Source: KBhBIO101Cells

1 | The Cell Cycle

1.1 | So, why do cell divide

> The ability to produce organisms more of their kind is one characteristic that best distinguishes living things from nonliving matter

Viruses + Organelles challenge this definition => they are symbiotic and cannot reproduce on their own. We tend to think that cells

- Everyday, 50-70 Billion die => **programmed cell death**
- To compensate this, Mitosis (cell division) happen
    - Cell divide in opposite directions
    - Two strands ANTIPARALLEL to each other

Before we continue, do yourself a favor and review KBhBIO101DNAStructures

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lecellcycle.png

1.2 | The (actual) Cell Cycle

1.2.1 | G1 => Rest Phase, Gap 1

This is the phase which is the “daily life of a cell”. There are two major checkpoints in this phase which, upon it is reached, sets the rest of the cell cycle into motion.

- May hit s.a. to volume checkpoint => if ratio too big, the cell is too big
- May hit diffusion checkpoint => larger cells would need to work harder to transport things to the centre

1.2.2 | S => S Phase, duplicate DNA. 150 mins

In this process, all of the DNA that is in the nucleus will be KBhBIO101DNAReplicationed in order to actually split the cell in half.

1.2.3 | G2 => Rest Phrase, Gap 2.

The pairs of DNA begins bundling and condensing; the DNA is also checked upon and verified for consistency and dumped based the needs of the cell.

1.2.4 | M => Mitosis!

- Chromesomes line up in equator
- Each chromesome has two chromatid exactly the same

- Microtubials to pull chromesomes appart connected to kinecore, a joint in the chromatid
- Kinetore senses tension, and when it is correct, molecules are sent down the microtubials to send a split signal

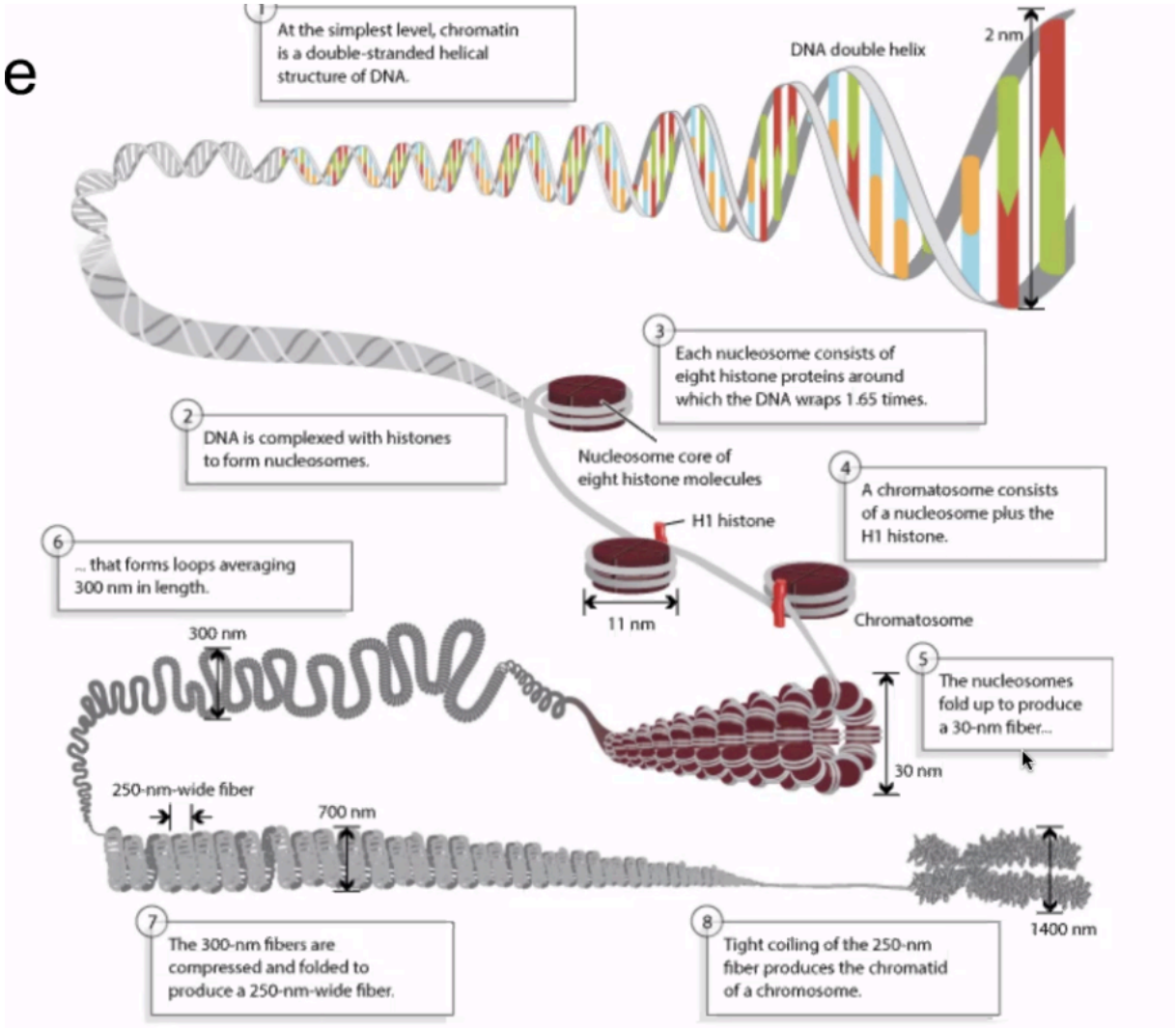

Figure 1: levelsofdna.png

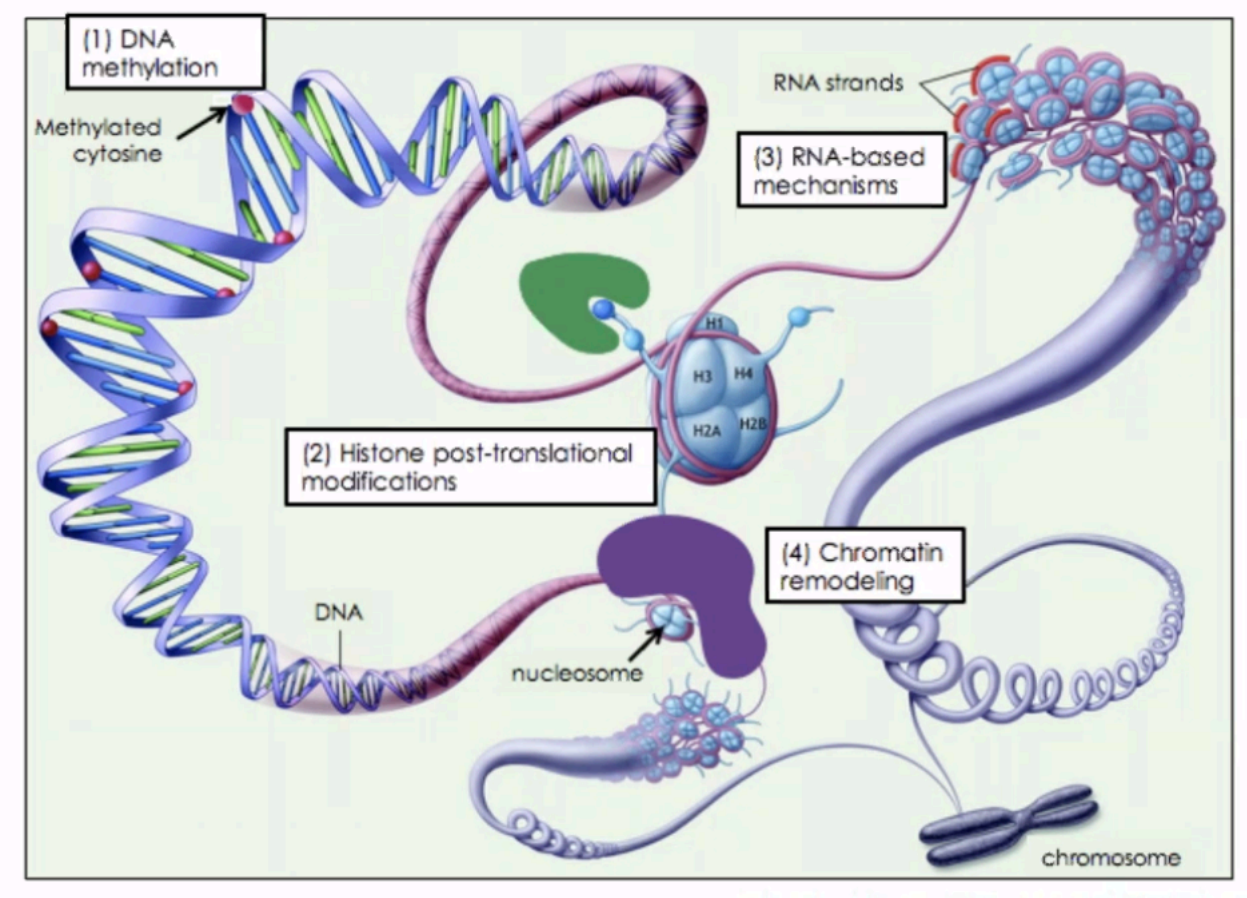

Figure 2: histones.png

Most cell division results in genetically identical daughter cell

Each cell, once specialised, chooses what parts of their chromasome to unwrap + permanently wrap.

Difference in transcription results in different phenotypes.

Sperm + Egg (imcomplete cells) combine together to form a “zygote” => a single cell. Each person is from a zygote.

For Eukarotes, cells divide using Mytosis.

Paul’s Cell Cycle Primer

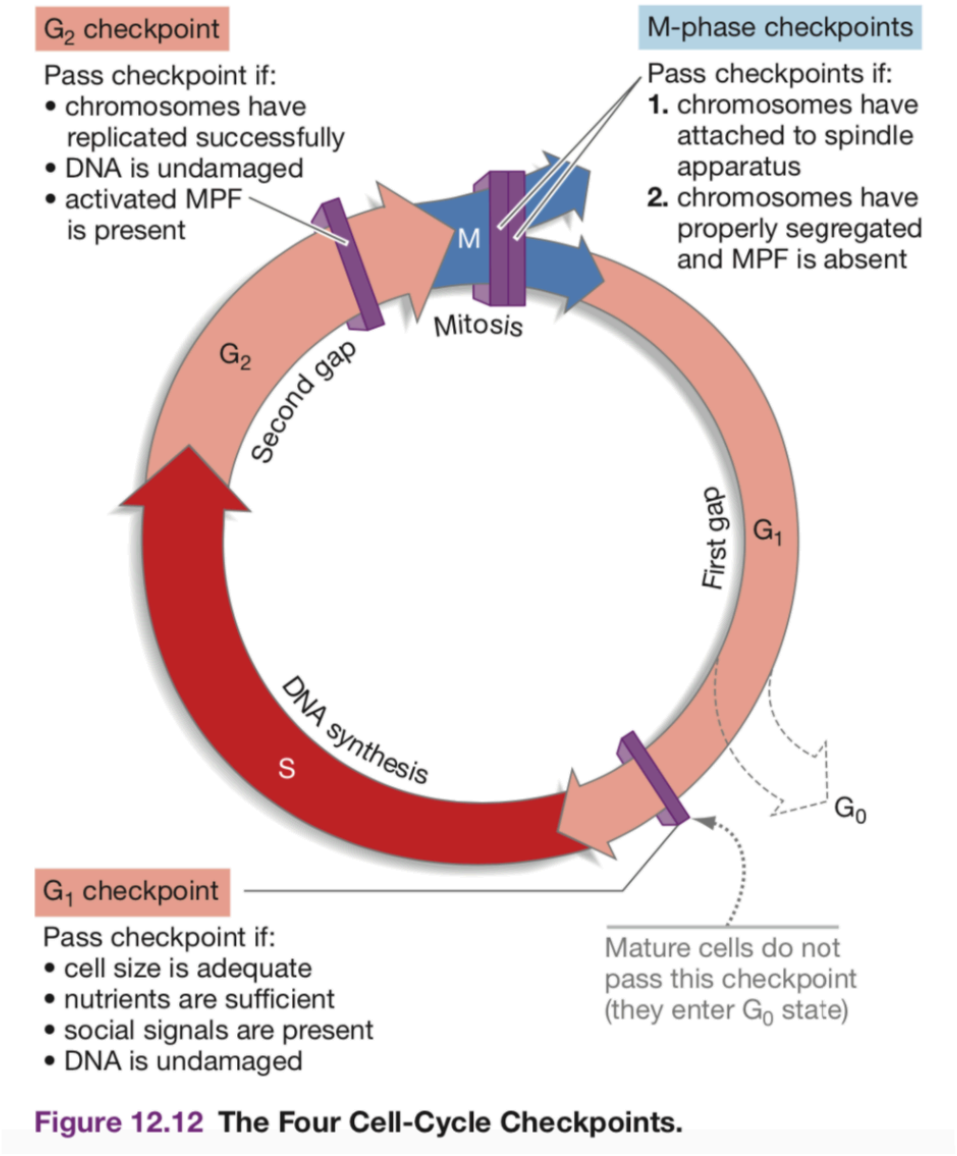

Figure 12.12 The Four Cell-Cycle Checkpoints.

Figure 3: Screen Shot 2020-11-09 at 3.16.12 PM.png

Cell regulators are proteins that manage and sheperard the process of cell division. They respond to molecular signals throughout the cell and check for internal signals like DNA damage to control the rate and progress of cell division.