

Paper 3:

Paper is looking at “diauxic shift” Results of chemostat studies using glucose as a limiting agent suggest some aspect of actual starvation of the yeast is required for triggering metabolic remodeling associated with the diauxic shift. Homeostatic mechanisms are able to carry out metabolic adjustment as though fermentation was preferred process until glucose is entirely depleted

Diauxic shift - yeast switches to a fully respiratory metabolism catabolizing carbon compounds via aerobic respiration. Allows for oxidation of accumulated fermentation products

So above implies that any aerobic respiration based CO₂ production equation is reliant on a fermentation equation that uses all glucose present and uses enzyme concentrations as parameters?

Paper focusing heavily on gene expression - likely not needed for this assignment

Paper mentions a respiratory rate in general - **specific respiratory rate decreases to a minimum at the point of glucose exhaustion and then increases rapidly**

Rapid increase = aerobic respiration = glucose now limiting factor?

Figure on following page shows possible way to organize equations based on limiting factors/conditional equations

Rest of paper discusses gene expression and regulation - not growth so Figure 9 is deemed to be the best summation of the paper for this assignment

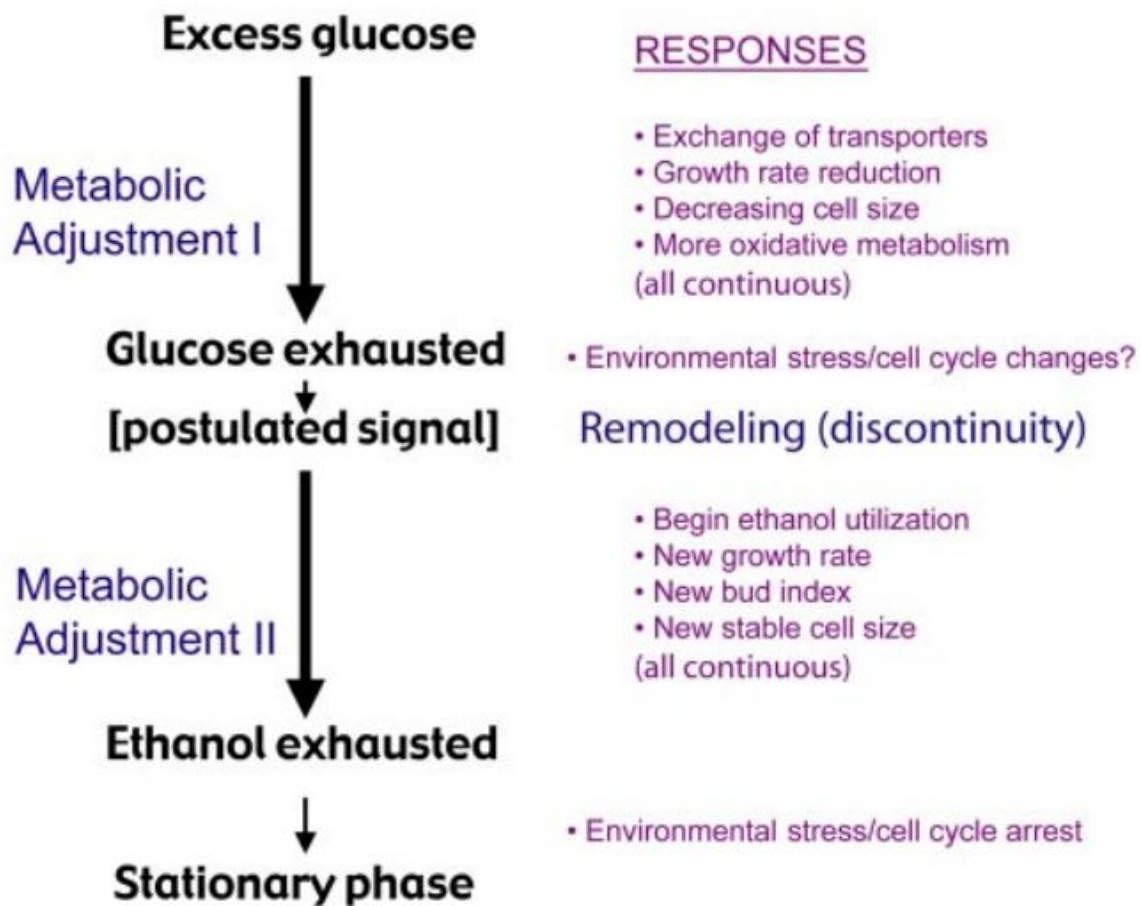


Figure 9. Model for metabolic changes during the diauxic shift. The cell's response to changes in carbon source availability is composed of two kinds of mechanisms: the continuous metabolic adjustments to declining residual metabolite concentration and the discontinuous remodeling that accompanies a switch between metabolic modes.