Introduction to Botany. Lecture 14

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October 3, 2014

Outline

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Previous final question: the answer

What is the difference between anaphase I of meiosis and anaphase of mitosis?

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What is the difference between anaphase I of meiosis and anaphase of mitosis?

- Meiosis: homologous chromosomes will go *independently* to different poles
- Mitosis: halves of *every* chromosome go to different poles

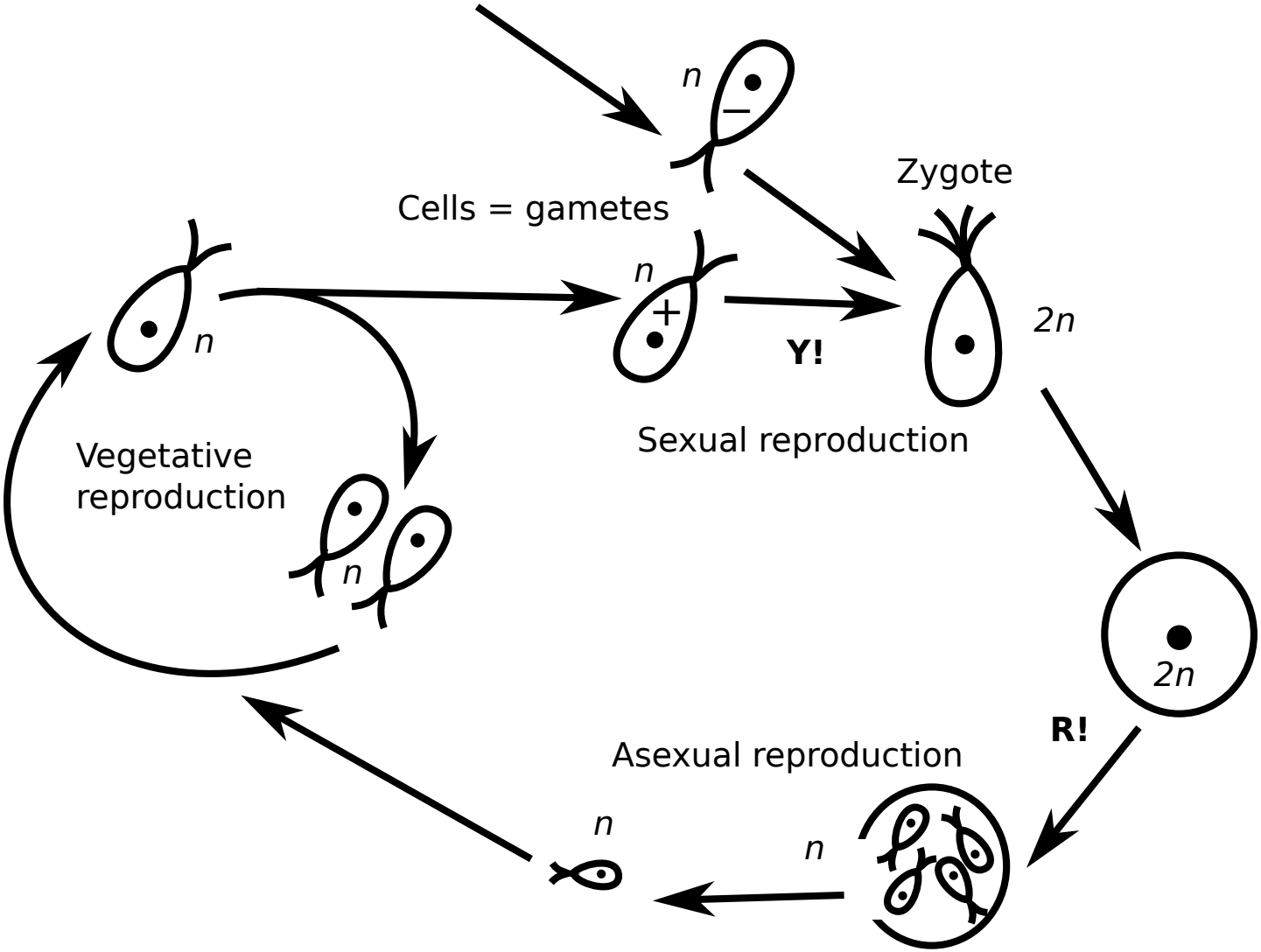
Life cycle

Basics

Simple life cycle: unicellular organism

Associated terms: mitosis, meiosis (R!), syngamy (Y!), reproduction, sexual reproduction, asexual reproduction, vegetative reproduction, isogamy, heterogamy, oogamy, zygote, gamete, male, female, spermatozoon, oocyte

Simple life cycle: unicellular organism



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Multicellularity, or Origin of Death

- Sometimes, cells do not part after mitosis. These simple cell aggregates may benefit from their size (e.g., harder to swallow) and putative division of labor (e.g., capture light from different sides and share products of photosynthesis)
- Next step is to separate *germ cells* and *somatic cells*. Somatic cells with eventually die whereas germ cells may give an offspring.
- This is the beginning of **multicellularity**.
- Life cycles of multicellular organisms are based on interleaving **gaplont** and **diplont**, the second is making **spores**

General life cycle: multicellular organism

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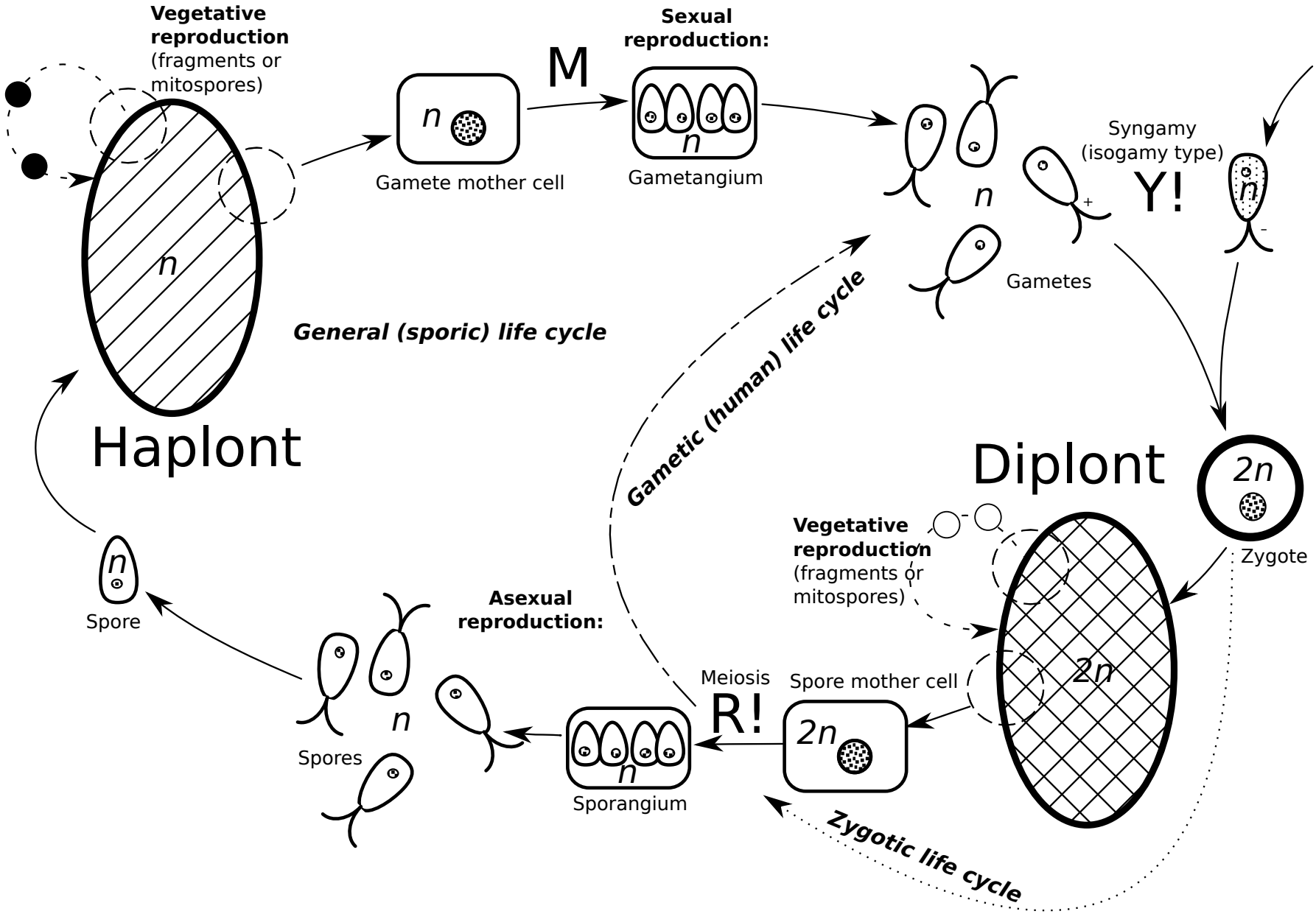

Final question (2 points)

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In most organisms, cells participating in syngamy are unequal (male and female).
Why?

Summary

- **Mitosis** is a process of cell multiplication, ploidy stays constant, genotype does not change. Chromosomes split.
- **Syngamy** is a sexual process of cell fusion, ploidy doubles, genotype changes. Chromosomes meet.
- **Meiosis** is a process of reduction of DNA amount, ploidy halves, genotype changes. Chromosomes separate, then split.

For Further Reading

A. Shipunov.
Introduction to Botany [Electronic resource].
2010—onwards.
Mode of access:
http://ashipunov.info/shipunov/school/biol_154

Th. L. Rost, M. G. Barbour, C. R. Stocking, T. M. Murphy.
Plant Biology. 2nd edition.
Thomson Brooks/Cole, 2006.
Chapter 12 (skip the angiosperm life cycle!.