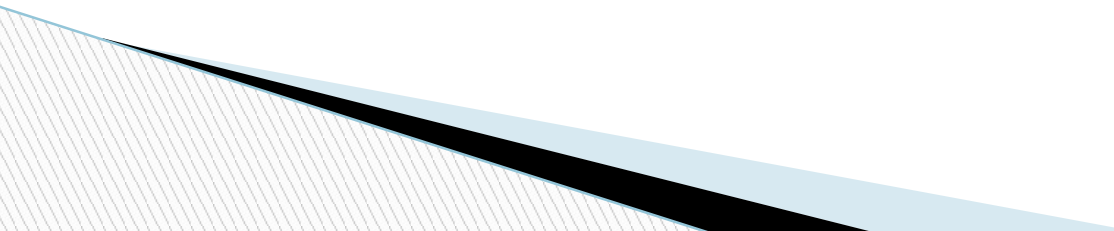


BIO 101: Introductory Biology Osinaike T.S. (Lecture C19 –3)

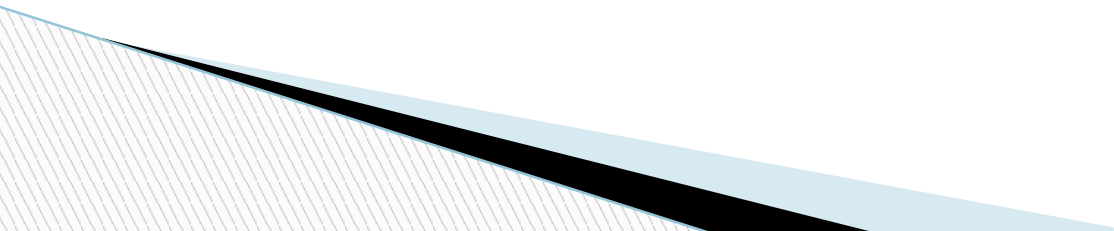
Gametogenesis

The bottom of the slide features a decorative graphic consisting of several overlapping, wavy horizontal bands. From top to bottom, the bands are light blue, black, dark grey, and a light grey band with a fine diagonal line pattern.

GAMETOGENESIS

- Gametogenesis is the process of the formation of haploid (n) gamete from diploid ($2n$) reproductive body.
 - Gametes are formed by specialized meiosis/reduction division.
 - Although the male and female gametes are sometimes very dissimilar morphologically (oogamy)- in higher plants and animals, yet both comprise similar phases of sequential changes.
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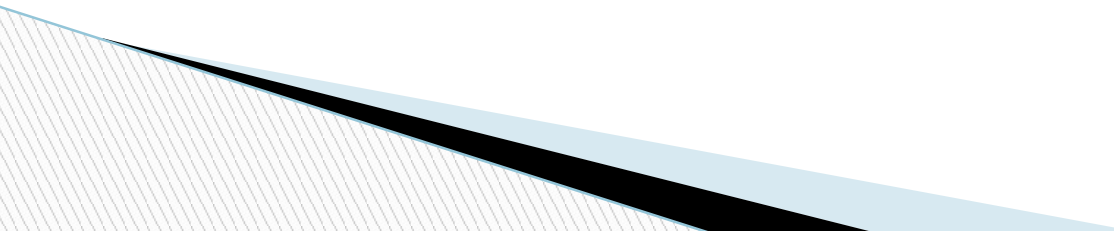
GAMETOGENESIS CONT'D

- Gametogenesis is of two types first one is known as microgametogenesis (spermatogenesis) and the second one is megagametogenesis (oogenesis).
 - Microgametogenesis/spermatogenesis is the process of formation of functional antherozoids –plants and sperm-animals from diploid microsporocyte/ spermatocyte.
 - Oogenesis is the formation of haploid egg/ovum from the diploid spore mother cell (megasporocyte)/ oocyte of the ovary.
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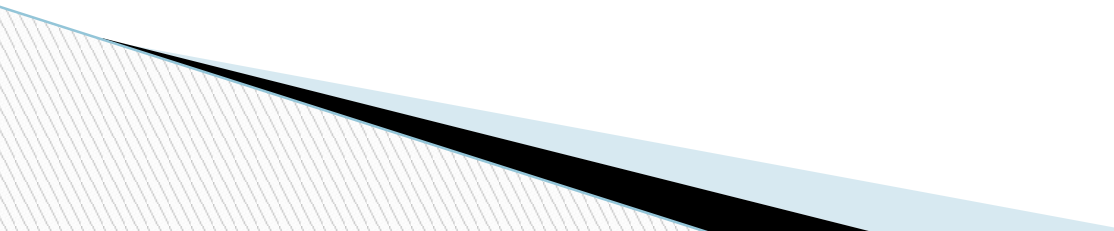
MICROGAMETOGENESIS:

- This is Gametogenesis leading to the formation of male gametes in plants and animals.
- In Angiosperms, the most advanced group of plants it occurs in two stages:
 - Microsporogenesis
 - Microgametogenesis

Microsporogenesis

- The androecium of the plant is made up of the stamen, filament, and anthers.
 - The pollen grains that carry the male gametes are contained in the anthers.
- 

MICROGAMETOGENESIS CONT'D

- The anther is anatomically divided into lobes and the lobes are further divided into chambers called microsporangia.
 - Pollens present in these microsporangia are known as pollen sac.
 - It is said that the pollen sac develops from a parent cell known as the archesporial cell.
 - This archesporial cell divides into outer and inner layers.
 - The inner layer forms the sporogenous tissue or cell that forms the pollen mother cell.
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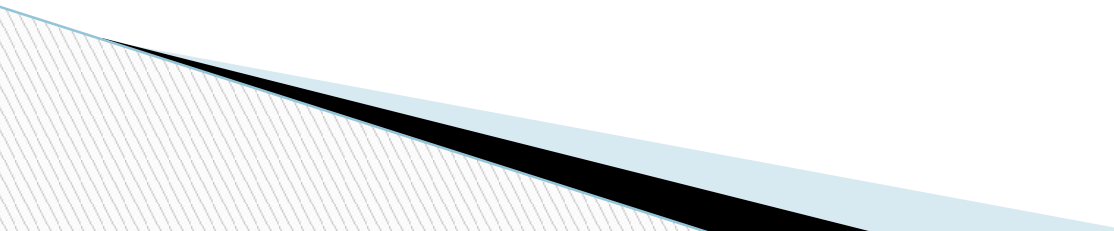
MICROGAMETOGENESIS CONT'D

- This sporogenous tissue is surrounded by the tapetum layer which provided nourishment to the pollen or microspore mother cell present in the sporogenous tissue.
- The microspore mother cell is diploid and divides meiotically to form haploid microspores or pollen.

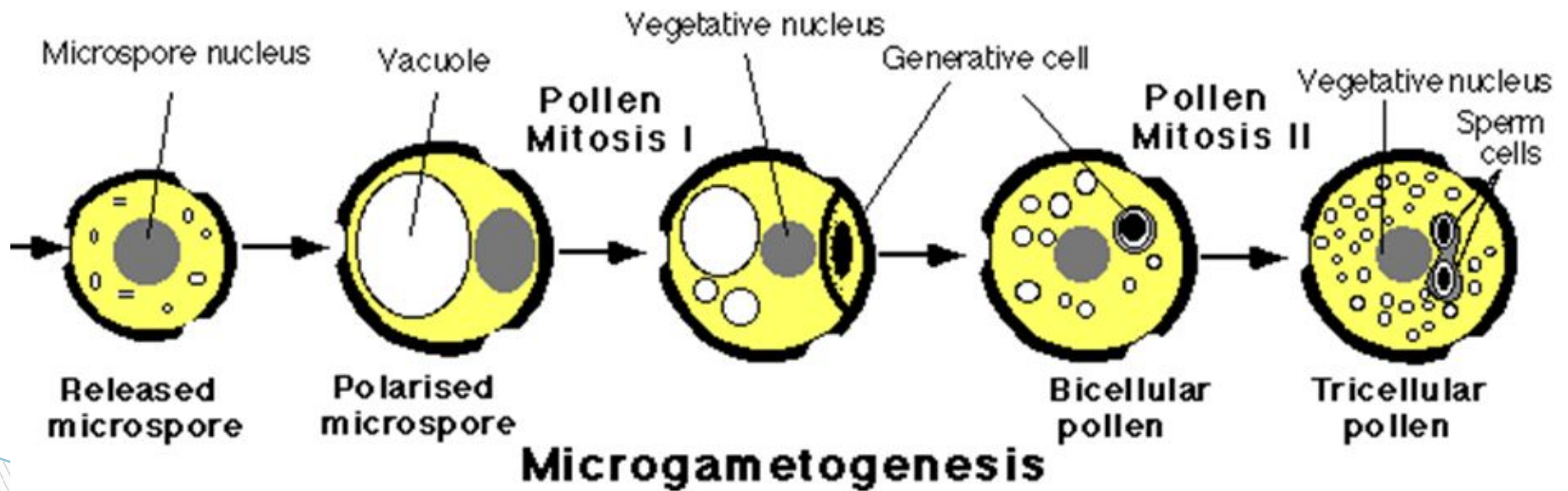
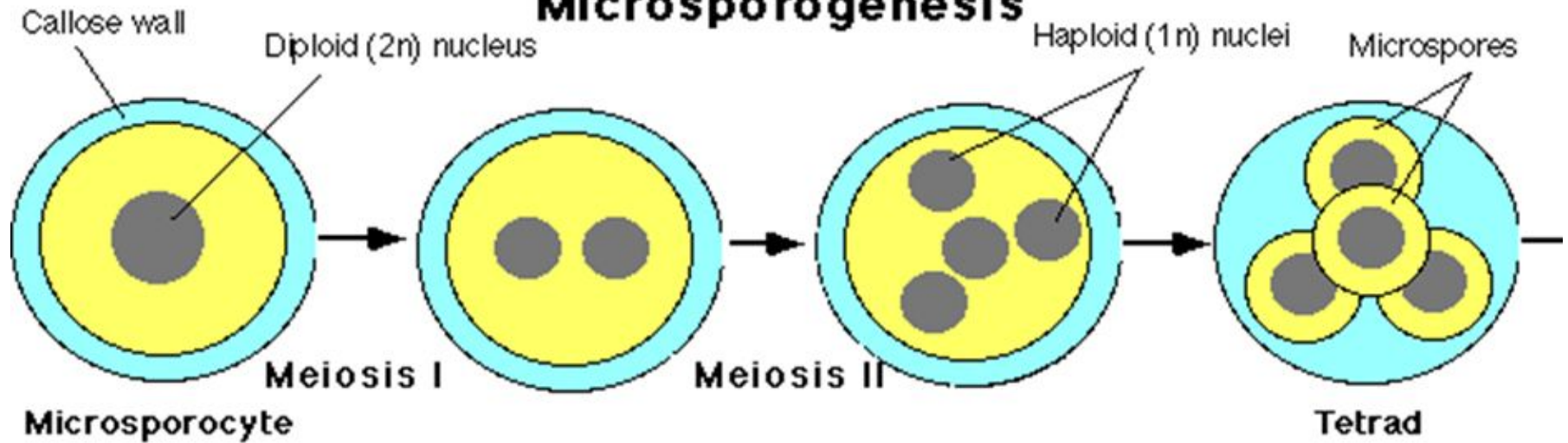
Microgametogenesis

- The pollen grain is the haploid cell that is made up of two layers: the outer exine layer which is derived from the tapetum and the inner layer called intine.

MICROGAMETOGENESIS CONT'D

- The exine is present all over the pollen grain except in one small part from where the pollen tube emerges during post pollination.
 - This small part is known as the germ pore. The pollen grain divides into two halves- the small generative nucleus and the larger vegetative nucleus.
 - The generative cell gives rise to two male nuclei whereas the vegetative cell gives rise to the pollen tube.
- 

Microsporogenesis

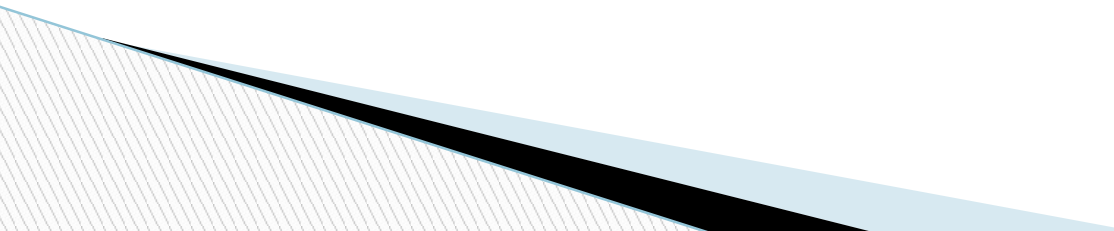


MEGAMETOGENESIS

- Megametogenesis in plants is a process leading to formation of the female gametes, like the male gametes, occurs in two stages:
 - Megasporogenesis
 - Megagametogenesis
- The word 'mega-' is used instead of 'micro-' in females because the female gametes are larger in size as compared to the male gametes.

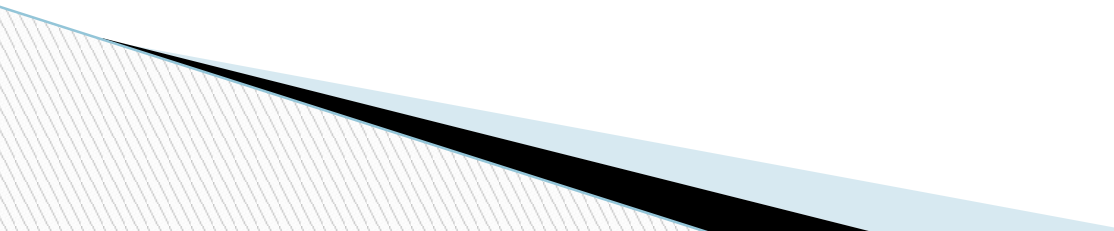
MEGAMETOGENESIS CONT'D

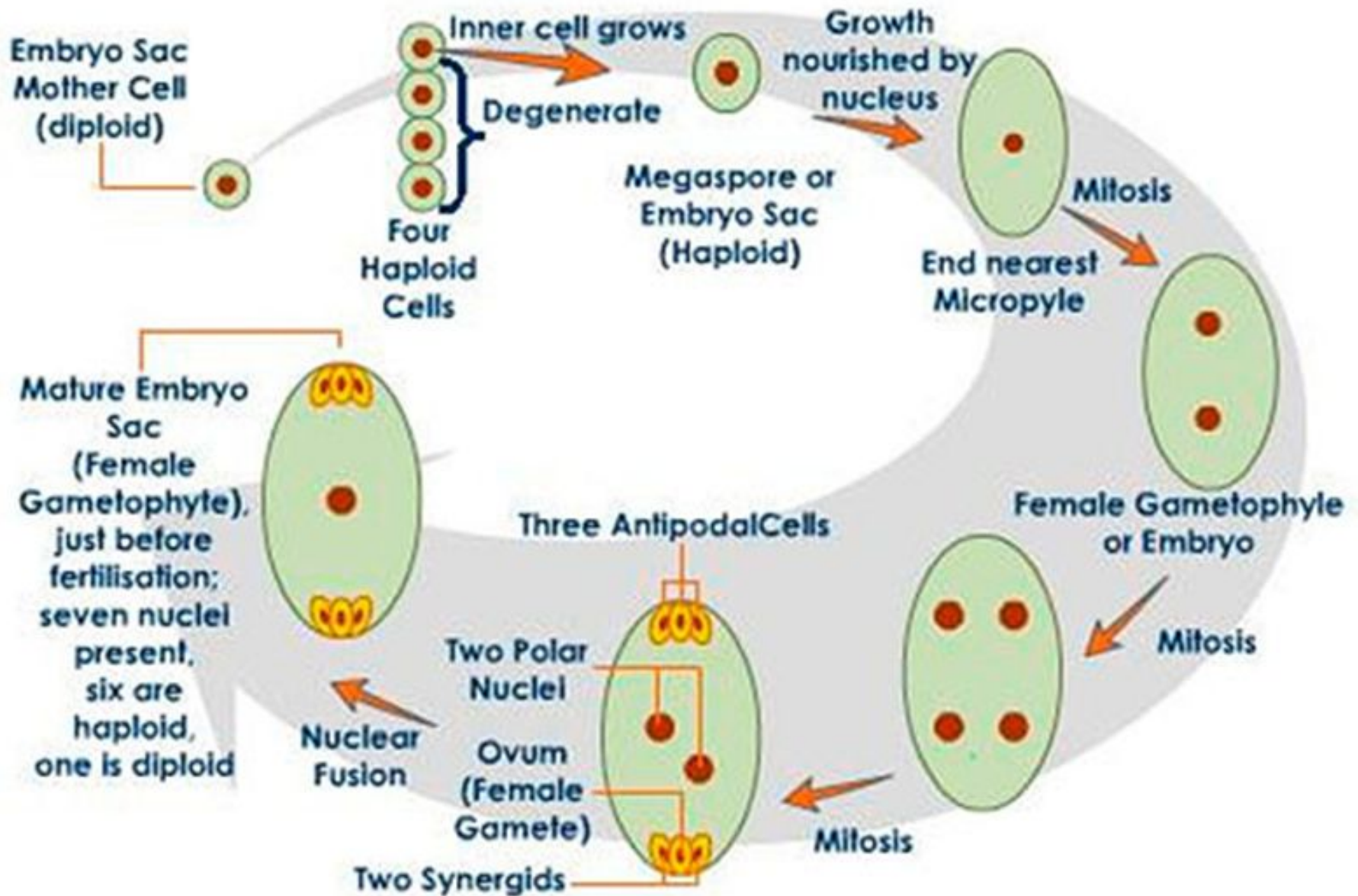
Megasporogenesis

- In Angiosperms the ovules are present inside the ovary in multiple lobes.
 - A cell in the ovule differentiates into a megaspore mother cell.
 - The megaspore mother cell is diploid.
 - This megaspore mother cell undergoes meiosis to form 4 haploid megaspores.
 - 3 of the 4 megaspores degenerate and only one megaspore is left in each ovule.
- 

MEGAMETOGENESIS CONT'D

Megagametogenesis

- This megaspore nucleus now begins to divide mitotically to form 8 nuclei.
 - 6 of the 8 nuclei migrate to opposing poles (3 each) while two nuclei remain at the center.
 - The nuclei that remain at the center are known as polar nuclei.
 - These polar nuclei fuse to form the secondary nucleus. The megaspore matures into an embryo sac.
- 



DIAGRAMMATIC REPRESENTATION OF GAMETOGENESIS IN ANIMALS E.G. HUMAN

