whereas the genus *Streptococcus* is a – catalase reaction.

IMPORTANT POINTS

• Read the slide reaction against a **DARK background**, preferably black: otherwise it is difficult to see the bubbles.
• Use a culture growing on **AN AGAR PLATE OR AGAR SLANT** to run the slide catalase test.
• You can drop \( \text{H}_2\text{O}_2 \) directly on an agar plate or slant, but it may kill the culture.

MATERIALS NEEDED

• 3% hydrogen peroxide

THE PROCEDURE

1. Pick the inoculum from a plate culture or slant culture and place it on a slide.
2. Add one drop of H$_2$O$_2$ and look for immediate bubbling.

**INTERPRETATION**

[Image of positive and negative catalase results]

**Usually immediately** you will see a reaction if there is one, most often lots of bubbles. Slight bubbles indicate a positive reaction also.

**QUESTIONS**

1. What are the bubbles that you see in a + reaction?
2. Name the reagent used for this test.

**Contributors**

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