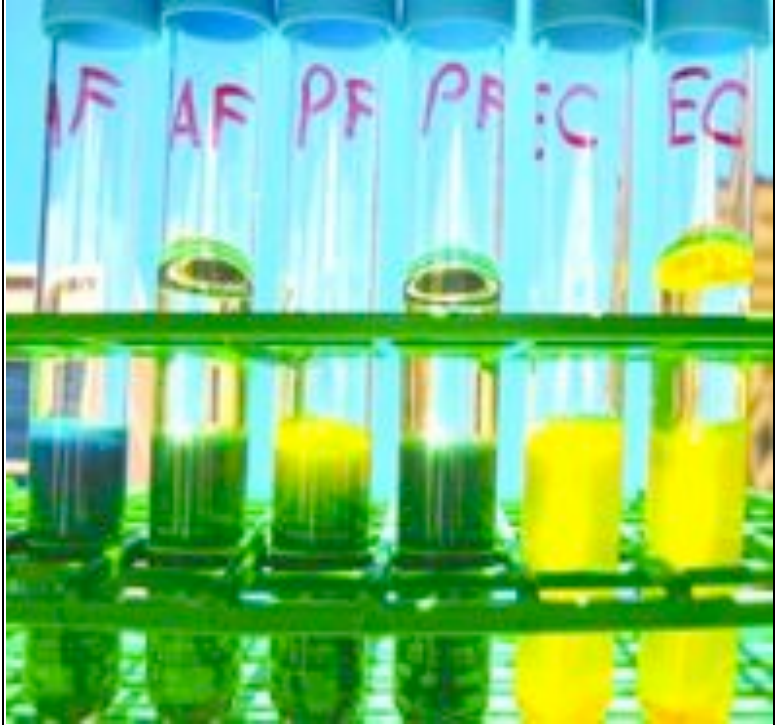


VIRTUAL EXPERIMENT 7B – GLUCOSE O/F MEDIUM

The Glucose O/F Medium demonstration is presented below and can also be seen in the lab. In the results table for Experiment 7B in the manual, indicate the reactions observed in Glucose O/F Medium and also the results seen for these same organisms in Glucose Fermentation Broth (Exp. 7A, Period 2). [Revised 6/29/11]

MEDIA WHICH DETECT GLUCOSE CATABOLISM	<i>Alcaligenes faecalis</i>	<i>Pseudomonas fluorescens</i>	<i>Escherichia coli</i>	
<p>Glucose O/F Medium and Glucose Fermentation Broth are each formulated with peptone, glucose, pH indicator, and other nutrients (all in aqueous solution). Amino acids in the peptone can be broken down by many organisms, resulting in release of ammonium (by aerobic deamination) which creates an alkaline pH. Glucose may be respired and/or fermented, resulting in acidic endproducts. <u>Fermentation</u> allows anaerobic growth and results in a <u>very large amount of acid</u>, compared to respiration. Depending on the amount of amino acids and deamination in a particular medium, the small amount of acid from respiration may or may not be overneutralized by the aerobic deamination process.</p> <hr style="border-top: 1px dashed black;"/> <p style="text-align: center;">REACTIONS IN GLUCOSE O/F MEDIUM</p> <p>pH indicator is brom thymol blue: blue = alkaline; green = neutral; yellow = acidic.</p> <p>AF: <i>Alcaligenes faecalis</i> is a strict aerobe and can respire, but it does not respire glucose. Amino acid deamination results in an alkaline reaction – detected by a blue color where the organism grows aerobically.</p> <p>PF: <i>Pseudomonas fluorescens</i> is a strict aerobe and can respire glucose. Associated with glucose respiration is a small amount of acid which will over-neutralize the alkaline reaction (from amino acid deamination), resulting in a net acidic reaction (yellow) where it grows aerobically.</p> <p>EC: <i>Escherichia coli</i> respire and ferments glucose. The large amount of acid from fermentation overneutralizes the alkaline reaction and permeates the entire tube with a strong yellow color resulting.</p>				
<u>Aerobic Reactions</u> (top 1/4 of open tube)	Growth (+ or –)	+	+	+
	Net pH observed	alkaline	acidic	strongly acidic
<u>Anaerobic Reactions</u> (closed tube and bottom 3/4 of the open tube)	Growth (+ or –)	–	–	+
	Net pH observed	neutral	neutral	strongly acidic
SUMMARIZED RESULT IN GLUCOSE O/F MEDIUM (O, F or –)		–	O*	F

Note: The “open tube” has access to air (oxygen) and will allow growth of all three organisms at the top of the medium. Respiration by these organisms uses up the oxygen in the medium such that the bottom 3/4 of the medium allows anaerobic growth by fermenters such as *E. coli*. The mineral oil in the “closed tube” (the 2nd tube of each pair) more directly cuts off oxygen and allows anaerobic growth of fermenters.

- * This small amount of acid produced with respiration (when fermentation is not present) is called the “O” (for “oxidative”) reaction. Do we see any net acidic reaction for *Pseudomonas fluorescens* in Glucose Fermentation Broth? Would a larger amount of amino acids in Glucose Fermentation Broth account for a different observation than in Glucose O/F Medium?