

## Concepts/Topics

- 3 types of RNA (and their functions) - rRNA, mRNA, tRNA
- Transcription - complementary RNA from DNA template
- Translation - protein (polypeptide) from mRNA instructions (using codon table)
- posttranscriptional modifications (spliceosomes, 5' cap, poly A tail)
- posttranslational modifications (what types, where in cell)
- gene regulation (prokaryotes): lac operon (including role of glucose)
- gene regulation (eukaryotes): transcription factors

## Readings

*Principles of Life* (2013), Chpt. 10-11

“Synthetic Microbe Lives with Fewer than 500 genes” (*Science* - 24 Mar 2016)

## Homework/Activities

- Article Questions: Science magazine Synthetic Microbe article Due: \_\_\_\_\_
- TBA: \_\_\_\_\_ Due: \_\_\_\_\_

## Videos/Tutorials

### Gene Expression/Protein Synthesis:

The Central Dogma of Biology (DNA Learning Center)  
mRNA Translation (DNA Learning Center)  
Transcription and Translation (Prof. Dave Explains)  
Transcription and Translation (Bozeman)  
Protein Synthesis (Amoeba Sisters)  
Protein Synthesis (Brightstorm)  
Transcription (Brightstorm)  
Translation (Brightstorm)  
DNA Transcription and Translation (Crash Course)

[www.youtube.com/watch?v=9kOGOY7vthk](http://www.youtube.com/watch?v=9kOGOY7vthk)  
[www.youtube.com/watch?v=Tfyf\\_rPWUdY](http://www.youtube.com/watch?v=Tfyf_rPWUdY)  
[www.youtube.com/watch?v=bKlpDtJdK8Q](http://www.youtube.com/watch?v=bKlpDtJdK8Q)  
[www.youtube.com/watch?v=h3b9ArupXZg](http://www.youtube.com/watch?v=h3b9ArupXZg)  
[www.youtube.com/watch?v=oefAl2x2CQM](http://www.youtube.com/watch?v=oefAl2x2CQM)  
[www.youtube.com/watch?v=ihxTFDQYJnI](http://www.youtube.com/watch?v=ihxTFDQYJnI)  
[www.youtube.com/watch?v=J6Fg8isWTrs](http://www.youtube.com/watch?v=J6Fg8isWTrs)  
[www.youtube.com/watch?v=mvV9LSUbm8g](http://www.youtube.com/watch?v=mvV9LSUbm8g)  
[www.youtube.com/watch?v=itsb2SqR-R0](http://www.youtube.com/watch?v=itsb2SqR-R0)

### Gene Regulation:

Gene Regulation (Amoeba Sisters)  
Regulation of Gene Expression (Prof. Dave Explains)  
Gene Expression (Brightstorm)  
Gene Regulation (Bozeman)  
Operon (Bozeman)

[www.youtube.com/watch?v=h\\_1QLdtF8d0](http://www.youtube.com/watch?v=h_1QLdtF8d0)  
[www.youtube.com/watch?v=J9jhg90A7Lw](http://www.youtube.com/watch?v=J9jhg90A7Lw)  
[www.youtube.com/watch?v=LVoaad73VB8](http://www.youtube.com/watch?v=LVoaad73VB8)  
[www.youtube.com/watch?v=9kOGOY7vthk](http://www.youtube.com/watch?v=9kOGOY7vthk)  
[www.youtube.com/watch?v=10YWgqmAEsQ](http://www.youtube.com/watch?v=10YWgqmAEsQ)