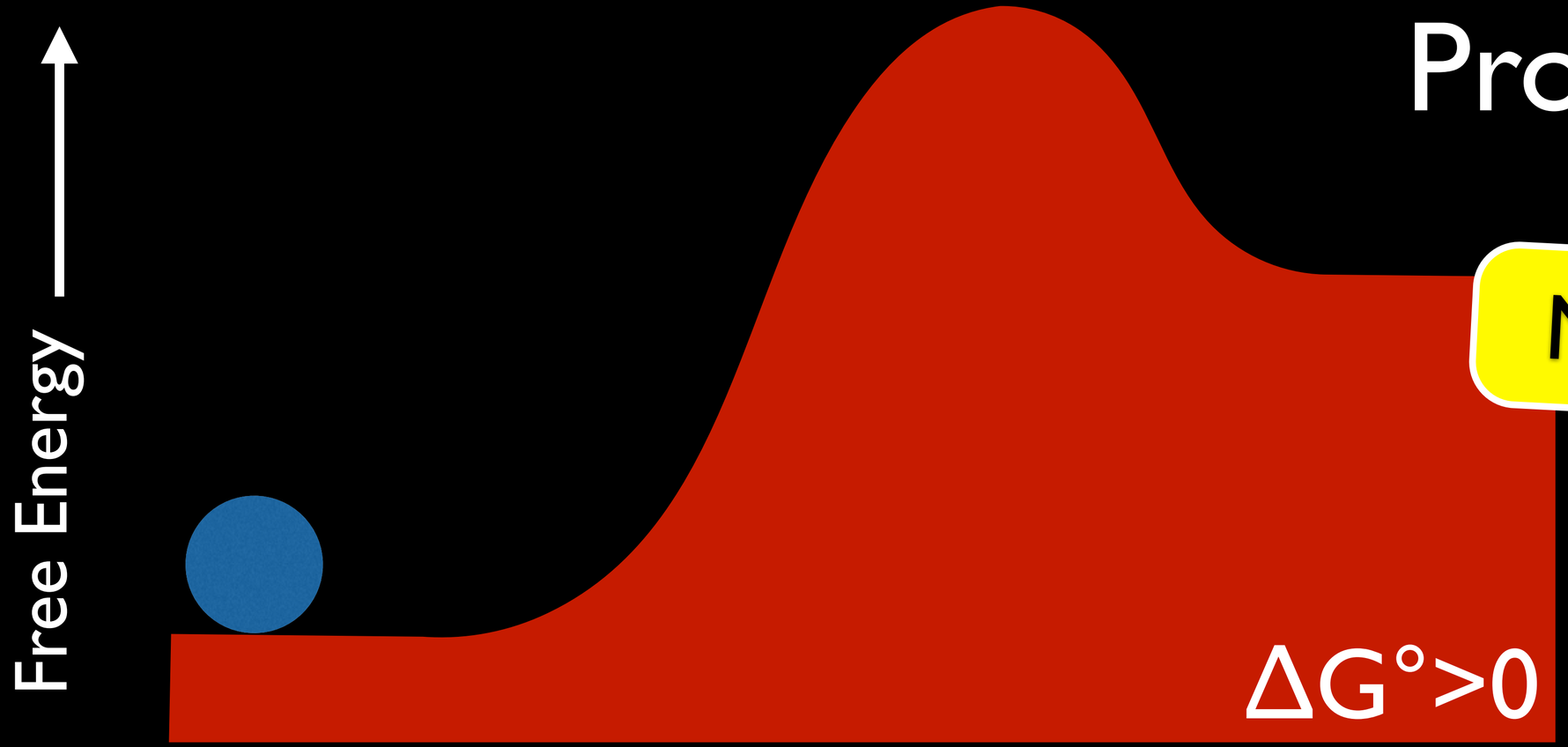
Driving Nonspontaneous Processes



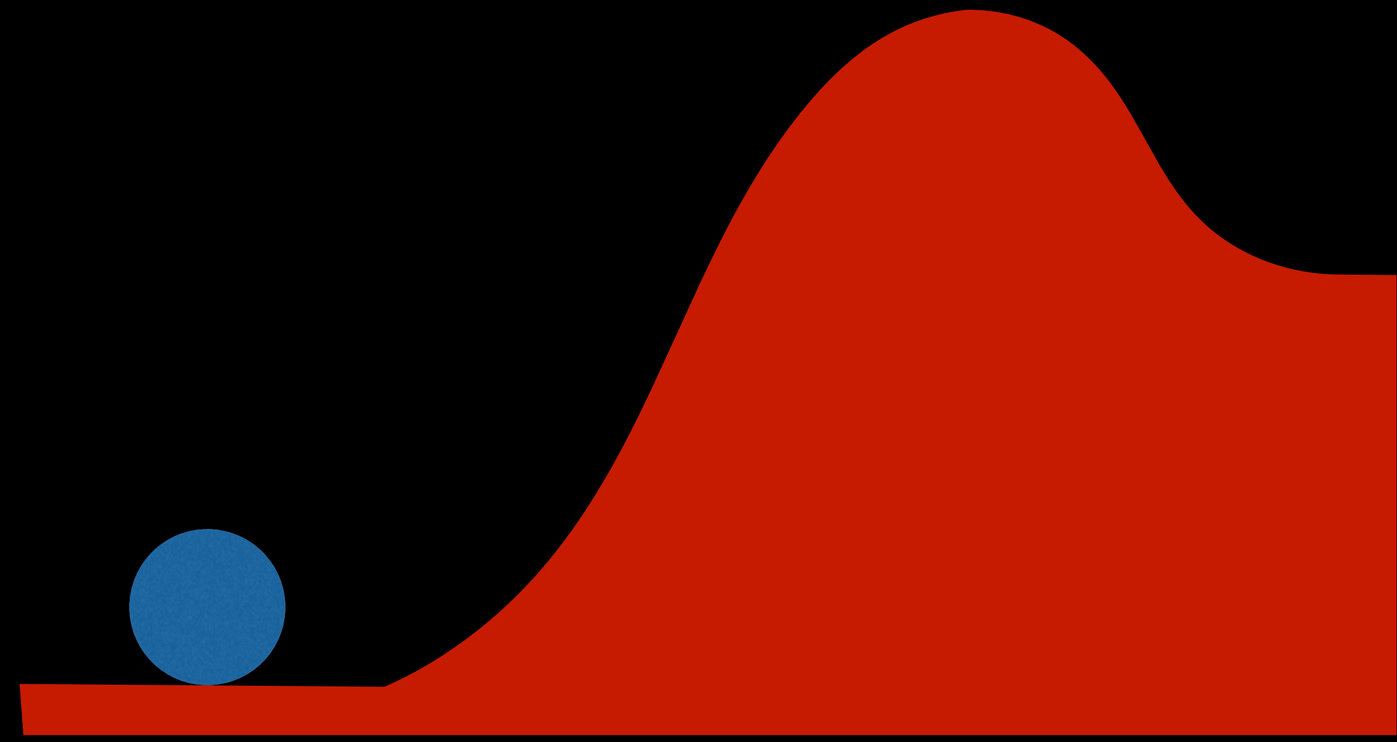
Nonfavorable

Endergonic

Chemistry Essentials - 060

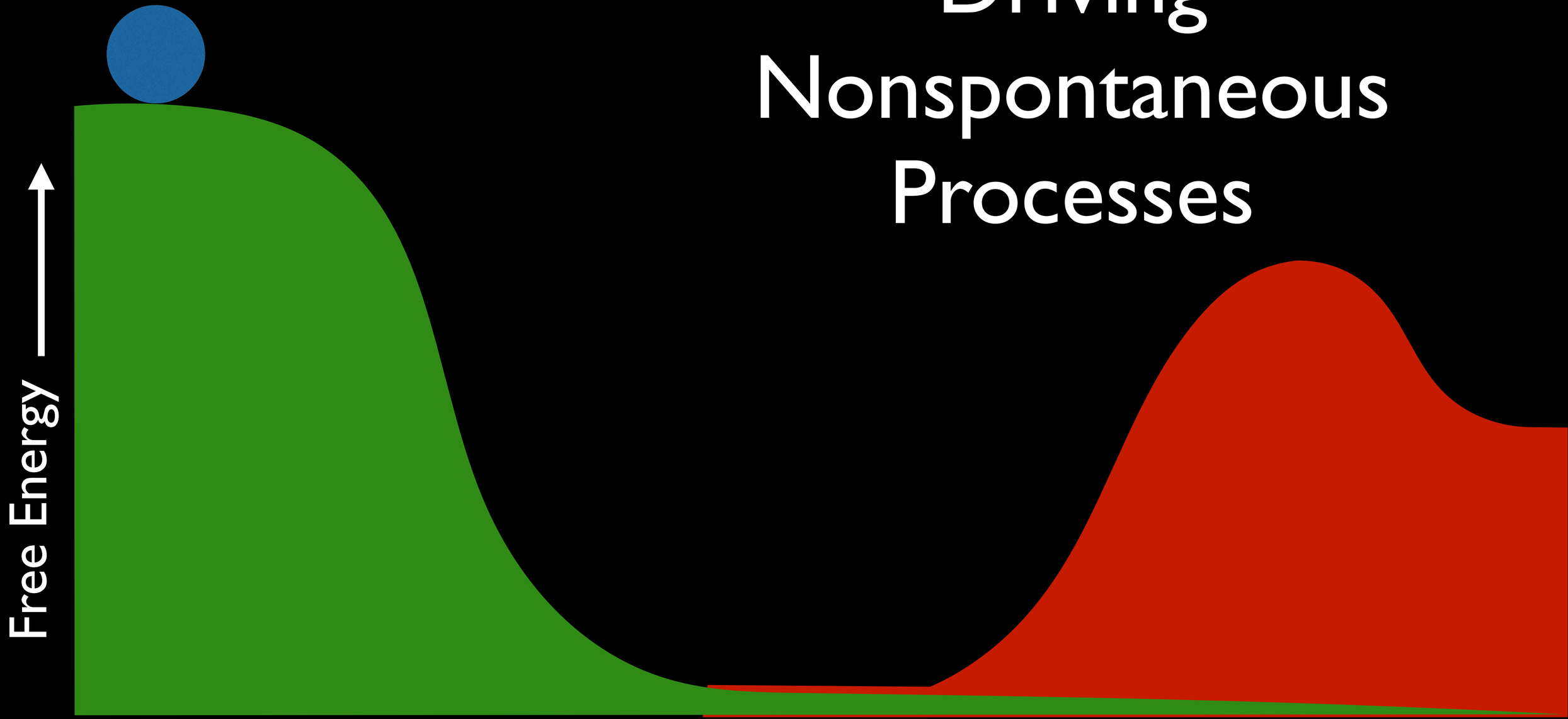
Driving Nonspontaneous Processes

Energy



Chemistry Essentials - 060

Driving Nonspontaneous Processes



Chemistry Essentials - 060

Nonspontaneous Process

$\Delta G^\circ > 0$

Energy

Reaction Coupling

Electricity

Light

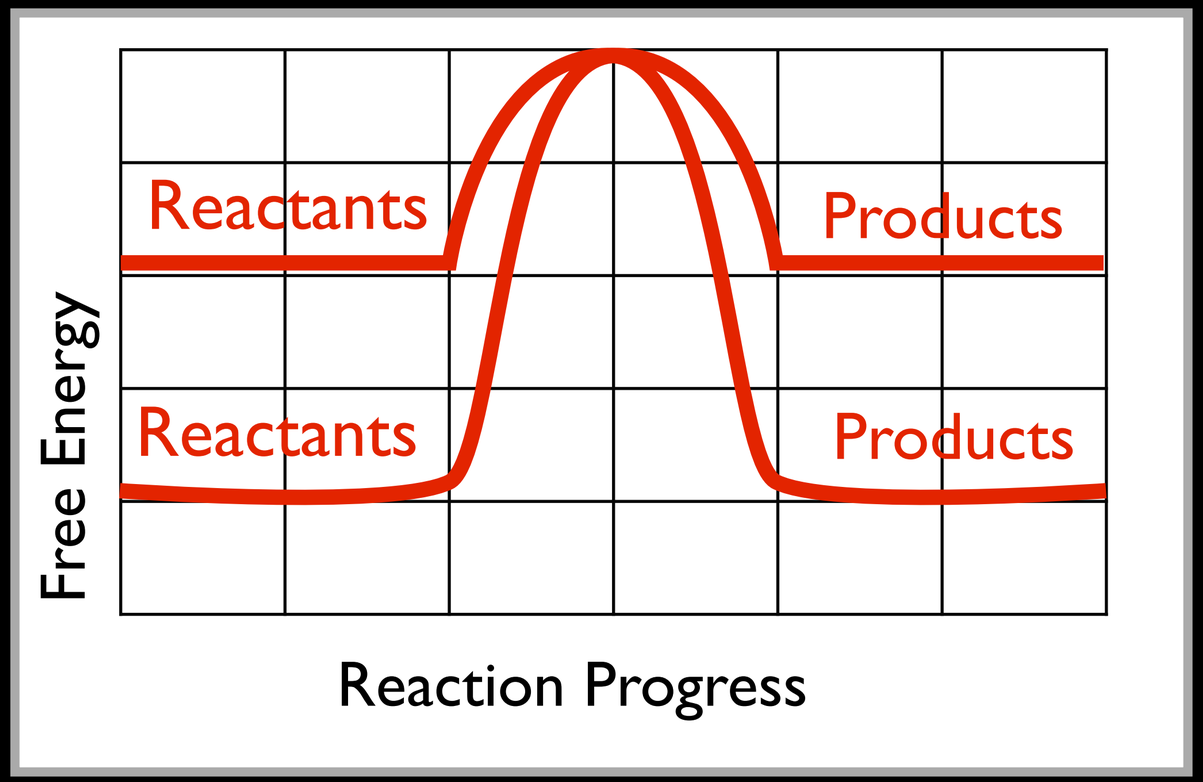
$\Delta G^\circ < 0$

Spontaneous

Battery charging

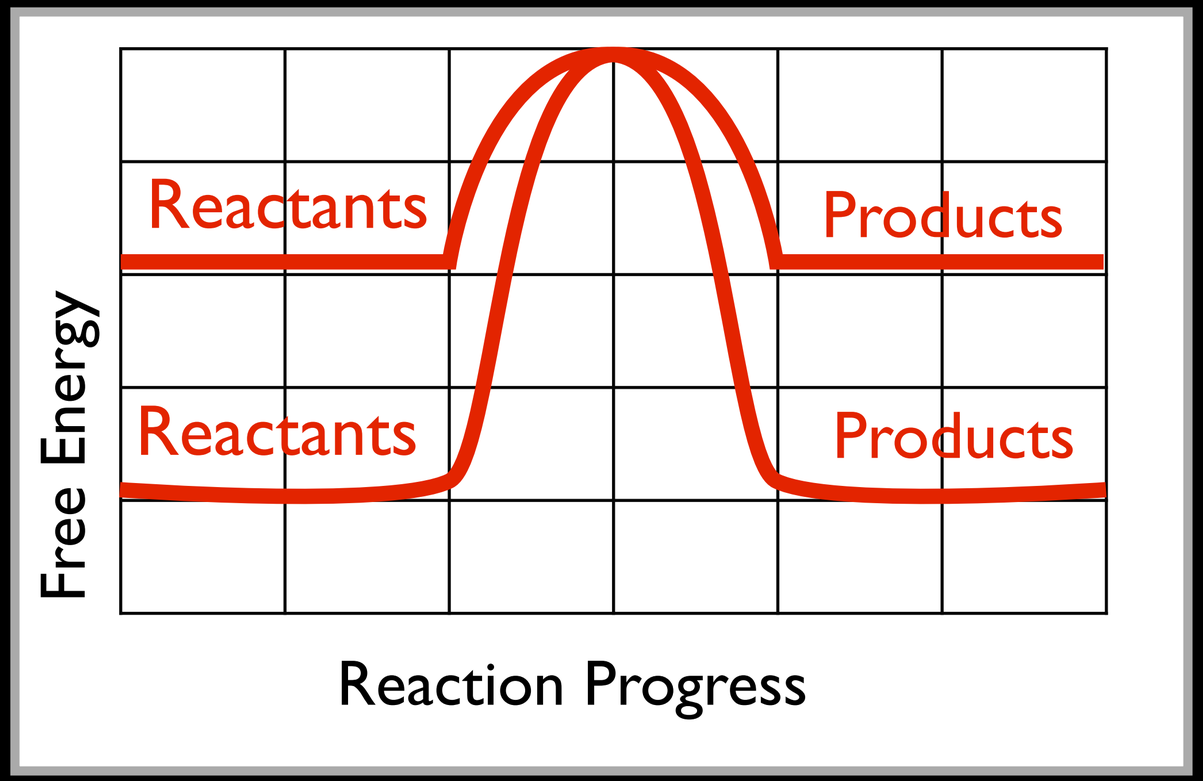
Photosynthesis

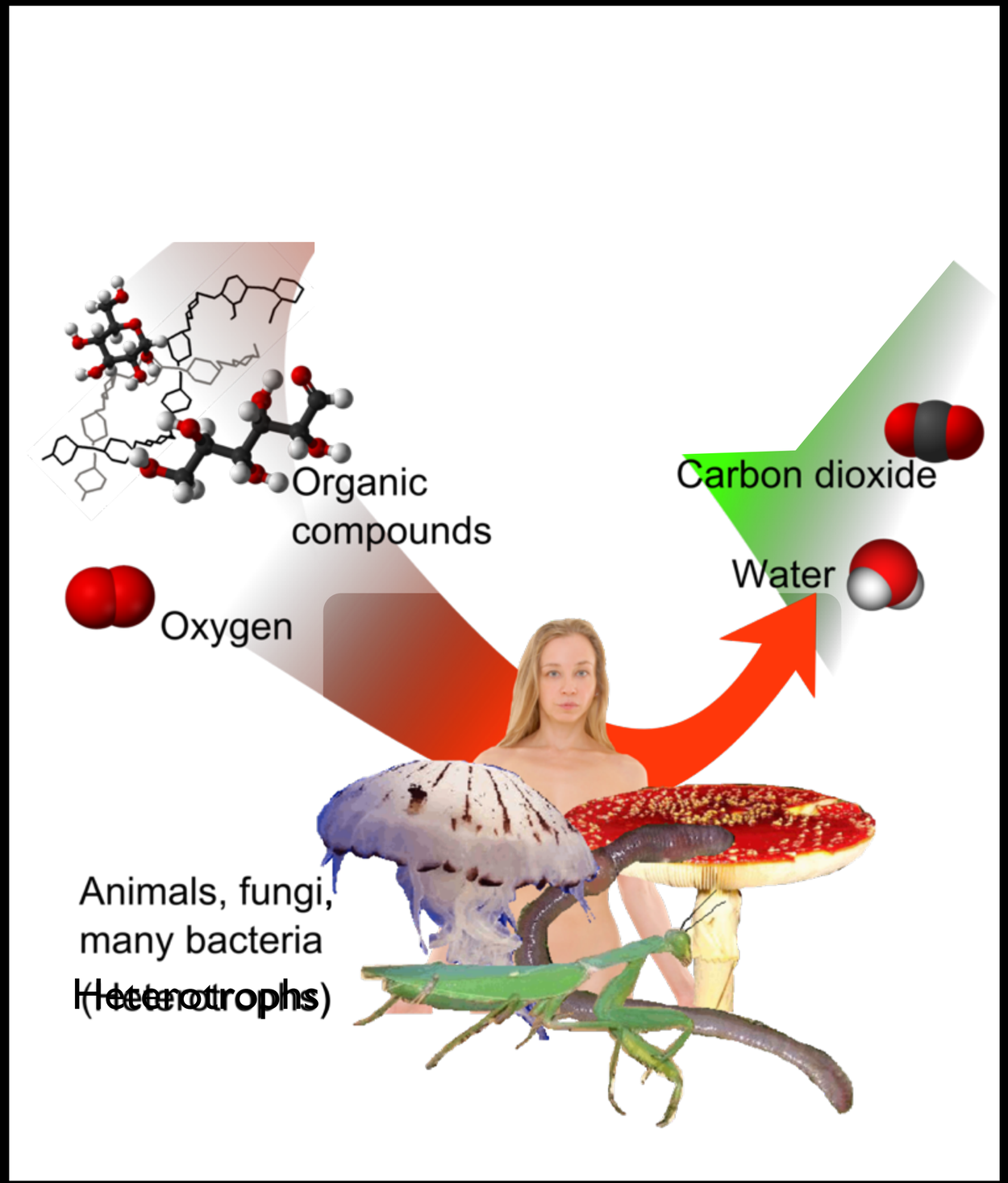
ATP → ADP

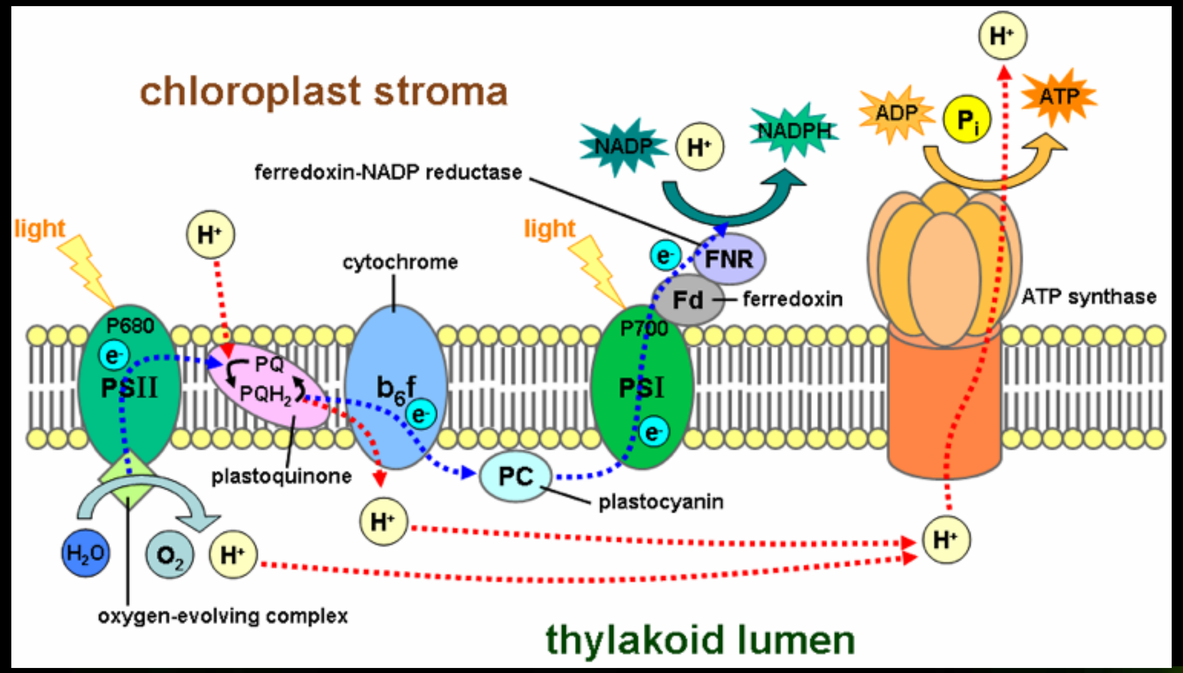

Reactants
Products
Reactants
Products
Free Energy
Reaction Progress

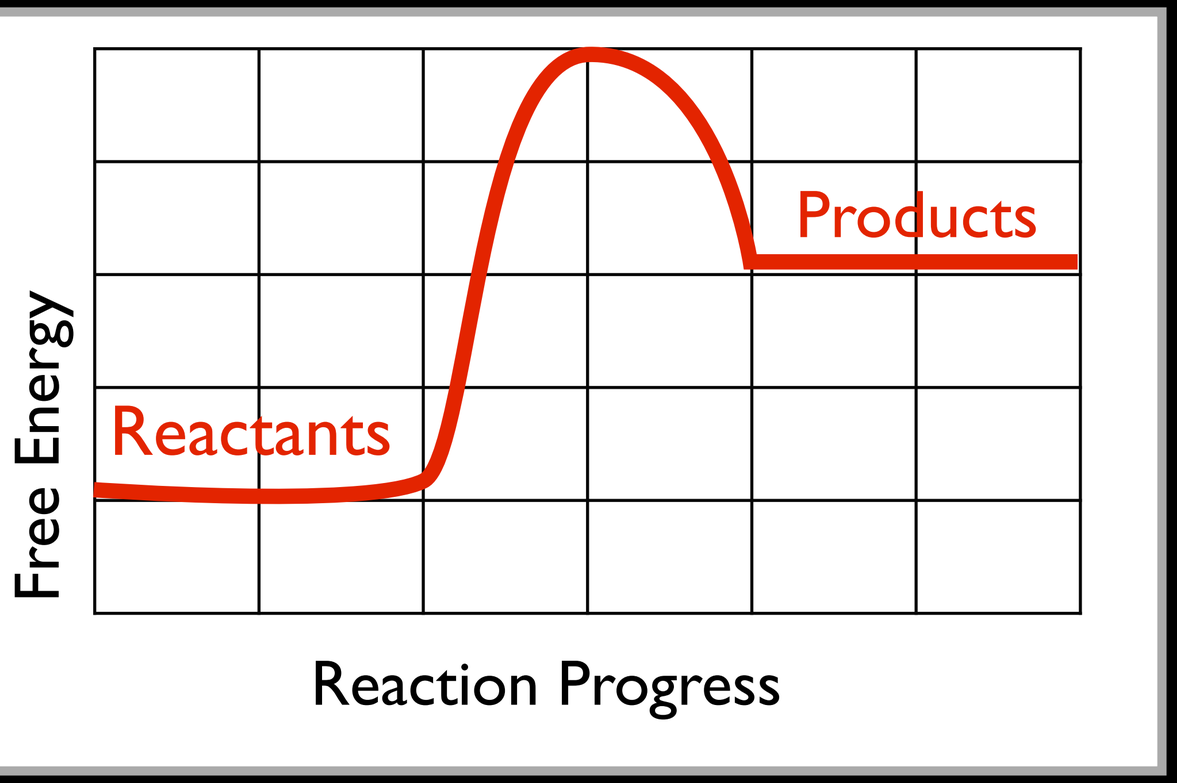

+ AA
2500 mAh
NICKEL-METAL HYDRIDE
Energizer
RECHARGEABLE


Trust
Charge
2
4
L
L+R
Ready
AAA
L
R
440PQ PORTABLE QUICK BATTERY CHARGER



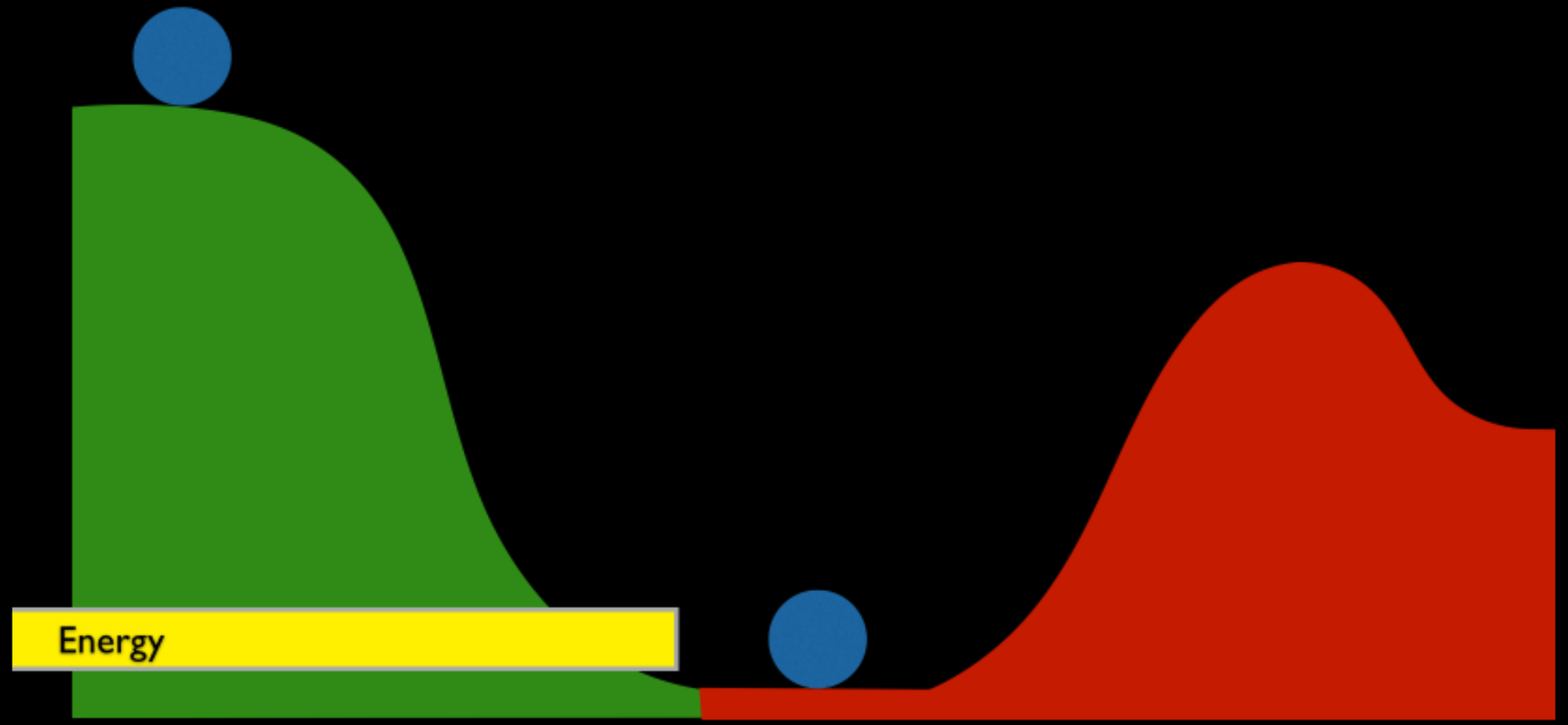




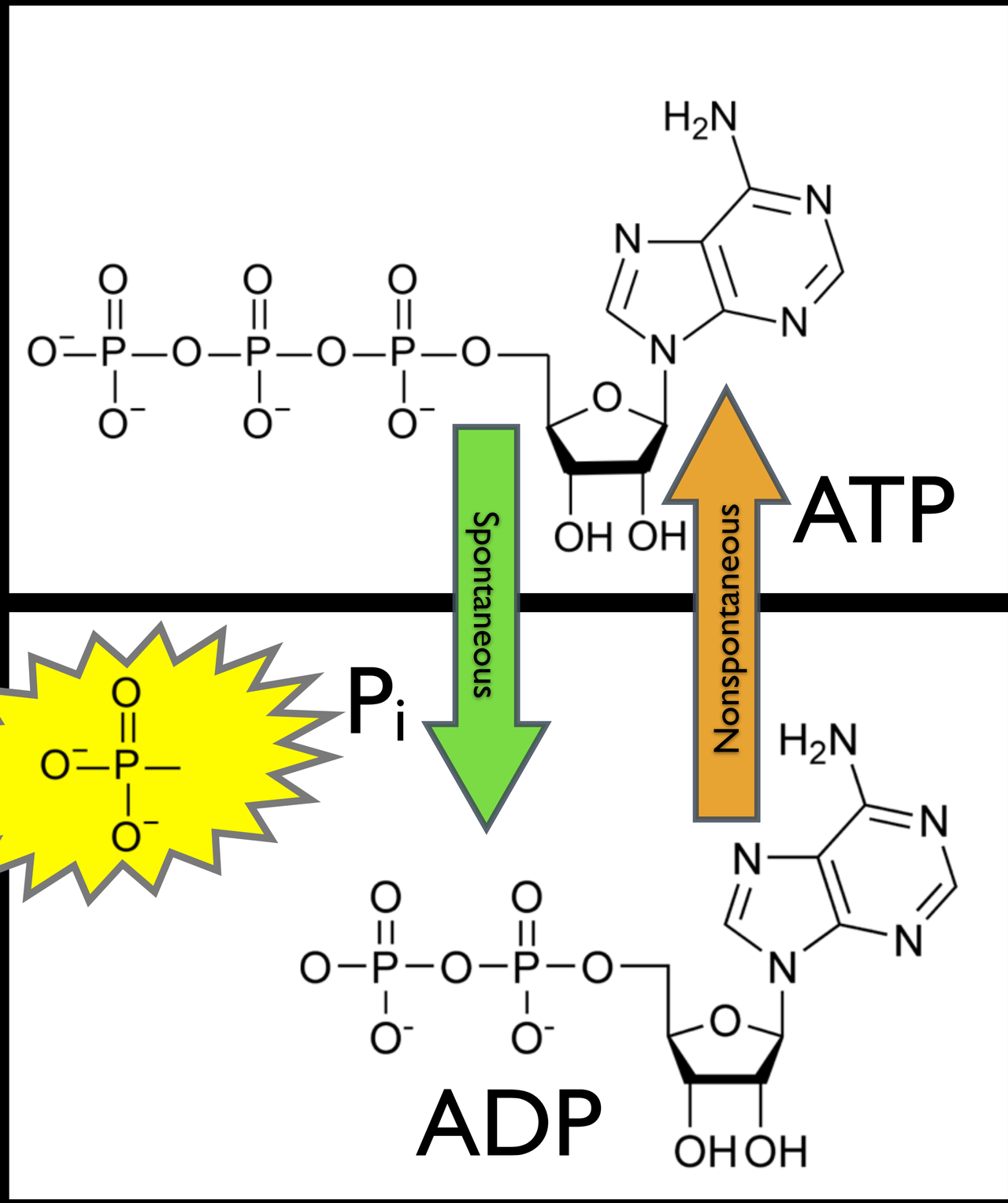


Heterotrophs

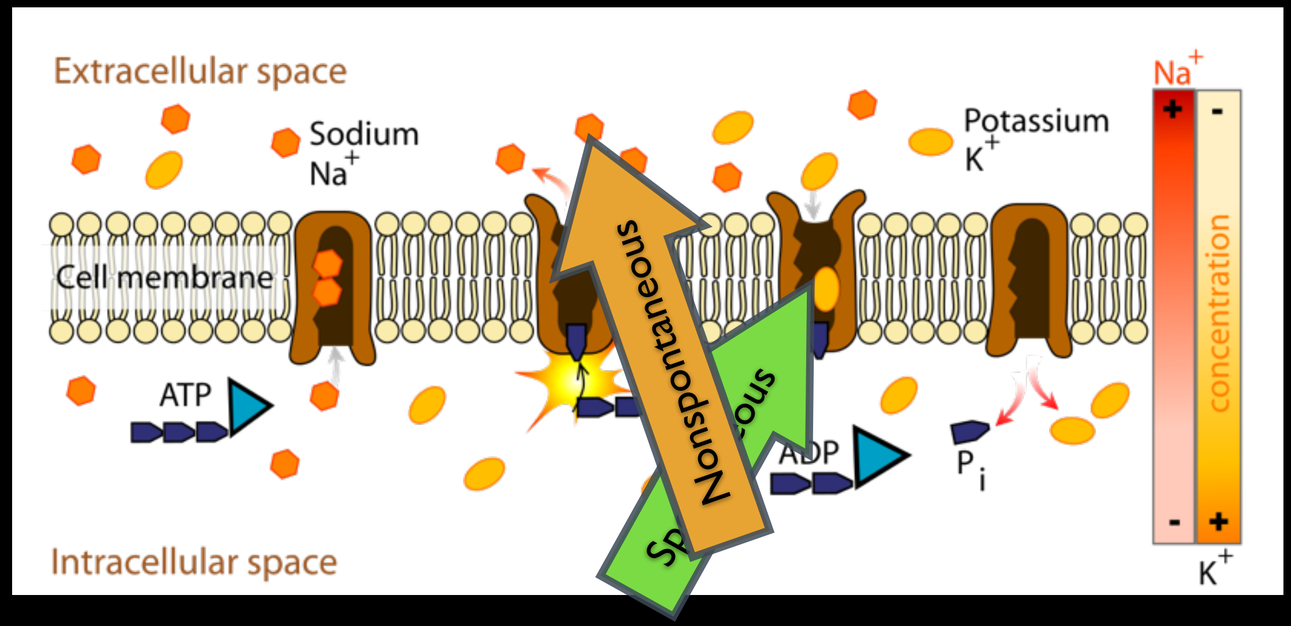
Energy Coupling

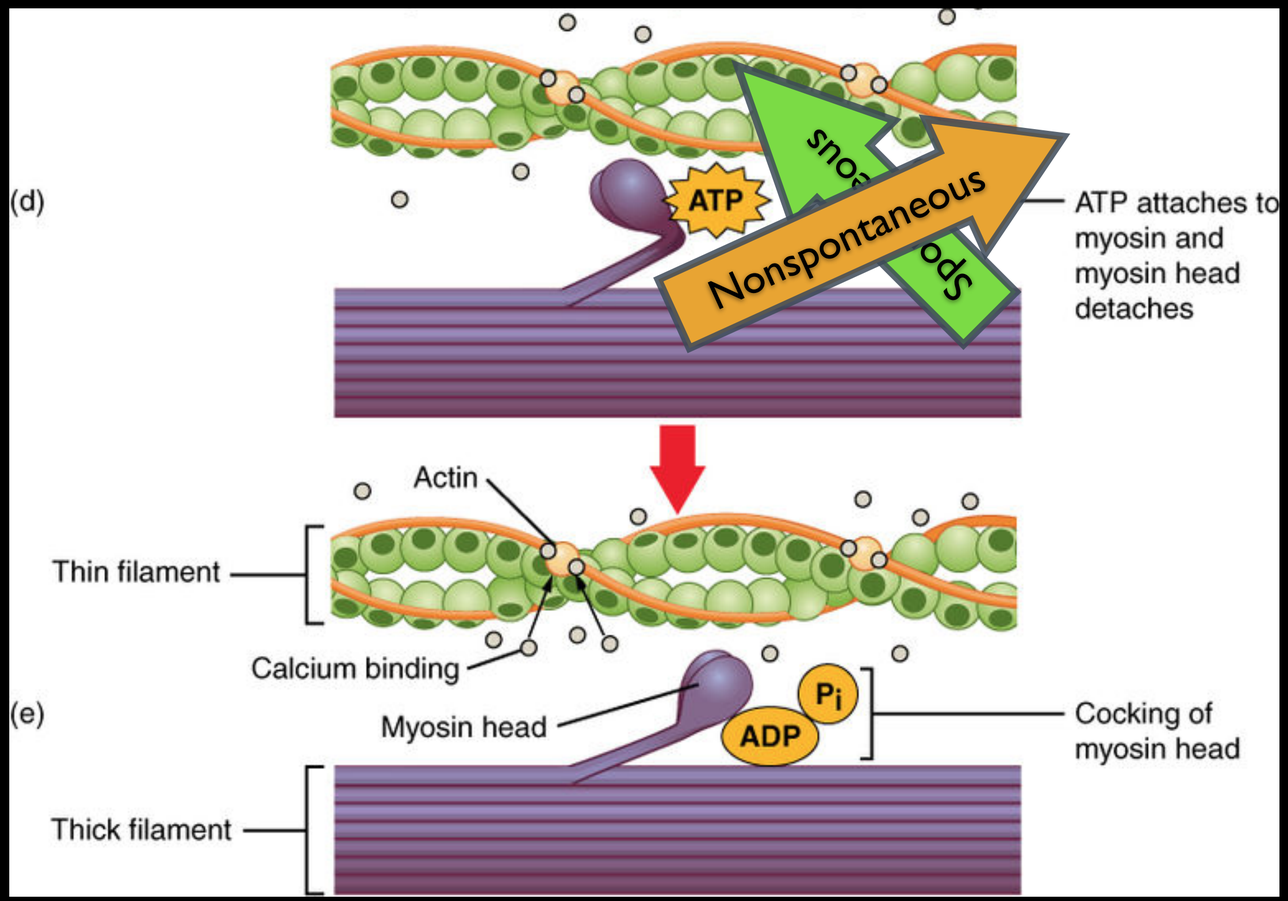


Energy Coupling

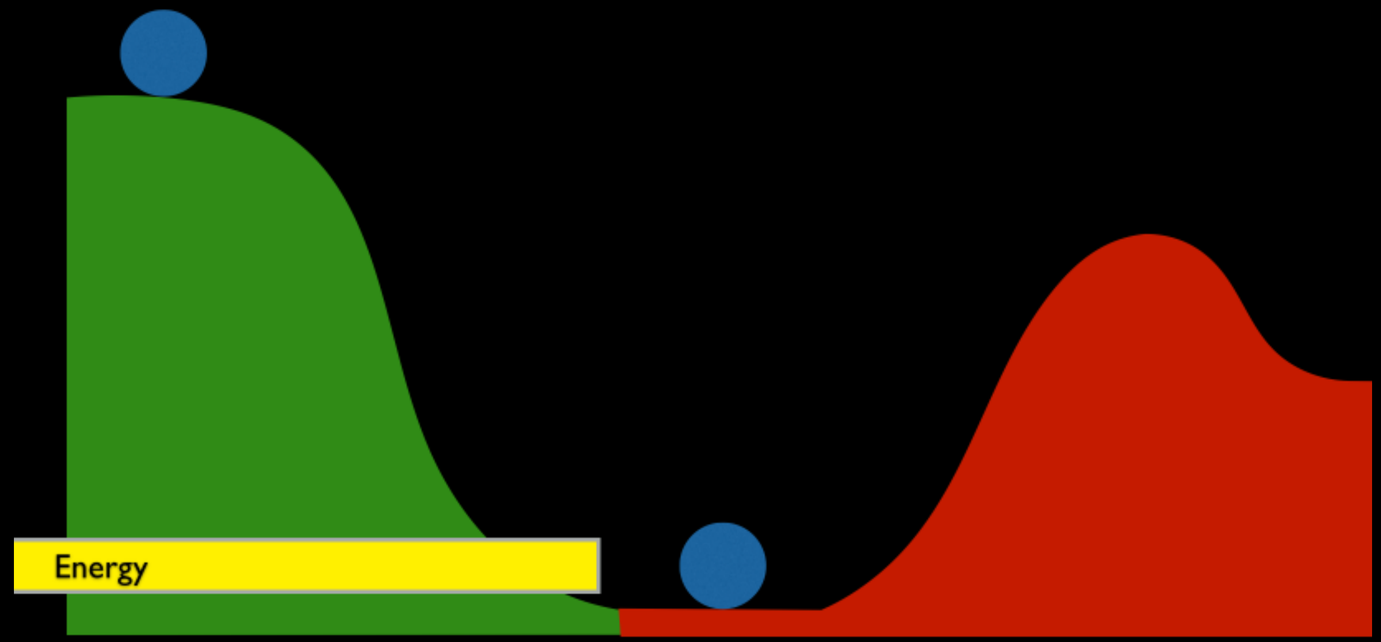


Energy Coupling





Did you learn?



To explain how external energy or reaction coupling can be used to drive endergonic reactions.

Acknowledgements

College, OpenStax. English: (a) The Active Site on Actin Is Exposed as Calcium Binds to Troponin. (b) The Myosin Head Is Attracted to Actin, and Myosin Binds Actin at Its Actin-Binding Site, Forming the Cross-Bridge. (c) During the Power Stroke, the Phosphate Generated in the Previous Contraction Cycle Is Released. This Results in the Myosin Head Pivoting toward the Center of the Sarcomere, after Which the Attached ADP and Phosphate Group Are Released. (d) A New Molecule of ATP Attaches to the Myosin Head, Causing the Cross-Bridge to Detach. (e) The Myosin Head Hydrolyzes ATP to ADP and Phosphate, Which Returns the Myosin to the Cocked Position., April 3, 2013. Anatomy & Physiology, Connexions Web site. http://cnx.org/content/col11496/1.6/, Jun 19, 2013. http://commons.wikimedia.org/wiki/File:1008_Skeletal_Muscle_Contraction.jpg.
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"File:Thylakoid Membrane.png." Wikipedia, the Free Encyclopedia. Accessed December 29, 2013. http://en.wikipedia.org/wiki/File:Thylakoid_membrane.png.
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Villarreal, LadyofHats Mariana Ruiz. English: Example of Primary Active Transport, Where Energy from Hydrolysis of ATP Is Directly Coupled to the Movement of a Specific Substance across a Membrane Independent of Any Other Species., February 23, 2007. Own work. Image renamed from Image:Sodium-Potassium_pump.svg. http://commons.wikimedia.org/wiki/File:Scheme_sodium-potassium_pump-en.svg. a

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