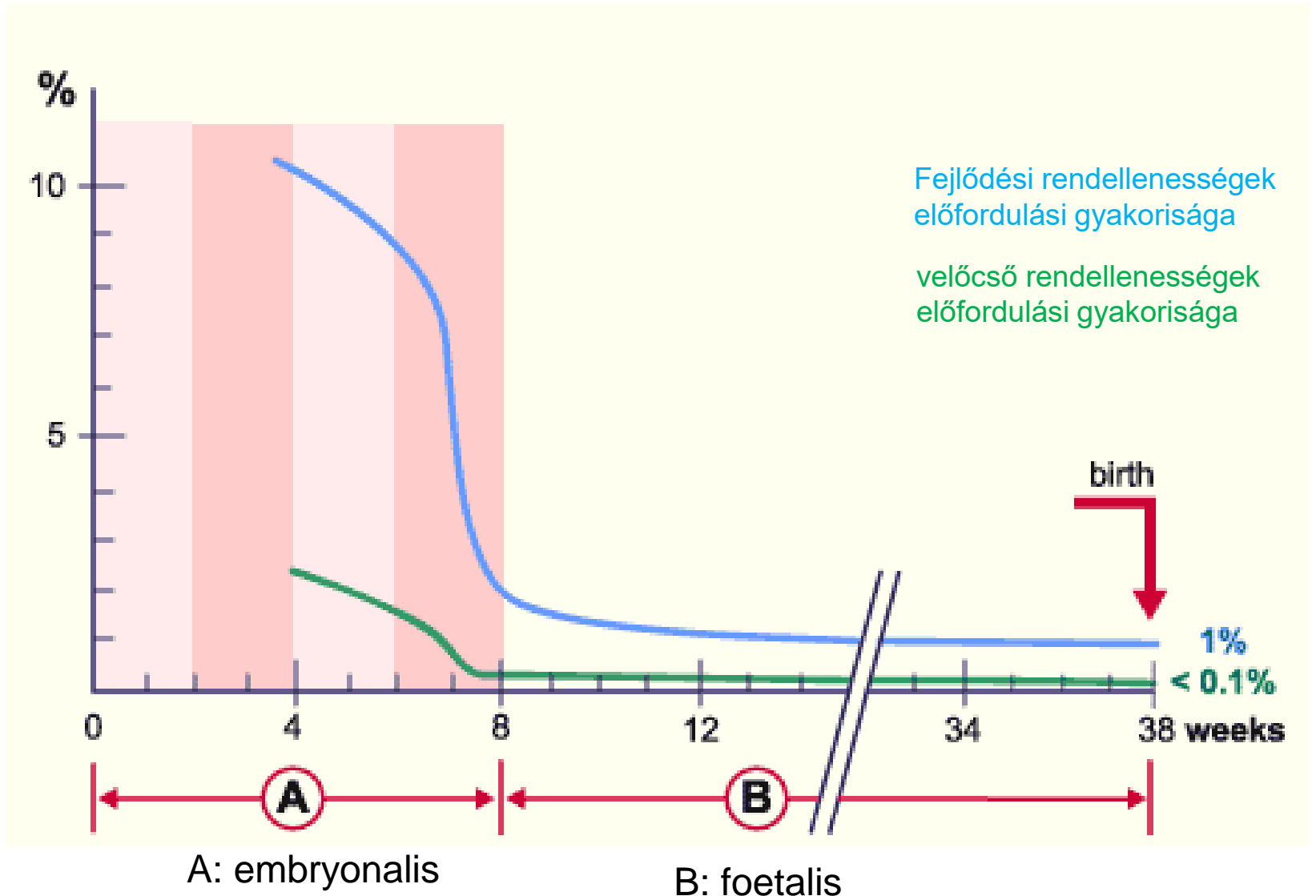


Ivarsejtek, megtermékenyítés, morula, blastula

Dr. Gerber Gábor

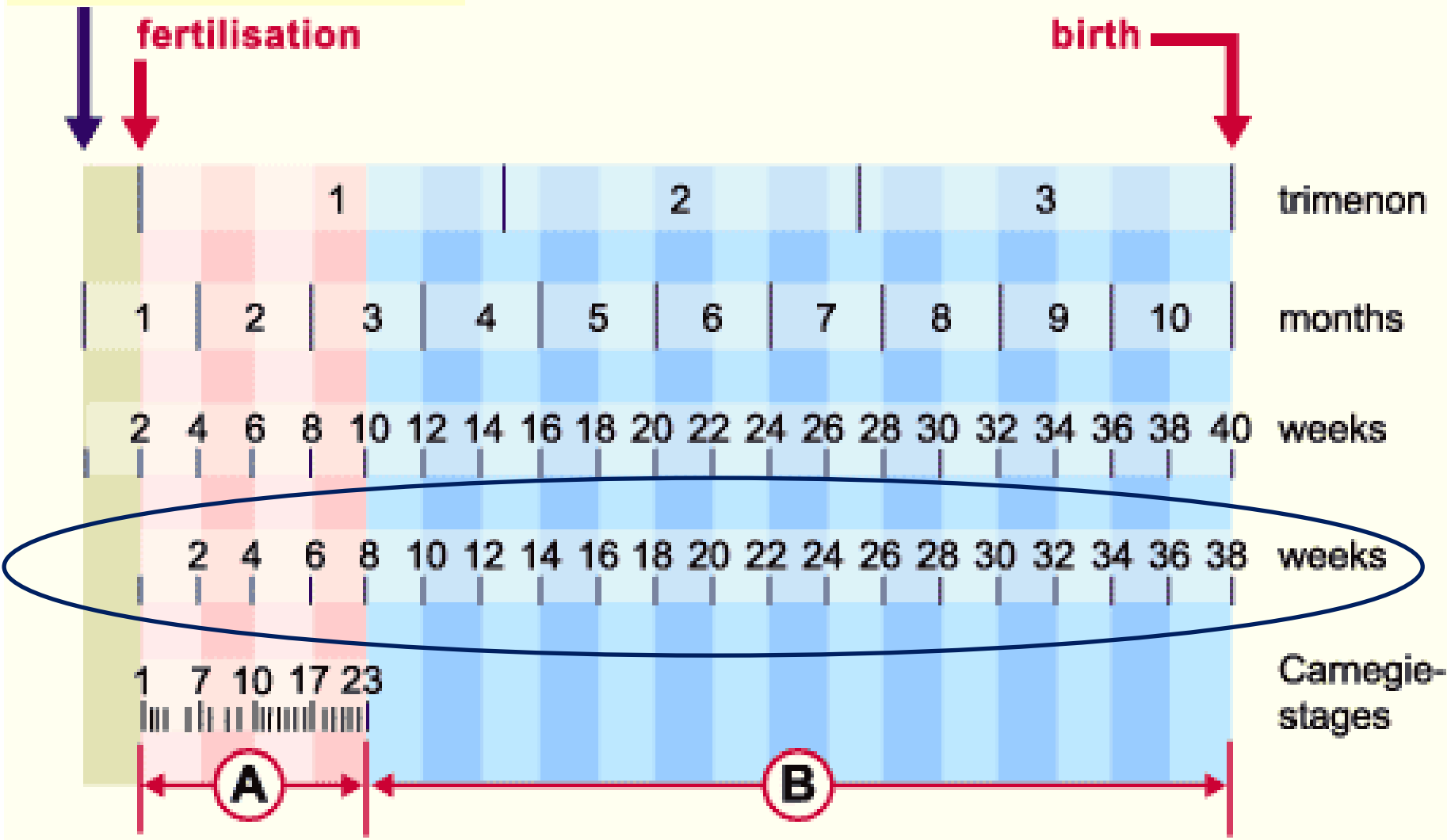
Intrauterin élet szakaszai

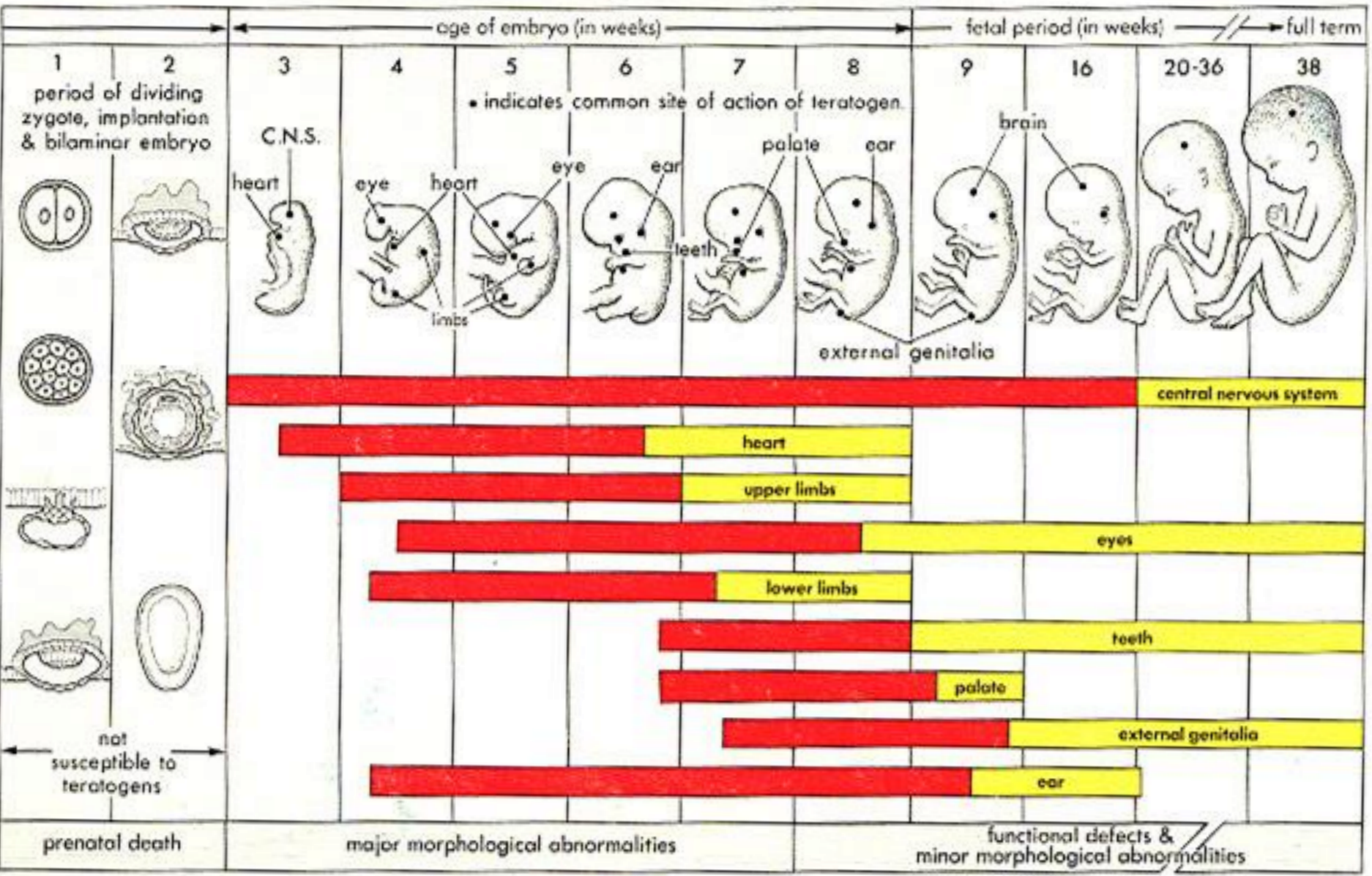


Last Menstruation Period

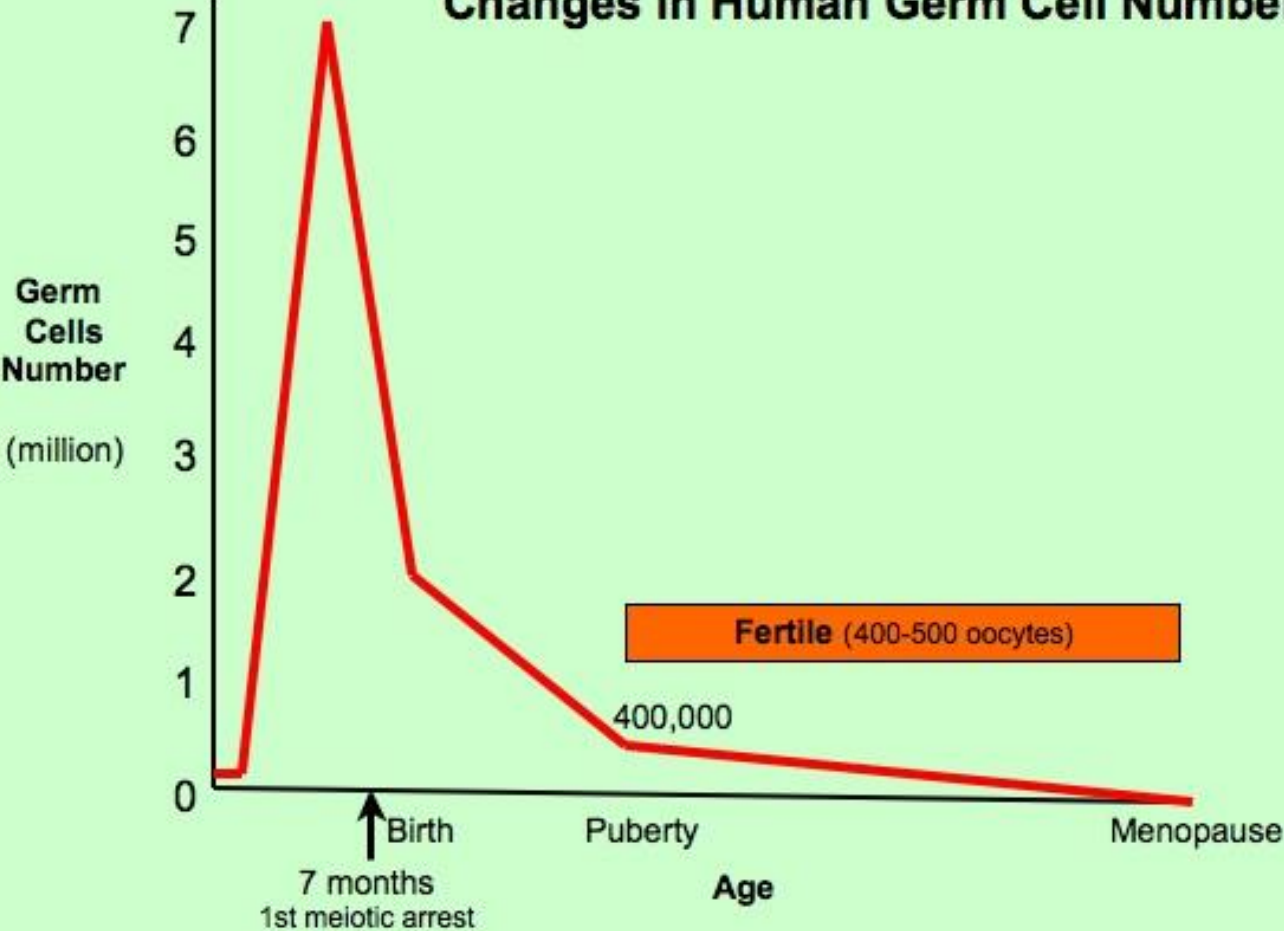
fertilisation

birth

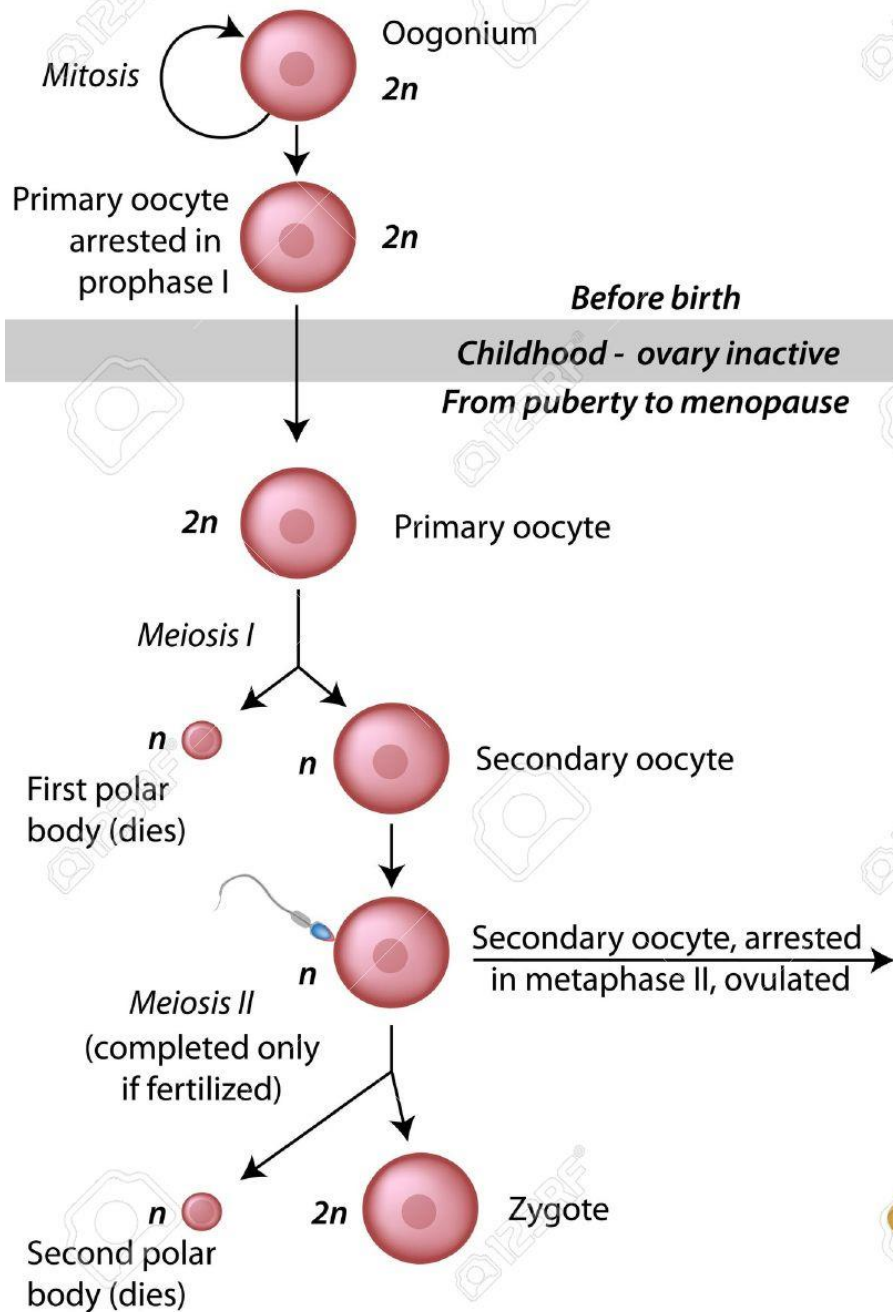




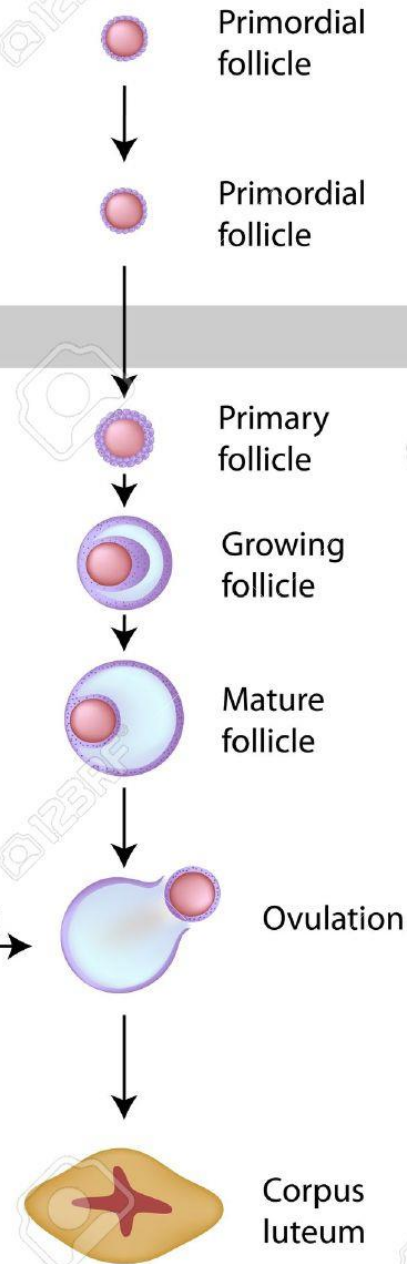
Changes in Human Germ Cell Number



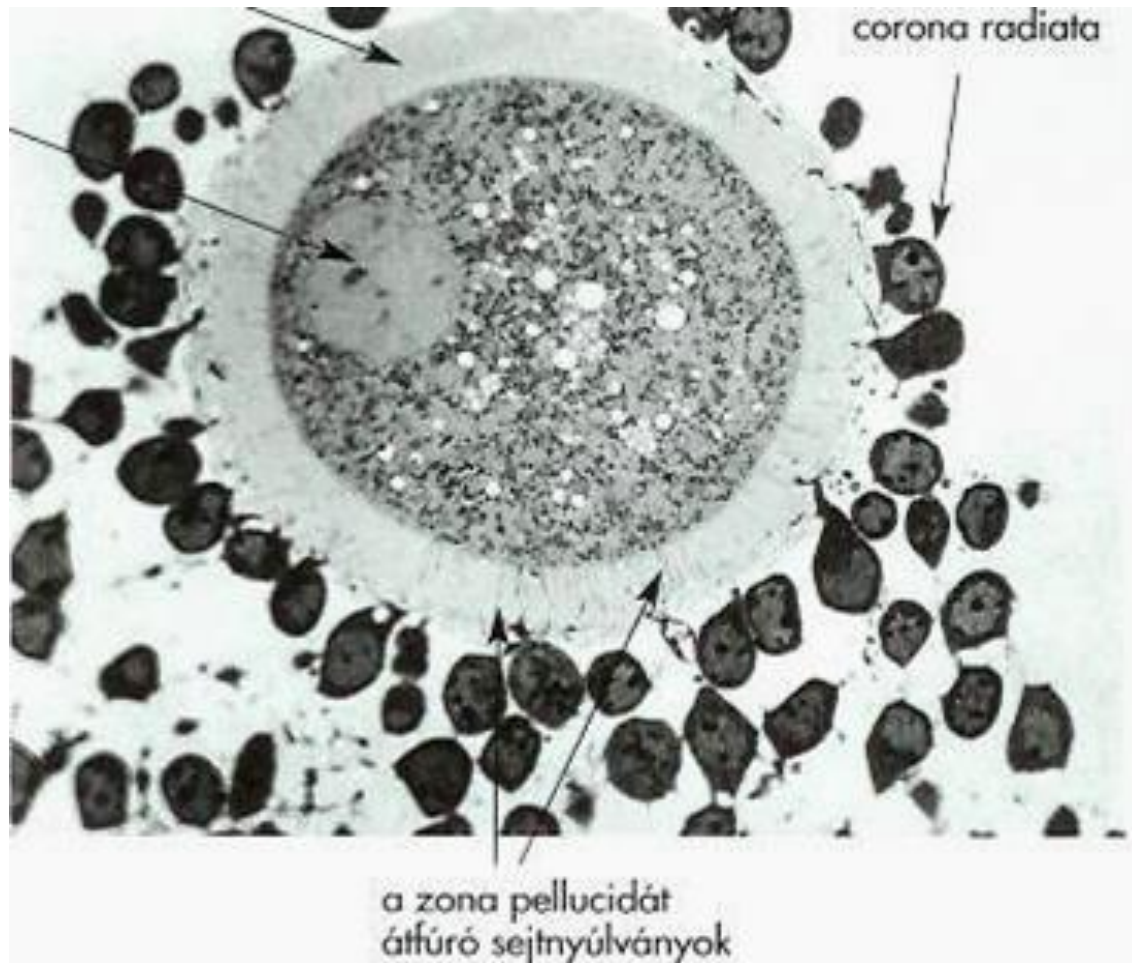
Oogenesis

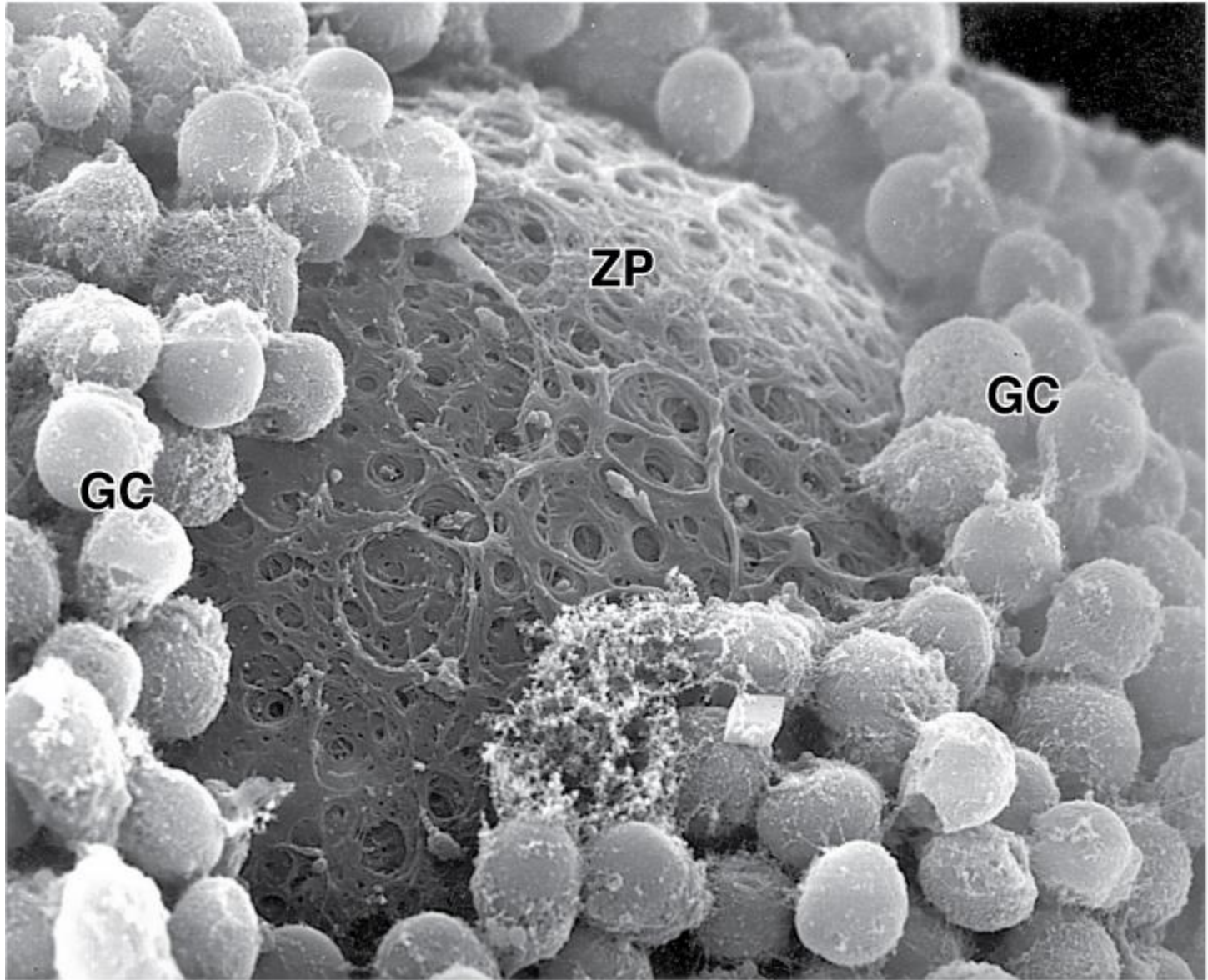


Follicle development



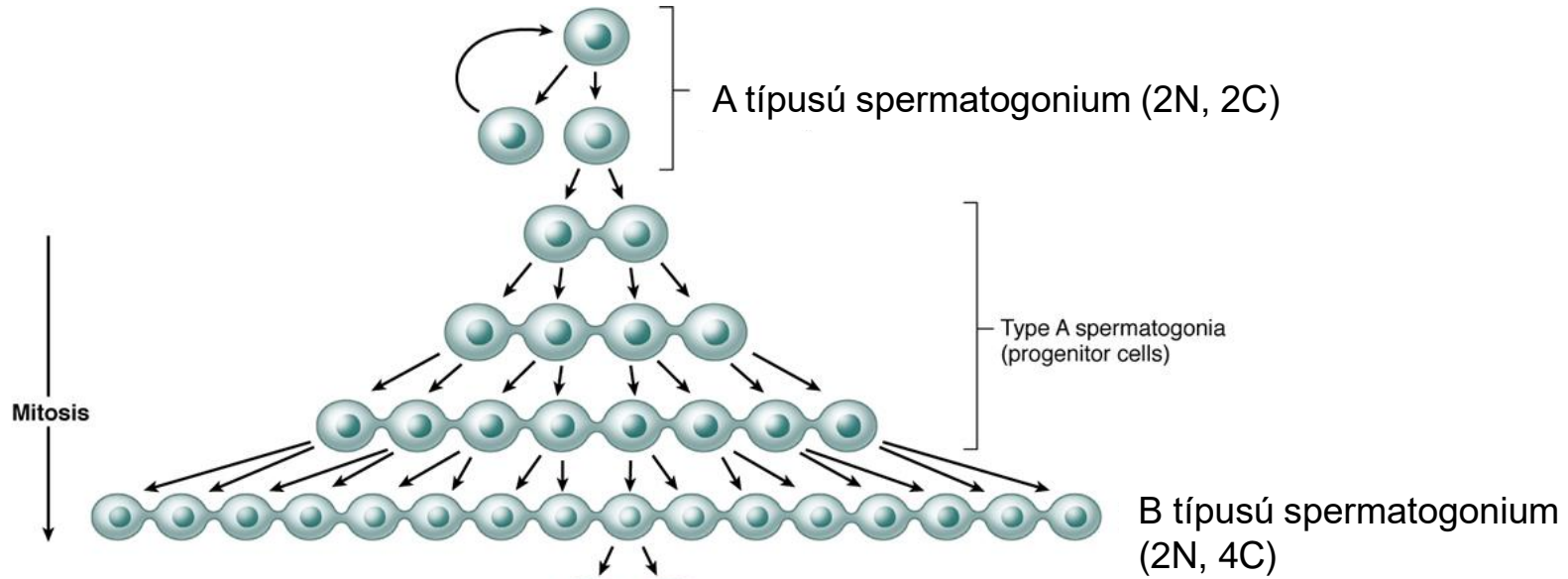
Ovum



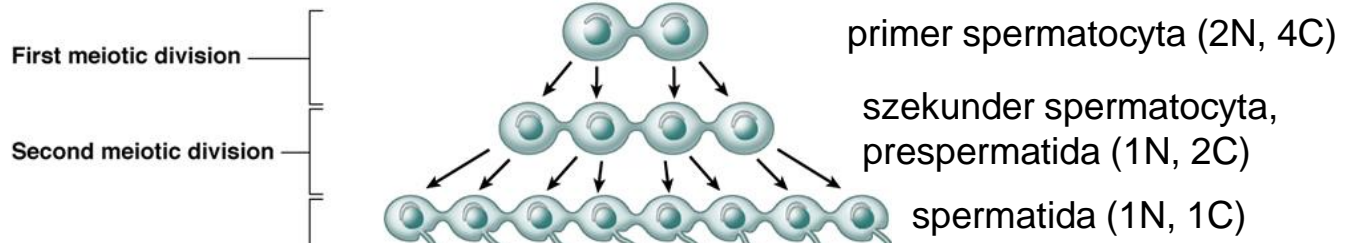




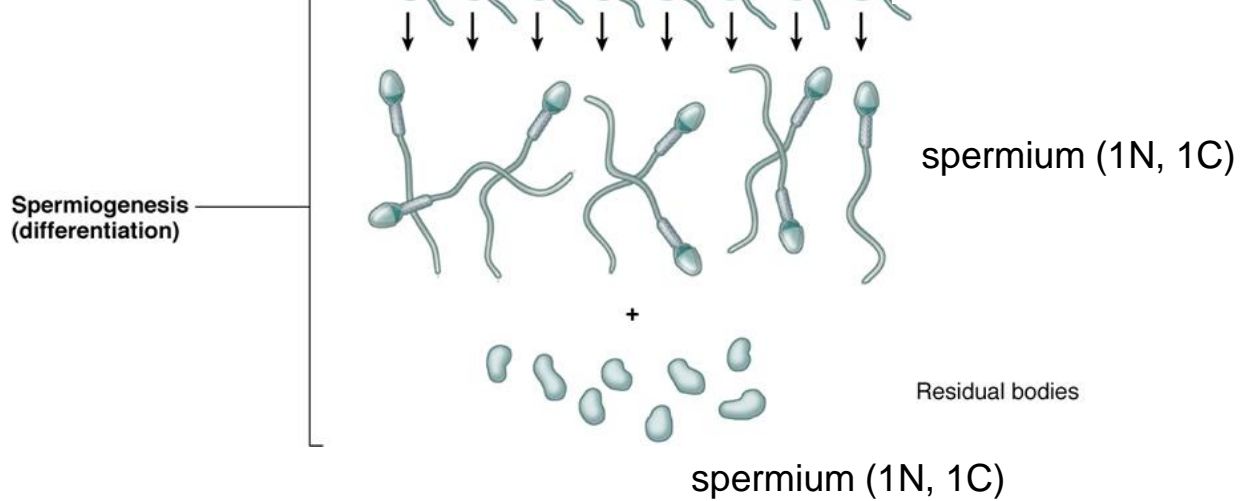
Spermatocytogenesis



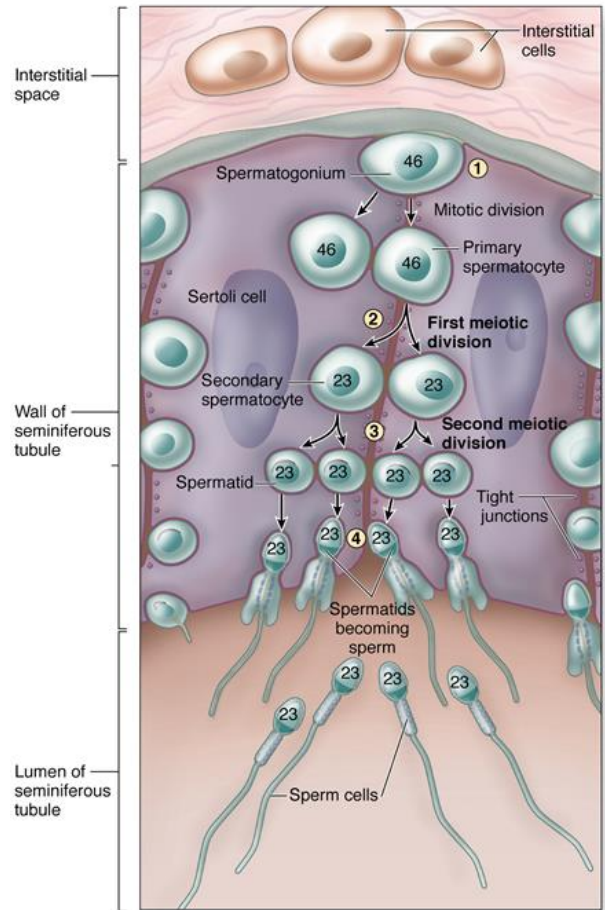
Meiosis



Spermiogenesis



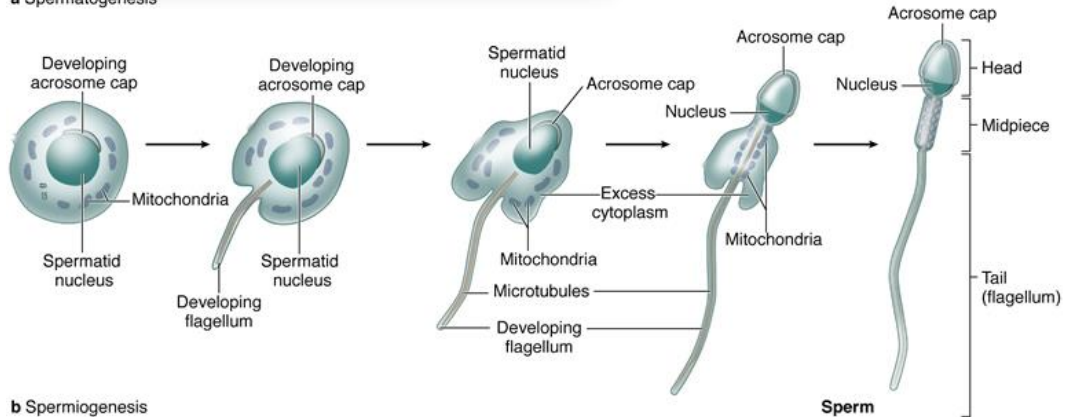
Spermatogenesis



- 1 Germ cells that are the origin of sperm cells are *diploid cells* (containing 46 chromosomes, or 23 pairs) called spermatogonia. Mitotic divisions of these cells produce a new germ cell and a committed cell. The committed cell is a primary spermatocyte.
- 2 The first meiotic division begins in the *diploid* primary spermatocytes. The *haploid cells* (containing 23 chromosomes only) produced by the first meiotic division are called secondary spermatocytes.
- 3 The second meiotic division originates with the secondary spermatocytes and produces spermatids.
- 4 The process of spermiogenesis begins with spermatids and results in morphological changes needed to form sperm that will be motile.

a Spermatogenesis

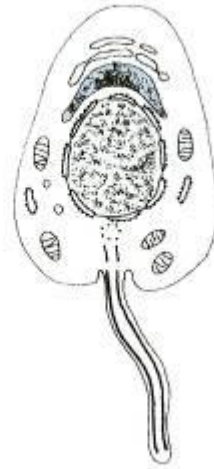
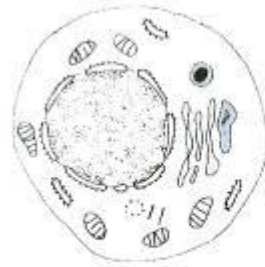
Spermiogenesis



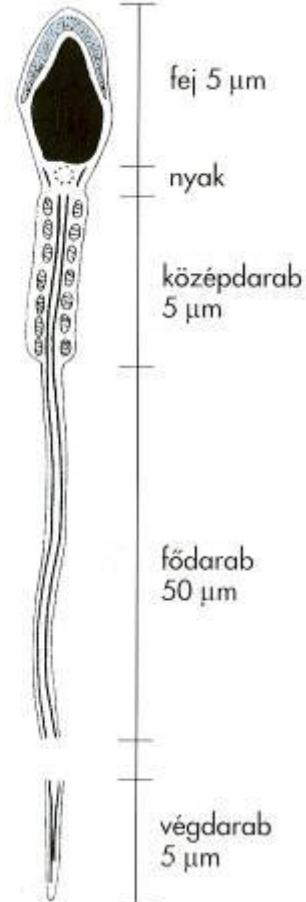
b Spermiogenesis

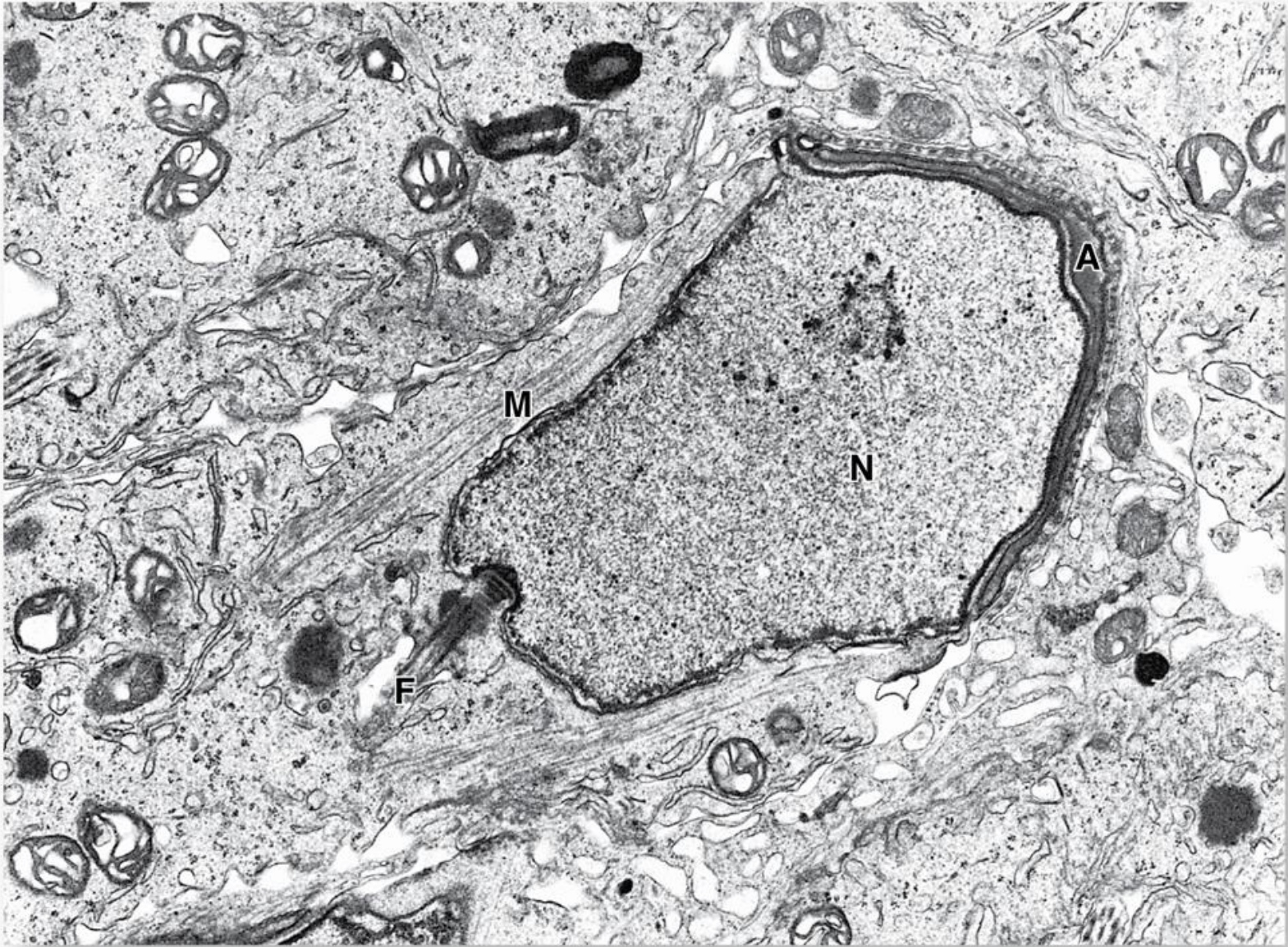
Spermiogenesis:
spermatida → érett spermium

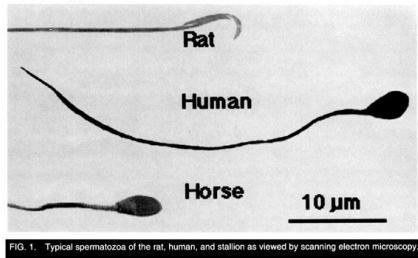
spermatida



spermium







EJAKULÁTUM (3.5 ml)

10% spermium ($200-600 \times 10^6/\text{ml}$)

50% ondófolyadék (*koagulál!*)

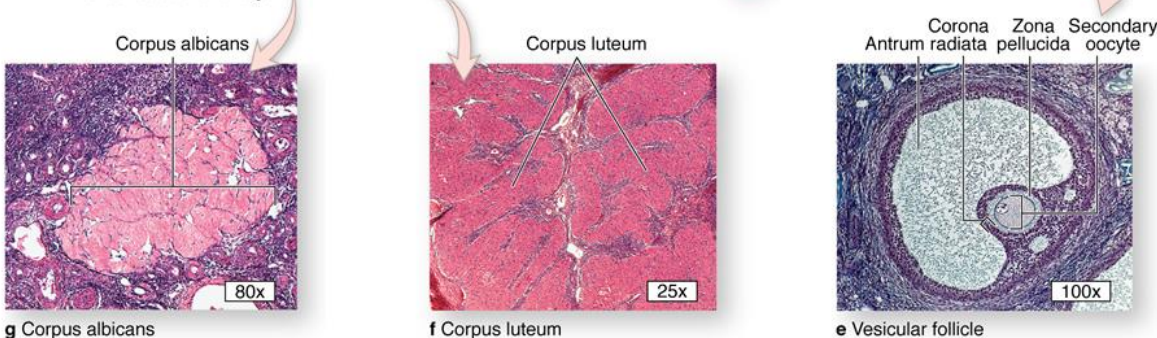
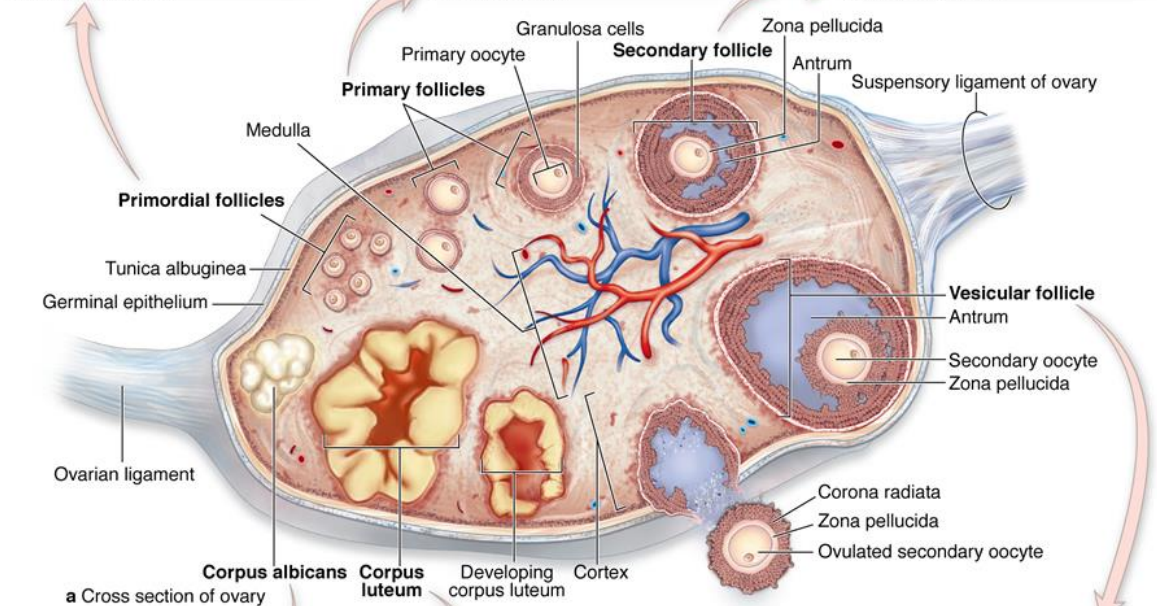
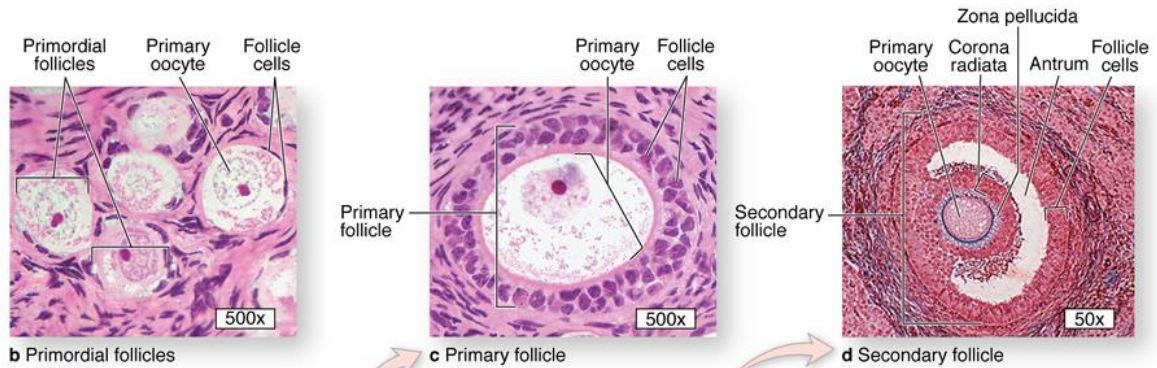
30% prostataváladék (*fruktóz!*)

10% Cowper-mirigy (*öblítés, síkosítás*)

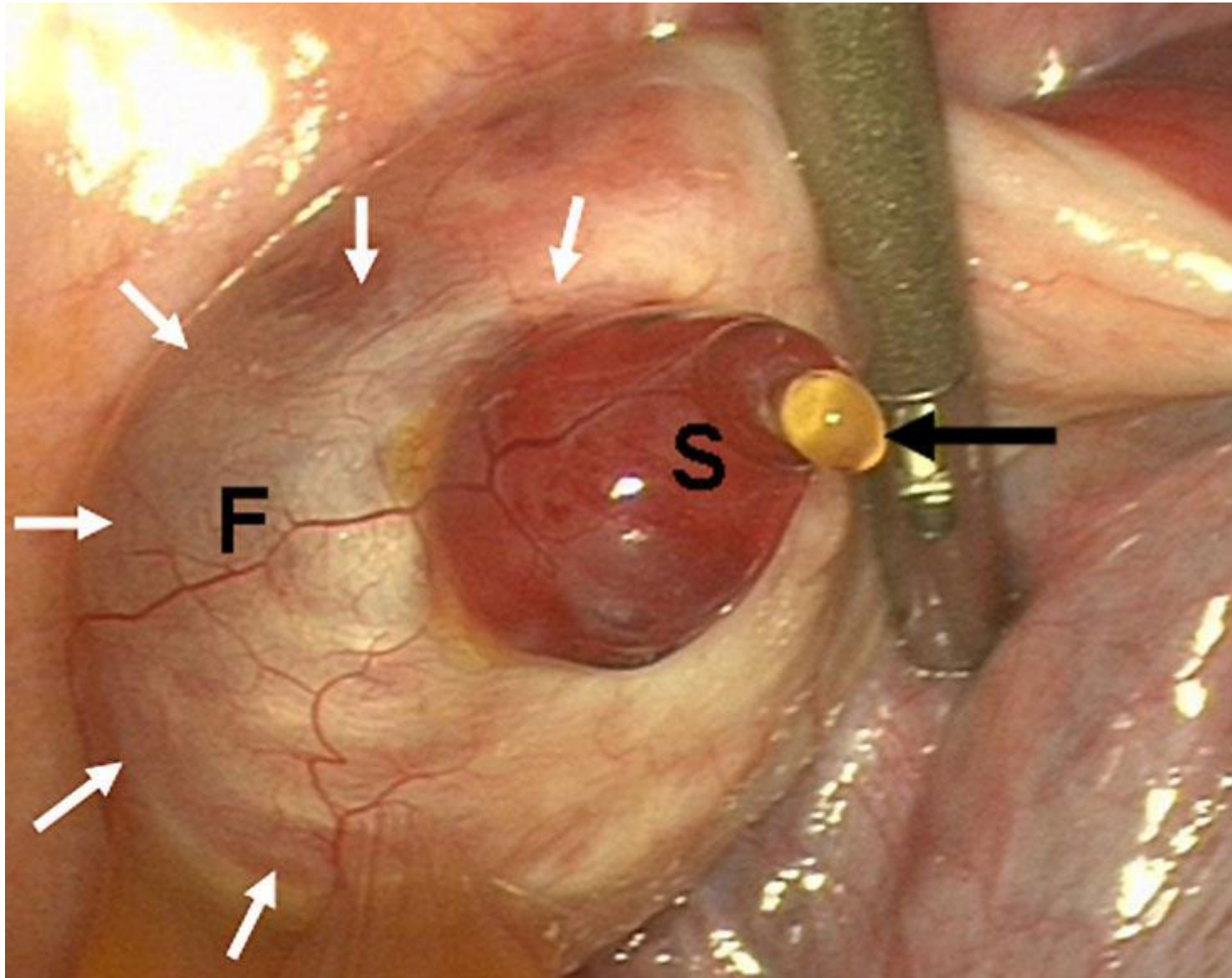
Species	Ejaculate Volume (ml)	Sperm Concentration ($\times 10^6/\text{ml}$)	Total Sperm per Ejaculate (10^6)	% Motile	% Normal
Bull	8.0	1500	12000	75	95
Ram	1.0	3000	3000	95	95
Boar	200	250	50000	70	90
Stallion	80	150	12000	70	40 - 90
Man	2-6	150	900 (100-300)	65	30 - 70

Normál ondó jellemzői

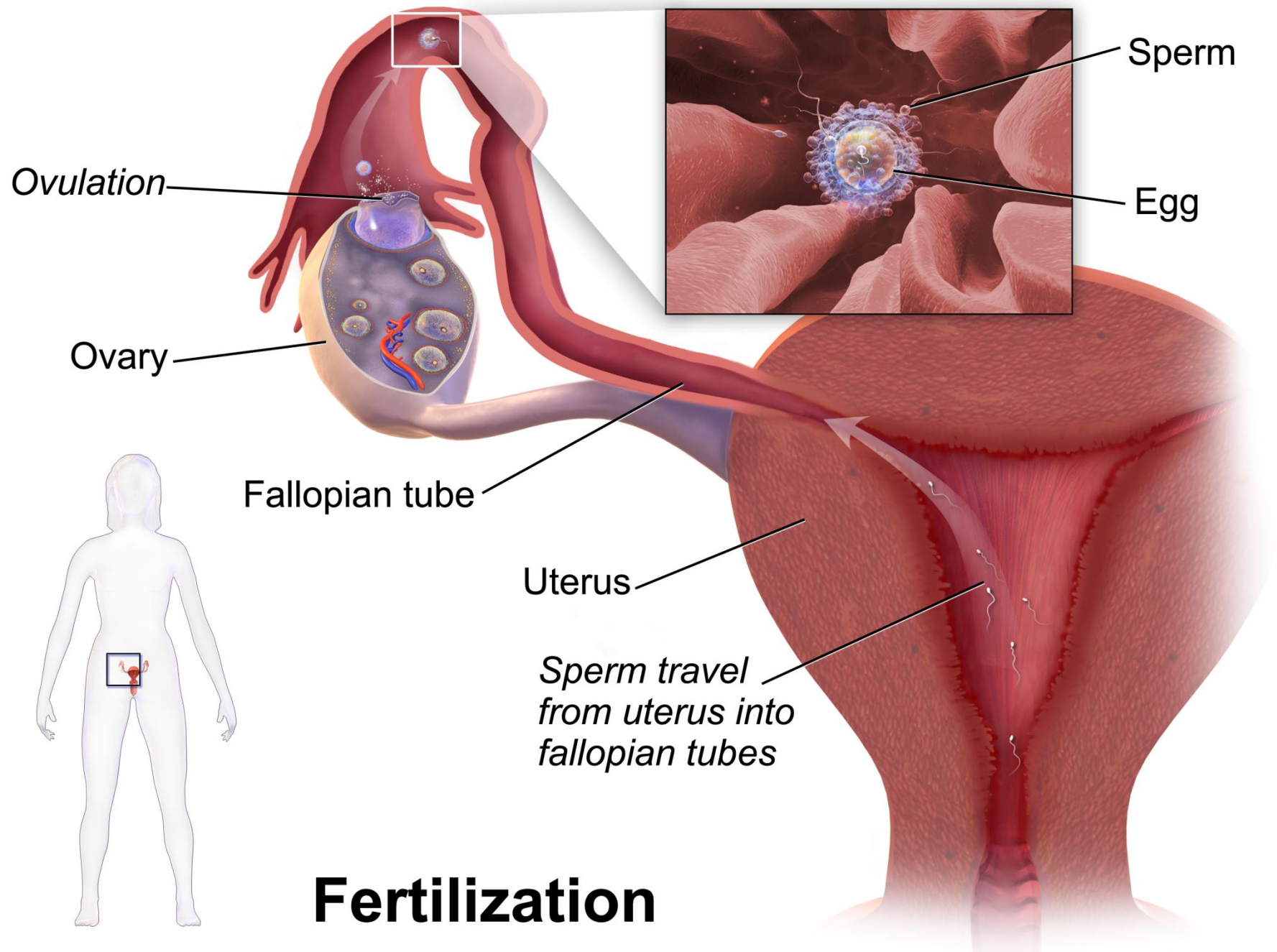
- 1) ejaculate volume is ≥ 2 ml,
- 2) sperm concentration ≥ 20 million/ml,
- 3) $\geq 50\%$ of the sperm are progressively motile, and
- 4) $\geq 30\%$ of the sperm are morphologically normal (WHO, 1992).

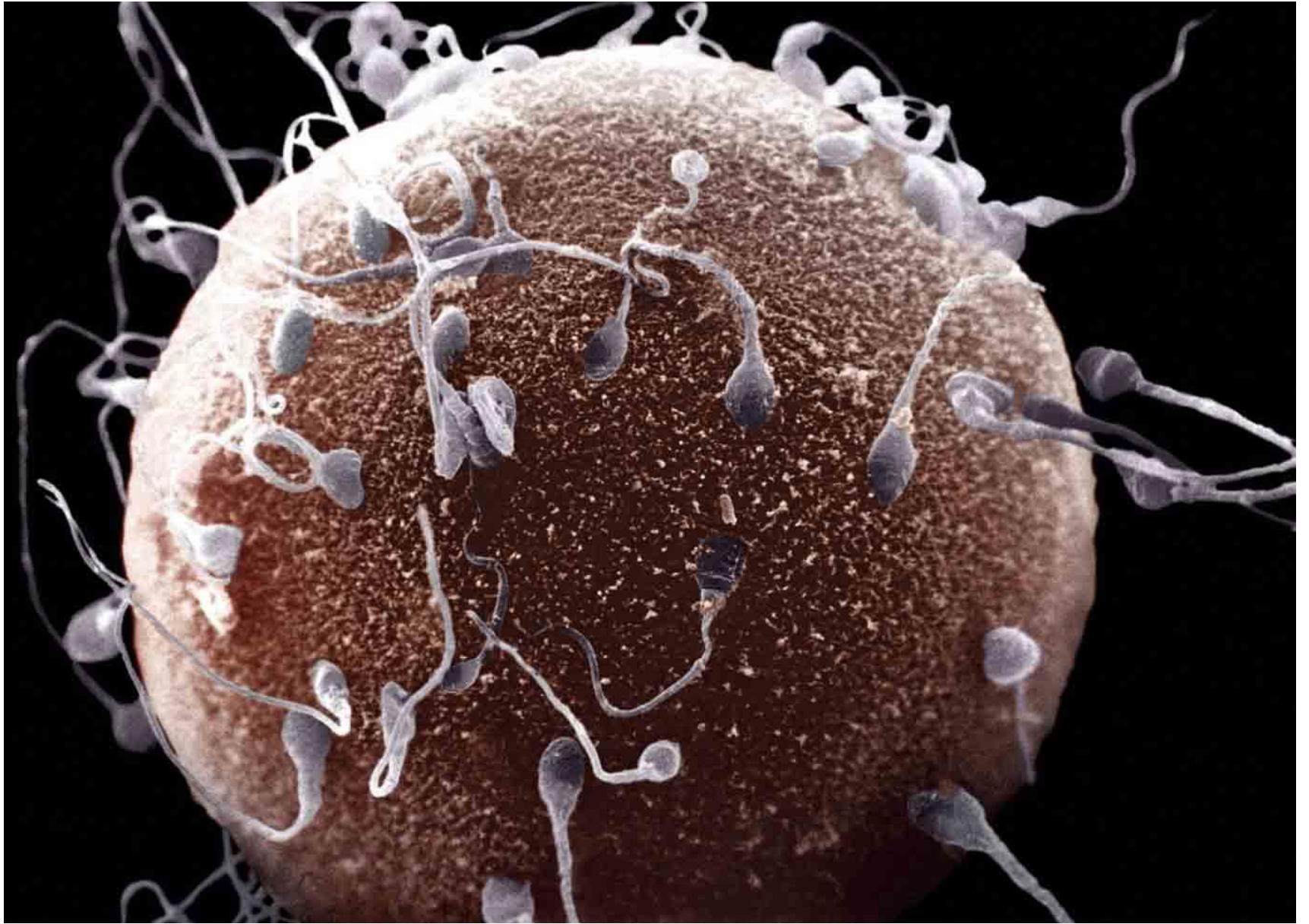


ovuláció



Fertilization





1

Binding of sperm to zona pellucida

2

Acrosomal reaction

AKROSZÓMA-REAKCIÓ
(a corona radiata érintésére
litikus enzimek ürülnek)

KAPACITÁCIÓ (cca 7 óra alatt
az akroszóma denudálódik –
kondicionálás)

acrosomal vesicle
zona pellucida
follicle cell

cumulus cell layer

egg nucleus

cortical granule

Sperm nucleus
enters
egg cytoplasm

Penetration
through
zona pellucida

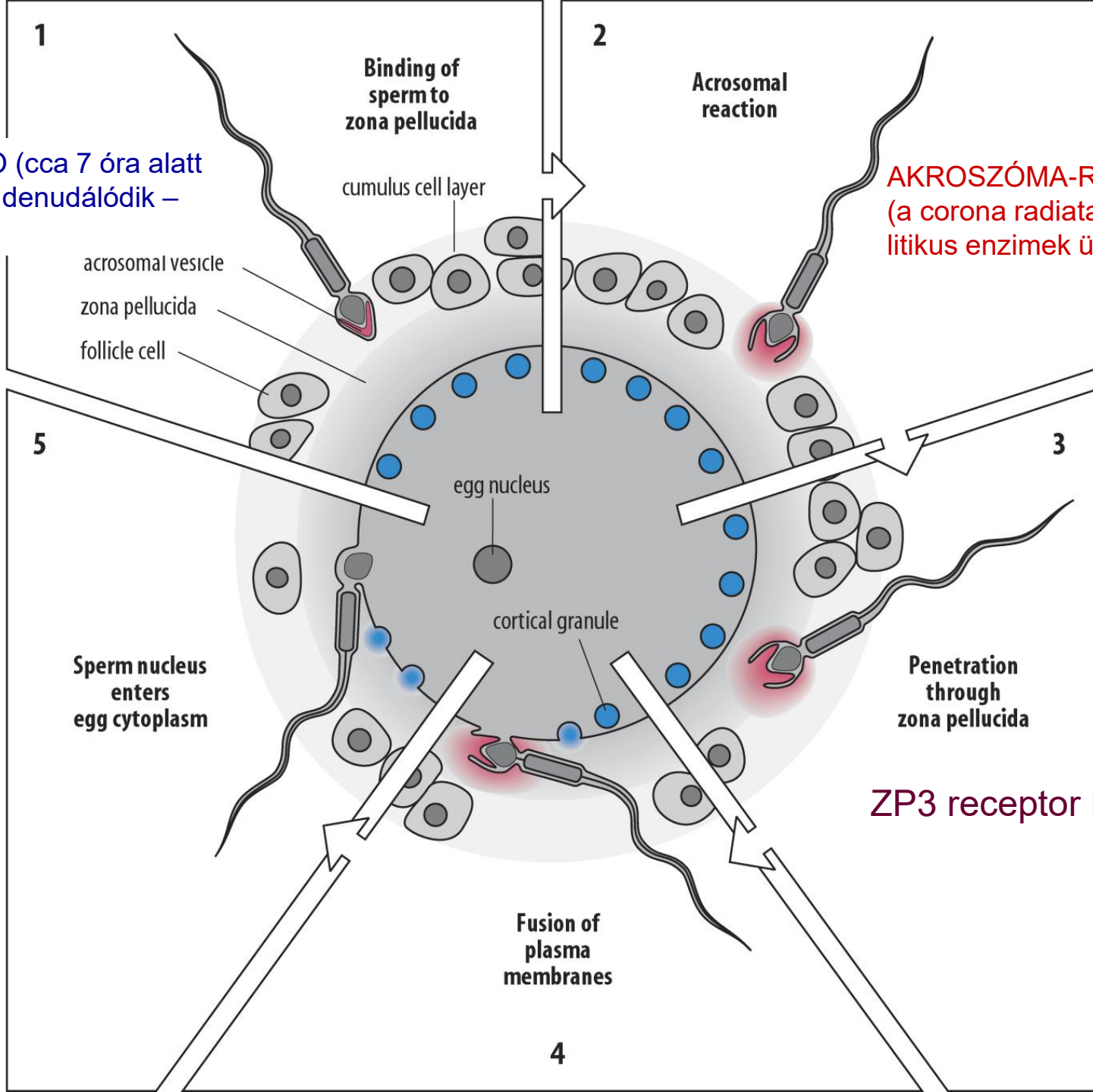
ZP3 receptor kötődés

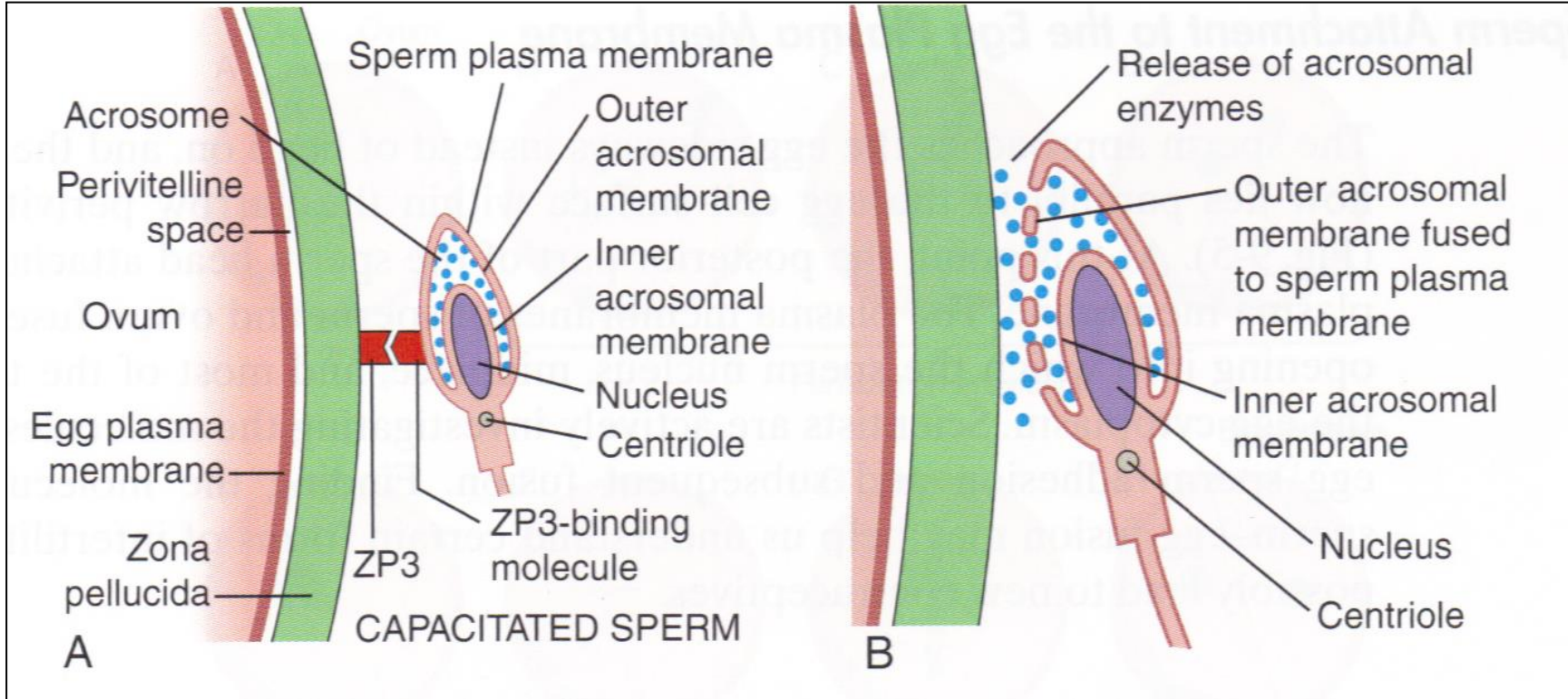
Fusion of
plasma
membranes

4

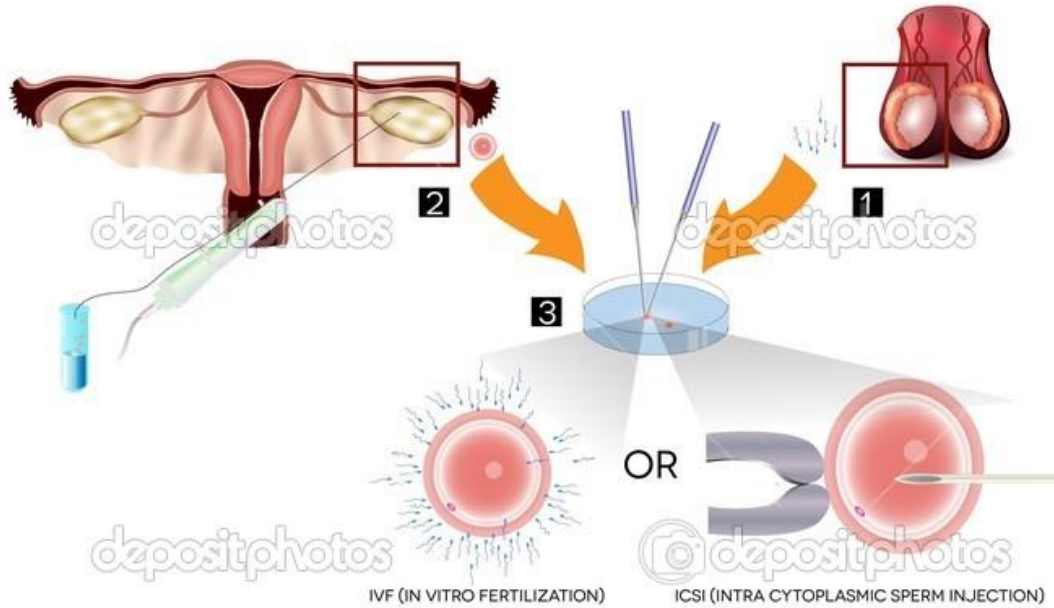
5

3

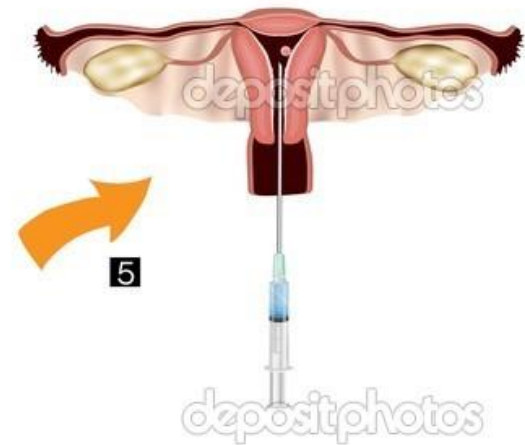
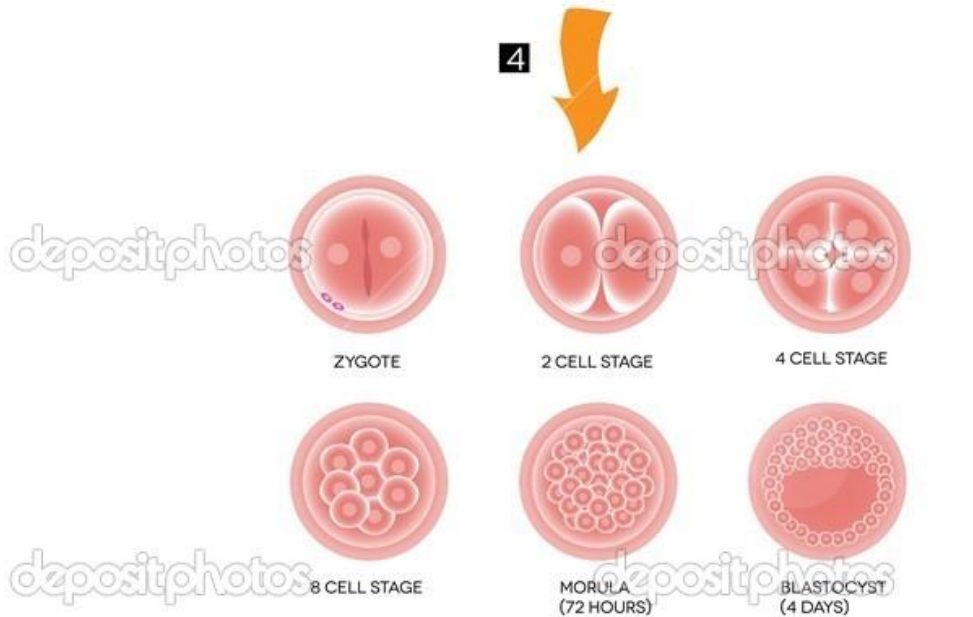




In Vitro Fertilizáció (IVF)



- 1 SPERM COLLECTION
- 2 THE EGGS ARE REMOVED FROM THE OVARY
- 3 THE EGGS ARE FERTILIZED WITH SPERM IN A LABORATORY
- 4 THE FERTILIZED EGGS ARE GROWING
- 5 THE EMBRYOS ARE TRANSFERRED TO THE UTERUS

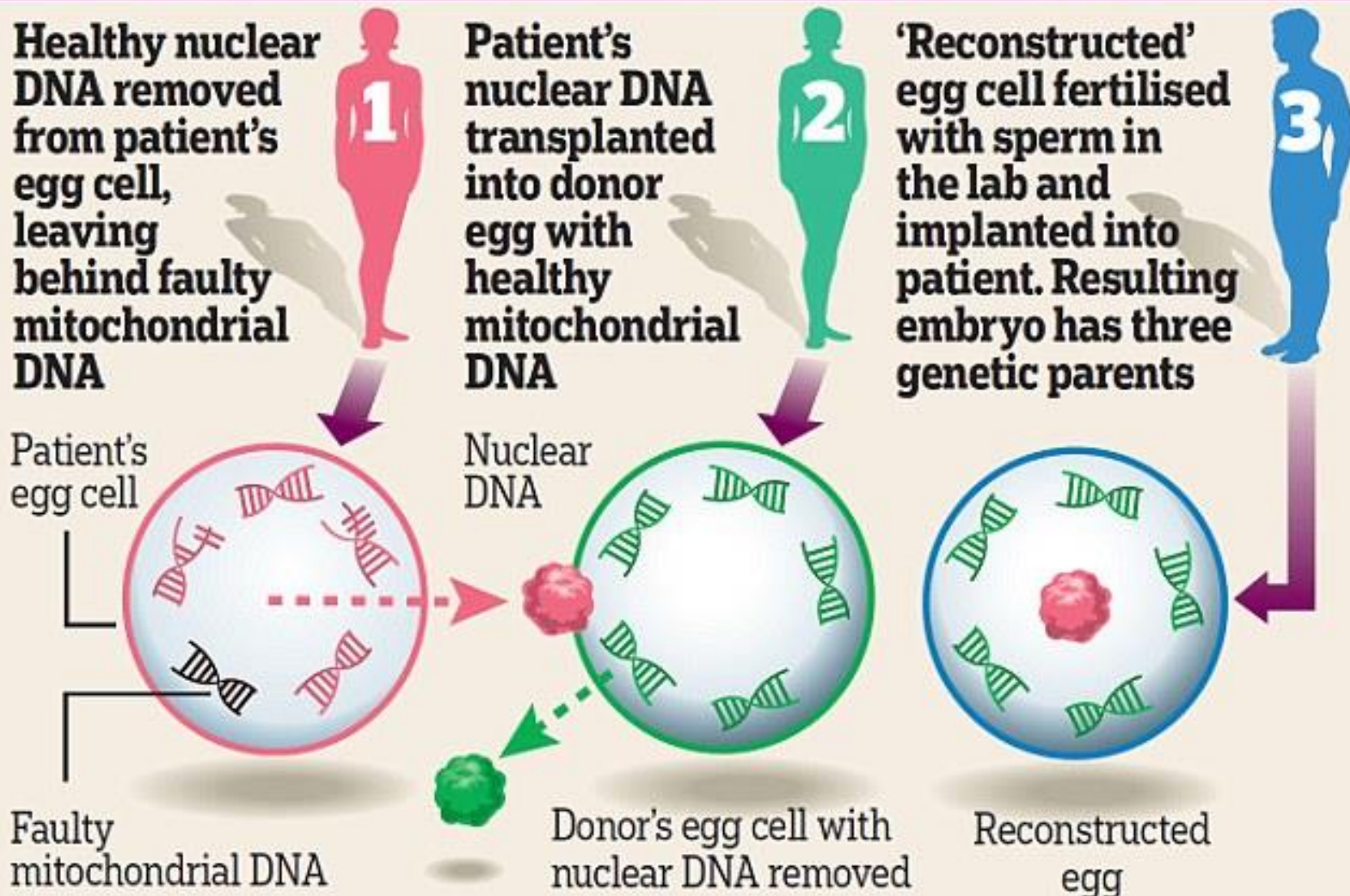


In Vitro Fertilizáció (IVF)



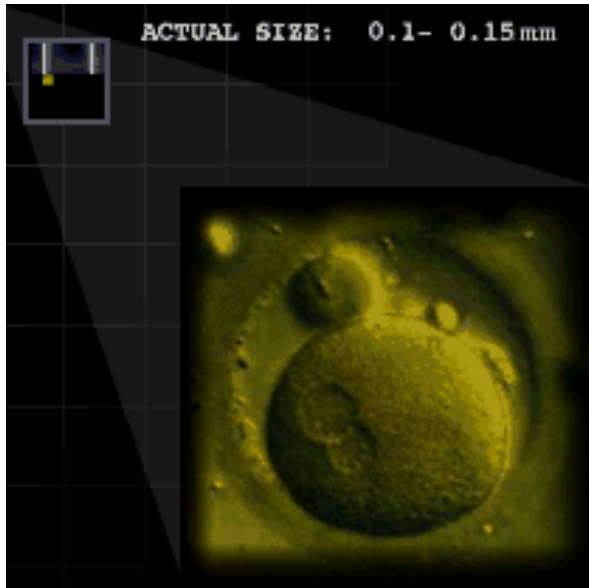
Három genetikai szülő

HOW THE IVF TECHNIQUE WORKS



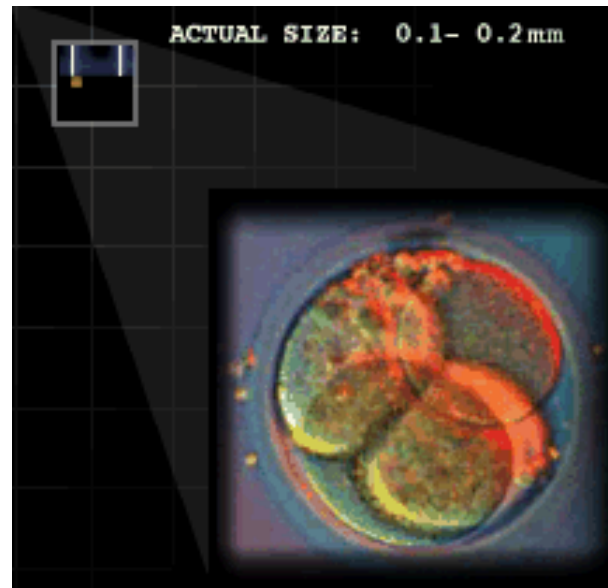
Barázdálódás

zygota



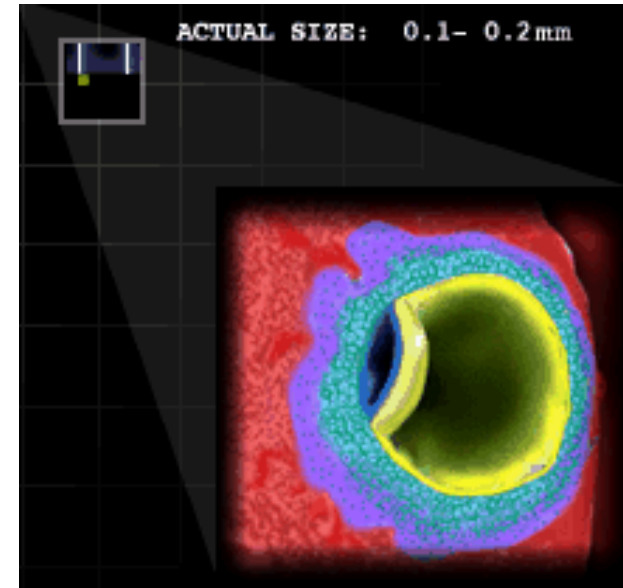
Fertilization
1 Oocyte, 300
Million Sperm, 24
Hours
0.1 - 0.15 mm
1 day post-
ovulation

morula



First Cell Division,
Blastomeres,
Mitotic division
0.1 - 0.2 mm
1.5 - 3 days post-
ovulation

blastula



Implantation
Complete,
Placental
Circulation
System Begins
0.1 - 0.2 mm
7 - 12 days post-
ovulation

Barázdálódás

1.5 - 3 nappal az ovuláció után

mitotikus sejtosztódás

0.1 - 0.2 mm

ZYGOTA – barázdálódni kezd, cca minden 20. órában
duplázódik a sejtek száma (*blastomera*)

MORULA – 16 sejtes stádiumtól, tuba uterinában sodródik,
a 4. napon üregesedni kezd (BLASTULA) és elhagyja a tubát

A MORULA KAVITÁCIÓJA

4 nappal az ovuláció után
korai blastocysta képződés
0.1 - 0.2 mm

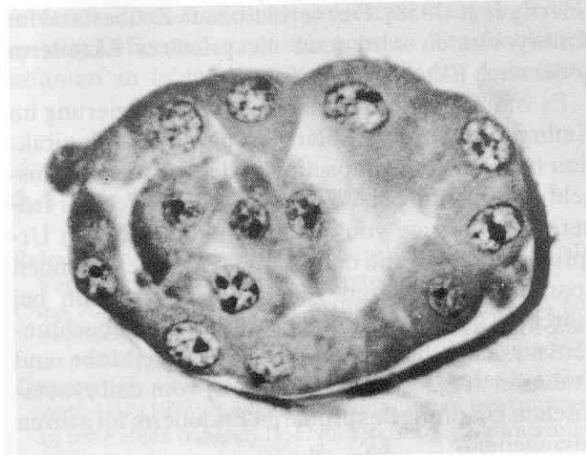


Abb. 4-8. Fröhe Blastocyste im lichtmikroskopischen Schnittbild (Carnegie 8794). Beginnende Konfluenz der Interzellularräume
(Mit freundlicher Genehmigung von Prof. O'Rahilly, Car-

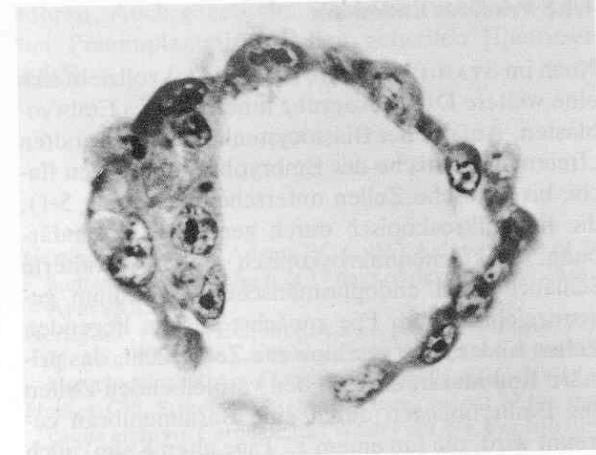


Abb. 4-9. Schnitt durch eine noch freie 107-Zellen-Blastocyste (Carnegie 8663). Embryoblastzellen mit etwas größeren Zellkernen werden vom polaren Trophoblasten, die Blastocystenöhle ist vom muralen Trophoblast umschlossen.

BLASTOCYSTA

- folyamatos sejtosztódás
- üreg (*blastocoel*) képződése
- a sejtek kompaktálódnak, ellapulnak

-DE a *zona pellucida* nem tágu

- 2 sejtípus differenciálódik:
 - embryoblast (belső)
 - trophoblast (külső)



A BLASTOCYSTA „KIKELÉSE” ELŐKÉSZÜLET AZ IMPLANTATIÓHOZ

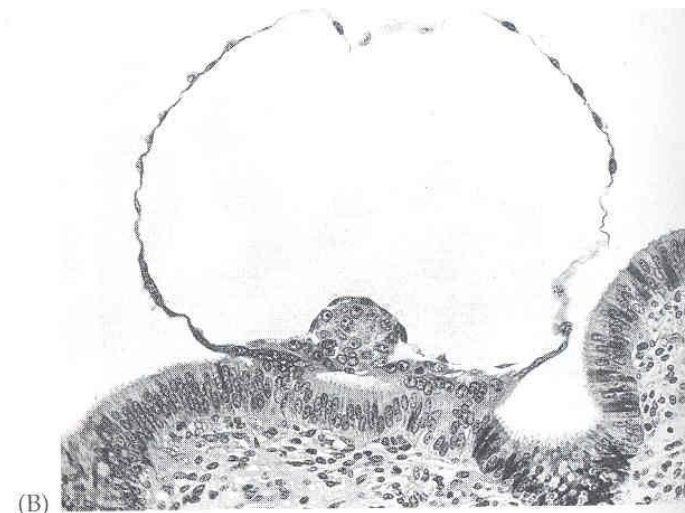
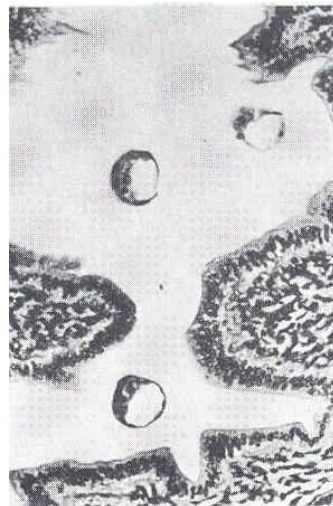
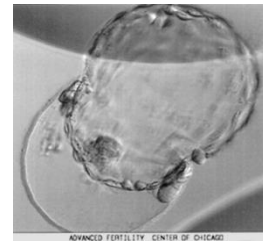
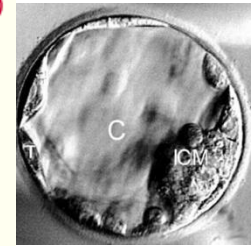
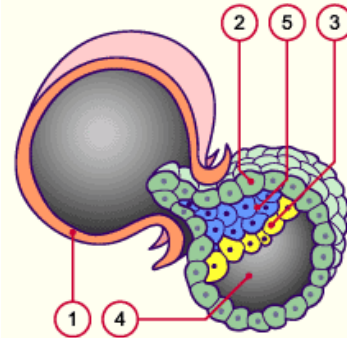
BLASTOCYSTA

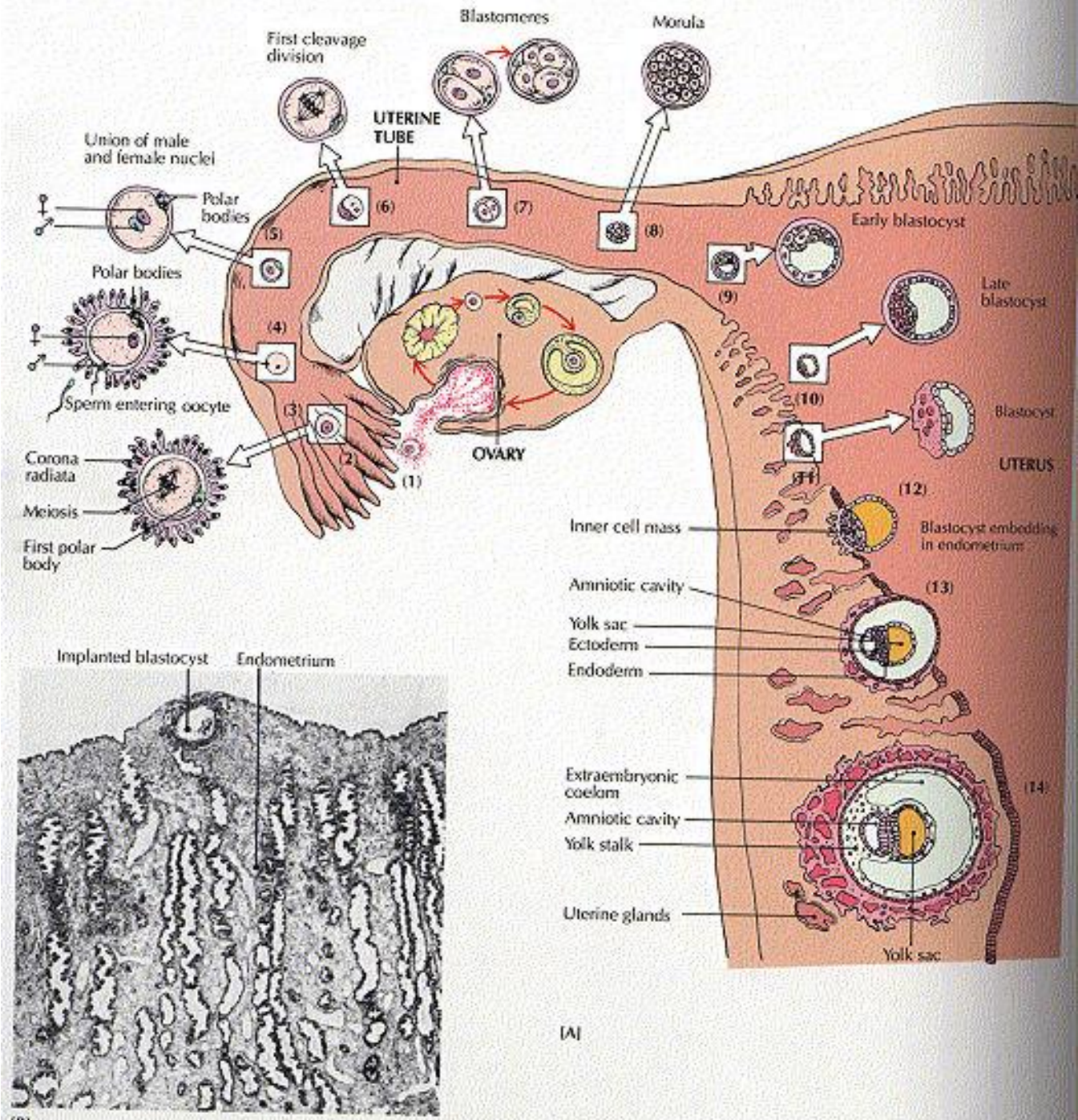
-belép az uterusba
-„*kike*” a zona pellucidából
5 - 6 nappal az ovuláció után kezdődik az implantatio folyamata, a blastula a méh üregében „úszik”, majd megtapad (a trophoblastok olyan enzimet termelnek, amely felmarja az endometriumot)

APPOZÍCIÓ (az embriócsomóval a fal felé fordulva helyezkedik el)

-A felszíni proteoglikánok kötik össze a sejteket
-hCG, progeszteron release nő
Terhességi próba!!

Megnövekszenek a mirigyek
Megduzzad az endometrium
Gazdagabb érhalózat alakul ki





[B]

[A]

Köszönöm a figyelmet!

