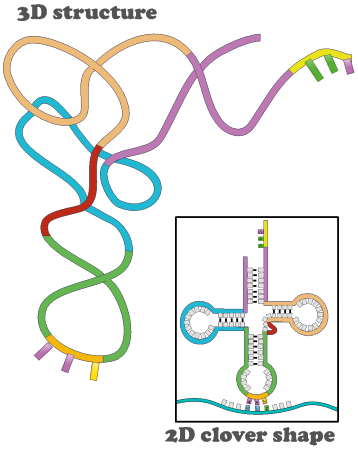
CONCEPT: RNA

- RNA differs from DNA
  - □ RNA was used as the genetic material during the _____ world
    - **Ribozymes** can catalyze chemical reactions
    - Can form secondary structures
  - □ RNA structure is _____ from DNA structure
    - Ribose sugars vs. deoxyribose sugars (difference lies in OH at 2' carbon)
      - This small difference makes RNA more easily degraded
    - Contains **uracil (U)** instead of thymine (T)
    - RNA is normally single stranded

EXAMPLE:



- There are many different RNA classes
  - □ **mRNA** is the coding RNA, which codes for proteins
  - □ Two RNAs are important for translation
    - **rRNA** creates ribosomal subunits
    - **tRNA** is used to add amino acids onto a polypeptide chain
  - □ There are many classes of **non-coding RNAs** with a variety of functions
    - *miRNAs* and *siRNAs* play a role in RNA interference, which controls gene expression
    - Small cytoplasmic RNAs (scRNAs) have an unknown function
    - Long non-coding RNAs have many different functions
    - snRNAs convert pre-mRNA into mRNA
    - snoRNAs – process rRNAs

PRACTICE

1. True or False: RNA predated DNA as the main genetic material during the early world.
    a. True
    b. False

2. Which of the following is not a difference between DNA and RNA?
    a. RNA uses ribose, DNA uses deoxyribose
    b. RNA uses uracil, DNA uses thymine
    c. RNA uses Phosphodiester bonds, DNA uses ester bonds
    d. RNA is normally single stranded, DNA is normally double stranded

3. Which of the following terms is used to describe catalytically active RNA molecules?
    a. Proteosomes
    b. Ribozymes
    c. Polymerases
    d. Ligases