

## Microbial Physiology MBI0 3440 Michaelis-Menton Tutorial Information

### Michaelis-Menton analysis using SigmaPlot (Excel based Scientific Program)

- Sigma Plot must be used for Michaelis-Menton analysis, Excel cannot
- Excel is a non-scientific program that lacks an algorithm for performing non-linear regressions, whereas SigmaPlot does non-linear regressions including the hyperbola regression that defines the Michaelis-Menton plot (ie. Michaelis-Menton equation)
- however, relative cost of SigmaPlot is far greater
- SigmaPlot is much more “Science friendly”, ie., easier to use

hyperbola equation:  $y = ax/b+x$   
is identical to the Michaelis-Menten equation  
 $V_o = V_{max}[S]/K_m+[S]$   
where  $a = V_{max}$ ,  $b = K_m$ ,  $y = V_o$  and  $x = [S]$

Michaelis-Menten computer analysis is more accurate as the calculation of the  $K_m$  is based equally on all substrate concentrations and data is not manipulated like the Lineweaver-Burk before determination of  $K_m$

The Lineweaver-Burk analysis is weighed heavily towards the low substrate concentration - playing the larger part in the calculation of the  $K_m$  - little consideration of the higher concentrations (due to reciprocal plot).