



- Chapter 46 ~
*Animal
Reproduction*

Overview

Asexual (one parent)

- fission (parent separation)
- budding (corals)
- fragmentation & regeneration (inverts)
- parthenogenesis

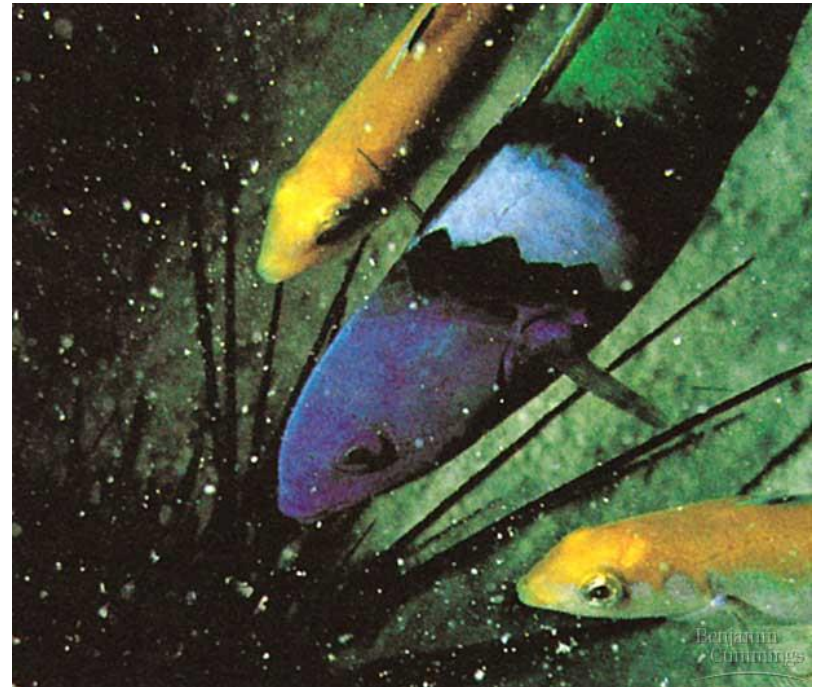


Sexual (fusion of haploid gametes)

- gametes (sex cells)
- zygote (fertilized egg)
- ovum (unfertilized egg)
- spermatozoon (male gamete)

Reproductive cycles

- Parthenogenesis
 - unfertilized egg development; haploid (honeybees)
- Hermaphroditism
 - both male & female reproductive systems; sessile & burrowing organisms (earthworms)
- Sequential hermaphroditism
 - reversal of gender during lifetime
 - protogynous (female 1st)
 - protandrous (male 1st)



Mechanisms of sexual reproduction

- Fertilization (union of sperm and egg)
 - external
 - internal
- Pheromones = chemical signals that influence the behavior of others (mate attractants)



Mammalian reproduction

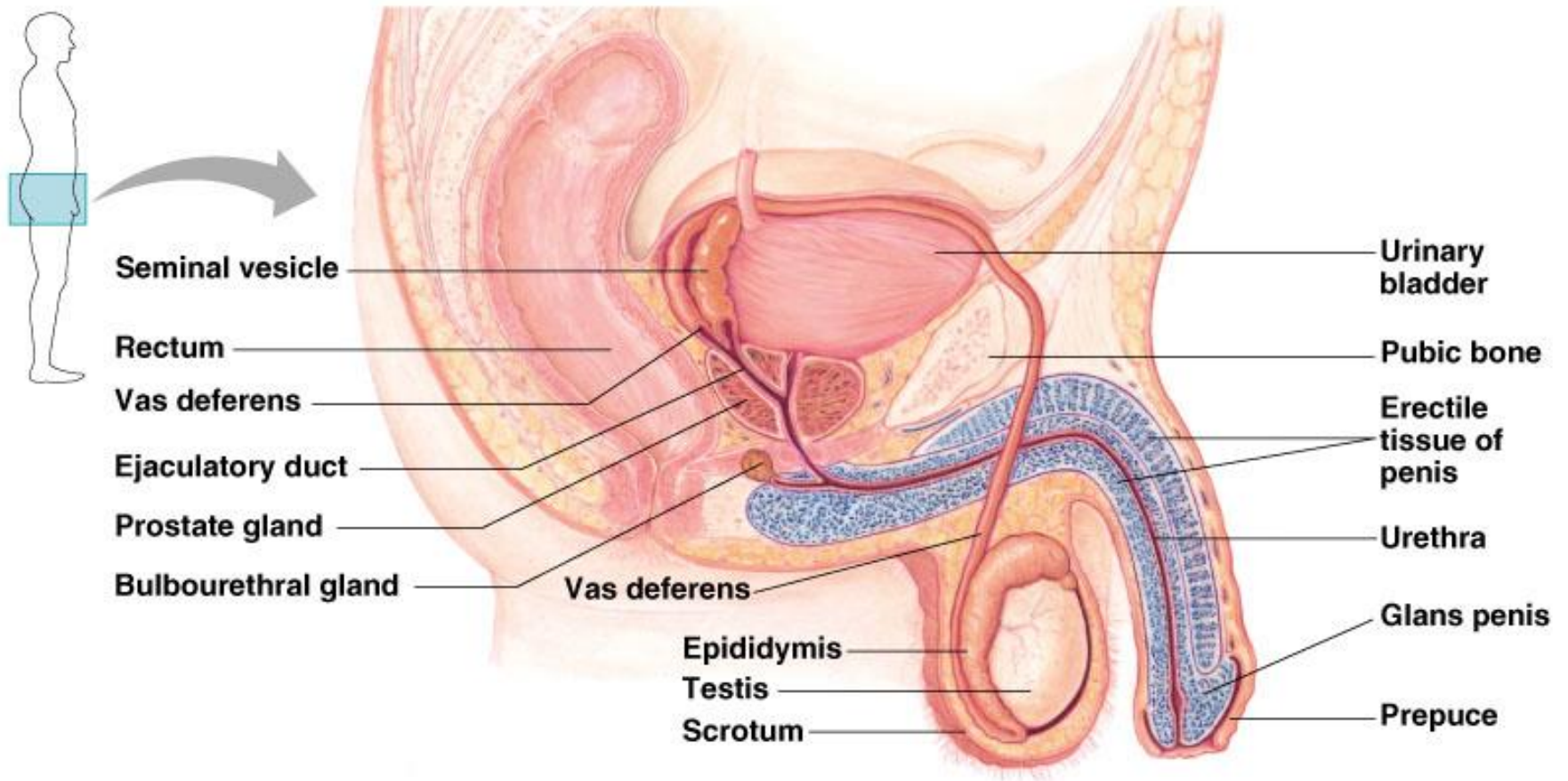
The Human Male

- Testes= male gonads
- Seminiferous tubules= sperm formation
- Leydig cells= hormone production
- Scrotum= skin surrounding testes and requires lower than body temp
 - Some species with lower body temps retain testes in the body
- Epididymis= sperm development and maturation

The Human Male

- Vas deferens= sperm propulsion
- Seminal vesicles= semen
- Prostate gland= anticoagulant; nutrients
- Bulbourethral glands= acid neutralizer
- Penis/urethra= semen delivery

Mammalian reproduction



Mammalian reproduction

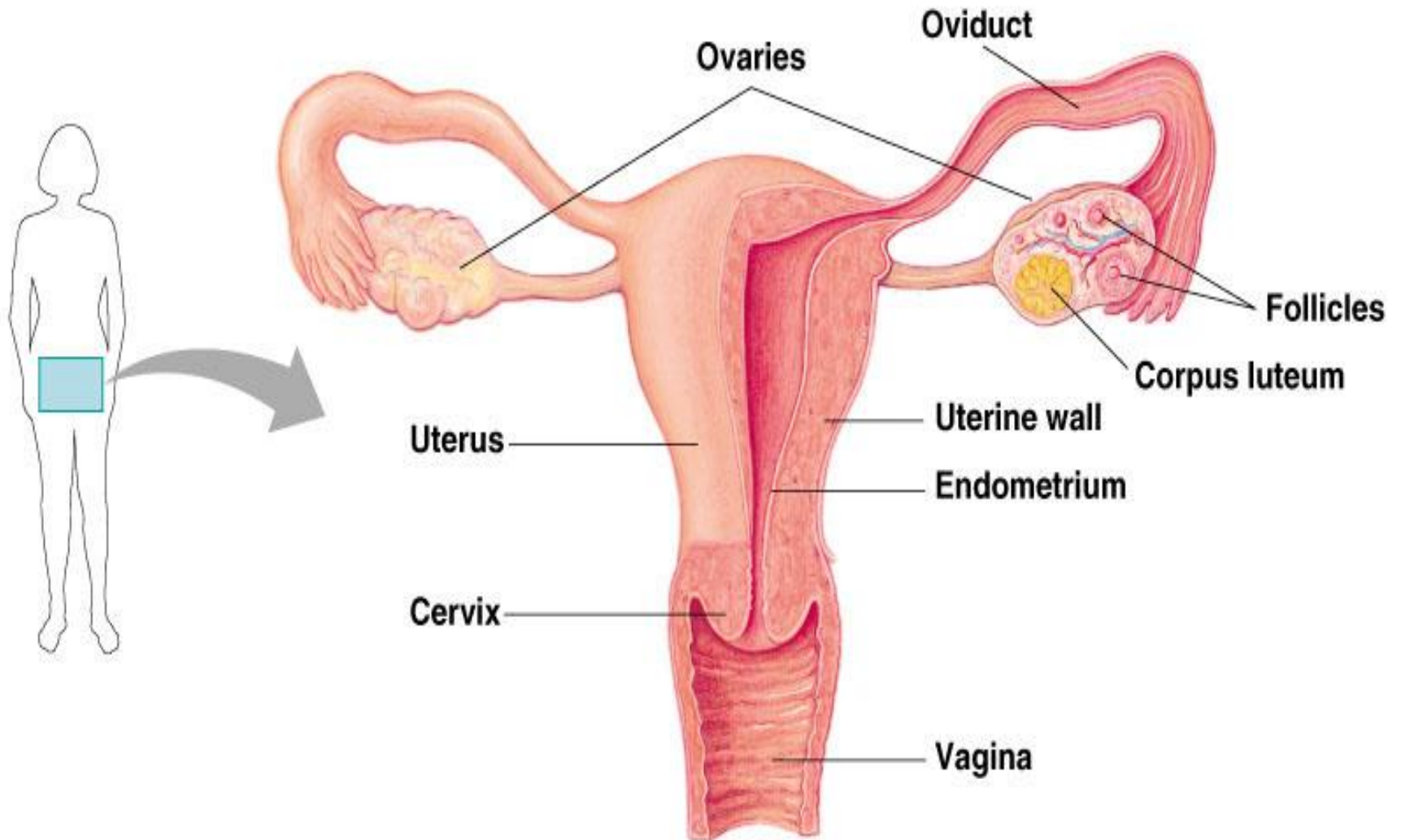
The Human Female

- Ovaries= female gonads
 - Follicle= egg capsule
 - Corpus luteum=
hormone secretion
- Oviduct (fallopian or uterine tubes)= site of fertilization
- Vulva= external genitalia including labia majora and minora and clitoris

The Human Female

- Uterus= womb and site of blastocyst implantation
 - Endometrium= inner lining
 - Cervix= entrance into uterus that is dilated
- Vagina= penis and sperm receptacle and birth canal
- Hymen= thin tissue that covers vaginal opening at birth

Mammalian reproduction



Spermatogenesis

- Puberty until death!
- Location is in the Seminiferous tubules

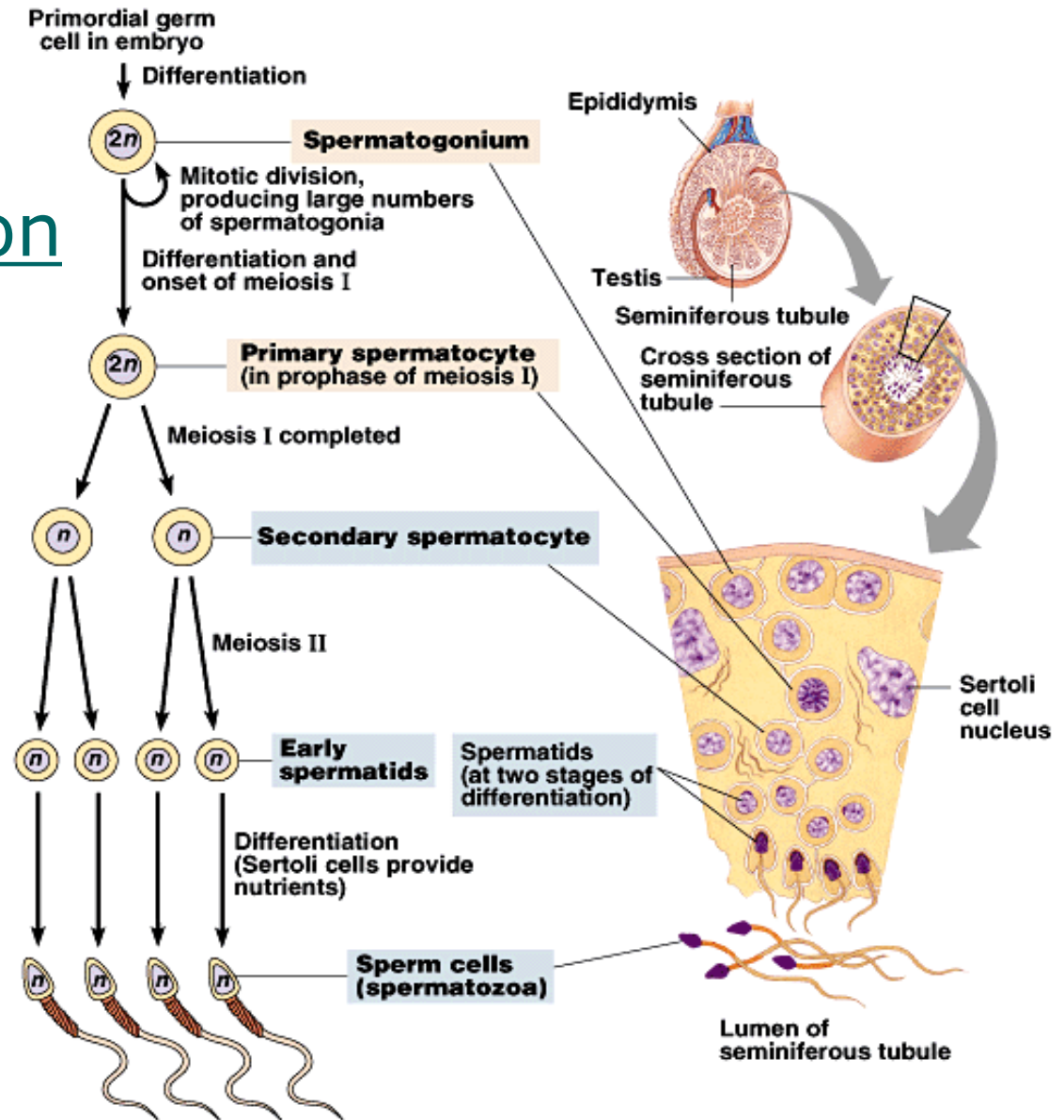
- Primordial germ cell (2N) differentiate into....
- Spermatogonium (2N)= sperm precursor

Repeated mitosis into....

- ◆ Primary spermatocyte (2N)
 - 1st meiotic division
- ◆ Secondary spermatocyte (1N)
 - 2nd meiotic division
- ◆ Spermatids (1N), then...
- ◆ Sperm cells (1N)

Spermatogenesis

○ Animation



Oogenesis

- Embryo until menopause...
- Location is in the Ovaries
- Primordial germ cells (2N)
- Oogonium (2N)
- Primary oocyte (2N)
- Before birth: prophase I of meiosis is completed
- Puberty: FSH; completes meiosis I
- Secondary oocyte (1N); polar body
- Meiosis II; stimulated by fertilization
- Ovum (1N); 2nd polar body

The Female Pattern

- Menstrual cycle (humans and many other primates)= Change in endometrial lining
 - Menstrual flow phase= removal of lining
 - Proliferative phase= building lining
 - Secretory phase= enlargement of endometrial glands



Hormonal Control of Menstrual Cycle

- Hypothalamus stimulates the release of gonadotropic-releasing hormone because of increase in estrogen
- GnRH stimulates the anterior pituitary gland in the brain to release follicle-stimulating hormone and luteinizing hormone
- FSH and LH stimulate the ovary to release more estrogen and progesterone, which stimulates endometrial development



- Ovarian Cycle:

- Follicular phase= follicle growth

- Growing follicle causes estrogen to be released

- Ovulation= oocyte release

- Luteal phase= hormone release which inhibits GnRH release

- Estrous cycles/estrus (many mammals)

- Reabsorbing the endometrium in the absence of a pregnancy

- Only copulate during periods around ovulation

Other Facts Associated with Reproduction

- Some animal species use visual displays in order to attract a mate
- Courtship behaviors plays an important role in choosing a mate
- Fruiting body formation from fusing mycelium in fungi is controlled by external factors
- Temperature can affect the sex determination of the offspring
 - Reptiles are influenced by this