

Outline

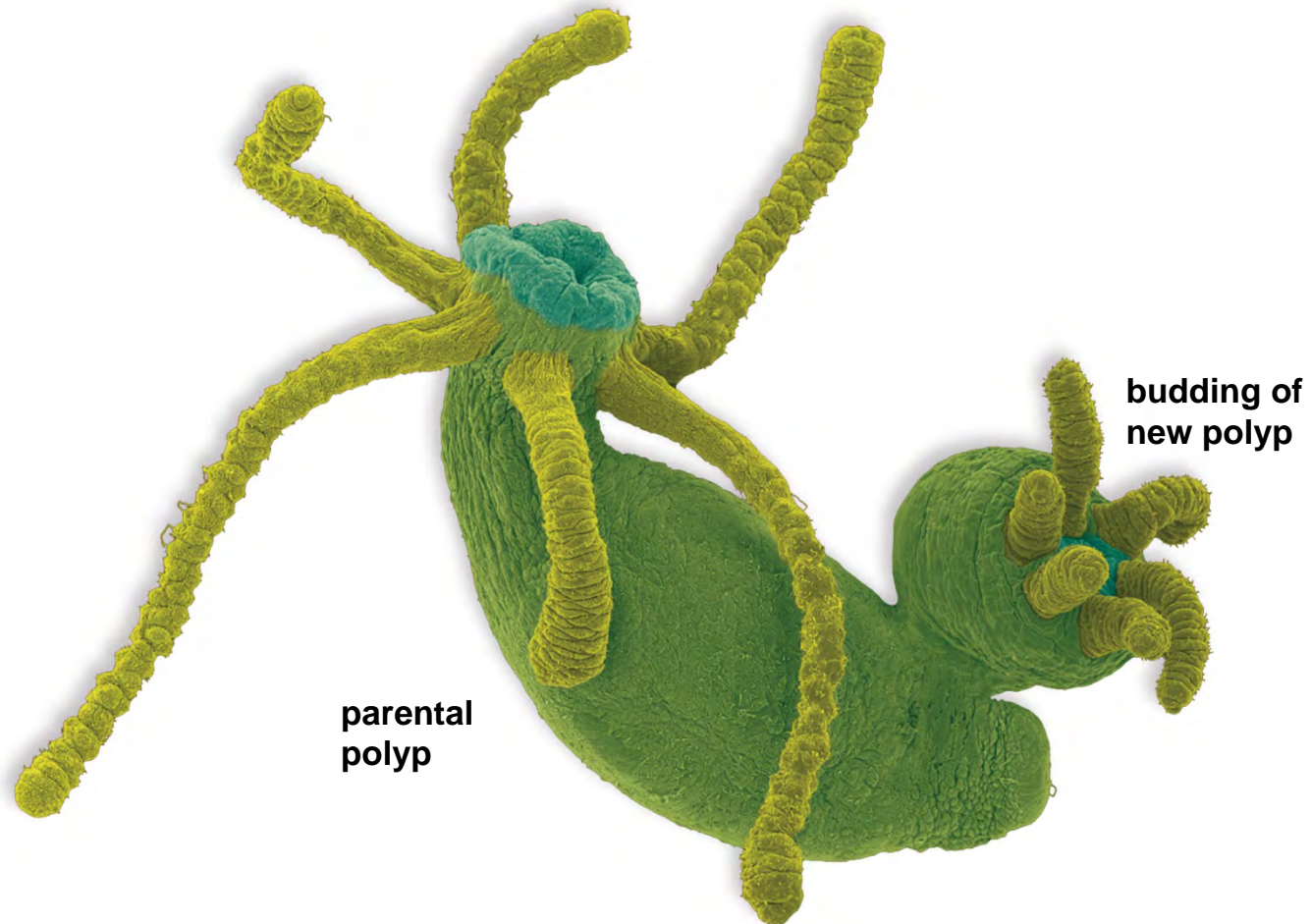
- How Animals Reproduce
 - Asexual Reproduction
 - Sexual Reproduction
 - Life History Strategies
- Male Reproductive System
- Female Reproductive System
- Sexually Transmitted Diseases

Asexual Reproduction

- Some animals usually reproduce asexually, but practice sexual reproduction on occasion
 - Hydra
- Parthenogenesis
 - Modification of sexual reproduction
 - Unfertilized egg develops into complete individual

Reproduction in *Hydra*

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Sexual Reproduction

- Egg of one parent fertilized by sperm of another
 - Animals usually produce gametes in specialized organs called gonads
 - Testes produce sperm
 - Ovaries produce eggs
 - Copulation is sexual union to facilitate reception of sperm

Life History Strategies

- Insect eggs produced in ovaries
 - Yolk is stored food to be used during development
 - Some form pupa and go through metamorphosis
- Many aquatic animals have a larval stage
 - Utilize different food source than adults
 - Strongly tied to aquatic environments

Life History Strategies

- Reptiles and birds provide eggs with plentiful yolk
 - Development takes place in shelled egg containing extra-embryonic membrane
 - Parents often tend eggs and young
- Mammals are viviparous (Live-born)
 - Care of zygote and embryo
 - Placental mammals eliminate need for shelled egg

Male Reproductive System

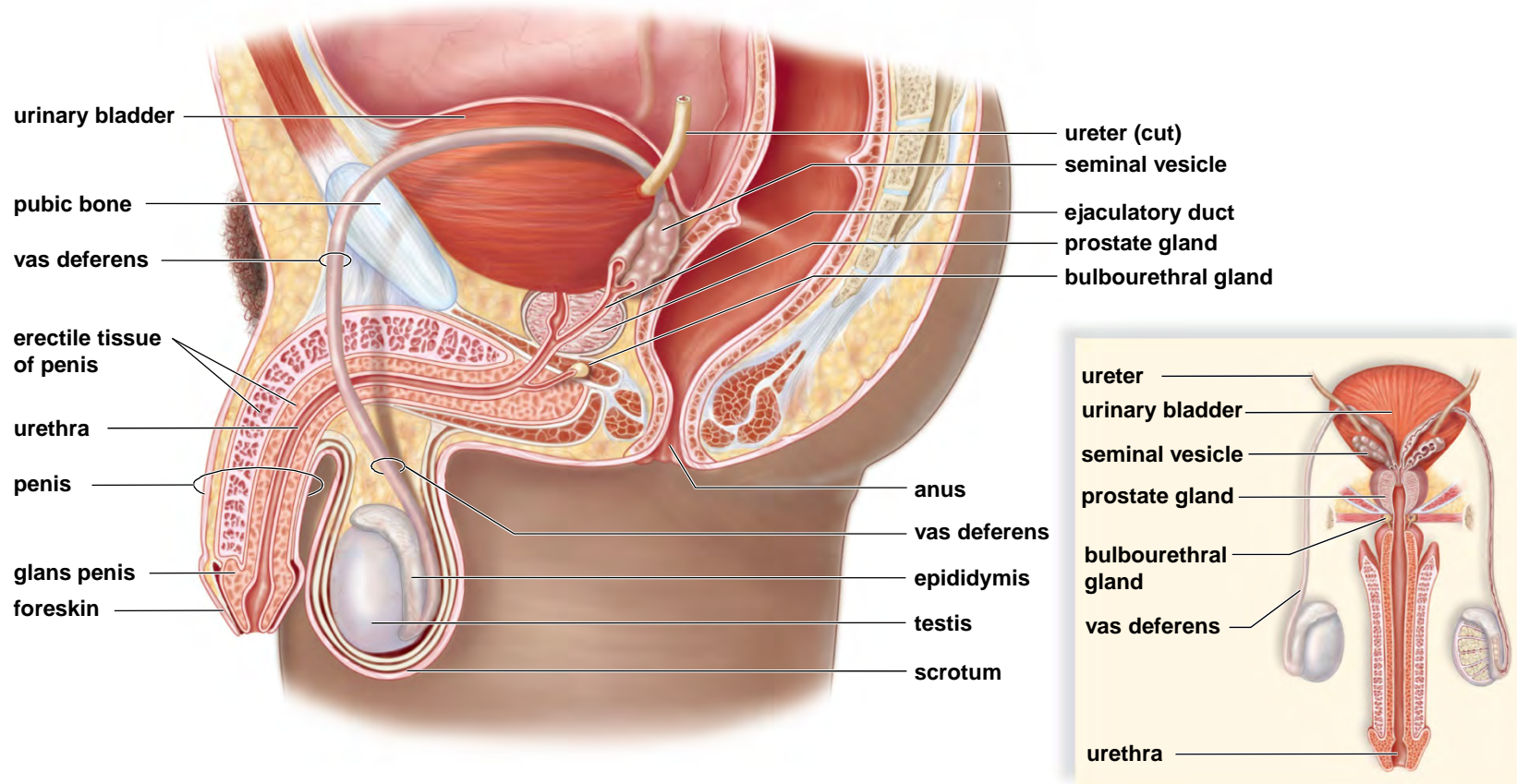
- Male gonads
 - Paired testes suspended in scrotum
 - Sperm
 - Produced by testes
 - Mature within epididymides
 - Propelled into vas deferentia by muscular contractions

Male Reproductive System

- Penis is cylindrical organ hanging in front of scrotum
 - Three cylindrical columns of spongy, erectile tissue
 - Blood flow stiffens penis and increases its size
 - Seminal fluid contains
 - Sperm
 - Secretions from
 - Seminal vesicles
 - Prostate gland, and
 - Bulbourethral gland

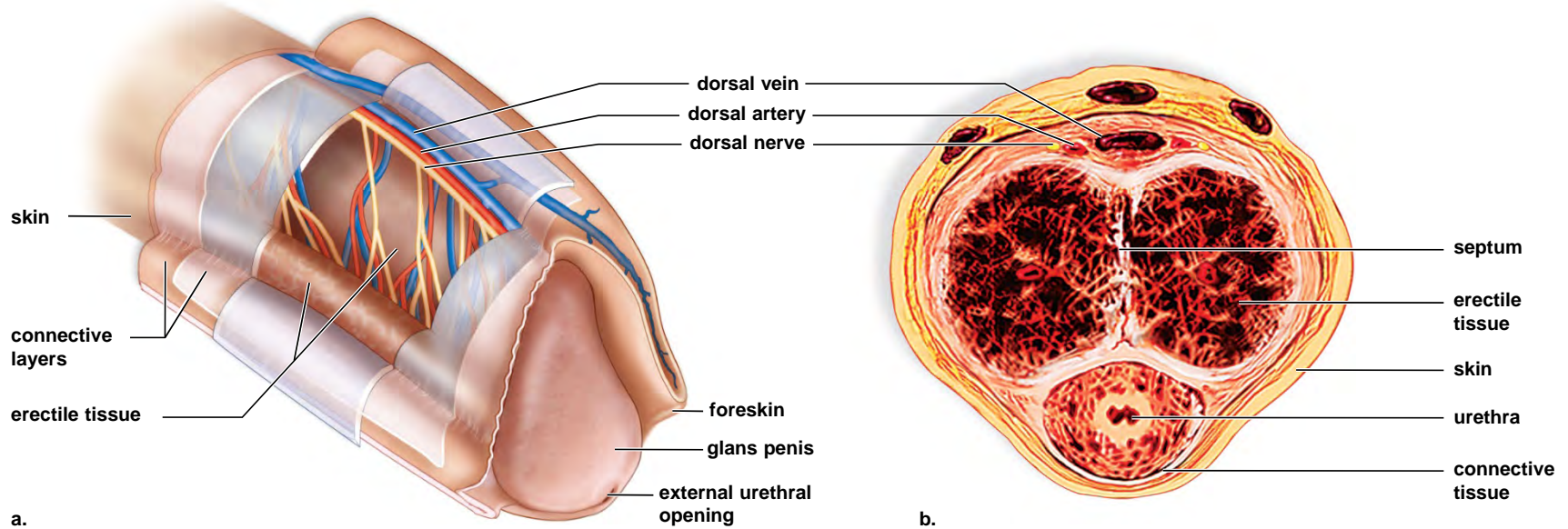
The Male Reproductive System

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Penis Anatomy

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Ejaculation

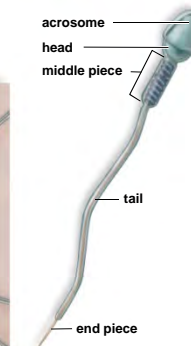
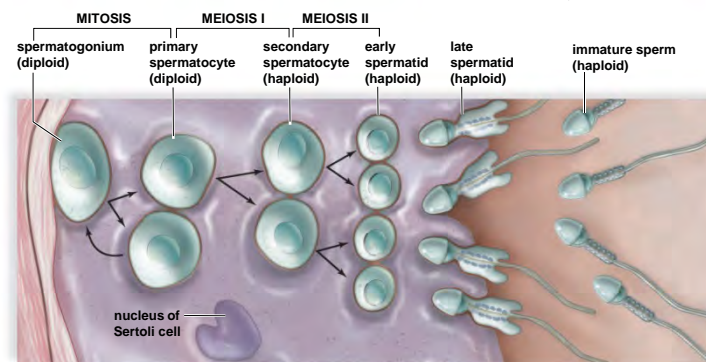
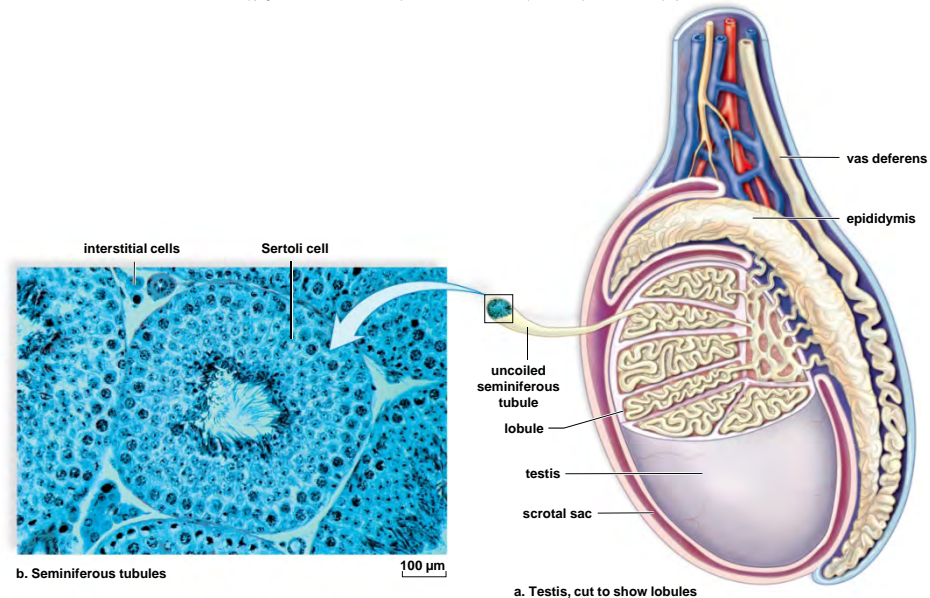
- Emission - First phase of ejaculation
 - Nerve impulses sent to epididymides and vasa deferentia
 - Sperm enter ejaculatory duct
 - Secretions released
- Expulsion
 - Rhythmical muscle contractions
 - Expel semen from opening of urethra

Testes and Sperm

- Testes contain one to three coiled seminiferous tubules
- Mature sperm have three distinct pieces
 - Head
 - Acrosome
 - Mid-piece
 - Tail
- Normal human ejaculate contains several hundred million sperm

Testis and Sperm

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b. © Ed Reschke

Hormonal Regulation in Males

- Hypothalamus has ultimate control of testicular sexual function
 - Gonadotropic Hormones
 - Follicle Stimulating Hormone
 - Promotes spermatogenesis
 - Occurs in seminiferous tubules
 - Lutenizing Hormone
 - Control production of testosterone
 - Testosterone produced by interstitial cells of testis

Animation

- <http://>
- <http://>



The image shows a screenshot of an interactive animation titled "Spermatogenesis" by McGraw-Hill. The main window displays a cross-section of a seminiferous tubule. The tubule is a light pinkish-red color, and its lumen is a darker blue. A jagged, irregular boundary separates the tubule from the lumen. A small blue circle with the number "46" is in the top-left corner of the animation area. Labels "Seminiferous tubule" and "Lumen of seminiferous tubule" are present. Below the animation is a control bar with "Play", "Pause", "Audio", and "Text" buttons, and a progress slider. A text box at the bottom contains the following text: "Spermatogonia are the cells from which sperm cells arise. The spermatogonia divide by mitosis. One daughter cell remains a spermatogonium and the other becomes a primary spermatocyte." The copyright notice "Copyright © The McGraw-Hill Companies, Inc." is at the bottom right.

McGraw-Hill **Spermatogenesis**

46

Lumen of seminiferous tubule

Seminiferous tubule

Play Pause Audio Text

Spermatogonia are the cells from which sperm cells arise. The spermatogonia divide by mitosis. One daughter cell remains a spermatogonium and the other becomes a primary spermatocyte.

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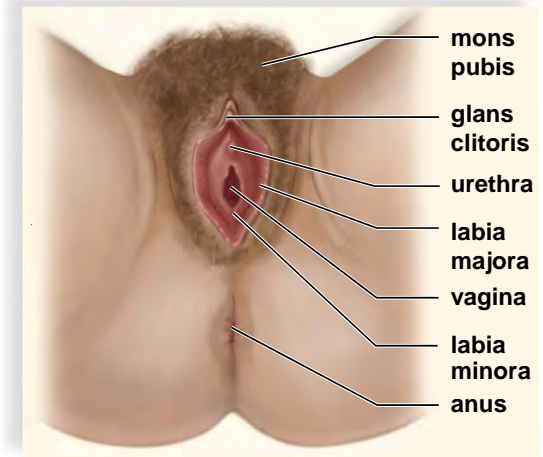
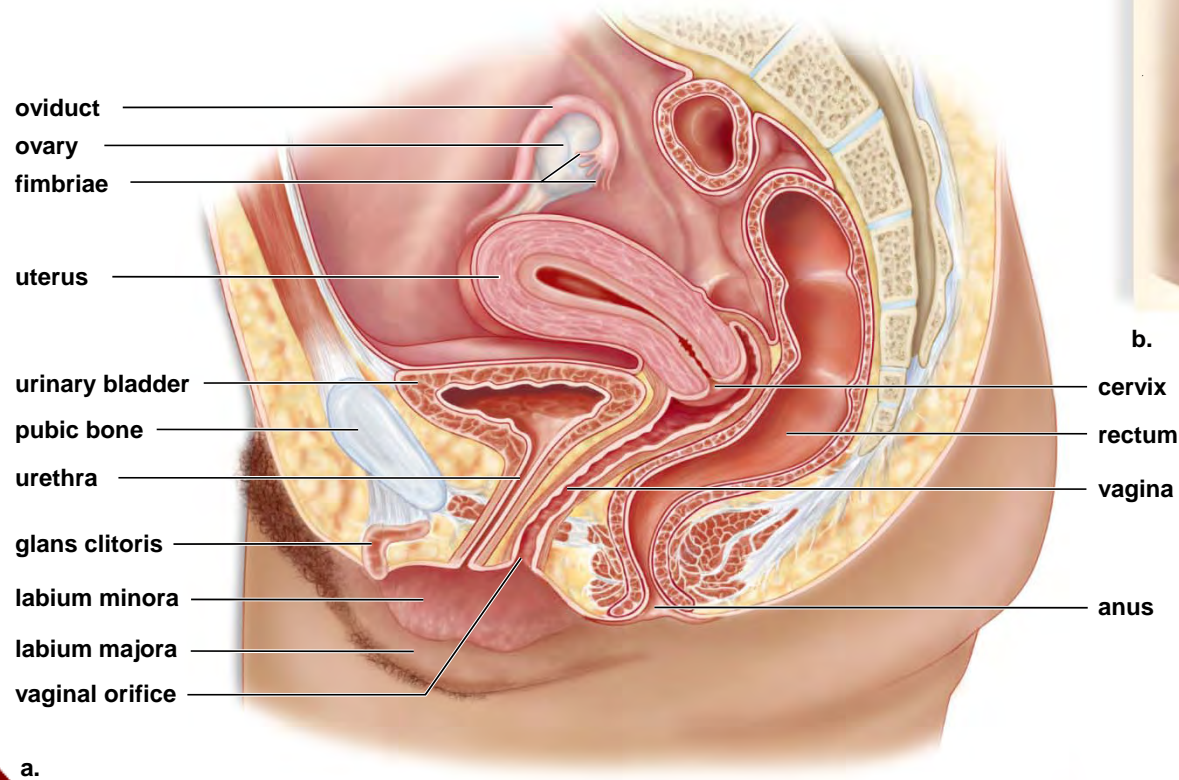
Female Reproductive System

- Ovulation

- An oocyte (egg) bursts from an ovary into coelom
- Swept into oviduct by currents in coelomic fluid
- Fertilization normally occurs in oviduct
- Ciliary movement moves zygote to uterus
- Embryo embeds in uterine lining (endometrium)

Female Reproductive System

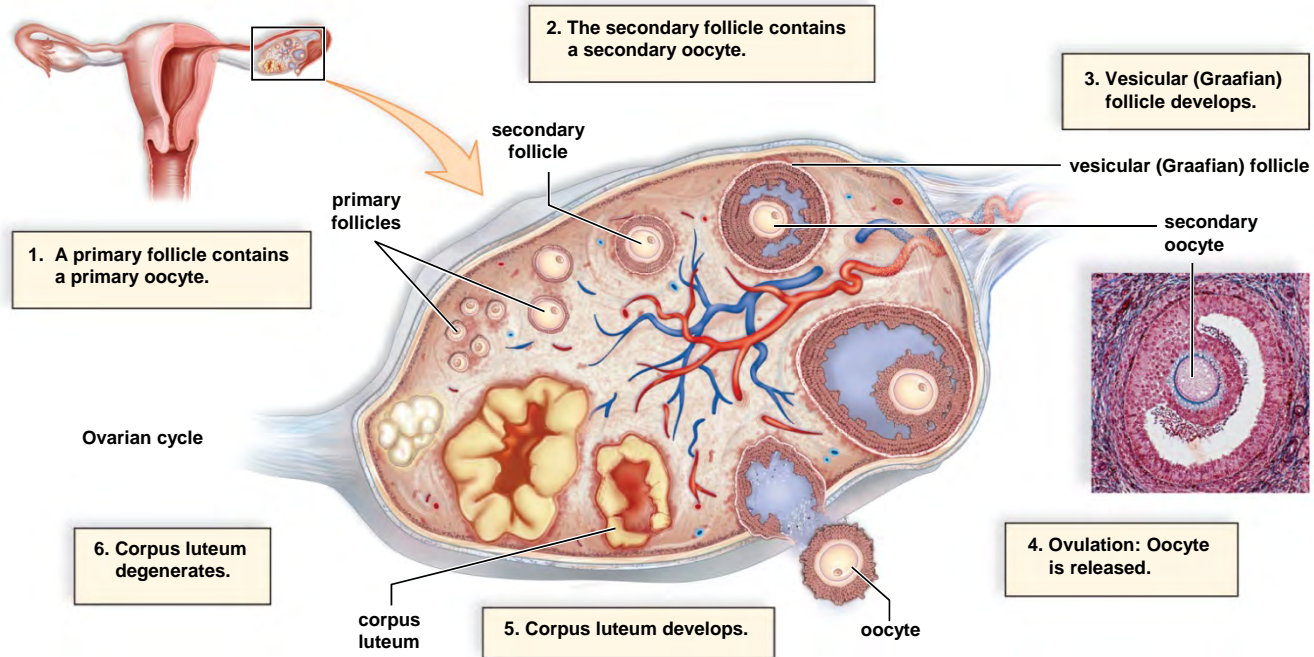
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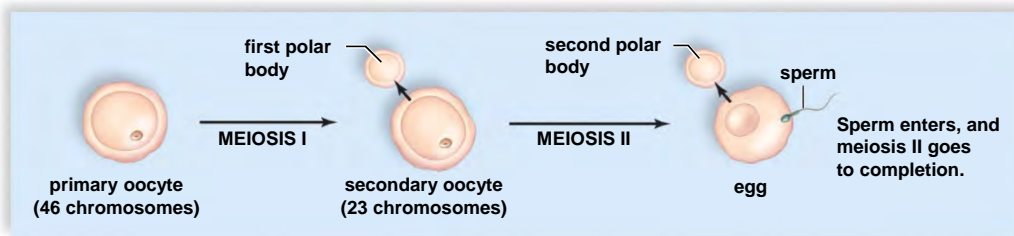
- <http://youtu.be/xFpVy9OC14o>
- <http://youtu.be/WGJsrGmWeKE>

Ovarian Cycle

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a.

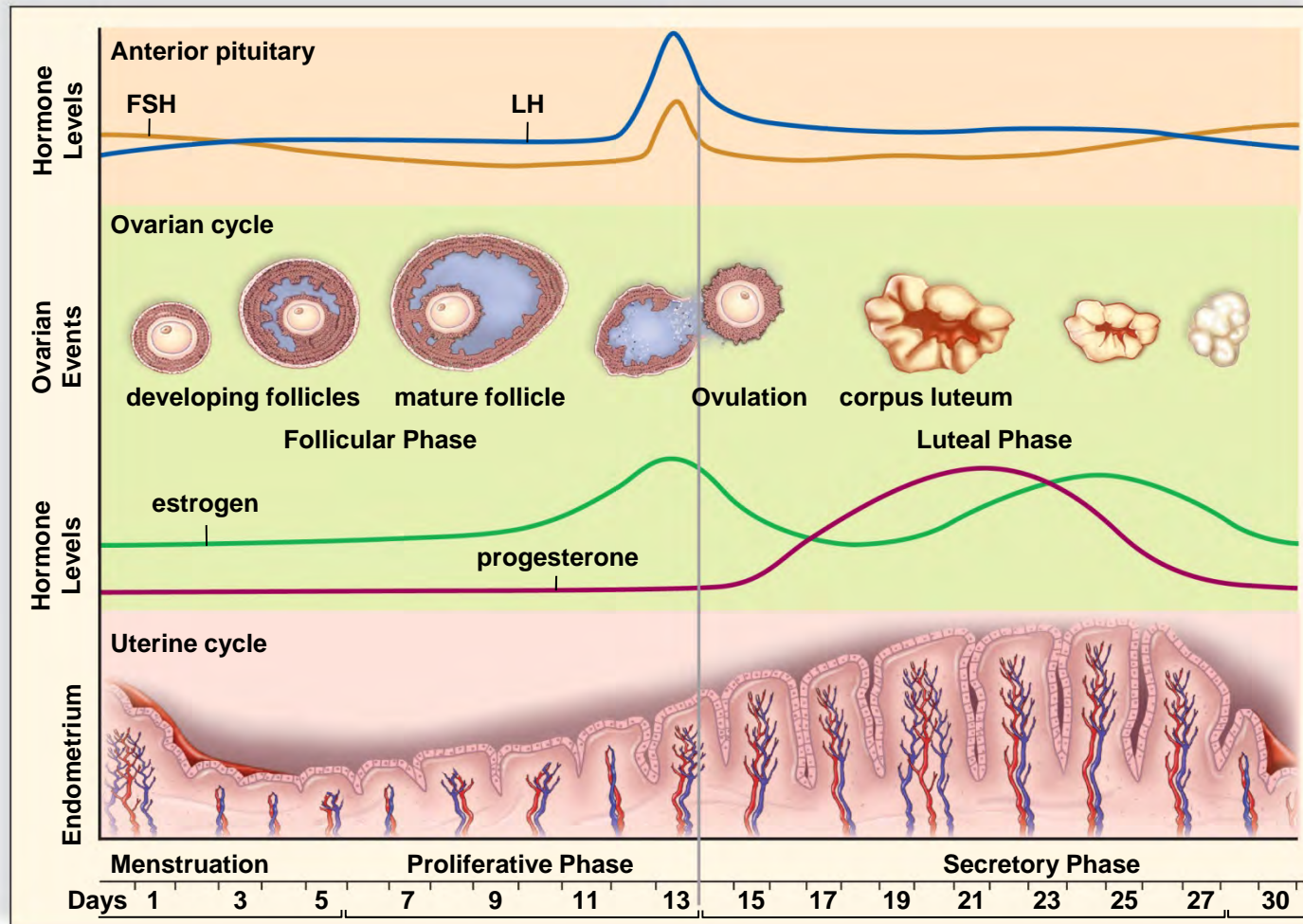


b.

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Female Hormone Levels During the Ovarian and Uterine Cycles

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Placenta

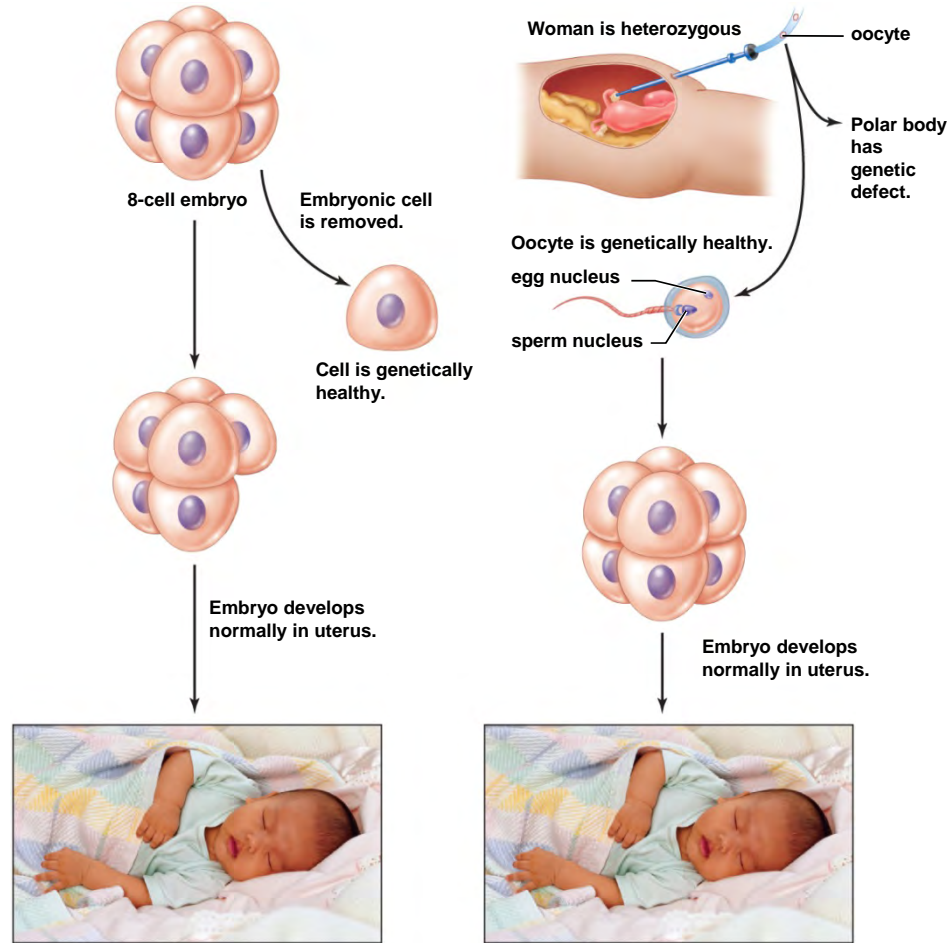
- Originates from both maternal and embryonic tissues
- Produces
 - Human chorionic gonadotropin (HCG)

Infertility

- Common Causes of Infertility
 - Females - Endometriosis
 - Males - Low Sperm Count
- Assisted Reproductive Technologies
 - Artificial Insemination by Donor (AID)
 - In Vitro Fertilization (IVF)
 - Gamete Intrafallopian Transfer (GIFT)
 - Intracytoplasmic Sperm Injection (ICSI)

Preimplantation Genetic Diagnosis

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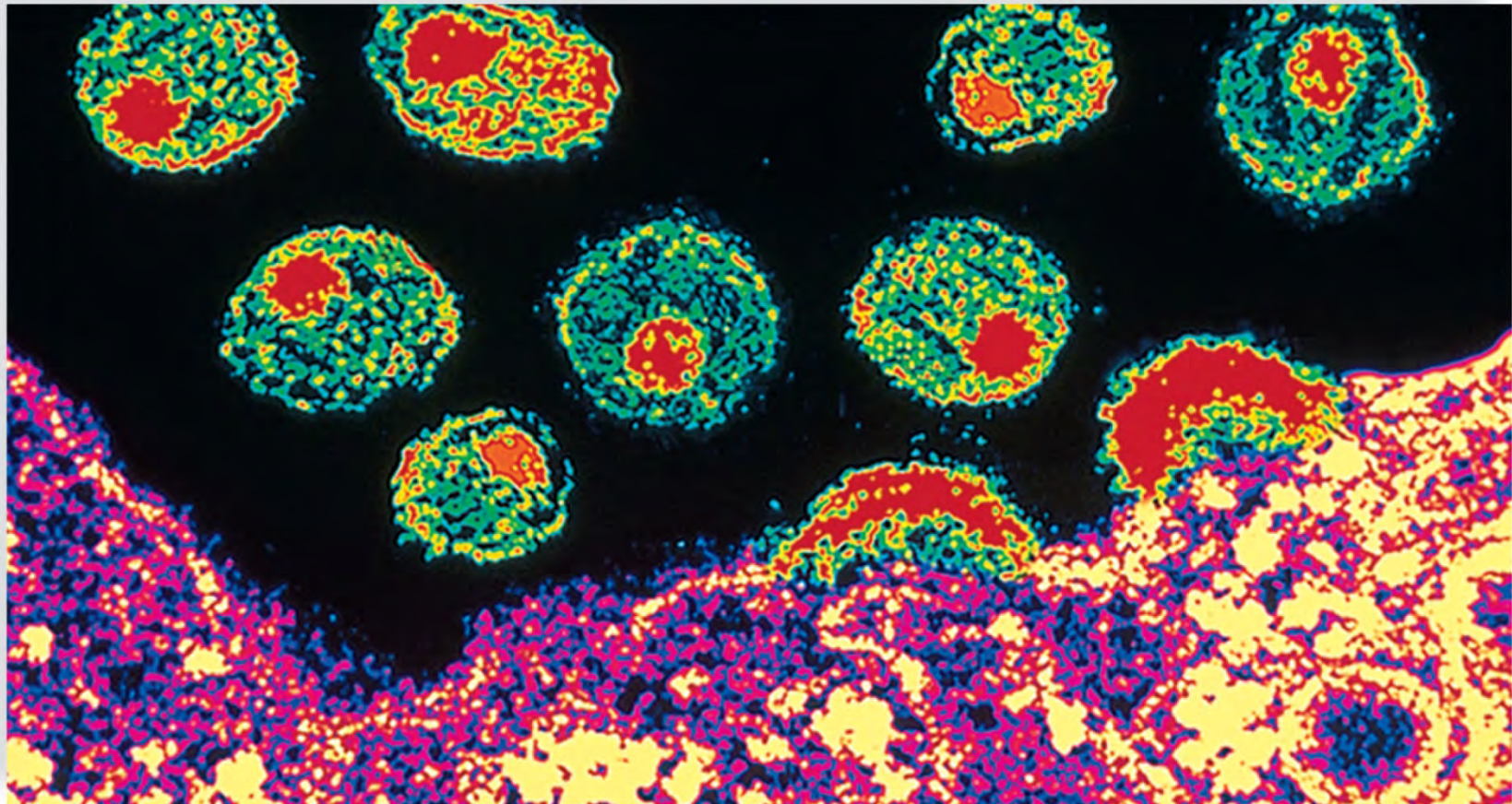
a. Testing the embryo.

b. Testing the oocyte.

a, b: © Brand X/SuperStock RF

HIV, the AIDS Virus

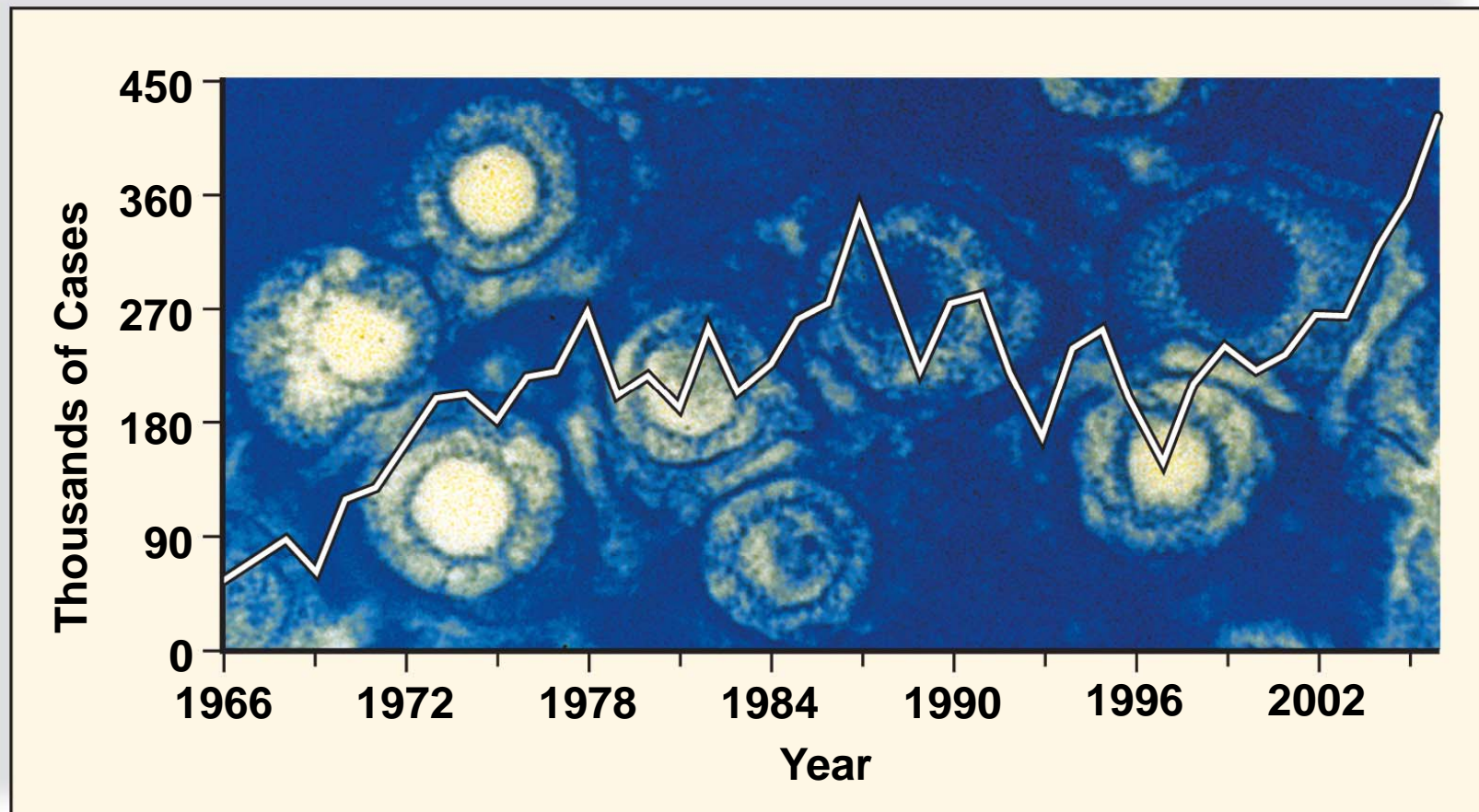
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Genital Warts

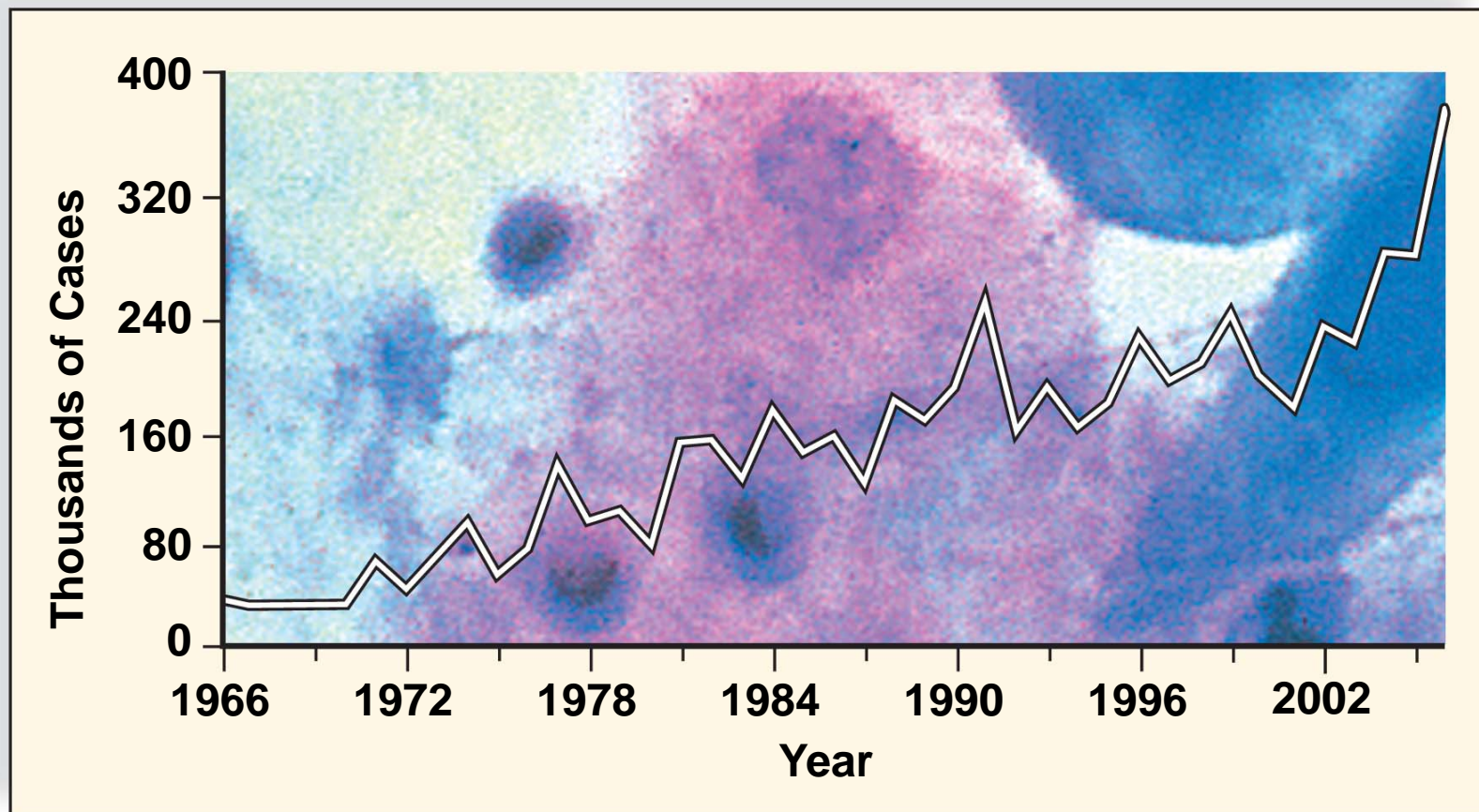
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Genital Herpes

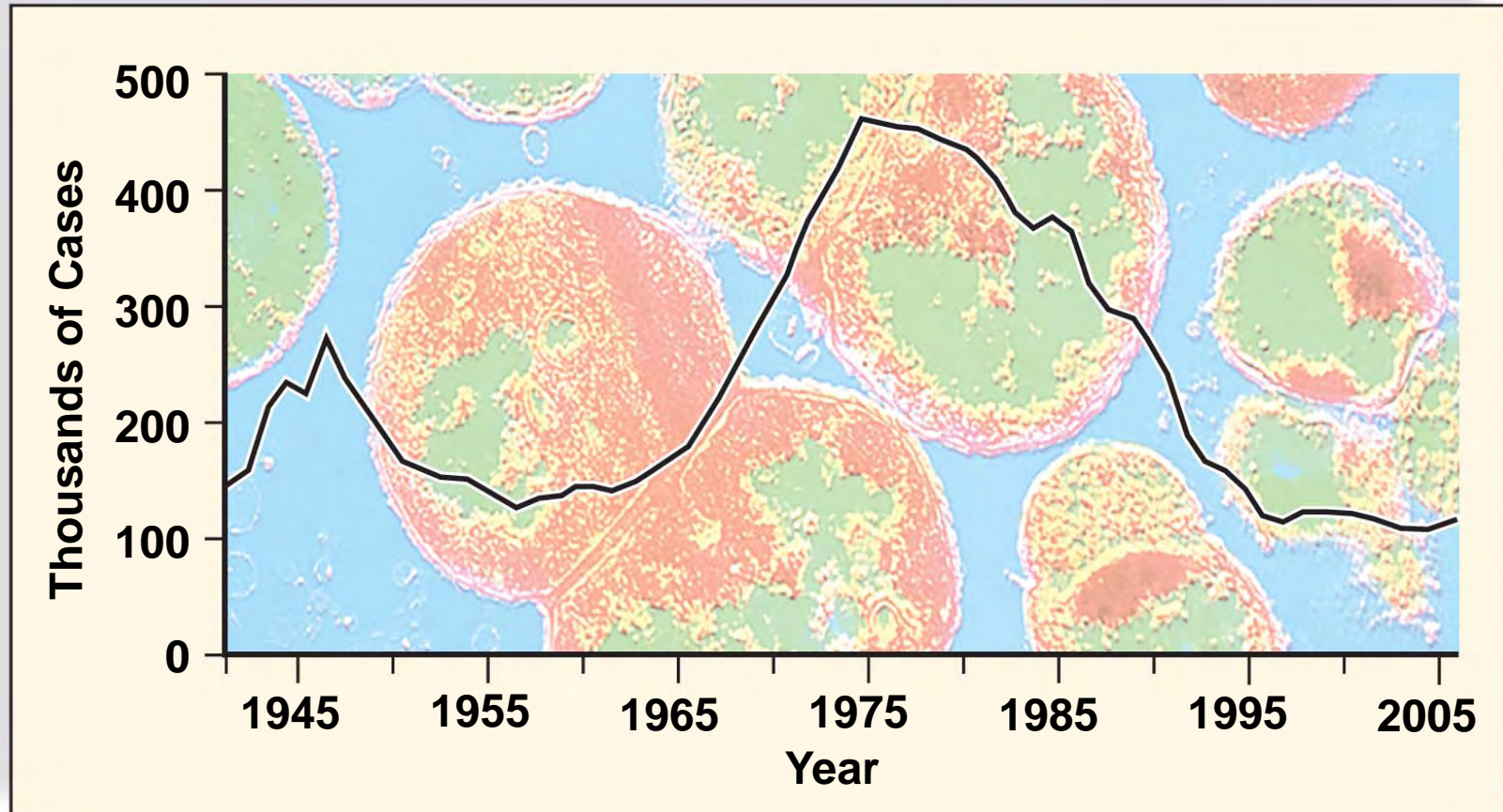
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Gonorrhea

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Review

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- Female Reproductive System
- Control of Reproduction
- Sexually Transmitted Diseases

Chapter 41: pp. 755 - 776

Reproductive Systems

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BIOLOGY

10th Edition

Sylvia S. Mader

PowerPoint® Lecture Slides are prepared by Dr. Isaac Barjis, Biology Instructor

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