

The cell cycle

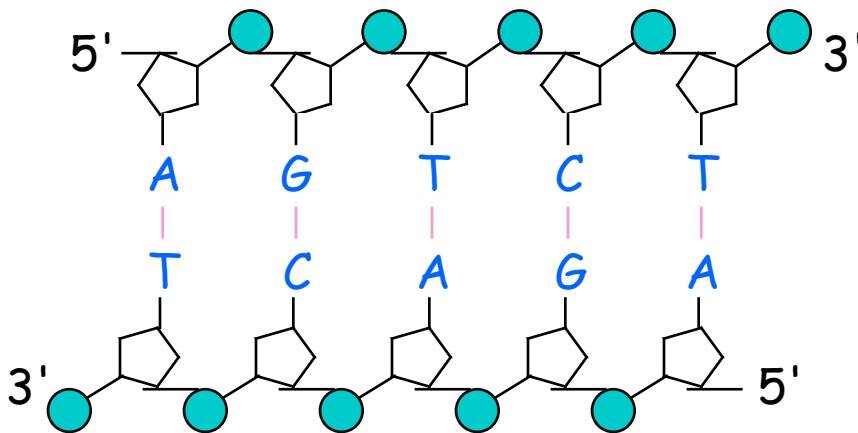
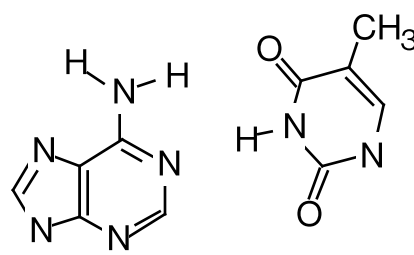
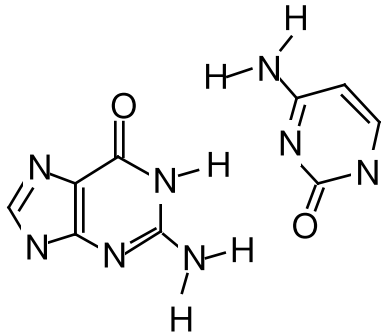
Genetics 371B Lecture 4

1 Oct. 1999

The structure of DNA

◇ Backbone

◇ Pairing



● phosphate
◻ ribose sugar



What holds the helices together?

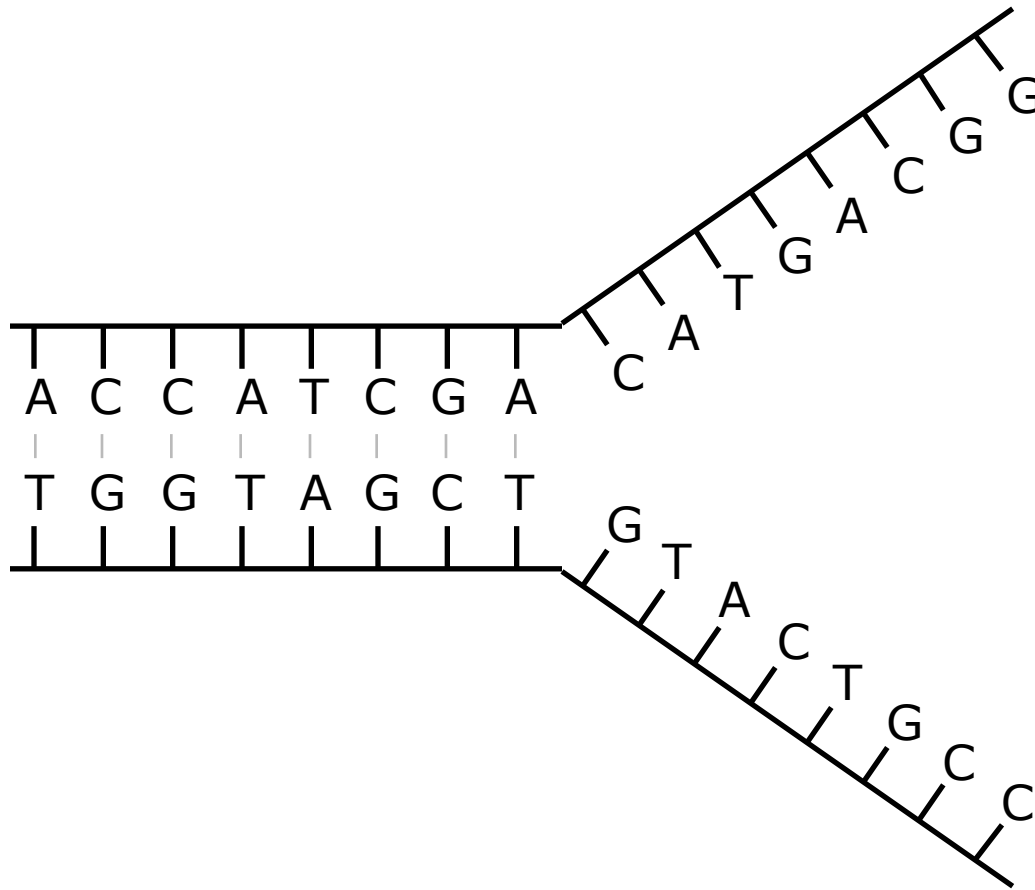
Length measure (double-stranded DNA):

Human genome:

What are alleles?

The cell cycle

DNA replication

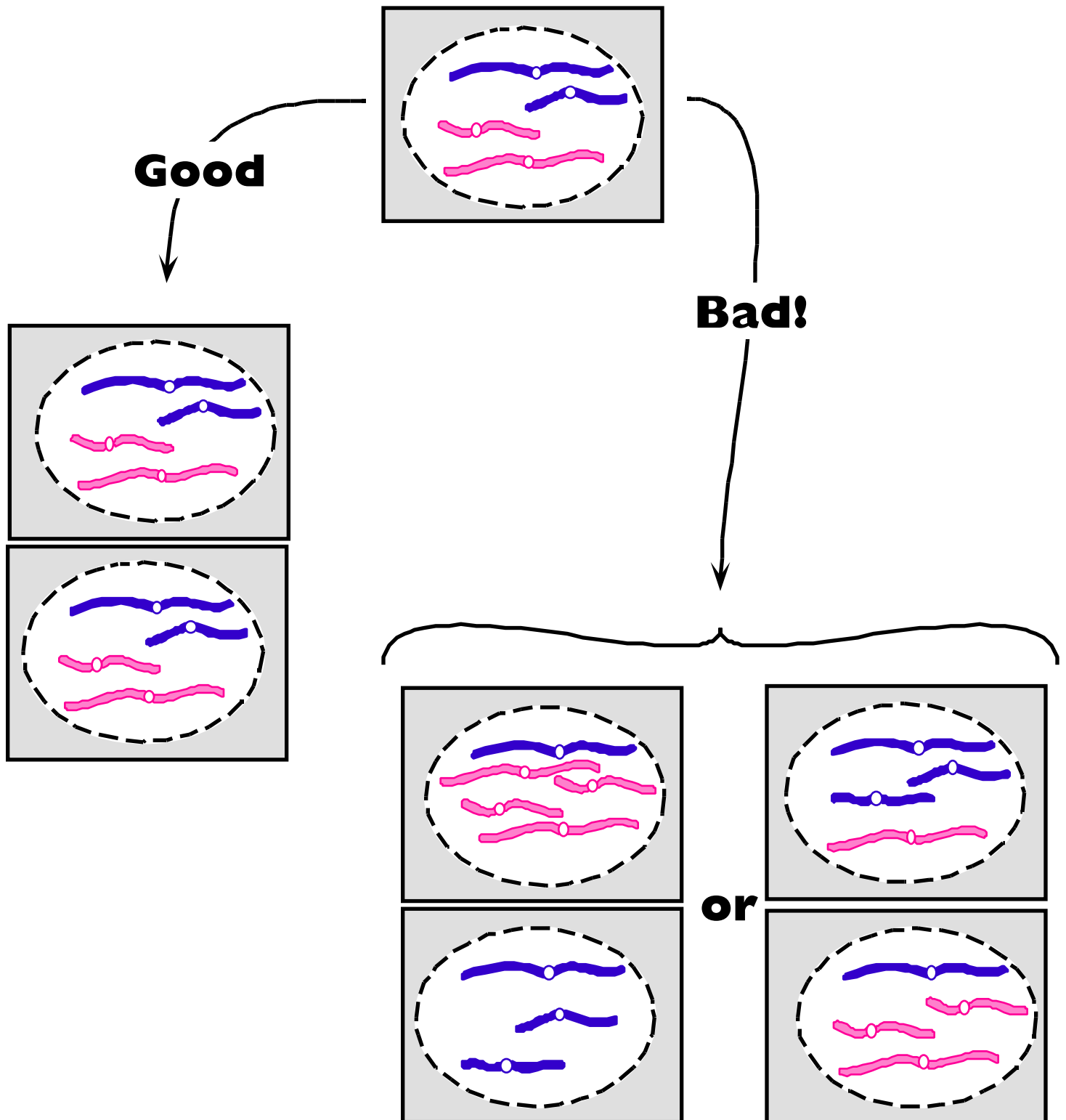


Cell division:

What happens to the chromosomes depends on the goal of the division

- ◆ to make more “vegetative” cells:
- ◆ to make gametes:

Mitosis – Partitioning replicated chromosomes

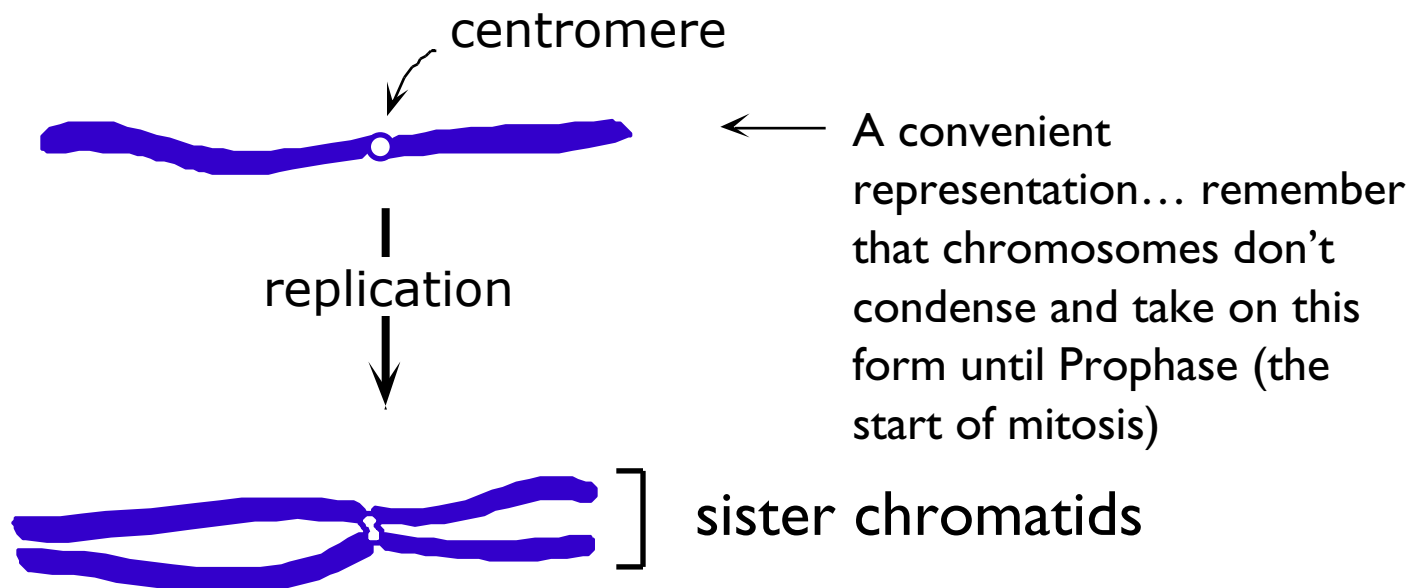


The problem: Partitioning replicated chromosomes so that each daughter cell gets one copy of each chromosome

The solution

After replication of a chromosome...

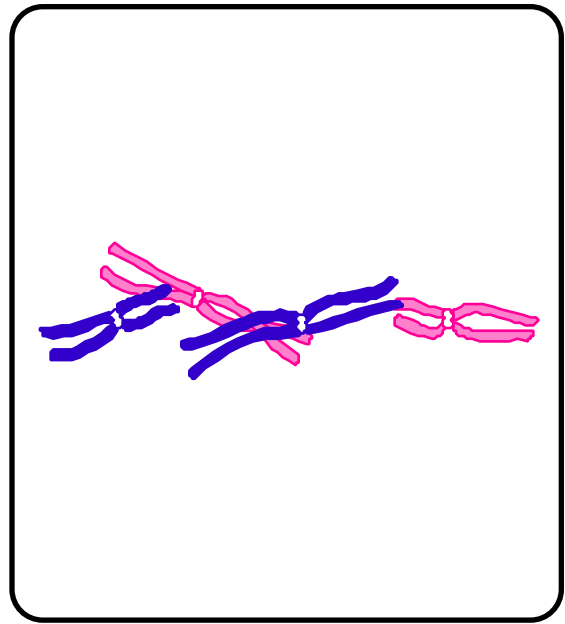
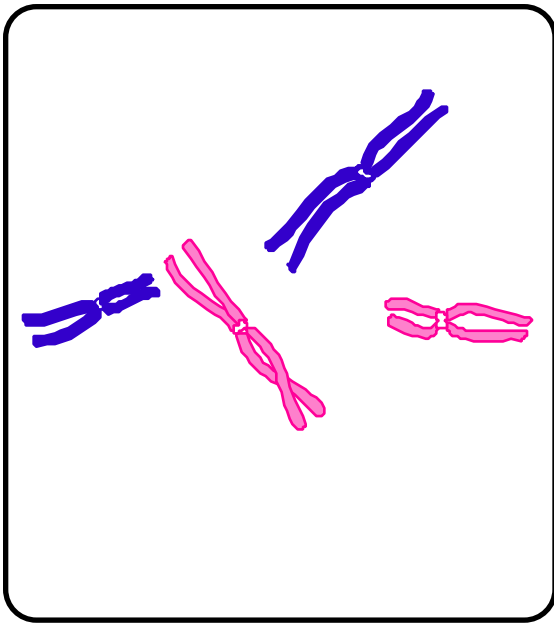
- ◆ hold the two **sister chromatids** together
- ◆ target them to opposite poles
- ◆ then separate the sisters



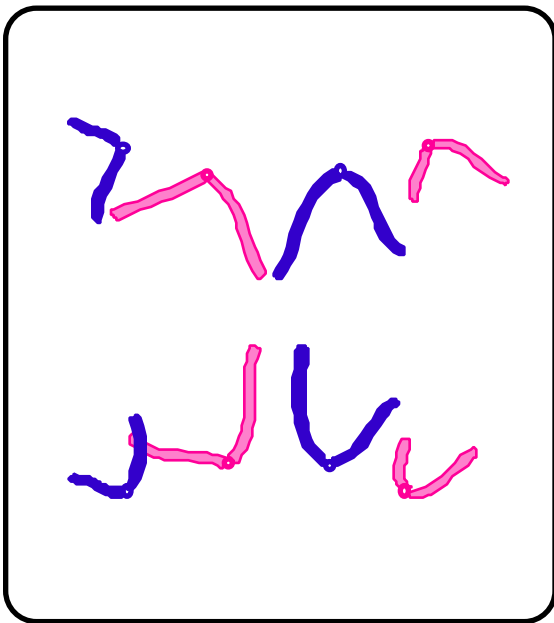
At Metaphase . . .

Chromosomes line up at cell's "equatorial plate"

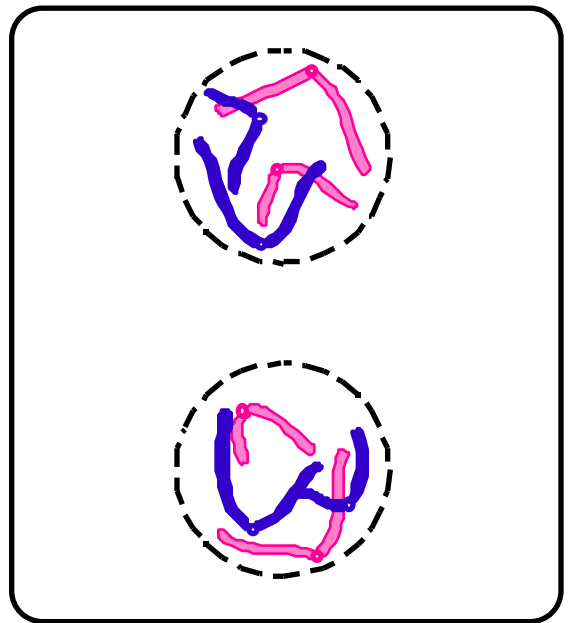
Mechanism? Spindle fibers exerting tension on kinetochores



Once all the chromosomes are lined up...



Anaphase



Telophase

What kinds of defects would make mitosis go haywire?