Cell Division & Mitosis

Chapter 2-1

Vocabulary

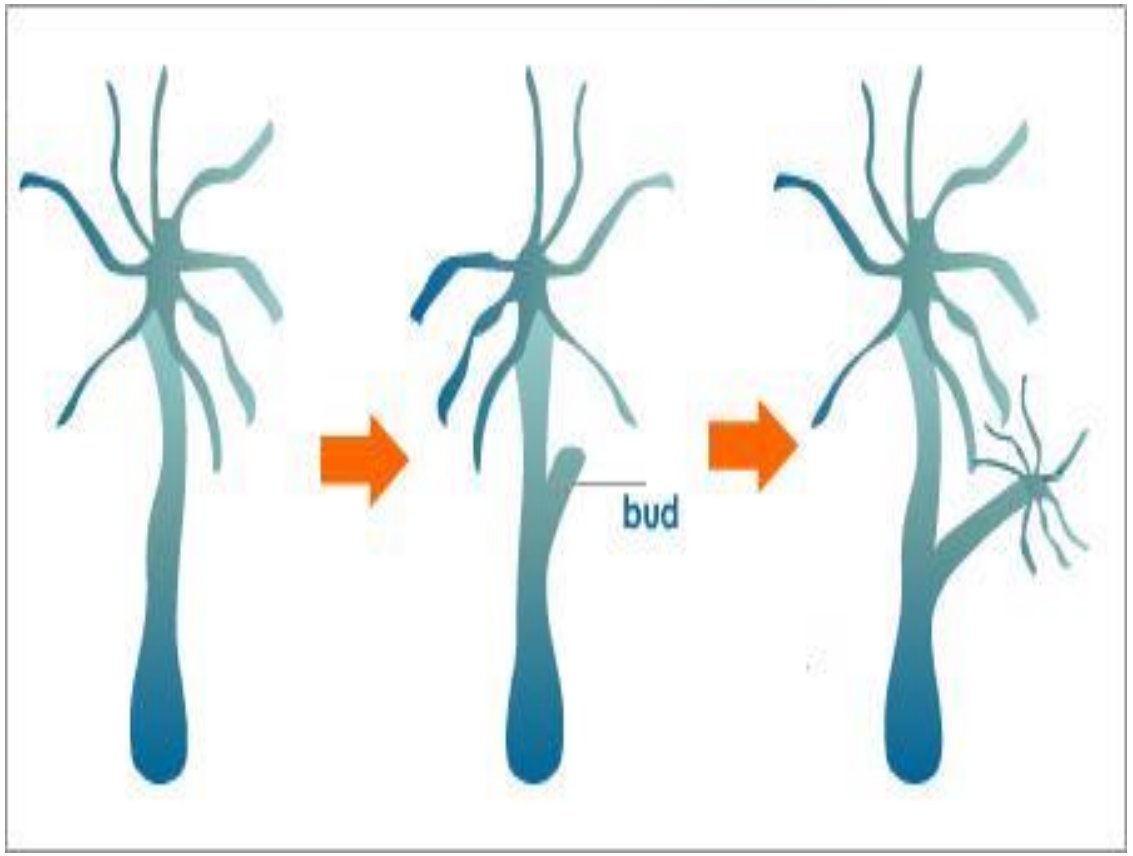
- Mitosis
- Chromosome
- Asexual Reproduction

Budding And Regeneration

Budding

During budding, the organism grows a “bud” on a part if it by mitosis.

When the bud grows large enough, it breaks off and lives on its own.



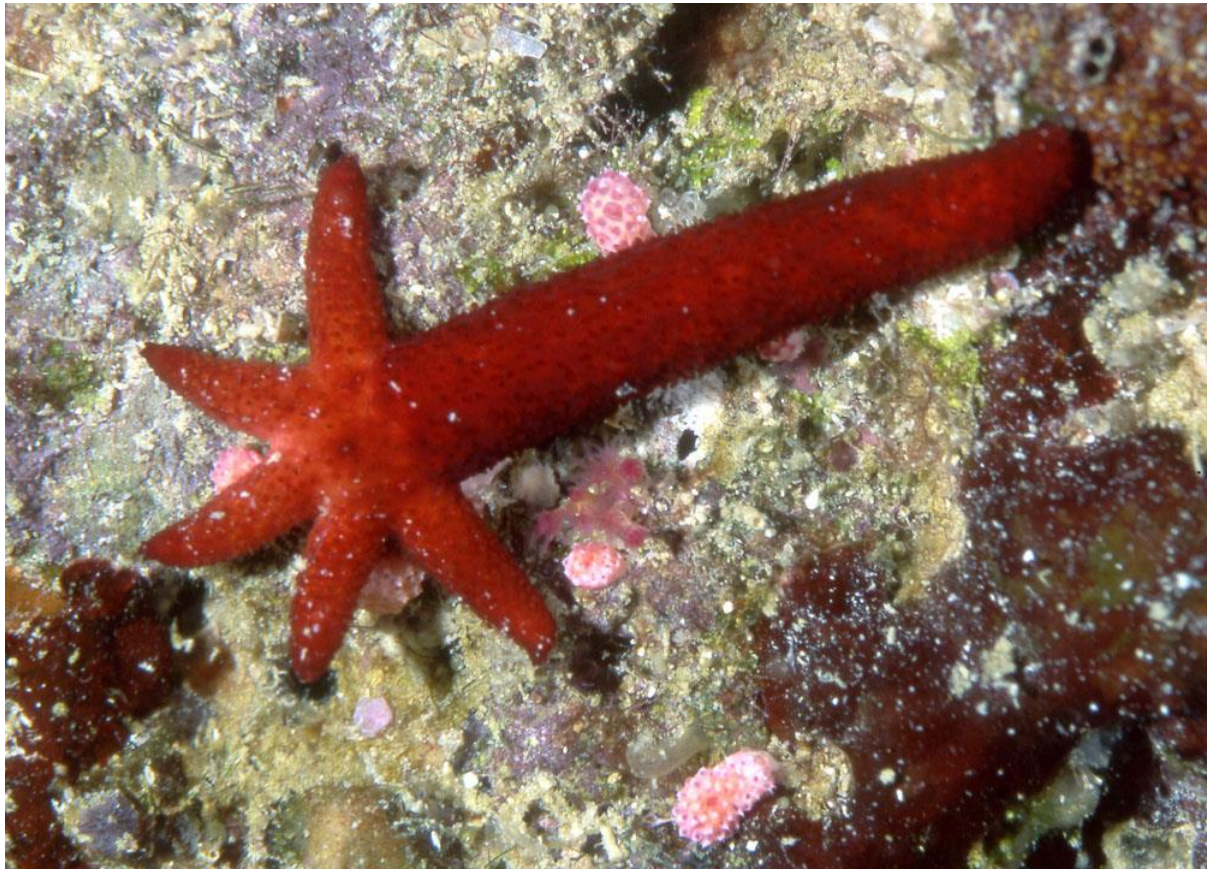
Budding And Regeneration

Regeneration

Regeneration is the process that uses mitosis to regrow body parts.

Some organisms will only regrow the body part that was severed.

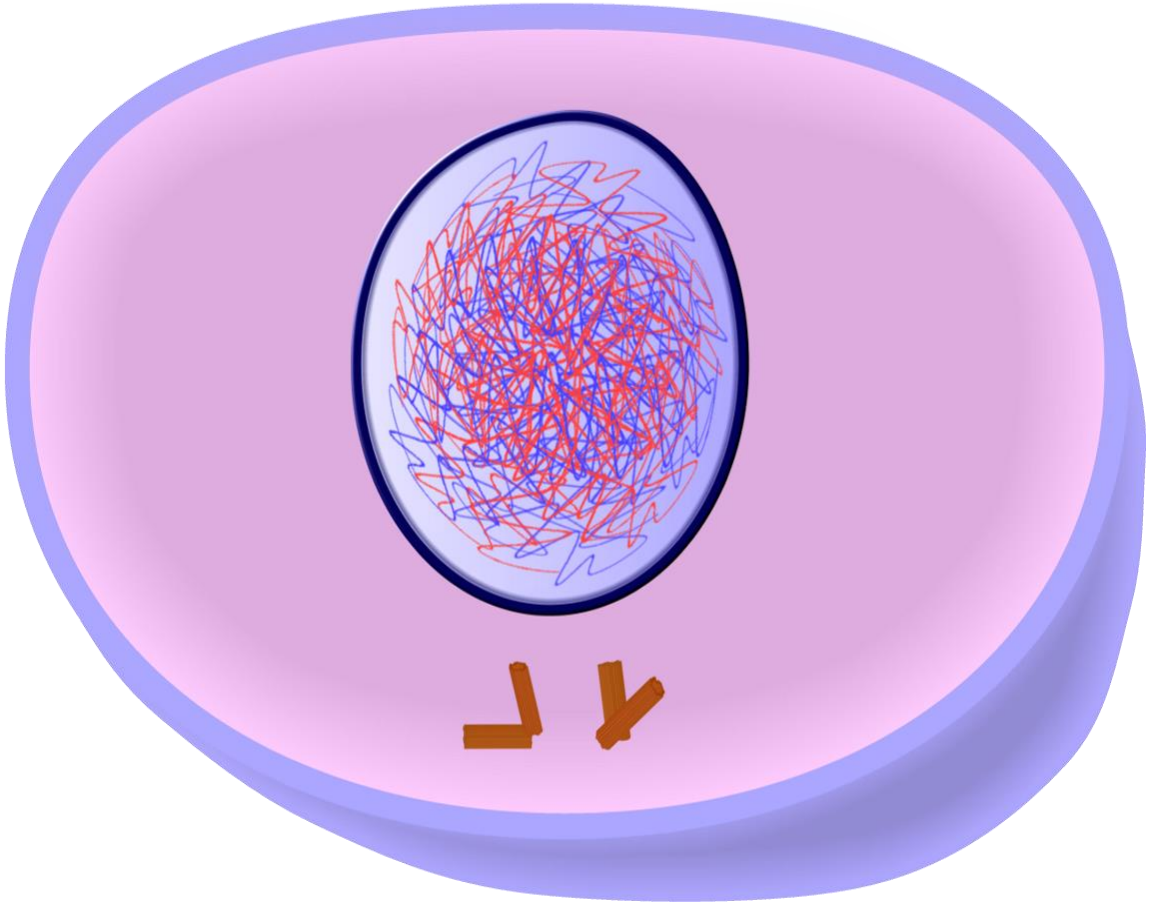
In some organisms, the severed part will become its own separate organism.



Mitosis

Interphase

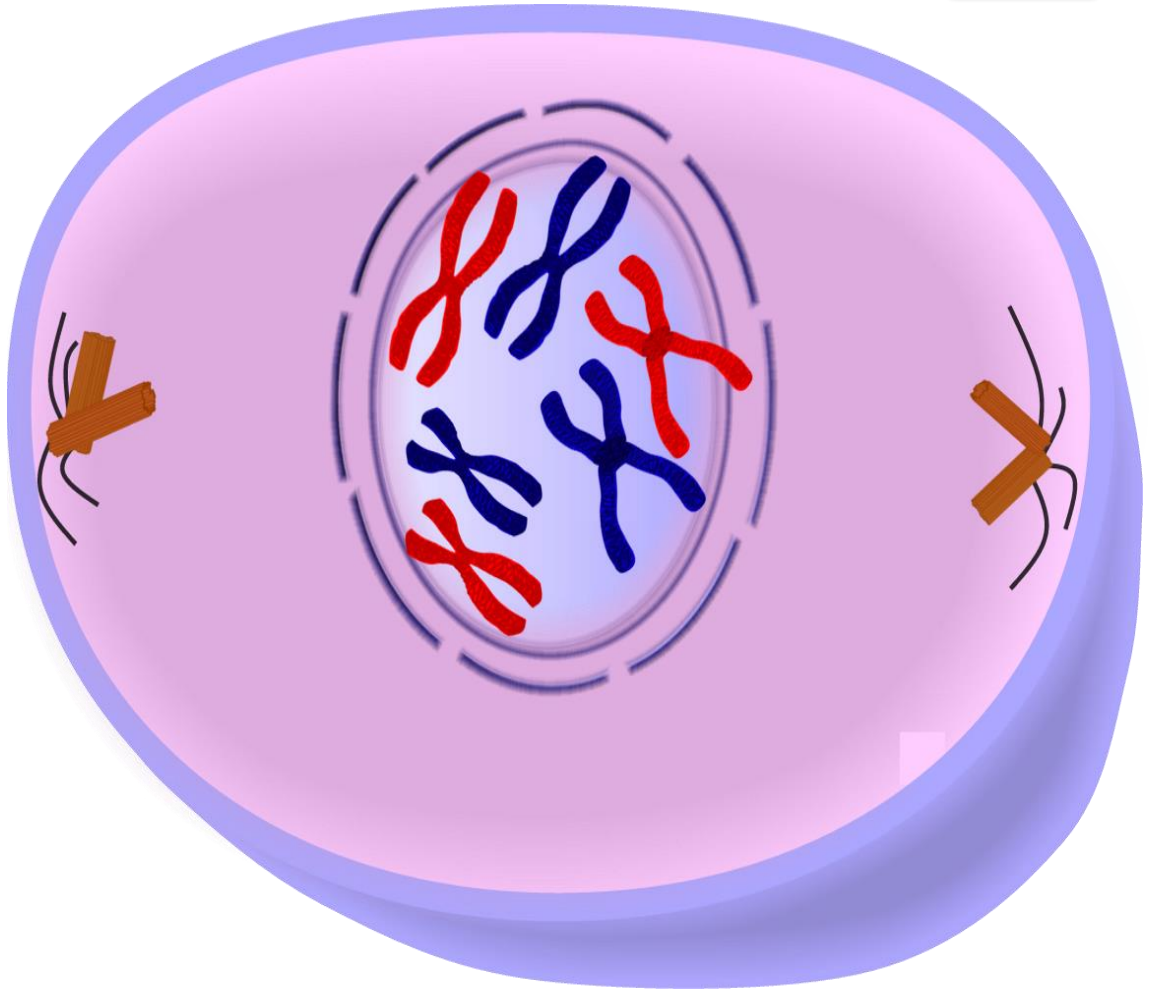
- The cell's chromosomes duplicate
- The nucleolus is clearly visible in the nucleus



Mitosis

Prophase

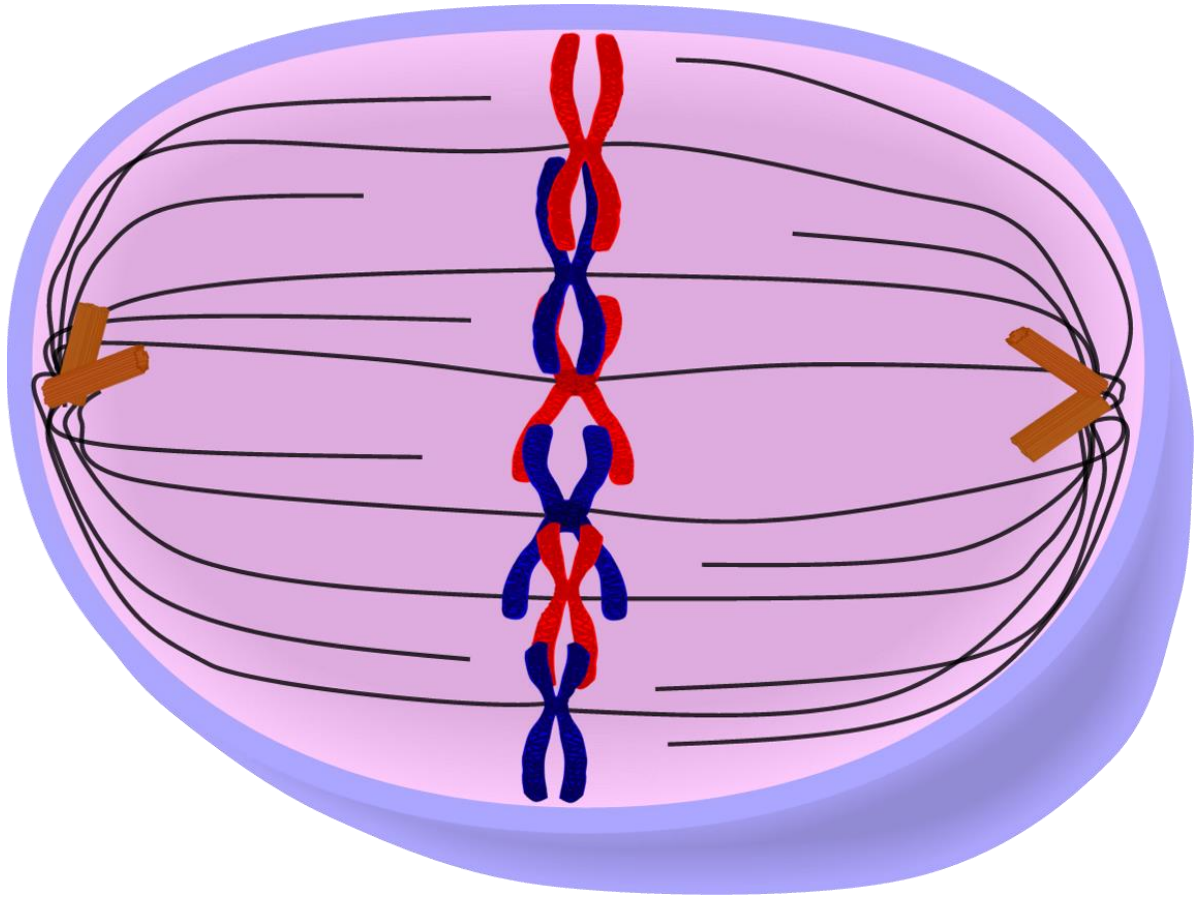
- The chromatid pairs are now visible
- Spindle fibers are beginning to form



Mitosis

Metaphase

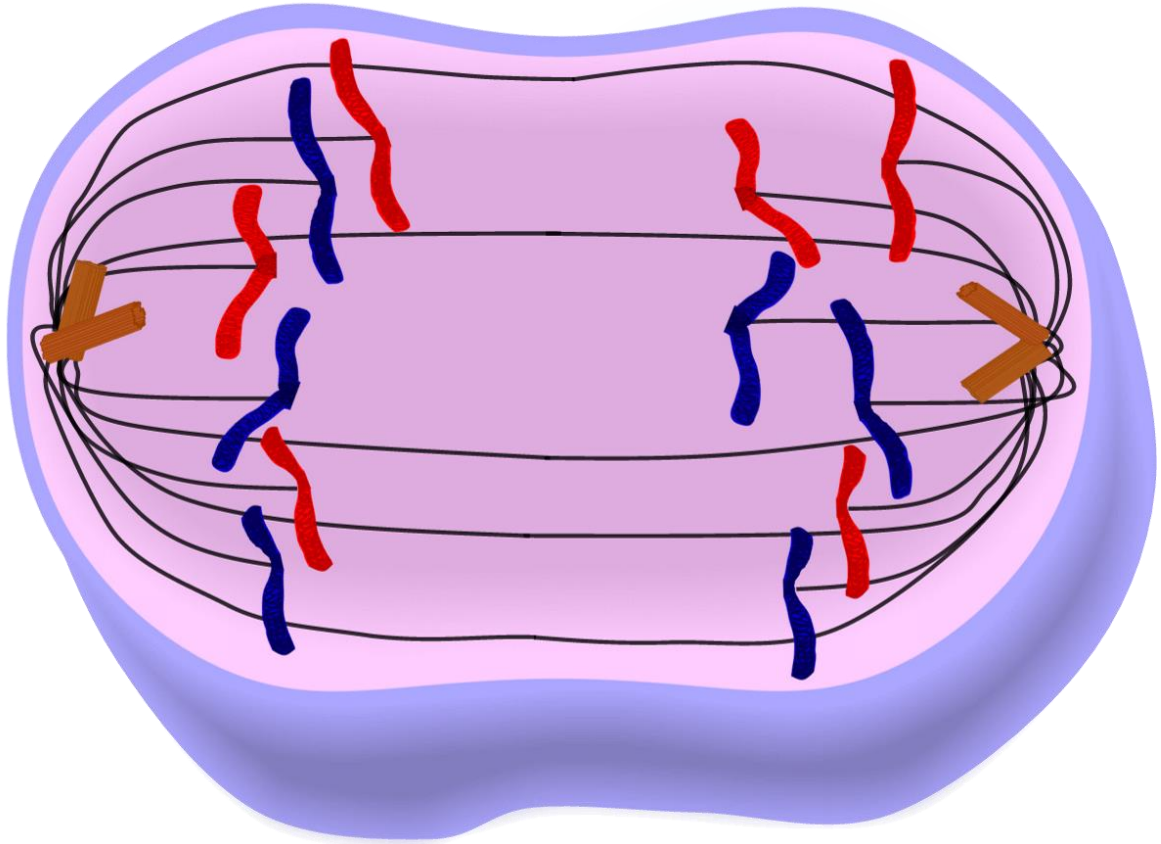
- Chromatid pairs are lined up in the center of the cell
- Spindle fibers connect to each chromatid



Mitosis

Anaphase

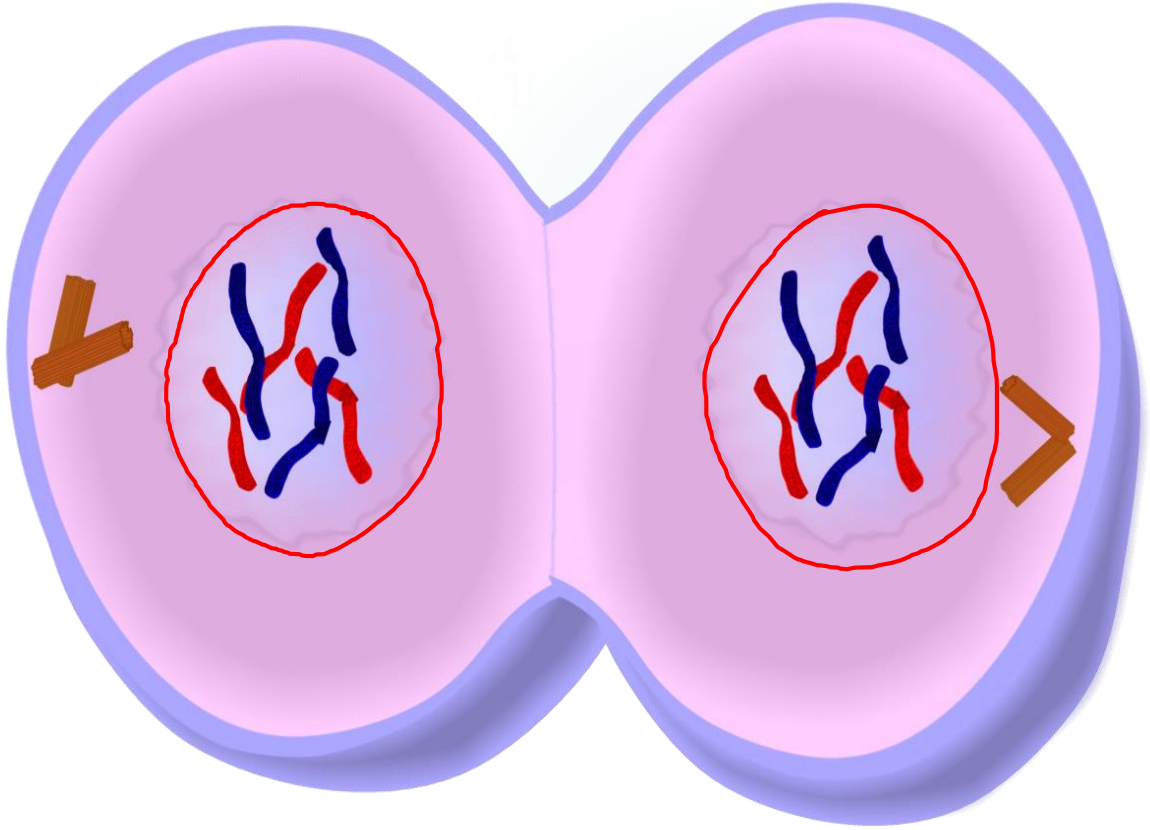
- The chromosomes have separated
- Spindle fibers have pulled the chromosomes apart



Mitosis

Telophase

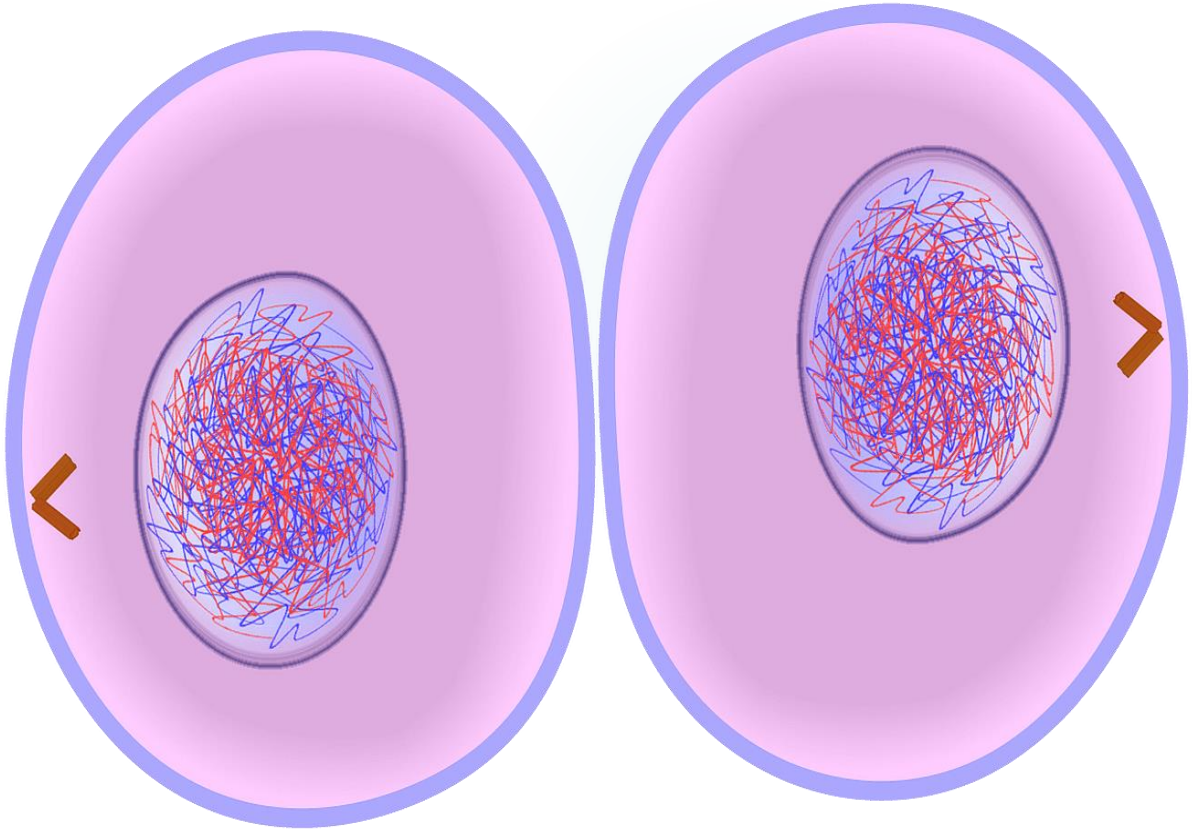
- Two new nuclei are formed
- The cytoplasm begins to split



Mitosis

Cytokinesis

- Two new complete cells are formed
- Interphase begins, thus starting the cycle again



DNA

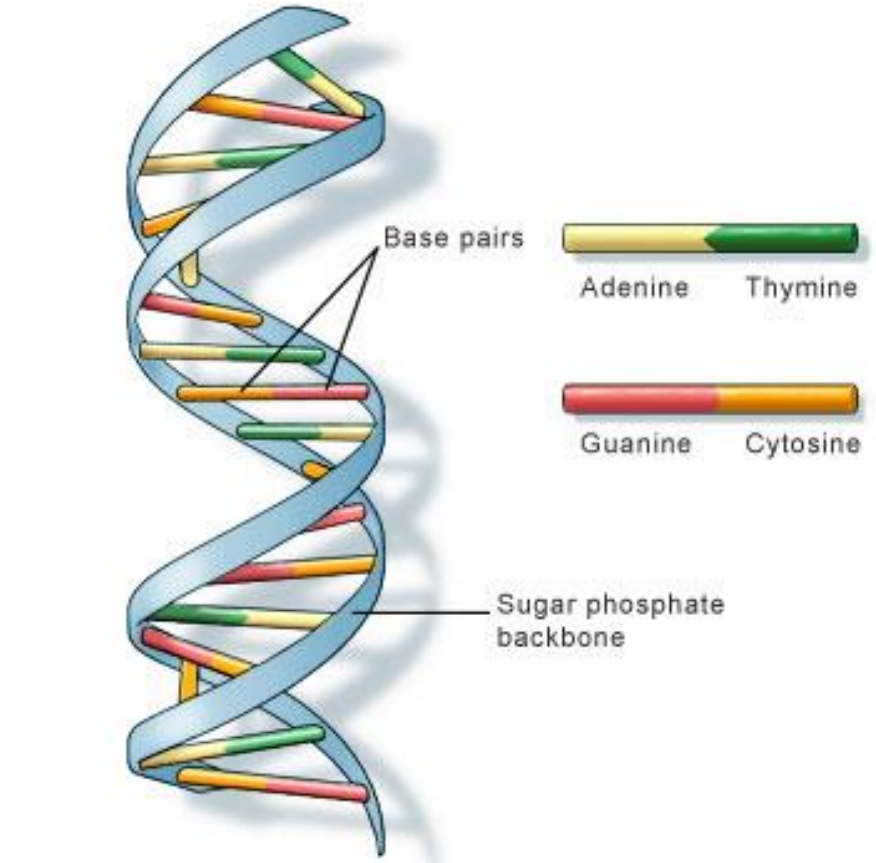
Chapter 2-3

Vocabulary

- DNA (Deoxyribonucleic Acid)
- Gene
- RNA (Ribonucleic Acid)
- Mutation

DNA's Structure

- DNA is a double helix structure
  - Looks like a twisted ladder
- The sides of the ladder are made up of sugar-phosphate molecules
  - Sugar – Deoxyribose
- The steps of the ladder are made up of nitrogenous bases



Nitrogenous Bases

- Four kinds of nitrogen bases are in DNA:
  - Adenine (A)
  - Thymine (T)
  - Cytosine (C)
  - Guanine (G)

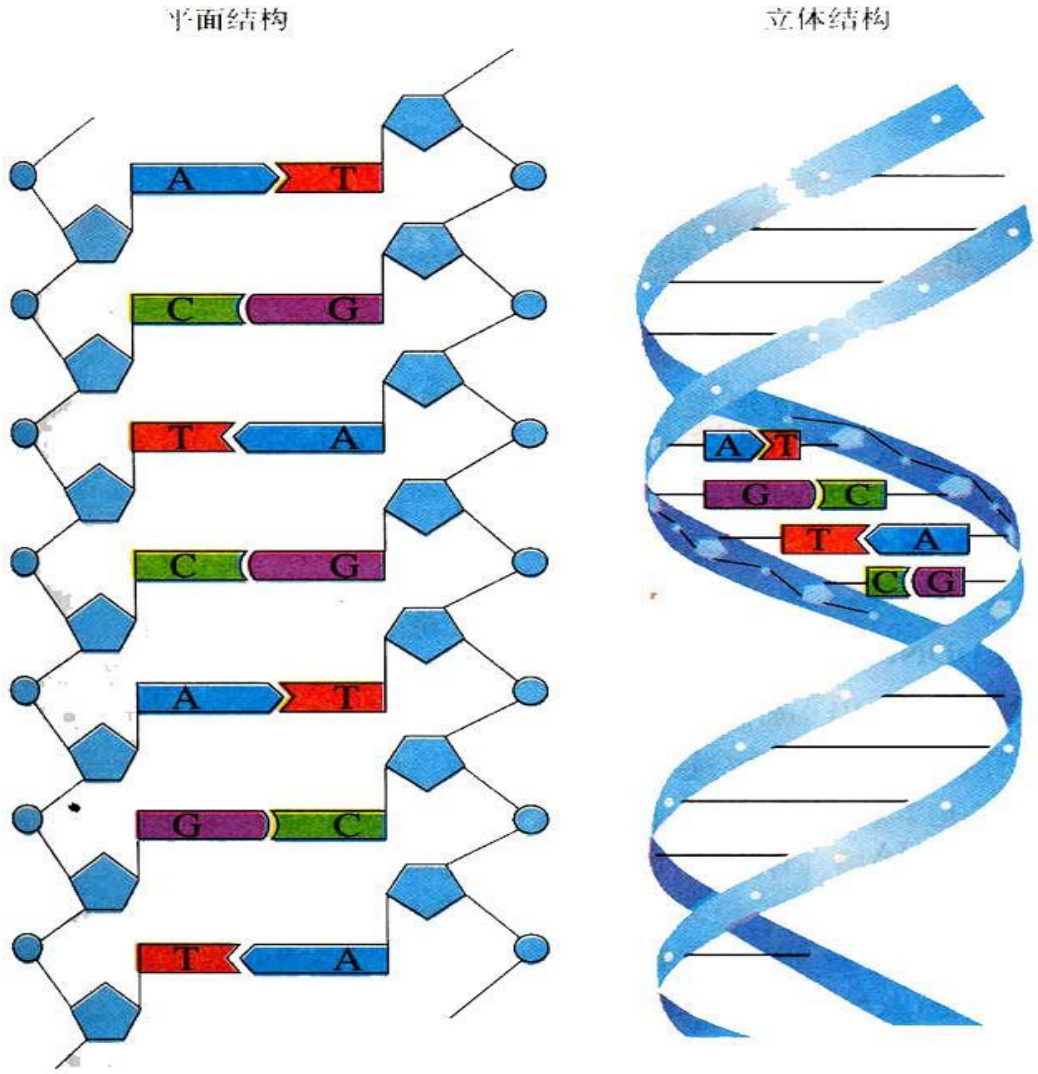


图 6－4　DNA 分子的结构模式图

DNA Nitrogenous Bases Pairing

- Nitrogenous bases in DNA always pair up in a specific pattern
- Adenine (A) always pairs up with Thymine (T)
- Cytosine (C) always pairs up with Guanine (G)

A ➡ T

C ➡ G

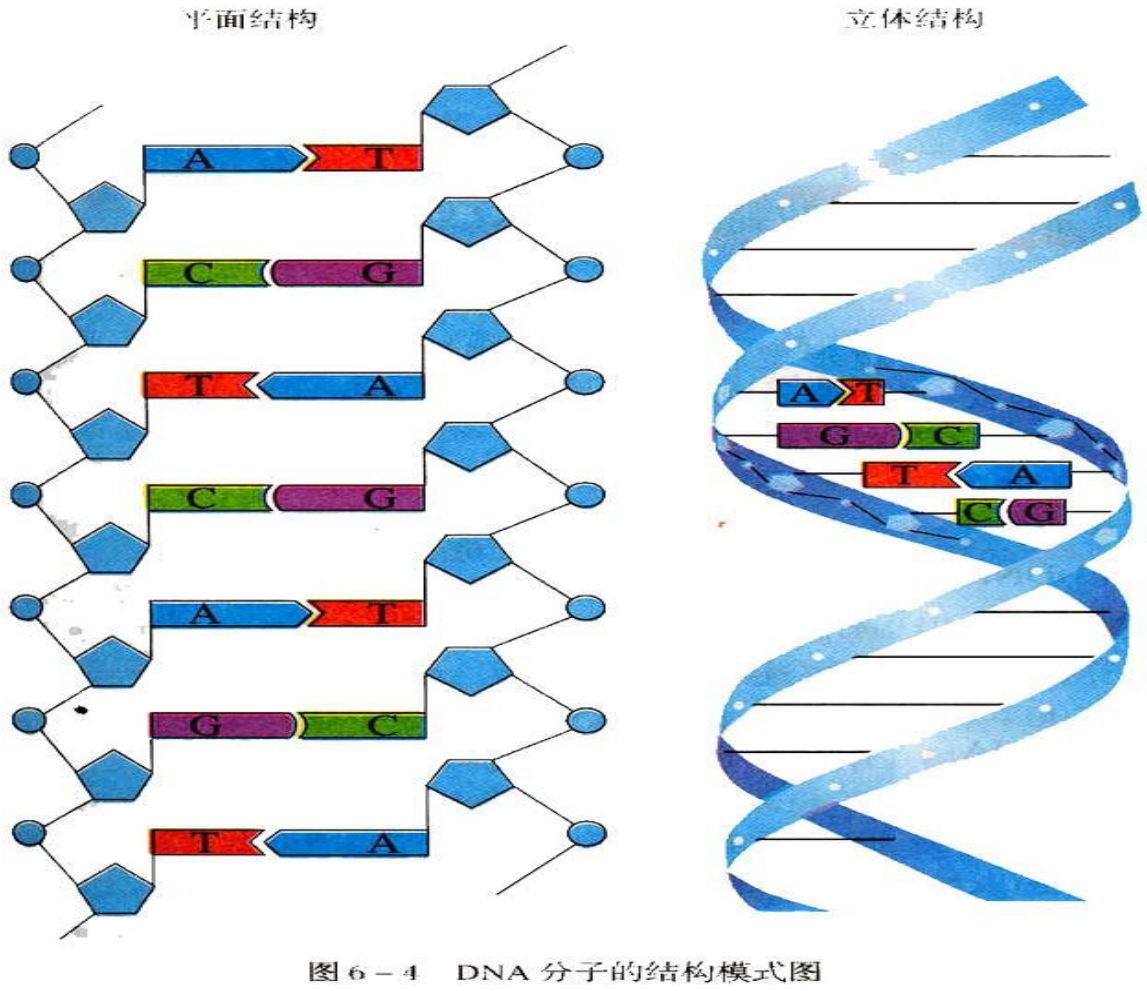


图 6－4　DNA 分子的结构模式图

RNA

- Ribonucleic Acid
- Made in the nucleus
- RNA is a copy of one side of a DNA strand

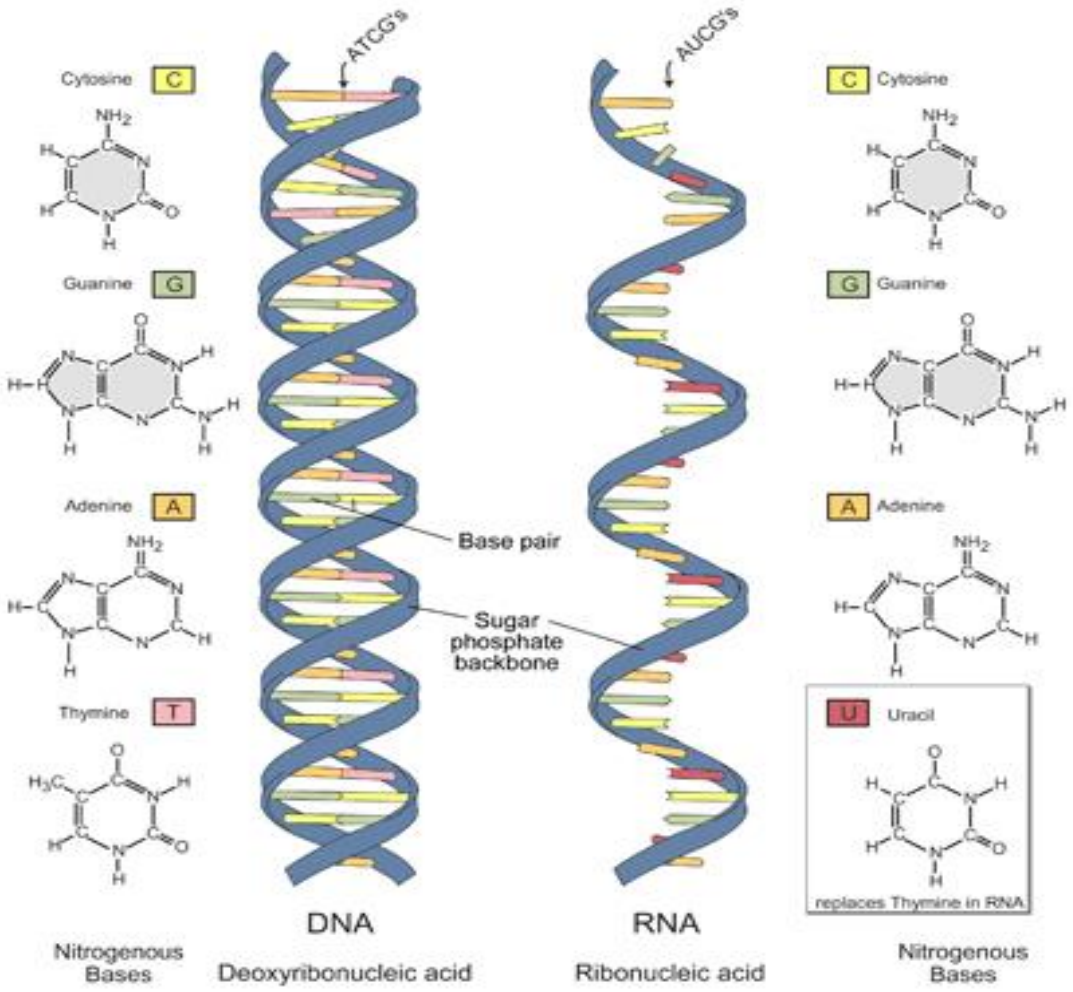
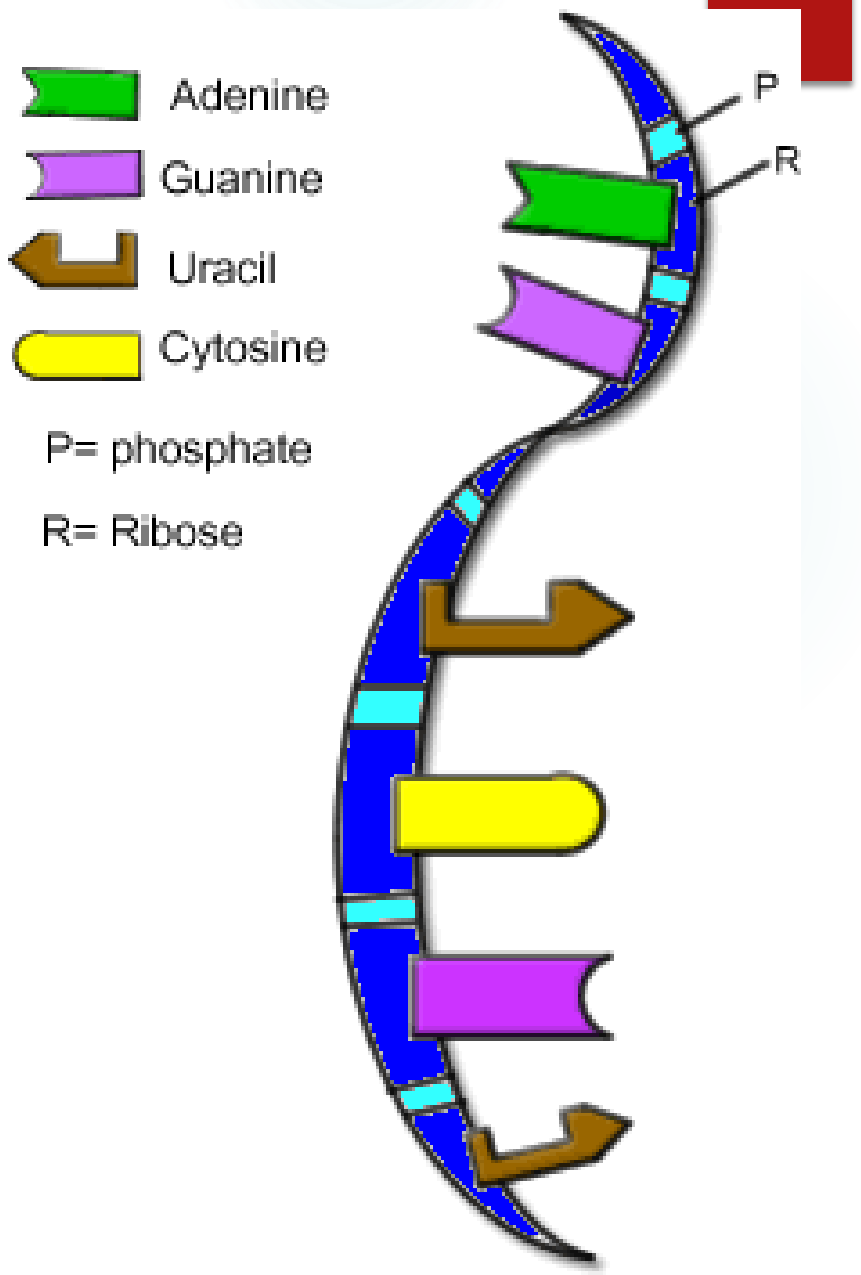


Image adapted from: National Human Genome Research Institute.

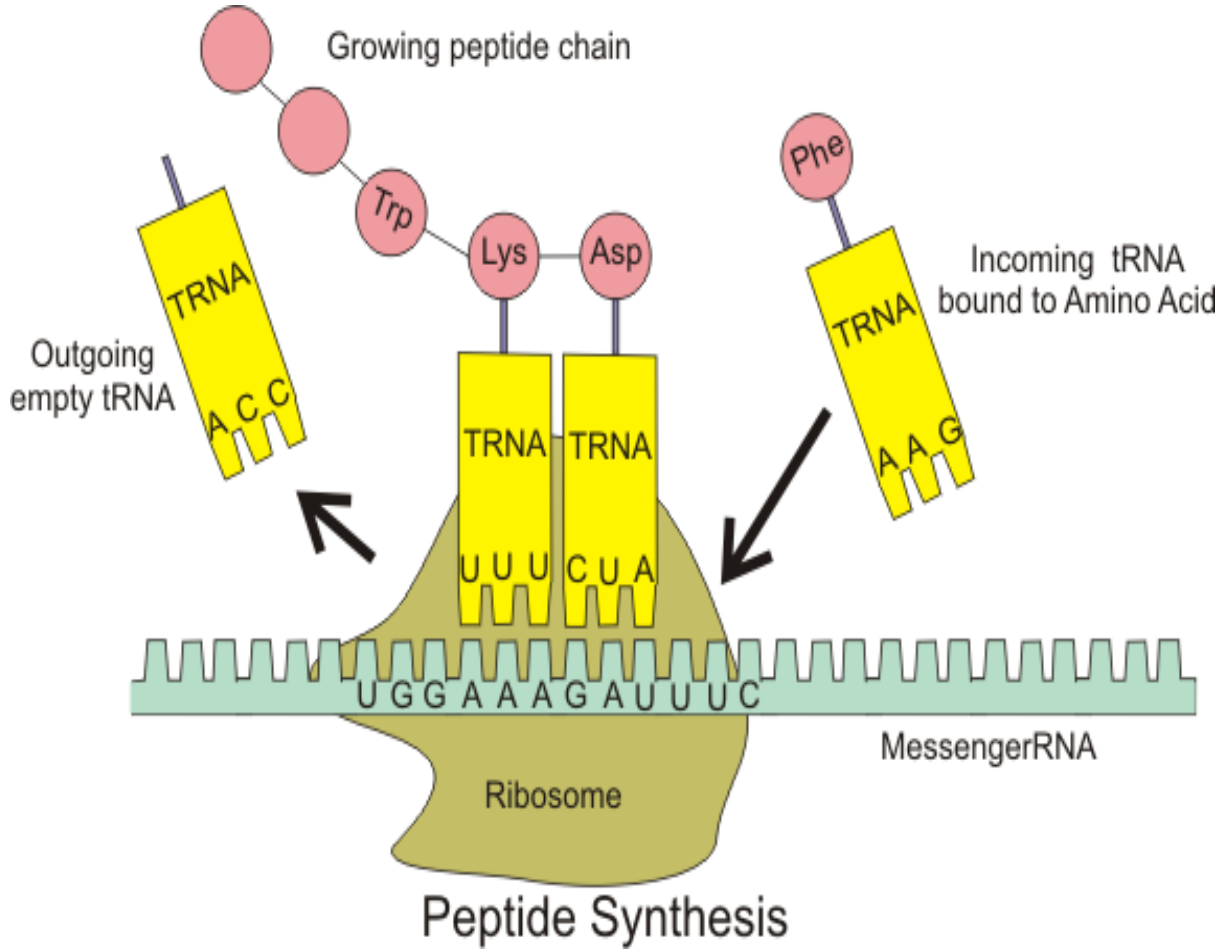
RNA Make-Up

- RNA has ribose instead of deoxyribose
- RNA bases are very similar to DNA bases
- Adenine (A)
- Uracil (U)
  - Instead of Thymine (T)
- Cytosine (C)
- Guanine (G)



Types Of RNA

- Messenger RNA (mRNA)
  - Moves into the cytoplasm, and ribosomes attach to it
- Ribosomal RNA (rRNA)
  - Ribosomes are made of rRNA
- Transfer RNA (tRNA)
  - Bring amino acids to the ribosome



PROTEINS

- The results of RNA making proteins result in the unique characteristics that make us the unique individuals we are:
  - Eye color
  - Hair color
  - Skin color/tone
  - Height
  - etc.