

Mitosis and cell division

Ch. 9:1-3

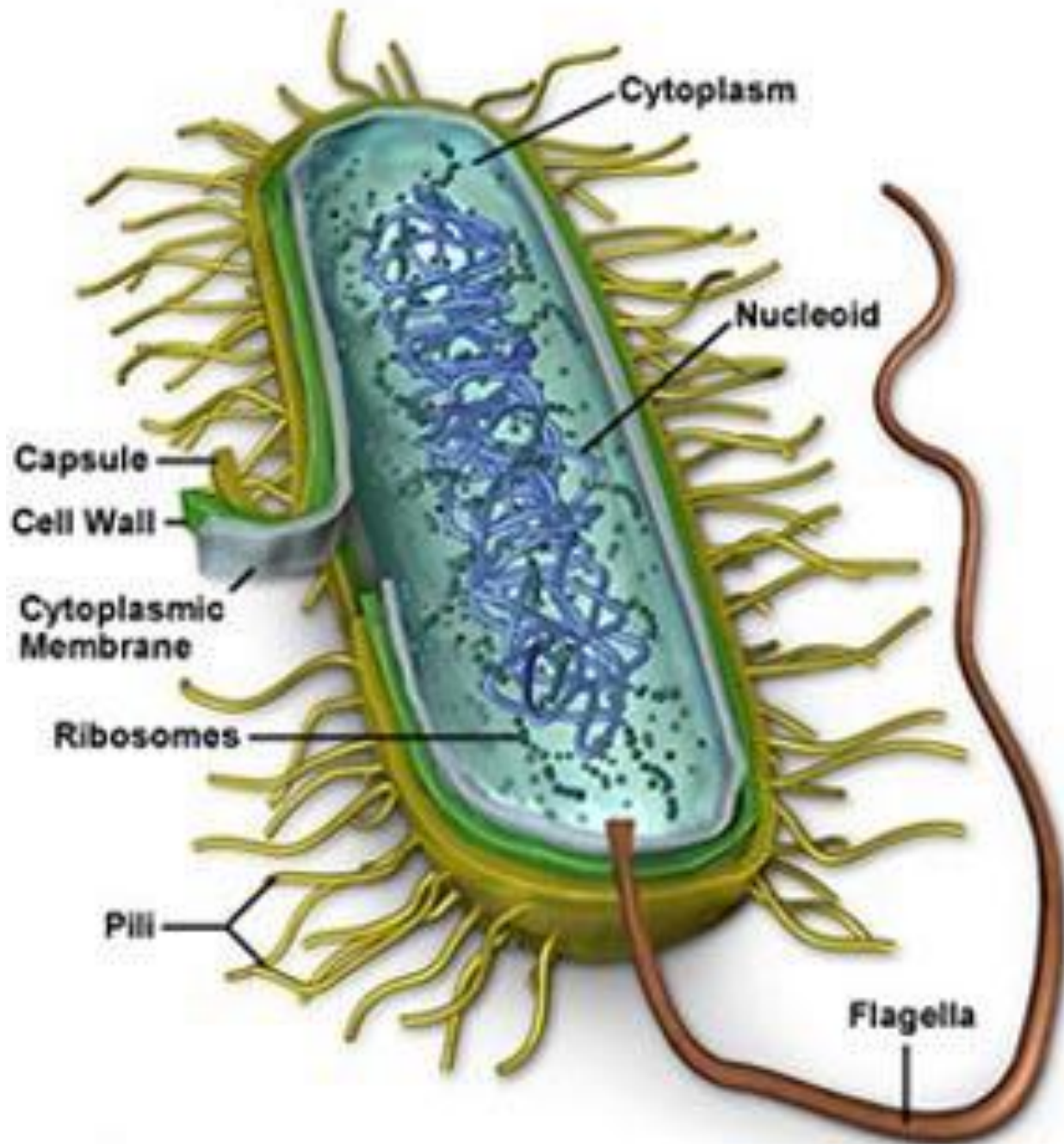
A. Cell repro

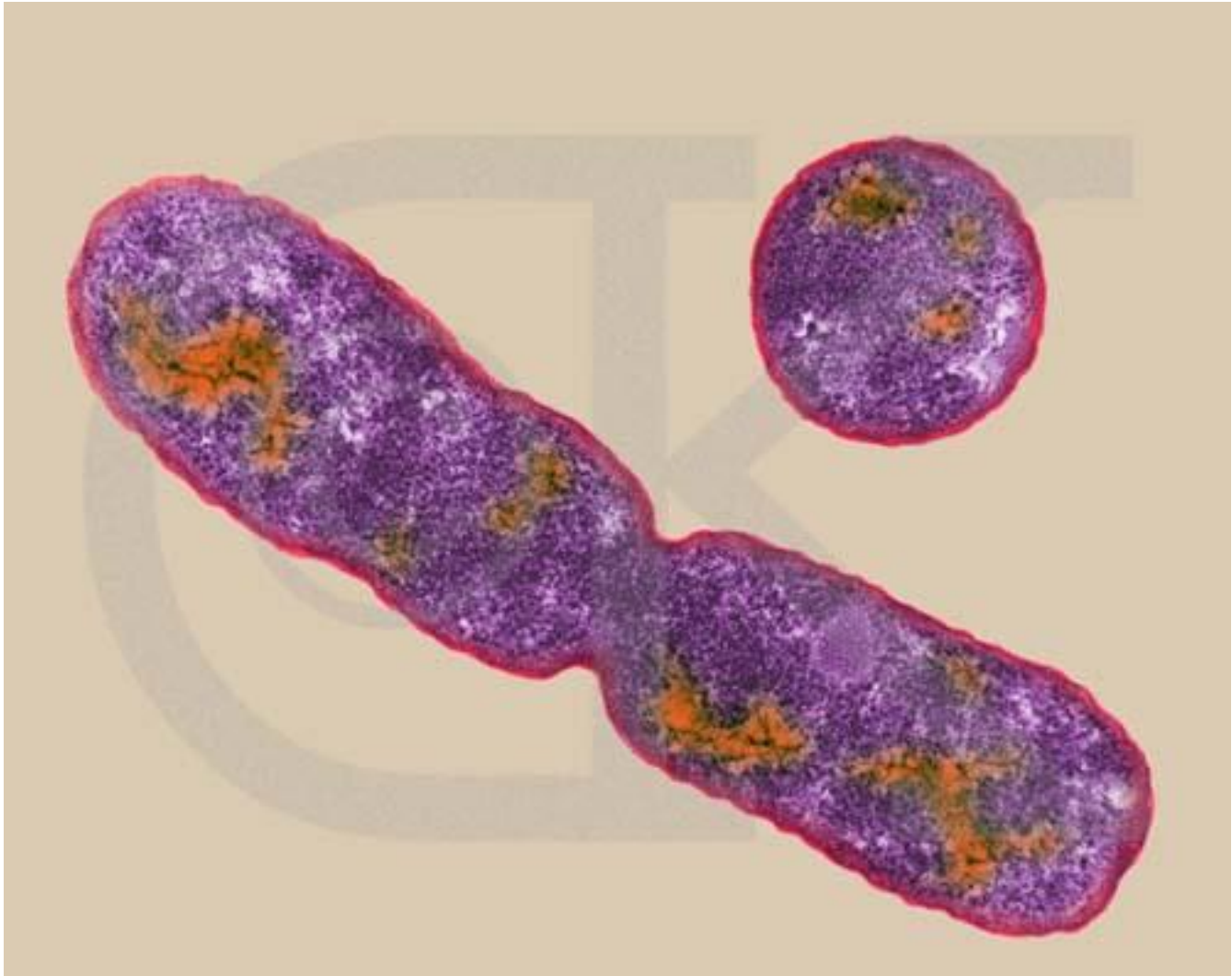
1. Prokaryotes

a. 20 minutes

b. Fission

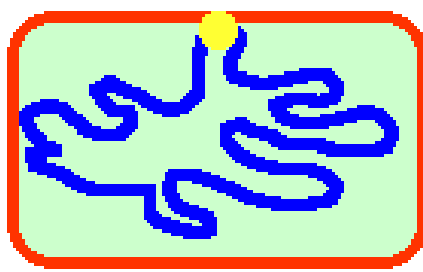
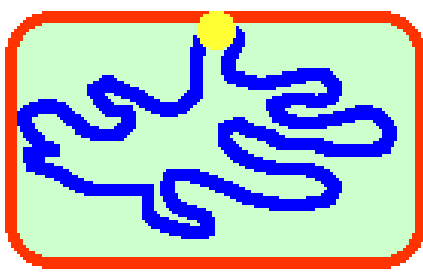
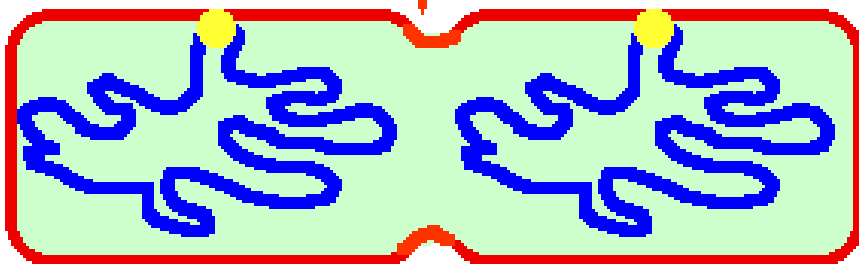
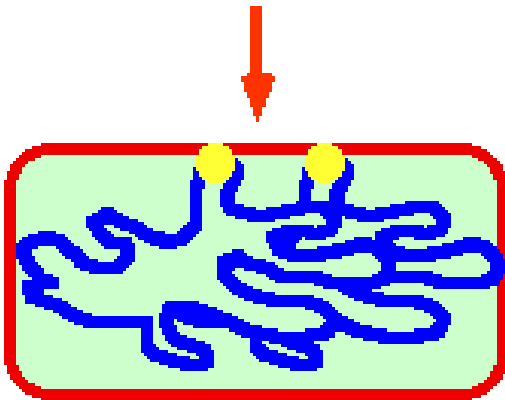
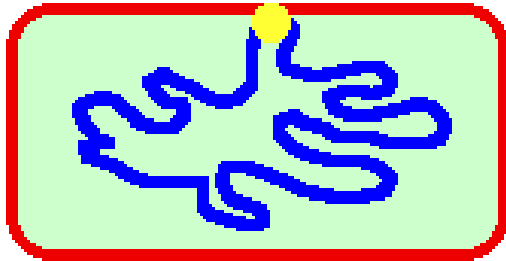






c. Fission process

1. DNA circle
2. attach to wall
3. pinching
4. 2 separate



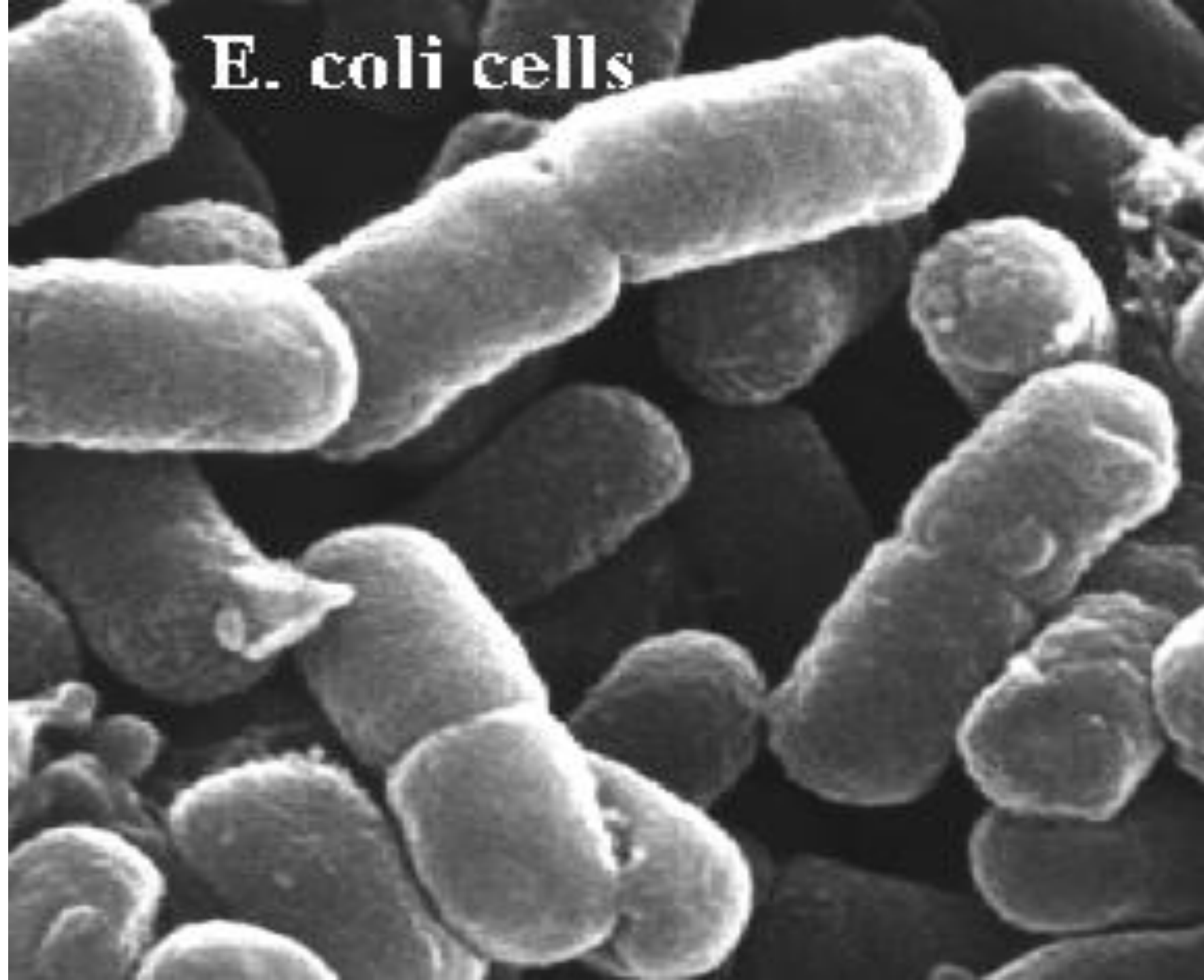
d. *E. coli* DNA

2. Eukaryotes

a. Limit to size

b. Interphase

E. coli cells

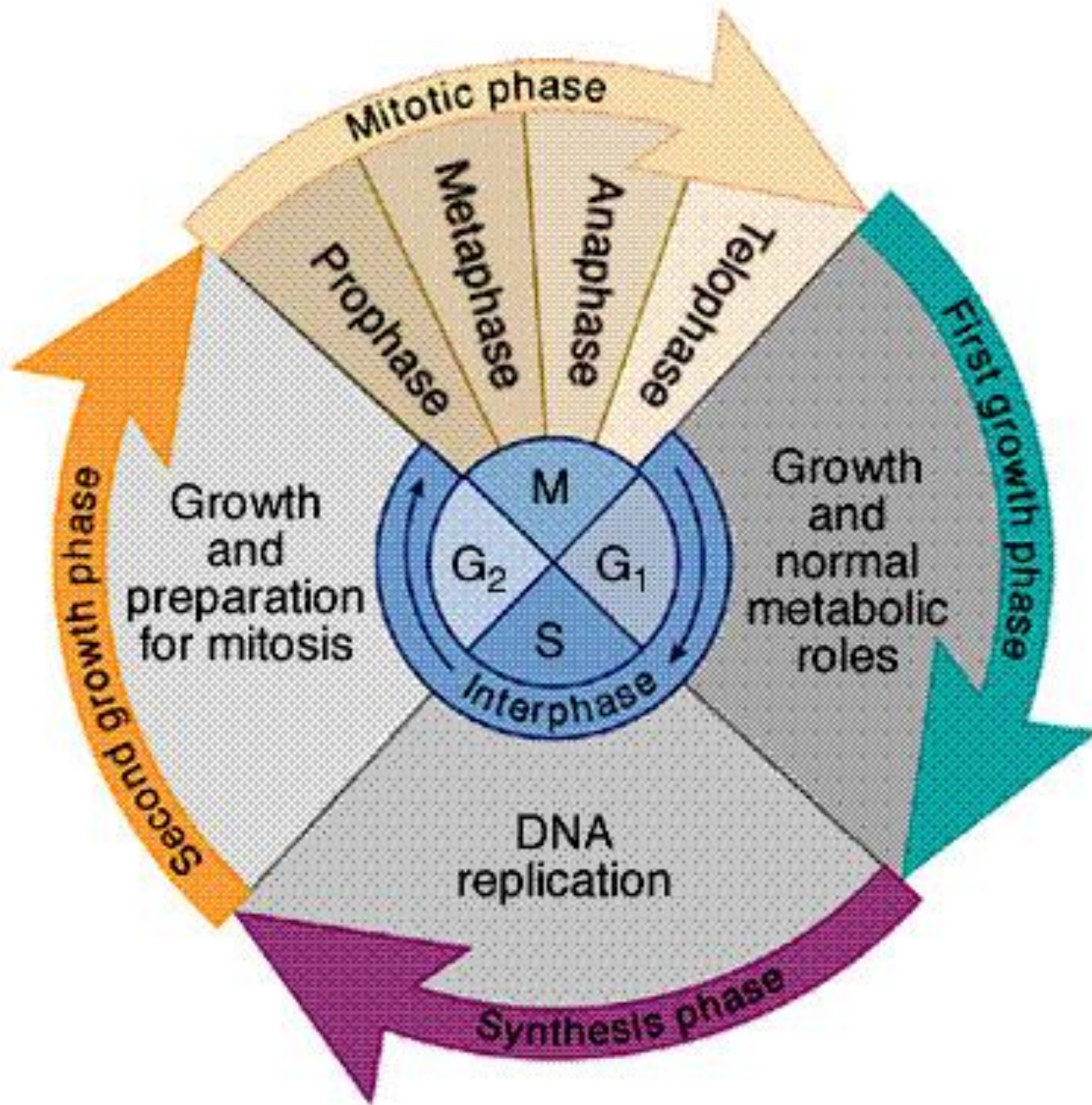


c. Mitosis

d. Cytokinesis

-animals

-plants



B. The Cell Cycle

1. Interphase

a. G1-gap

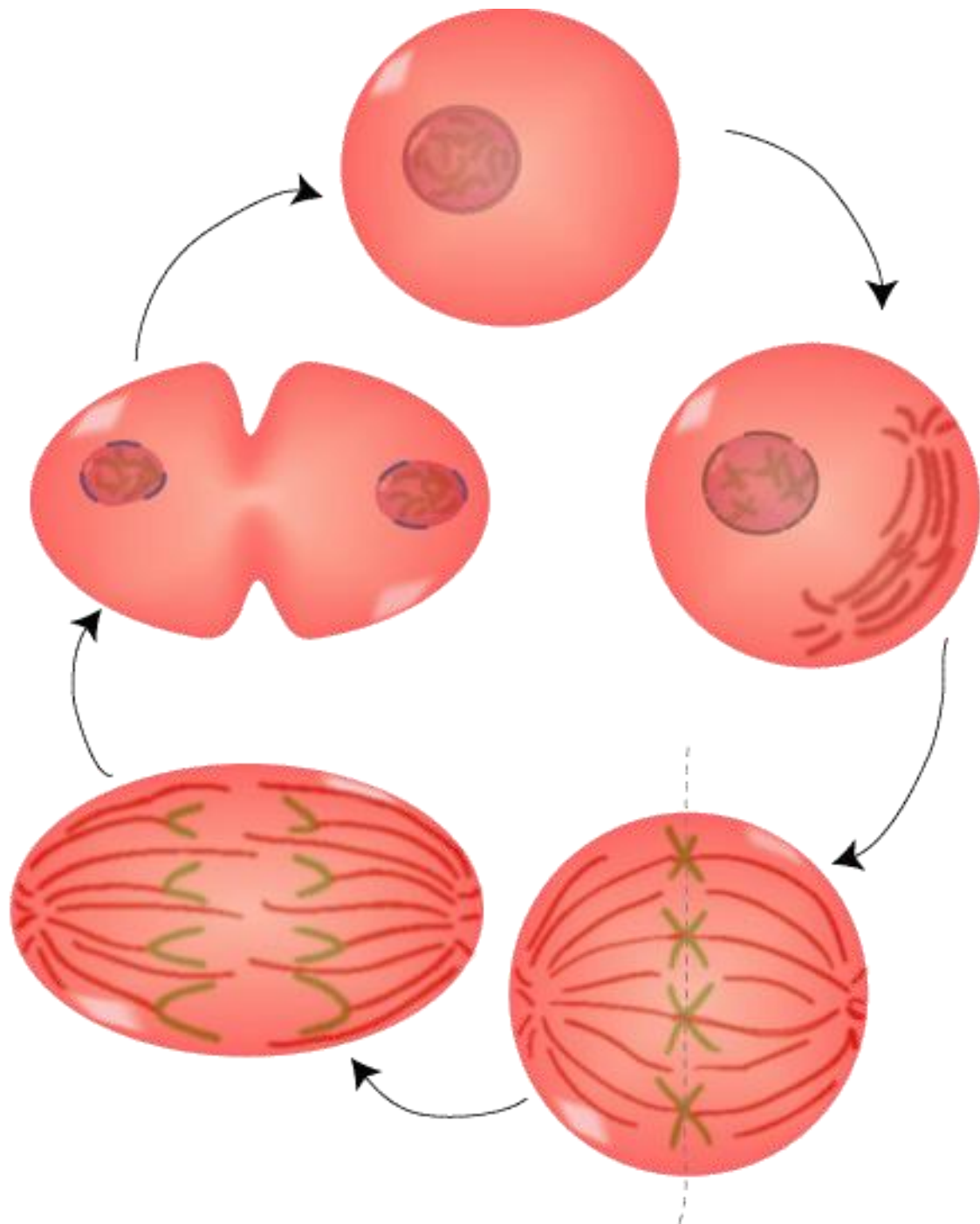
b. S-synthesis

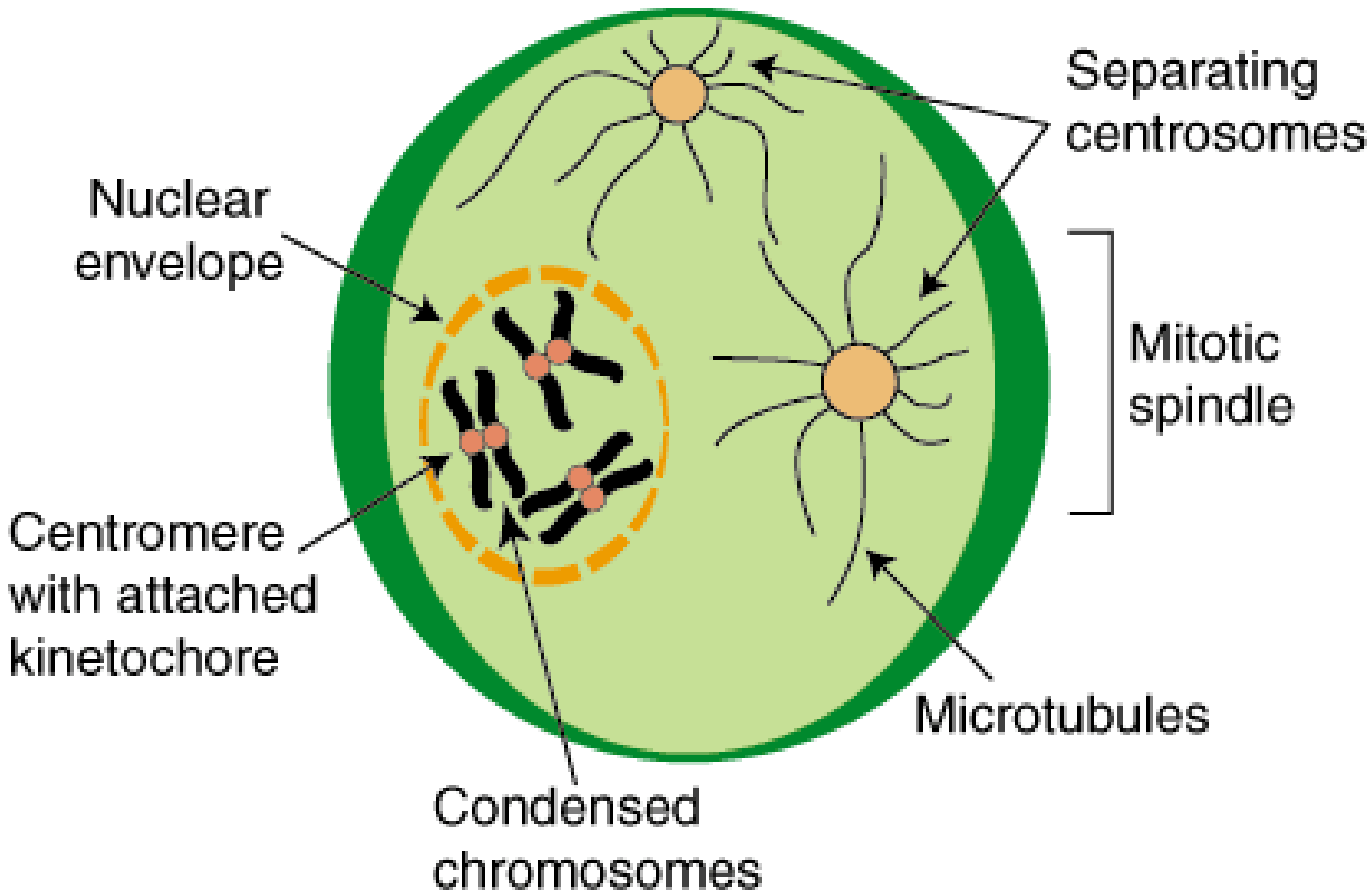
c. G2-gap

2. M-mitosis

a. prophase

b. metaphase





Separating centrosomes

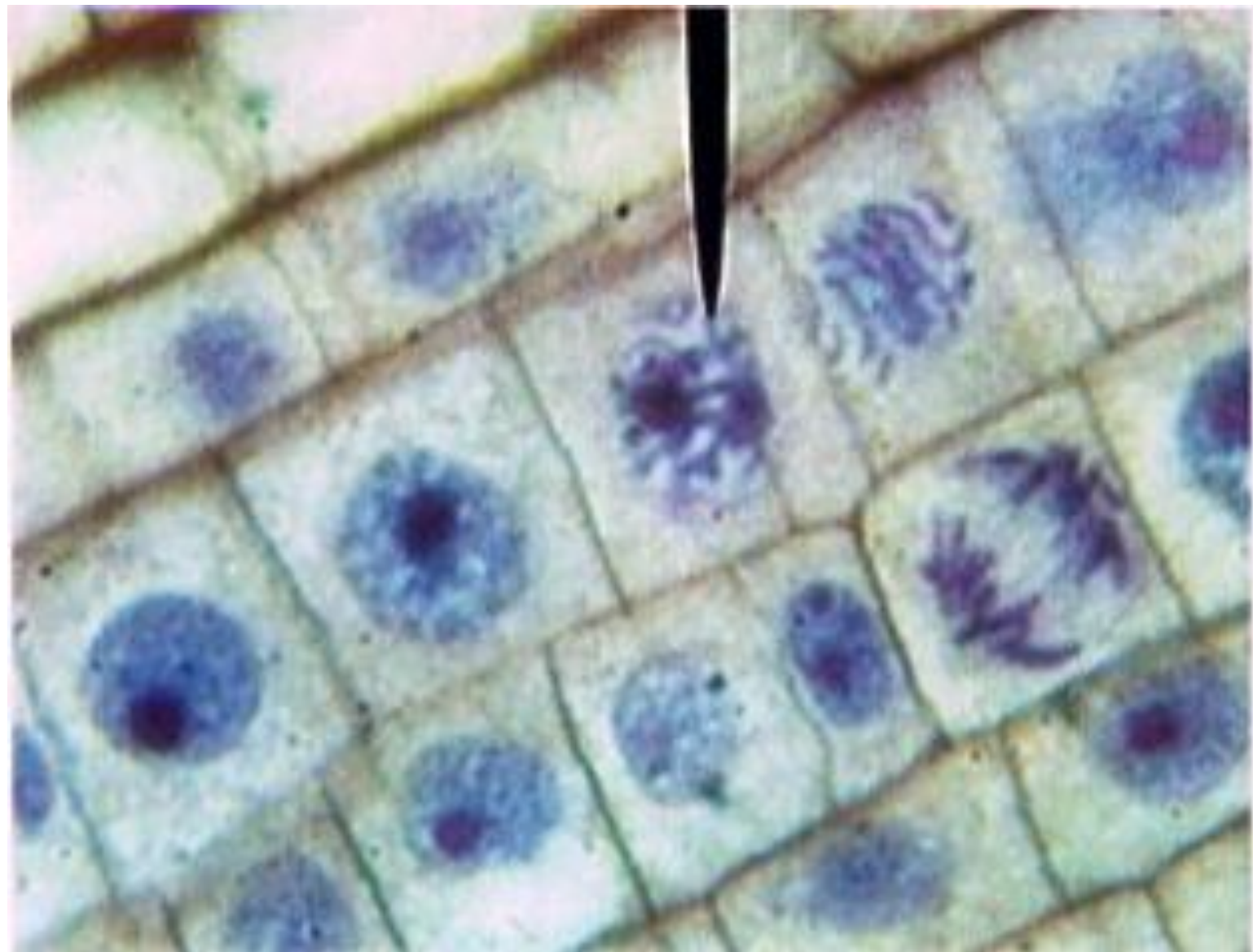
Nuclear envelope

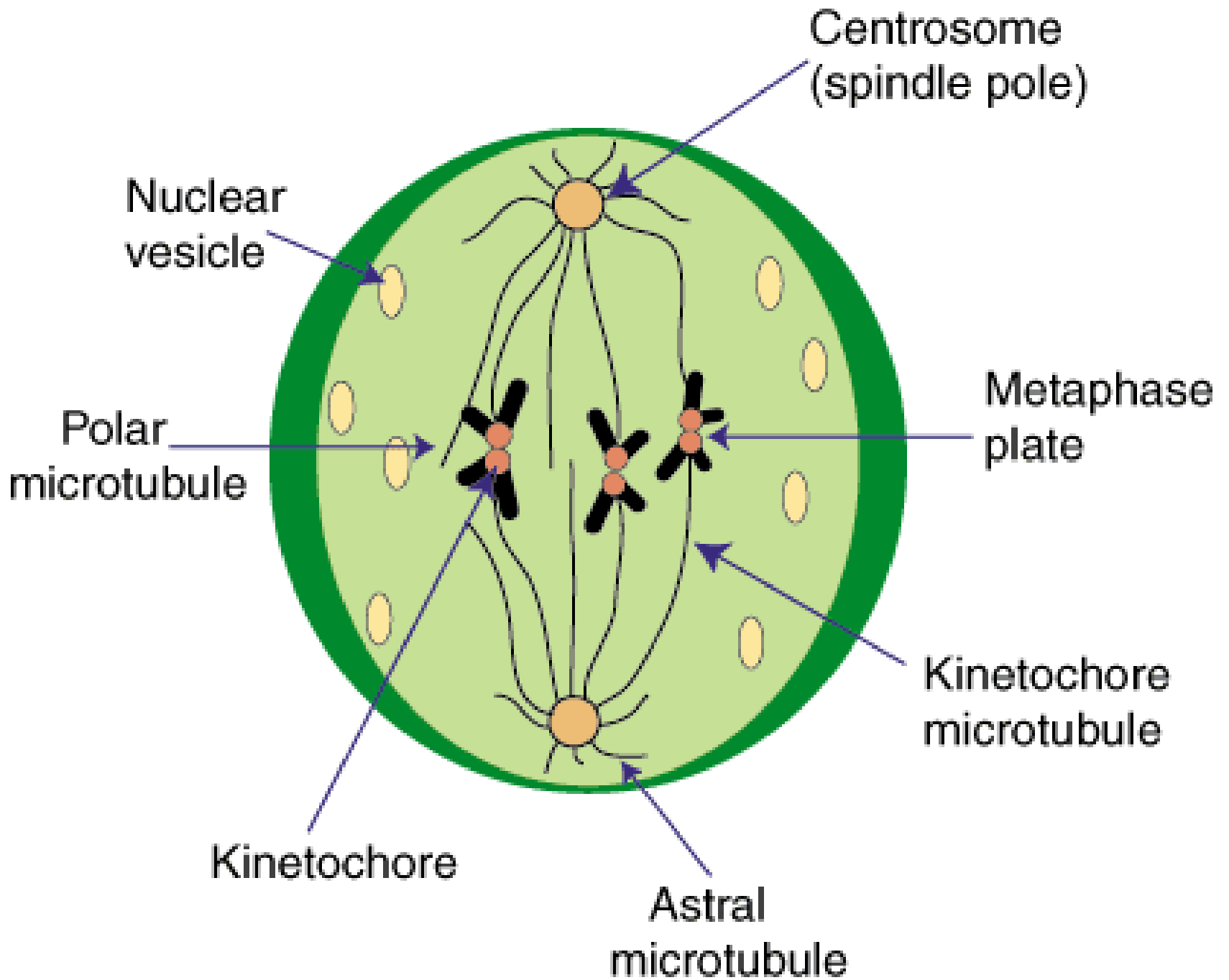
Mitotic spindle

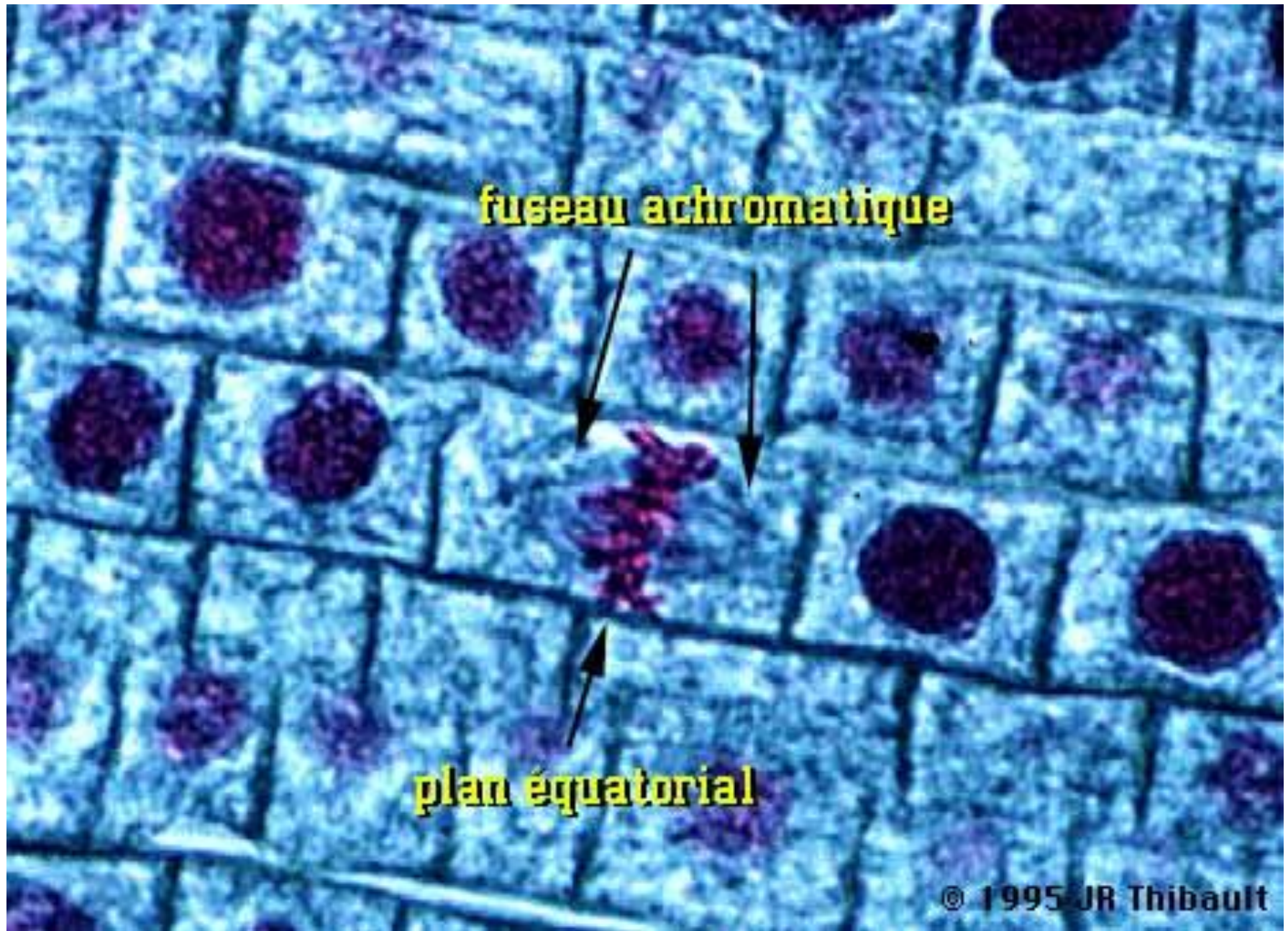
Centromere with attached kinetochore

Microtubules

Condensed chromosomes







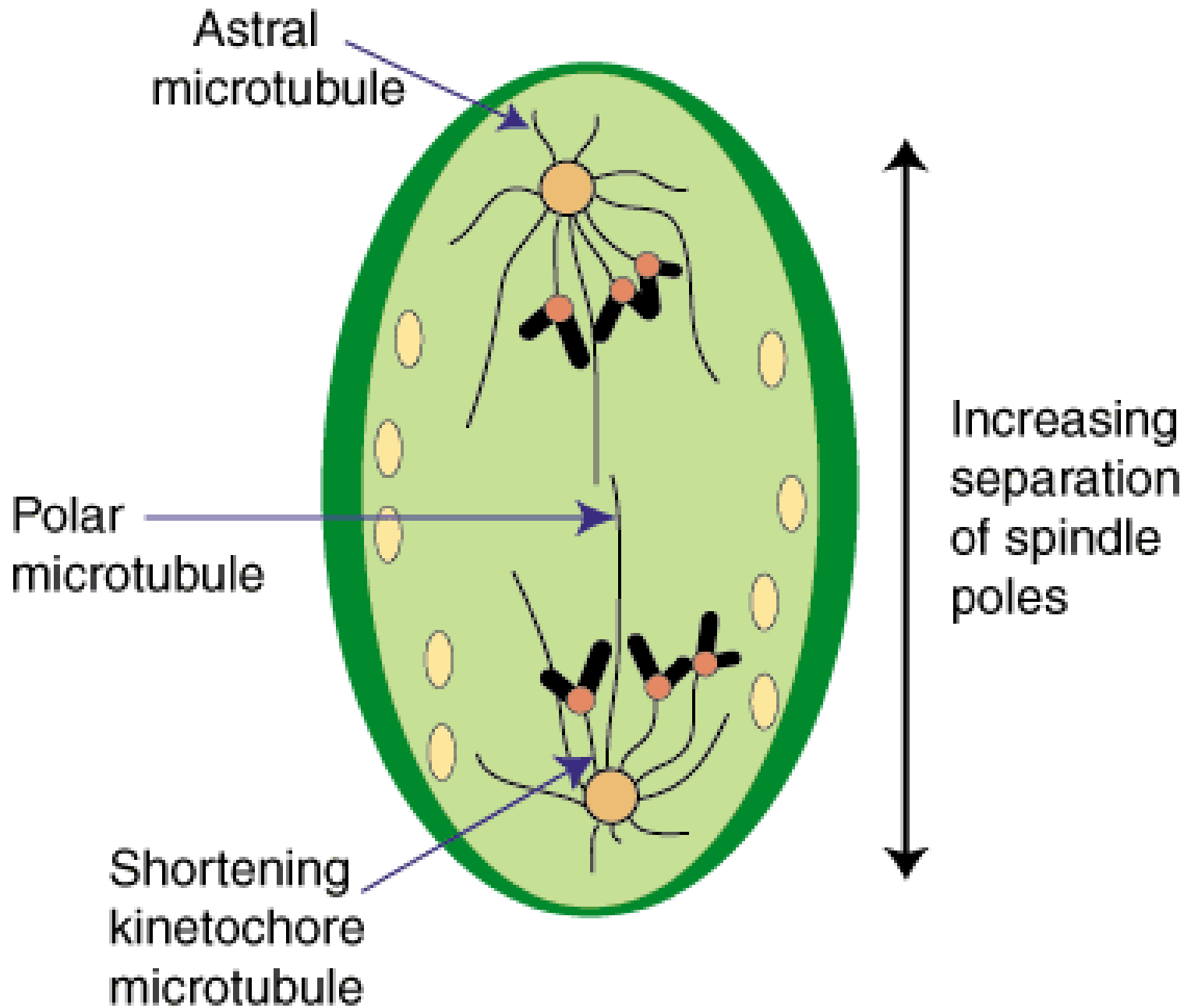
fuseau achromatique

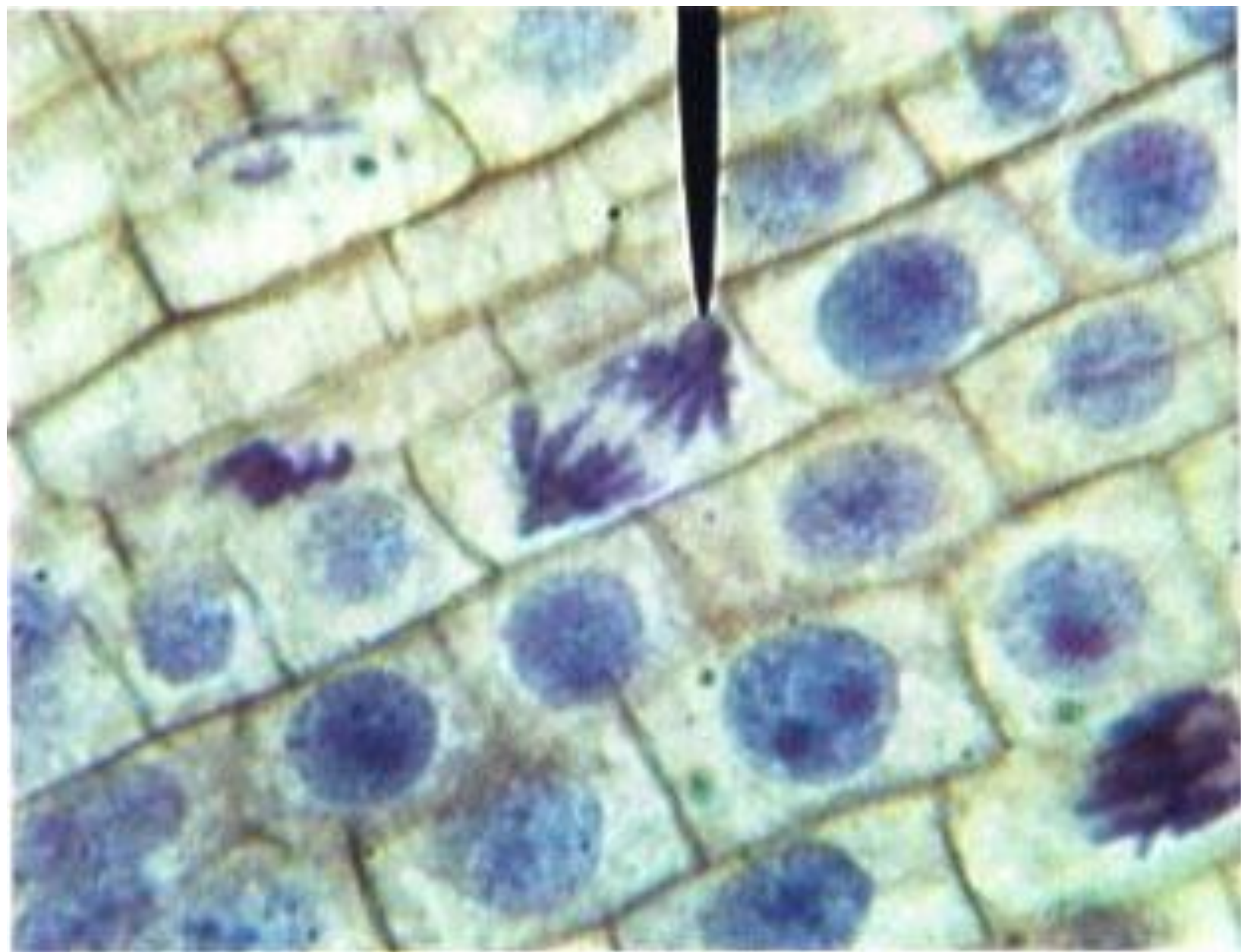
plan équatorial

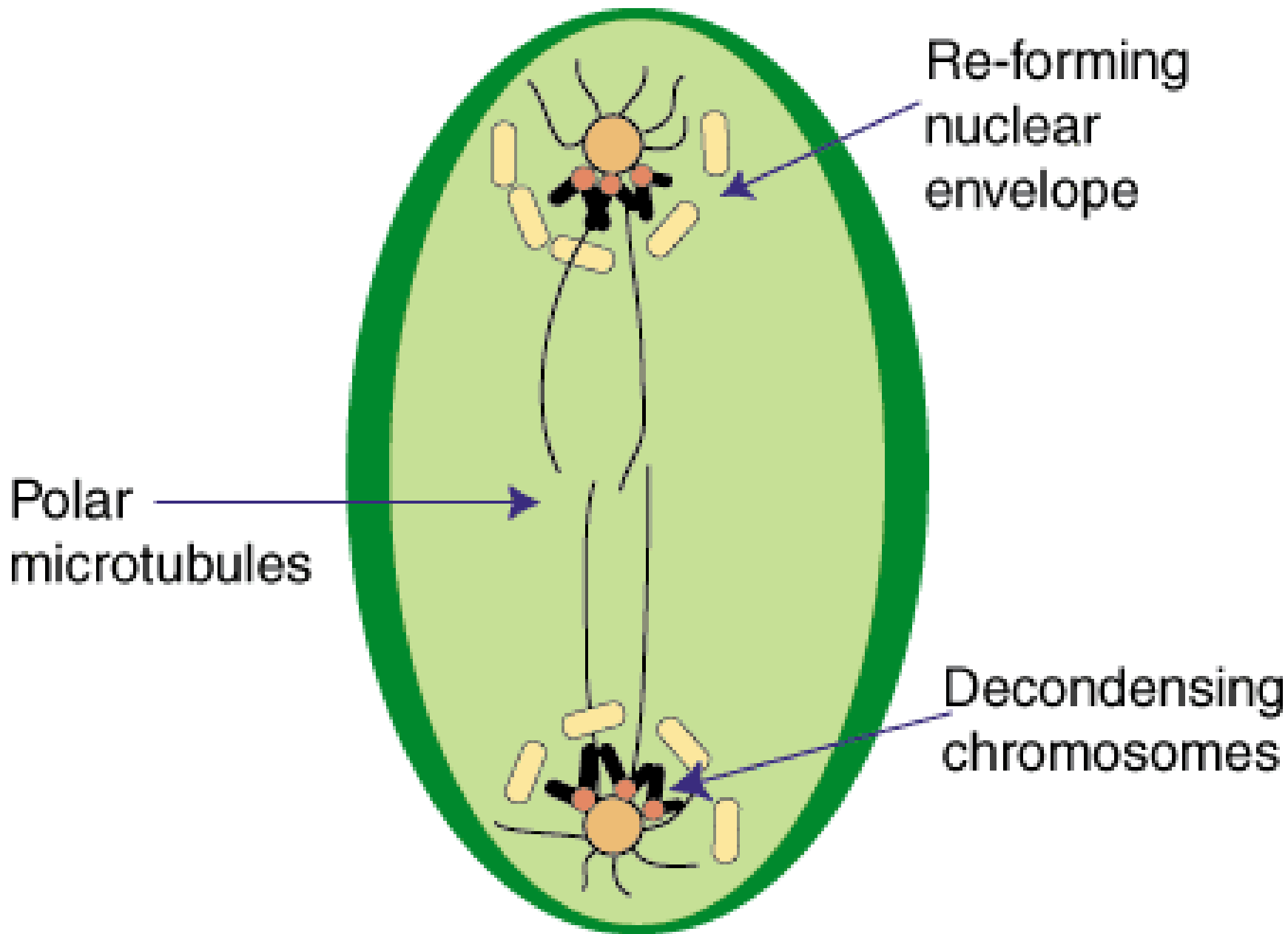
c. anaphase

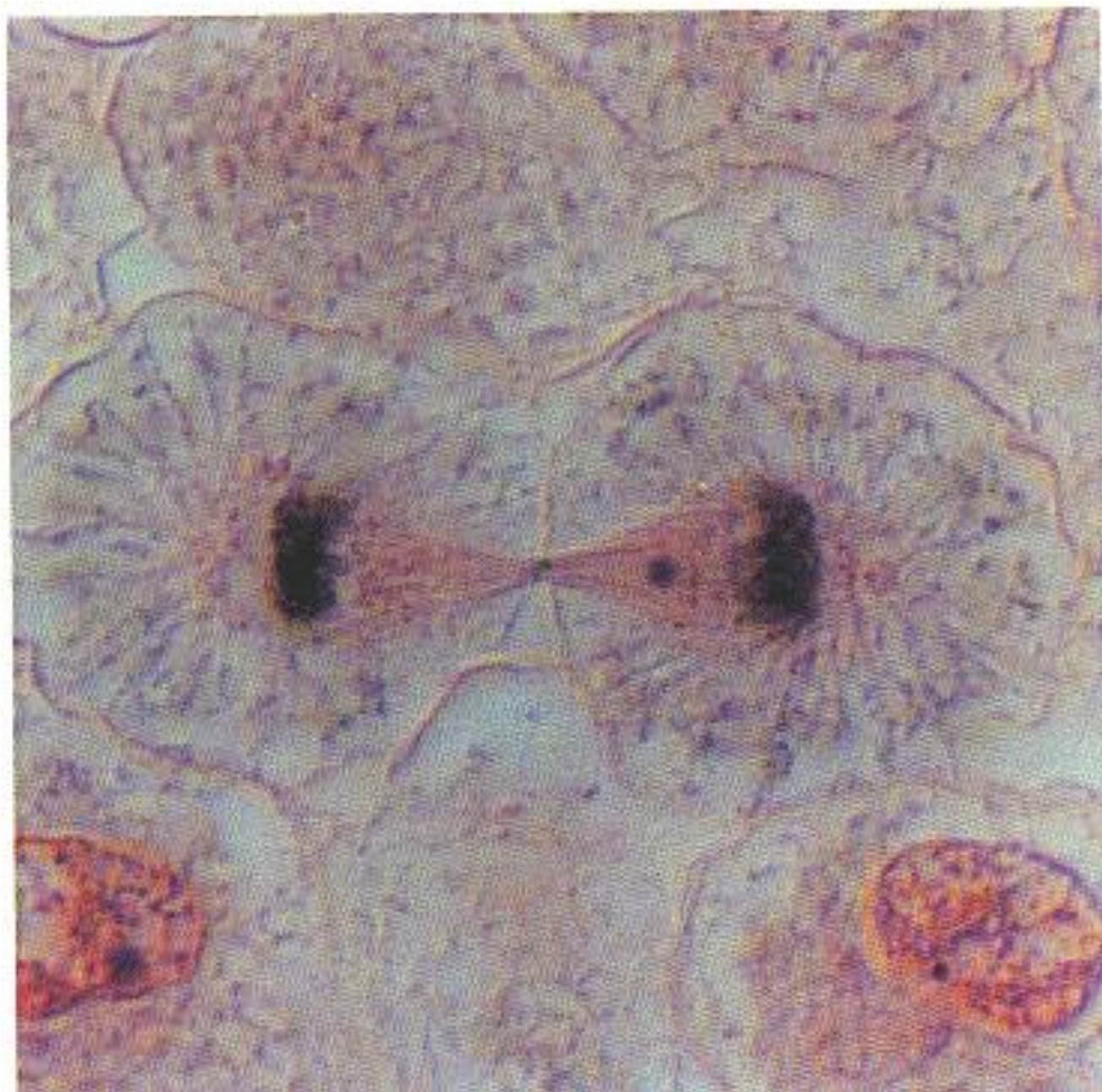
d. telophase

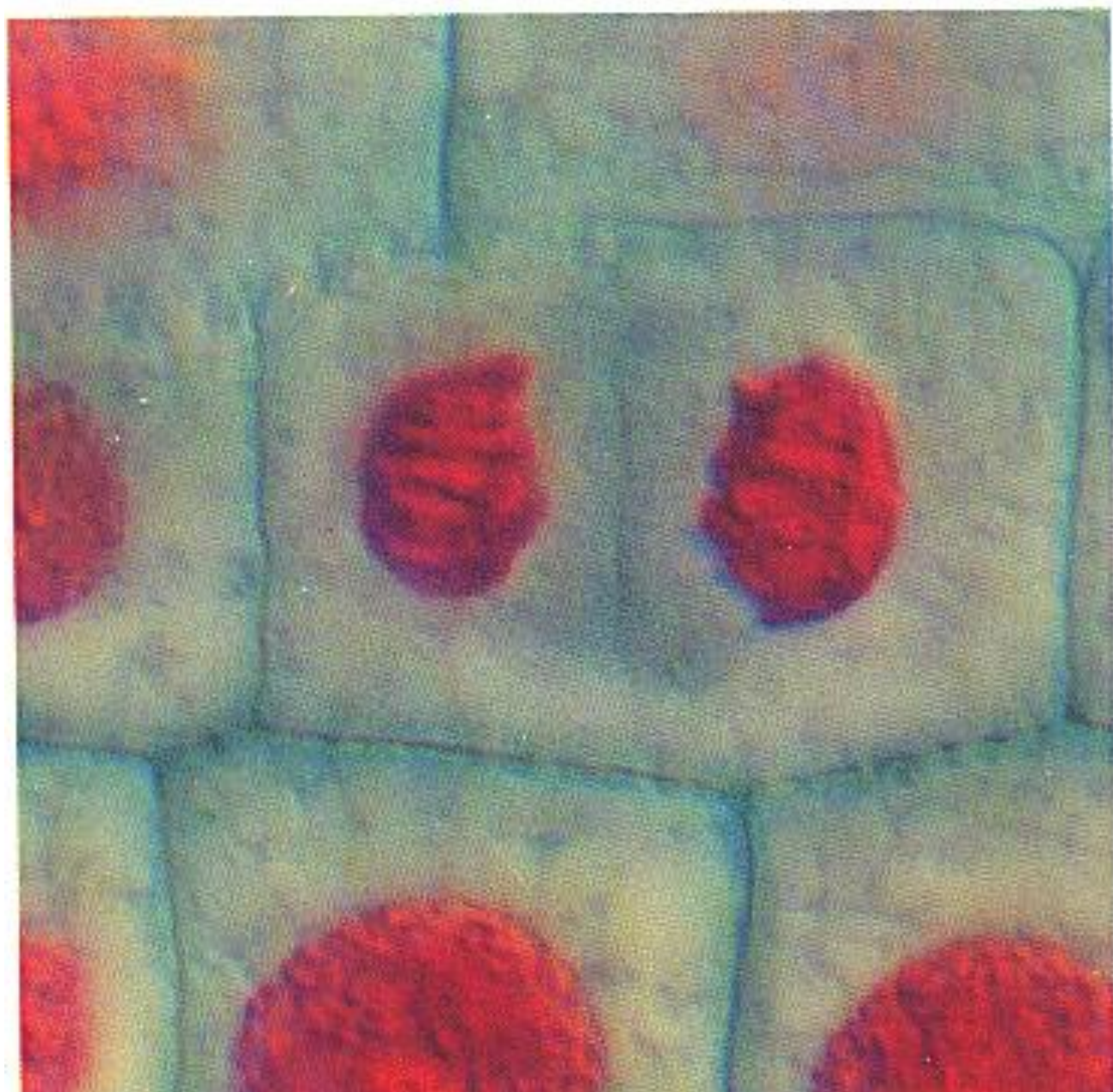
3. Cytokinesis

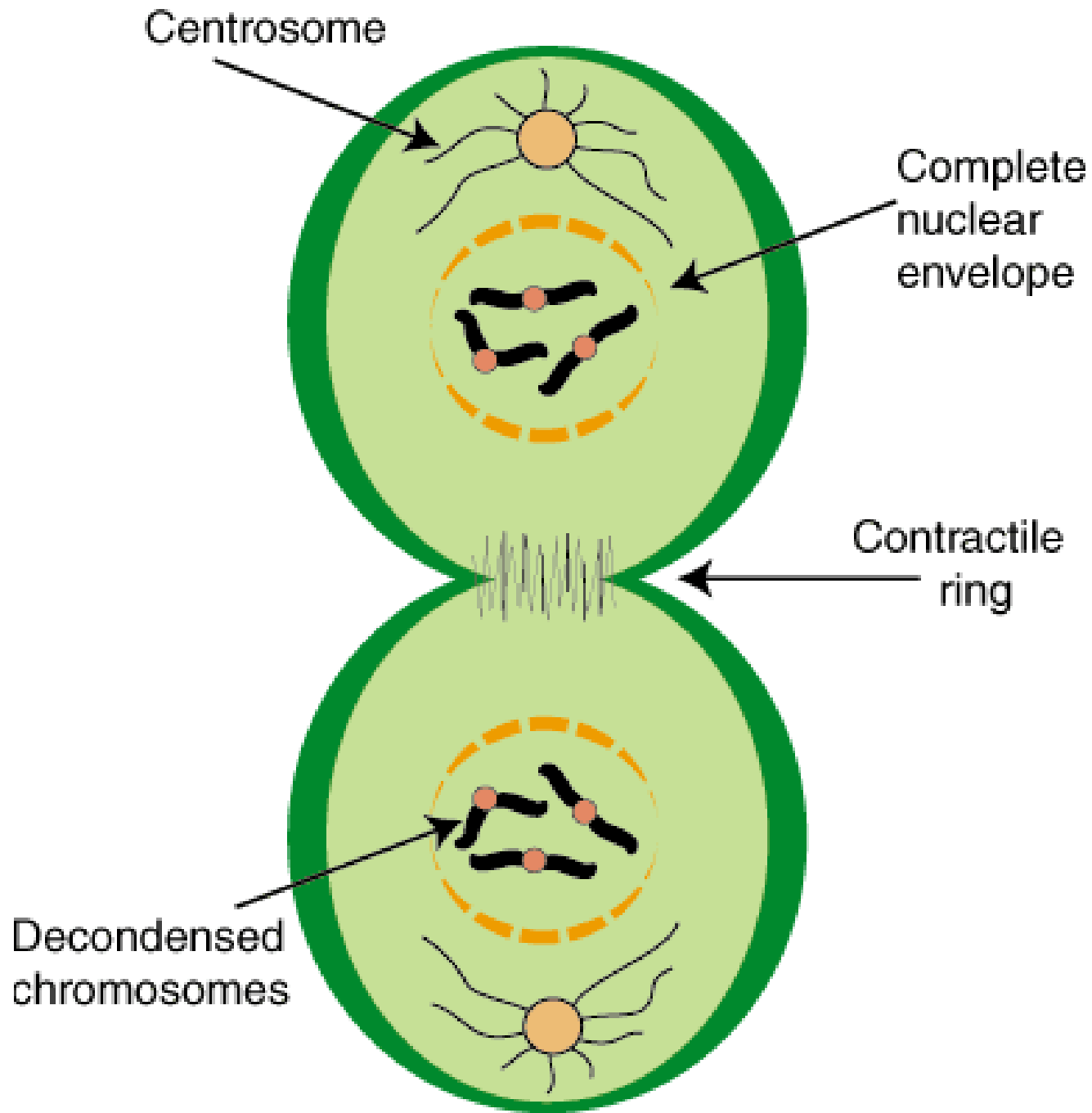




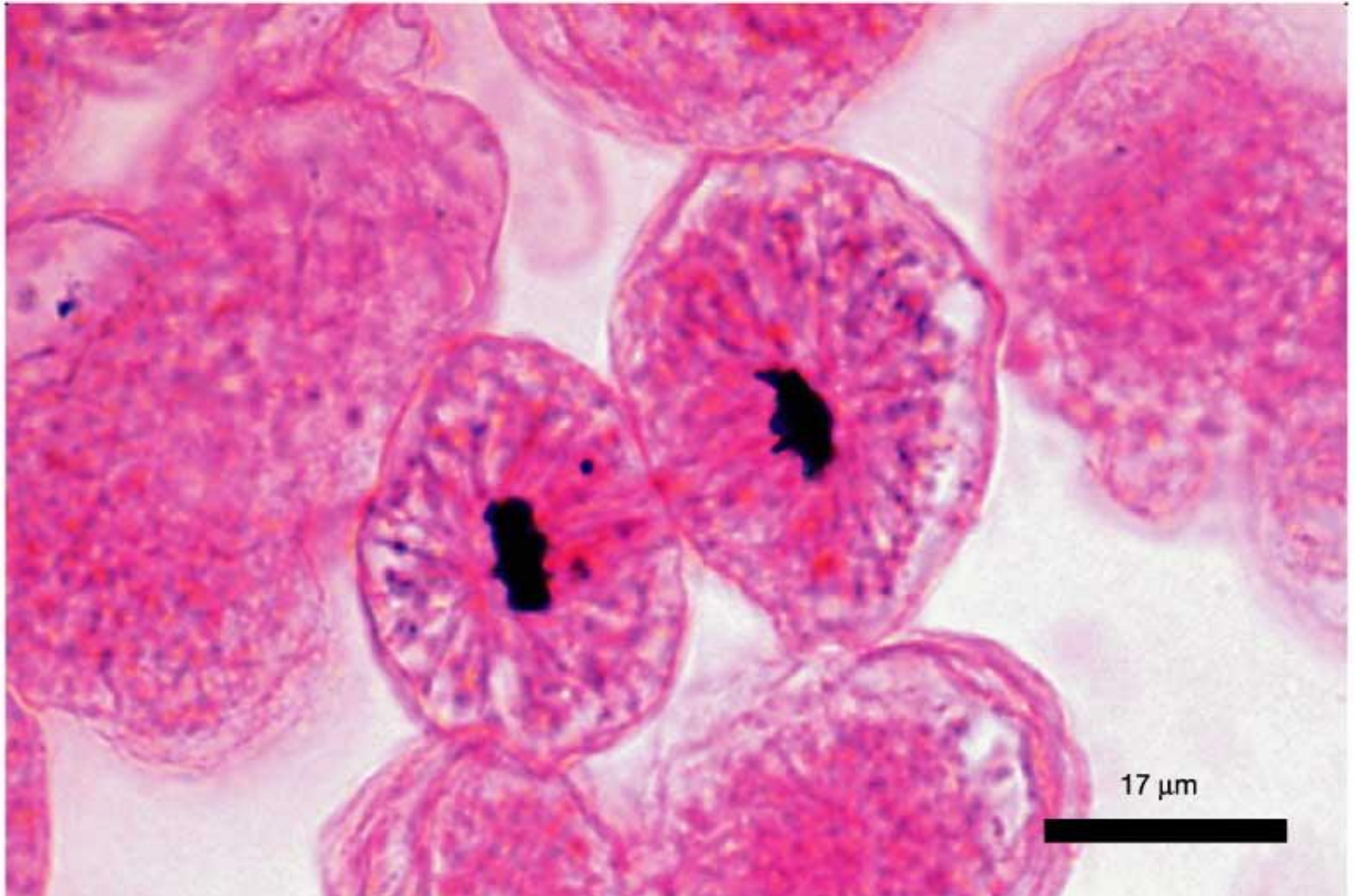








Cytokinesis



4. Daughter cells

a. 2 identical

b. Genetic continuity

5. Divisions

a. *Varies*

b. *Finite*

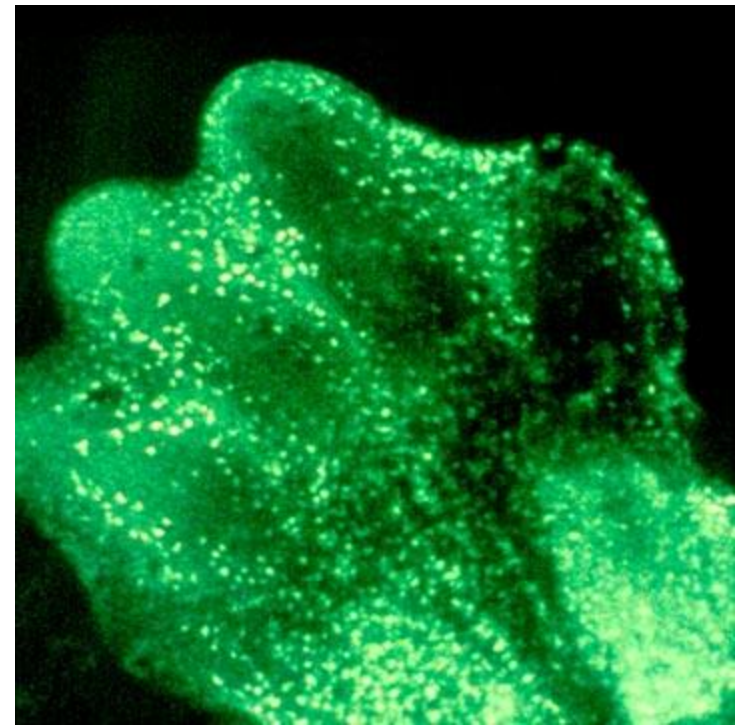
c. *Apoptosis*

Apoptosis

a. Normal in cells

b. Human 'webbing'

c. Damaged cells



C. Controlling the cycle

1. Cyclins (CDK' s)

2. Growth factors

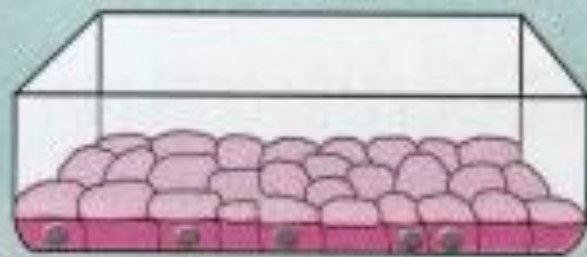
6. Cancer

a. Tumor

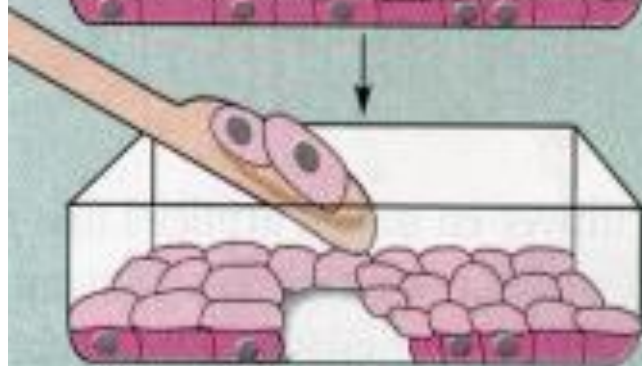
-benign

-malignant

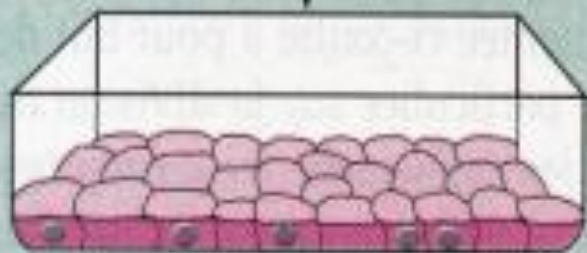
b. Contact inhibition



Les cellules normales forment une couche puis cessent de se diviser



On retire quelques cellules de la culture



Les cellules adjacentes à la zone de prélèvement recommencent à se diviser et reconstituent la couche

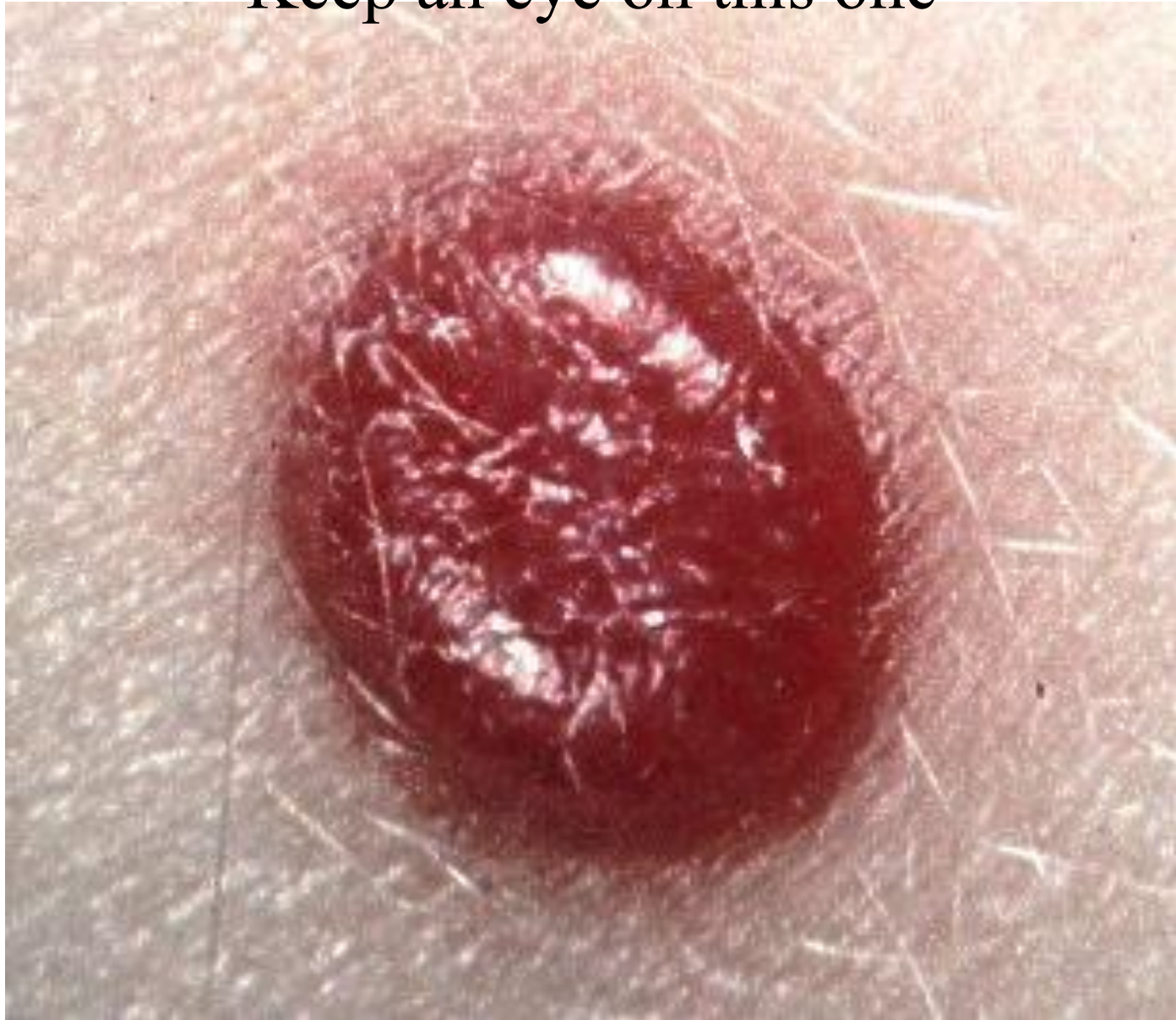
(a)



Les cellules cancéreuses échappent à l'inhibition de contact

(b)

Keep an eye on this one



Get to a doctor!!!



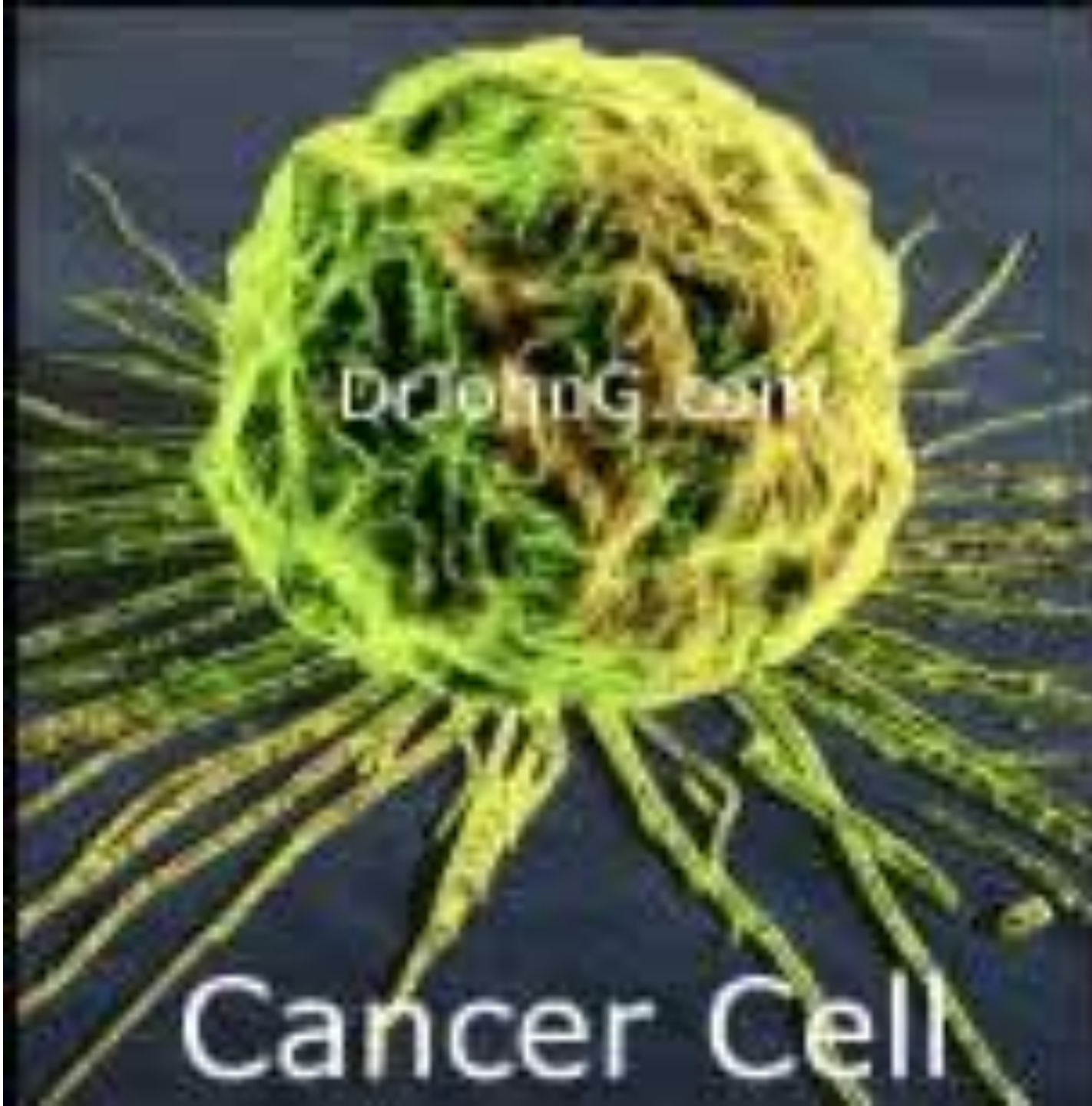
c. Characteristics

-spherical, mobile

-solid or liquid

-abnormal proteins

(CD-47 prevents mac-attack)



Dr. J. G. Smith

Cancer Cell

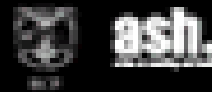
-mutations

-viruses

-other factors
(carcinogens)



FORTY
FATAL YEARS



A review of the 40 years since the publication of the 1962 Report of the Royal College of Physicians on Smoking and Health

CAUTION



**RADIATION
AREA**

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7. Stem Cells

a. Adult, induced,
and embryonic

b. Potency

c. Ethics