

Final Review

BIO-1305 - Biology 1 – Campbell Textbook

Hello and welcome to the weekly resources for BIO-1305 - Biology 1 – Campbell Textbook!

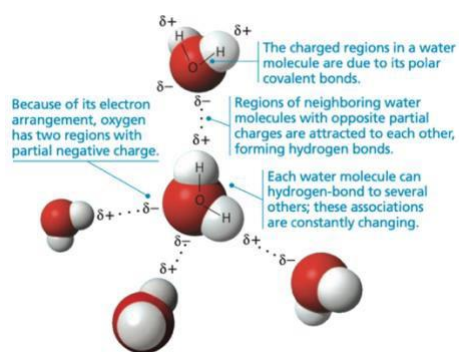
This week is Week 15 of class, and typically in this week of the semester, your professors are reviewing for the final exam. If you do not see the topics your particular section of class is learning this week, please take a look at other weekly resources listed on our website for additional topics throughout the semester.

We also invite you to **look at the group tutoring chart on our website to see if this course has a group tutoring session offered this semester.**

If you have any questions about these study guides, group tutoring sessions, private 30 minute tutoring appointments, the Baylor Tutoring YouTube channel, or any tutoring services we offer, please visit our website www.baylor.edu/tutoring or call our drop in center during open business hours (M-Th 9am-8pm on class days at 254-710-4135).

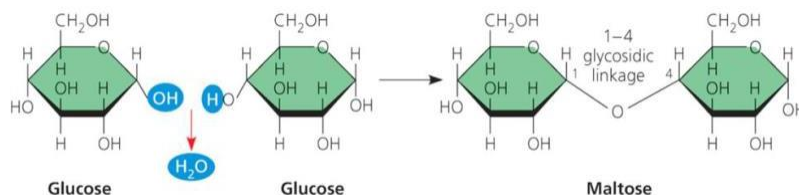
Water and It's Properties

Water is a polar molecule
 Hydrogen bonding gives water its unique properties and makes it the universal solvent
 Remember to review the special properties of water including surface tension, high specific heat, and heat of vaporization!

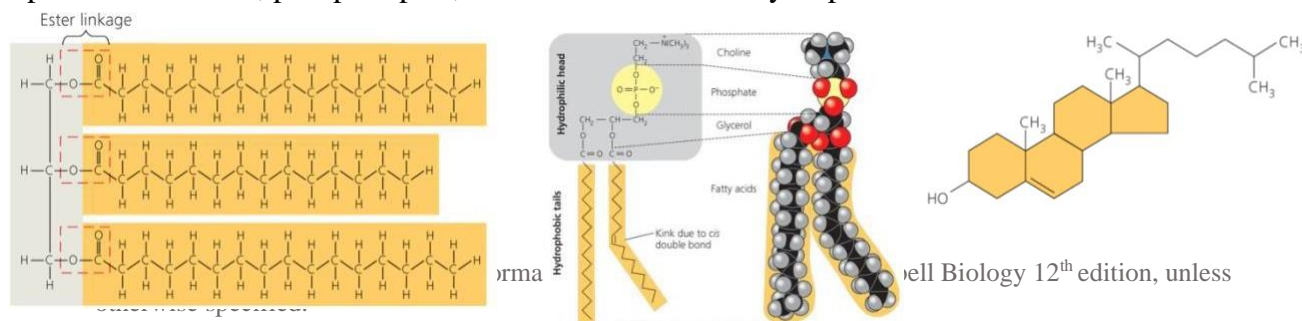


Macromolecules

Carbohydrates: polysaccharides made of monosaccharides connected through glycosidic linkages



Lipids: includes fats, phospholipids, and steroids that have hydrophobic character

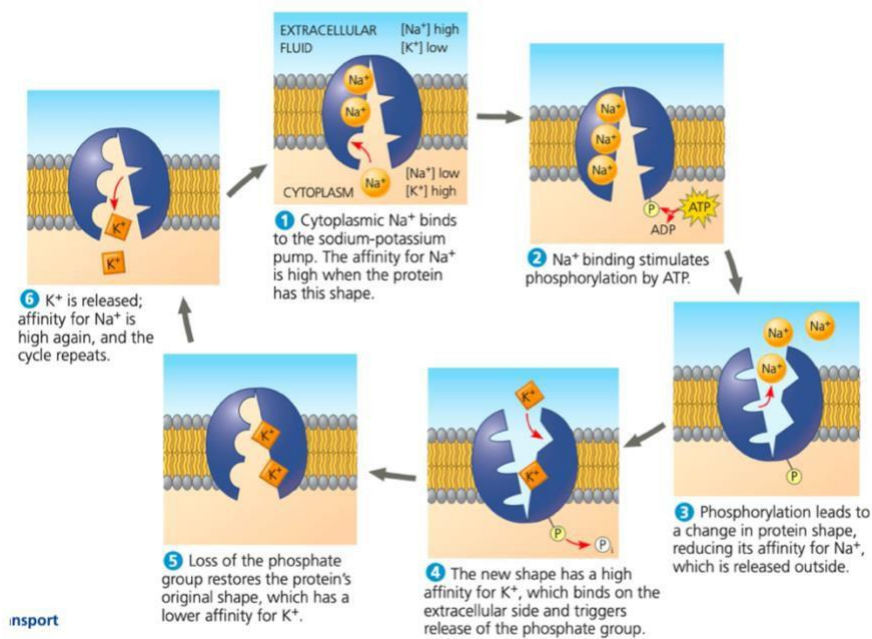


Proteins: polypeptides made of amino acids connected through peptide bonds. They have primary, secondary, tertiary, and quaternary structure

Nucleic acids: polynucleotides, including DNA and RNA, made of nucleotides. Remember to review the distinctions between DNA and RNA!

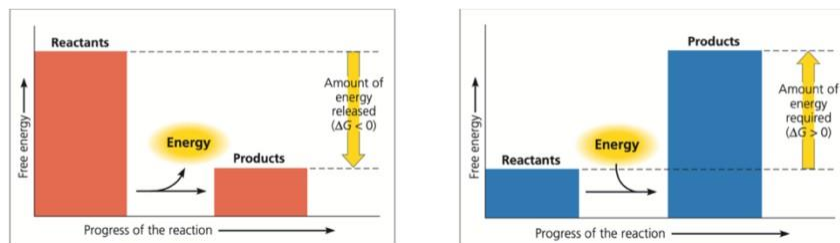
Membrane Transport

Simple diffusion, facilitated diffusion, and active transport are the main types of membrane transport. Diffusion does not require energy but instead relies on a concentration gradient. However, active transport requires ATP to move things against their concentration gradient. An example of active transport is the Sodium-Potassium Pump.



Energy

Remember that a negative delta G is associated with an exergonic, spontaneous process, while a positive delta G is associated with an endergonic, non-spontaneous process



Cellular Respiration

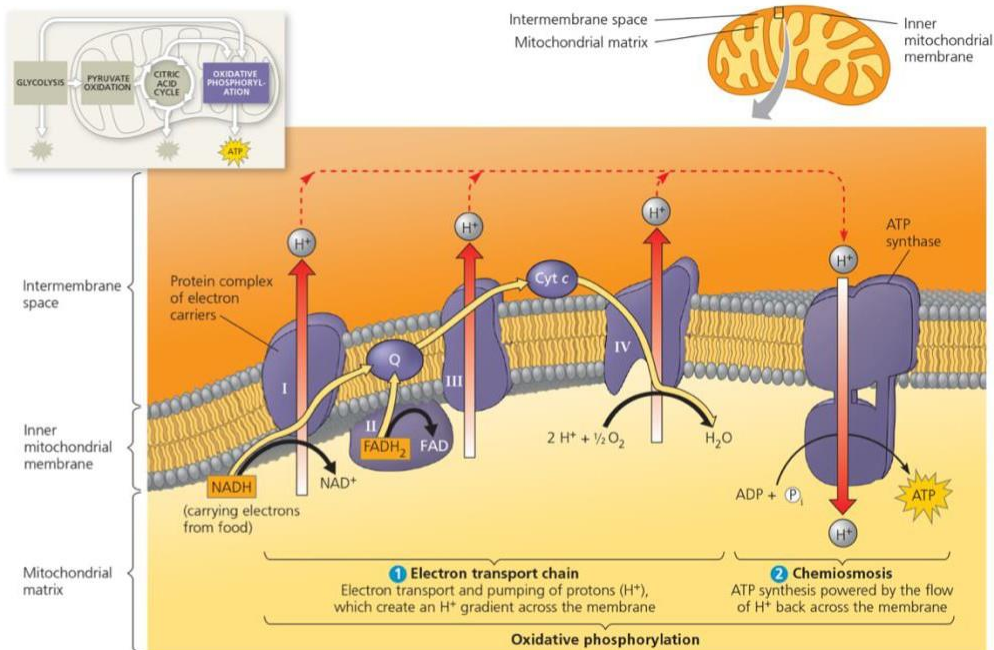
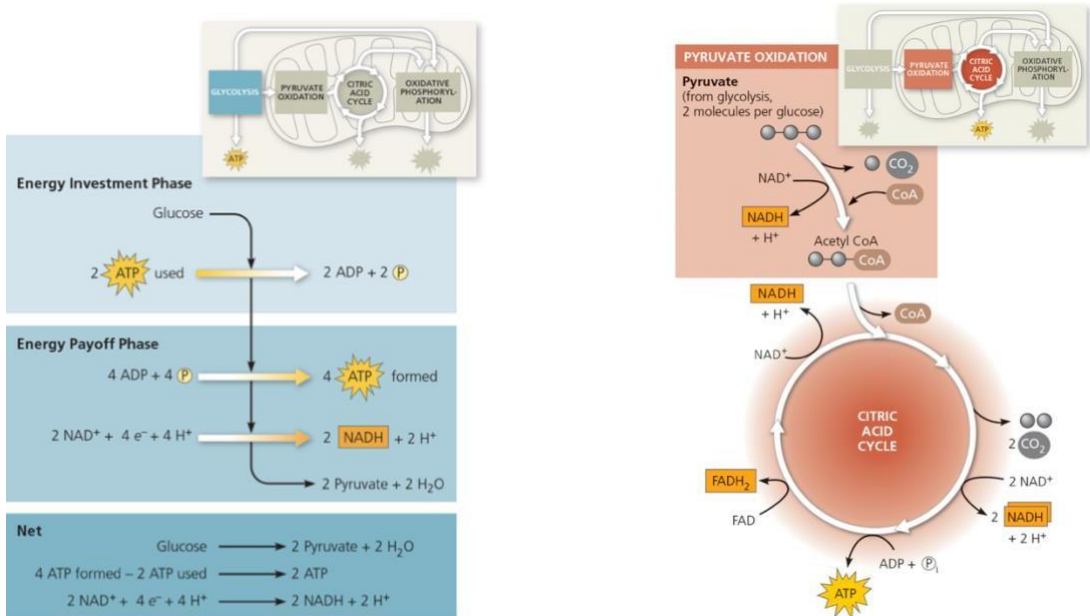
This is a HUGE topic to focus on as you are studying for your final exam! Make sure you can “tell the story” of cellular respiration to your friends – that is how you know you are familiar with the information!

All diagrams, tables, and external information is property of Pearson Campbell Biology 12th edition, unless otherwise specified.

Glycolysis: takes place in the cytosol, oxygen independent, two phases: energy investment and energy payoff. The goal is to make electron carriers that go to the rest of cellular respiration.

Pyruvate oxidation: oxidation of pyruvate and addition of Co-enzyme A.

Electron Transport Chain: final portion of cellular respiration where ATP is created by a proton gradient. Electron carriers from other parts of cellular respiration bring their electrons to the chain, allowing protons to be pumped into the intermembrane space.



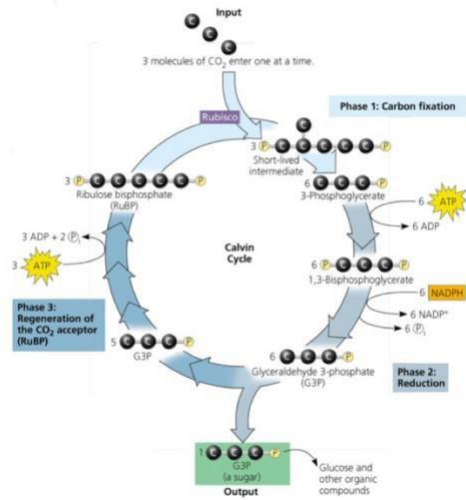
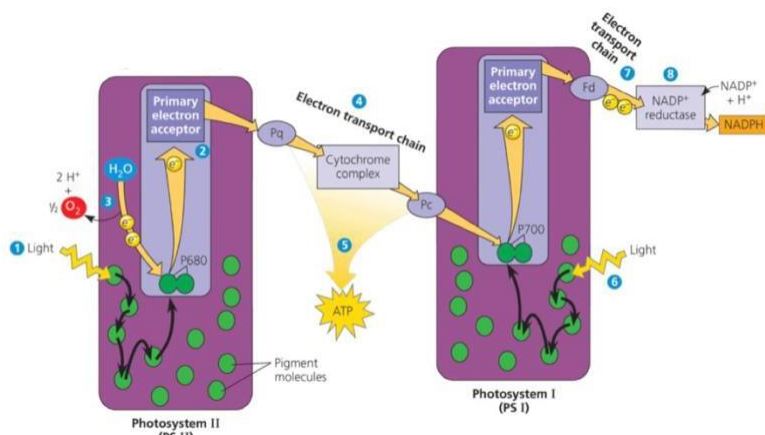
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Photosynthesis

Two main stages of photosynthesis: light reactions, Calvin cycle

In the light reactions, light is converted into ATP and NADPH. Chlorophyll is excited.

In the Calvin cycle, there are three phases: carbon fixation, reduction, and regeneration of RuBP



The Cell Cycle

Prophase—DNA condenses, mitotic spindle begins to form

Prometaphase—nuclear envelope breaks down, kinetochore forms

Metaphase—chromosomes line up at the center

Anaphase—sister chromatids pull apart

Telophase—nuclei reform, chromosomes relax

Cytokinesis—cytoplasm divides and two daughter cells are formed

Meiosis and Sexual Life Cycles

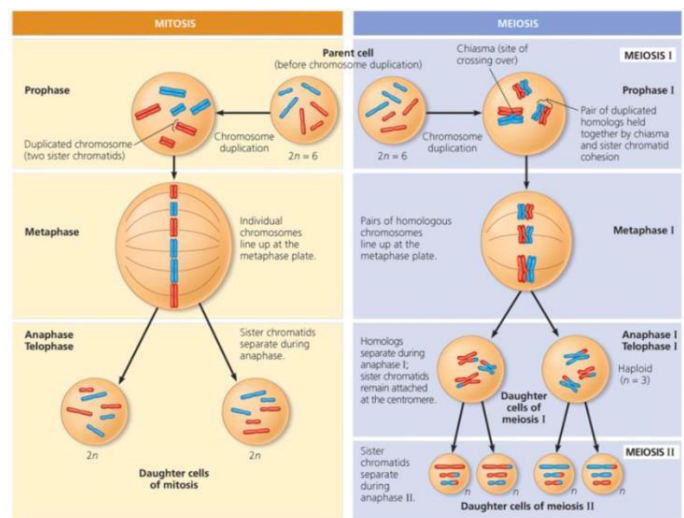
Genes: hereditary units

Locus: a gene's location on the chromosome

Homologous chromosomes: a pair of chromosomes where one comes from mom and one comes from dad

Sex chromosomes: chromosomes that determine sex

Autosomes: all other chromosomes besides sex chromosomes



Genetics

The Law of Segregation: alleles on a gene separate from each other and end up in separate gametes

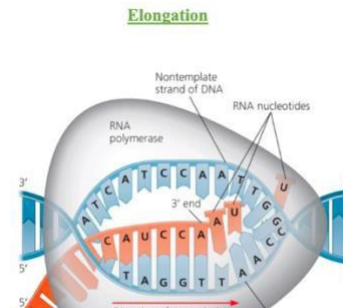
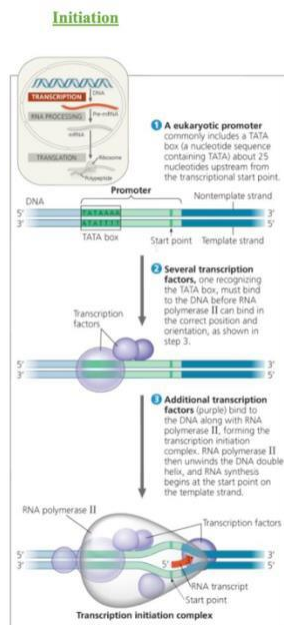
Inheritance of X-Linked Genes

Genes found on the X chromosome exhibit interesting inheritance patterns. Here are some significant patterns:

- Fathers pass the trait to all daughters but no sons
- Mothers pass the trait to sons and daughters
- If the trait is recessive, a female will only express the trait if she is homozygous
- Heterozygous and homozygous are terms that do not apply to males since they only have 1 X chromosome
- **Deletion:** part of the chromosome is lost
- **Duplication:** broken piece becomes attached to a separate chromosome
- **Inversion:** part of the chromosome breaks but reattaches in the opposite orientation
- **Translocation:** a broken fragment attaches to a nonhomologous chromosome

Transcription and Translation

- **mRNA** – Remember RNA from a few resources back? RNA is the “*bridge*” between DNA and protein. Specifically, mRNA is the molecule used. mRNA is “*messenger*” RNA, because it is a “message” that comes from the DNA to be made into a protein.
- **Transcription** – creation of the mRNA molecule from the DNA template.
- **Translation** – creation of a polypeptide from the mRNA. Occurs on ribosomes



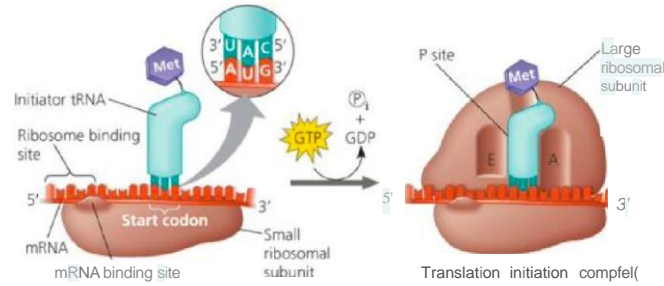
Termination

This stage is different for bacteria and eukaryotes.

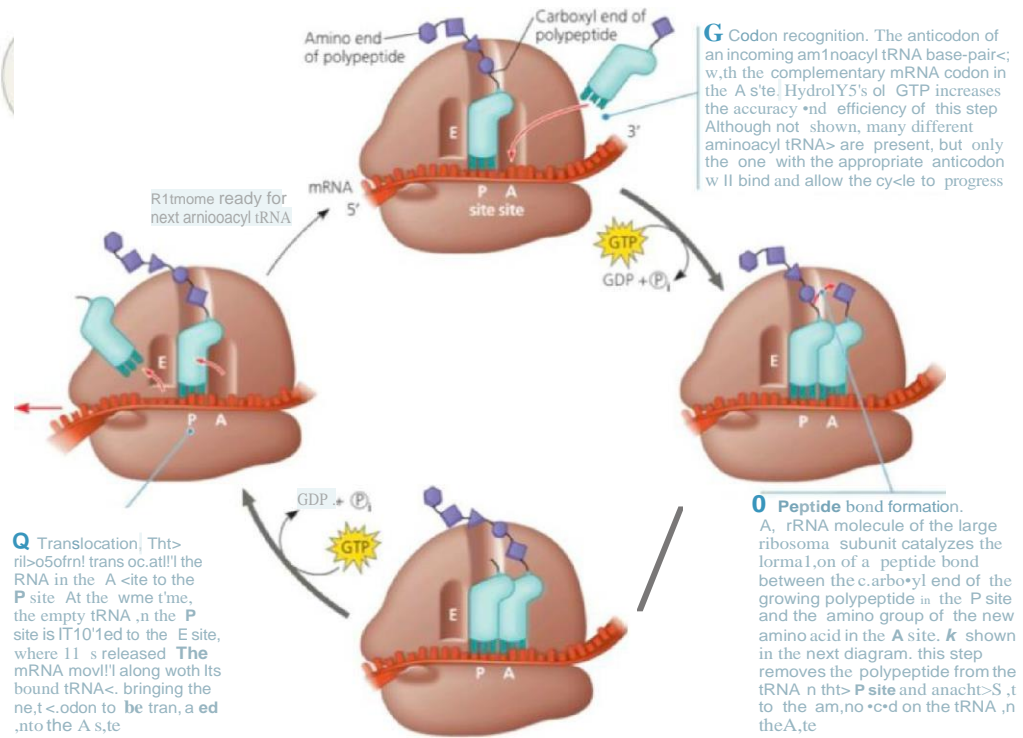
In *bacteria*, a terminator sequence stops the RNA polymerase.

In *eukaryotes*, the RNA polymerase transcribes a **polyadenylation signal**. Proteins bound to this area cut the mRNA from the polymerase.

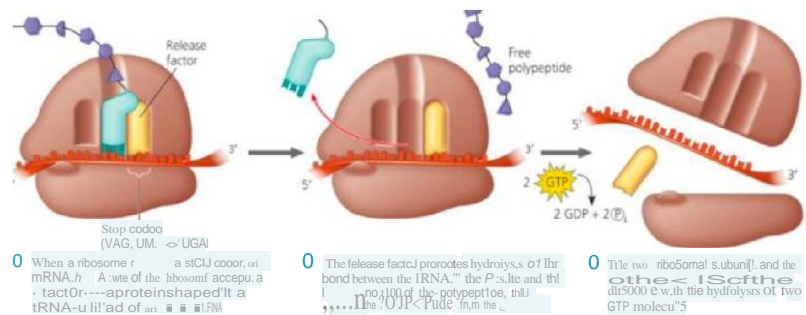
Initiation



Elongation



Termination



Thanks for checking out these weekly resources!

Don't forget to check out our website for group tutoring times, video tutorials and lots of other resources: www.baylor.edu/tutoring/

