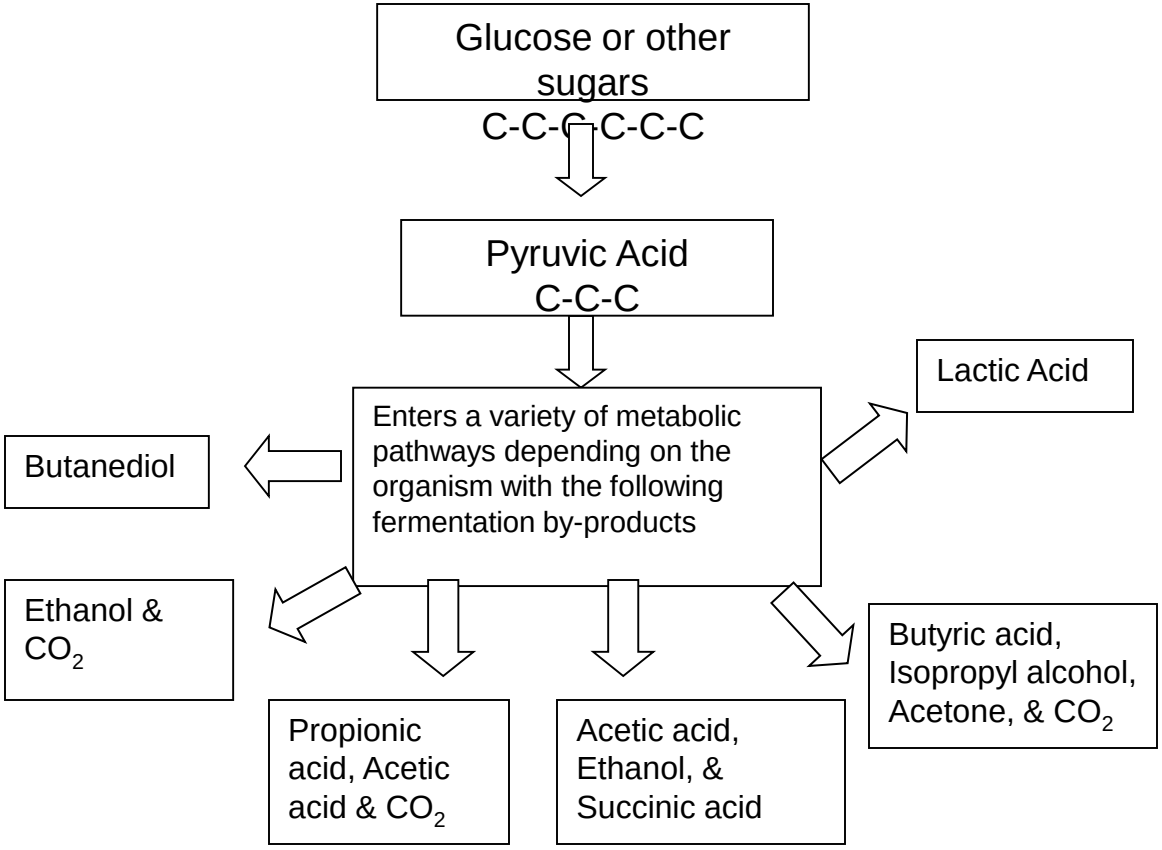
Fermentation Lab

Fermentation



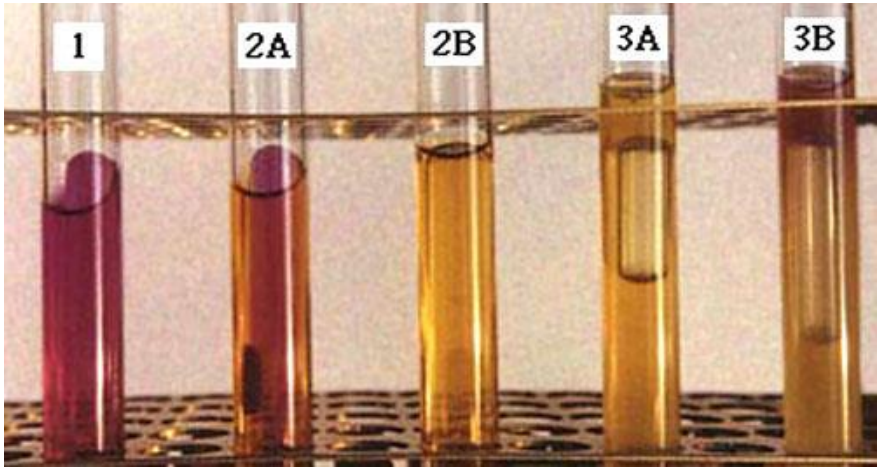
Media Used For Determination

- ***Fermentation Broth***
  - **Fermentation** of carbohydrates results in the **abundant production of acidic end products**, the presence of which can be **detected by the pH indicator** in the medium.
  - Many organisms produce **gas** – either CO_2 alone or a mixture of H_2 and CO_2. **H_2 is insoluble** and is **detected by bubble formation in a Durham tube** placed in the medium.

Durham Tube

- A Durham fermentation tube is a test tube that has a second inverted tube inside used to capture fermented gas byproducts of bacteria.
- Typically the tube has a pH indicator in it, like phenol red, that will change color when acid is present (in this case to yellow).
- Gases are trapped inside the Durham tube, indicating the production of gas.

Possible Results



Tube 1: No fermentation. The pH indicator remains red. **There can still be growth** due to the use of amino acids as sources of energy (usually by respiration).

Tubes 2A and 2B: Fermentation with the production of acid (yellow color) but no gas. A slight amount of acid is seen in tube 2A, but fermentation is still recorded for this tube.

Tubes 3A and 3B: Fermentation with the production of acid (yellow color) and insoluble gas (bubble in Durham tube). Tube 3B shows an alkaline reaction on top; this is simply due to deamination of amino acids whose alkaline reaction has not been over-neutralized by the acid diffusing through the tube from fermentation.

Your Experiment

- You will use a loop to inoculate each of five different fermentation tubes with your unknown bacterium.
  - Dextrose (D-glucose)
  - Lactose
  - Sucrose
  - Maltose
  - Mannose

Cont'd

- The tubes will incubate at 30 degrees Celsius.

- Tubes will be scored next week
  - Growth +/- (Turbidity?!)
  - Acid +/- (Yellow vs. red)
  - Gas +/- (Bubble in Durham tube)