CALCULATING K_M AND V_{MAX}

- V_{max} is inherently hard to calculate or measure because the graph of enzyme velocities is hyperbolic.
  - Velocity asymptotically approaches its maximum
  - Even at 10-20 times the K_M we are only reaching 90-95% of the maximum
- To solve this issue, Hans Lineweaver and Dean Burk rearranged the Michailis-Menten equation into a linear function (y = mx + b), and then took the reciprocal.

$$\frac{1}{v} = \left(\frac{K_M}{V_{max}}\right) * \frac{1}{[S]} + \frac{1}{V_{max}}$$

y = m x + b

- This double reciprocal plot is called the Lineweaver-Burk Plot
  - It can be used to approximate both K_M and V_{max}

CALCULATING K_M AND V_{MAX}

- When $\frac{1}{[S]} = 0$, or at the y=intercept
  - Substrate Concentration = Infinite
  - Reaction is at its maximum velocity

- K_M can be calculated using the slope of the line

$$Slope = \frac{K_M}{V_{max}}$$

- Since only initial velocities are used to make this graph, it can be highly error prone
  - Non-Linear Curve fitting software is used to study these values
  - It is still useful in enzyme inhibition studies