

October 14, 2020
MSE 2101 topics

- The transition from chemistry to biology
 - chicken or egg?
 - ribozymes
 - mineral clay
 - vesicles
- The RNA world
 - transition to DNA?
 - The rate of replication → path to natural selection
- 4+ billion years ago: early microbial evolution
 - anaerobic chemoautotrophs
- 3.5+ billion years ago: rapid diversification
 - evolution of photosynthesis in steps
- 2.5 billion years ago: initial oxygen buildup
 - everything balances everything, adaptation rules!
- 2.1 billion years ago: first cell nuclei; symbiotic relationships
 - complex structures → more diversity
 - compartmentalized structure, mitochondria, chloroplasts
- 1.2 billion years ago: first multi-cellular eukarya
 - repeatable independent evolution
- 542 million years ago: the Cambrian explosion
 - 30 phyla within ~40 million years
 - clues for sudden, unrepeated diversification?