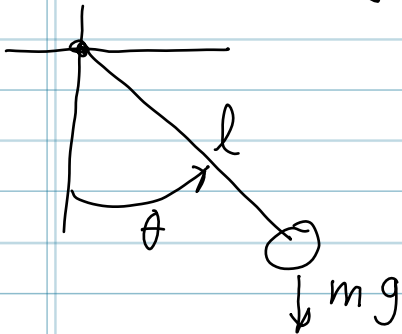


## A break from Biology:

Classical Mechanics: The pendulum and his friends!



The usual way to model the pendulum is to compute all the force vectors & then use  $m\ddot{x}$  to compute the differential equations for  $\theta$ , the only "degree of freedom".

I always screw up the vectors & angles so I don't like this way.

I use a more general method which is easiest, to me.

The Lagrangian of a system is defined as:

$$L = K.E. - P.E.$$

kinetic energy - potential energy

Once you write down  $L$ , then the equations of motion are obtained from the Euler-Lagrange EQUATION