

# Watson and Crick



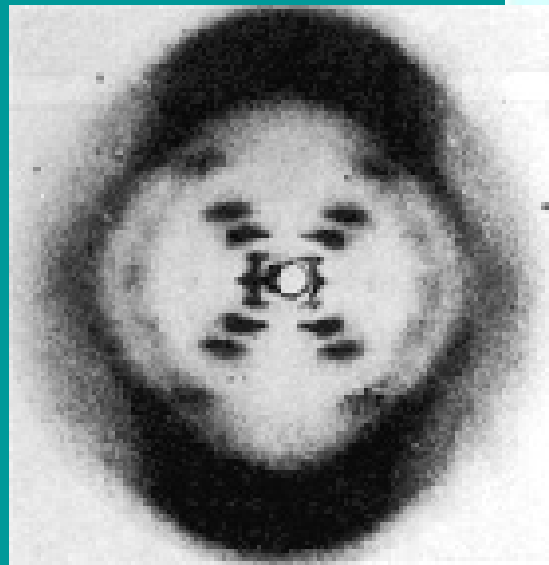
- <http://www.dnai.org/timeline/index.html> 1954 Watson Remembers

# They weren't so great

- Knew that proteins were made in cytoplasm
- Knew DNA was in nucleus
- Didn't know how info from DNA got to cytoplasm

# The REAL Scientist

- Roslind Franklin
- X-rays of DNA
- ACTUALLY WORKED  
IN A LAB!

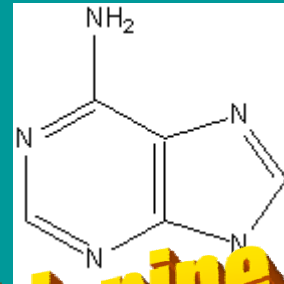


# The Boys Just Played with Paper

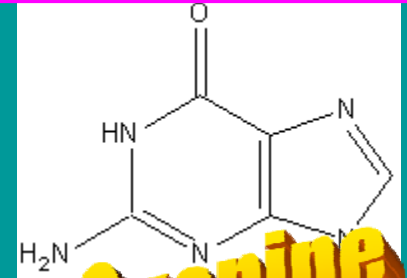
- We know DNA is a nucleic acid
- Nucleic acids are strings of

## NUCLEOTIDES

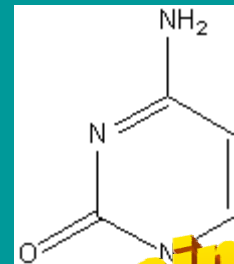
Start with 4 bases



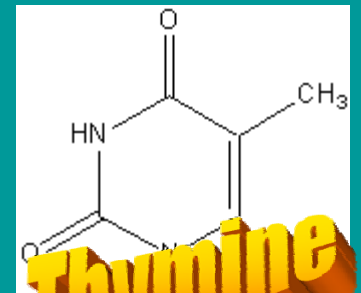
Adenine



Guanine

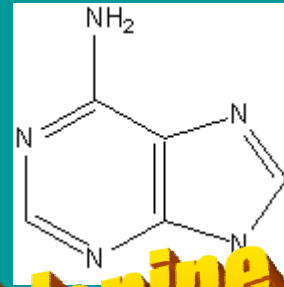


Cytosine

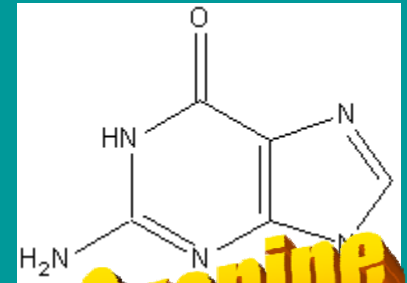


Thymine

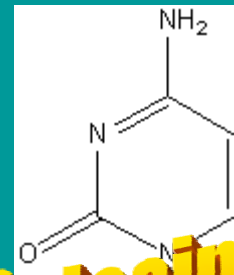
# The Boys Just Played with Paper



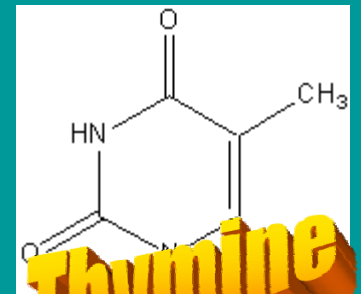
**Adenine**



**Guanine**

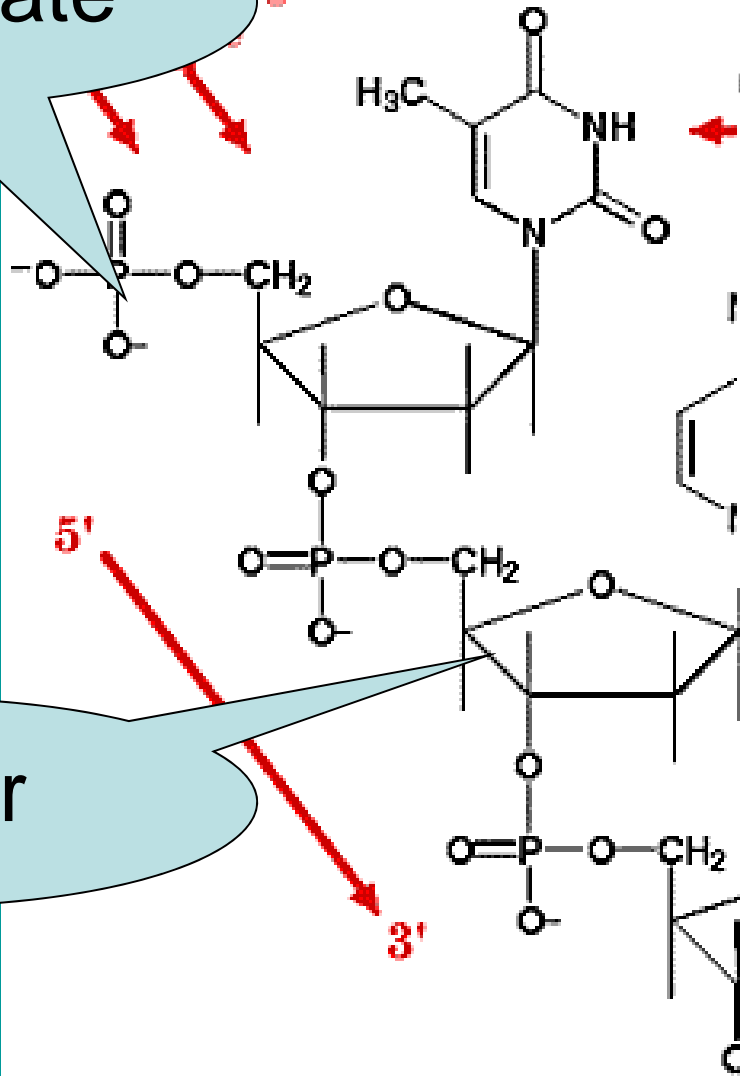


**Cytosine**

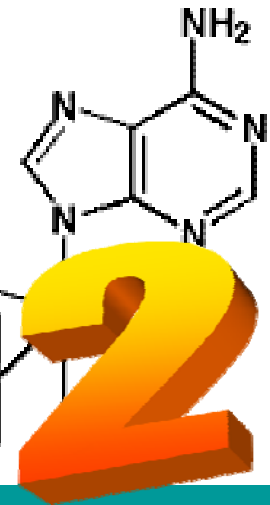
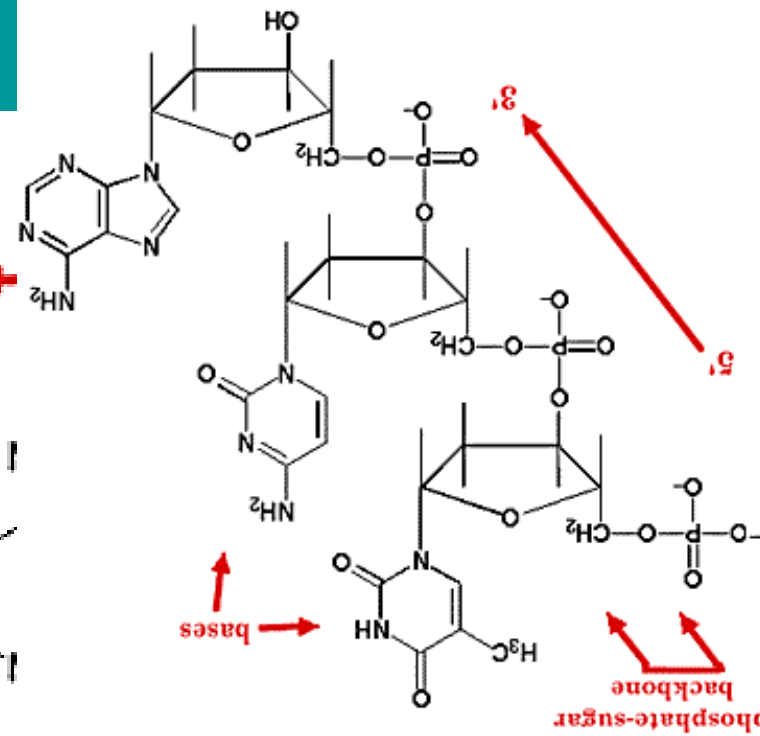


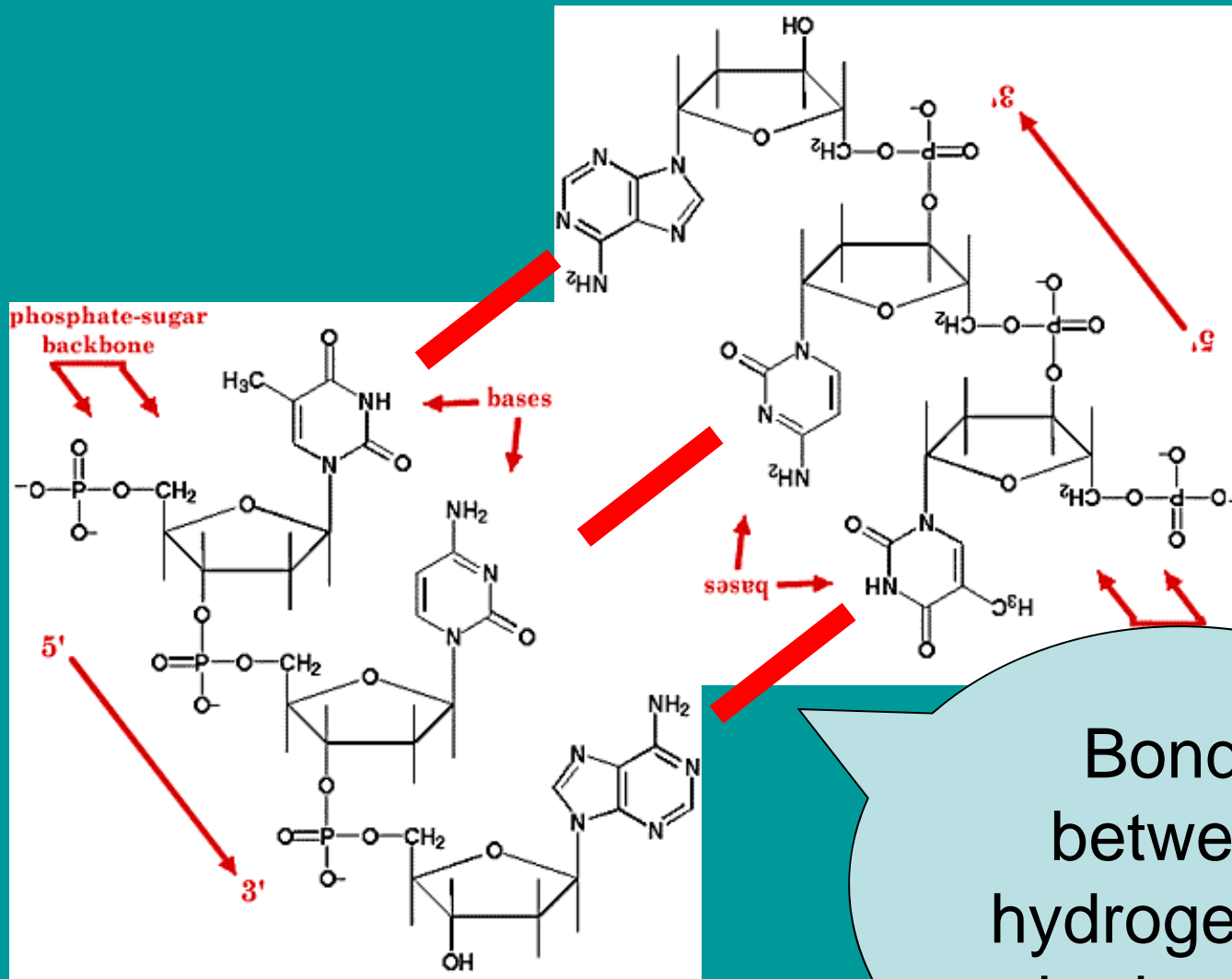
**Thymine**

Phosphate

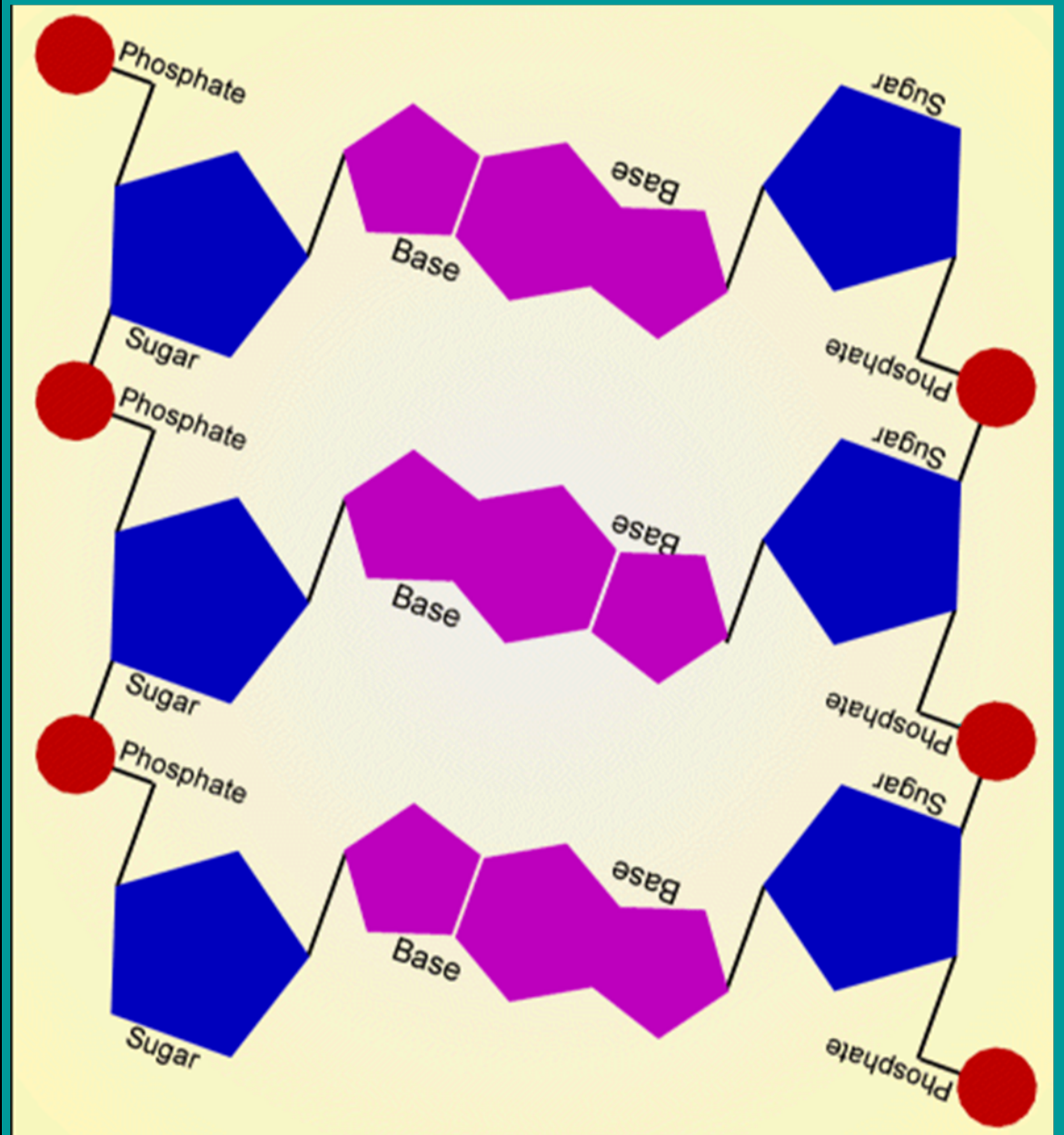
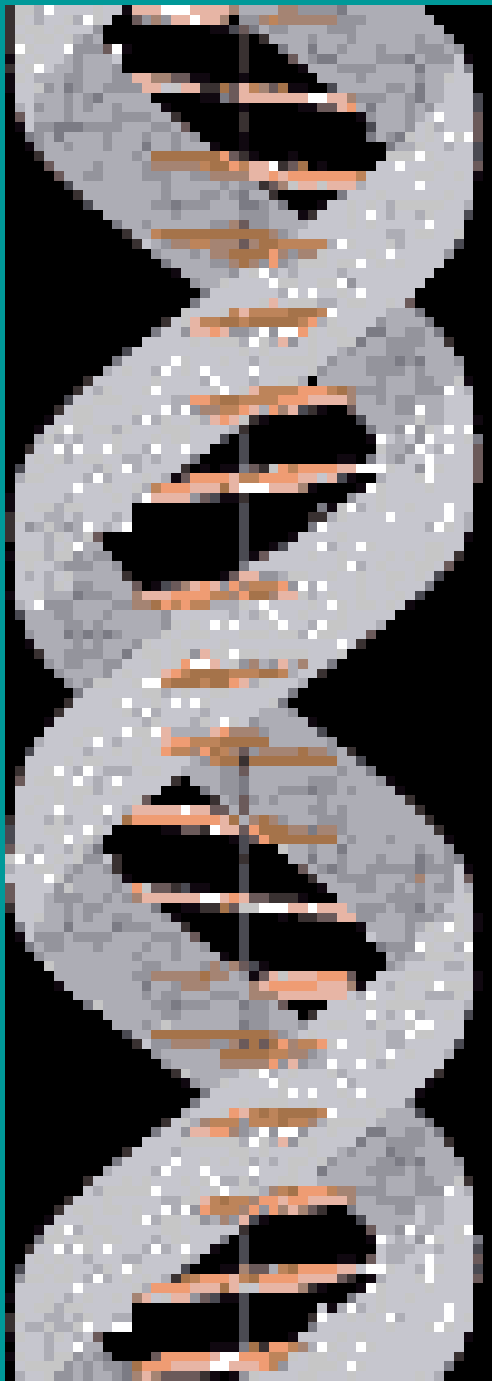


Sugar





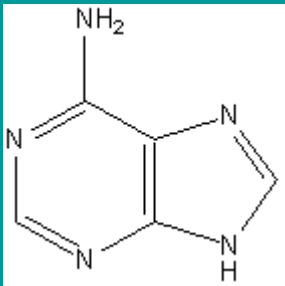
Bonds between hydrogens = hydrogen bonds



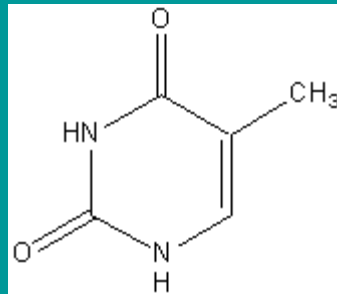


# Bases are where its at

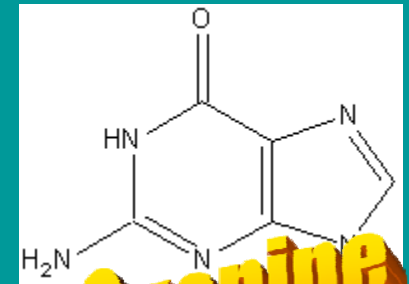
- A always pairs with T
- C always pairs with G



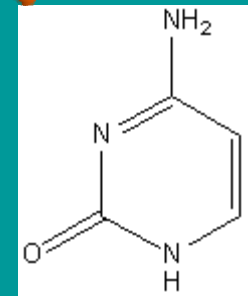
**Adenine**



**Thymine**



**Guanine**



**Cytosine**

You Try!

A G C A T G G T A

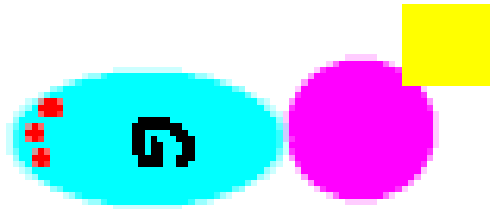
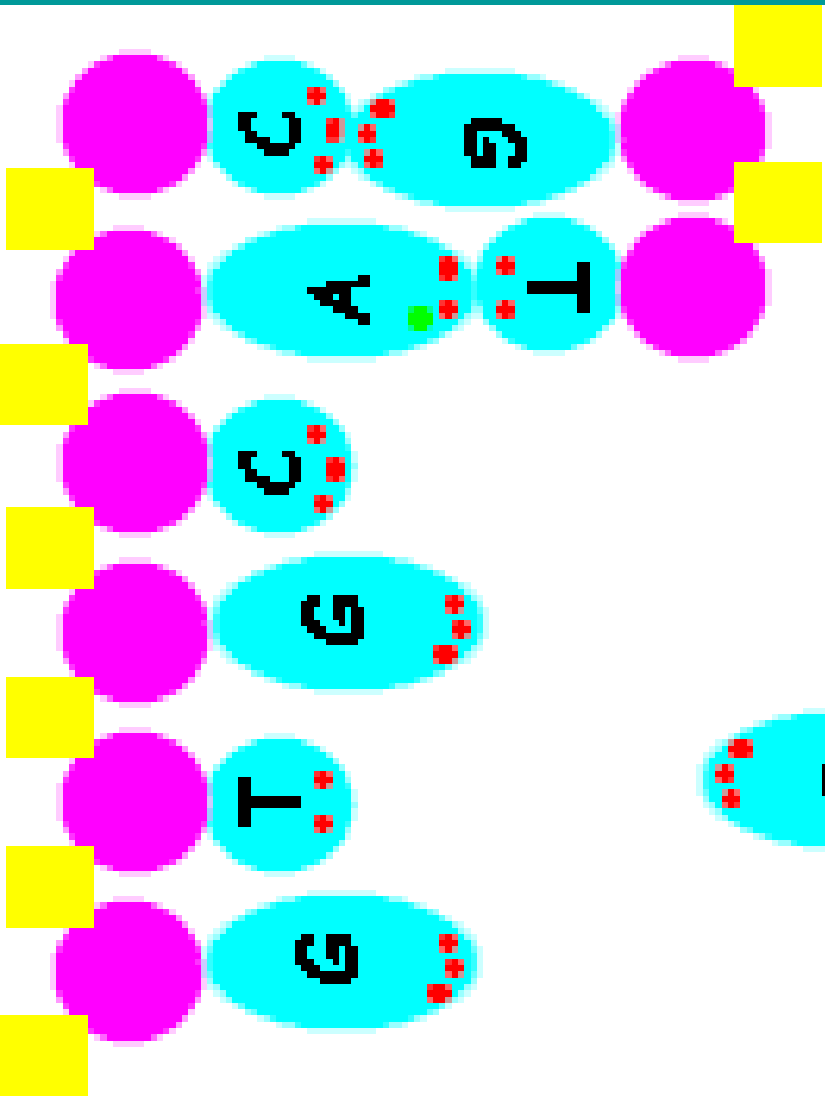
T C G T A C C A T

**Replication**



# Replication

- [http://www.fed.cuhk.edu.hk/~johnson/teaching/genetics/animations/dna\\_replication.htm](http://www.fed.cuhk.edu.hk/~johnson/teaching/genetics/animations/dna_replication.htm)
- <http://learn.genetics.utah.edu/>
- Only look at first three slides



So there you have it....DNA

....But didn't Watson and Crick want to know how it got from the nucleus to the cytoplasm?

# RNA

- It ain't DNA
- It's "D Sugar" that's different
- Deoxyribose - DNA
- Ribose - RNA





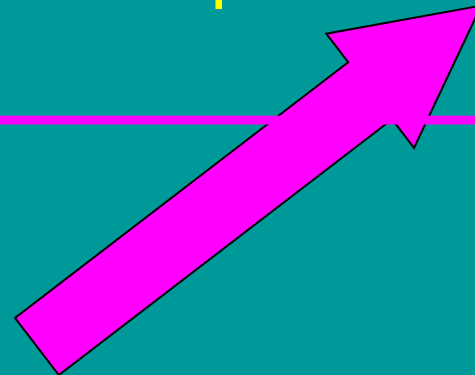
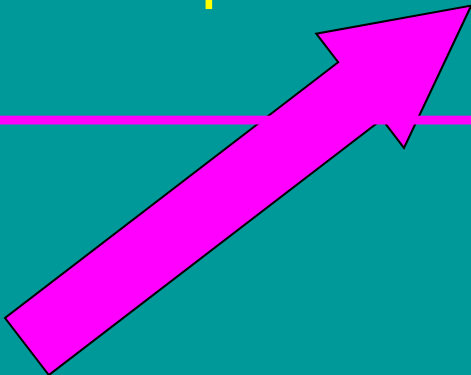
# No Biggie

## RNA

- One strand
- Ribose sugar backbone
- Moves out of the nucleus (mRNA)
- 4 Base pairs: AUCG

## DNA

- Two strands
- Deoxyribose sugar backbone
- Can't leave the nucleus
- 4 Base pairs: ATCG



A G C A T G G T A

U C G U A C C A U

# Transcription

So if we're making RNA from a DNA strand....



You Try!

Replication: Just copying to stay in  
the nucleus, DNA

Transcription: Making mRNA to  
move out of nucleus

Important: Use U instead of T

# From Code to Amino Acid

1. mRNA takes message to ribosome
2. Ribosome links up the correct amino acid following the message
  - How does it “read” the message?

# CODONS

- Codons = three letters of the message



- What does UCG mean?
- What do chains of amino acids make?

# Look at the code breaker!



[http://highered.mcgraw-hill.com/sites/0072437316/student\\_view0/chapter15/animations.html#](http://highered.mcgraw-hill.com/sites/0072437316/student_view0/chapter15/animations.html#)



# Transcription

# Translation

Amino acids are actually like a different  
“language” from RNA/DNA

# Translation

- Making protein (amino acid chains) from mRNA at the ribosome
- Video : [Protein Synthesis](#) in groups DNA folder

# Great Animation

- [http://highered.mcgraw-hill.com/sites/0072437316/student\\_view0/chapter15/animations.html#](http://highered.mcgraw-hill.com/sites/0072437316/student_view0/chapter15/animations.html#)
- <http://www.ncc.gmu.edu/dna/ANIMPROT.htm>
- <http://www.lewport.wnyric.org/jwanamaker/animations/Protein%20Synthesis%20-%20long.html>

# Translation

- Why a firefly glows

<http://learn.genetics.utah.edu/units/basics/firefly/>

Whole process put together

<http://www.lewport.wnyric.org/jwanamaker/animations/Protein%20Synthesis%20-%20long.html>