

# Lecture 1

January 4, 2018

## 1 Overview

Uses of computational biology:

- Cellular processes
- Organismal health or disease
- Ecosystems
- Evolution
- Molecular/Macromolecular

## 2 Central Dogma

- Dna: encoding with fasta files
- RNA: Translation (codon tables)
- Protein: post translational modification, cleavage, glycosylation

## 3 DNA Sequences

- With a GC bias, you can count  $G+C/A+C+G+T$  to get a percent of total and use that to find runs
- With TATATAAT blocks you can use regular expressions to find the sequences you want
- With TG groups, you can use Dinucleotide Composition, which does  $TG/(AA+AT+AG...+TT)$
- With hairpin loop formations, you need to find complimentary nucleotides on each side start from the first U in the last run.