Move Me

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• Topic - Motor Proteins Interactions

• Context
  – General Biology or Human Anatomy & Physiology
  – 30-90 students
  – Freshman/Sophomore
  – Tidbit will be in the middle of a 1-2 week unit. Tidbit may be followed by discussion of neutrophil movement and/or cytokinesis. Next class will cover other molecular motors.

• Prior Knowledge
  – Three main types of cytoskeletal proteins: actin filaments (microfilaments), microtubules, intermediate filaments
  – ATP as an energy source
  – Components and arrangement of sarcomeres in skeletal muscle
  – Introduction to the Sliding Filament Theory
• **Unit Goal**
  – Understand how motor proteins interact with cytoskeleton components to direct movement.

• **Tidbit Goal**
  Know how ATP binding and hydrolysis regulate the interaction of actin and myosin

• **Teachable tidbit intended learning outcomes**
  – Describe the molecular structure and functional features of a myosin molecule.
  – Dramatize the interaction of myosin and actin during the ATP cycle.
  – Discuss how the physical features of myosin allow it to function as a motor protein.
  – Recall ATP hydrolysis causes the high energy configuration of the myosin head.
  – Explain how actin and myosin interact to contract a muscle.
  – Predict what happens if there is no ATP.

### Alignment – Group 6 – *Move Me*

<table>
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<tr>
<th>Learning Objective</th>
<th>Assessment</th>
<th>Active learning</th>
<th>Low Order/High Order</th>
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| Know how ATP binding and hydrolysis regulate the interaction of actin and myosin | Formative: Strip sequence | Strip sequence and placement of ATP and ADP | Formative  
Part 1  
Recall – Low
Part 2  
Predict – High |
| Know the physical movement of the myosin and how it functions as a motor. | Formative: Dramatization of the actin myosin movement  
Summative: Exam question - Predict properties of various myosin dysfunctions ie. Mutated ATP binding site | | Summative  
Predict – High |

### Diversity

All students participate in the activity. There is a diversity of learning styles: visual, auditory, and kinesthetic.