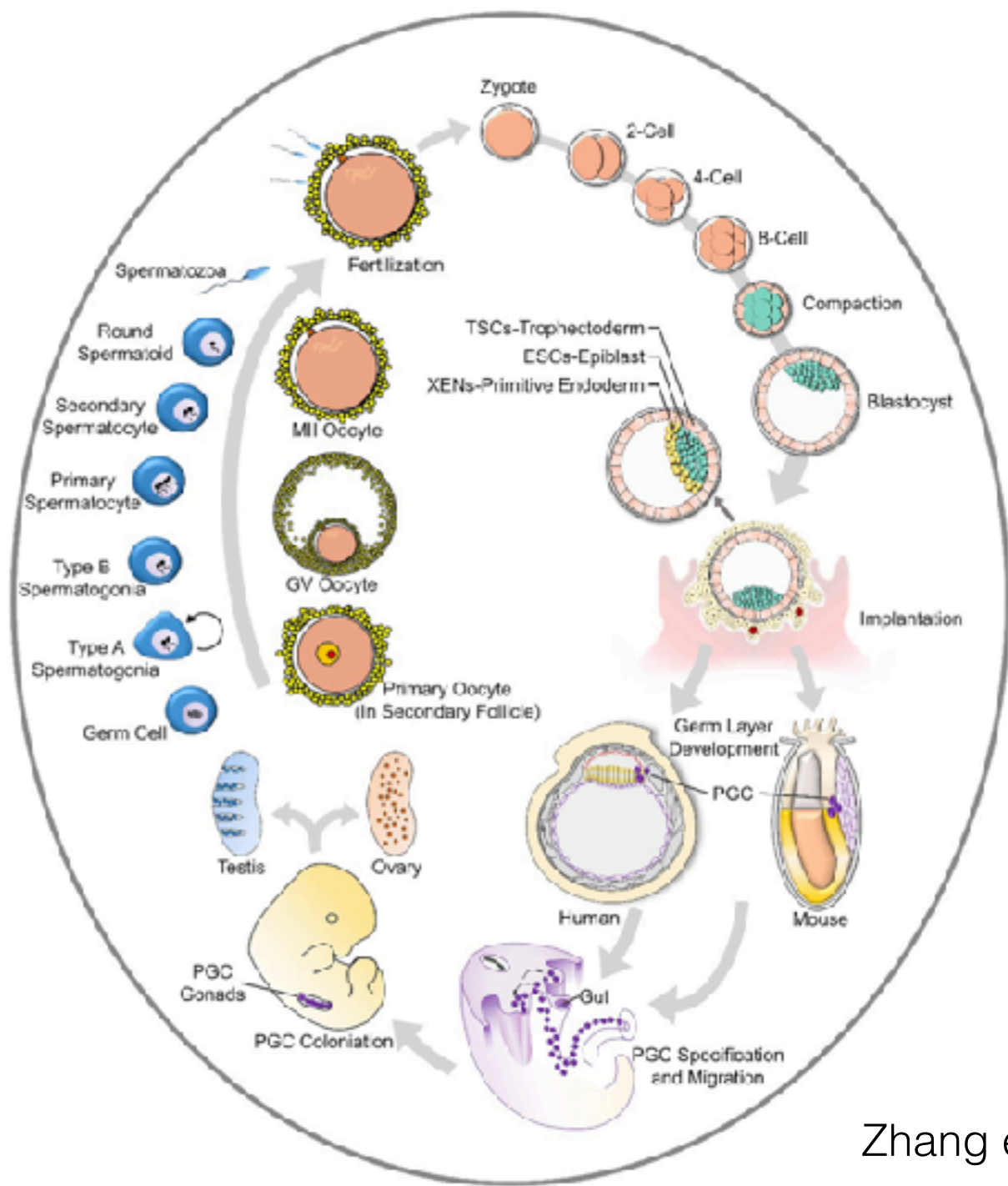
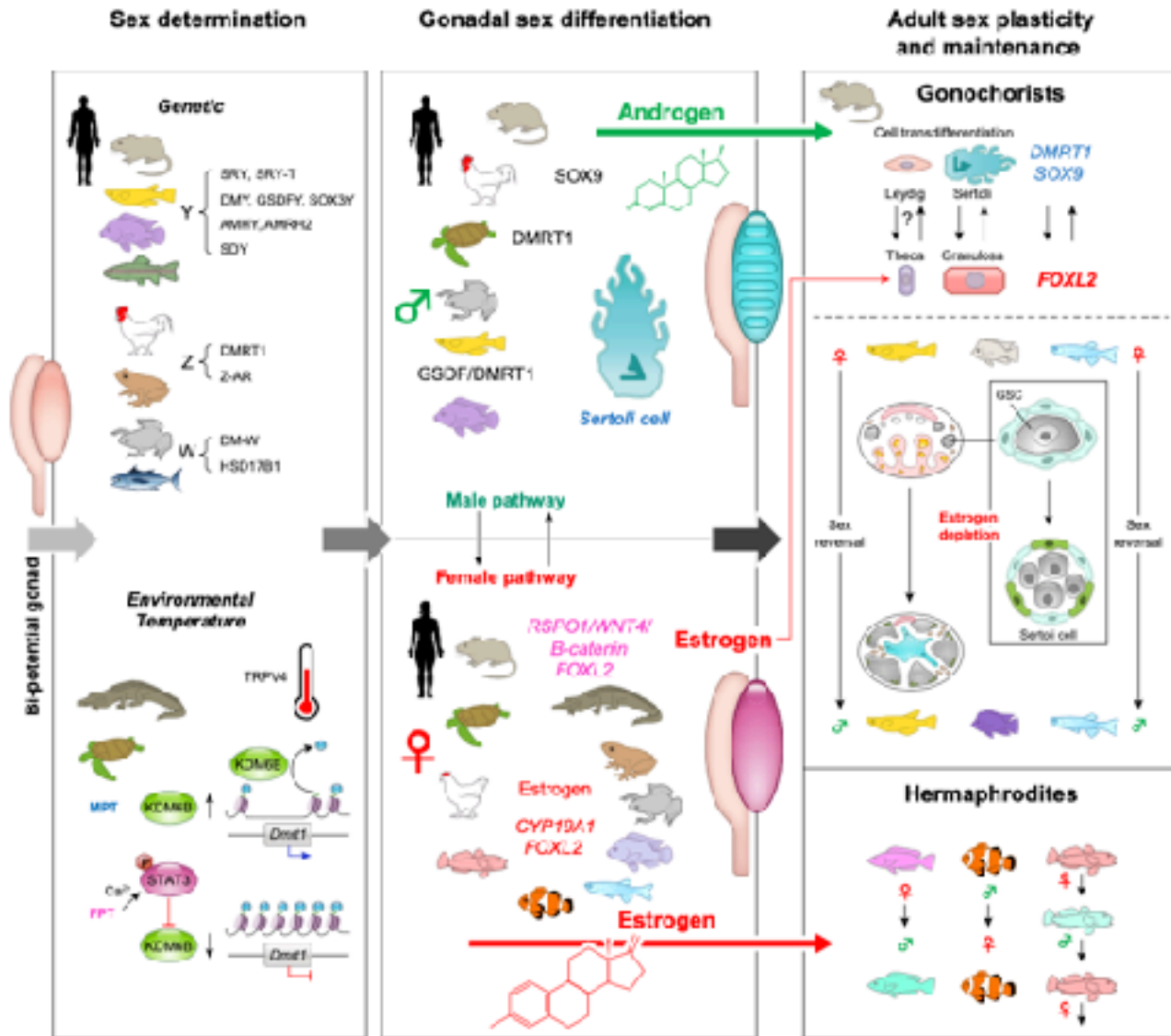



















Bi6336
Biologie zárodečných
buněk_3



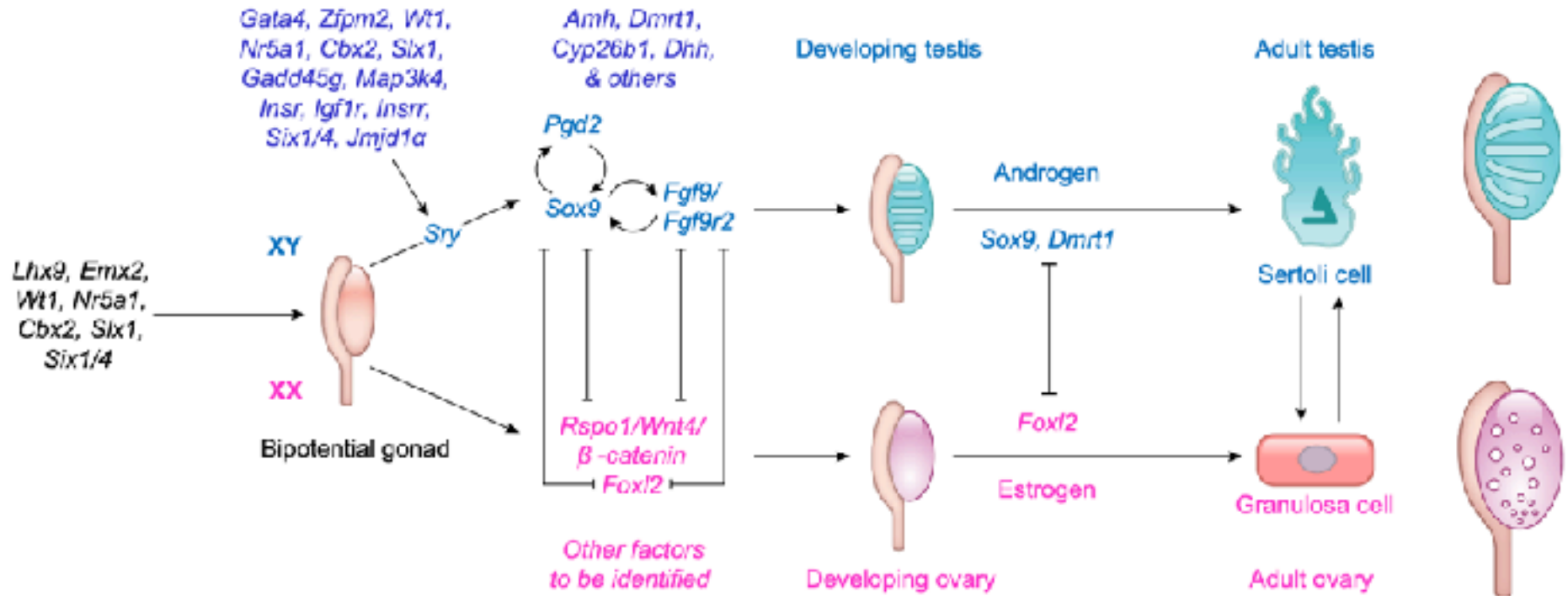
Determinace pohlaví



Determinace pohlaví

Animal	Species	Genetic type	SD gene	Protein function	Reference
	Mammals	XY/XX	<i>SRY/Sry</i>	TF	<i>Sinclair et al 1990 (104)</i>
	Medaka, <i>Oryzias latipes</i>	XY/XX	<i>DMY</i>	TF	<i>Matsuda et al 2002 (10)</i>
	Medaka, <i>Oryzias latipes</i>	XY/XX	<i>dmr1by</i>	TF	<i>Nanda et al 2002 (121)</i>
	African clawed frog, <i>Xenopus laevis</i>	ZZ/ZW	<i>DM-W</i>	TF	<i>Yoshimoto et al 2008 (6)</i>
	Chicken, <i>Gallus gallus domesticus</i>	ZZ/ZW	<i>DMRT1</i>	TF	<i>Smith et al 2009 (13)</i>
	Patagonian pejerrey, <i>Odontesthes hatcheri</i>	XY/XX	<i>amhy</i>	H	<i>Hattori et al 2012 (2)</i>
	Luzon medaka, <i>Oryzias luzonensis</i>	XY/XX	<i>Gsdf^r</i>	GF	<i>Myosho et al 2012 (16)</i>
	Tiger pufferfish, <i>Takifugu rubripes</i>	XY/XX	<i>Amhr2</i>	HR	<i>Kamiya et al 2012 (146)</i>
	Rainbow trout, <i>Oncorhynchus mykiss</i>	XY/XX	<i>sdY</i>	IRF	<i>Yano et al 2012 (17)</i>
	Indian medaka, <i>Oryzias dancena</i>	XY/XX	<i>Sox3^Y</i>	TF	<i>Takehana et al 2014 (18)</i>
	Nile tilapia, <i>Oreochromis niloticus</i>	XY/XX	<i>amhy</i>	H	<i>Li et al 2015 (3)</i>
	Turquoise killifish, <i>Nothobranchius furzeri</i>	XY/XX	<i>gdf6^Y</i>	GF	<i>Reichwald et al 2015 (151)</i>
	Japanese wrinkled frog, <i>Glandirana rugosa</i>	ZZ/ZW	<i>Z-AR</i>	HR	<i>Oike et al 2017 (19)</i>
	Chinese tongue sole, <i>Cynoglossus semilaevis</i>	ZZ/ZW	<i>dmr1</i>	TF	<i>Cui et al 2017 (14)</i>
	<i>Seriola</i> fishes	ZZ/ZW	<i>Hsd17b1</i>	SE	<i>Koyama et al 2019 (155)</i>
	Northern pike, <i>Esox lucius</i>	XY/XX	<i>amhbY</i>	H	<i>Pan et al 2019 (4)</i>
	Mouse	XY/XX	<i>Sry-T</i>	TF	<i>Miyawaki et al 2020 (106)</i>

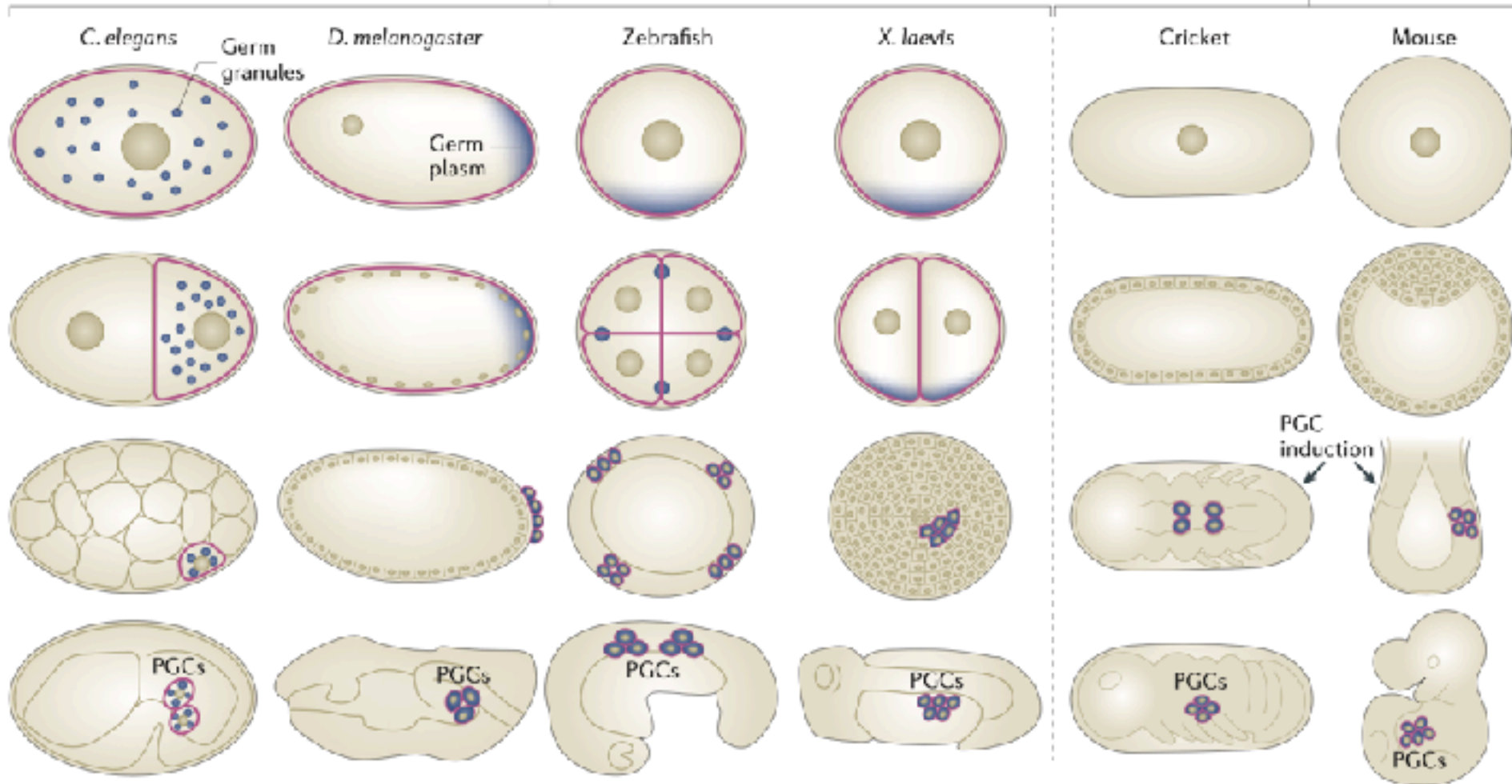
Sex determination



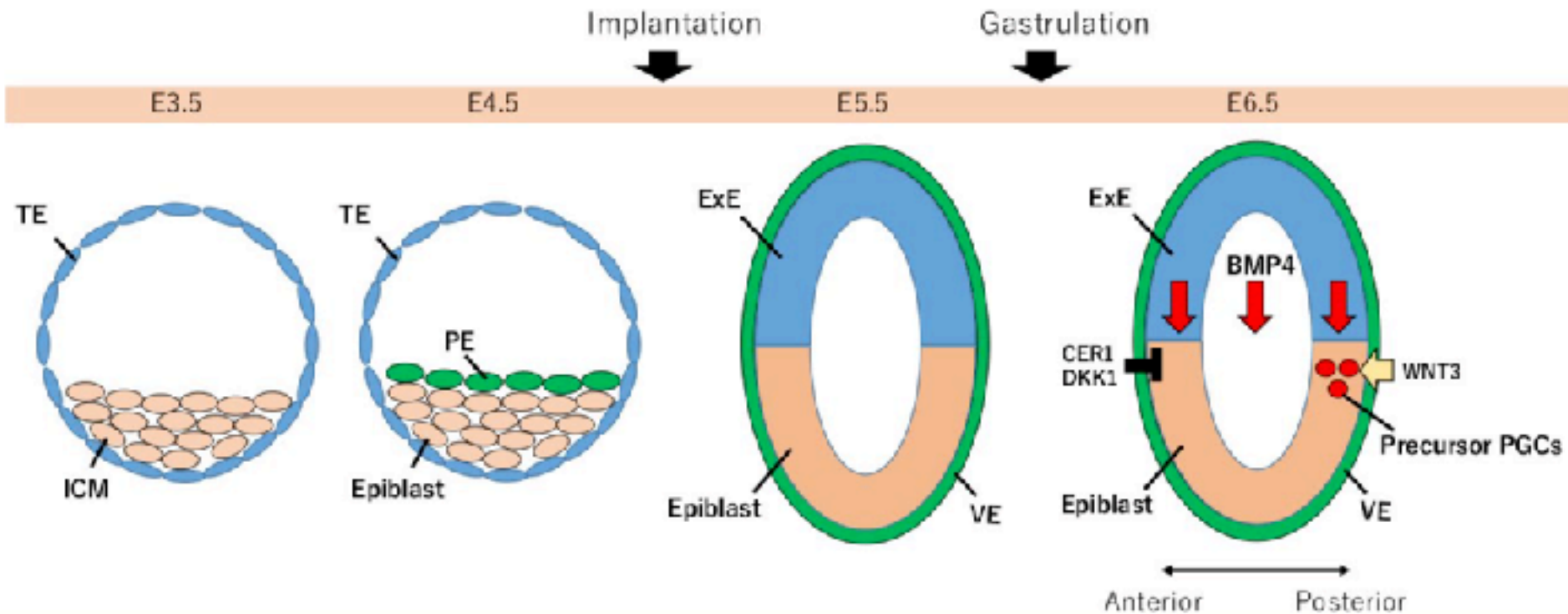
Vznik PGCs continuum vs indukce

Preformation

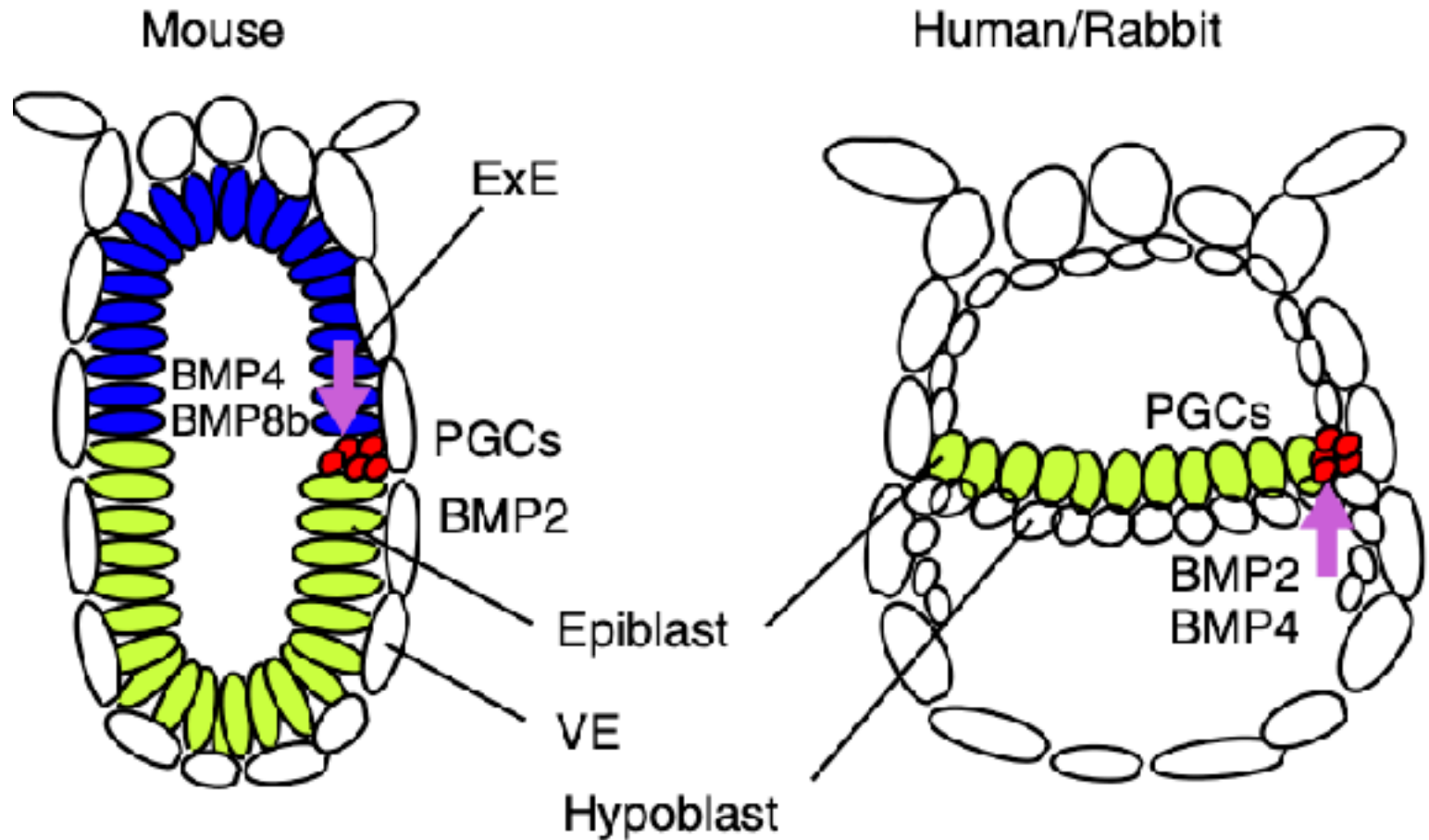
Induction



Indukce vzniku zárodečných buněk myši



Indukce zárodečných buněk myši a člověka



Modifikace chromatinu v PGCs

Mouse

BMP4 and WNT3 signalling of post-implantation epiblast cells



BLIMP1, PRDM14 and AP2 γ



DNA methylation lost
H3K9 methylation lost
H3K27 methylation gained
H3K4 methylation gained



PGCs turn on germline genes and repress somatic genes

C. elegans

Transmission of germline chromatin state from parental germ cells to embryo PGCs



MES-4 and MES-2-MES-3-MES-6 (PRC2)

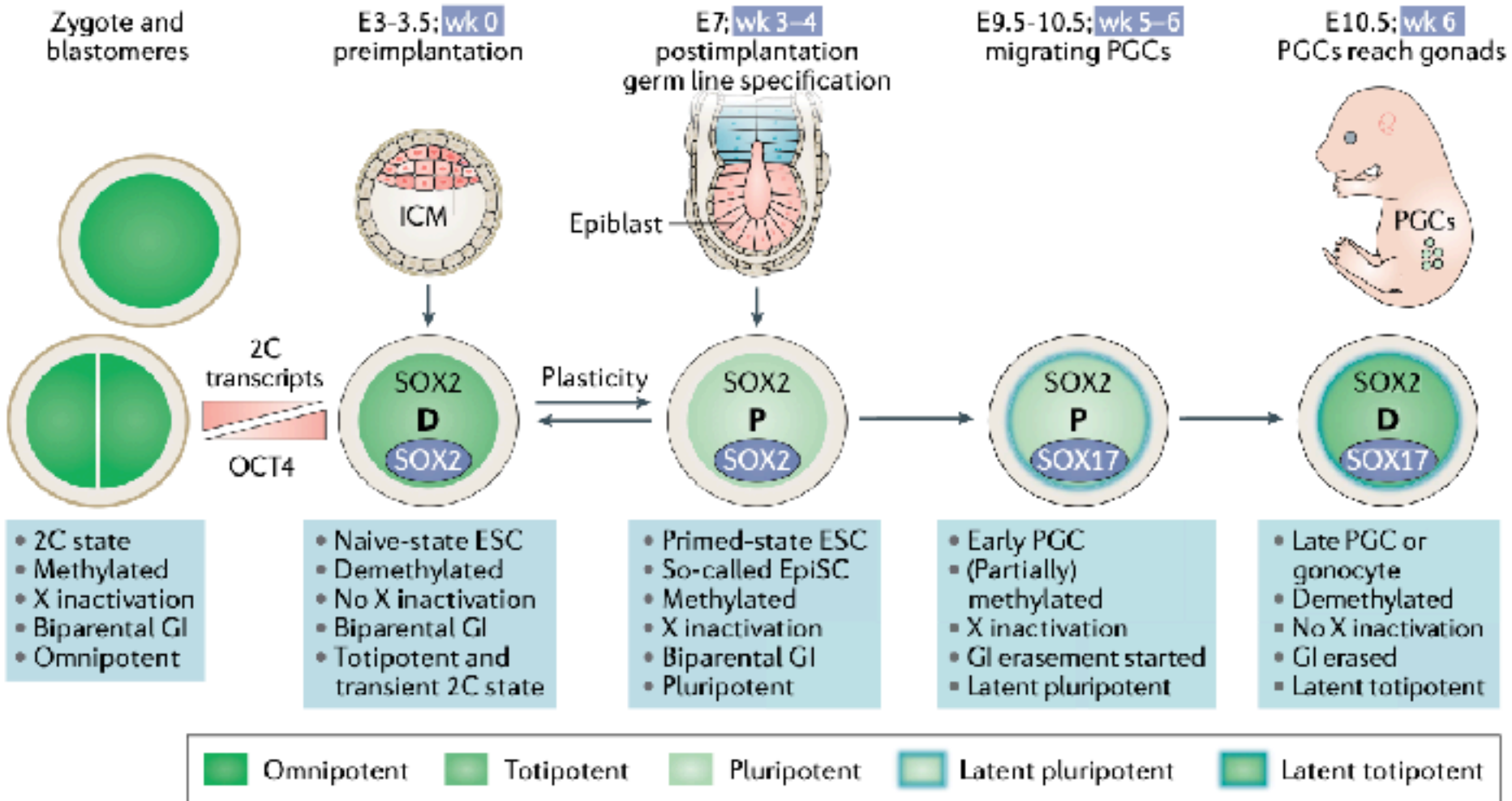


H3K36 methylation (by MES-4) on germline genes
H3K27 methylation (by PRC2) on somatic genes
H3K4 methylation gained after embryo hatches

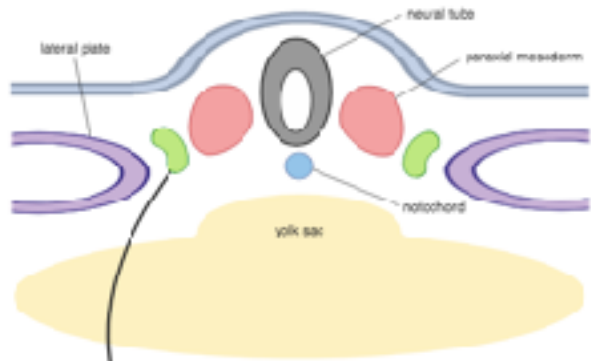


PGCs turn on germline genes but not somatic genes

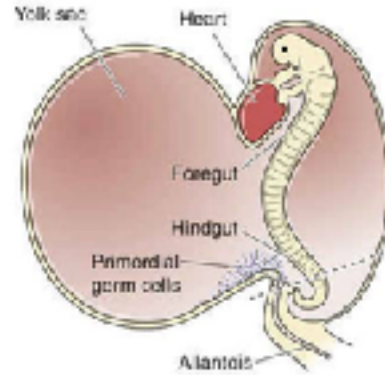
Modifikace chromatinu v PGCs



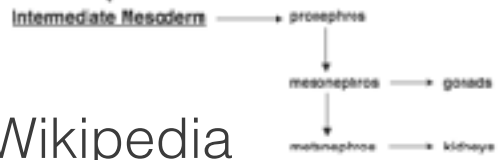
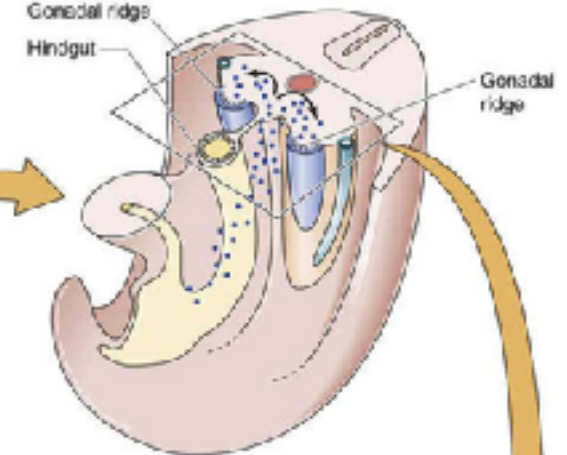
Migrate PGCs



A EARLY EMBRYO (FIFTH WEEK)

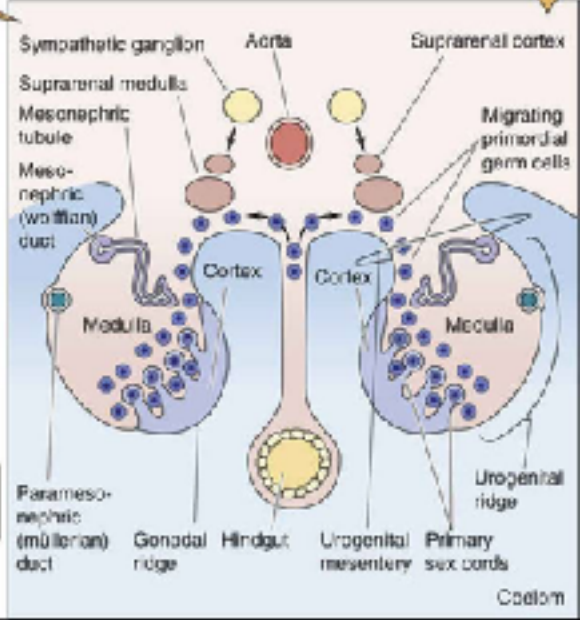


B MIGRATION OF GERM CELLS TO GONADAL RIDGES

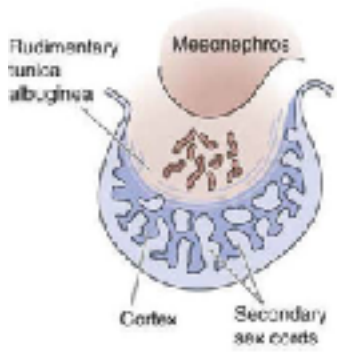


Wikipedia

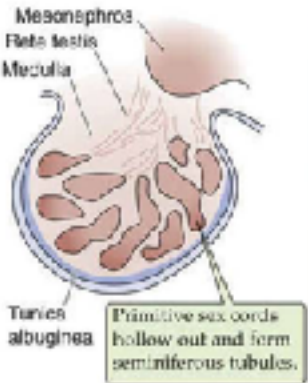
C INDIFFERENT OR PRIMORDIAL GONAD



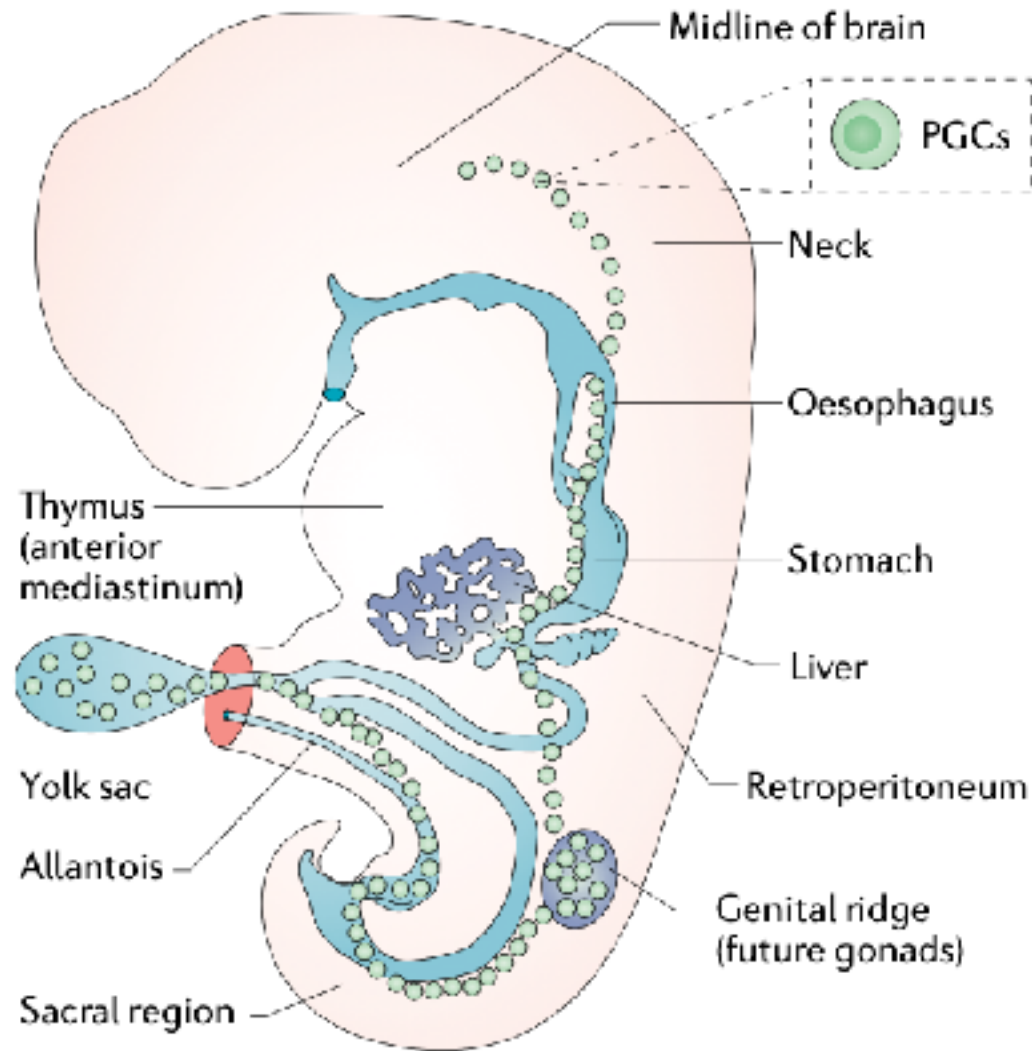
E DEVELOPING OVARY



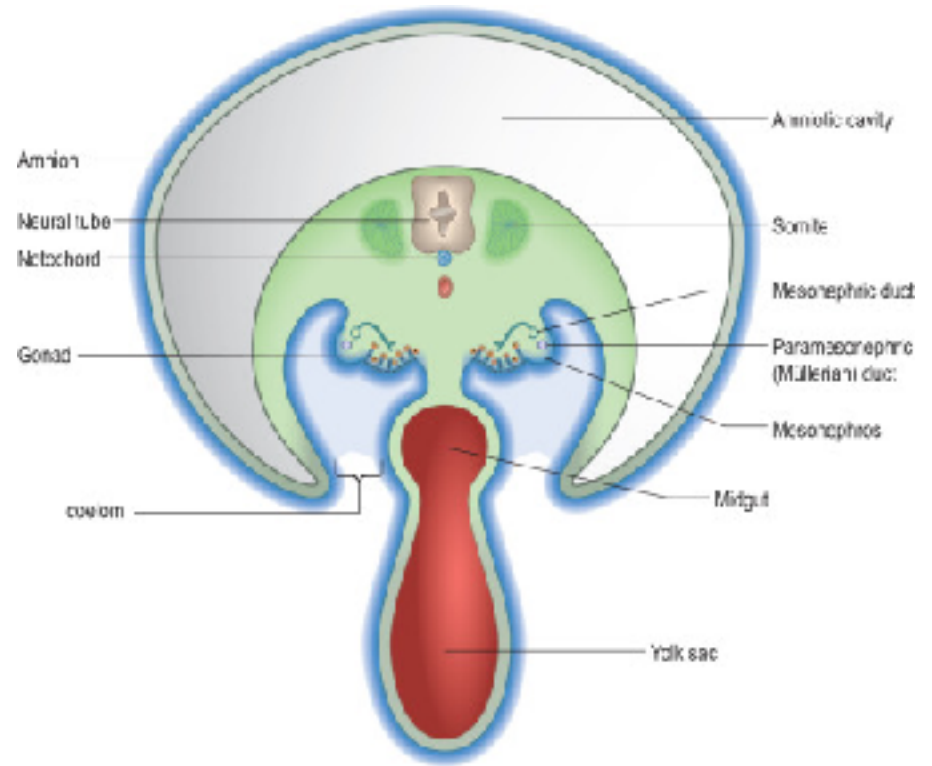
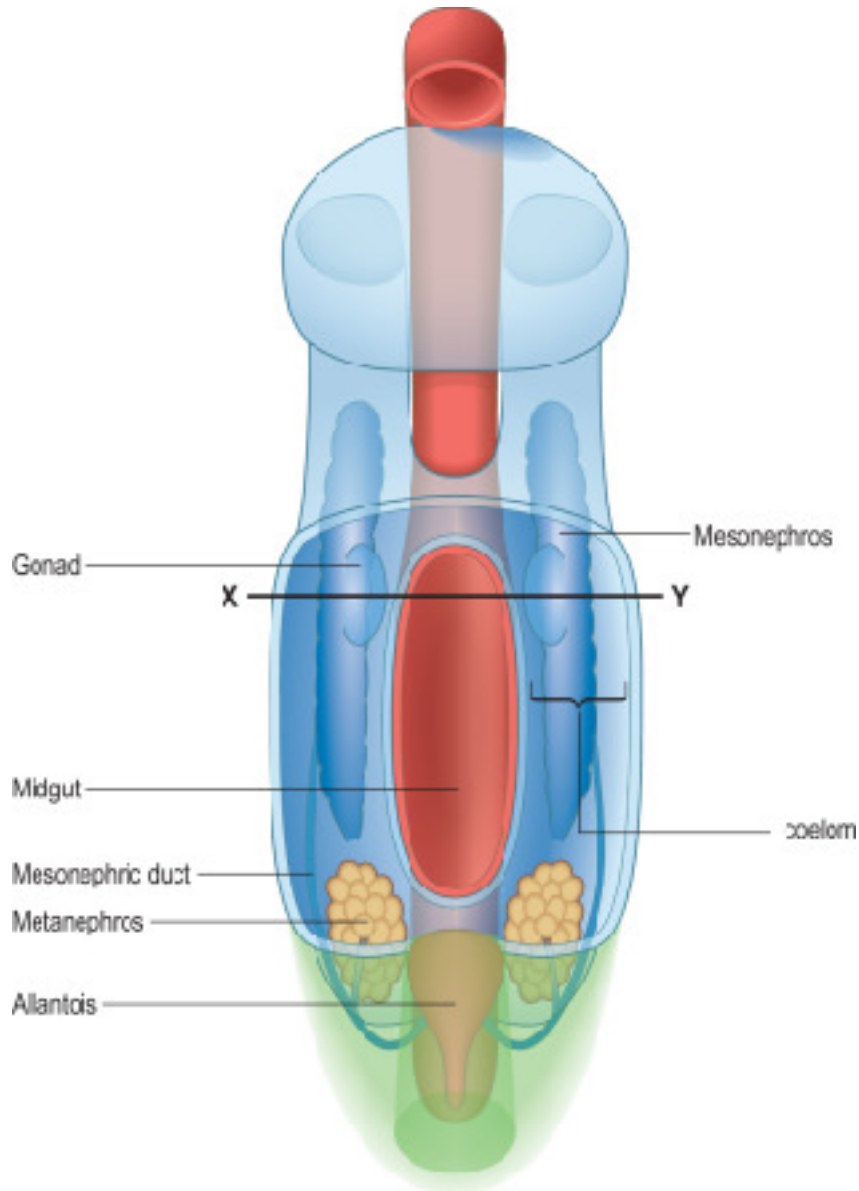
D DEVELOPING TESTIS



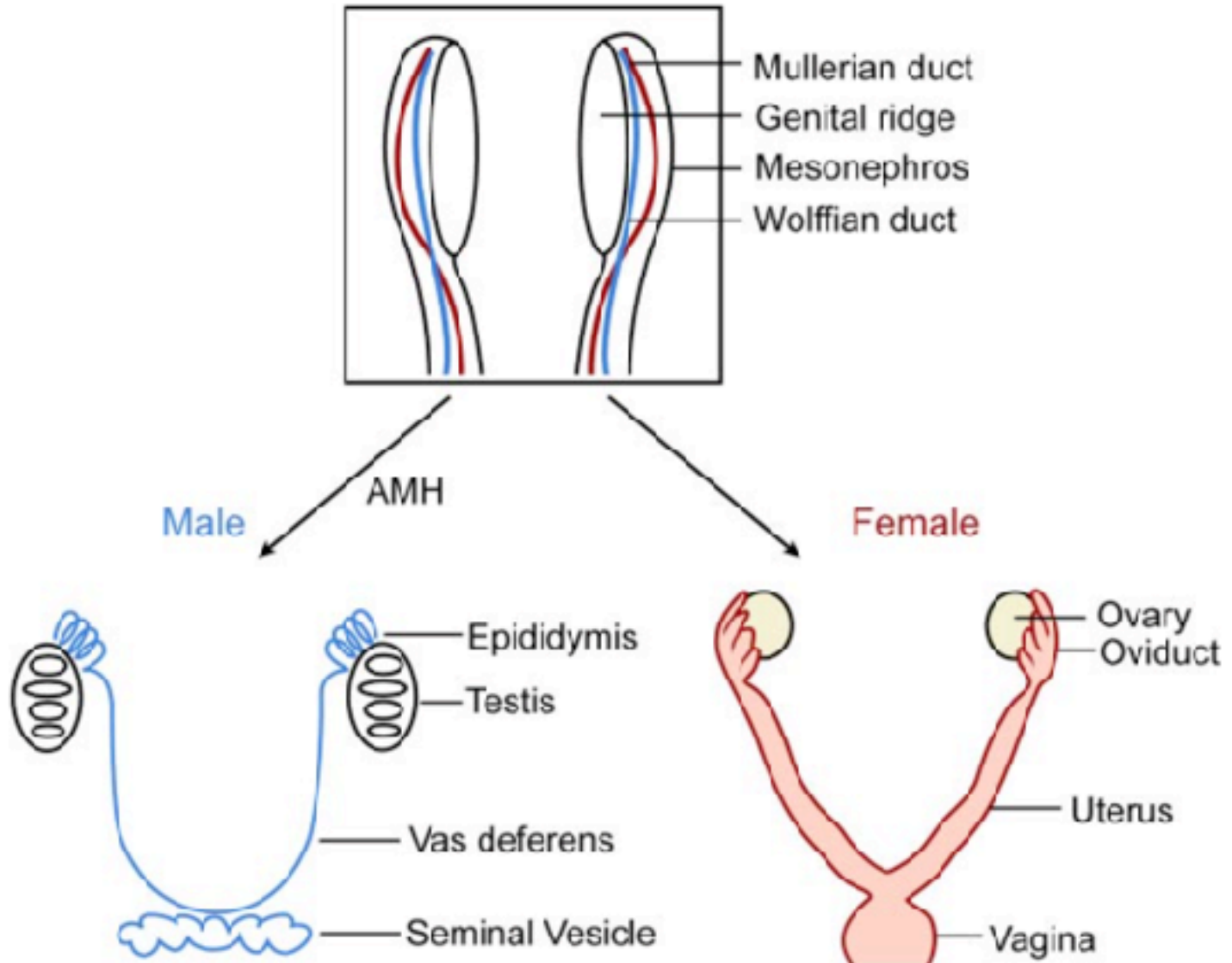
Migrate PGCs - rizika



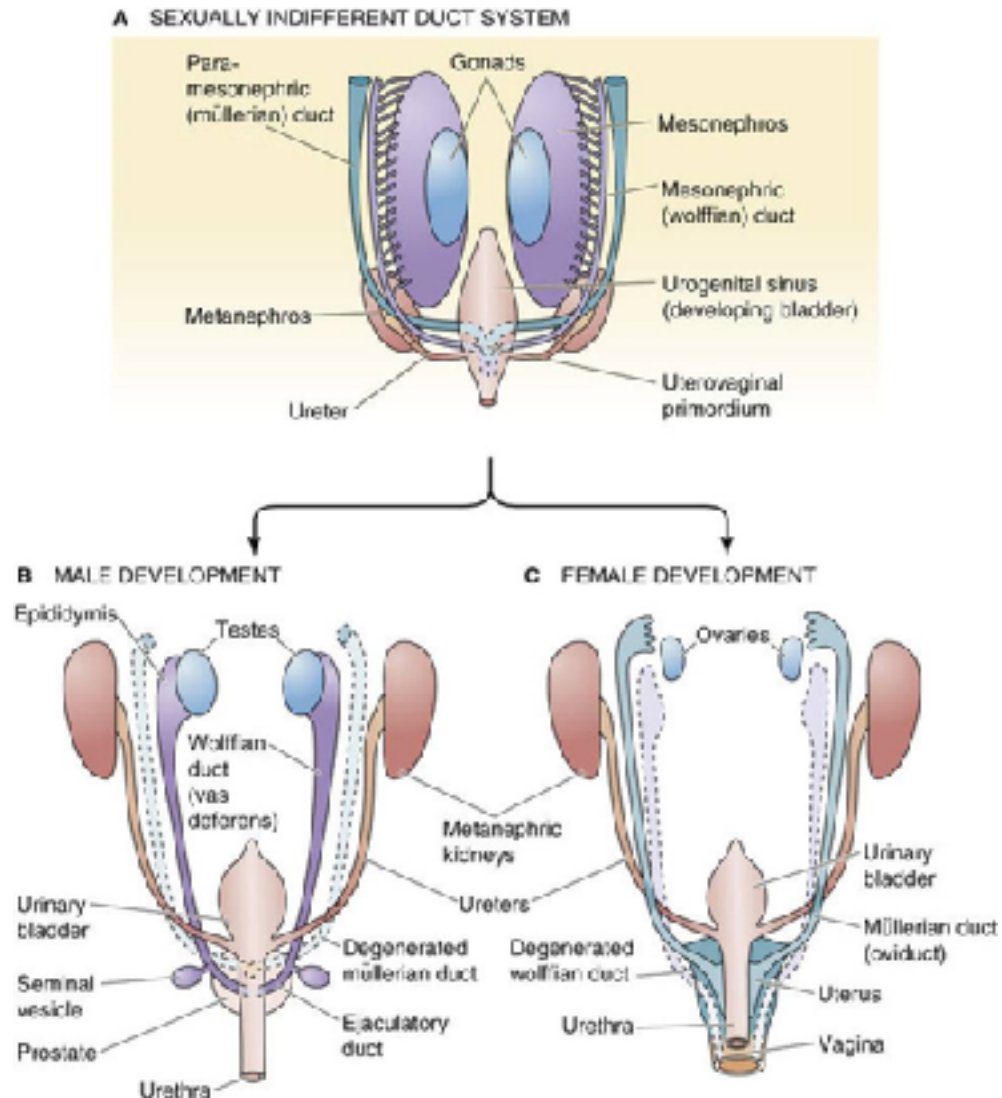
Vývoj pohlavního aparátu



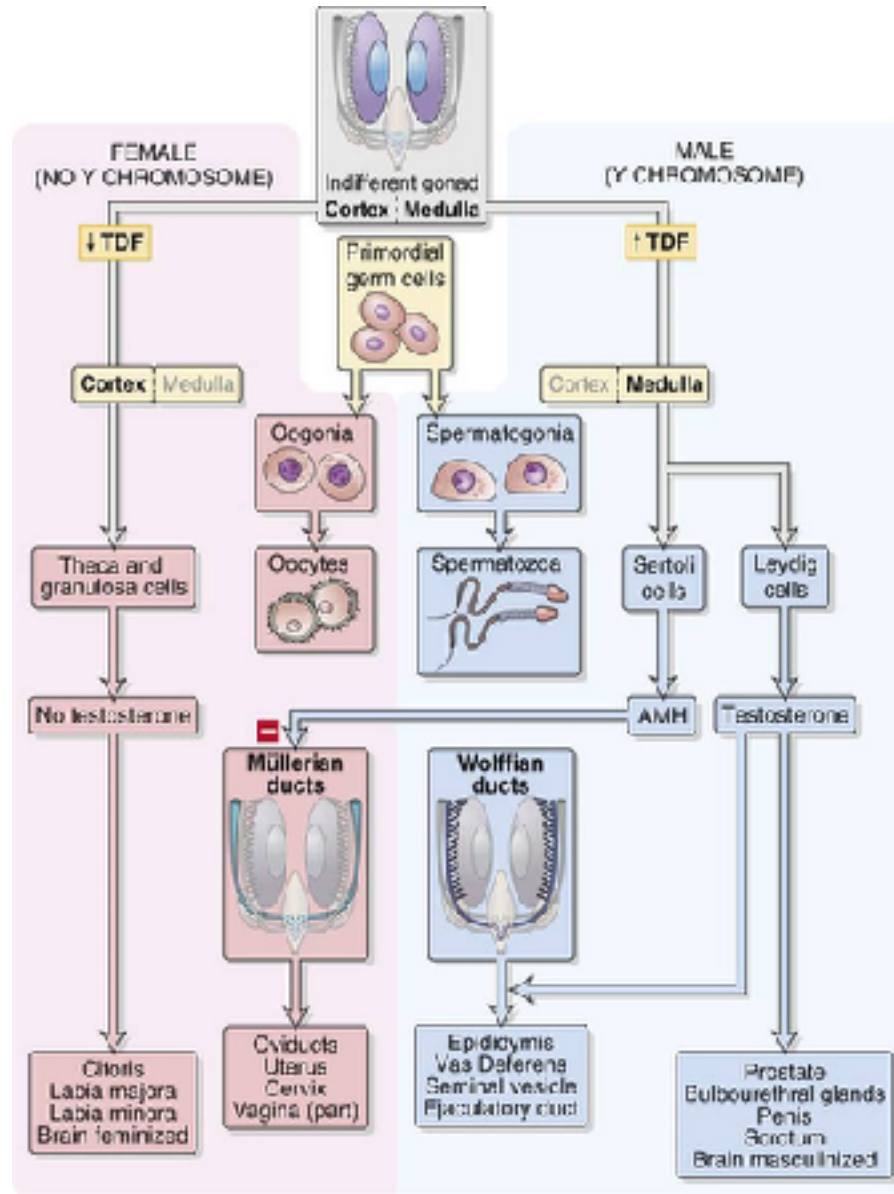
Vývoj pohlavního aparátu



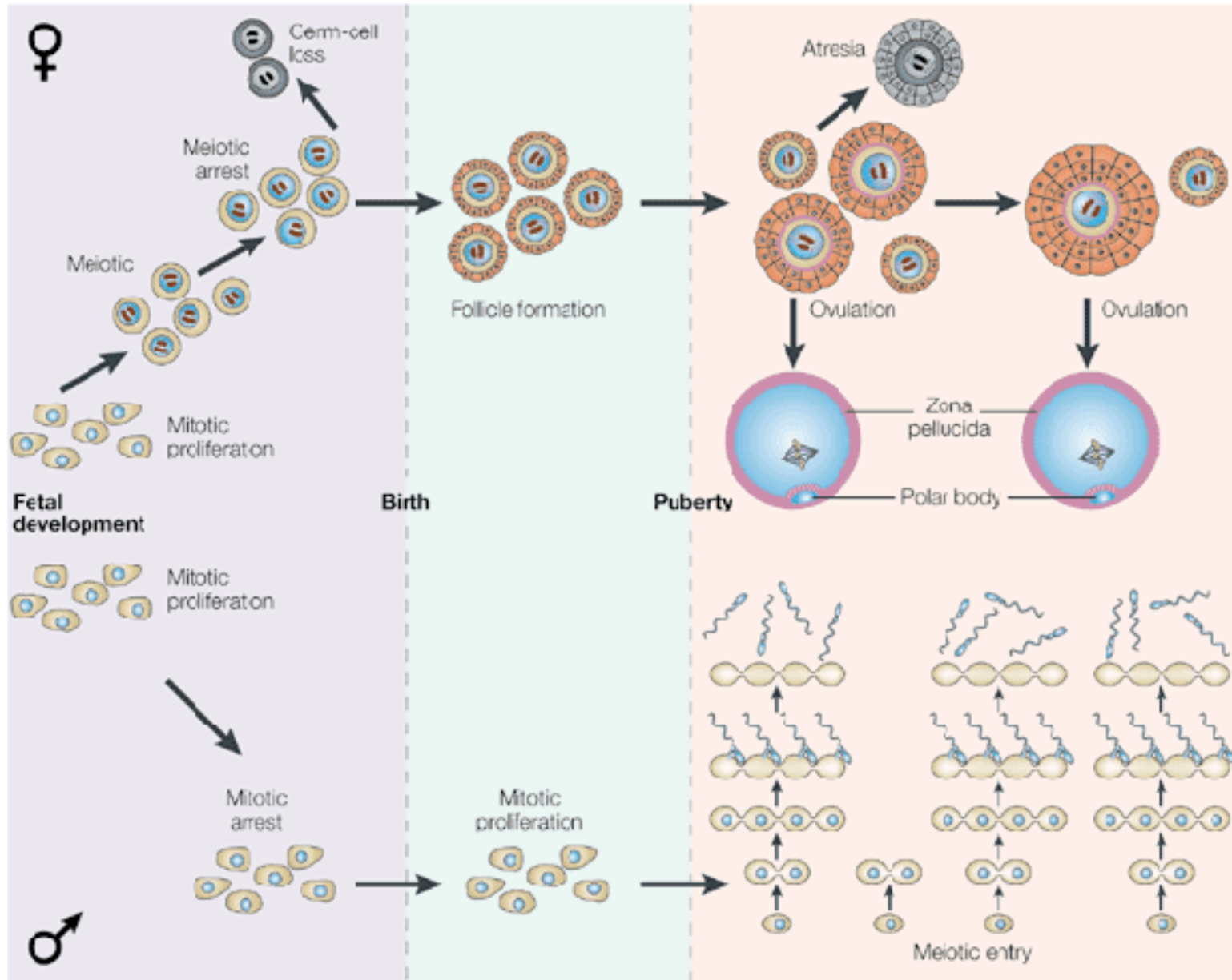
Vývoj pohlavního aparátu



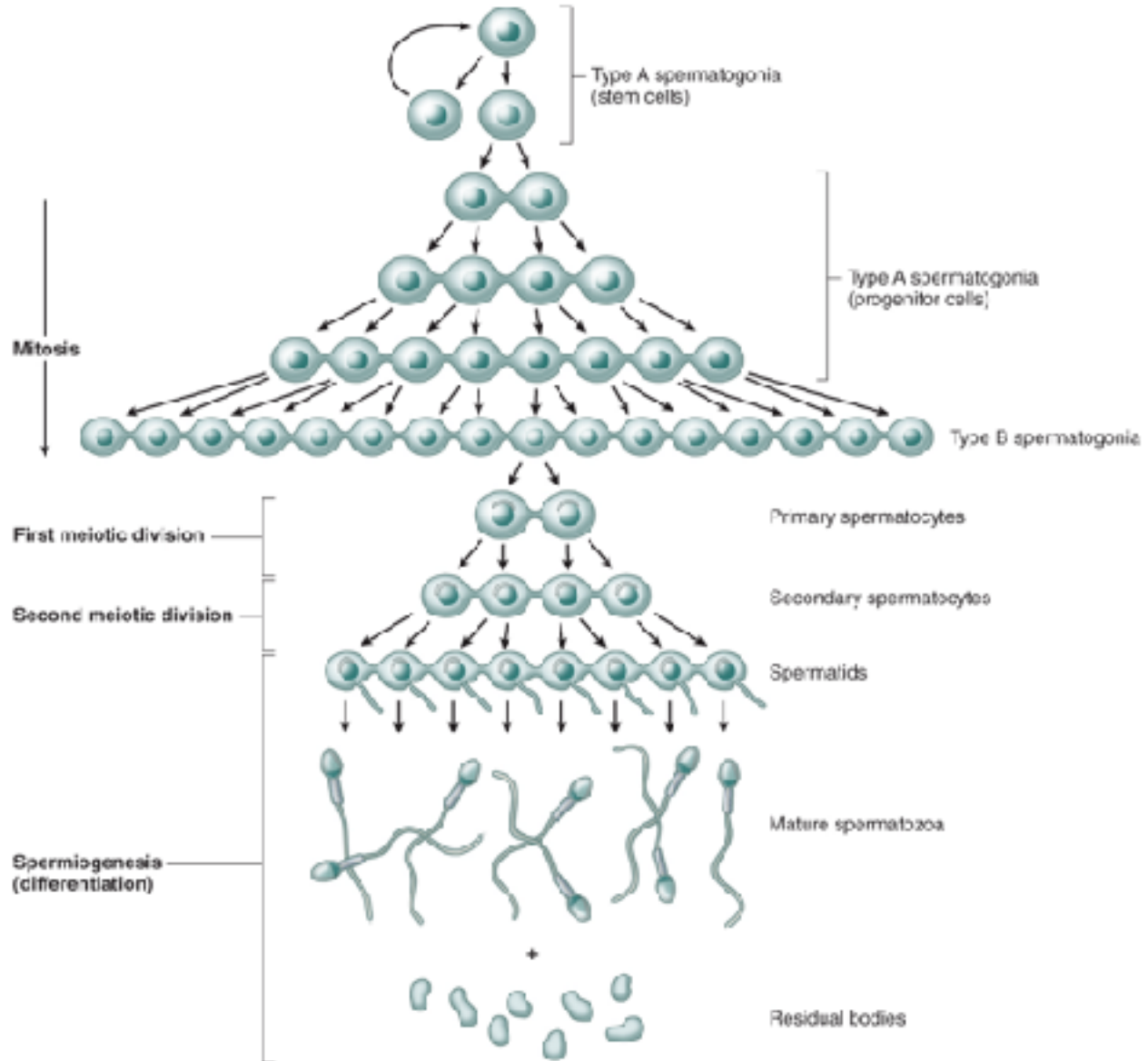
Vývoj pohlavního aparátu



Srovnání vývoje oocytů a spermii



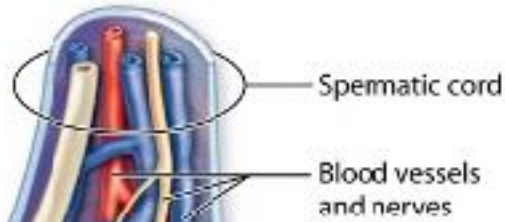
Spermatogeneze



Spermatogeneze



Ductus deferens



Spermatic cord

Blood vessels and nerves

Head of epididymis
Duct of epididymis
Seminiferous tubule
Straight tubule

Efferent ductule

Mediastinum testis
(housing rete testis)

Body of epididymis

Septum

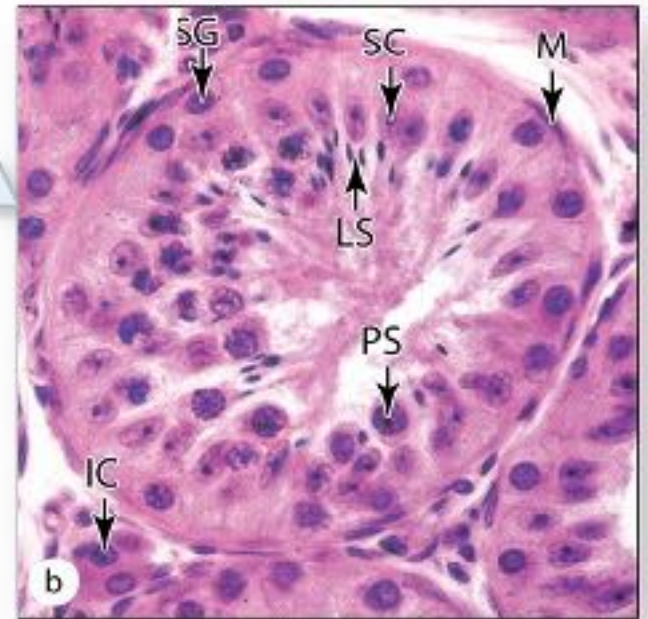
Lobule

Visceral layer of tunica vaginalis

Parietal layer of tunica vaginalis

Tunica albuginea

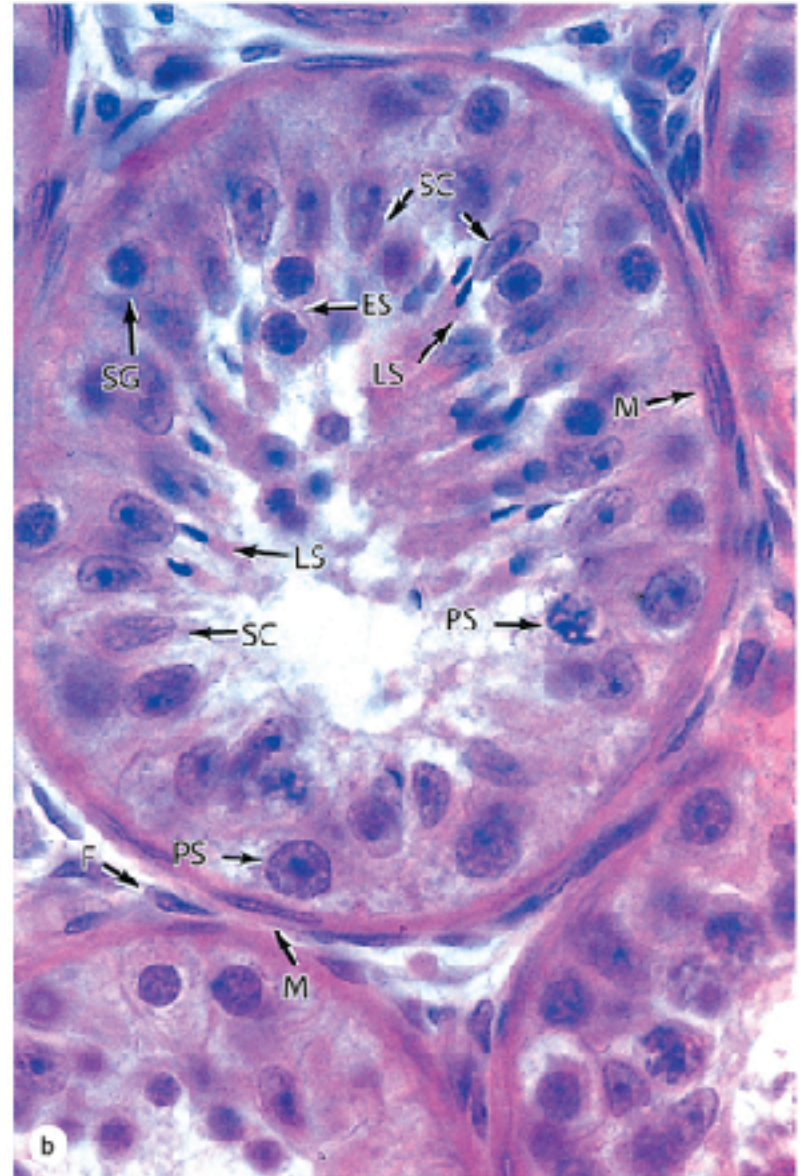
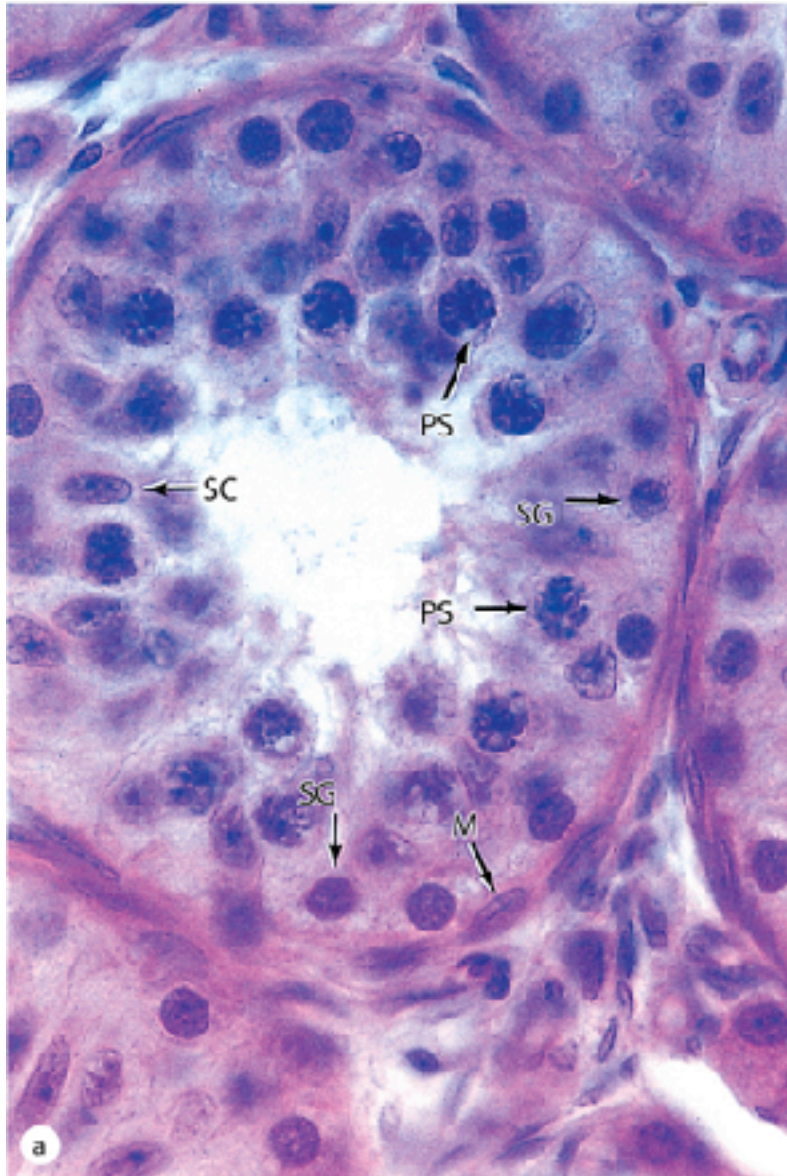
Tail of epididymis



b

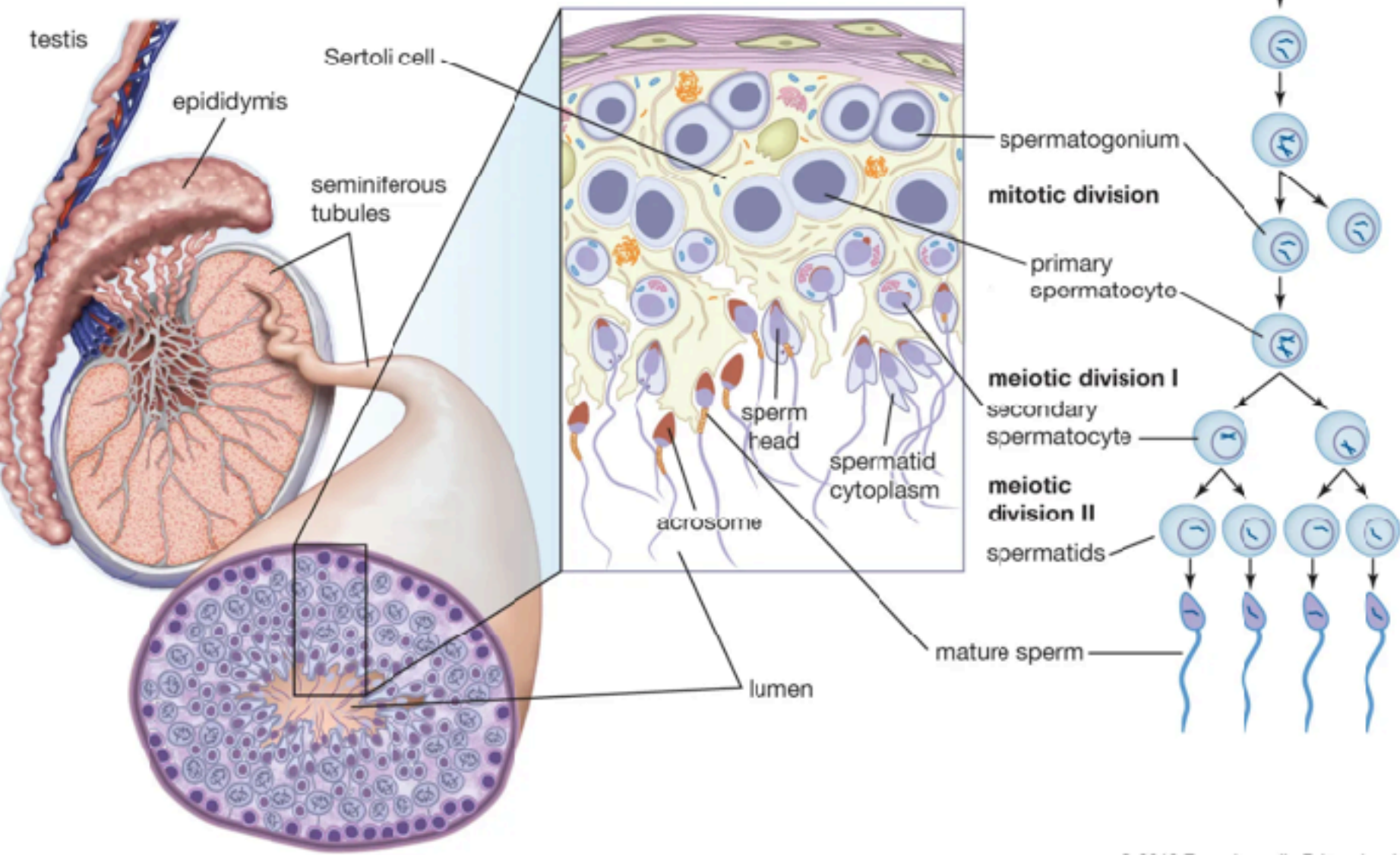
a

Spermatogeneze



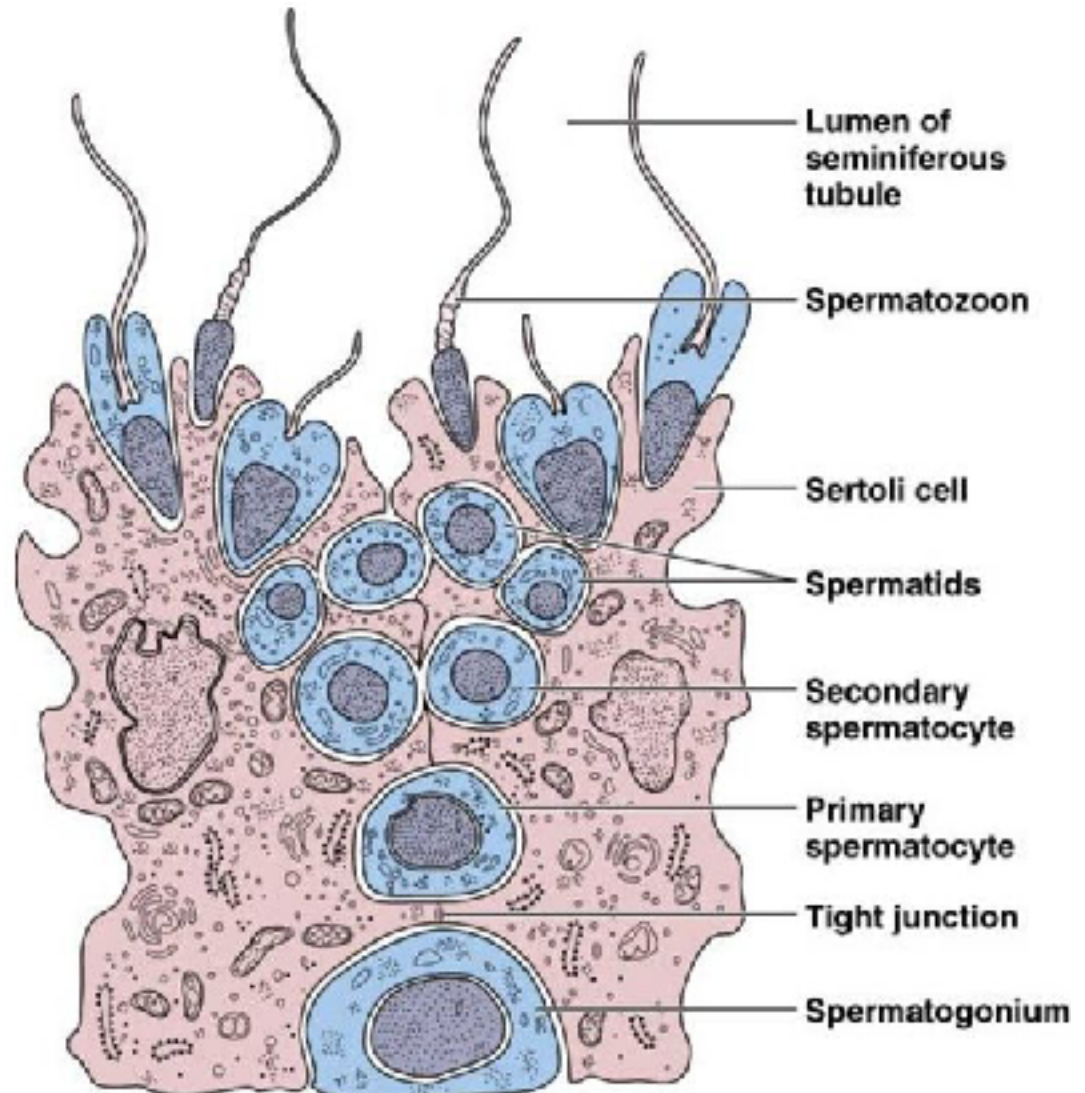
Spermatogeneze

Spermatogenesis

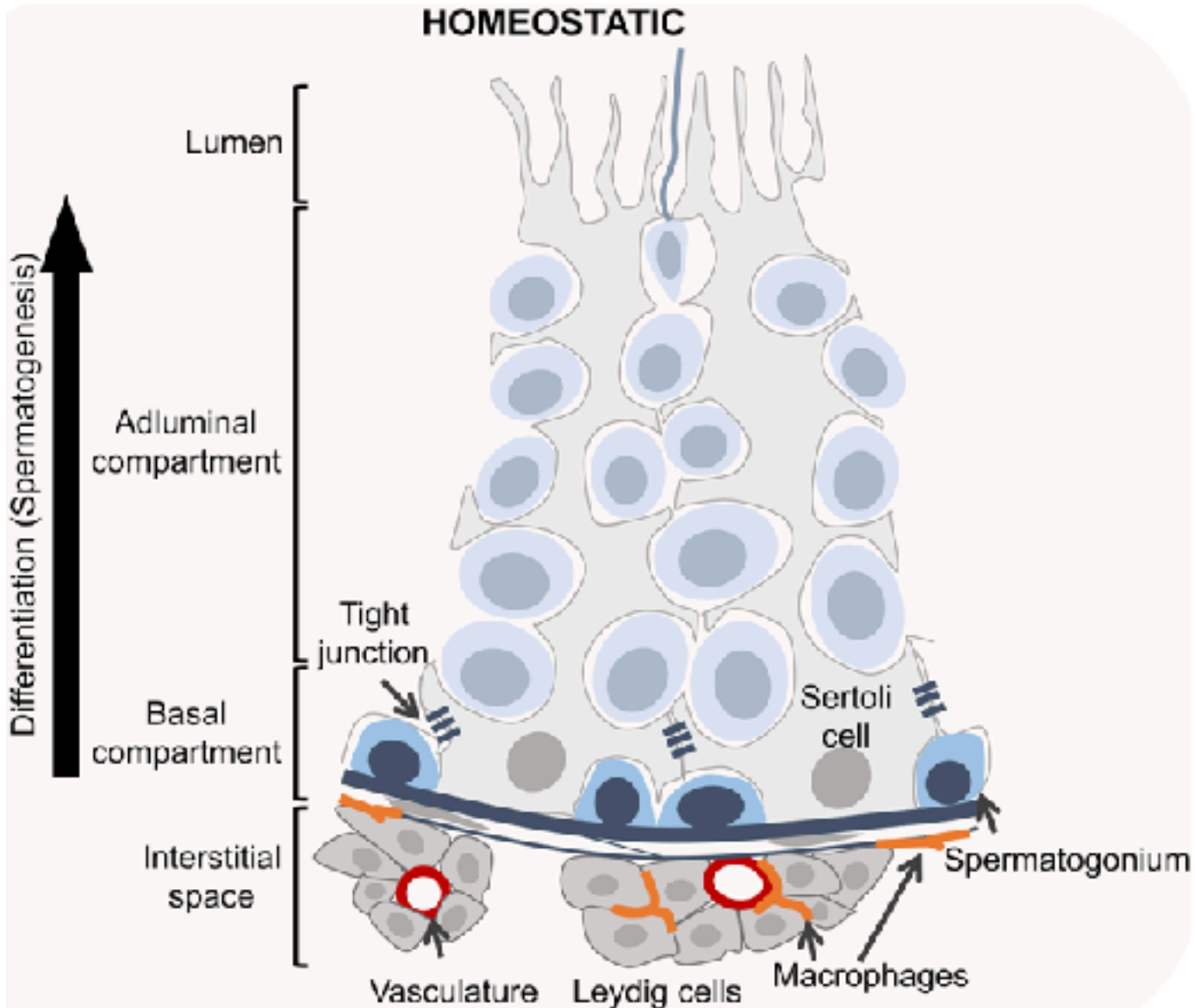


Spermatogenesis

- Meiosis
- Sertoli cells
 - Nourish and “clean”
 - Secrete testicular fluid
 - androgens
- Tight junction
 - Blood-testis barrier
 - prevents sperm antigens from the immune

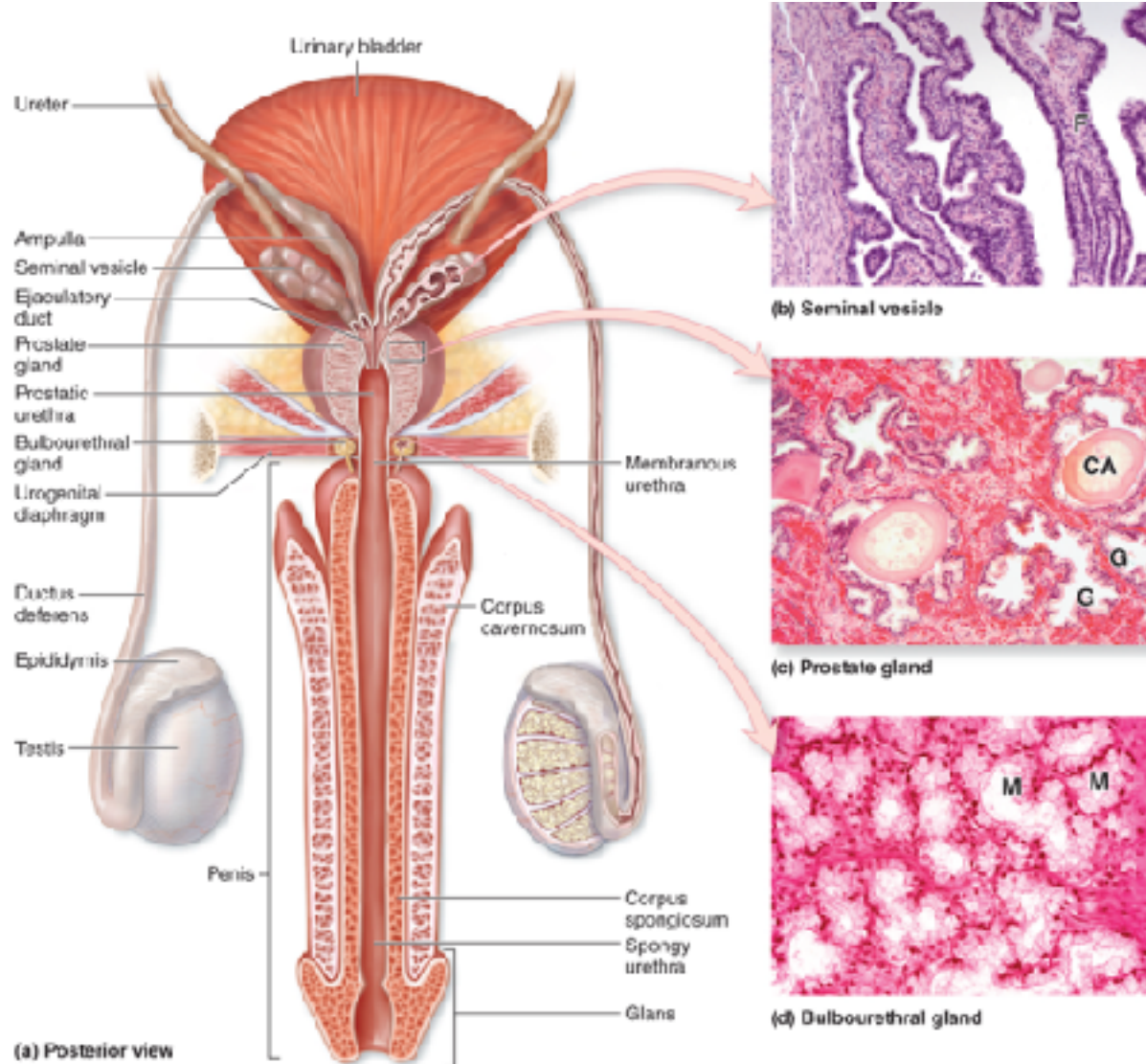


Spermatogeneze





Průchod spermií pohl. aparátem



Vývoj savčích oocytů

Follicle Development

1
Primordial
follicle
formation
(35 μ m)

2
Follicle recruitment
and growth
(46-200 μ m)

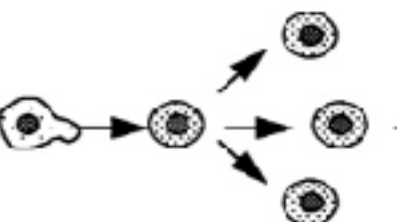
3
Antral cavity
formation
(200-500 μ m)

4
Growth and Maturation of
Graafian follicle
(>6000 μ m)

antrum
expansion

5
Growth of meiotically incompetent oocyte:
replication and redistribution of cytoplasmic organelles
mRNA transcription, translation and storage
synthesis of the zona pellucida

6
Mature GV Oocyte
Meiotically
competent
(2n4C)



1
PGC

2
Oogonia

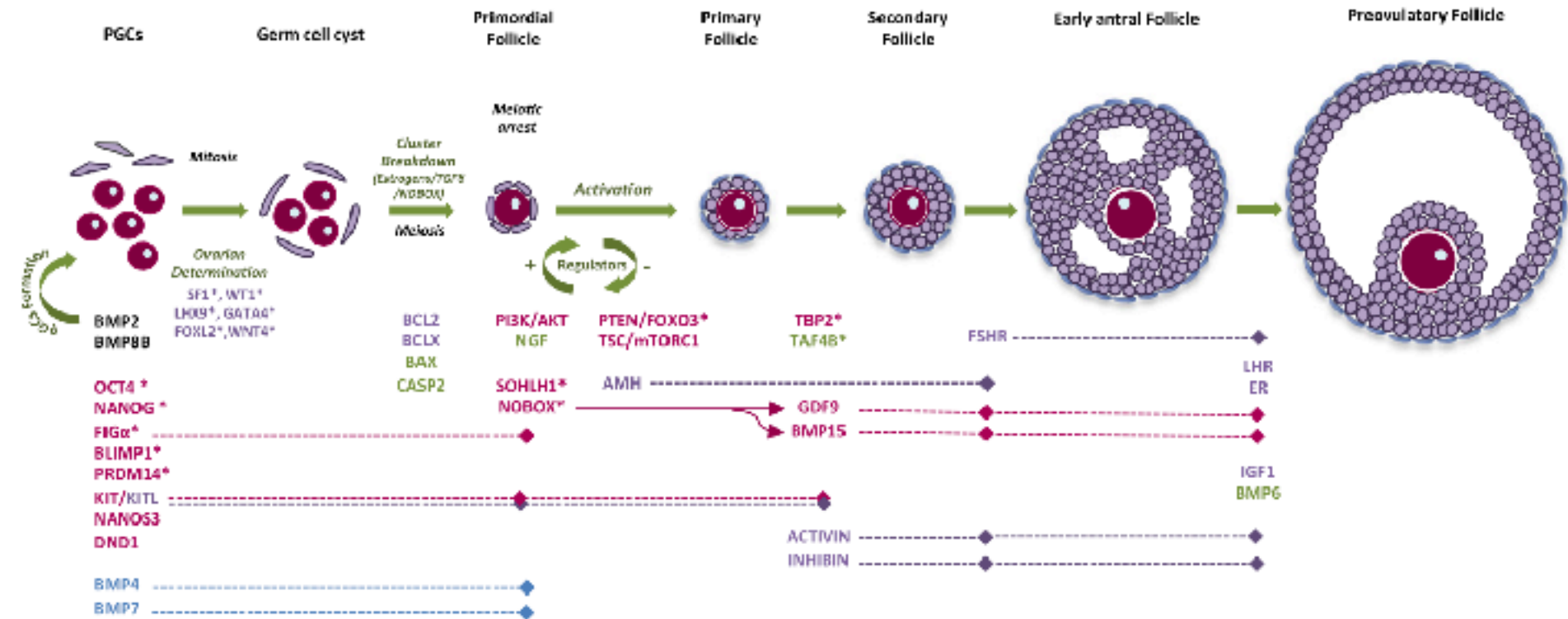
3
Initiation
of Meiosis

4
Diploid
Oocyte
(2n4C)

Meiotic block
(diplotene of prophase I)

Oocyte Development

Vývoj savčích oocytů



Oogeneze - folikuly a rŭst oocytu

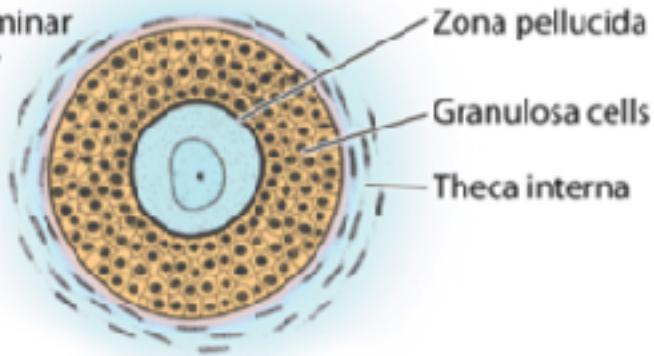
Primordial follicle



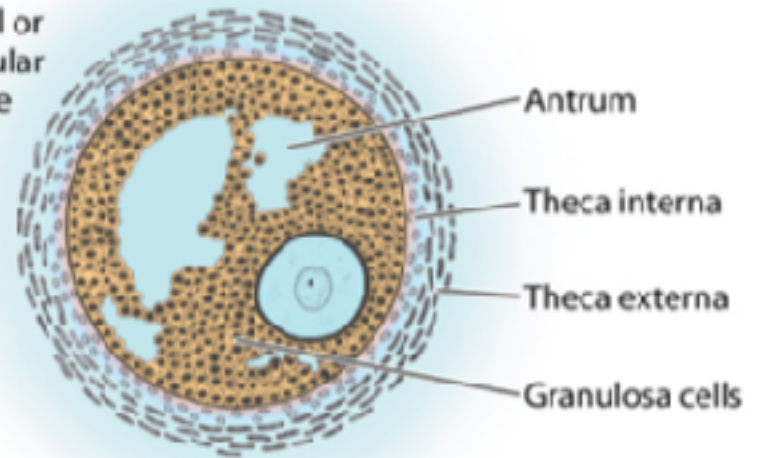
Unilaminar primary follicle



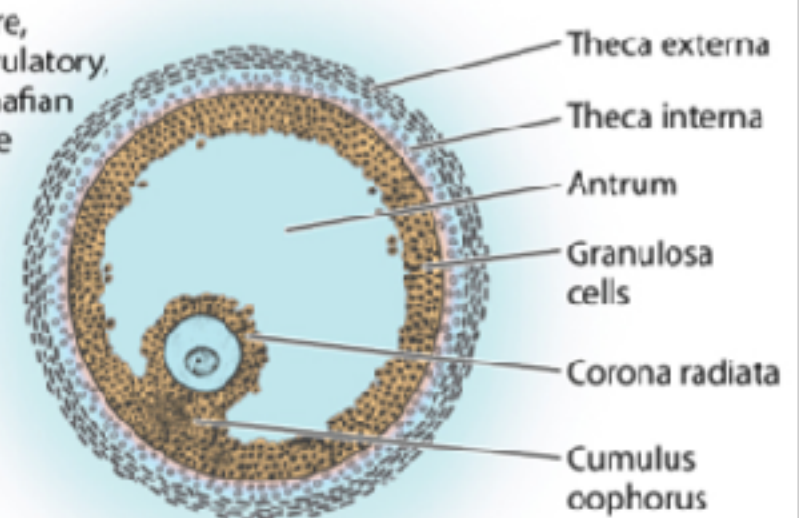
Multilaminar primary follicle

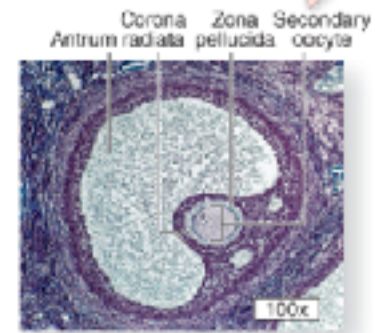
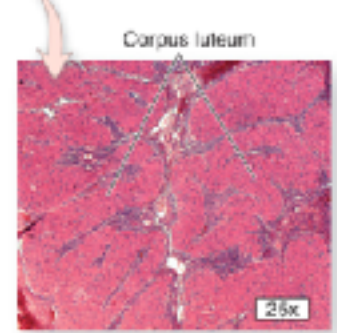
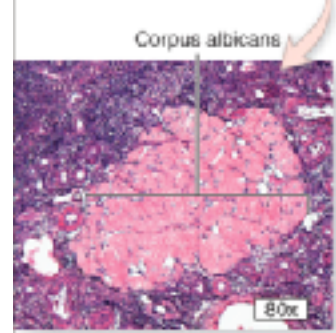
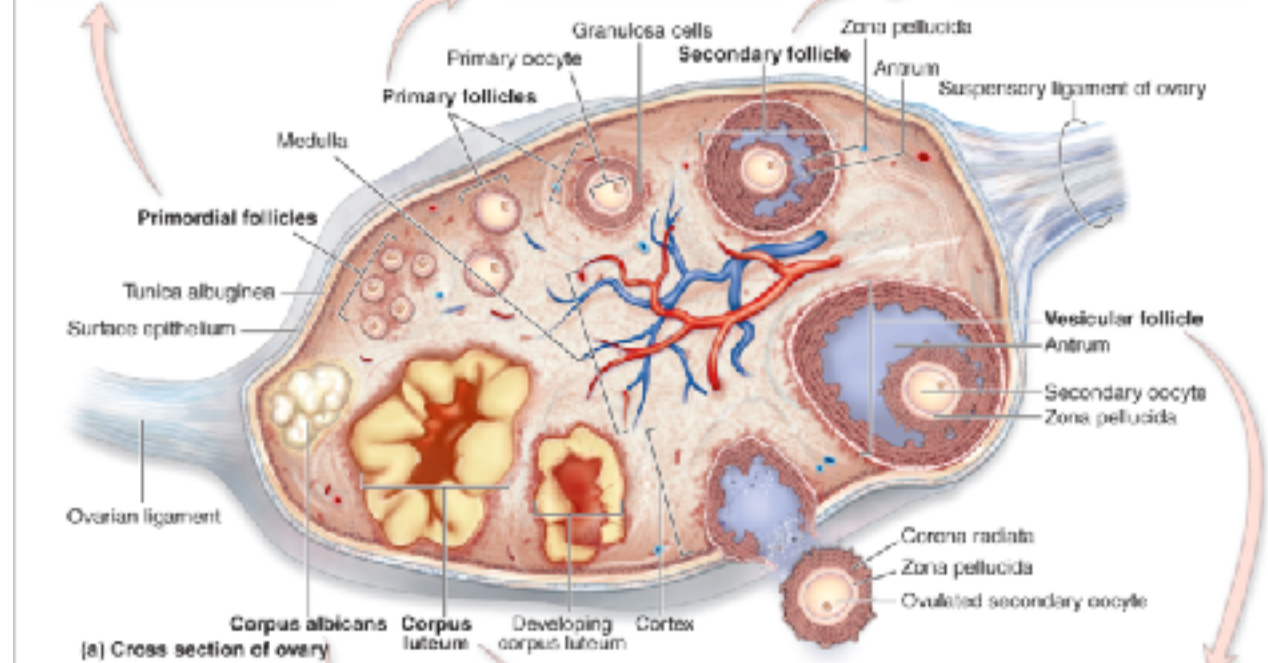
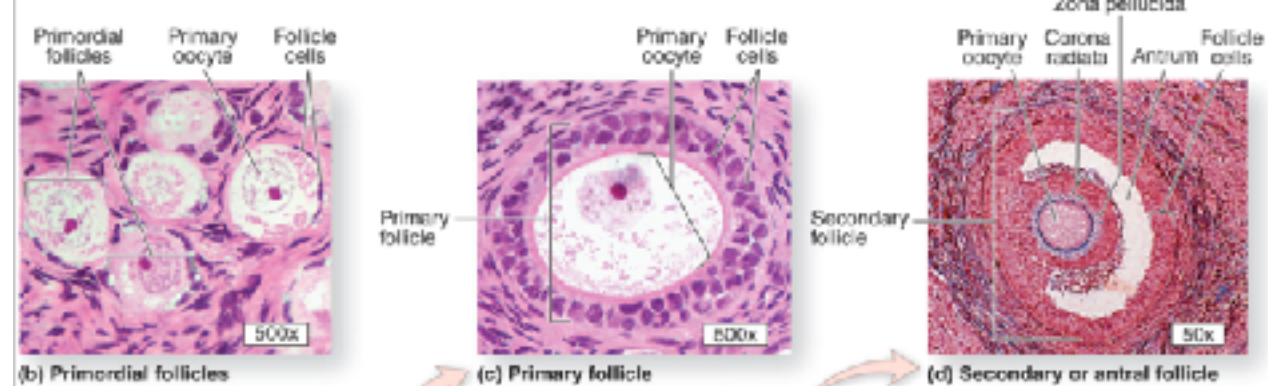


Antral or vesicular follicle



Mature, preovulatory, or graafian follicle

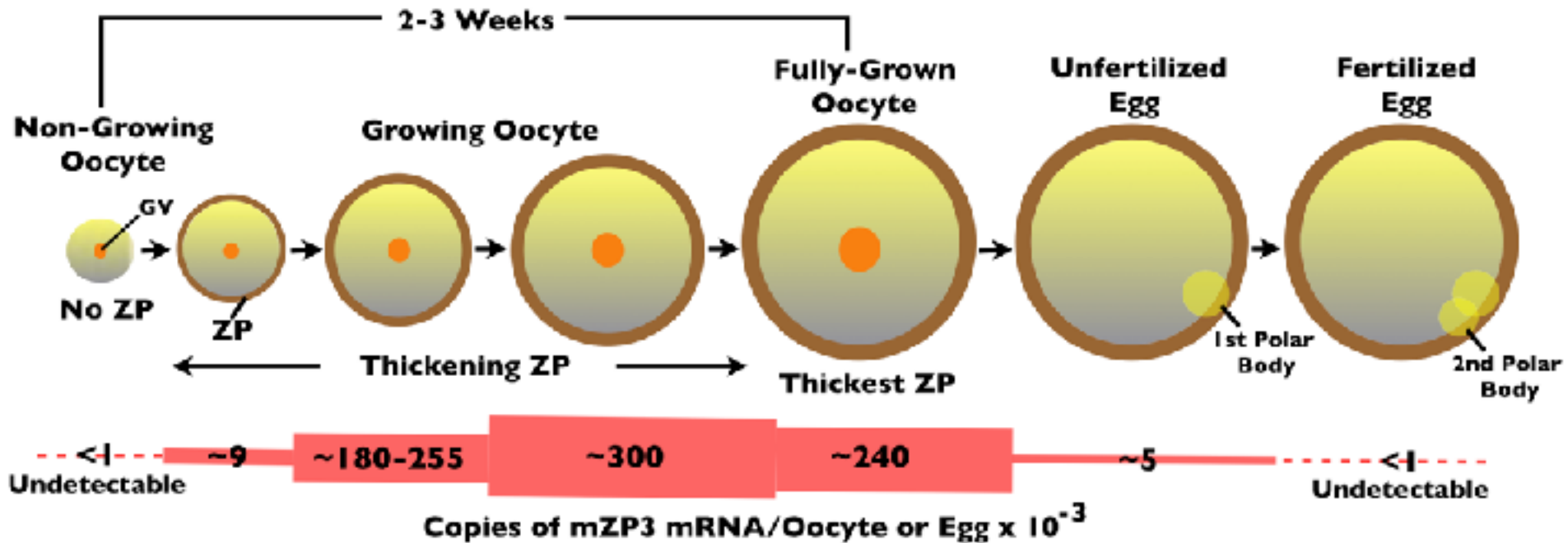
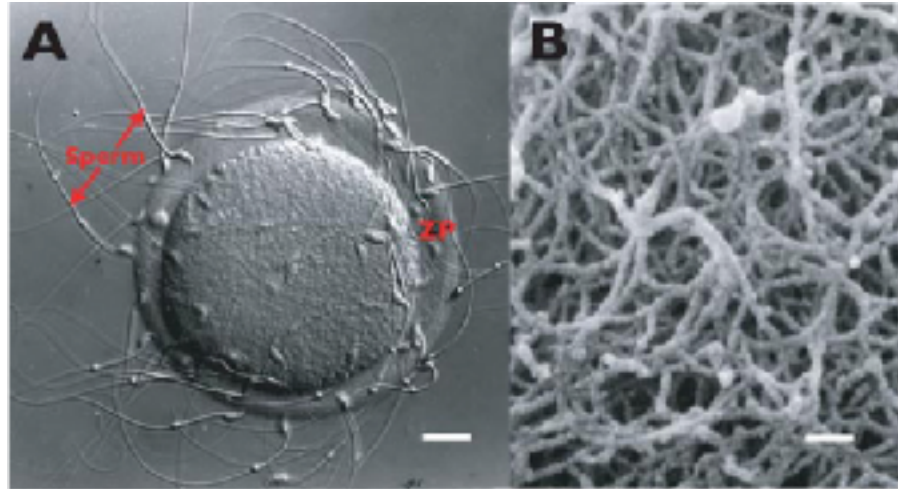




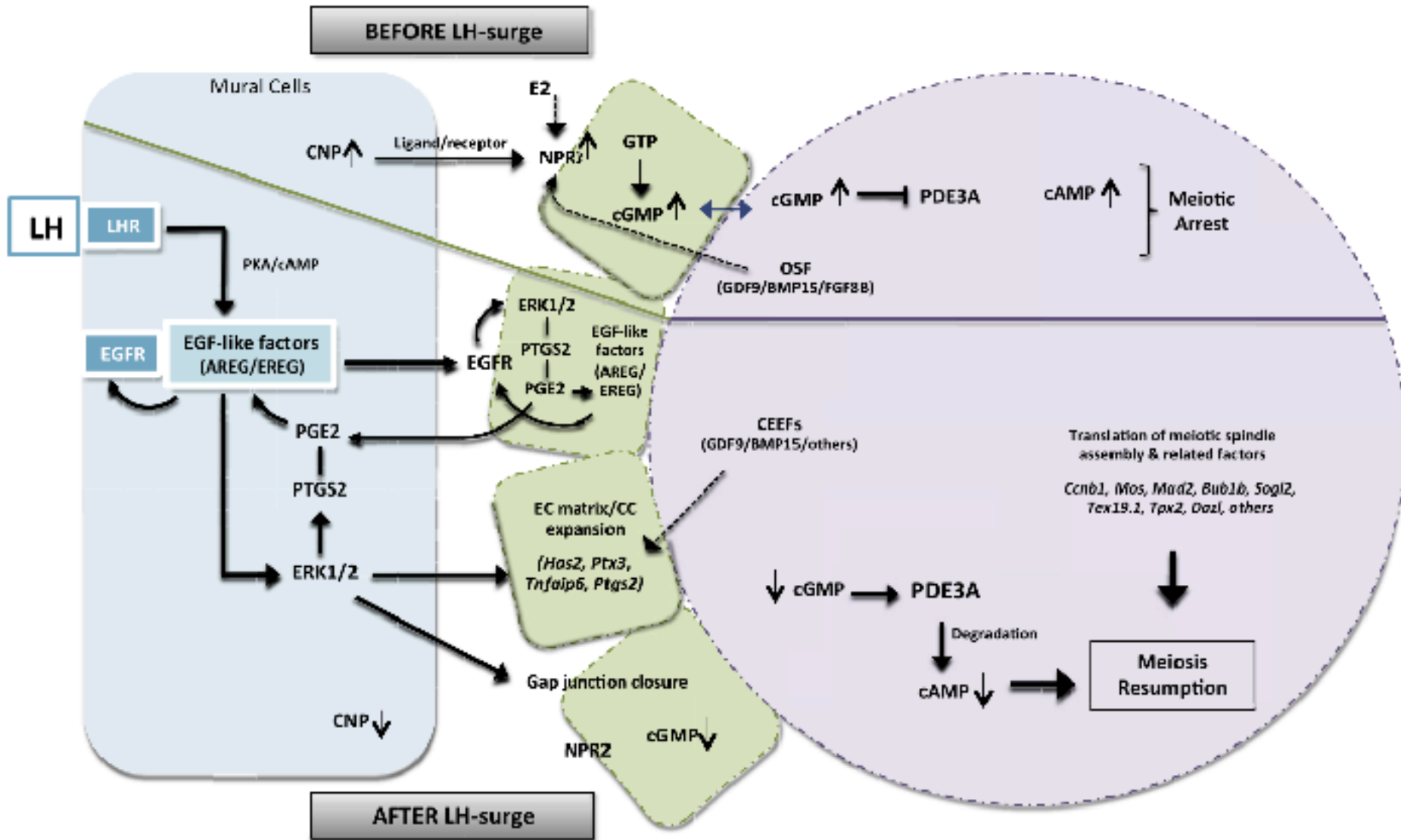
Oogeneze

Junqueira's Basic Histology: Text and Atlas, Sixteenth Edition
 McGraw - Hill companies

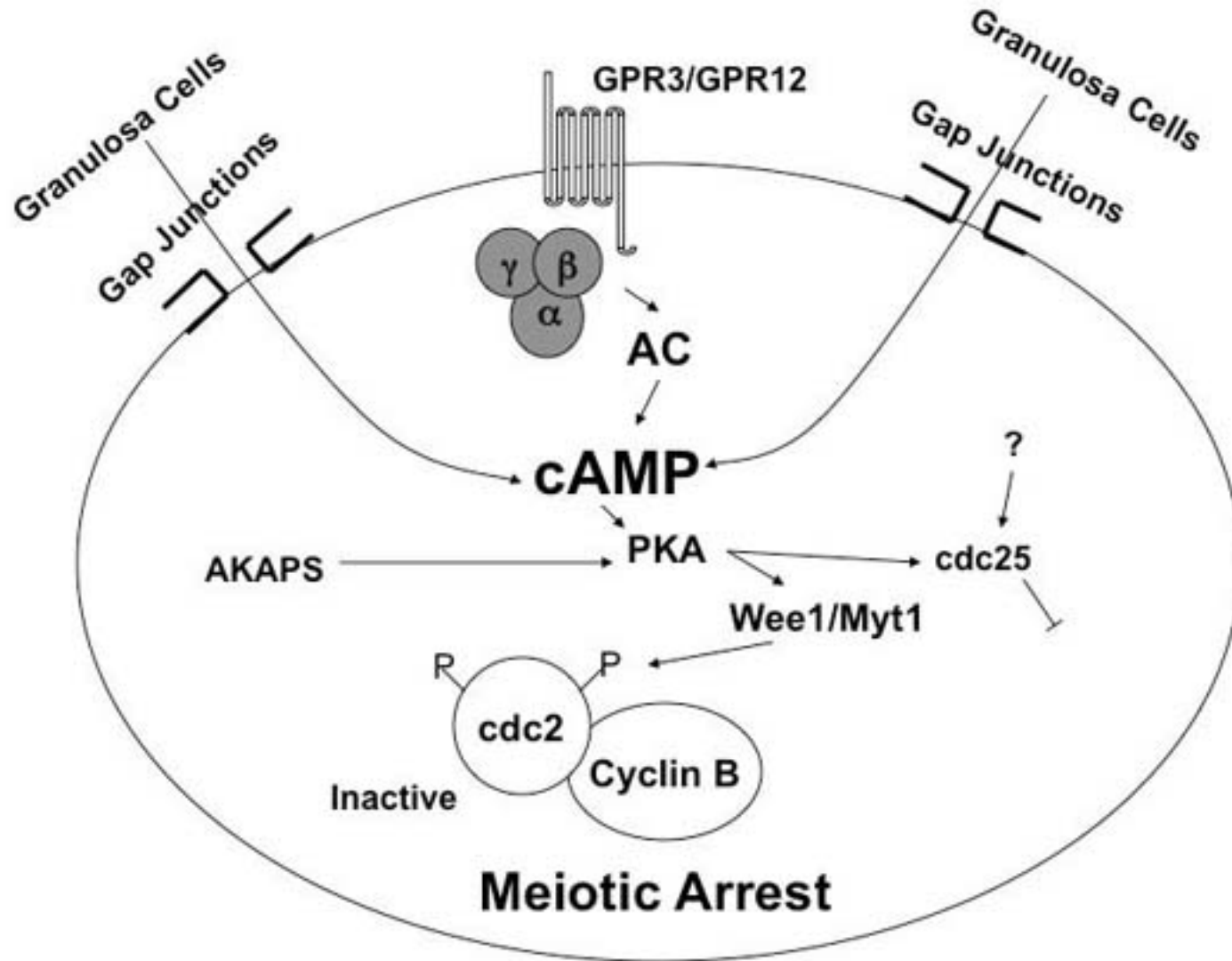
Oogeneze - zona pellucida



Komunikace mezi oocytem a kumulárnými buňkami



První meiotický blok



“Výroba” savčích oocytů in vitro oocytů

