Introduction to Botany. Lecture 37

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Outline

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Previous final question: the answer

How to optimize the life cycle of seed plants?

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How to optimize the life cycle of seed plants?

- Reduce size
- Reduce unnecessary organs like archegonium
- Make endosperm appear after fertilizarion
- Employ insects wherever possible

Seed plants

Flowering plants

Flowering plants are “Spermatophyta 2.0”

- Reduction of gametophyte: 3-celled pollen and 7-celled embryo sac
- No archegonia and anteridia
- Spermatia, pollen tube
- Double fertilization
- New endosperm (second embryo)
- Cupule (pistil) and fruit
- In general, **angiosperms have accelerated life cycle** needed for fast-growing herbs

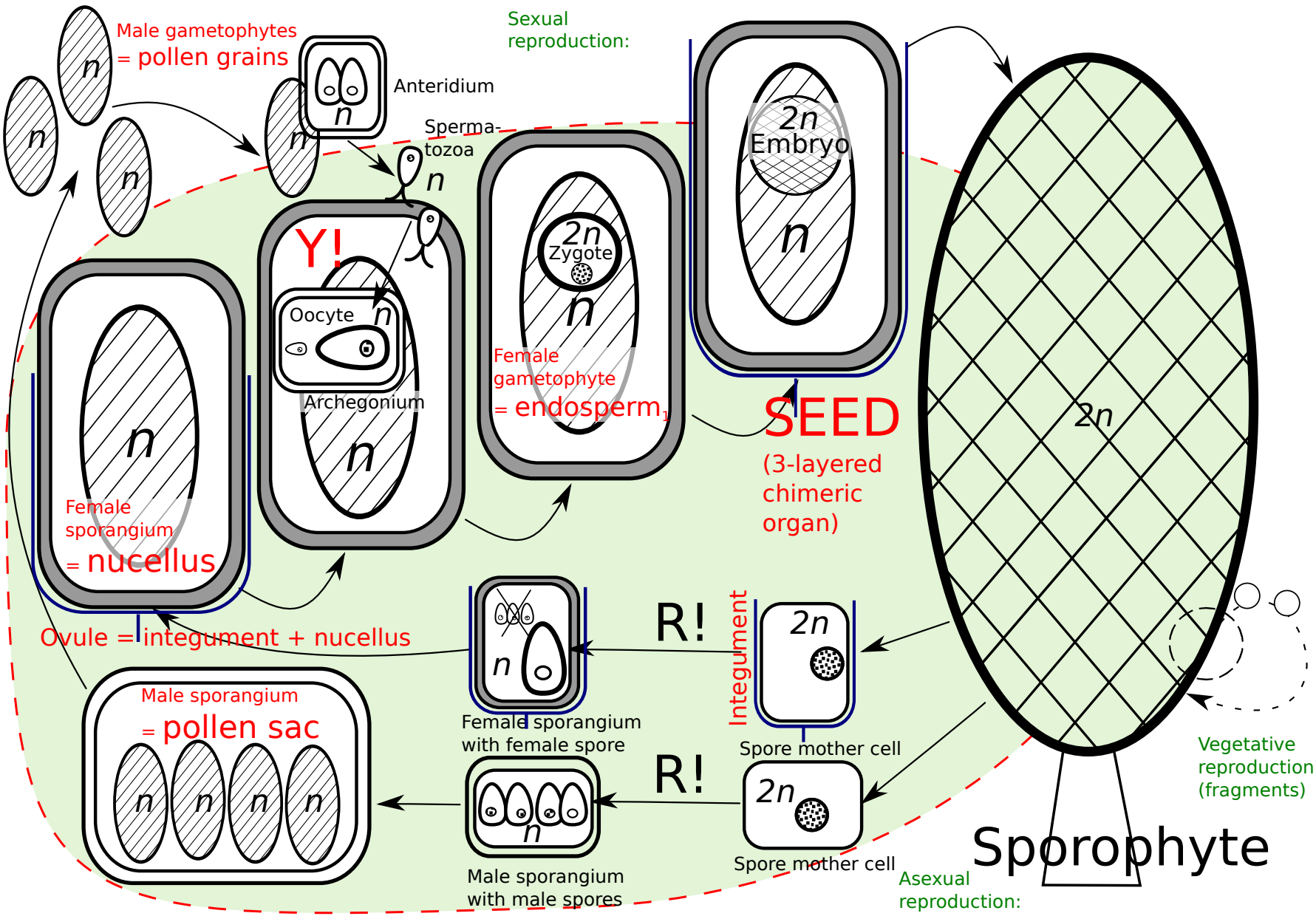
Note: angiosperms = flowering plants = class Magnoliopsida

Life cycle of angiosperms

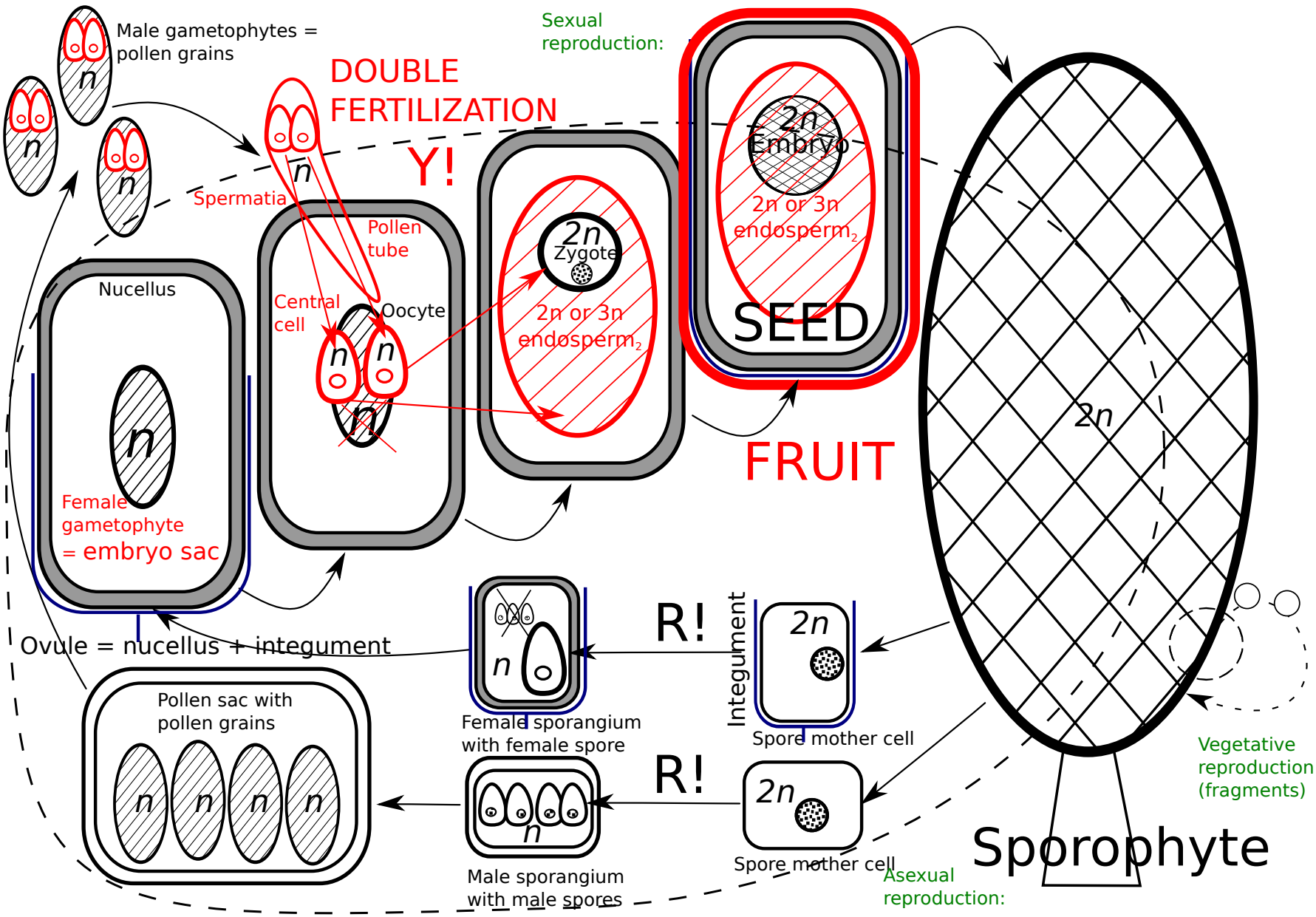
Terms covered:

- Embryo sac, central cell
- Spermatia (sperms without flagella), pollen tube
- Double fertilization
- Pistil and ovule $\rightarrow$ fruit and seed

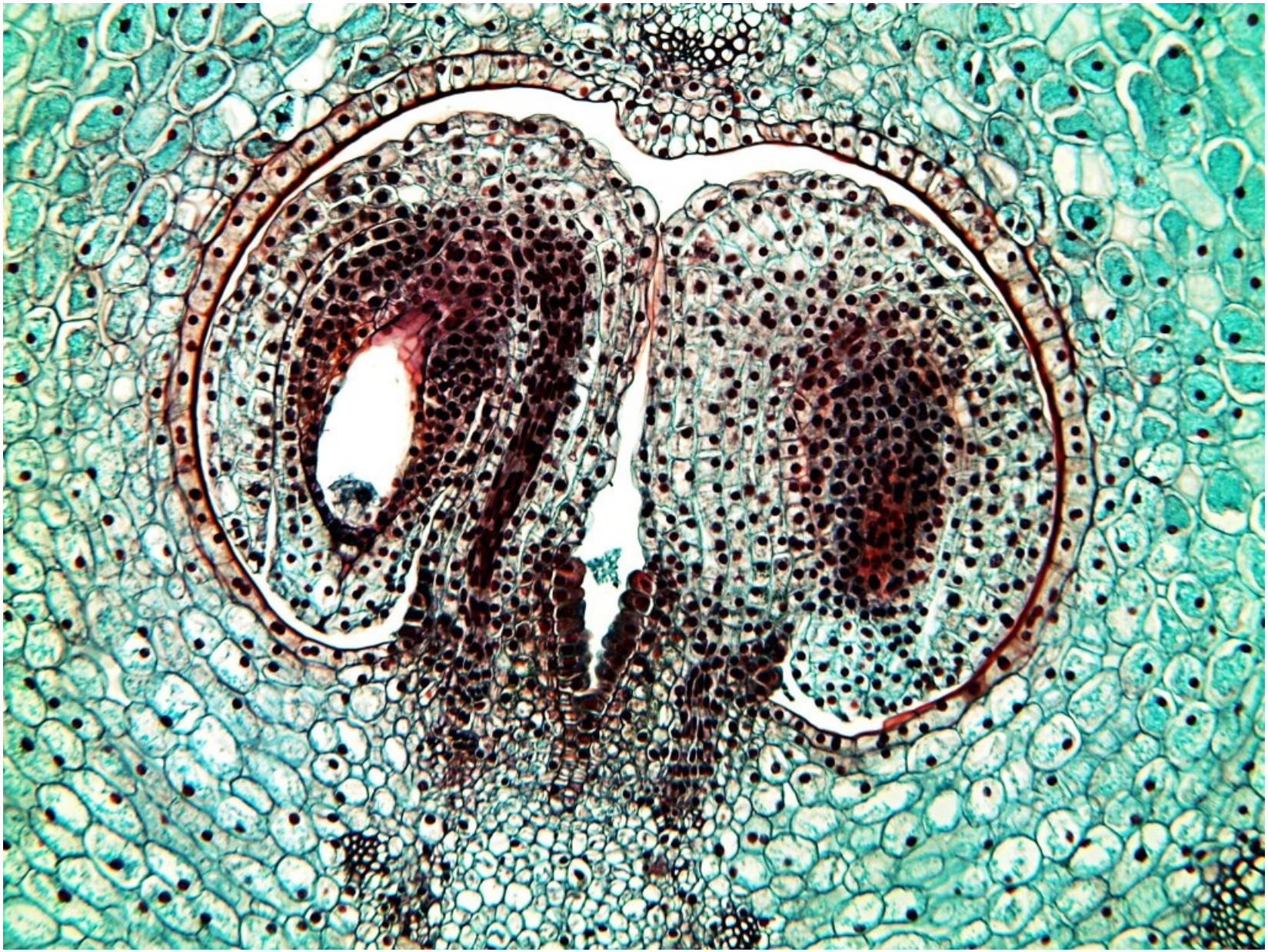
Life cycle of “gymnosperms”



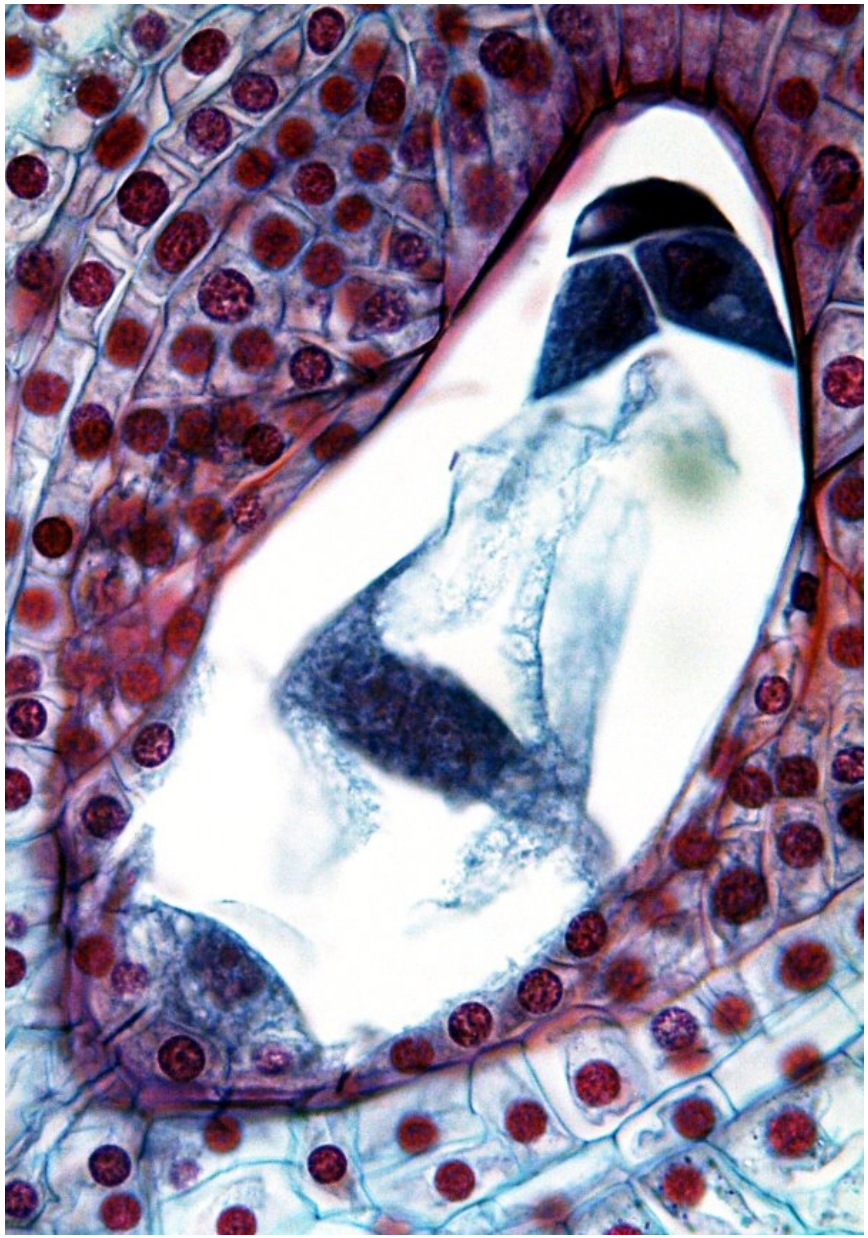
Life cycle of angiosperms: differences



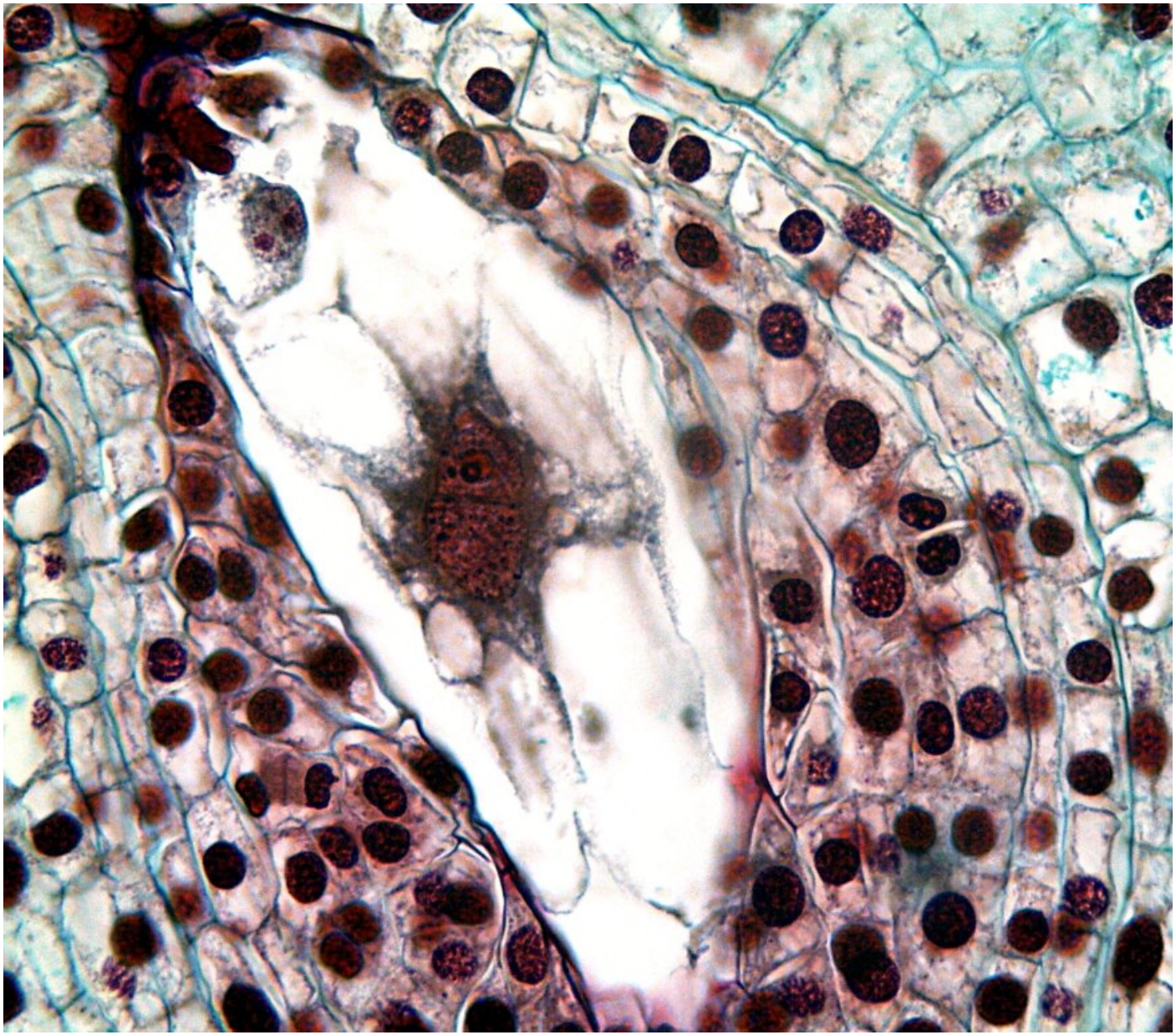
Ovules (*Lilium* sp., lily)



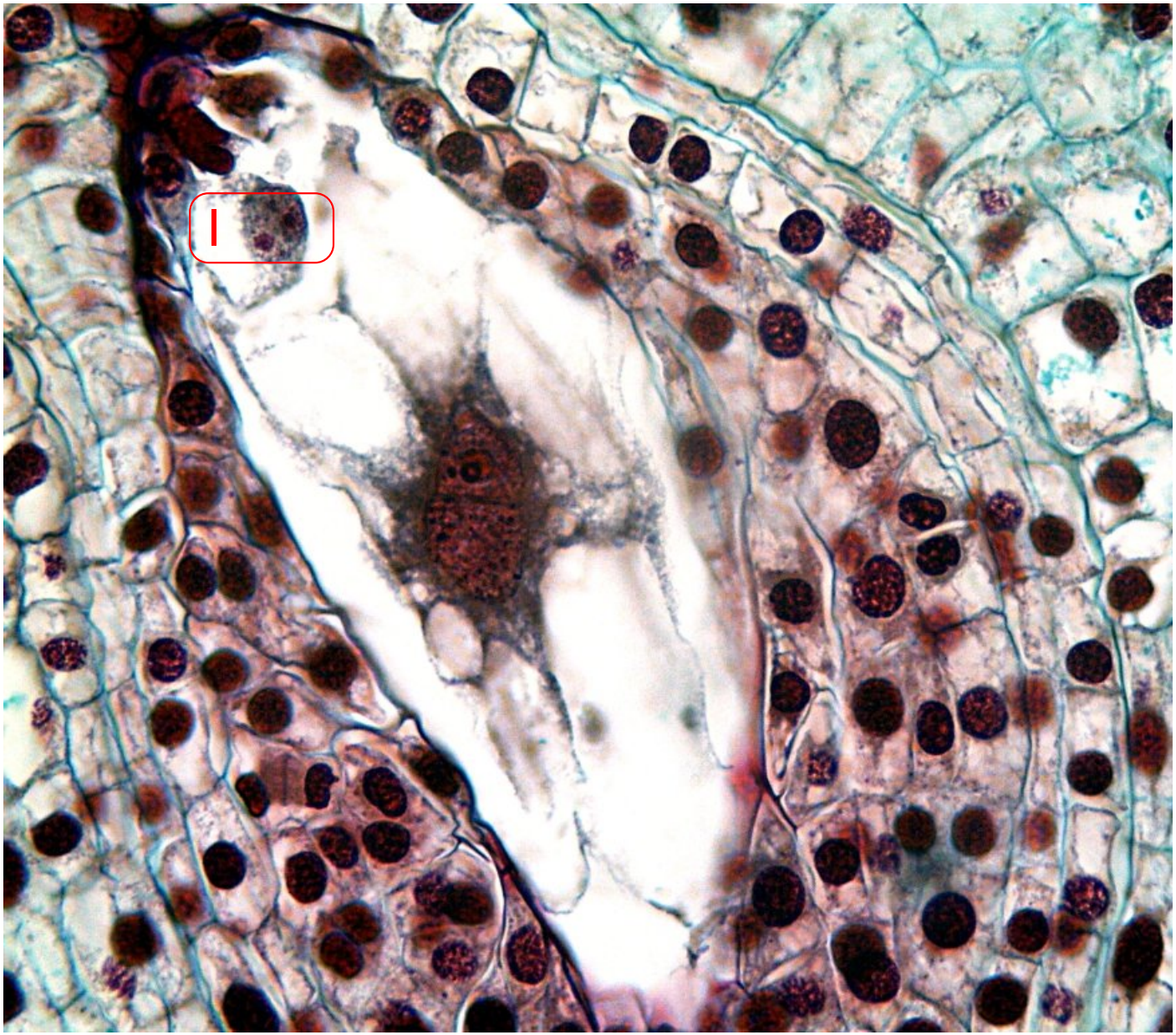
Embryo sac (*Lilium* sp., lily)



Double fertilization (*Lilium* sp., lily)



Double fertilization (*Lilium* sp., lily)



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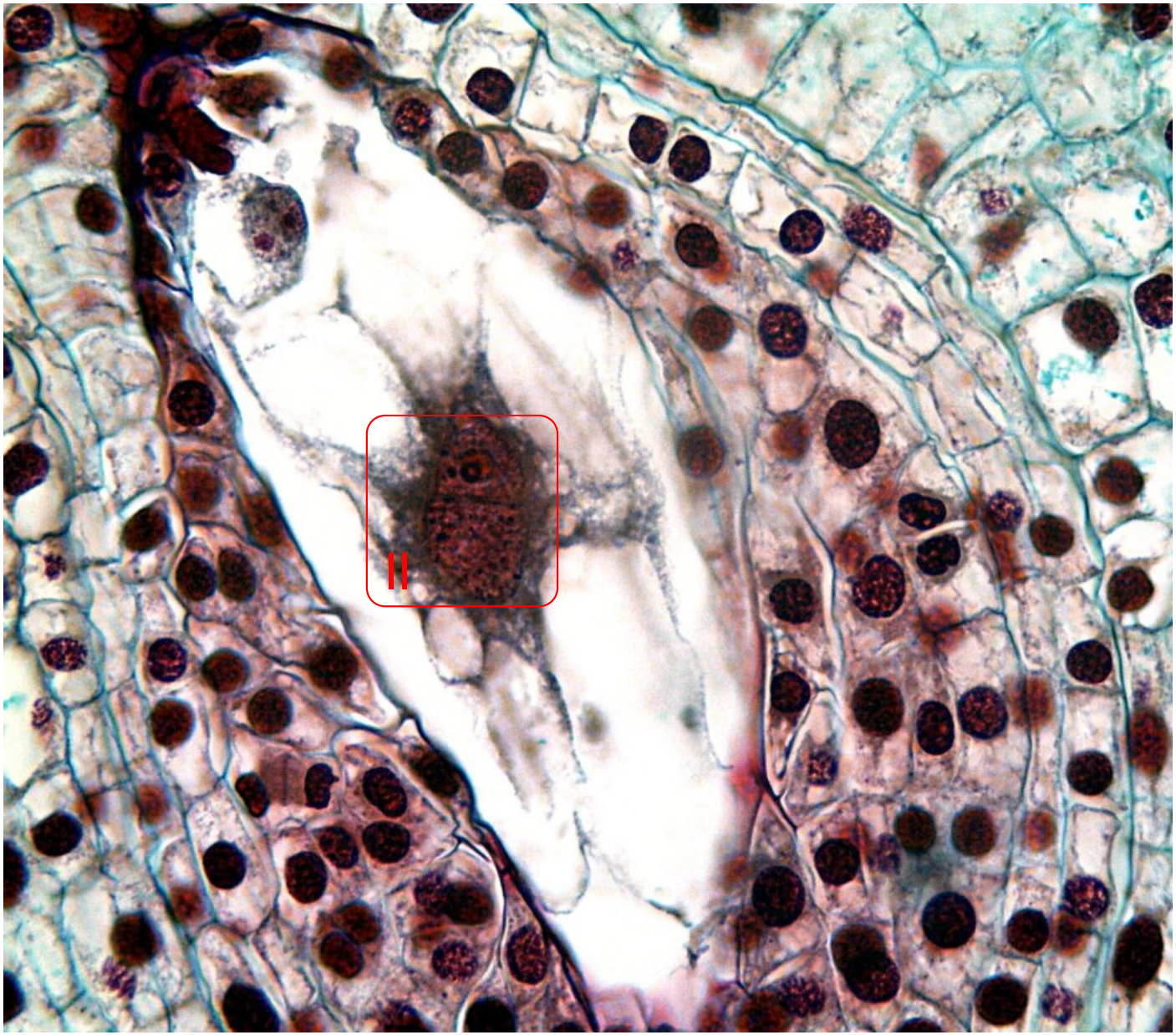
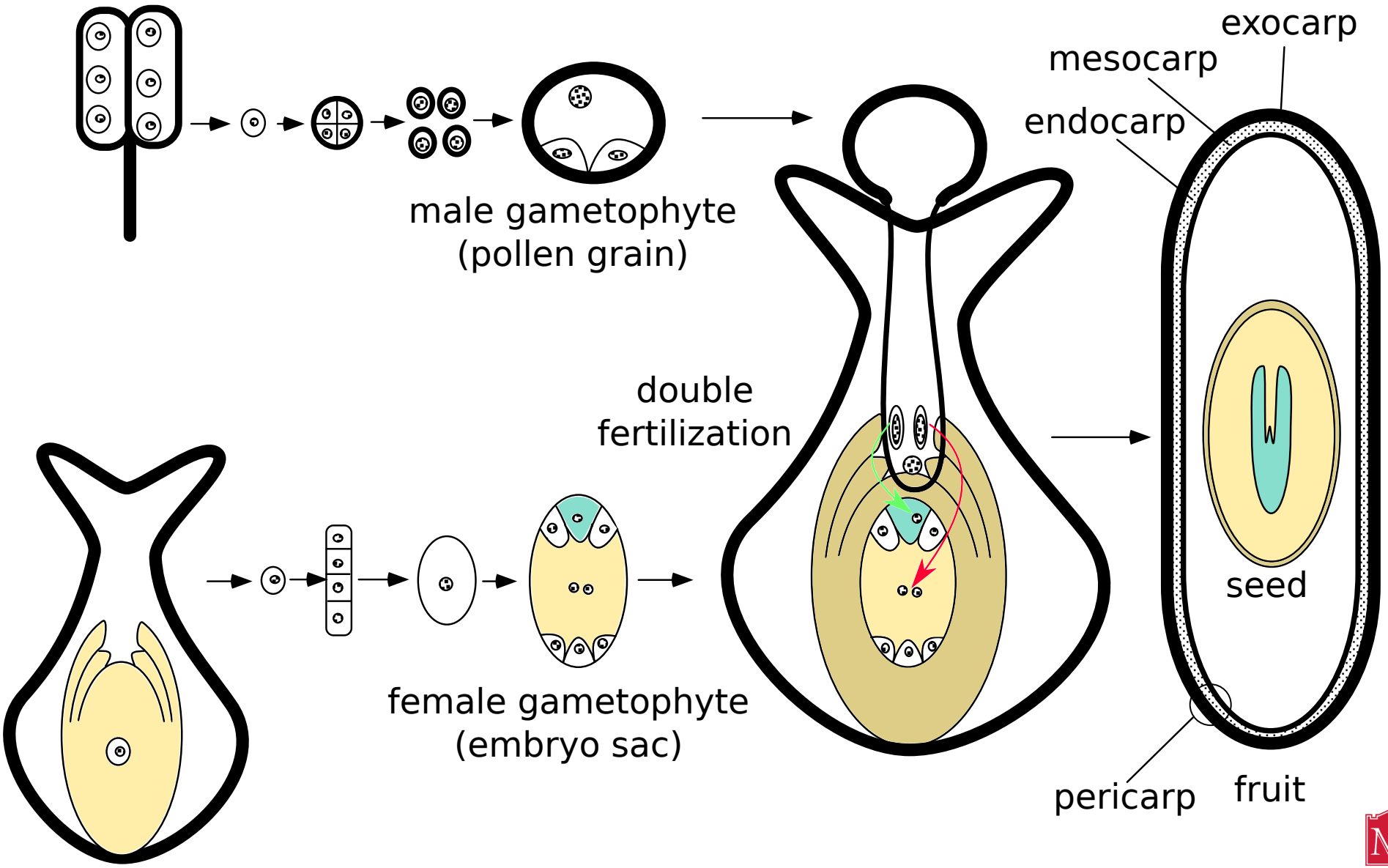
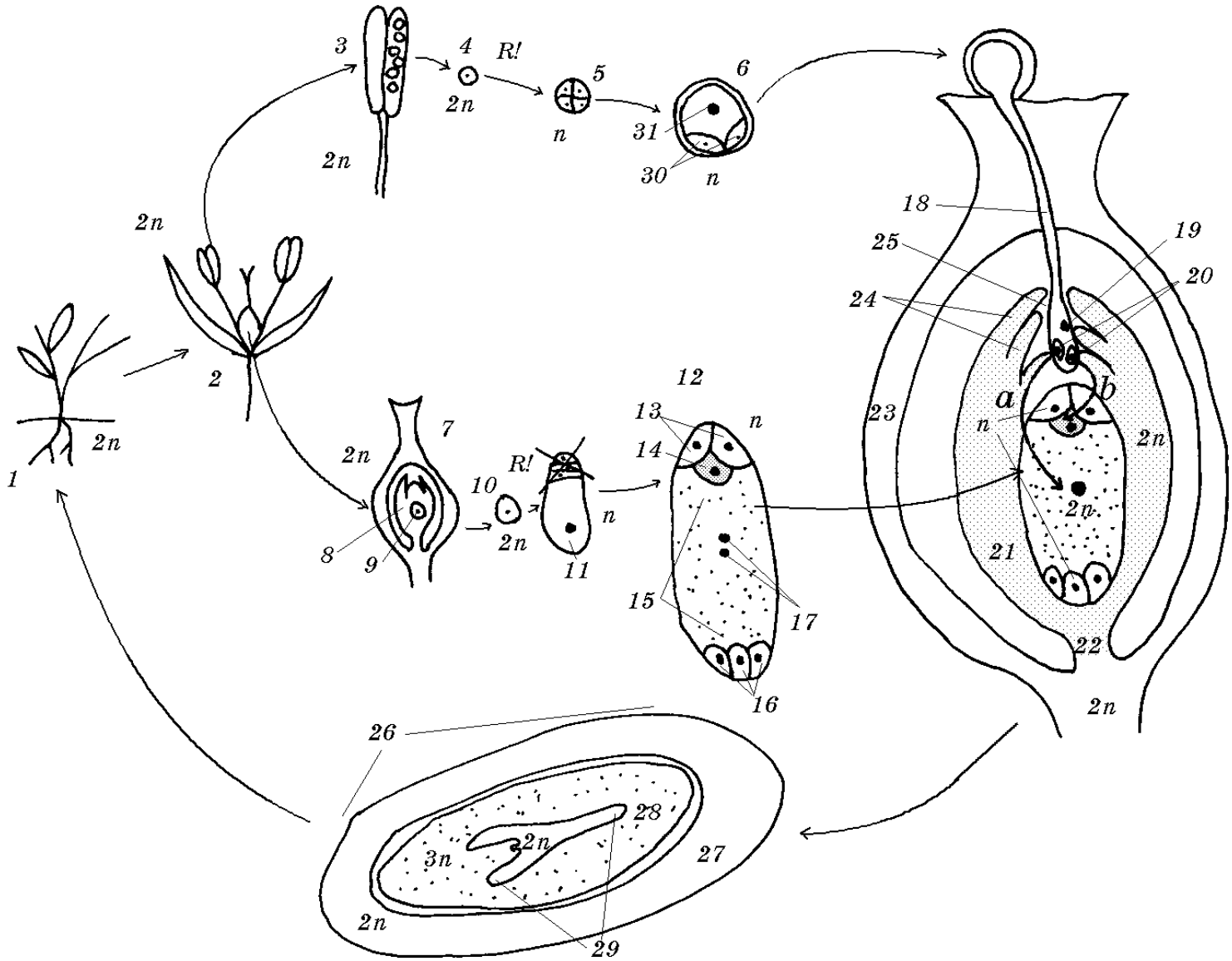


Angiosperms: relations between structures



Life cycle of angiosperms: another view



For Further Reading

A. Shipunov.
Introduction to Botany [Electronic resource].
2015.
Mode of access:
http://ashipunov.info/shipunov/school/biol_154