BIOL 1001 Final PAL Review

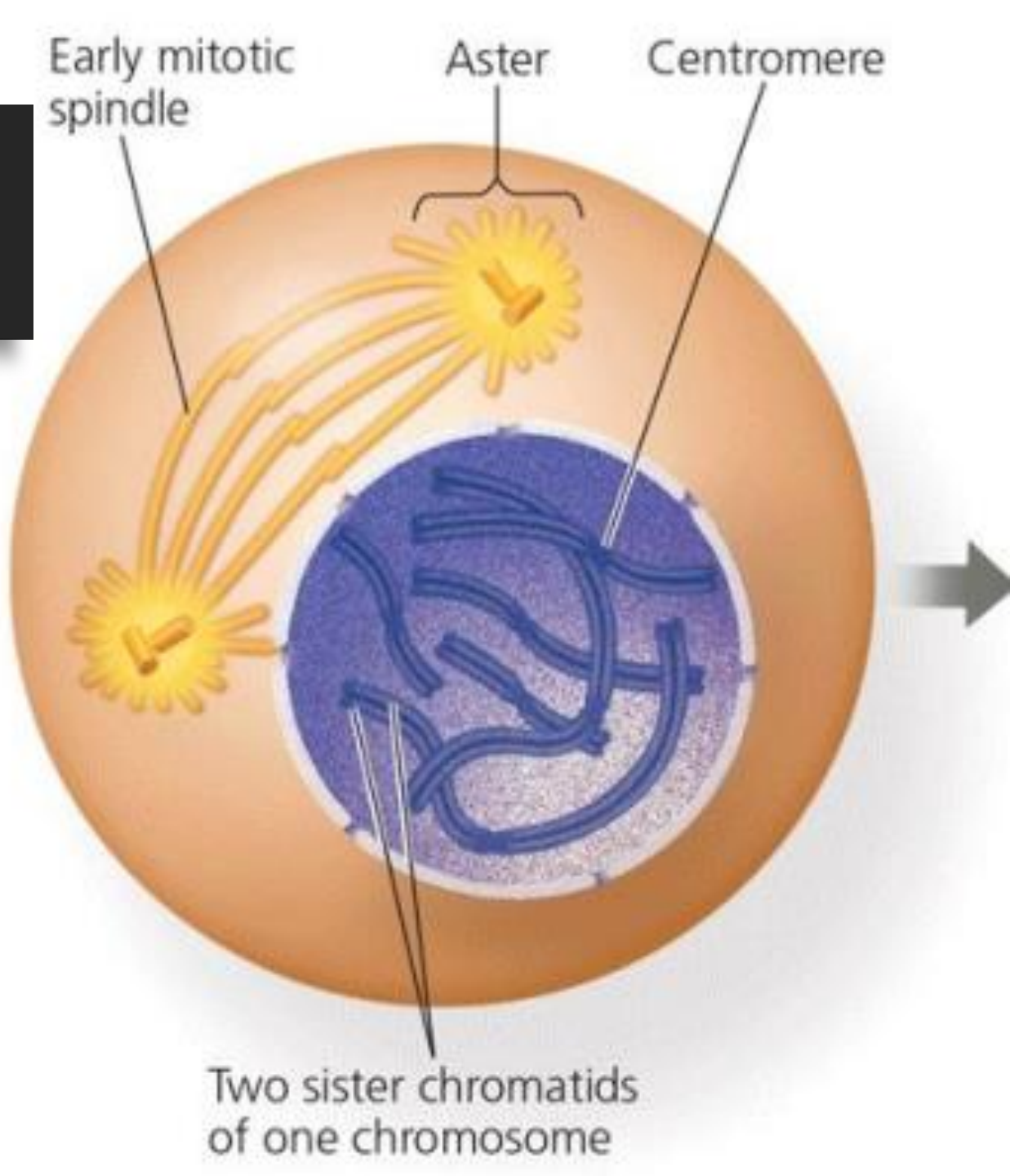
In what form is DNA when the cell is NOT undergoing mitosis?

What are the 2 main phases of the cell cycle? Which stage does the cell spend most of its life in?

What are the 3 stages of Interphase? What happens at each?

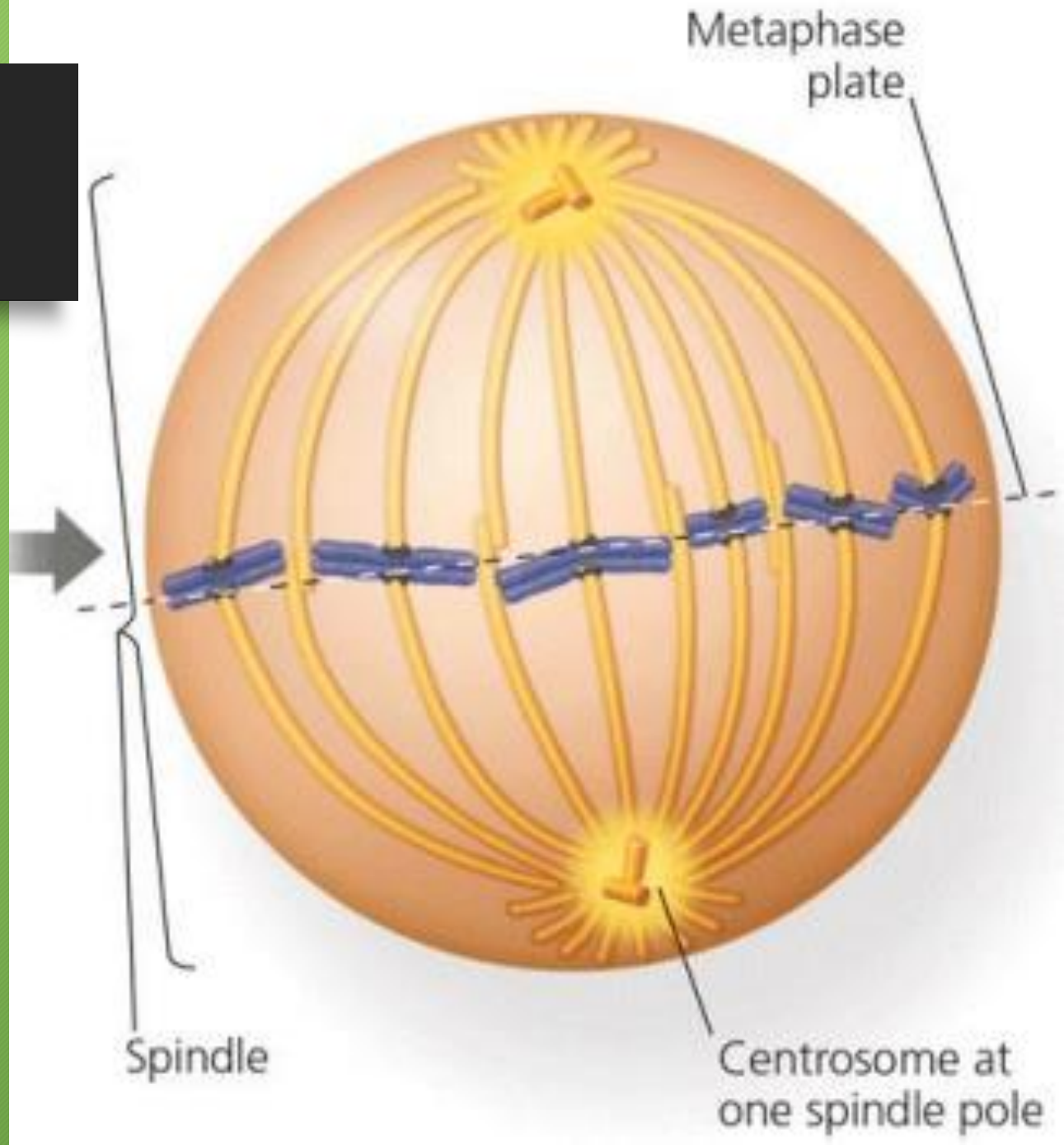
Name that phase

- What is the mitotic spindle?
- What stage comes after this one?
- What is happening to the DNA in this phase?
- What is happening to the nuclear envelope?



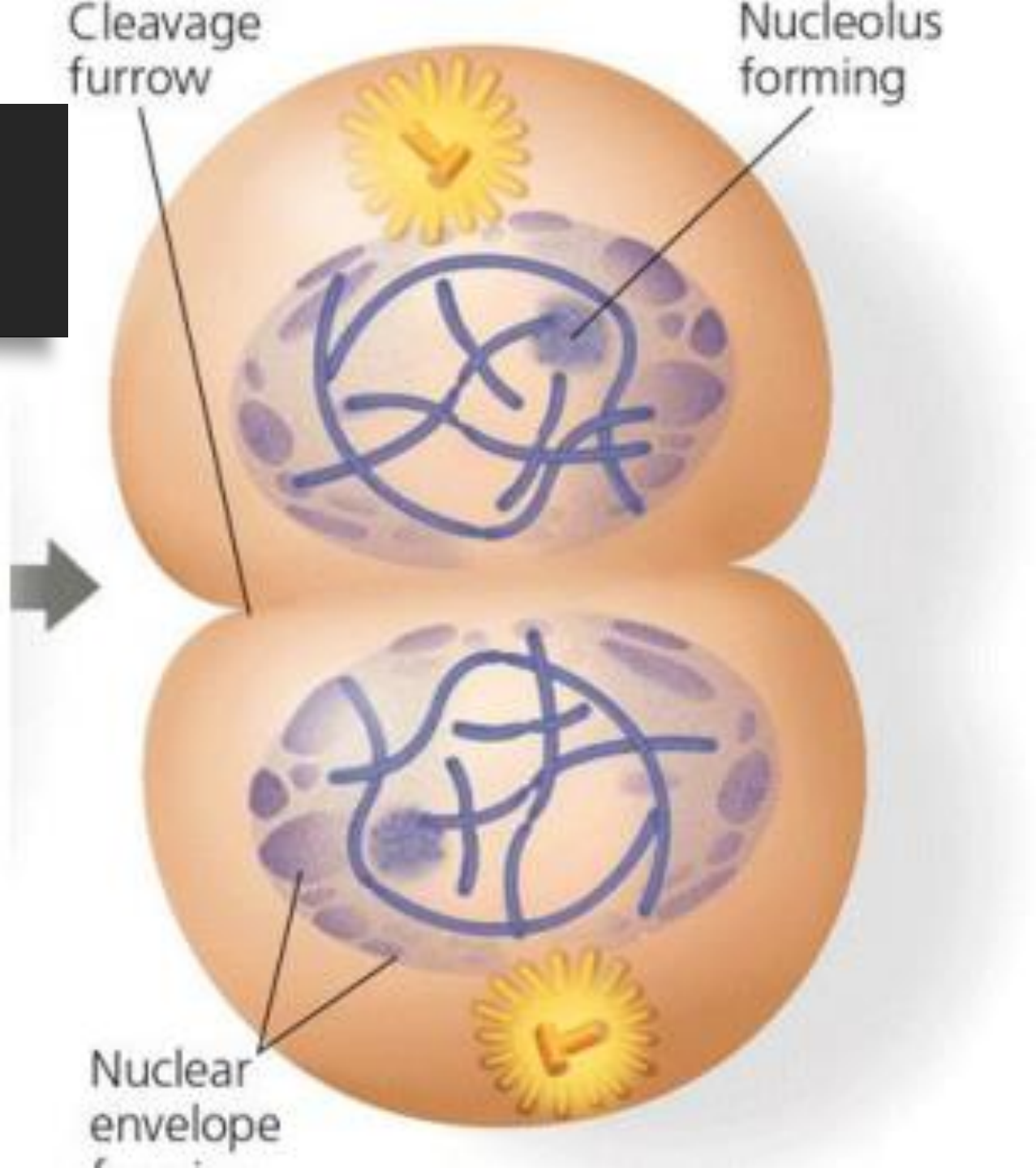
Name that phase

- What form is DNA found in here?
- What phase comes before this one?
- After?



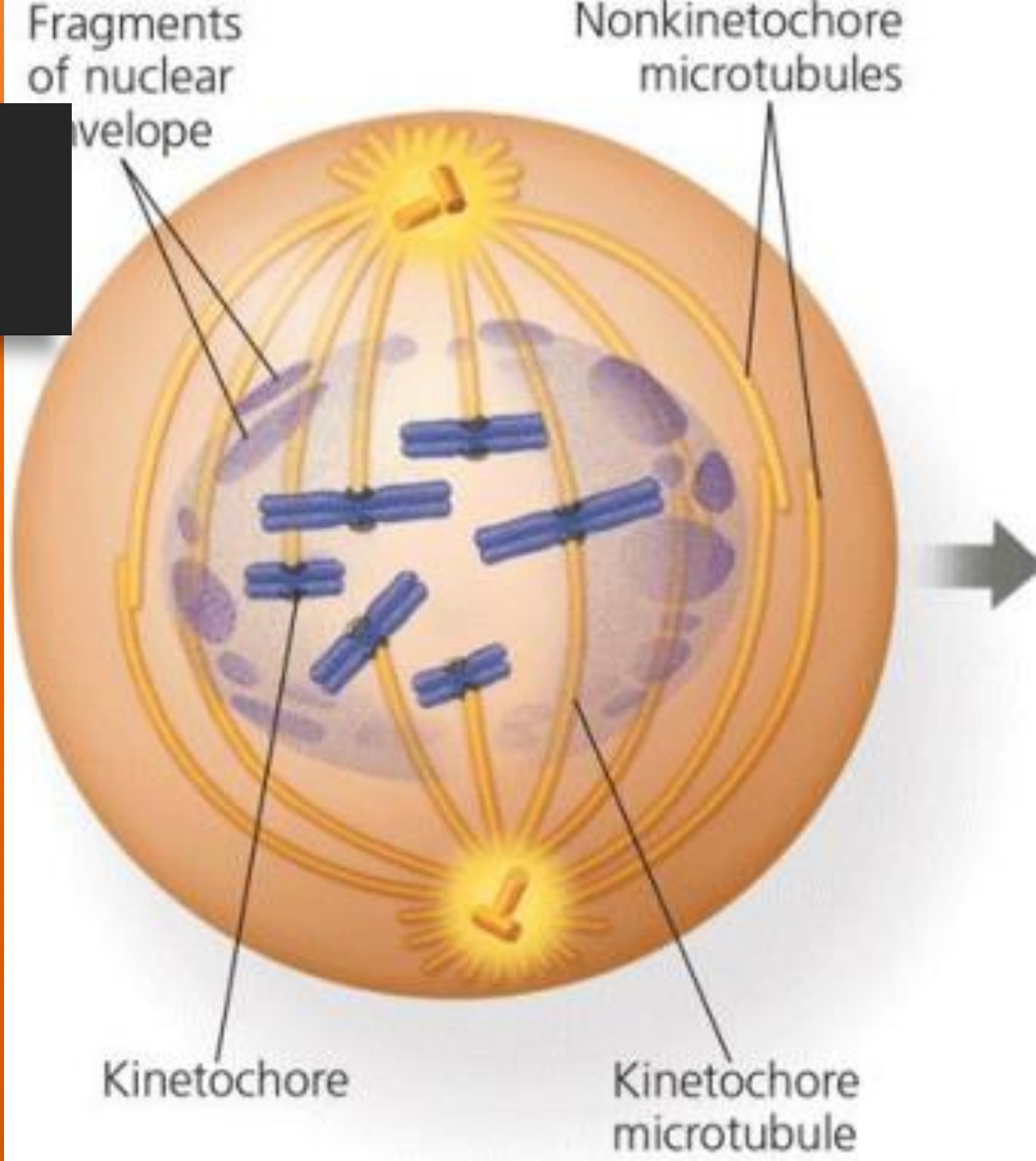
Name that phase

- What is happening to DNA in this phase?
- What phase comes before this?
- After?
- What causes formation of the cleavage furrow?
- What is happening to the nuclear envelope in this phase?



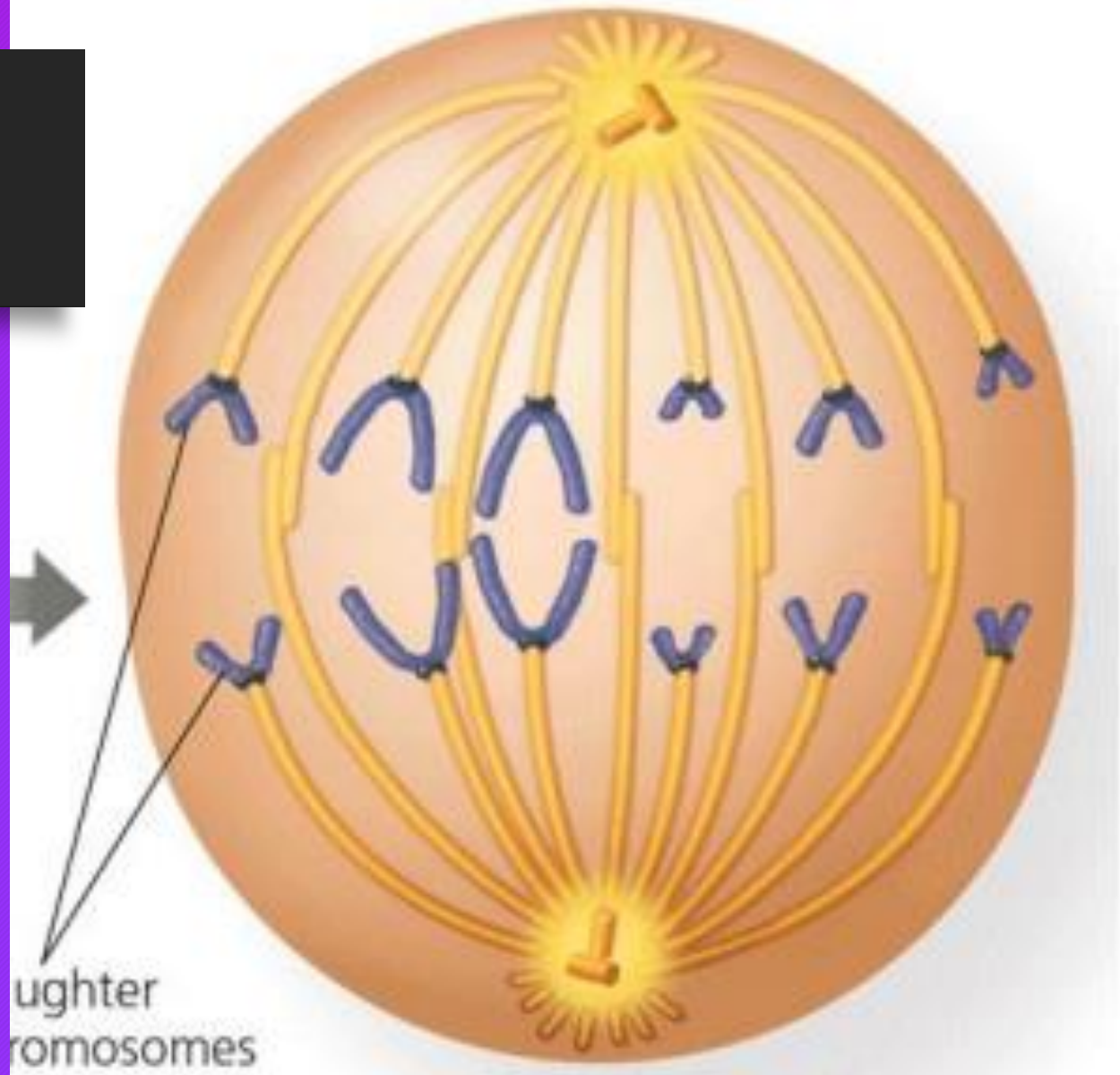
Name that phase

- What form is DNA in this phase?
- What phase comes before this one?
- After?
- What is the name of the protein the microtubules bind to and where does it form?



Name that phase

- What phase comes before this one?
- After?
- What causes the cell to stretch in this phase?



How does Cytokinesis happen in plant cells?

What type of cell division occurs in Bacteria?

What type of protein cleaves the daughter cells?

Does DNA condense?

Does DNA get copied before elongation, after elongation, or during?

What type of protein moves DNA to opposite ends of the cell?

How does cell division happen differently in Dinoflagellates? What about Diatoms?

Where does mitotic spindle form?

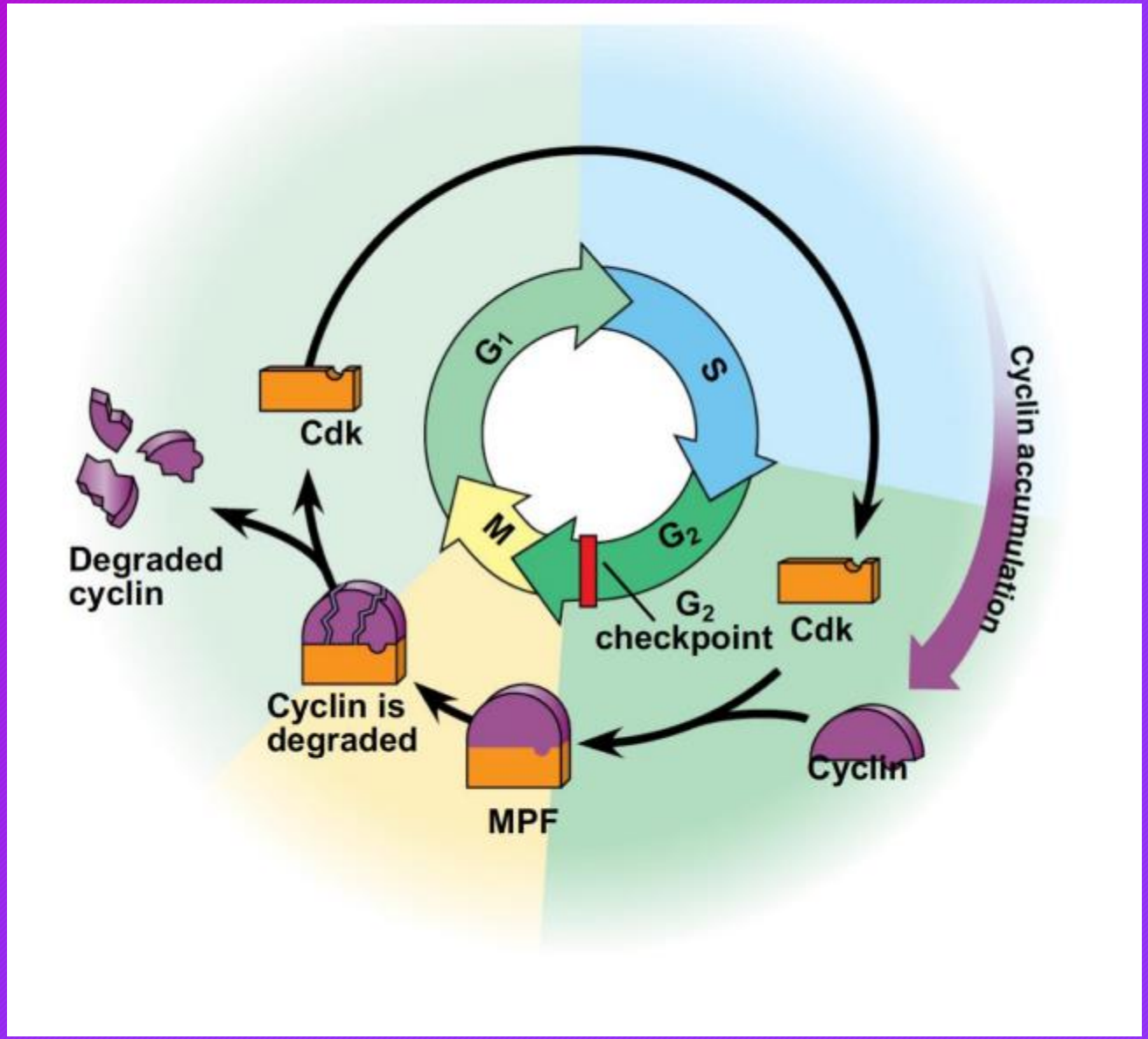
What happens to the nuclear membrane?

Cell Cycle Regulatory Molecules

Where in the cell are they found?

How do we know?

What are they called?


G1
S
G2
M
G2 checkpoint
Cdk
Cdk
Cyclin accumulation
Degraded cyclin
Cyclin is degraded
MPF
Cyclin

Cell Cycle Checkpoints

What makes them halt the cell cycle?

What happens at the G1 checkpoint? What happens to the cell if it doesn't pass?

What happens at the M checkpoint? What happens to the cell if it doesn't pass?

Apoptosis

Cell receives a signalling molecule that binds to a surface receptor, which stops the active inhibitor that works against apoptosis

What is a PDGF? How does it affect cell division? What type of Surface receptor is used?

This helps with healing wounds when injured

Experiment: Cells were cultured in lab, in dishes with optimal growth conditions. One culture supplemented with PDGF, and one not. Supplemented culture proliferated

What are the 2 types of external physical factors in cell growth/division?

Telomeres

What are they?

Why does age effect cell division?

How does cell division effect telomeres?

Cancer

Hypertrophy vs Hyperplasia vs Neoplasia (Tumors)

Steps in tissue renewal vs steps in Cancer Pathogenesis

Malignant vs Benign

Henrietta Lacks

Who was she?

Why are her cells significant?

6 Hallmarks of cancer

What about expanded hallmarks?

Stem Cells

Incompletely Differentiated

Totipotent vs Pluripotent vs Multipotent

What are the 6 classes of Stem cells, what therapeutic benefits do they have?

Somatic stem cells, what are they used for, can we isolate them?

What are induced pluripotent stem cells and how are they made, who is Yamanaka?

What is Therapeutic Cloning?

Asexual Reproduction

How many parents?

Binary fission, Budding, Fragmentation, Vegetative Reproduction, Parthenogenesis

Bananas are clones?

Apomixis

Advantages and Disadvantages

Sexual Reproduction

How many parents?

Are offspring genetically identical?

Fusion of gametes (only in sexual reproduction not in asexual)

Karyotyping

What is a karyotype?

How is a karyotype made (what type of cells, what stage pf the cell cycle)?

Sex Chromosomes

Do X chromosomes and Y chromosomes share the same genes?

What does intersex mean?

What sex chromosome combinations denote intersex?

What are non-sex chromosomes called?

Life Cycles

Generation to generation sequence of stages in an organism's reproductive history (example: zygote formation to gamete production in animals)

Some stages of an organism’s life are spent as haploid, some spent diploid, and some spent dikaryotic (Try to know some of these stages or processes that lead to these stages – for example, meiosis produces haploid organisms)

If an organism is in haploid form before mitosis, then the daughter cells will also be haploid (for example gametophyte stage of plant life cycle)

Meiosis

What occurs in meiosis' prophase 1 that doesn't happen in prophase of mitosis?

How many daughter cells are produced from mitosis? Are they genetically identical to one another? Are they genetically identical to the parent cell?

Is DNA replicated between Meiosis 1 and Meiosis 2?

Mitosis produces cells for growth and repair, what cells are made from meiosis?

Genetic Variation

What are the 3 main origins of genetic variation?

How do they cause genetic variation?

Why is genetic variation significant in evolution?

Genetics: Terminology

What is a character? What is a trait? How is it different from a character?

What is an allele? How does it relate to traits?

What is a phenotype? What is a genotype? (How are the 2 related)

What is a sex-linked trait?

What is complete dominance? Conversely what is incomplete dominance?

What is wild type vs mutant phenotype?

Genetics: Experiments

Gregor Mendel: What organism did he work with? How did he intentionally breed them?

What is the law of segregation?

What is the law of independent assortment? (Think dihybrid cross)

Thomas Morgan: What organism did he work with?

How did he discover that eye colour was a sex-linked trait in this organism?

Good luck on the final!

I hope to see you guys back at PAL next term

(and I'll see some of you in ESCI)!