

VZDĚLÁVAT SE LZE V KAŽDÉM VĚKU

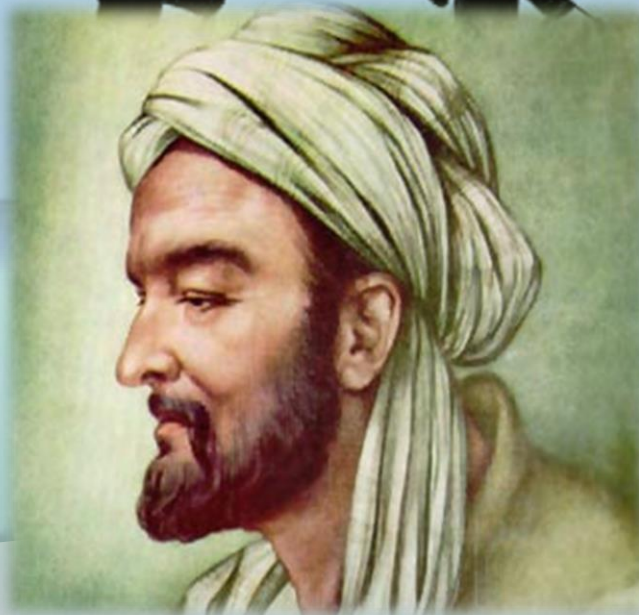
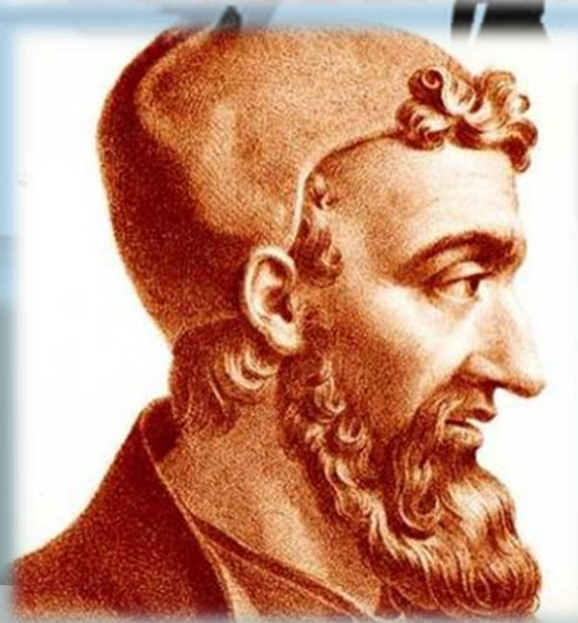
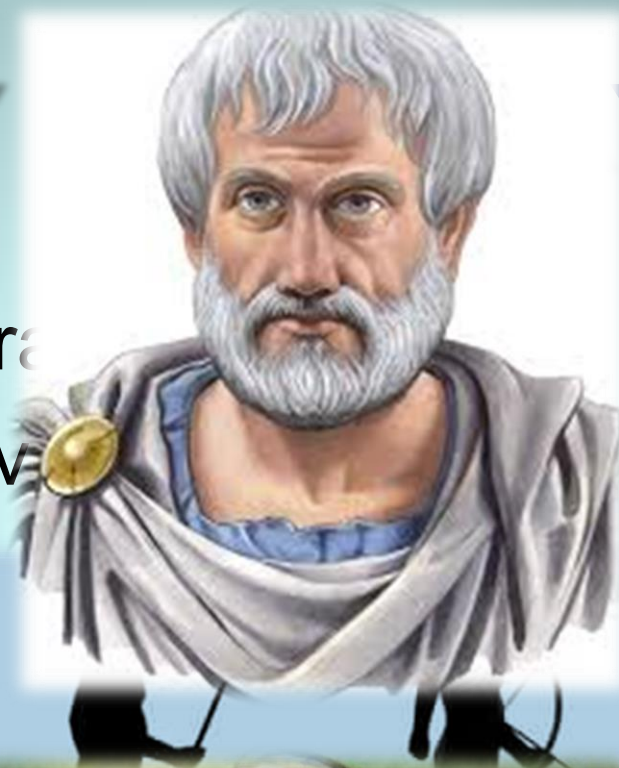
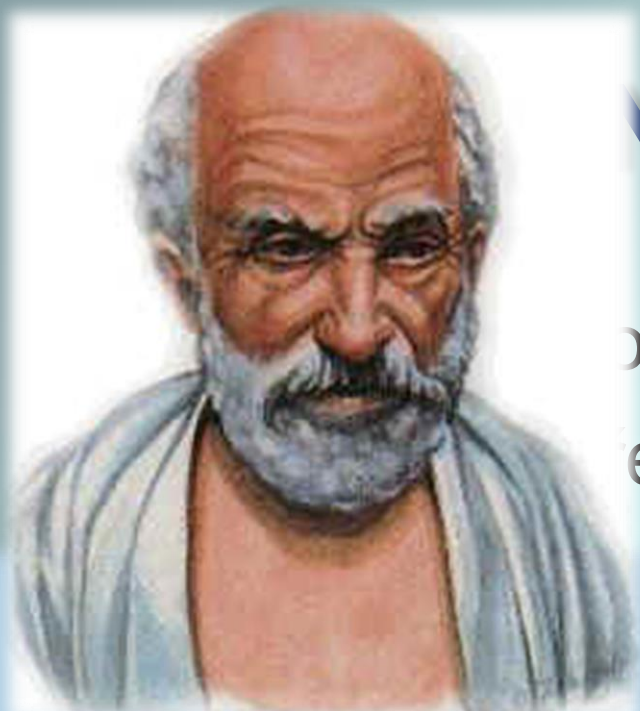
JITKA RÖSSLEROVÁ

TAJEMSTVÍ GENETIKY

NY

Y

od pra
edov



CAROLI LINNÆI

S: R: G: M: T: S: S: V: E: C: I: A: R: C: H: I: A: T: R: I: ; M: E: D: I: C: & B: O: T: A: N: .
P: R: O: F: E: S: S: . U: P: S: A: L: ; E: Q: U: I: T: I: S: A: U: R: . D: E: S: T: E: L: L: A: P: O: L: A: R: I: ;
N: E: C: N: O: N: A: C: A: D: . I: M: P: E: R: . M: O: N: S: P: E: E: . B: E: R: O: L: . T: O: L: O: S: .
U: P: S: A: L: . S: T: O: C: K: H: . S: O: C: & P: A: R: I: S: . C: O: R: E: S: P: .

**SPECIES
PLANTARUM,**

EXHIBENTES

PLANTAS RITE COGNITAS,

AD

GENERA RELATAS,

CUM

DIFFERENTIIS SPECIFICIS,
NOMINIBUS TRIVIALIBUS,
SYNONYMIS SELECTIS,
LOCIS NATALIBUS,

SECUNDUM

SYSTEMA SEXUALE

DIGESTAS.

TOMUS I.

Cum Privilegio S. R. M: t: S: S: u: e: c: i: e: & S. R. M: t: S: S: P: o: l: o: n: i: c: e: ac: E: l: e: c: t: o: r: i: s: S: u: e: c: i: e: .

HOLMIÆ,
IMPENSIS LAURENTII SALVII.

1753.

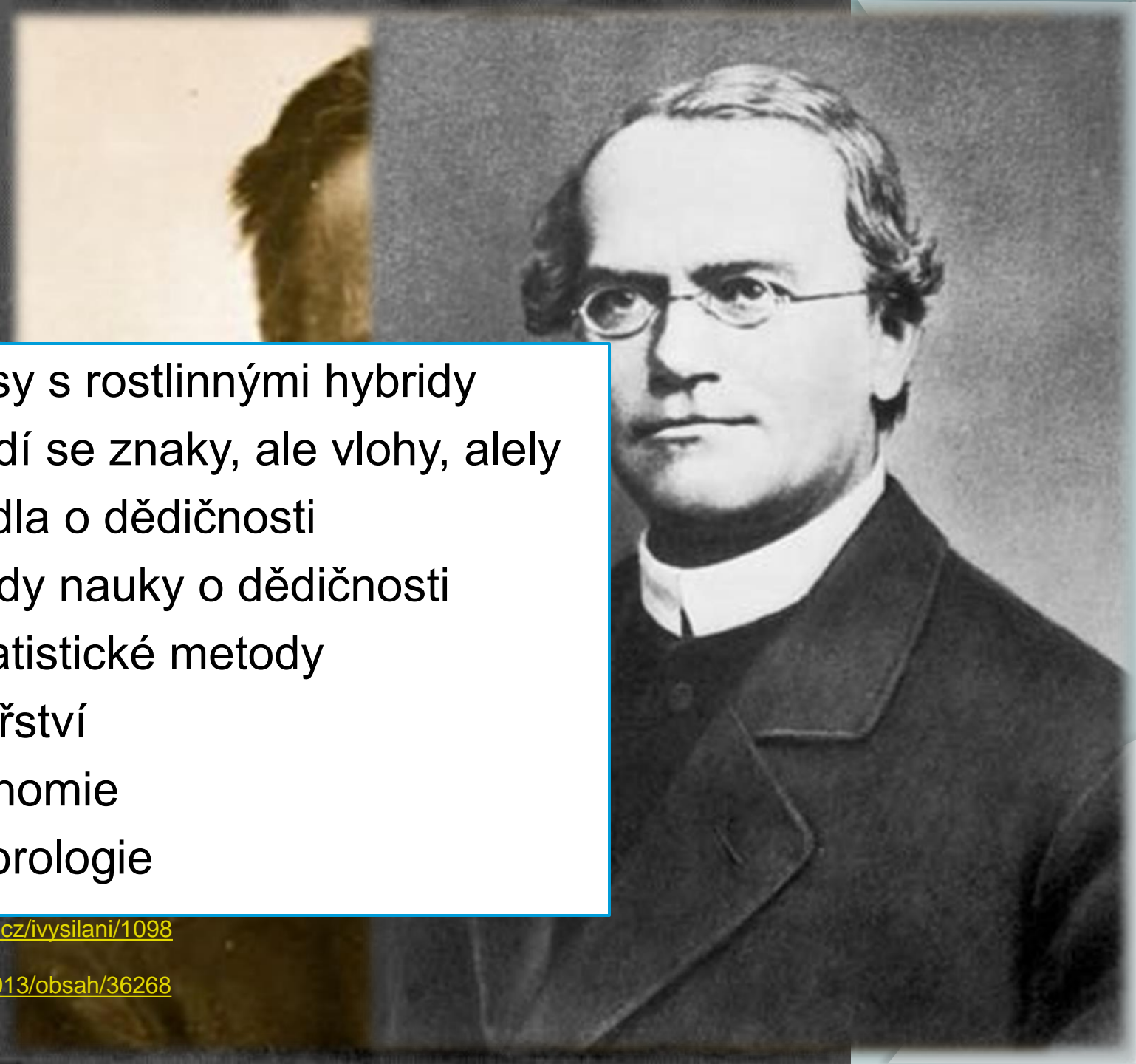
C. Appelgren



D

19.st

- Pokusy s rostlinnými hybridy
- Nedědí se znaky, ale vlohy, alely
- Pravidla o dědičnosti
- Základy nauky o dědičnosti
- Biostatistické metody
- Včelařství
- Astronomie
- Meteorologie



DĚJINY GENETIKY

- ◎ 20.století
 - 1900 – Hugo de Vries - MUTACE
 - 1904 - Theodor Boveri – CHROMOZOM
 - 1909 - Wilhelm Ludvig Johannsen – GEN
 - 1944 – DNA nositelka gen.informace
 - 1951 – RTG snímek DNA
 - 1953 – Watson,Crick,Wilkins – struktura DNA
 - 1957 – centrální dogma molekulární biologie
 - 1961 – genetický kód
 - 1970 – první umělý gen – gen.inženýrství
 - 1982 – bakteriálně vyráběný inzulin
 - 1996 – klonovaná ovce Dolly
 - 2000 – kompletní lidský genom

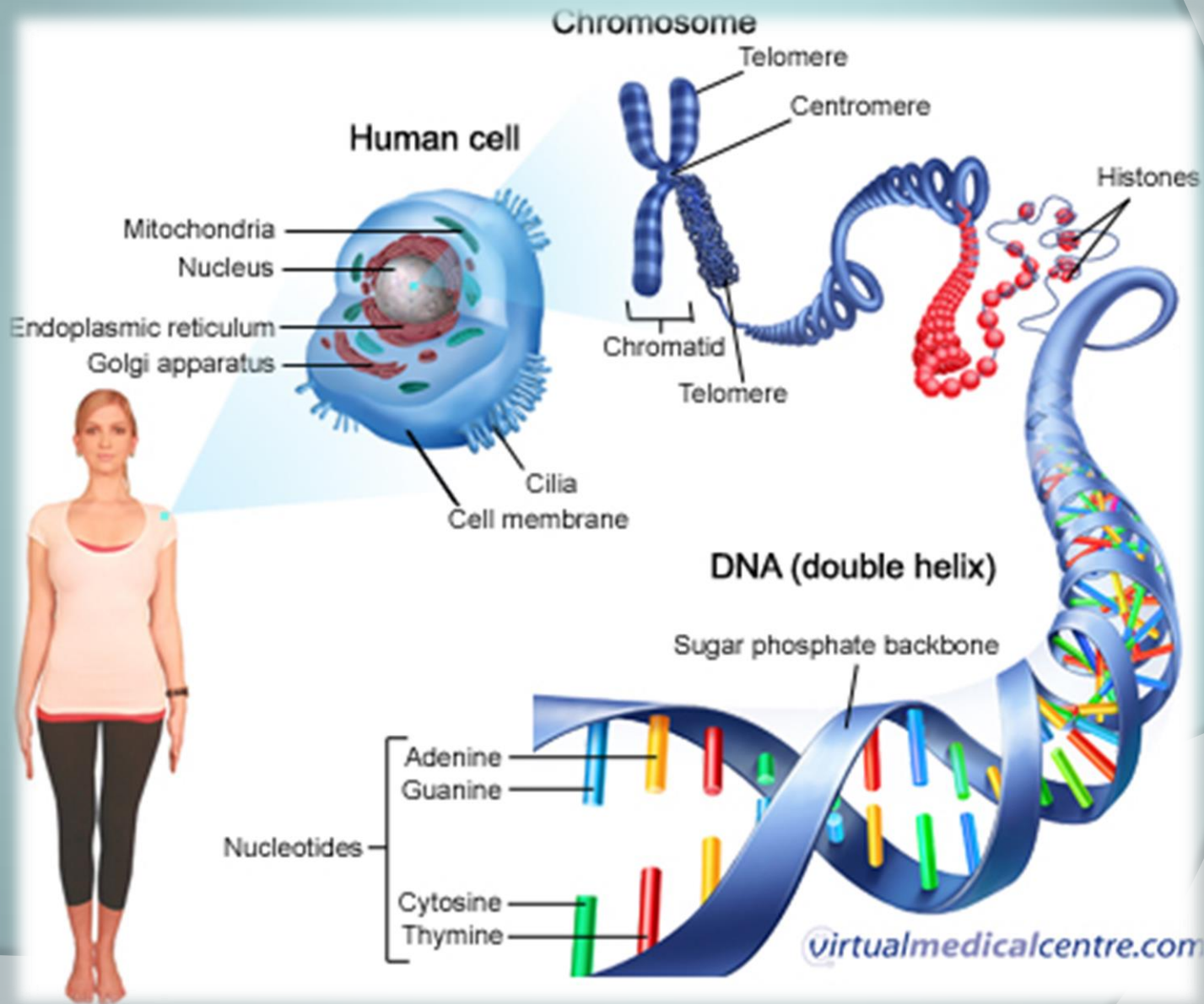
ORGANISMUS



až do DNA



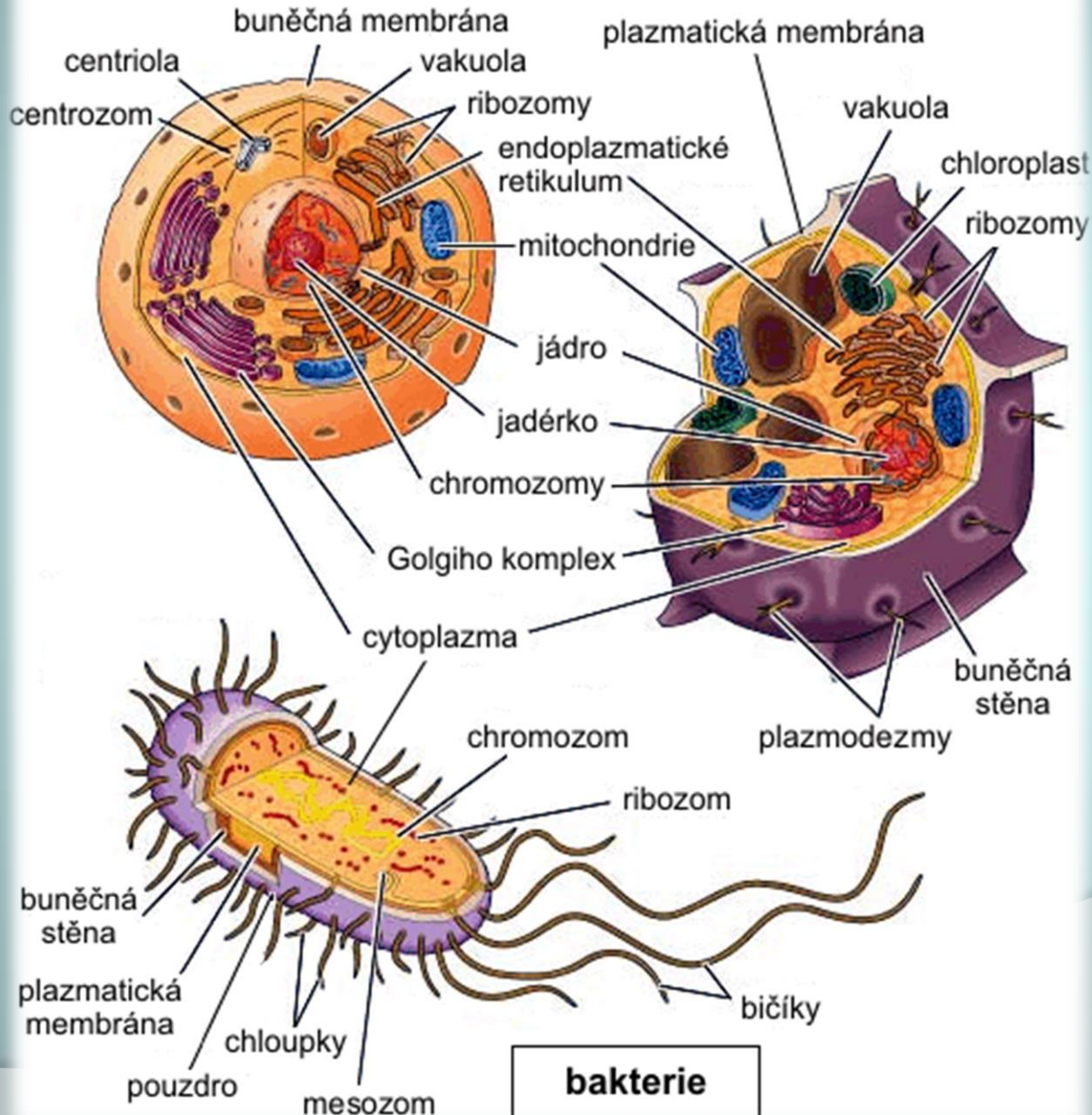
KDE JE ULOŽENA GENETICKÁ INFORMACE?



živočišná buňka

rostlinná buňka

Ze života buňky



<https://www.youtube.com/watch?v=MZ47-G4XK Dw>

Nucleolus

Nuclear envelope

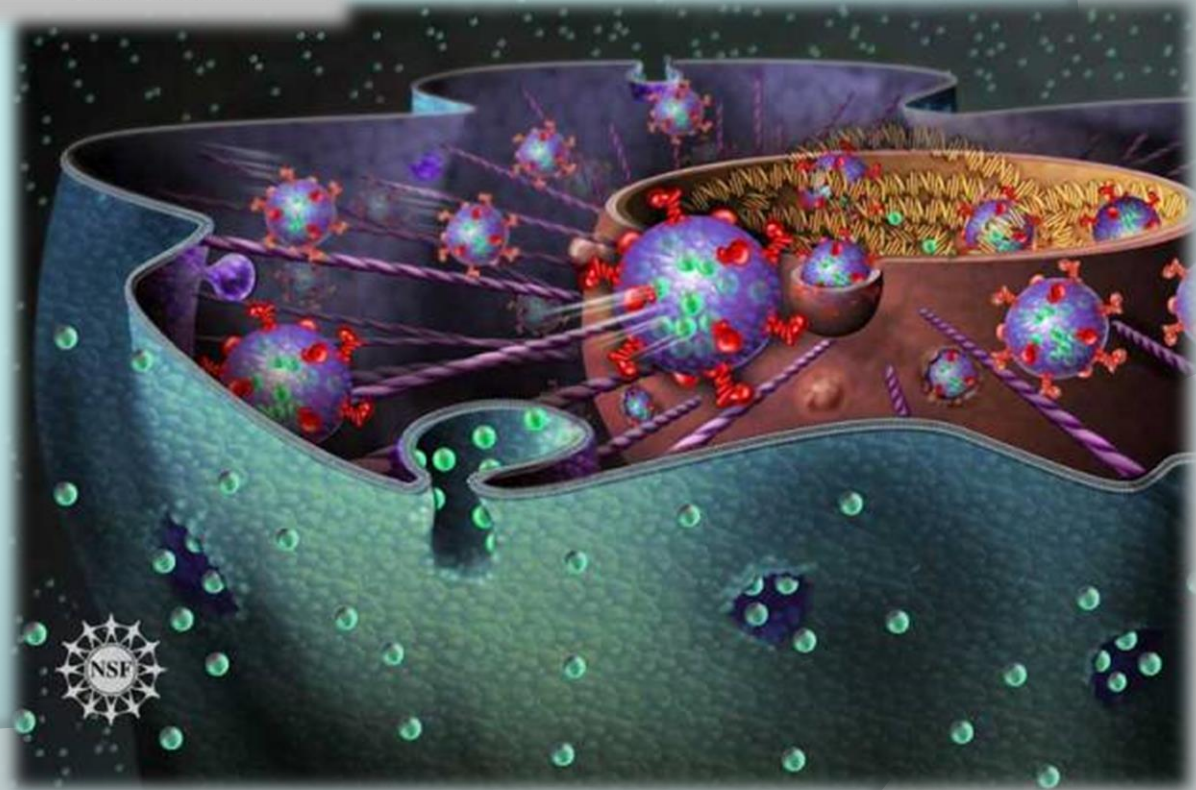
Nuclear pores

Chromatin

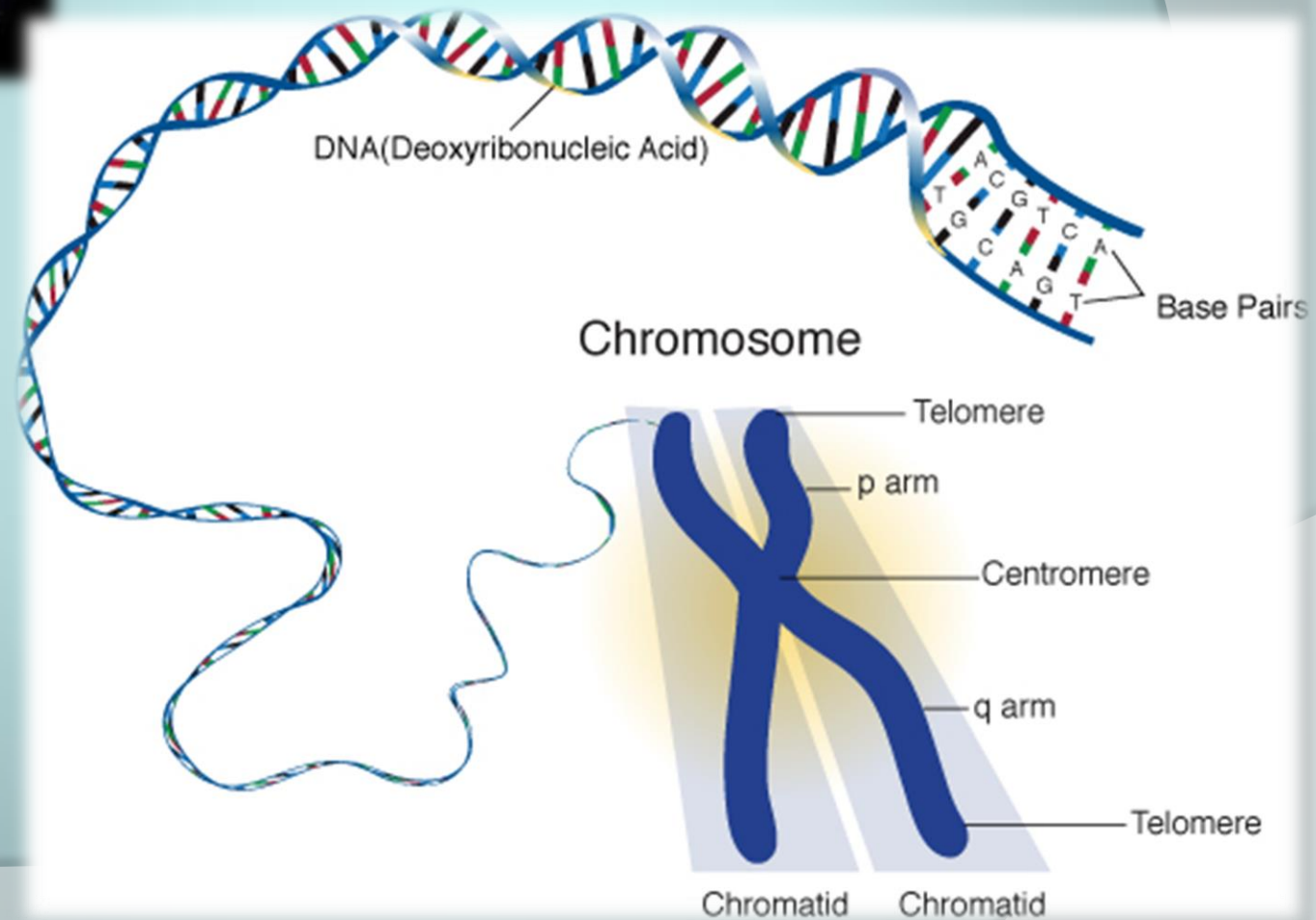
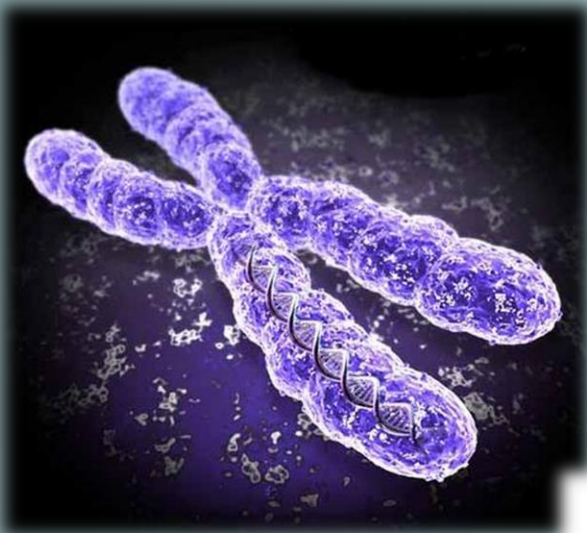
Chromosomes

© Buzzle.com

JÁDRO
nucleus
karyon



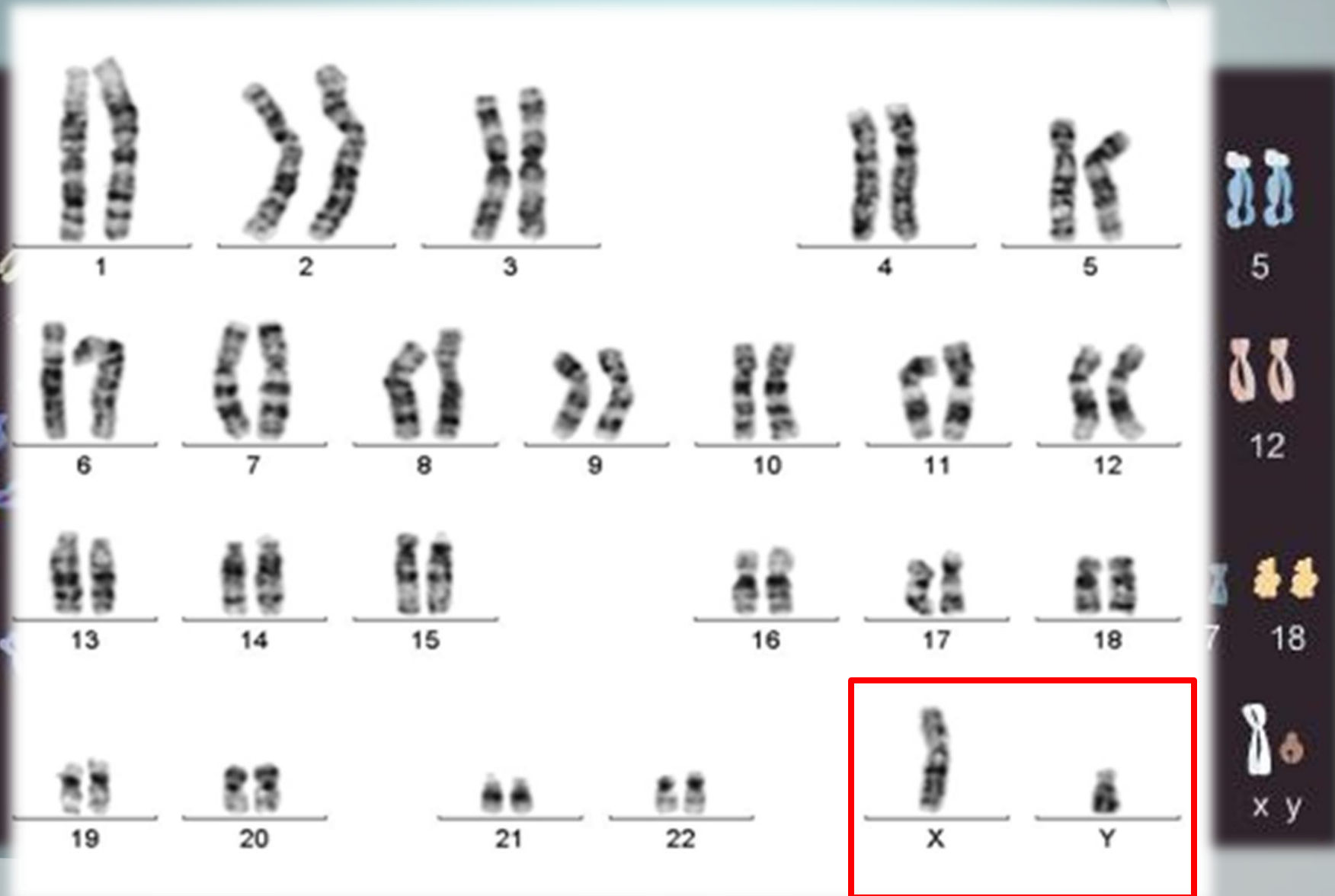
CHROMOSOM



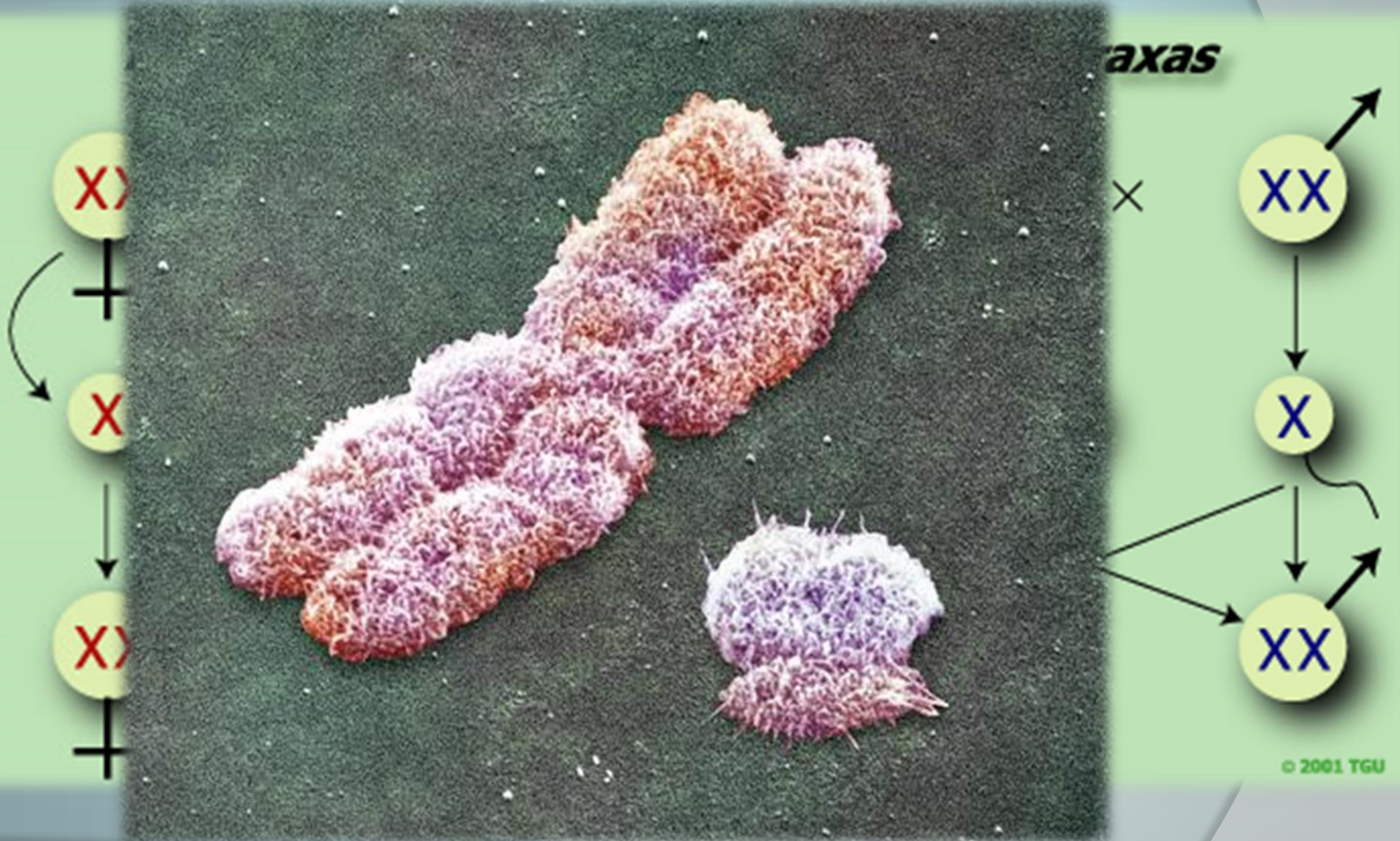
DIPLOIDNI POČTY CHROMOZOMŮ NĚKTERÝCH ROSTLIN A ŽIVOČICHŮ

Hrách setý	14
Ječmen obecný	14
Rajče jedlé	24
Jasan ztepilý	46
Lípa srdčitá	82
Žížala obecná	36
Štika obecná	18
Kapr obecný	104
Pes domácí	78
Šimpanz učenlivý	48

KARYOTYP

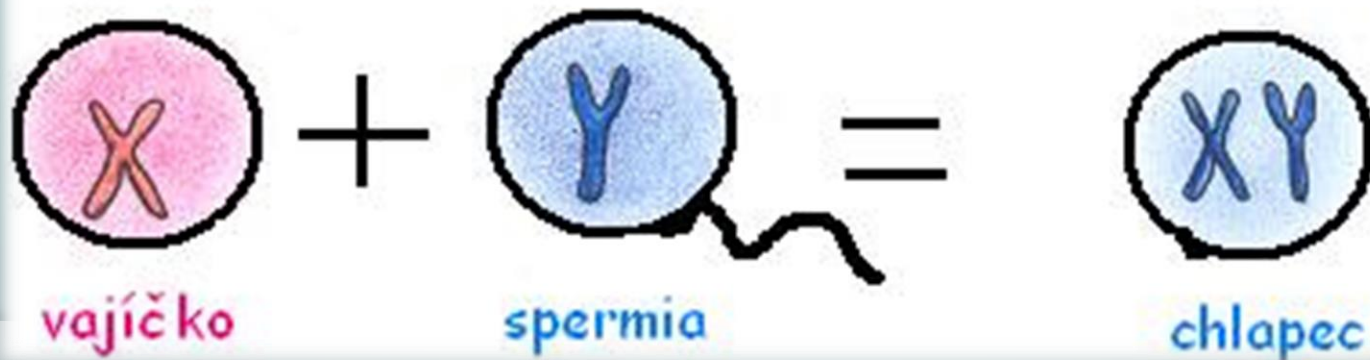


CHROMOZOMOVÉ URČENÍ POHLAVÍ

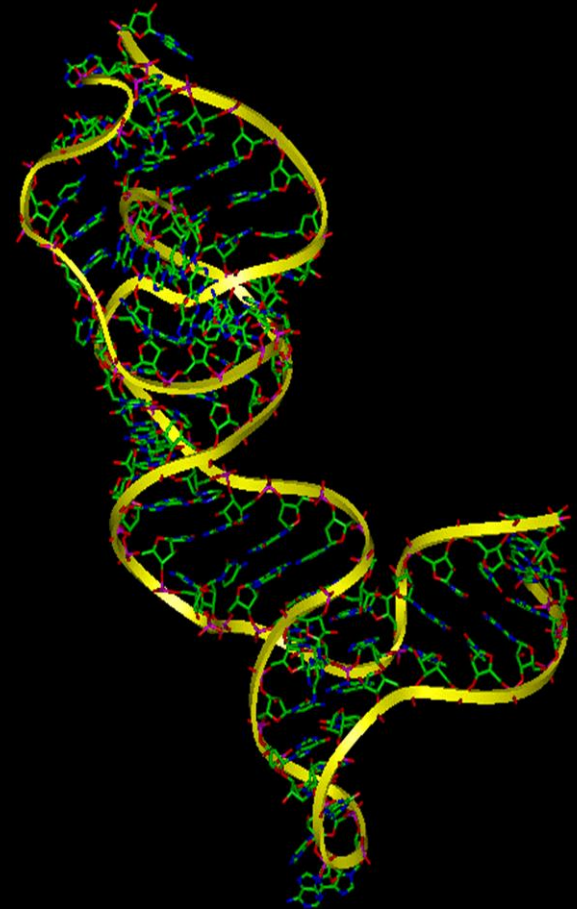
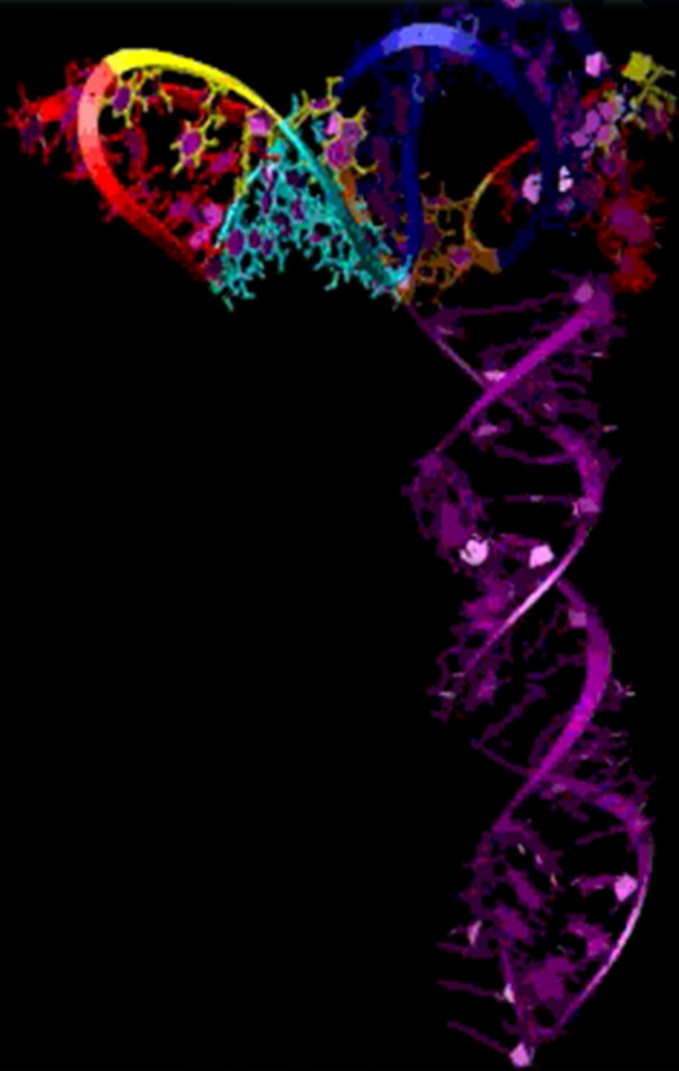


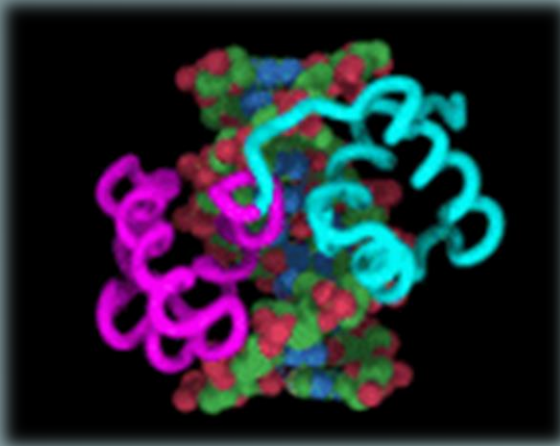


<https://www.youtube.com/watch?v=5OvgQW6FG4>



NUKLEOVÉ Kyseliny



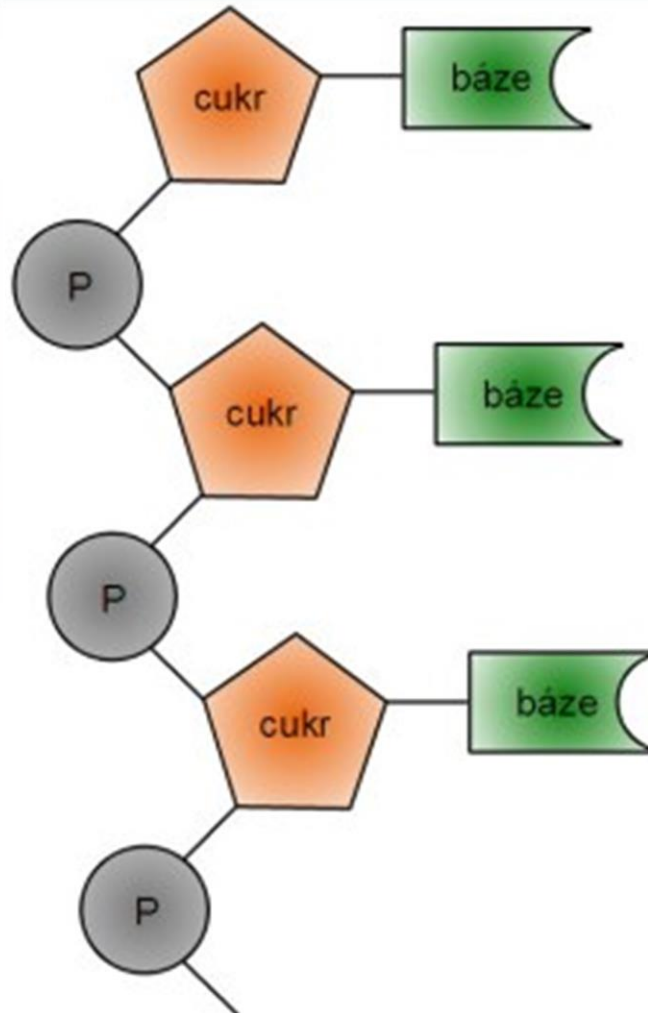


NUKLEOVÉ KYSELINY

- ⊙ Makromolekulární látky, které uchovávají a přenášejí genetickou informaci.
- ⊙ Jsou přítomny ve všech buňkách a virech.
- ⊙ Rozlišujeme dva druhy:
 - kyselina deoxyribonukleová (deoxyribonucleic acid DNA),
 - kyselina ribonukleová (ribonucleic acid RNA).

Základními stavebními jednotkami jsou nukleotidy.

fosfátová skupina



dusíkatá báze
(adenin)



katý cukr
a)

VIDEO

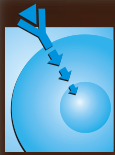
- ◉ LEUKOCYT: <https://www.youtube.com/watch?v=TnDeITPGQjk>
- ◉ PROTEOSYNTÉZA: https://www.youtube.com/watch?v=lpb5s2F1pyM&index=7&list=PLMI_9CqZGOfW7yCel69jBD8SvVAI-_hby
- ◉ PŘÍBĚH BÍLKOVIN: https://www.youtube.com/watch?v=suN-sV0cT6c&list=PLMI_9CqZGOfW7yCel69jBD8SvVAI-_hby&index=8
- ◉ TRANSLACE: <https://www.youtube.com/watch?v=B6O6uRb1D38&index=10&list=PL8091AA96CA7136B2>
- ◉ REPLIKACE: <https://www.youtube.com/watch?v=zdDkiRw1PdU>
- ◉ TRANSKRIPCE: <https://www.youtube.com/watch?v=7-itY-Z28ic>

GENETIKA BUŇKY V ČÍSLECH

- POČET BUNĚK: 75×10^{18}
- POČET CHROMOZOMŮ V BUŇCE: 46, 23 PÁRŮ
- POČET GENŮ V BUŇCE: 20 000
- POČET NUKLEOTIDŮ V BUŇCE: 6×10^9
- POČET NERVOVÝCH BUNĚK : 44×10^9
- VARIABILITA POHL.BUNĚK: 2^{23}
- VARIABILITA POTOMKŮ: 10^{480}

DĚLĚNÍ BUNĚK

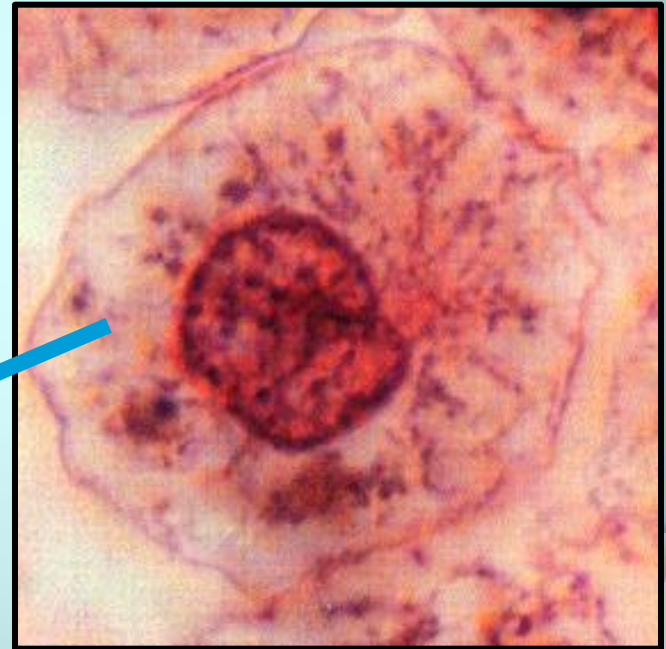
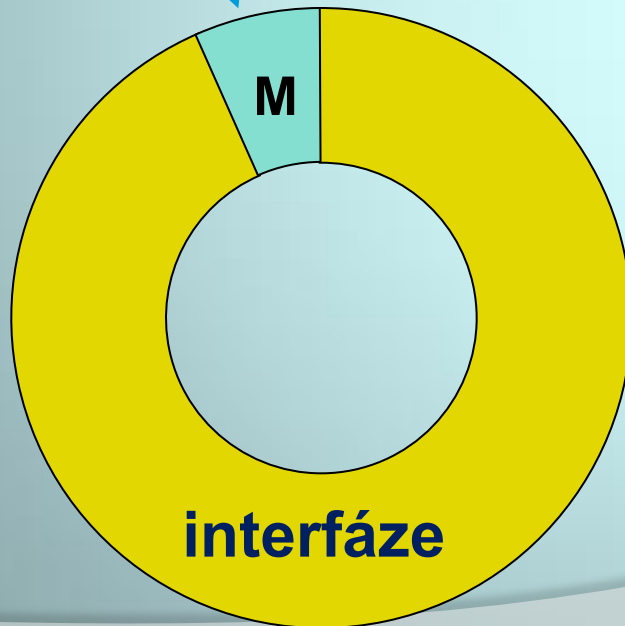
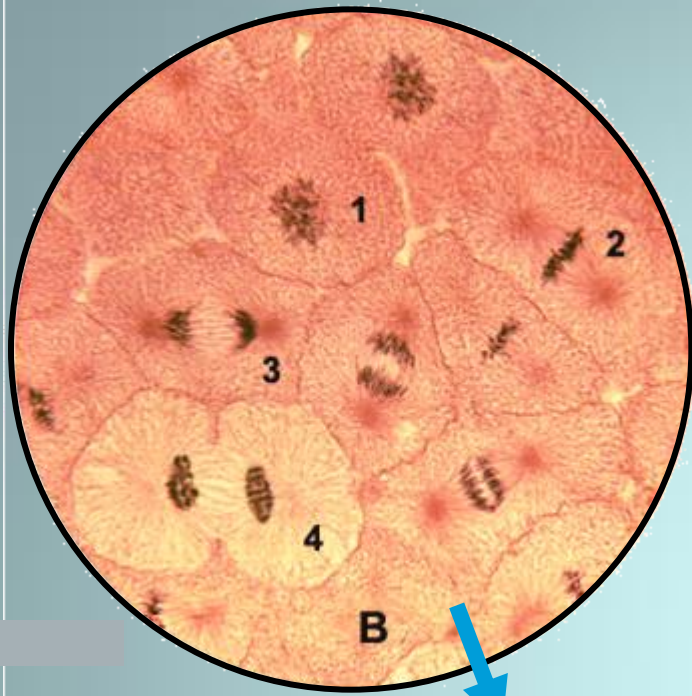
- ⊙ V každém z nás proběhne za život 10^{16} mitóz
- ⊙ ...v průběhu života se buňky vymění asi 100 x.
- ⊙ Každou hodinu vznikne 16×10^9 erytrocytů

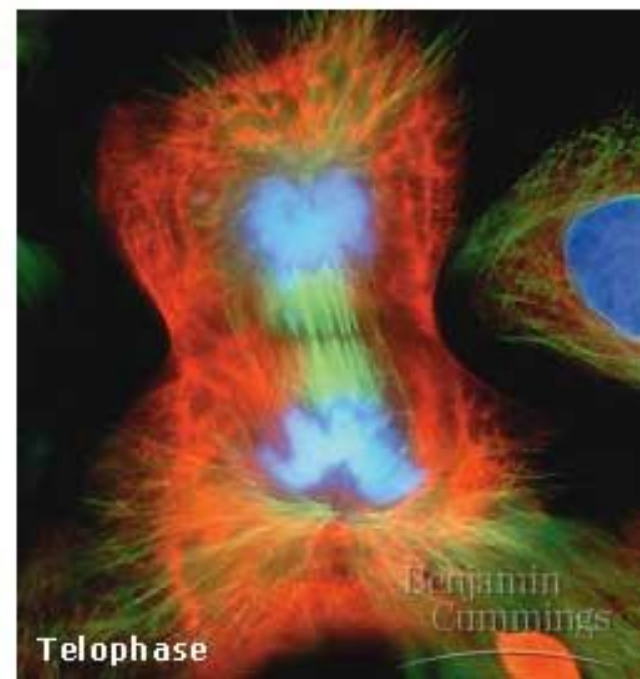
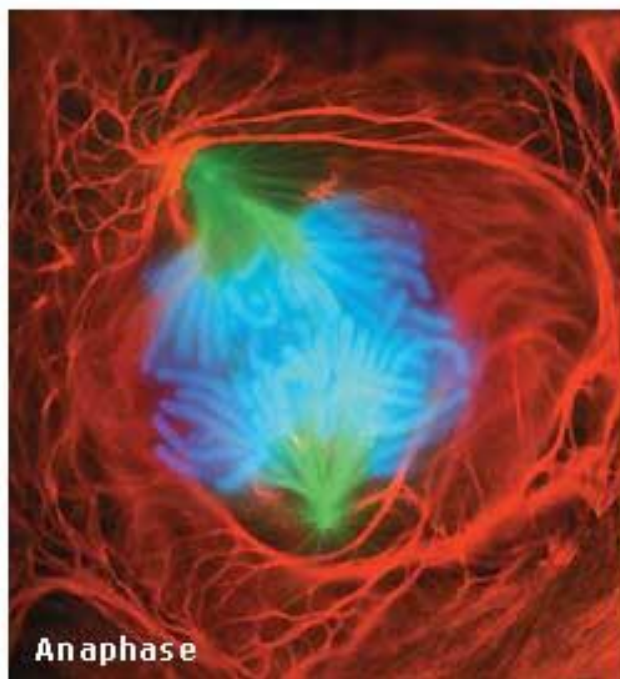
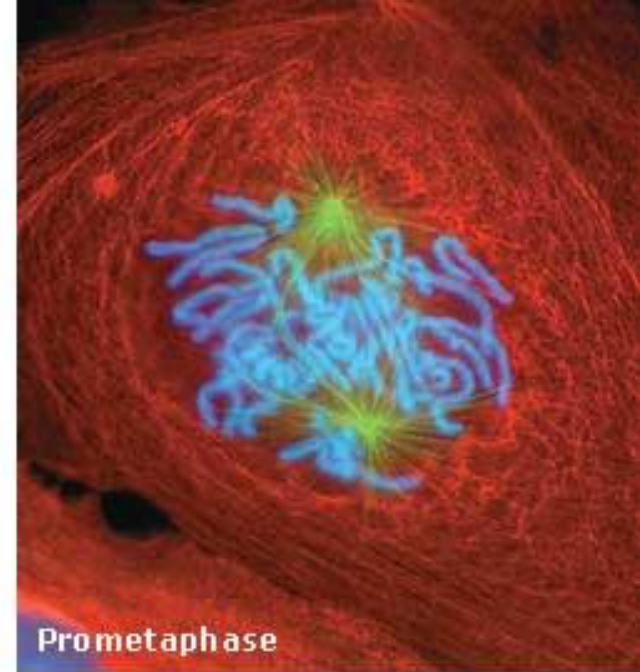
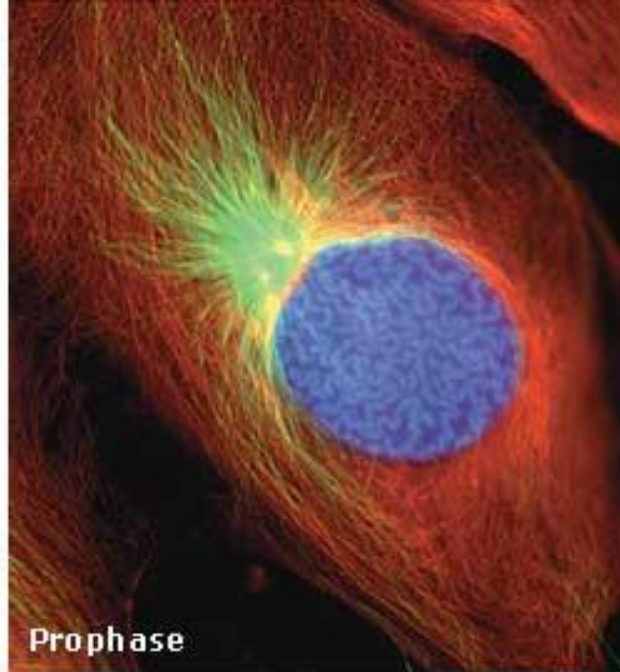
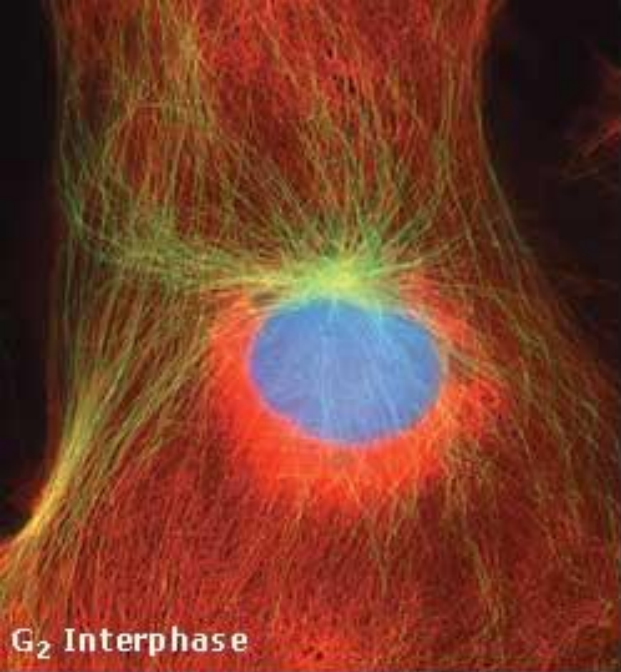


MITÓZA – nepřímé dělení



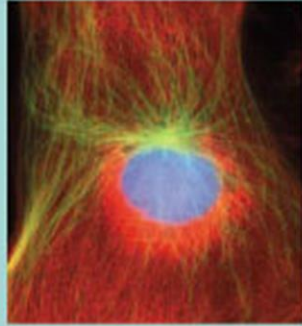
BUNĚČNÝ CYKLUS



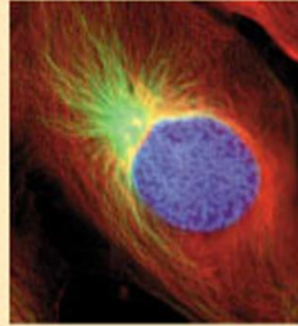


Benjamin
Cummings

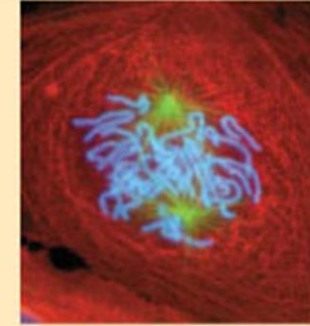
Profáze, Prometafáze



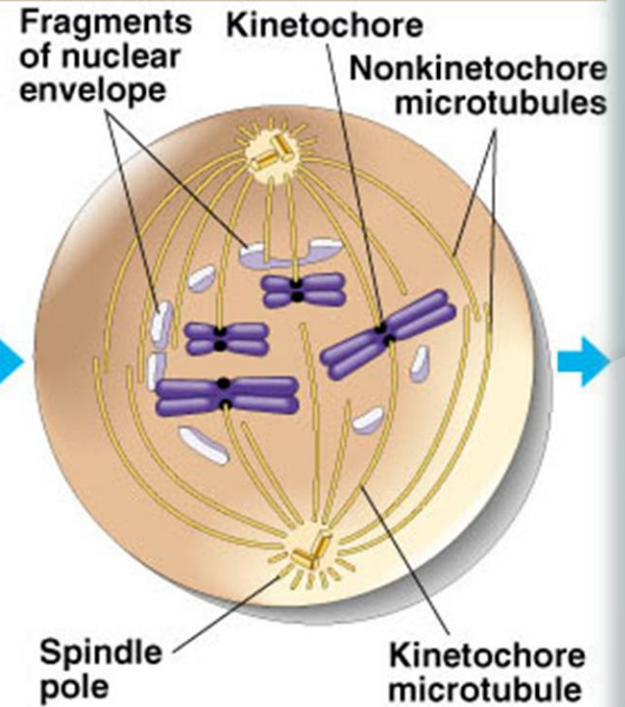
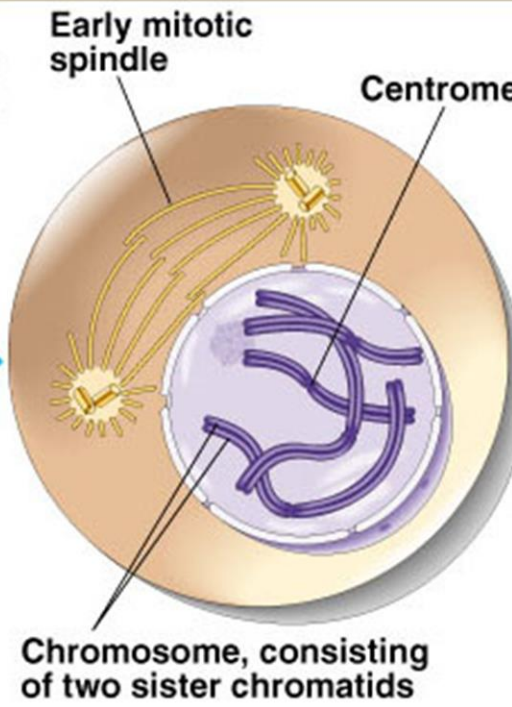
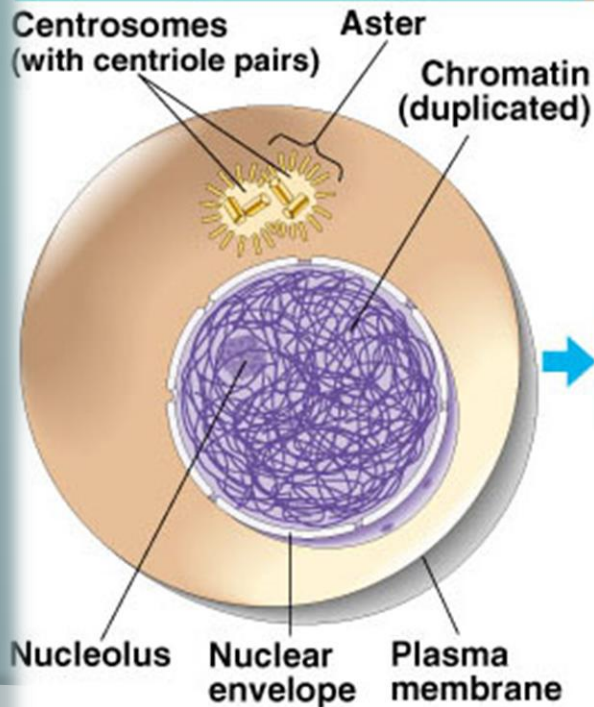
G₂ OF INTERPHASE



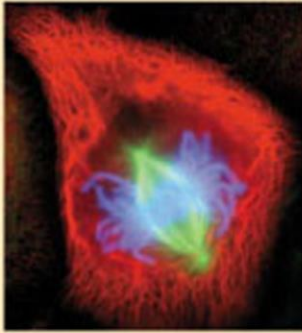
PROPHASE



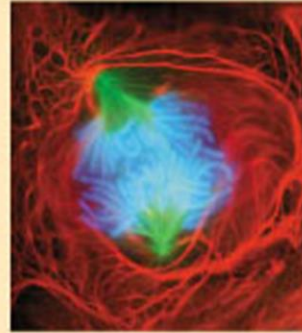
PROMETAPHASE



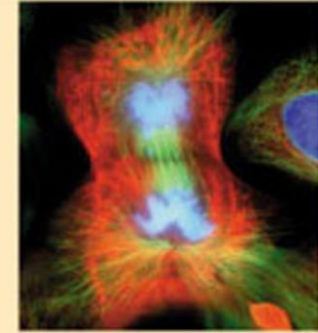
Metafáze, Anafáze, Telofáze



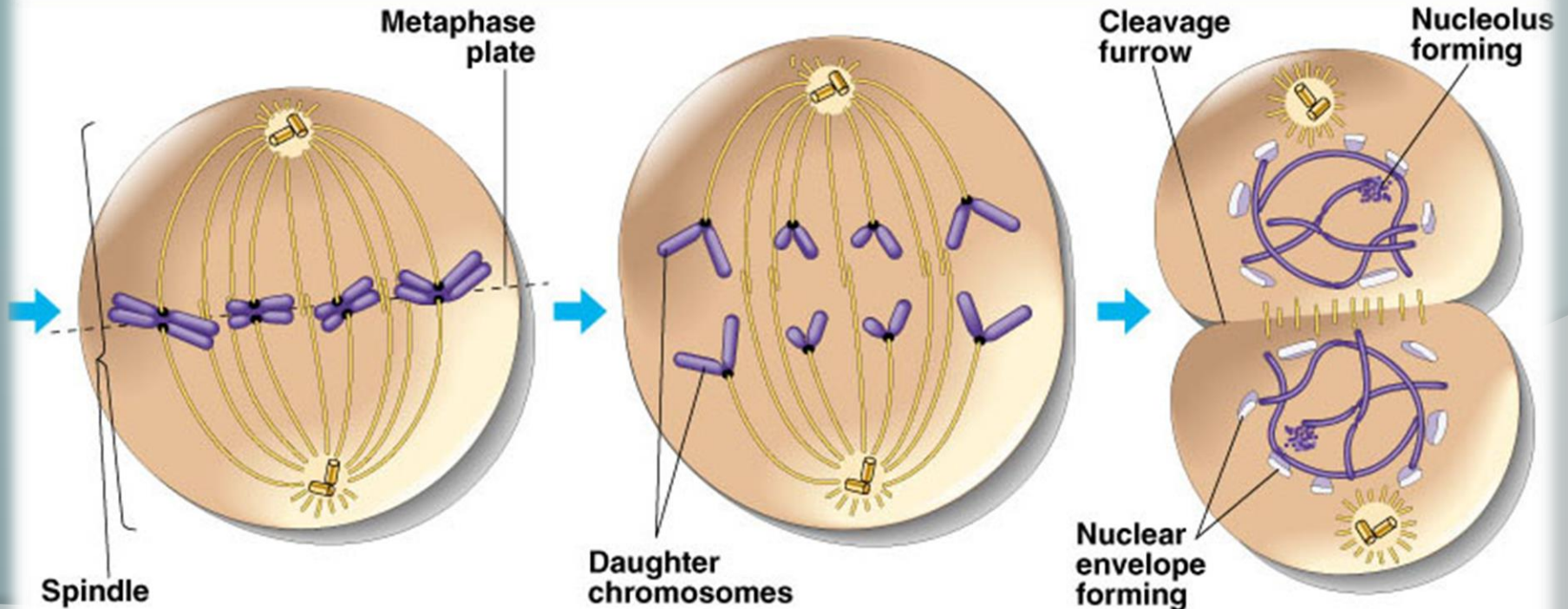
METAPHASE



ANAPHASE

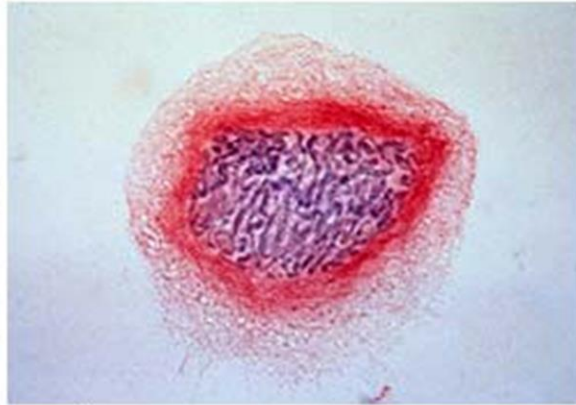


TELOPHASE AND CYTOKINESIS





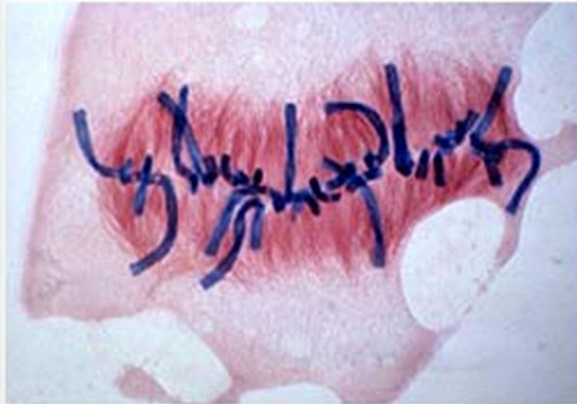
Interphase



Prophase



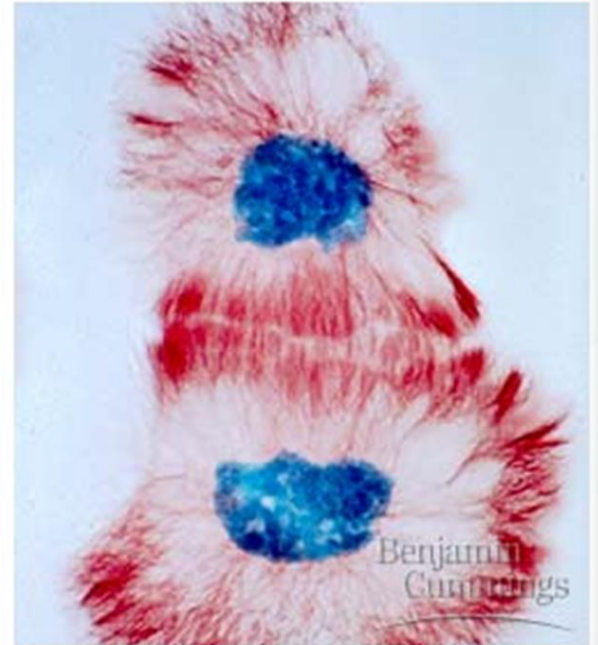
Prometaphase



Metaphase



Anaphase



Telophase

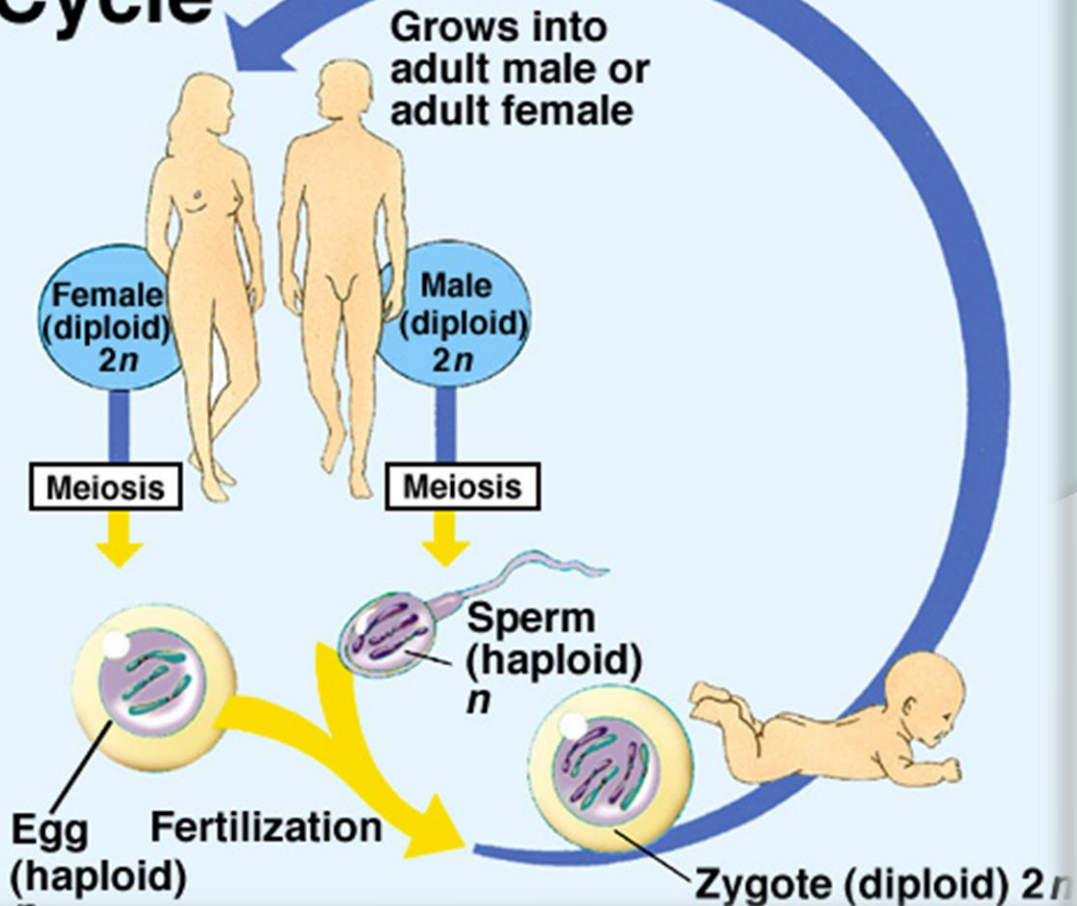
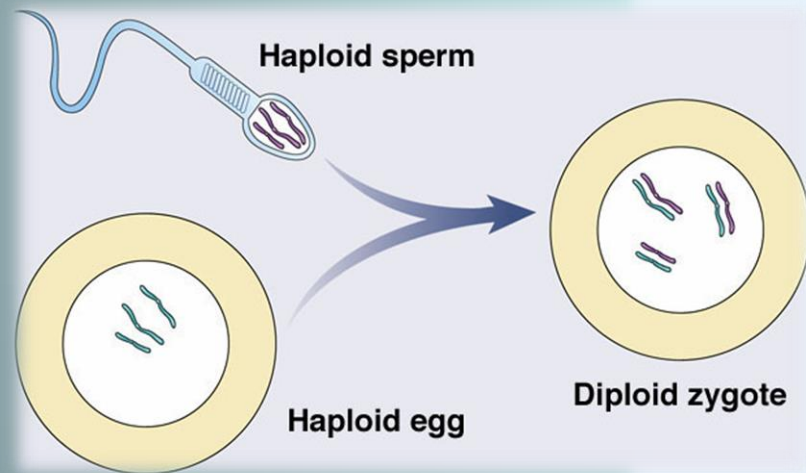
<https://www.youtube.com/watch?v=NR0mdDJMHIQ>

Benjamin
Cummings

MEIÓZA – redukční dělení

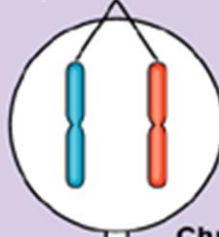
The Sexual Life Cycle

● Diploid ($2n$)
● Haploid (n)



Interphase I of Meiosis

Homologous pair of chromosomes
in diploid parent cell

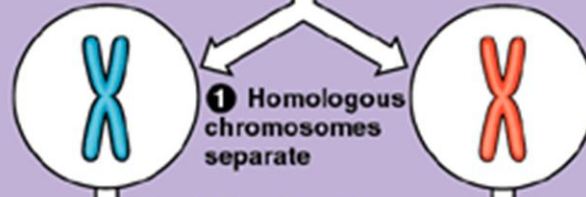


Chromosomes
replicate

Homologous pair of replicated chromosomes

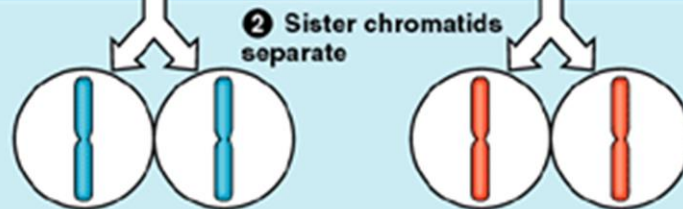


Meiosis I



Haploid cells with
replicated chromosomes

Meiosis II

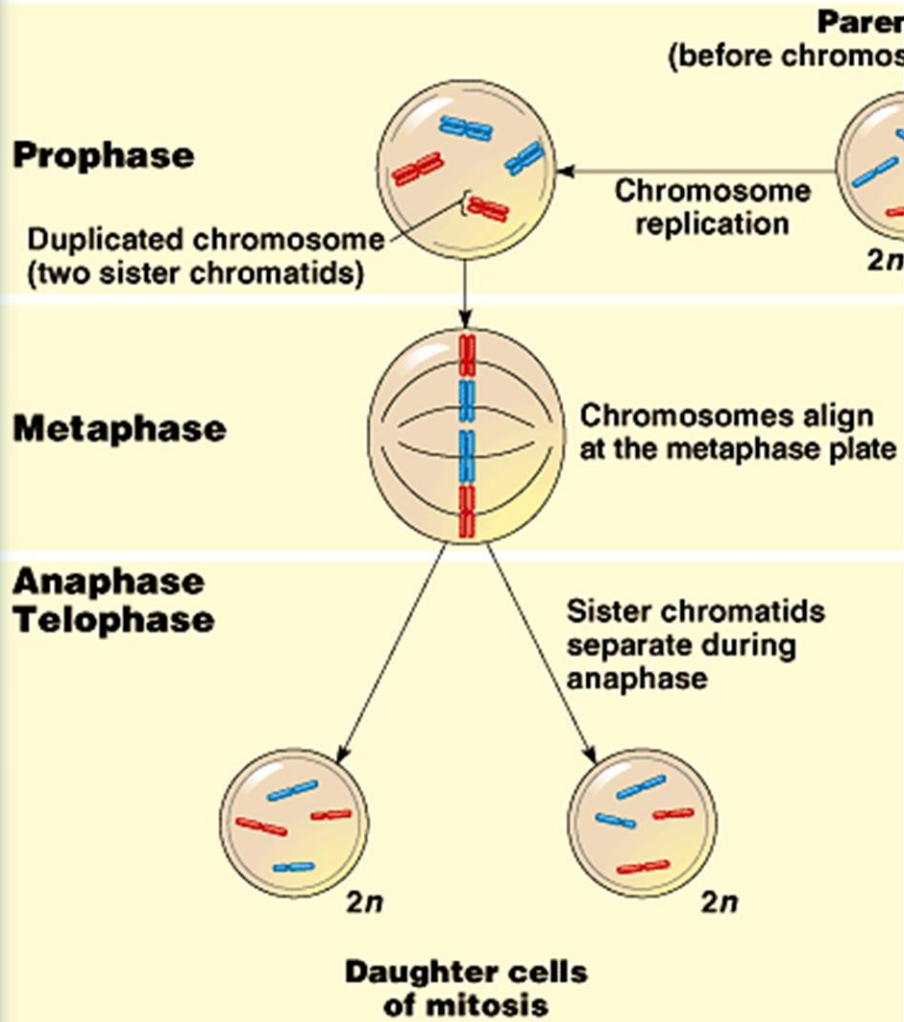


Haploid cells with unreplicated chromosomes

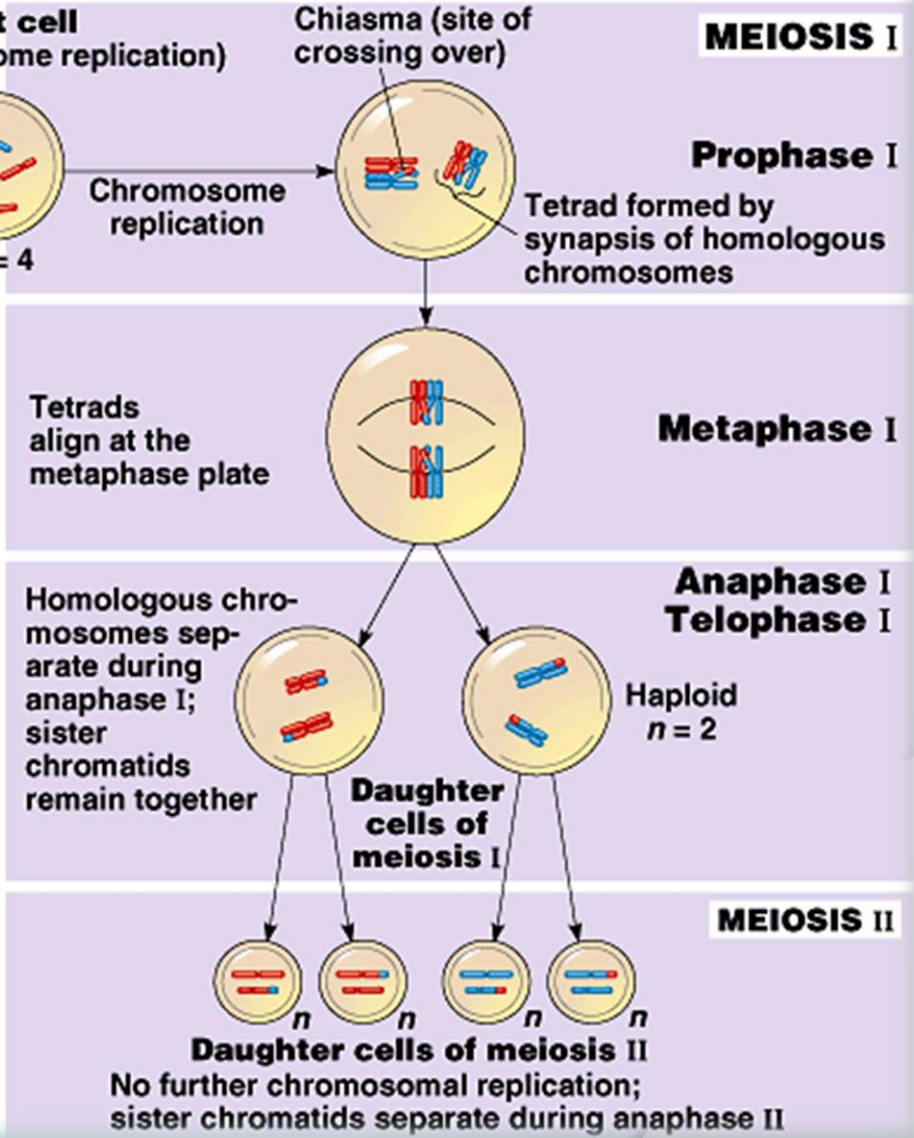
<https://www.youtube.com/watch?v=GqwMDIDAKl8>

Mitóza a meióza - srovnání


MITOSIS



MEIOSIS






Dekuji za pozornost

