

ch. 5

## DNA, Gene Expression, Biotechnology

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- > DNA: contains instructions for your body
  - structure?
  - function?
  - replication ability?

- (Structure)
- > DNA = nucleic acid
  - consists of nucleotides
  - w/ sugar + phosphate backbone
  - genetic code = ATCG sequence



- (Function)
- > Genes = sections of DNA w/ instructions for making proteins
  - > Only 5% DNA actually serve as coding instructions
    - ^  
regions
  - > Transcription: reading + copying of proteins to make DNA
  - > RNA = like DNA but DNA
  - > DNA to RNA
    - 1.) Unzip DNA
    - 2.) Take the complement A for T, C for G, etc
    - 3.) Replace all T's w/ U's
      - o so it can leave nucleus to go to ribosomes
  - > built into DNA code is a "start code"
    - the ribosome can begin coding

Bio p.2 DNA(cont)

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Example:

DNA copy TAC ATT CGG GCT AGT CAT TCG (unzip)

+ + + + + + +

Complement ATG TAA GCC CGA TCA GTA AGC (complement)

RNA AUG UAA GCC CGA UCA GUA AGC (replace T → U)

Aminos Met (STOP) Ala Arg Ser Ala Ser

(Replication) > When, Where, How?

- > When: during interphase
- > Where: in the nucleus
- > How:

- 1) Unzip DNA (split DNA molecule)
- 2) Bases are Read (A, T, C, G's)
- 3) Complementary copy made (A → T, C → G, etc.)
- 4) Proofread both strands
- 5) Mistakes cut out & corrected
- 6) Resume process

- > Mutations: errors, changes in sequence of bases in DNA
  - Point mutation = 1 single base is changed (A, T, C or G)
  - Addition/Deletion = addition or deletion of a protein;  
throws off proofreading thus cell is destroyed faster
  - Causes = chemical exposure & radiation
    - also through internal mistakes in DNA copying