

# SEXUAL REPRODUCTION IN FUNGI



Dr. Poonam Shakya


# Introduction

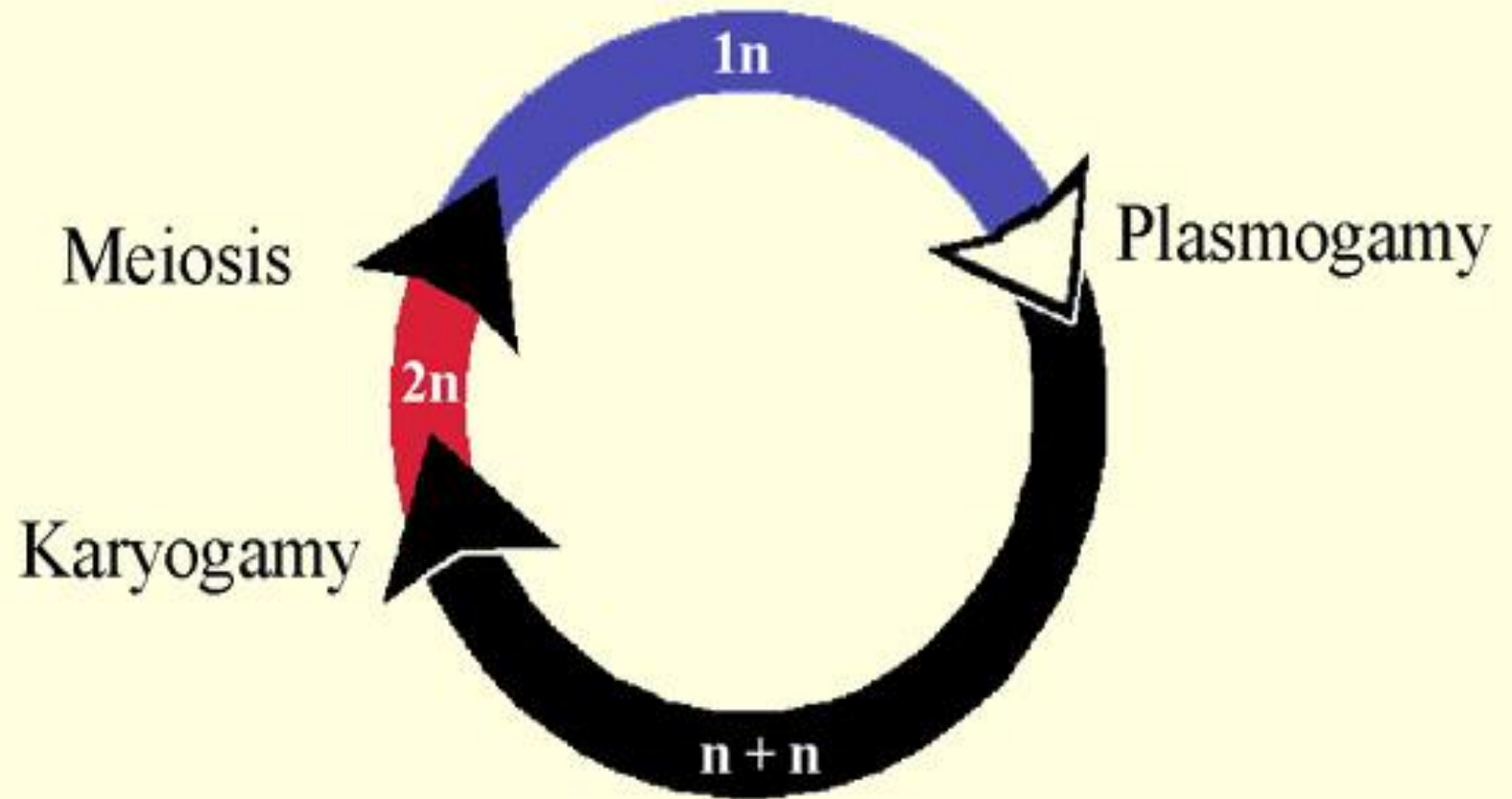
It is carried out by fusion of the compatible nuclei of 2 parent cells

The process begins with the joining of two cells and fusion of their protoplasts ( Plasmogamy)

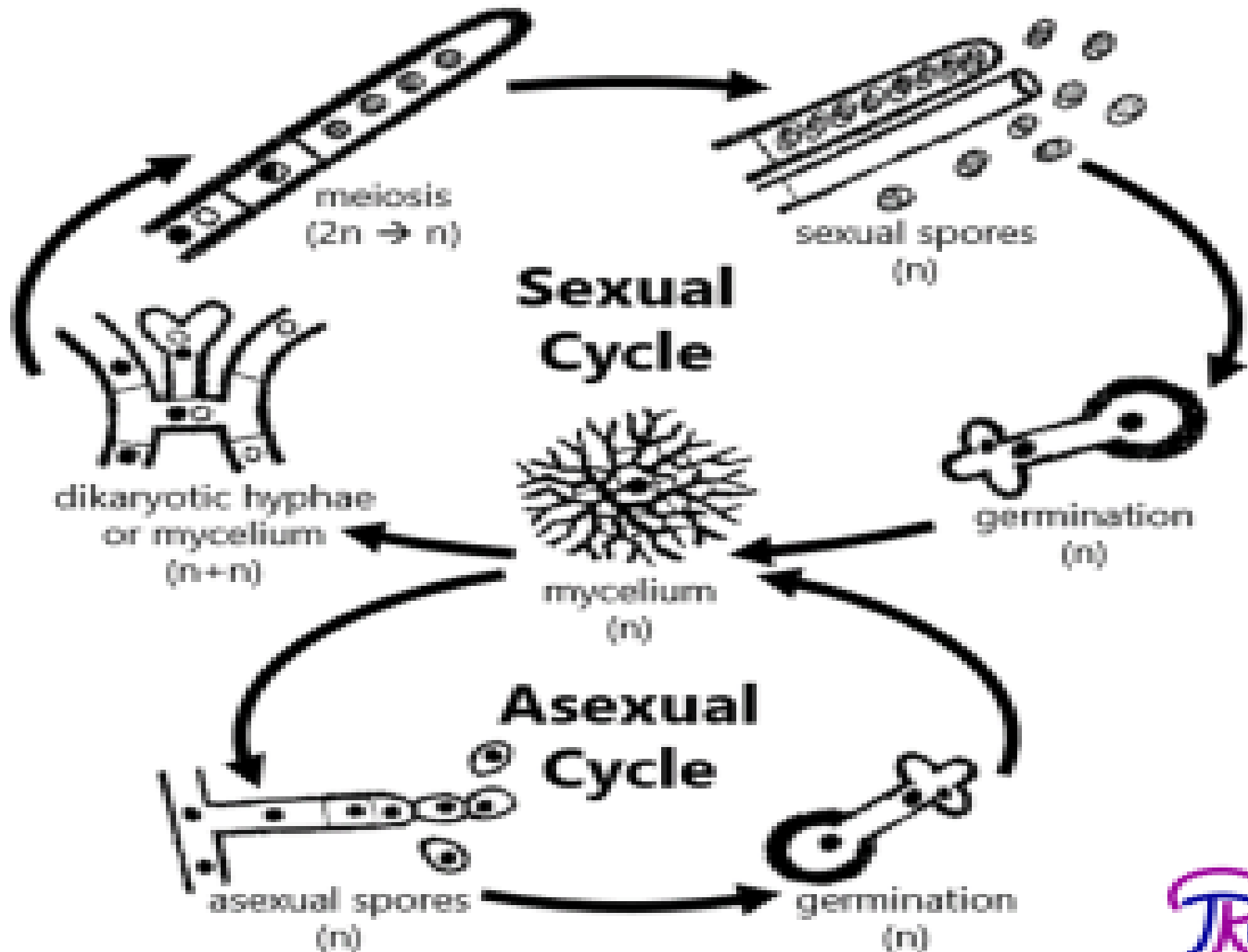
Thus enabling the two haploid nuclei of 2 mating types to fuse together (Karyogamy) to form a diploid nucleus

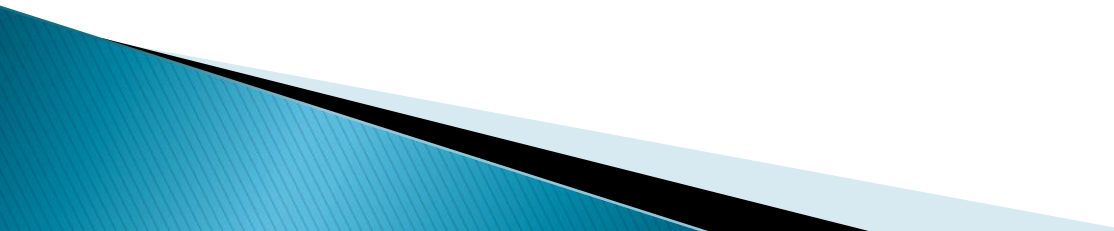
This is followed by meiosis, which again reduces the number of chromosomes to the haploid number.



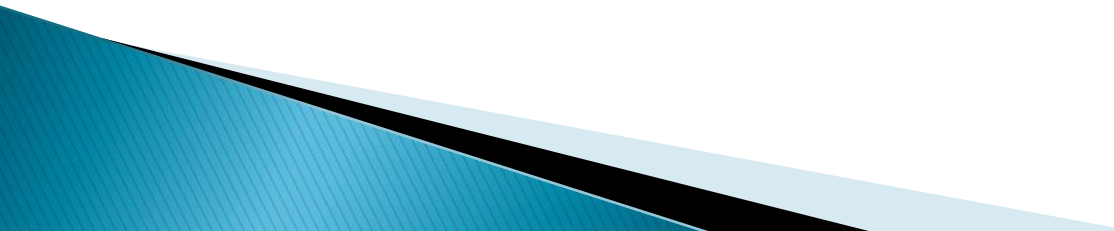


# Generalized Fungal Life Cycle



- ▶ The sex organelles of fungi, if they are present, are called Gametangia/gametangium.
  - ▶ They may form differentiated sex cells (gametes) or may contain instead one or more gamete nuclei.
  - ▶ If the male and female gametangia are morphologically different, the male gametangium is called the antheridium/antheridia and the female gametangium is called the oogonium/oogonia.
- 

# Methods

1. Gametic copulation
  2. Gamete-gametangial copulation
  3. Gametangial copulation
  4. Somatic copulation
  5. Spermatization
- 

# Gametic copulation

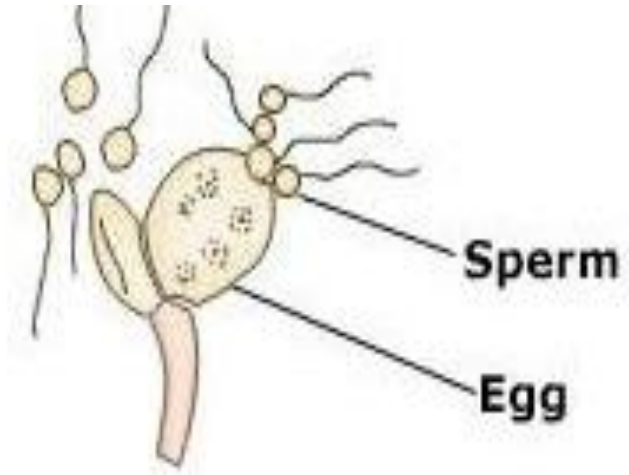
- ▶ Fusion of naked gametes
- ▶ One or both of which are motile



Isogamy



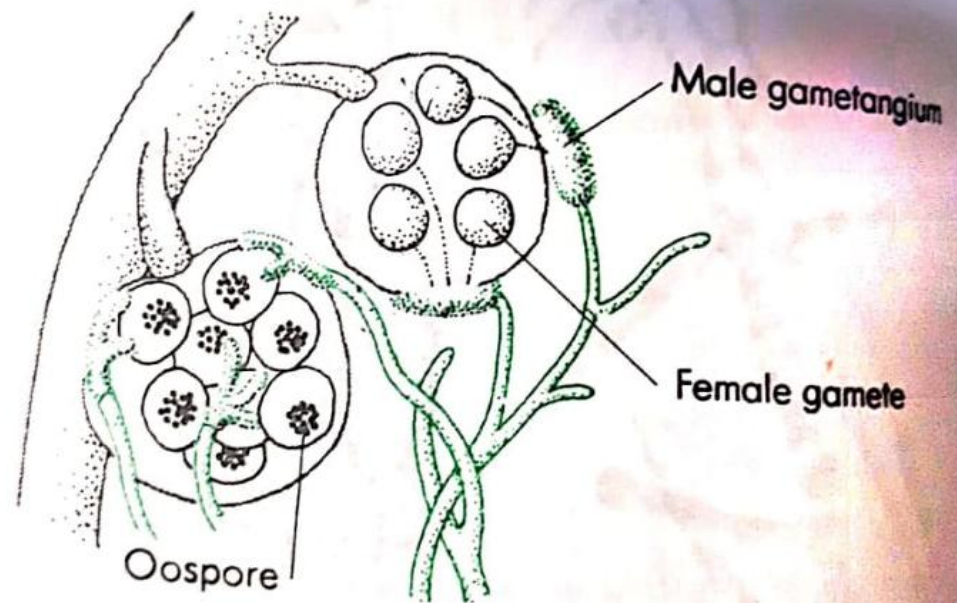
Anisogamy



# Gamete- gametangial copulation

- ▶ Two gametangia come into contact but do not fuse
- ▶ The male nucleus migrates through a pore or fertilization tube into the female gametangium

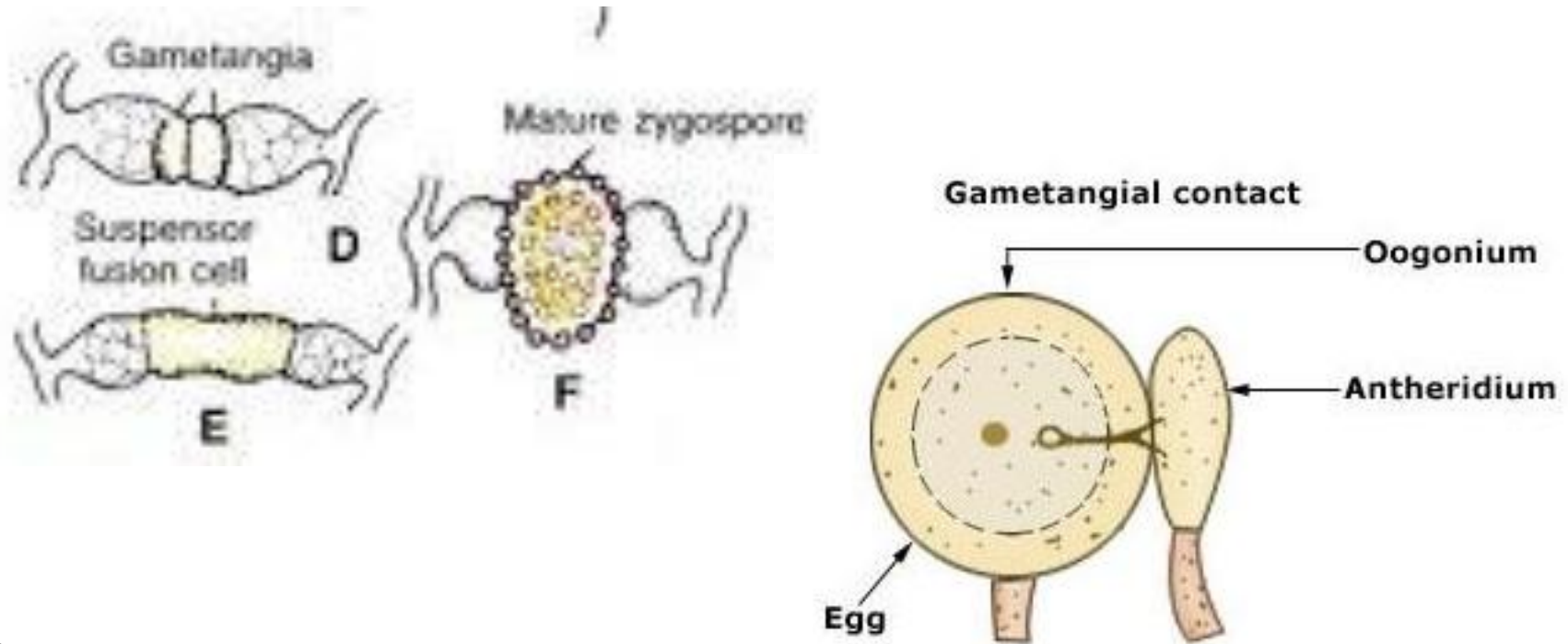
B Gamete-gametangial copulation





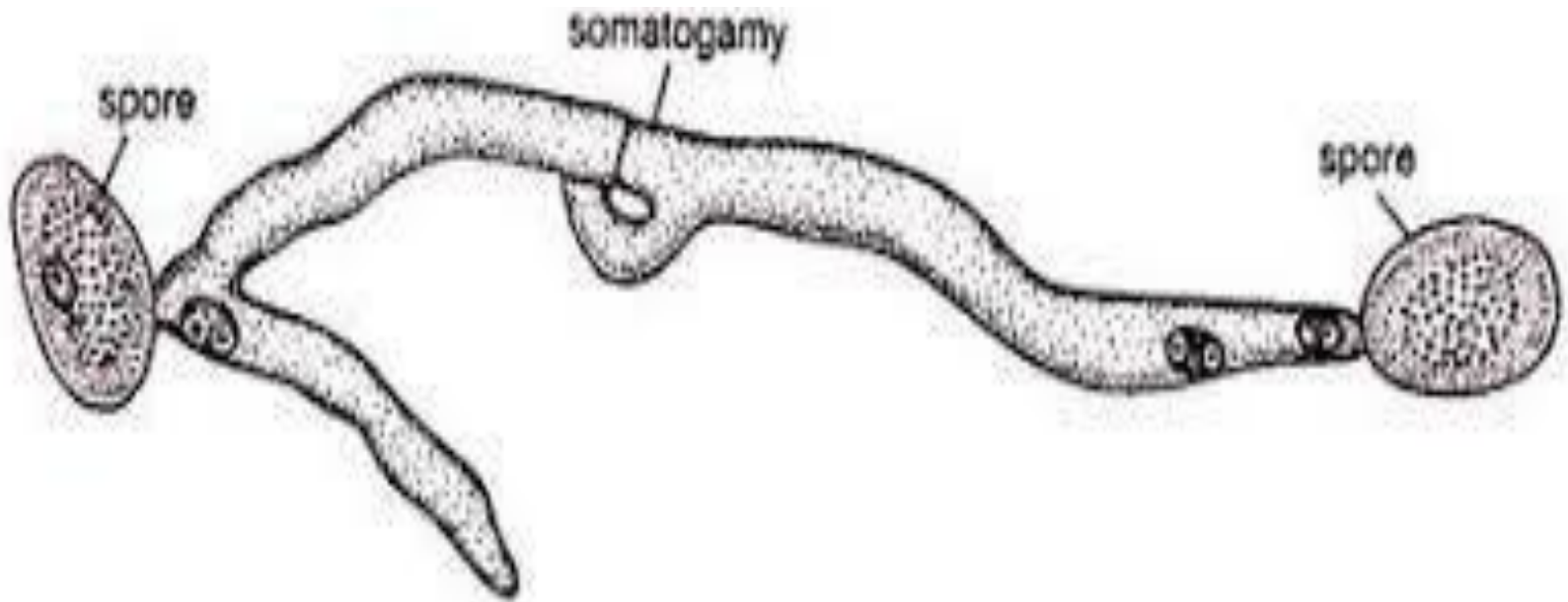
# Gametangial copulation

- ▶ Two gametangia or their protoplasts fuse and give rise to a zygote that develops in to a resting spore

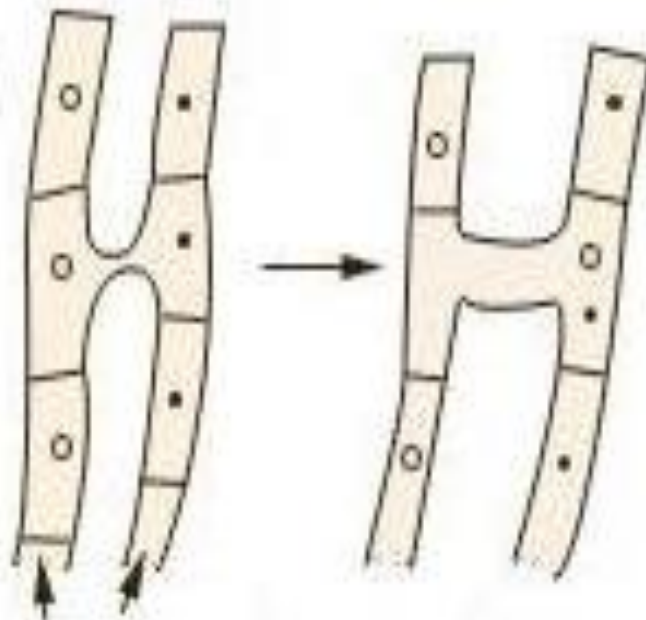


# Somatic copulation

- ▶ Fusion of somatic or vegetative cells



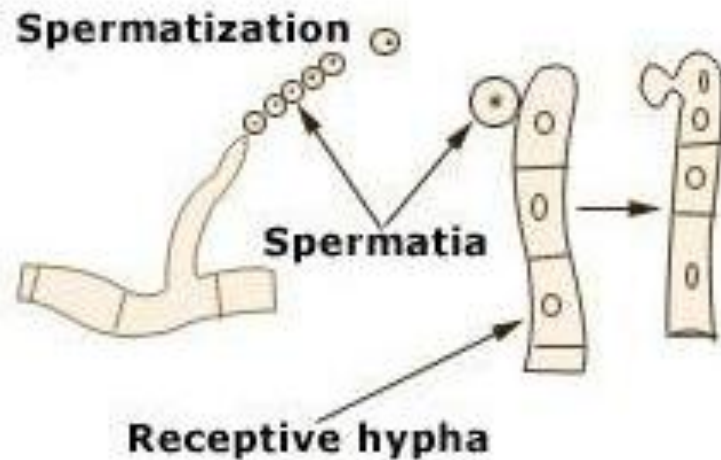
**Somatogamy**



**Hyphae of opposite mating types**

# Spermatization

- ▶ Union of a special male structure called a spermatium/spermatia with a female receptive structure.
- ▶ The spermatium empties its contents into the latter during plasmogamy



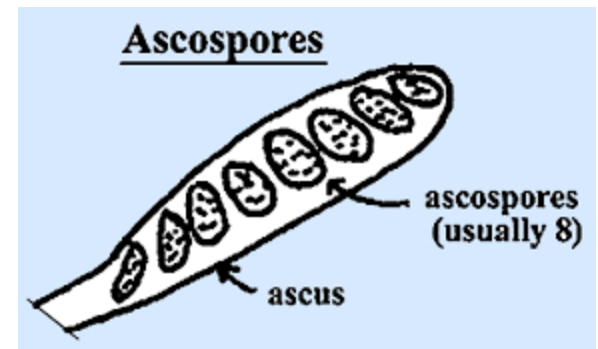
# Sexual Spores

- ▶ Produced by the fusion of two nuclei
- ▶ Occur less frequently
- ▶ Small in number than asexual spores

1. Ascospores
2. Basidiospores
3. Zygosporangia
4. Oospores

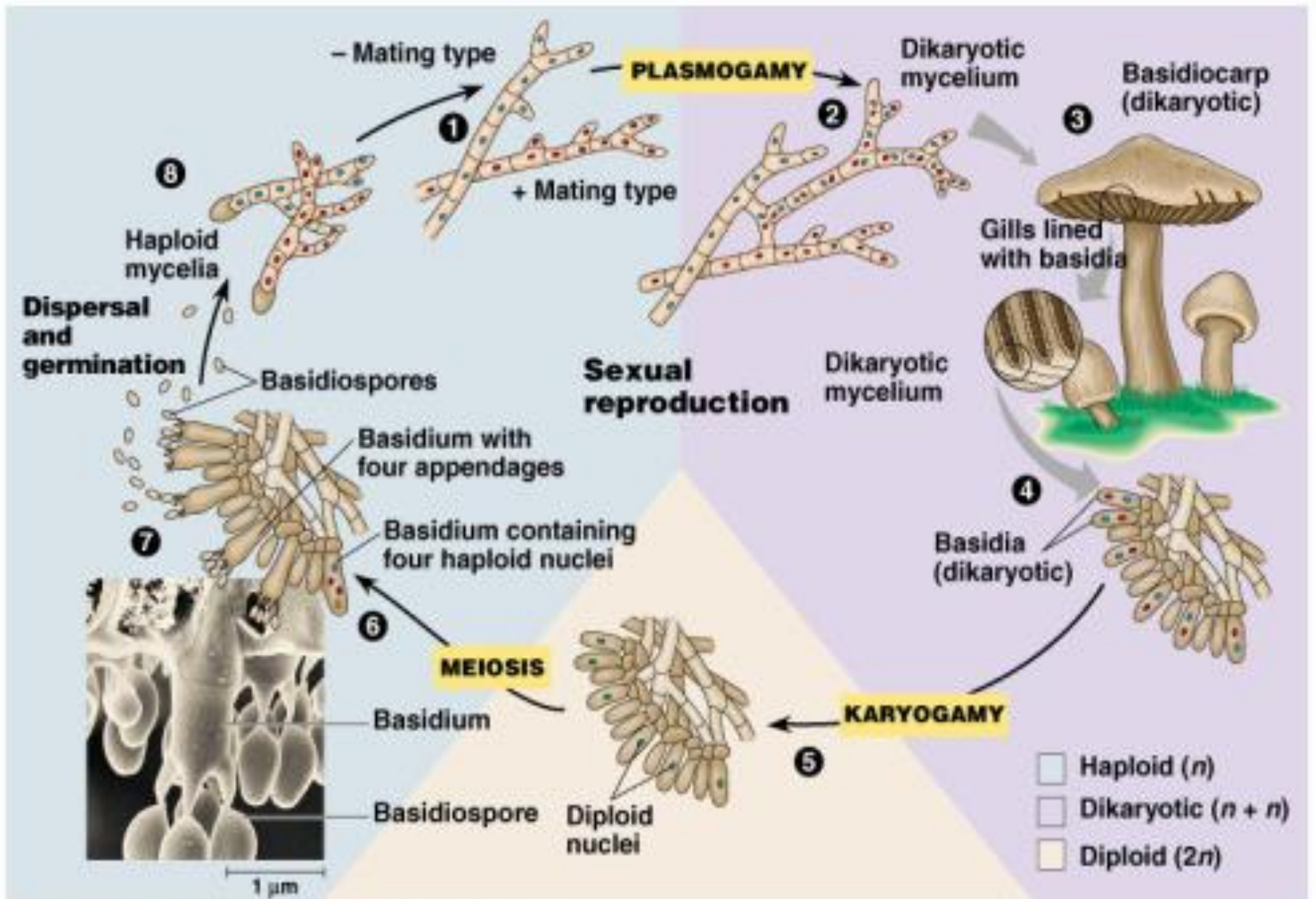
# Ascospores

- ▶ These single celled spores are produced in a sac called an ascus /asci.
- ▶ Usually 8 ascospores in each ascus
- ▶ Nuclear fusion takes place in the ascus. The diploid zygote nucleus divides by meiosis almost immediately after fusion and produces 4 haploid nuclei. These haploid nuclei divide once more by mitosis, forming the 8 ascospores which are typically produced in each ascus.



# Basidiospores

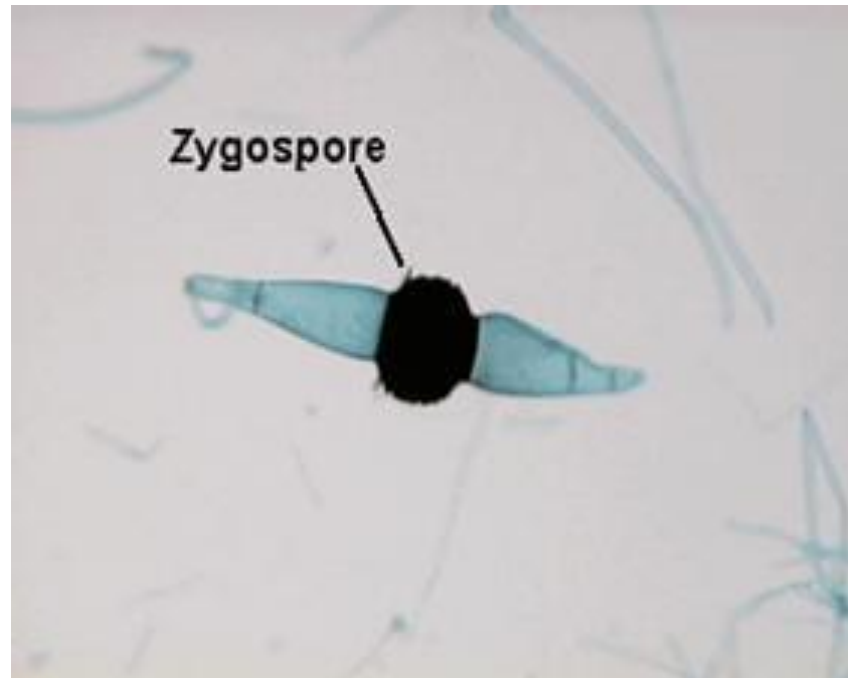
- ▶ These single celled spores are borne on club shaped structure called a basidium/basidia.
- ▶ Nuclear fusion and meiosis take place in the basidium.
- ▶ Basidiospores are then formed exogenously at the tips of the special outgrowths called sterigmata/sterigma.
- ▶ Usually 4 spores are formed one at the tip of each sterigma, but if meiosis is followed by a mitotic division then 8 basidial nuclei are formed.

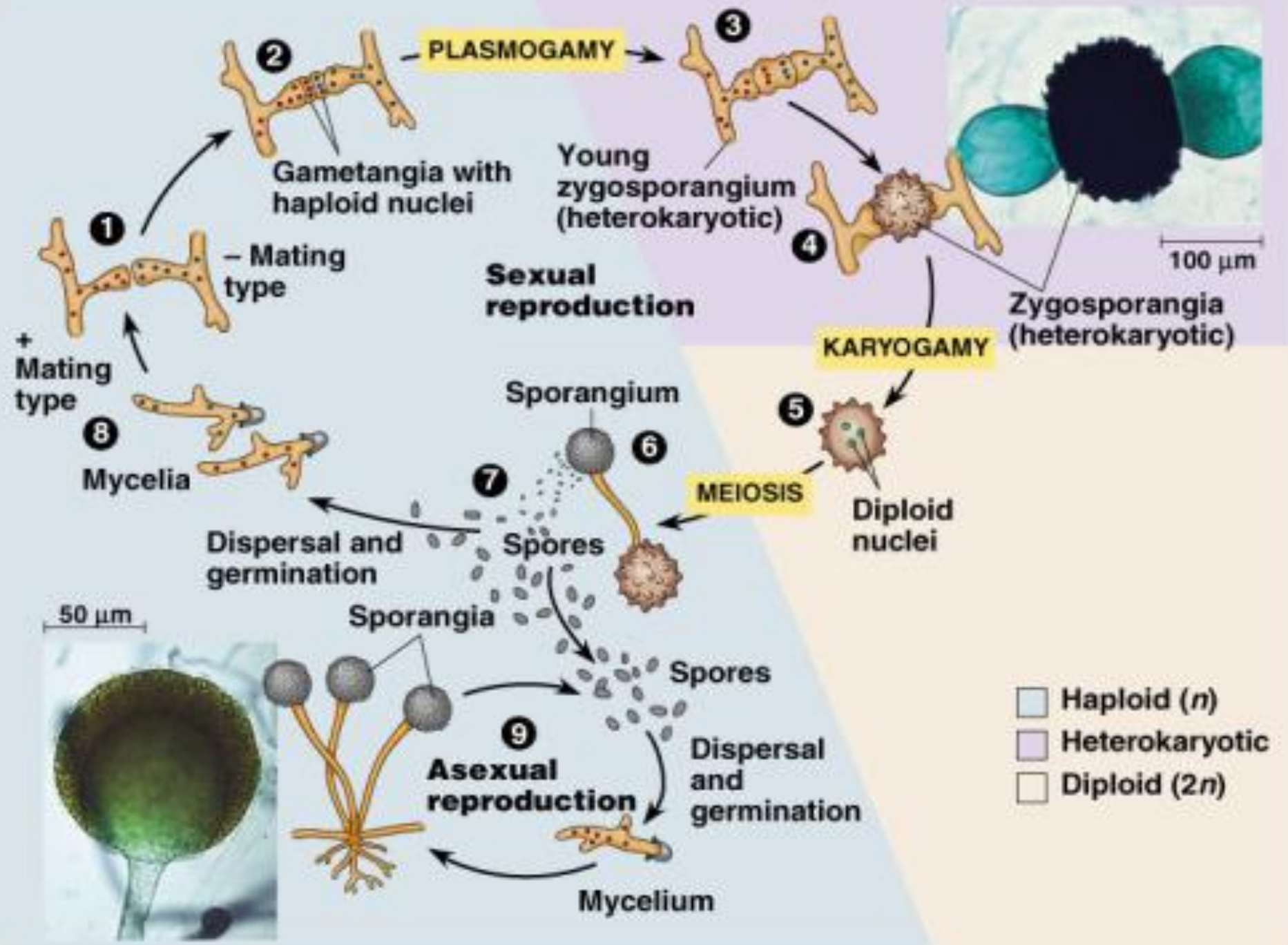




# Zygospores

- ▶ They are large, thick walled spores formed when the tips of 2 sexually compatible hyphae, or gametangia, of certain fungi fuse together





# Oospores

- ▶ These are formed within a special female structure, the oogonium.
- ▶ Fertilization of the eggs, or oospores , by male gametes formed in an antheridium gives rise to oospores.
- ▶ There are 1 or more oospores in each oogonium

