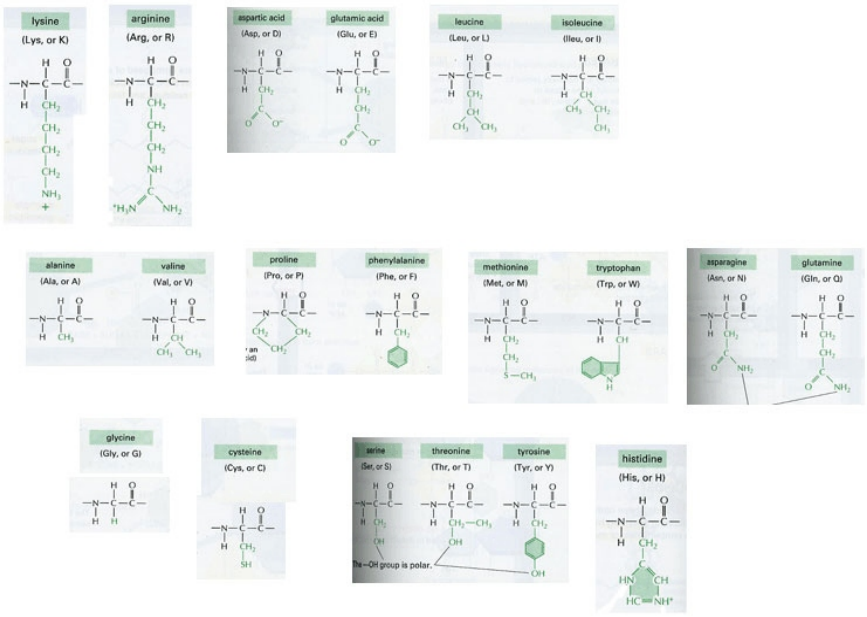
Why We Believe
Week 10: Molecular Evolution

I. First Steps

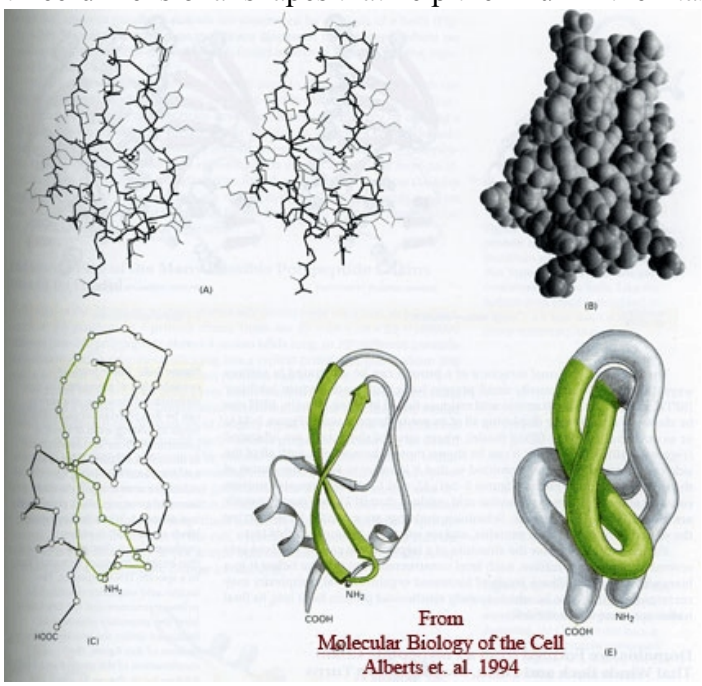
A. In order to make life from non-life you need to make some initial biologic molecules.

1. The most often proposed are amino acids and nucleosides.



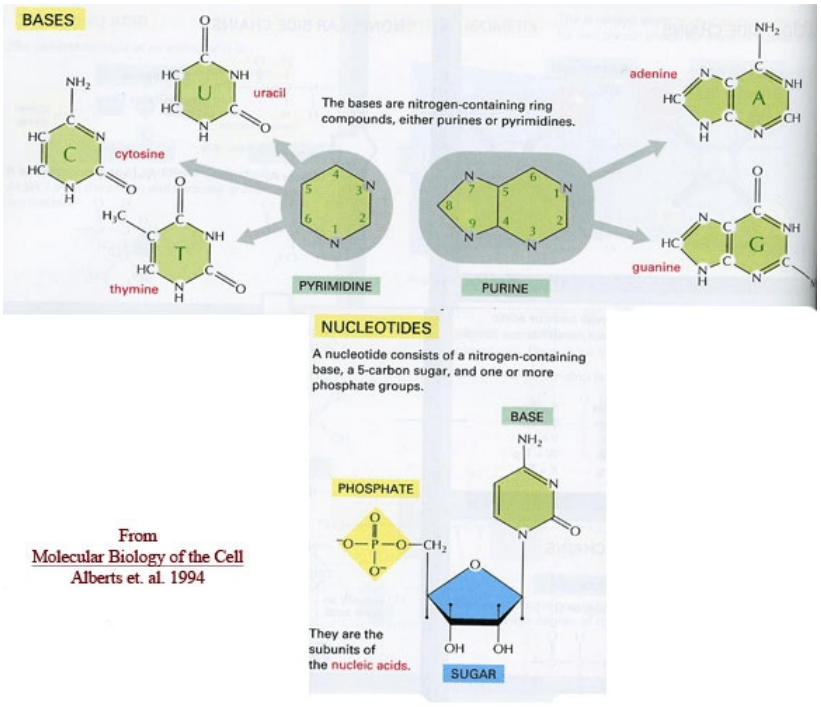

*Amino Acids*
*from Molecular Biology of the Cell, Alberts, et. al. 1994*

2. Amino acids are assembled to chains which fold on themselves to form three-dimensional shapes that help them fulfill their tasks.



3. Proteins that help to promote chemical reactions are called enzymes. The combination of their shape and charge help them to complete their task.

4. Enzymes like tools are very dependent on their shape and small variations can mean significant changes in function.
5. Nucleoside Bases are the building blocks of DNA.




No one has ever shown how nucleoside bases could be formed by any random process, much less assemble into chains spontaneously.

II. Miller's Work

A. In 1957 chemist Stanley Miller discovered that if you put hydrogen, methane, water, and ammonia in a glass loop with a trap, a heater, and electrodes (to cause electric shocks), you can make amino acids.

B. This caused a great stir in the scientific community and was hailed as great evidence for evolution.

C. The Problems with Miller's Work

1. Virtually no one believes that Miller's proposed atmosphere ever existed on our planet.
2. The evidence from the oldest strata specifically contraindicate Miller's system. (Miller's system should have produced large amounts of nitrates which are not present).
3. Miller built a machine.
4. Miller's machine is very finicky (even slight variations in the mixture results in no amino acids).
5. Miller's machine produces amino acids for the first two weeks, then tar.
6. Miller's Machine only makes 4 of the 20 essential amino acids.
7. Biology texts state that other scientists were able to create other amino acids with other mixtures.
8. They don't mention:
    a. That they have only made 16 of the 20 required amino acids.
    b. Any given mixture would destroy the amino acids created by the others.
    c. The other mixtures include set-ups with wildly unrealistic parameters like 30% sulfuric acid, or 2-3 times the normal atmospheric pressure.
    d. Even if you can produce amino acids they don't form proteins when floating in water.
    e. Some have tried to solve this problem by talking about some way the amino acids could then get out of solution onto a dry heated surface, but this does not produce proteins, just proteinoids. Proteinoids have no biologic significance.
9. Others have supposed that some sort of a clay could catalyze the formation of proteins, but they have yet to produce the clay.
10. Even if you form proteins in solution it is virtually impossible to form a normal protein with even 100 amino acids, much less a biologically active one.
11. Even if you could produce a biologically active protein, it cannot reproduce, and it is not alive, so it cannot be selected for by natural selection.

III. RNA World

A. With all the problems that come with a protein based molecular evolution, some have turned to RNA.

B. Some short strands of RNA can act like enzymes and some short strands of RNA can "self replicate."

C. As such some have proposed that life arose from an initial system based on self-replicating RNA.

D. The Problems with RNA World

1. No one has ever been able to show how you can get the nucleoside bases to form RNA without a cell or a complex chemical process.

2. Even if you can get the nucleoside bases they don't spontaneously form chains.

3. Some RNA molecules have enzyme like activity, and some may self-replicate (under very very specific conditions), but no RNA molecules do both.

VI. The Principle of Irreducible Complexity

A. Some things are just complicated and you cannot make it any simpler.

B. A mousetrap is an example of irreducible complexity. It has a few indispensable parts; remove any one and it stops doing its job.


C. Many of the systems in cells are like these examples - if you remove one part the rest don't do anything.

D. Michael Behe discusses this in depth in his book, Darwin's Black Box.

E. Why does Irreducible Complexity Matter?

1. Darwinian evolution states that evolution occurs due to random mutation causing small changes, which result in a advantage which is selected for by natural selection. Over time these small changes add up and result in major change.

2. In an irreducibly complex system there is no advantage until all parts work together. As such you cannot build it up by simple intermediates.

VII. Making Proteins

A. To make a protein you need a ribosome (a group of 50 proteins that makes proteins).

B. You need DNA to tell you how to make the protein, and to tell you how to make tRNA.

C. You need a protein to open the DNA for copying, a protein to unwind the DNA, and a protein to copy the DNA into RNA.

D. You need 30 tRNAs to bring amino acids to the ribosomes.

E. You need proteins to attach the amino acids to the tRNA.

F. You need a system to generate energy to run the system.

G. Without any one of these factors you don't get less protein, you get no protein.

H. If you don't have protein, you don't have life.

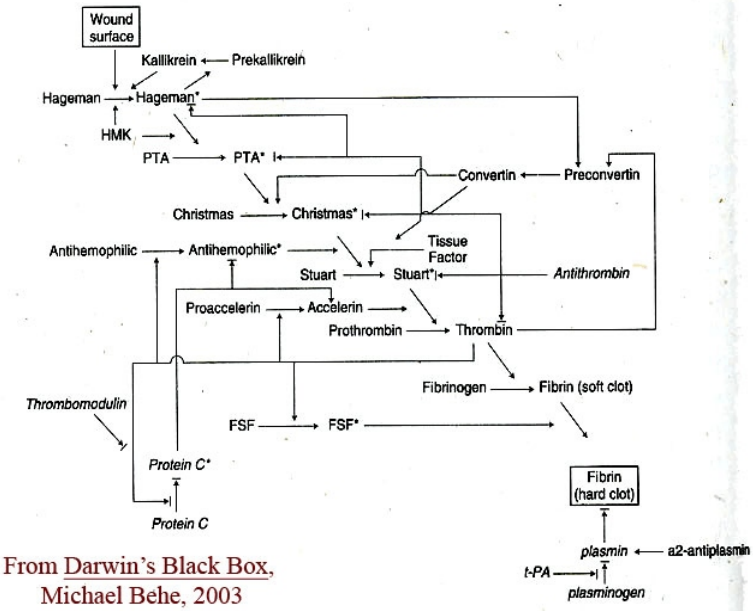
VIII. Blood Clotting

A. Blood clotting is really really important. Without it a small cut would result in your death. With too much of it you die as well.

B. Blood clotting is really complicated.

C. It is not simple to figure out when to clot, where to clot, when to stop and when to disassemble the clot.

D. Forming a Clot




From Darwin's Black Box, Michael Behe, 2003

E. Blood clotting requires all of the factors working together. A lack of, or excess of, any given factor results in a failure of the system: either bleeding too much, or formation of clots that can lead to death.

XI. Vision

A. Evolutionists make the argument that the eye could develop from a simple eye spot, to an eye spot in a pit, to a covered eye spot, to a modern eye as a series of steps.

B. The problem is that they treat eyes as simple devices. There is no such thing as a simple eye spot.

C. Vision works when light strikes a molecule called 11-cis-retinol which is transformed to transretinol. The change in the shape of retinol causes a change in the shape of the rhodopsin protein, to which it is bound, causing the rhodopsin to change to metarhodopsin II. Metarhodopsin II causes the protein transducin to release a small molecule called GDP. When the GDP falls off, GTP can bind transducin, which allows the metarhodopsin-transducin-GTP complex to bind phosphodiesterase. Phosphodiesterase is then enabled to begin to cut up cGMP. As phosphodiesterase lowers the cGMP concentration there is not enough cGMP to bind another protein that keeps a sodium ion channel open and as a result it closes. The change in sodium concentration sends a signal to do something useful in the simple organism. In simplest circumstances the signal turns off the action of the cillia. In more complicated animals it sends a signal to a nerve that goes to the brain.

D. Then another similarly complicated system has to reset everything.

E. If any of these components don't work or don't work exactly right the organism has no vision.

F. If all of these components work and the organism doesn't know what to do with the signal, it is just a huge waste of energy.