

# GDCB 511

## Course notes

- TA: Rebecca Weeks (rlmauton@iastate.edu)
- Purpose of textbook: learn how to draw conclusions from experimental results

## Central dogma

Our course will focus on the central dogma of molecular biology; specifically, we will look at:

- the important processes in molecular detail
- the related regulatory mechanisms

## Biomolecular structures

### DNA structure

- phosphodiester bonds between 5' phosphate and 3' carbon
- double helical structure
  - most binding on major groove
  - .34 nm (3.4 Å) between nucleotides
  - 3.4 nm (34 Å) period in the helix (10 bp = 1 turn of the helix)

### Protein structure

- I need to memorize the peptide bond
- reactivity at the peptide bond (especially the double-bonded oxygen and the hydrogen) is responsible for protein secondary structure
- secondary structure elements:  $\alpha$  helix,  $\beta$  sheet, loops (especially near prolines)

## Molecular cloning

- molecular recombination using restriction enzymes, DNA ligase
- alkaline phosphatase method can be used for screening out vectors that have re-ligated to themselves (vs vectors successfully transformed with recombinant DNA)