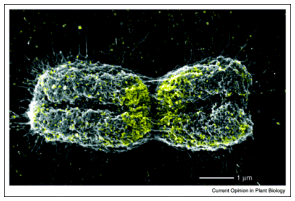
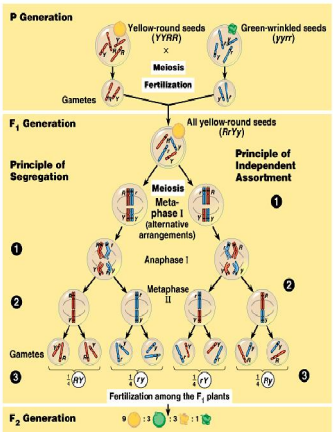
Chromozómy a reprodukcia buniek



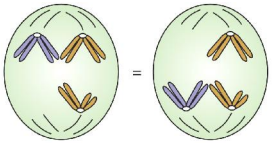
High resolution scanning immunogold electron micrograph.

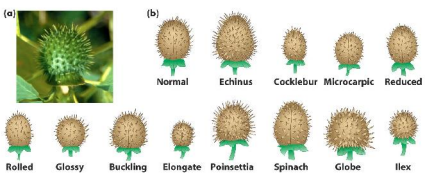
- Bunky a chromozómy
- Mitóza
- Meióza

- 1902 - Walter Sutton a Theodor Boveri – chromozómová teória



Chromozómová teória dedičnosti – cytologické dôkazy



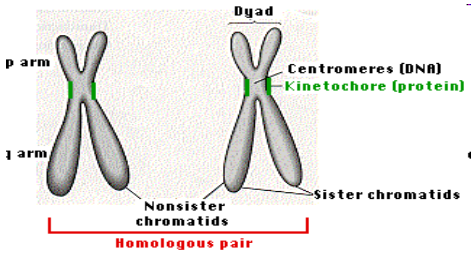


Chromozómová teória dedičnosti – genetický dôkaz

- Thomas Hunt Morgan
- modelový organizmus *Drosophila melanogaster*

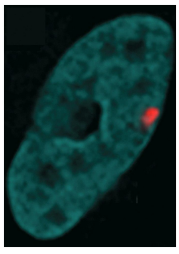
Nobelova cena za fyziológiu a medicínu, 1933, *„za jeho objavy týkajúce sa úlohy chromozómov v dedičnosti".*

Eukaryotický chromozóm

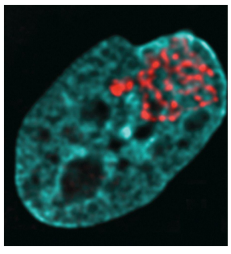


Dve formy chromatínu (na základe farbenia)

1. Euchromatín – aktívne transkribované regióny, bez repetitívnych sekvencií
2. Heterochromatín



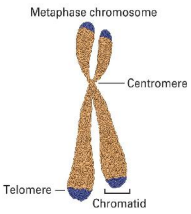
100 Mb DNA v heterochromatíne

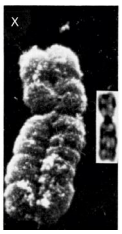


100 Mb DNA v euchromatíne

Tumbar et al. (1999) *J. Cell Biol.* **145**:1341

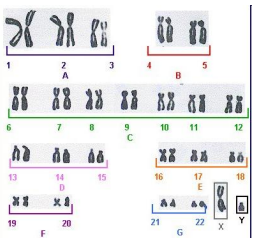
Funkčné oblasti na chromozóme – teloméra, centroméra, satelit



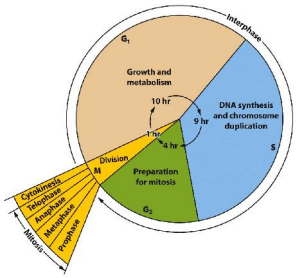


Schématická a elektrónmikroskopická snímka X chromozómu.

Karyotyp

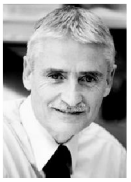


Delenie eukaryotických buniek - mitóza



S fáza – replikácia DNA

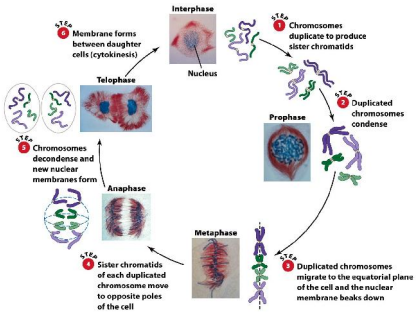
The Nobel Prize in Physiology or Medicine 2001
"for their discoveries of key regulators of the cell cycle"

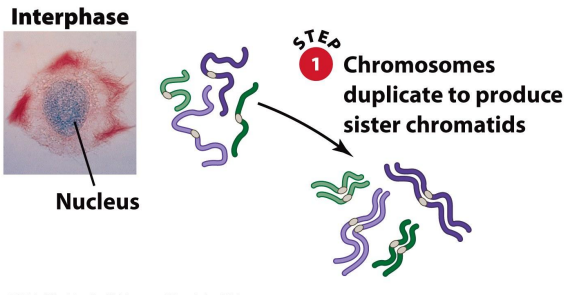

Leland H. Hartwell

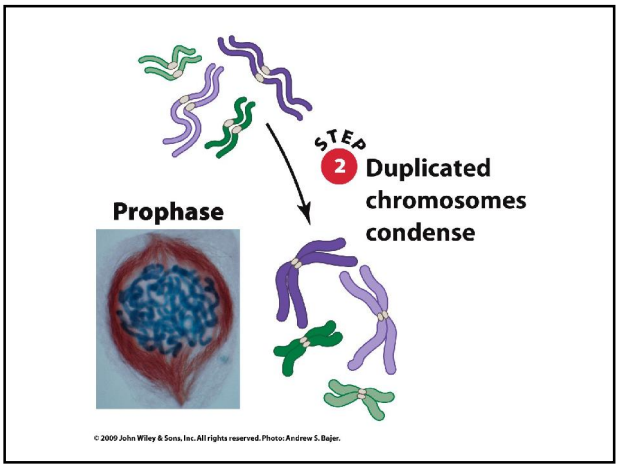

Tim Hunt

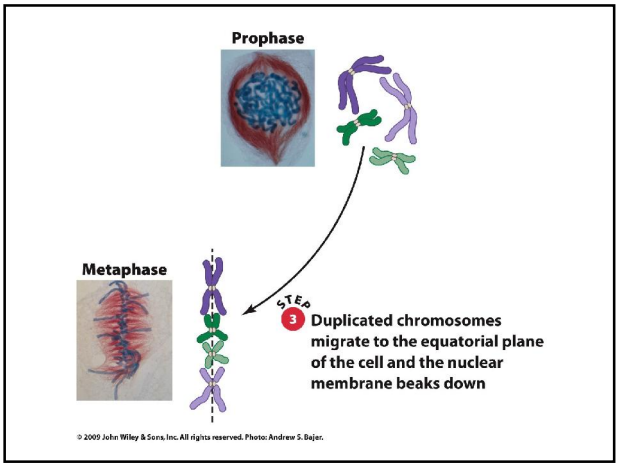

Sir Paul M. Nurse

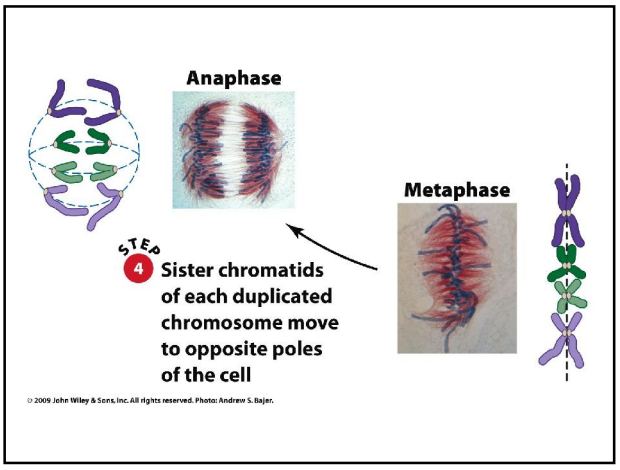
Mitóza

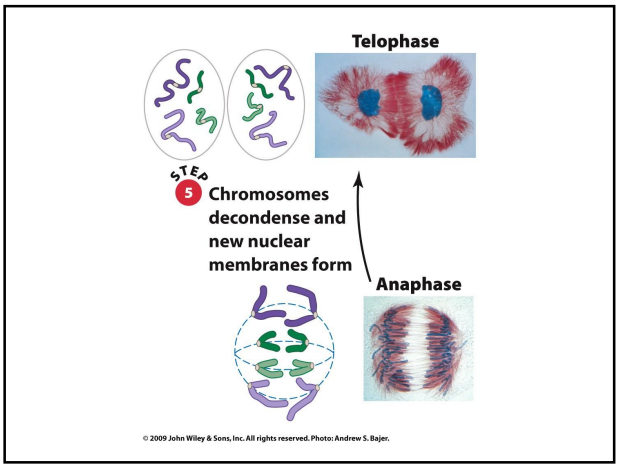


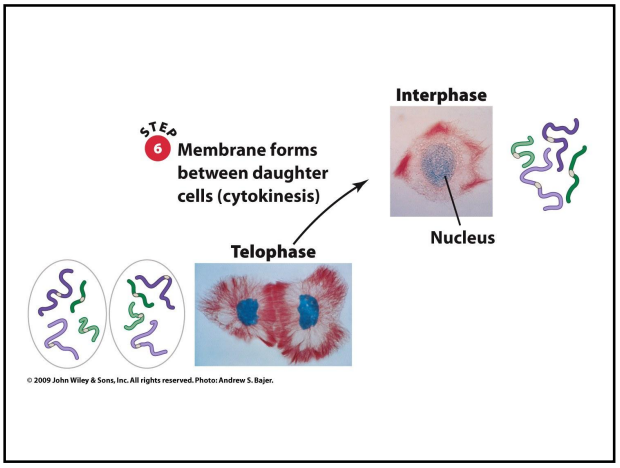



STEP 2
Duplicated chromosomes condense
Prophase
© 2009 John Wiley & Sons, Inc. All rights reserved. Photo: Andrew S. Bajer.

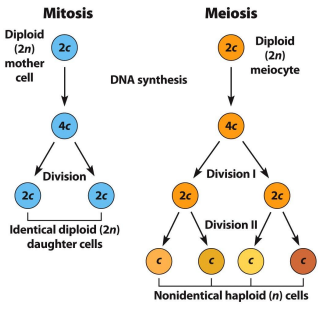

Prophase
Metaphase
STEP 3
Duplicated chromosomes migrate to the equatorial plane of the cell and the nuclear membrane beaks down
© 2009 John Wiley & Sons, Inc. All rights reserved. Photo: Andrew S. Bajer.


Anaphase
Metaphase
STEP 4
Sister chromatids of each duplicated chromosome move to opposite poles of the cell
© 2009 John Wiley & Sons, Inc. All rights reserved. Photo: Andrew S. Bajer.

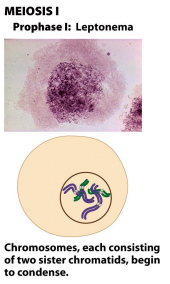




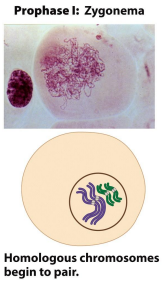
Mitóza vs. Meióza



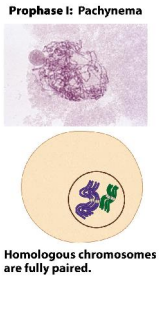
Profáza I: Leptonema

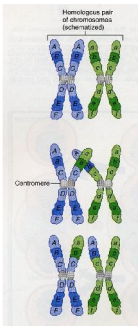


Prophase I: Zygonema

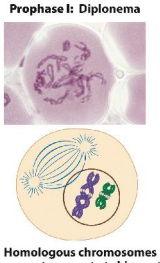


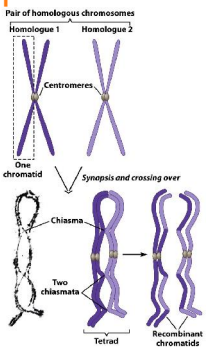
Prophase I: Pachynema



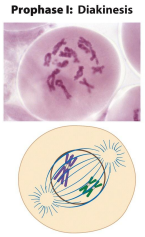


Profáza I: Diplonema



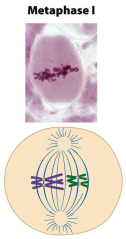


Profáza I: Diakinéza



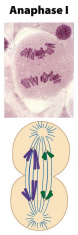
Paired chromosomes condense further and become attached to spindle fibers.

Metafáza I



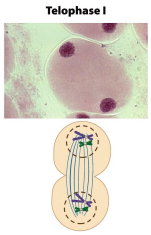
Paired chromosomes align on the equatorial plane in the cell.

Anafáza I



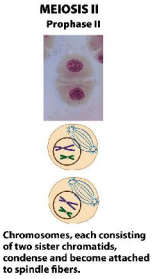
Homologous chromosomes disjoin and move to opposite poles of the cell.

Telofáza I

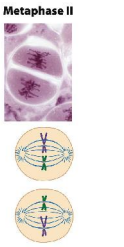


Chromosome movement is completed and new nuclei begin to form.

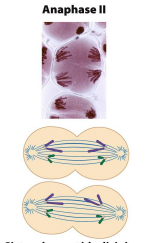
Profáza II



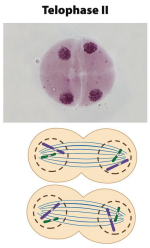
Metafáza II



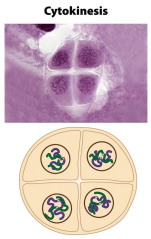
Anafáza II



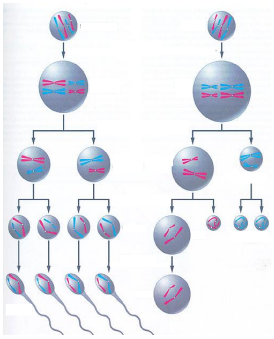
Telofáza II



Cytokinéza



Spermatogenéza a oogenéza u ľudí



Zmeny v počte chromozómov

- Nondisjunkcia