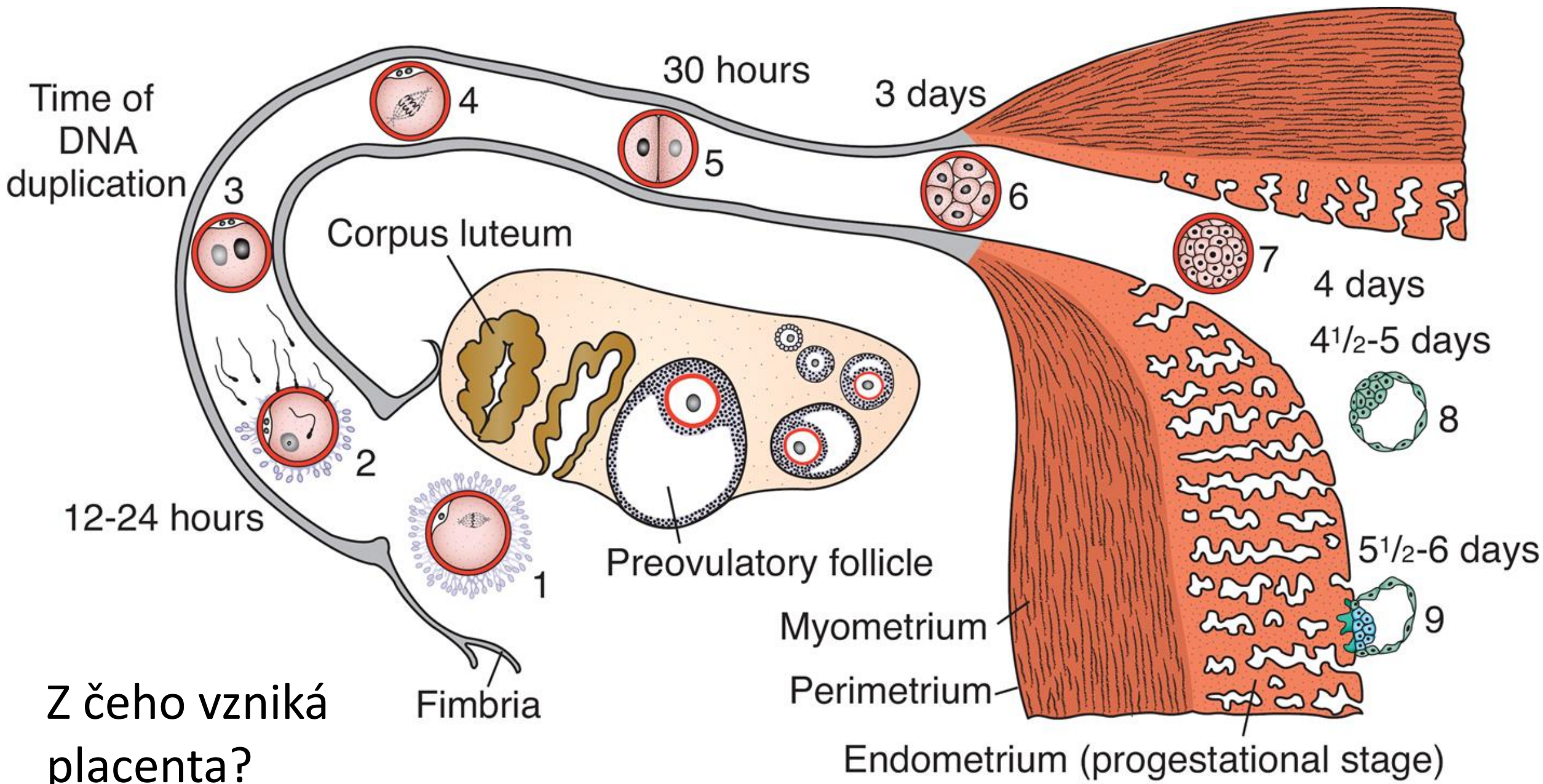


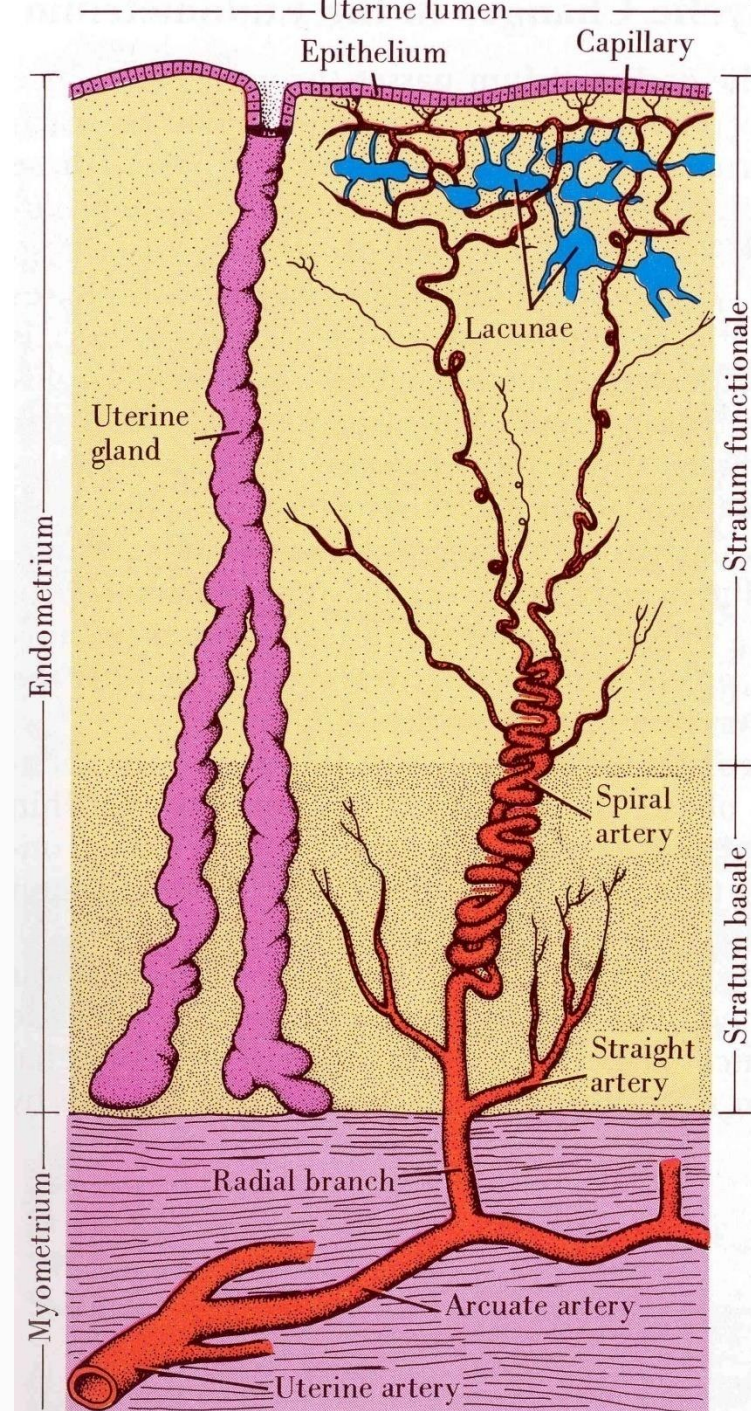
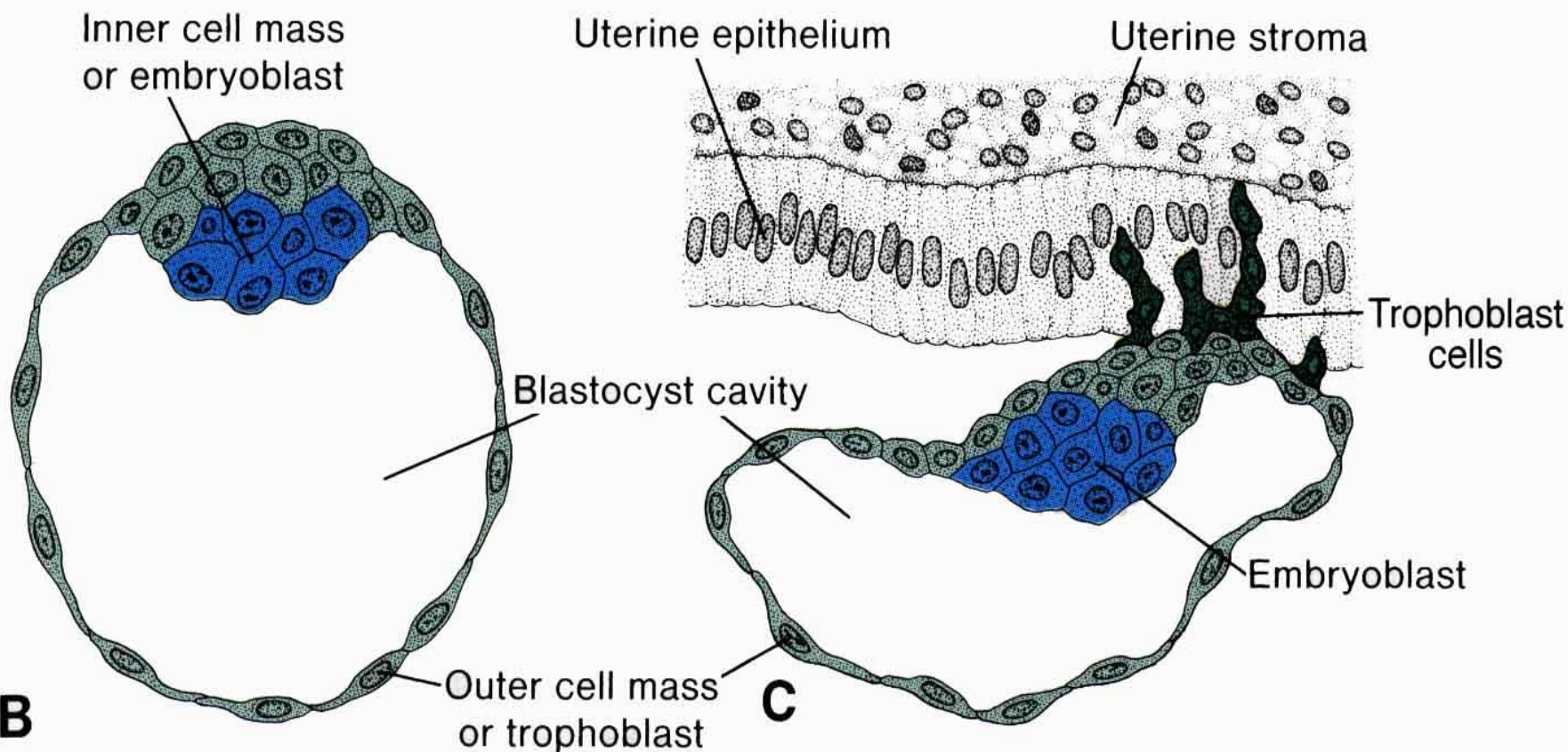
Plodové obaly a placenta

MUDr. Pavel Rožtok

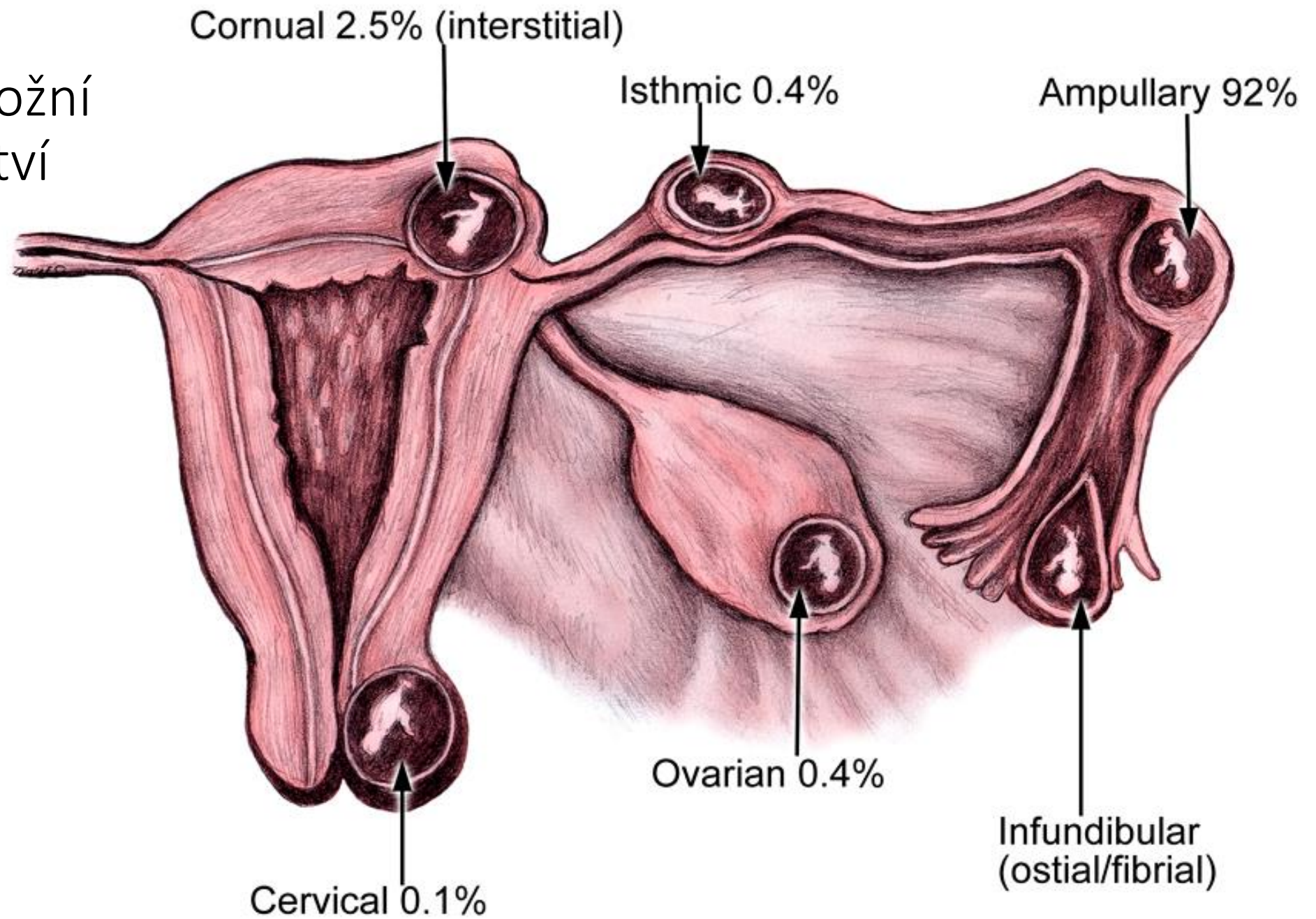


Z čeho vzniká placenta?

Jaké hormony zde hrají roli?

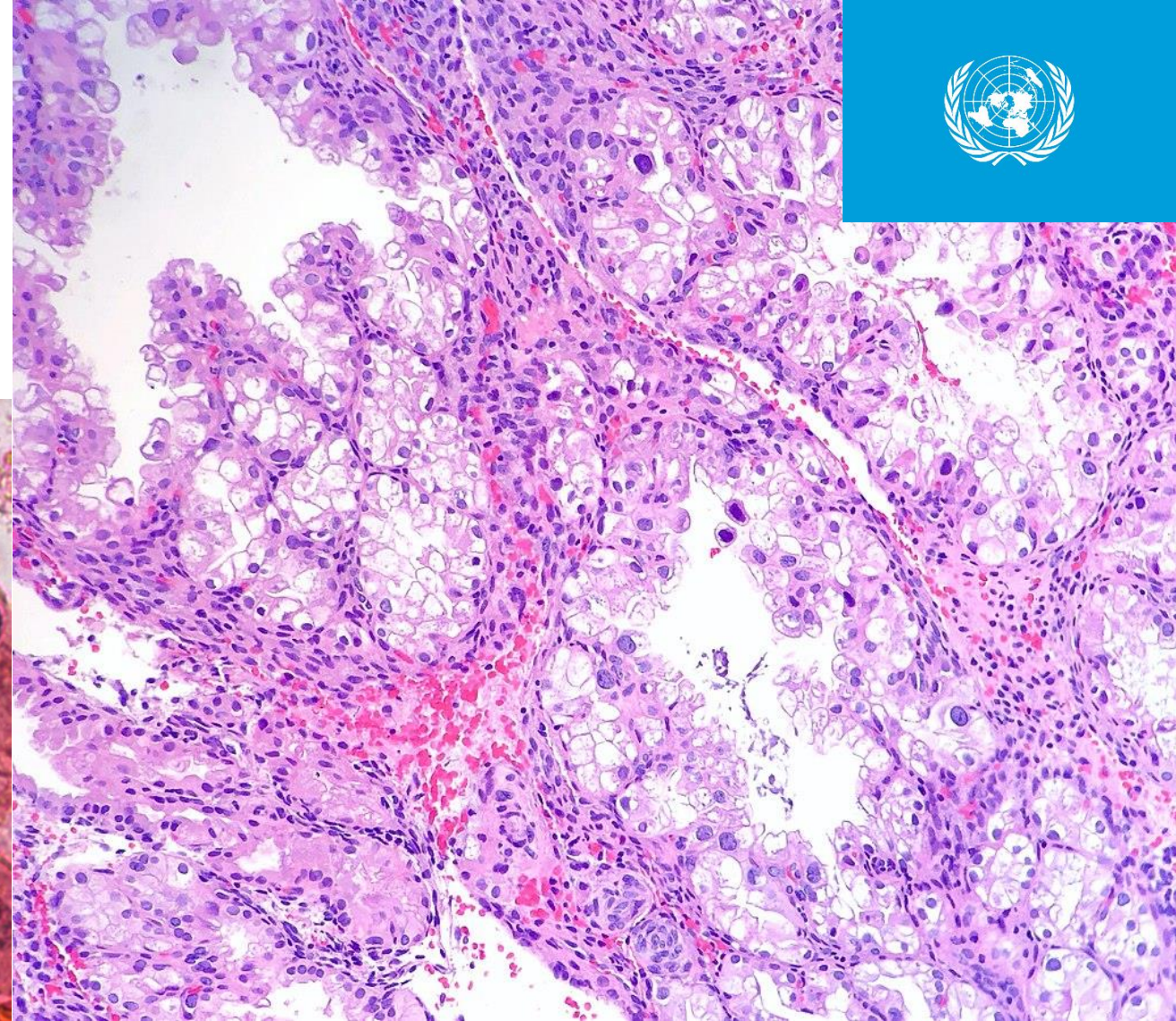
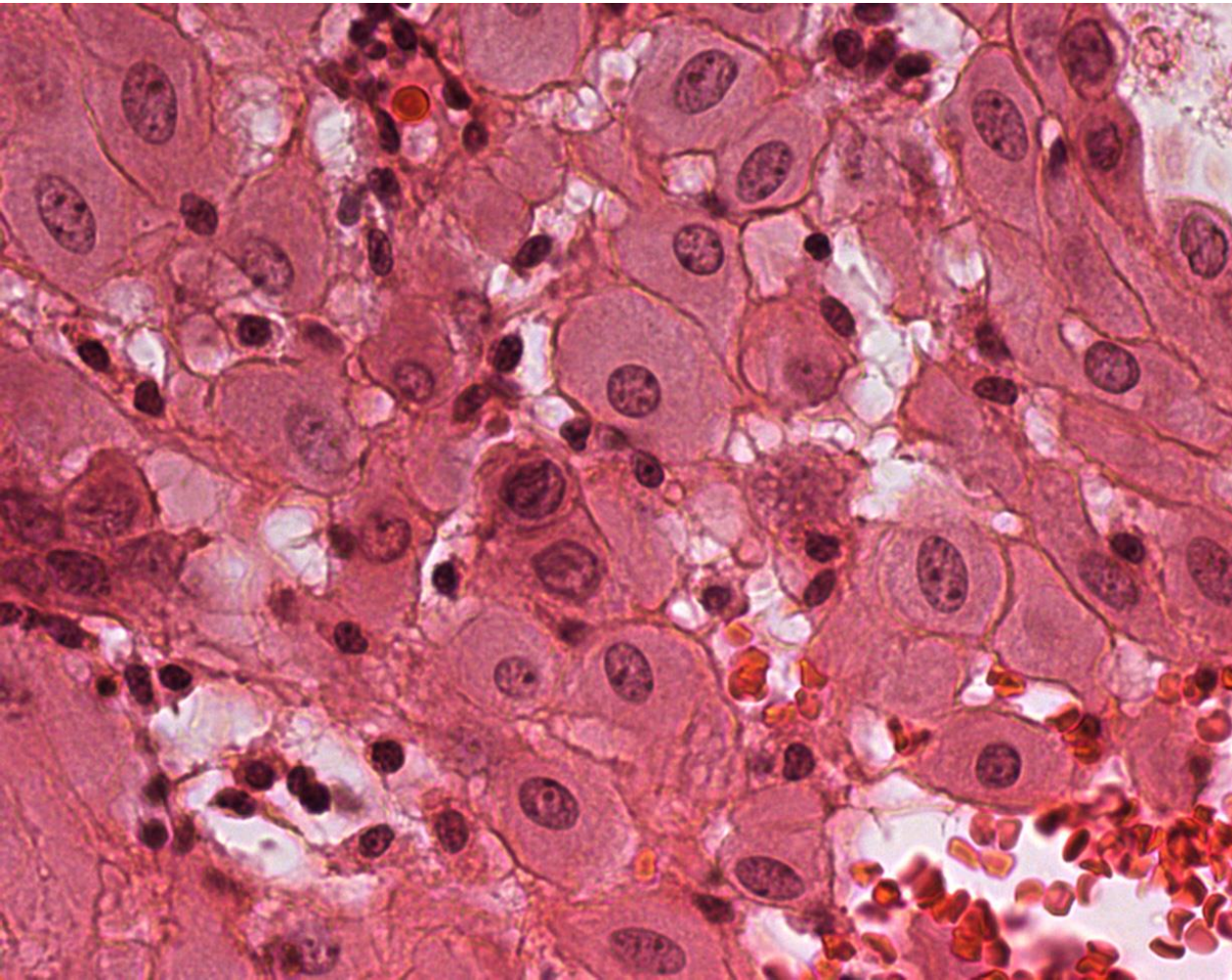


Mimoděložní těhotenství





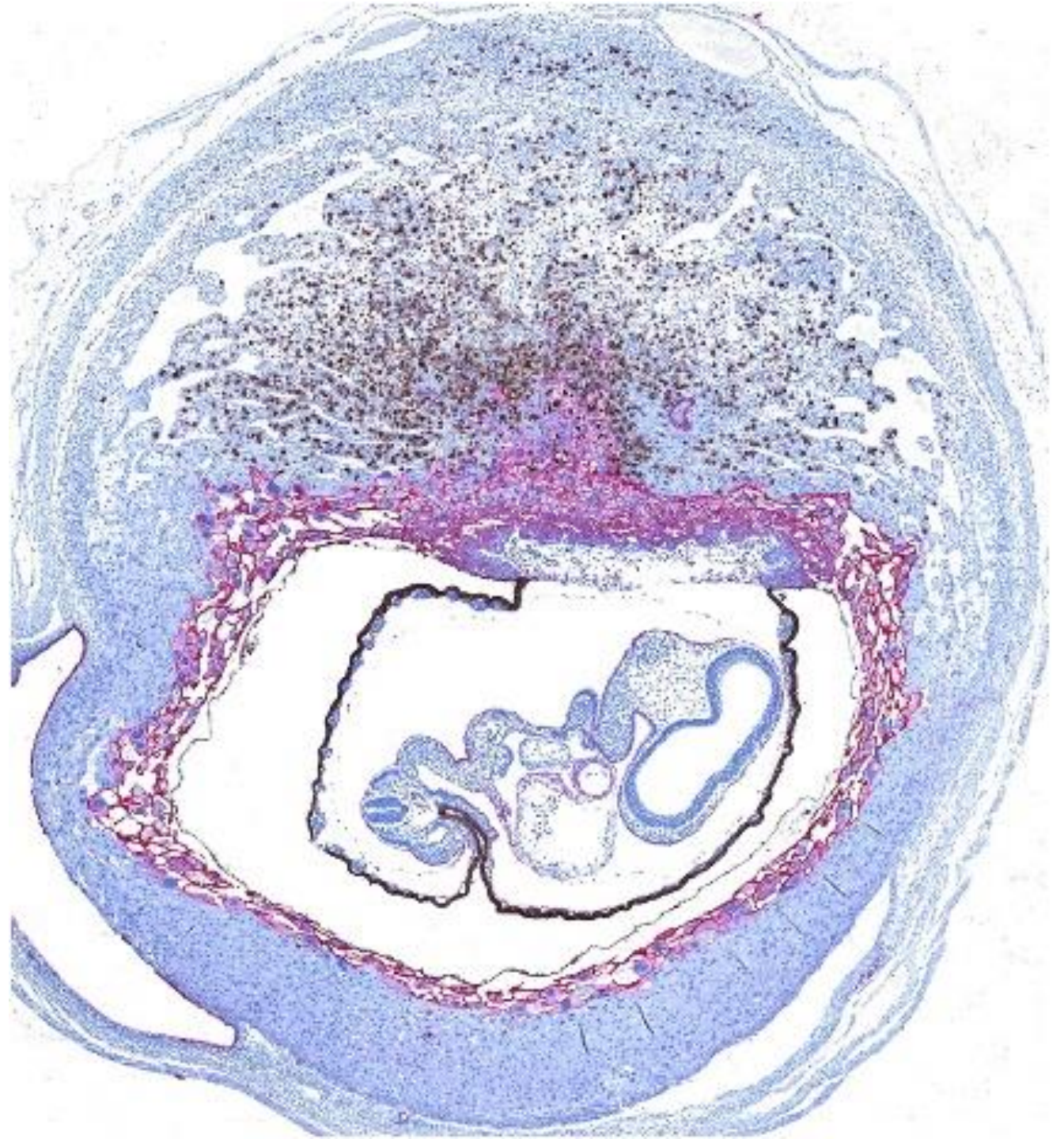
Buňky endometriálního vaziva se v reakci na přítomnost trofoblastu mění, vzniklé deciduální buňky jsou polyedrické s obsahem glykogenu a lipidů.



Mění se i žlázy endometria (reakce Arias-Stella). I přes určitou nukleární atypii je tato reakce zcela benigní.

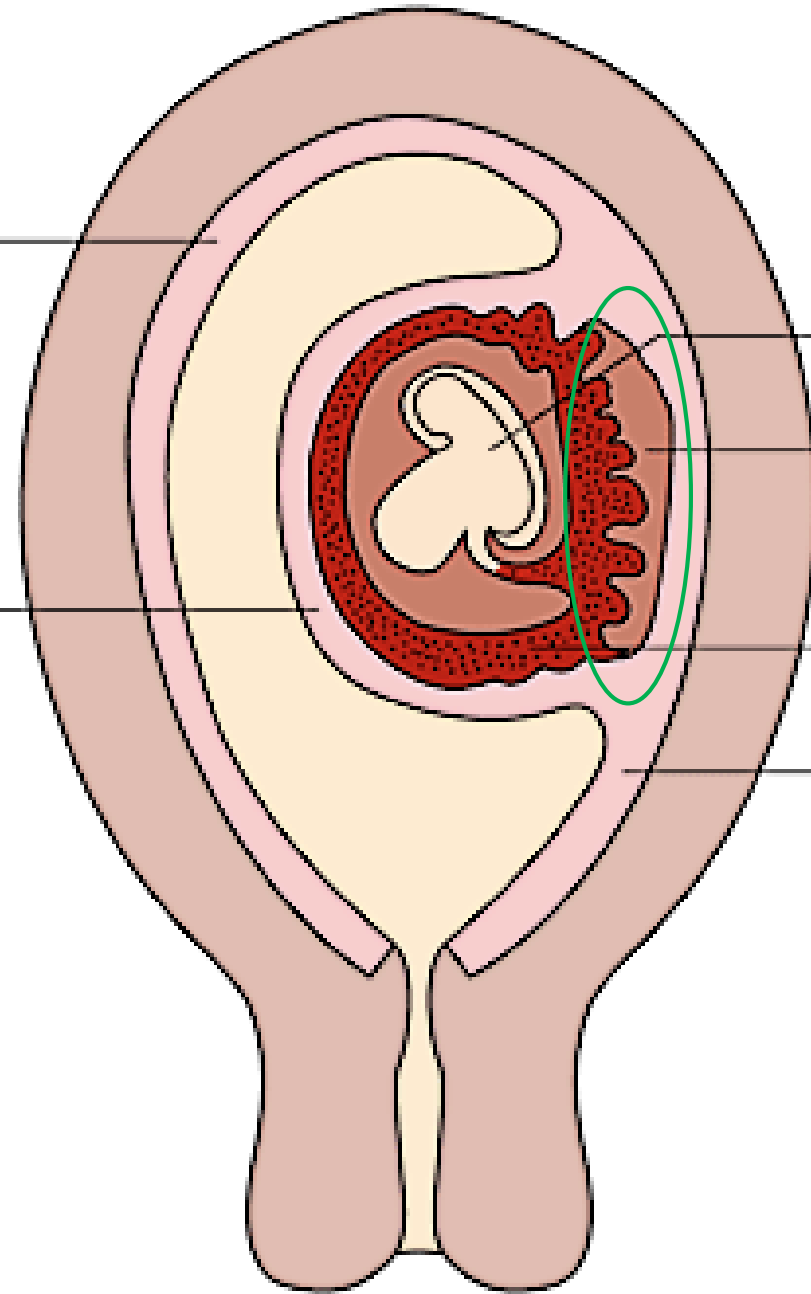
Myší embryo a plodové obaly, trofoblast – červená, uNK buňky – hnědá. Tato zvláštní populace buněk byla dříve známá jako velké granulózní lymfocyty. Jejich funkcí je kromě ochrany před patogeny i regulace vývoje placenty a imunitní tolerance.

Moffett A, Colucci F. Co-evolution of NK receptors and HLA ligands in humans is driven by reproduction. *Immunol Rev.* 2015 Sep;267(1):283-97. doi: 10.1111/imr.12323. PMID: 26284484.



Decidua
parietalis

Decidua
capsularis



Fetus

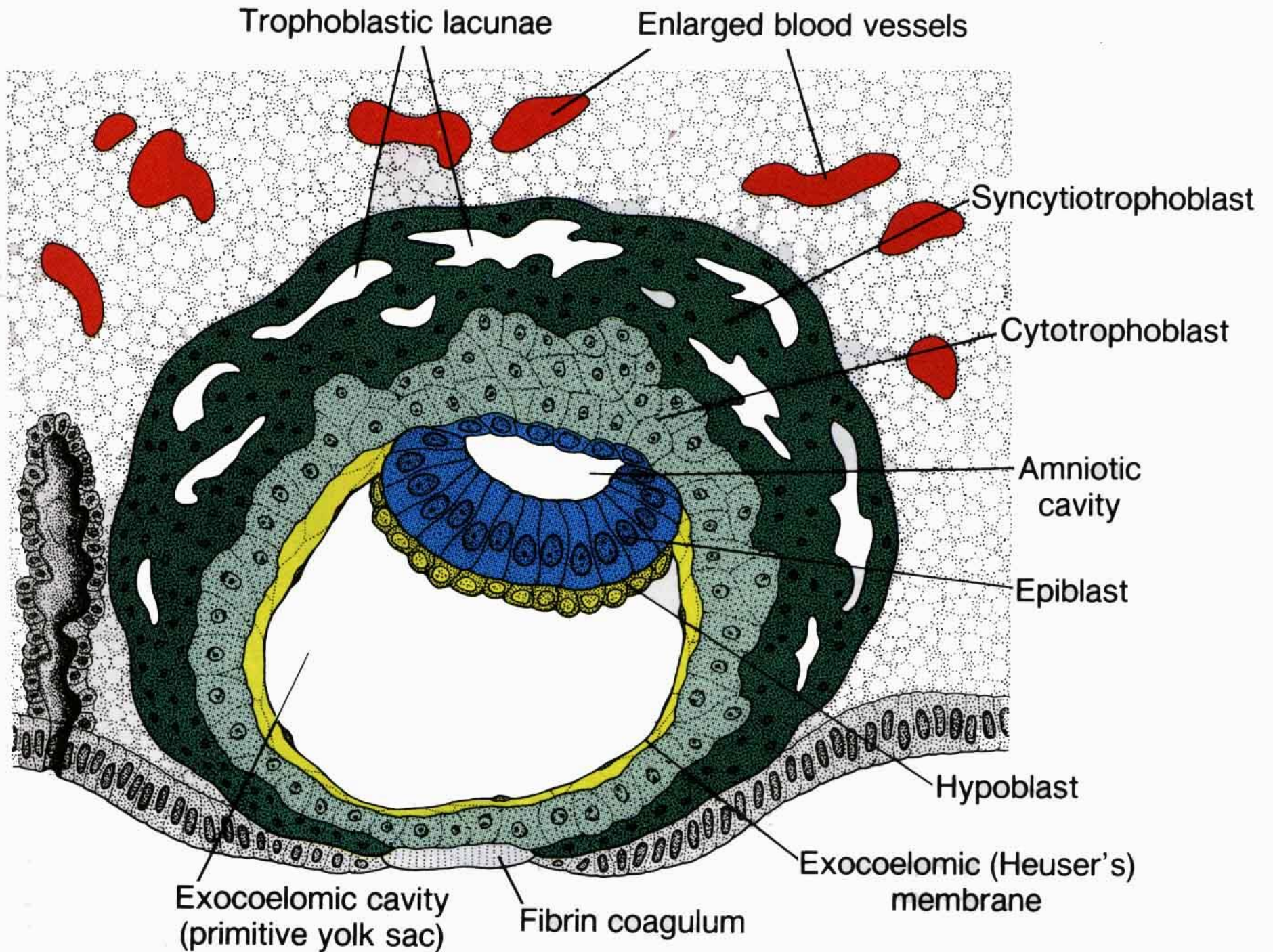
Decidua
basalis

Chorion

Decidua
marginalis

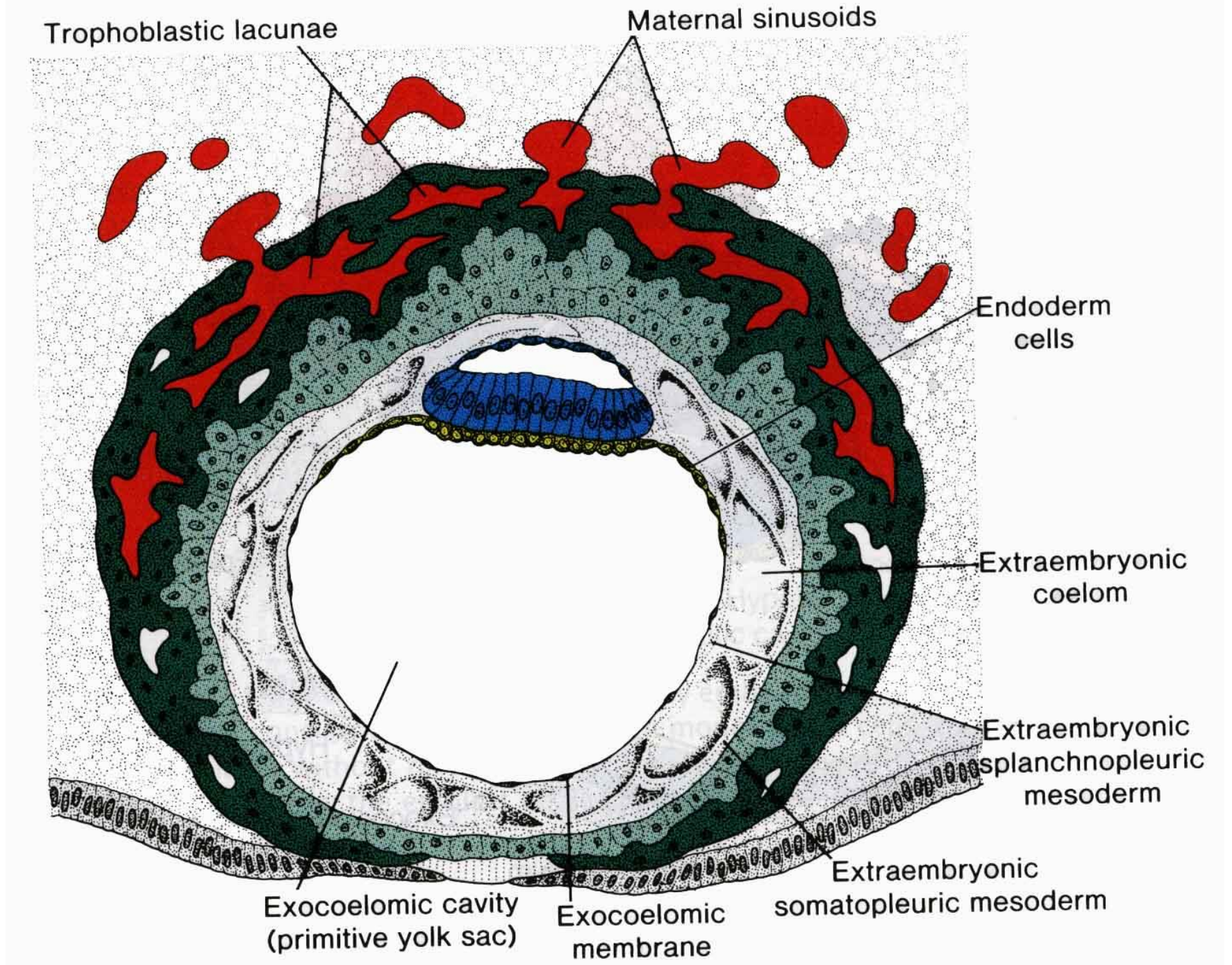
9. den

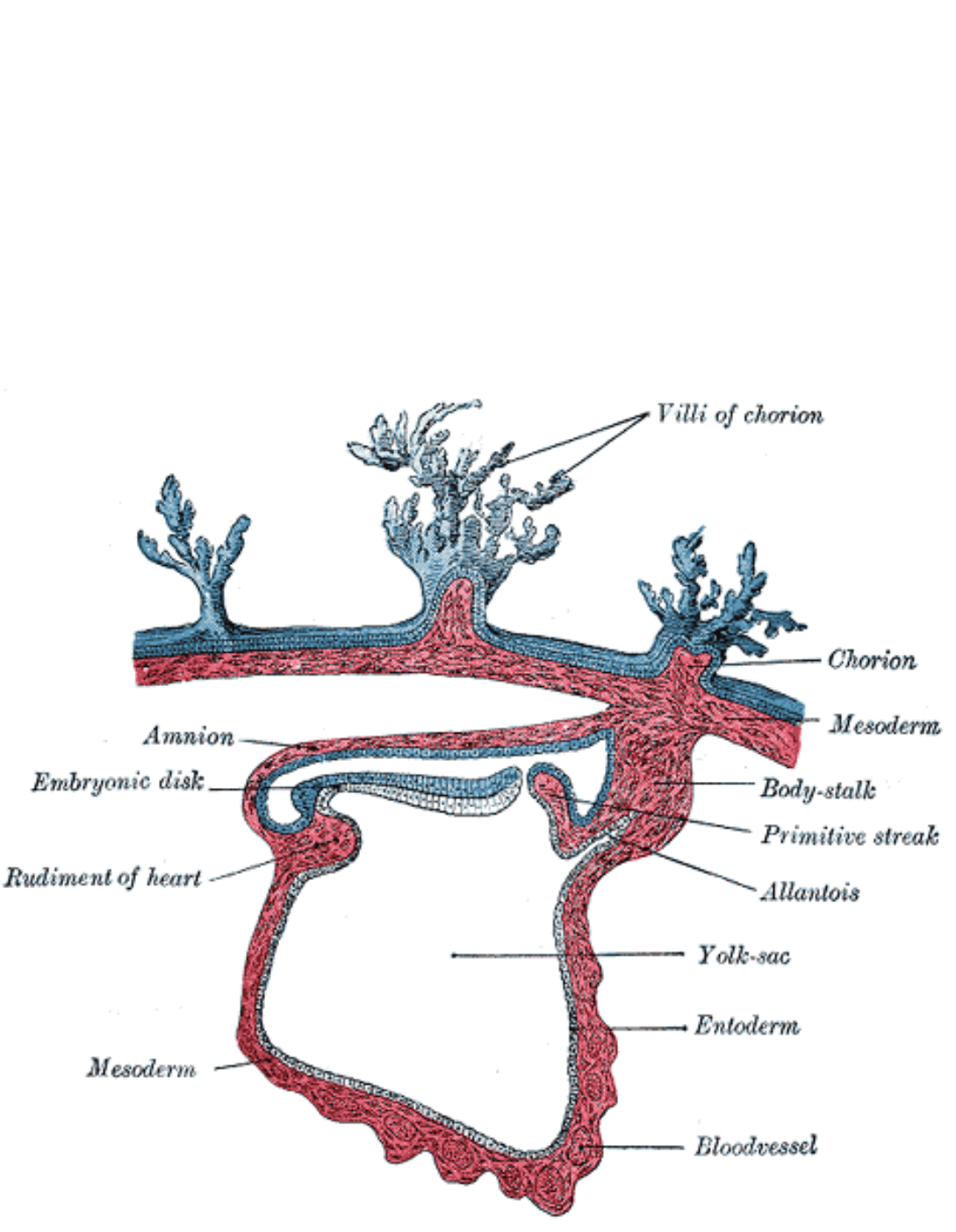
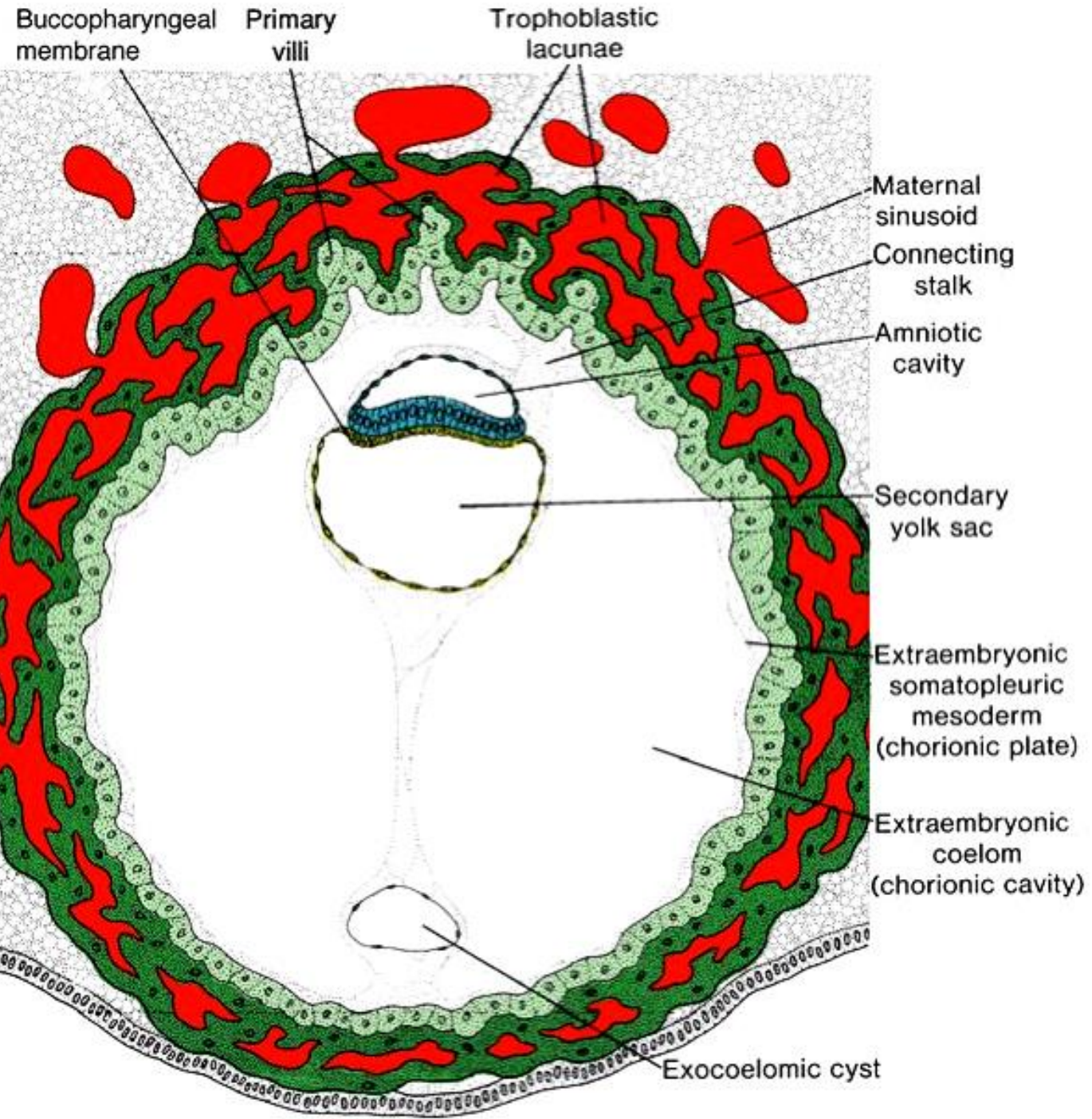
Histotrofické
stadium výživy

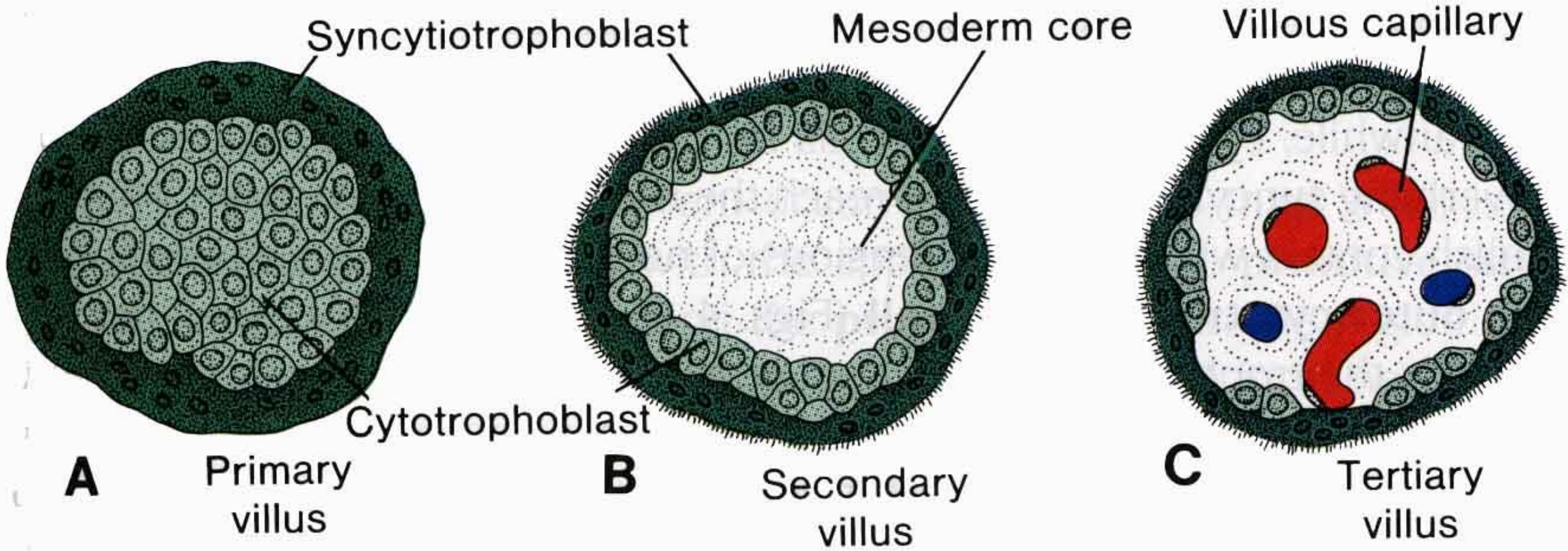


12. den

Počátek vývoje
fetoplacentárního
oběhu







Konec 2. týdne

3. týden

Konec 3. týdne

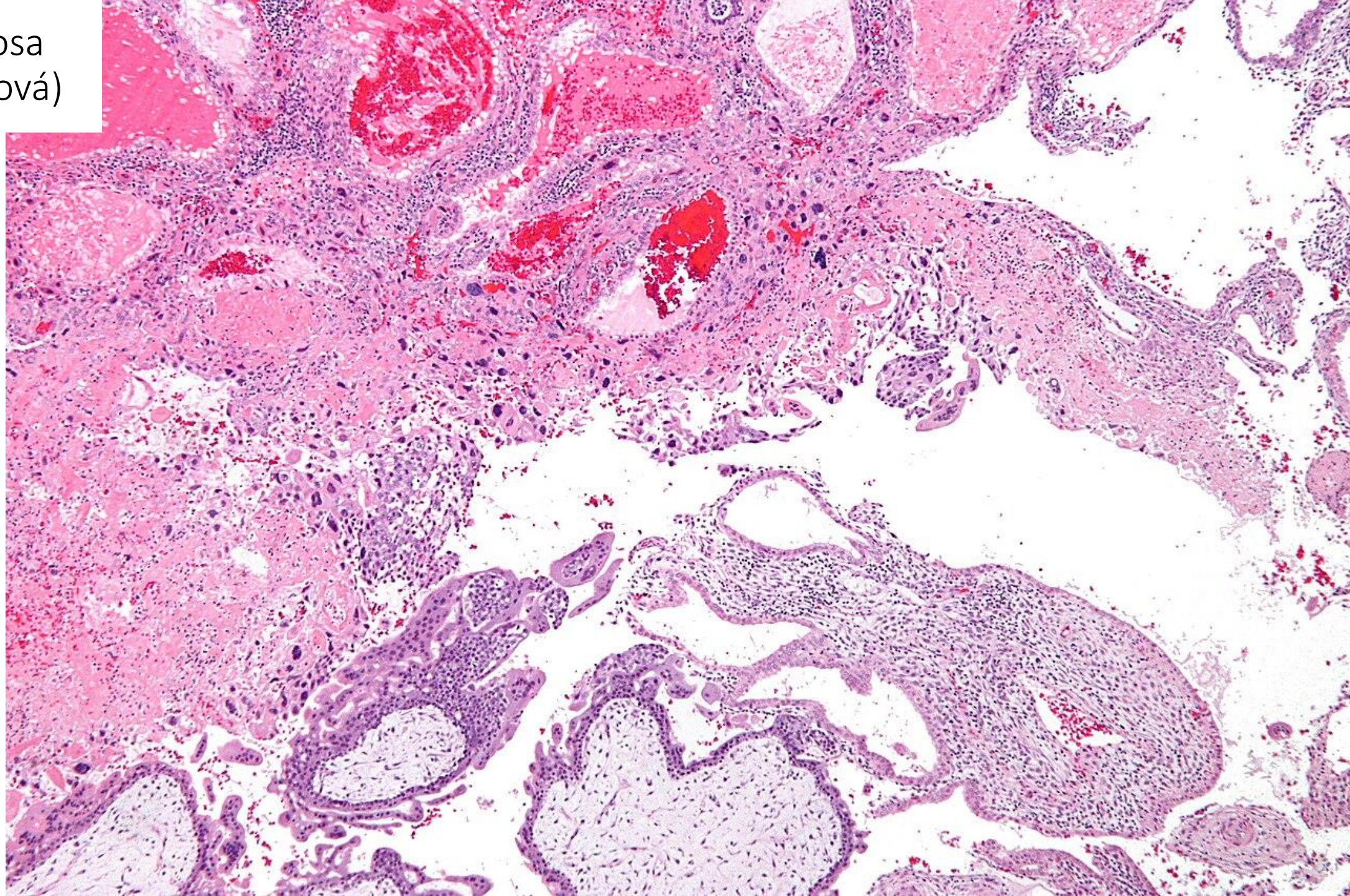
Gestační trofoblastická nemoc/neoplasie

- Hydatidiformní mola (benigní)
 - Parciální
 - Kompletní
- Choriokarcinom (maligní)
 - V 50 % mu předchází mola hydatidosa

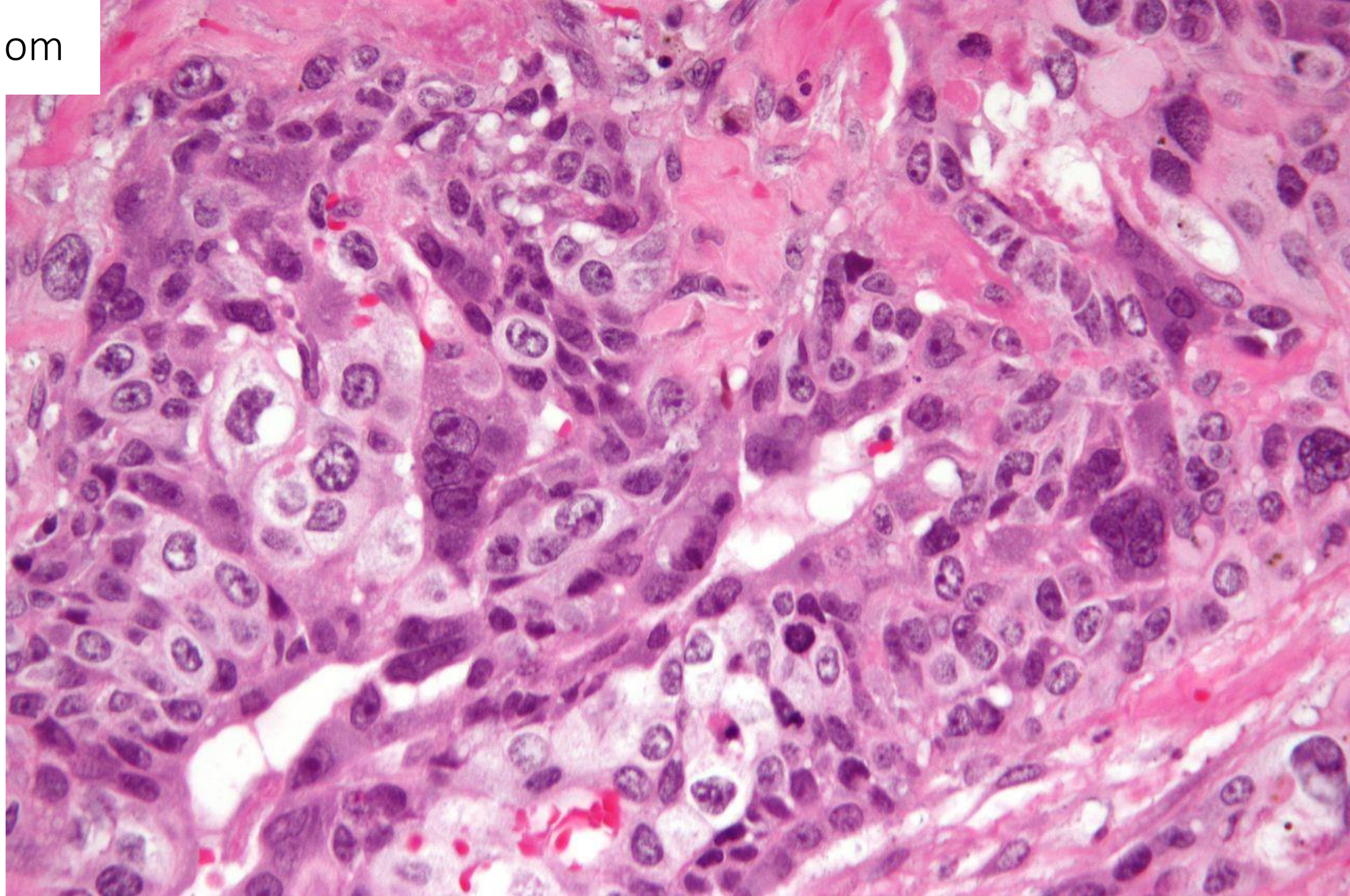
Jaký marker používáme ke sledování?

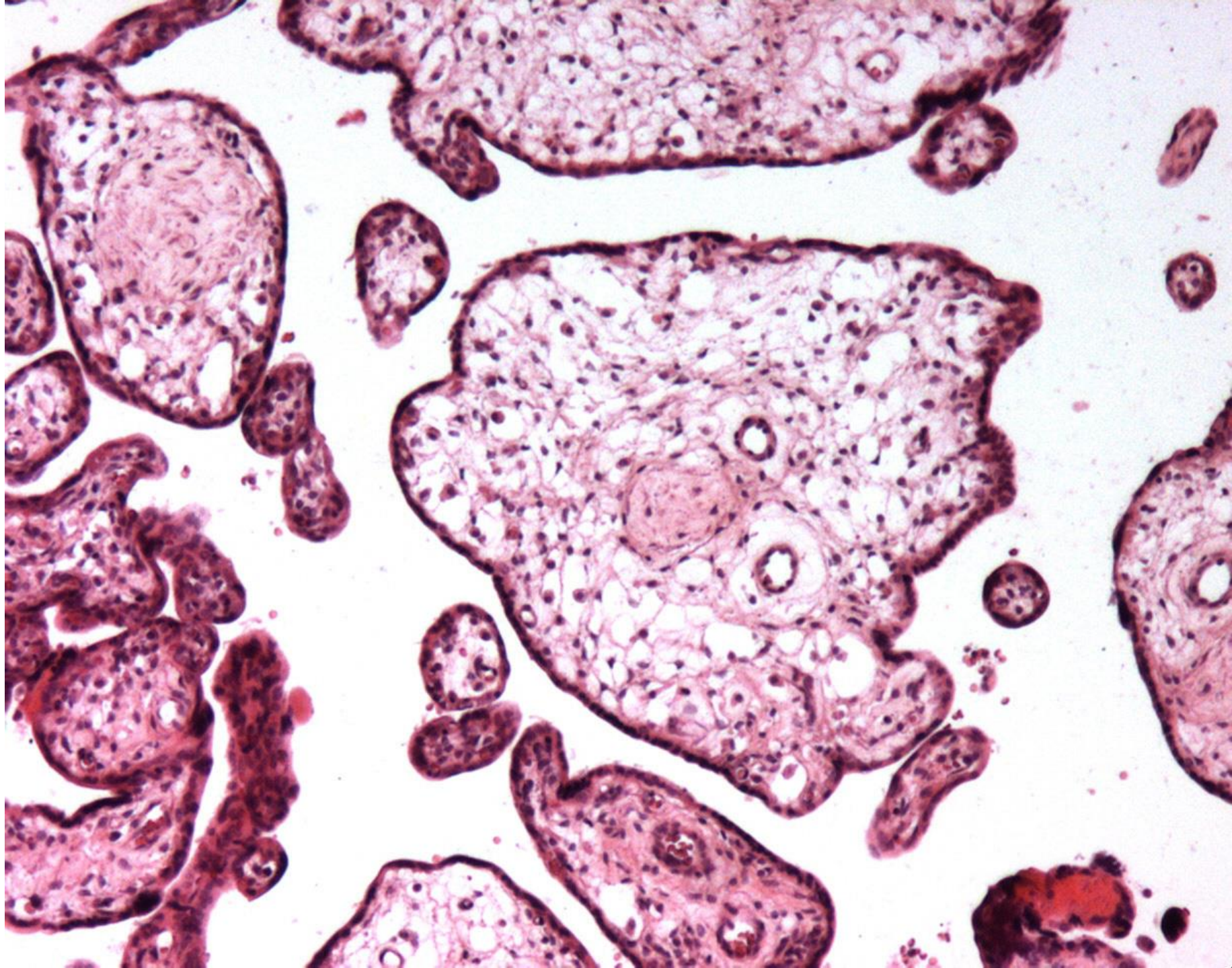


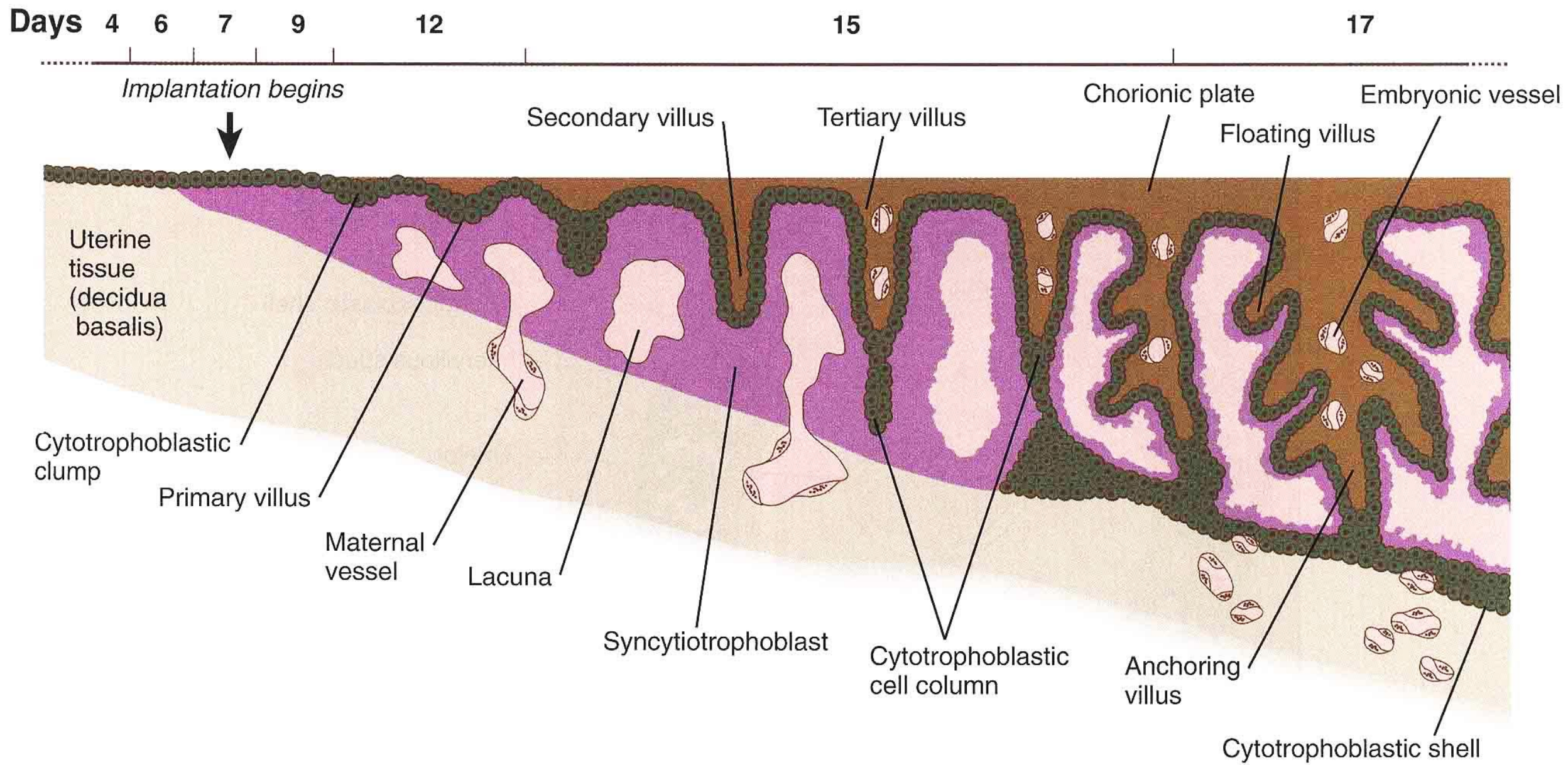
Mola hydatidosa
(zásněť hroznová)

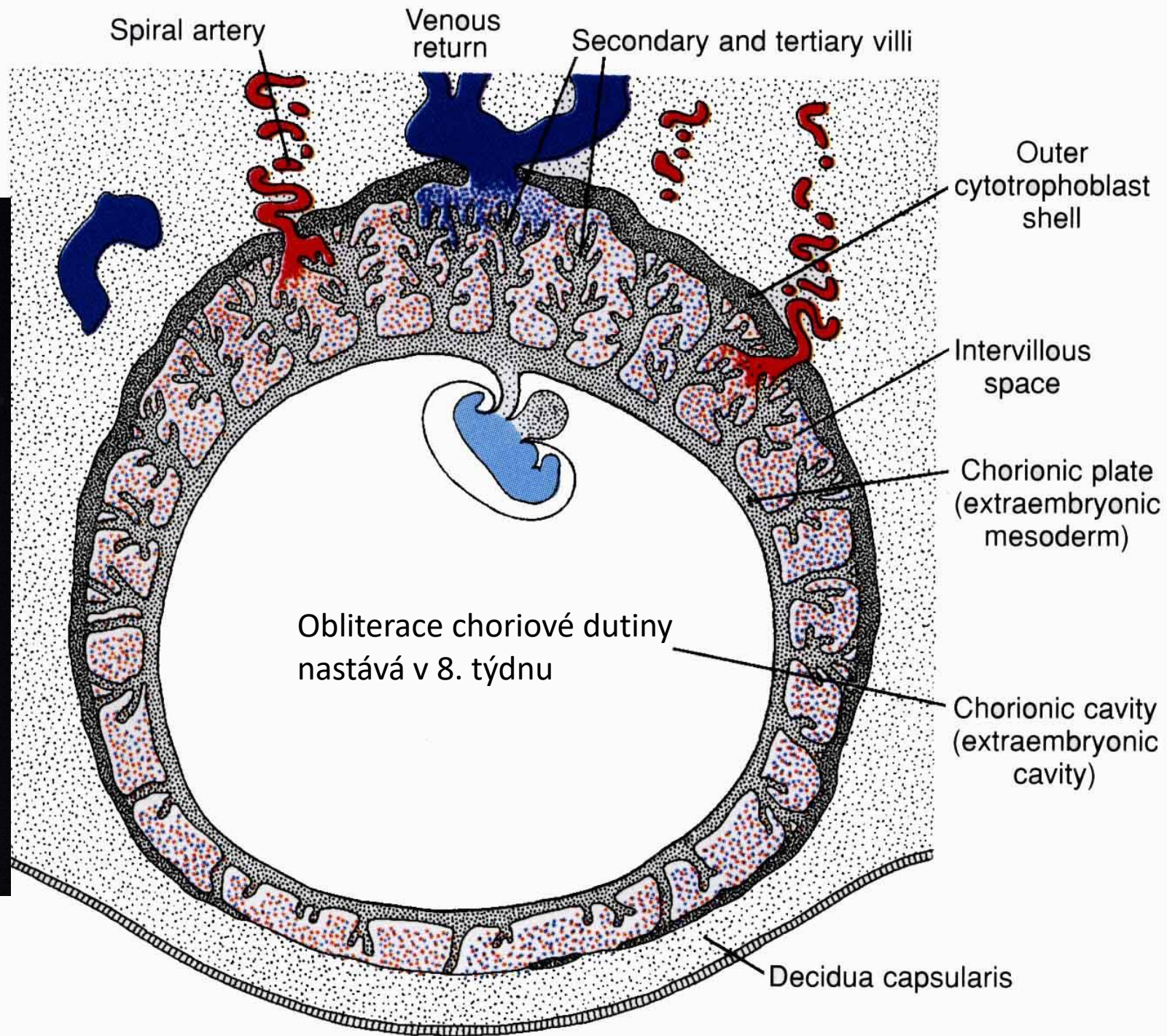
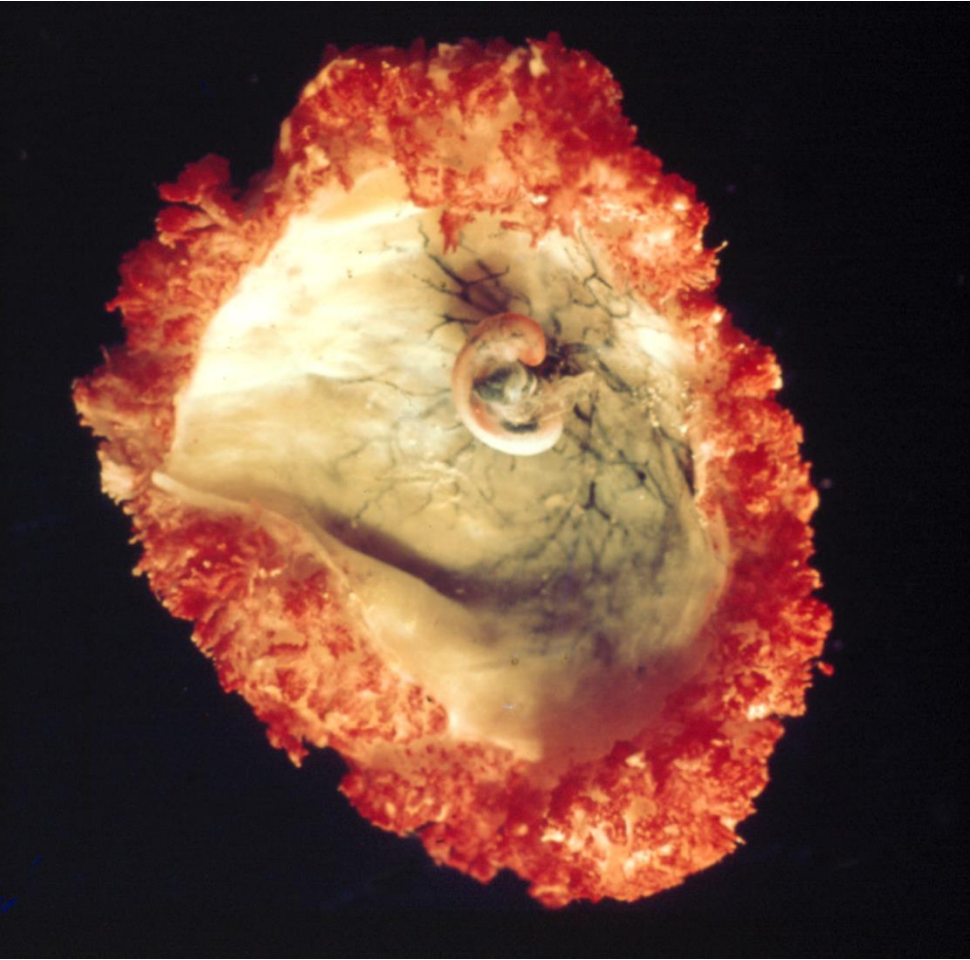


Choriokarcinom



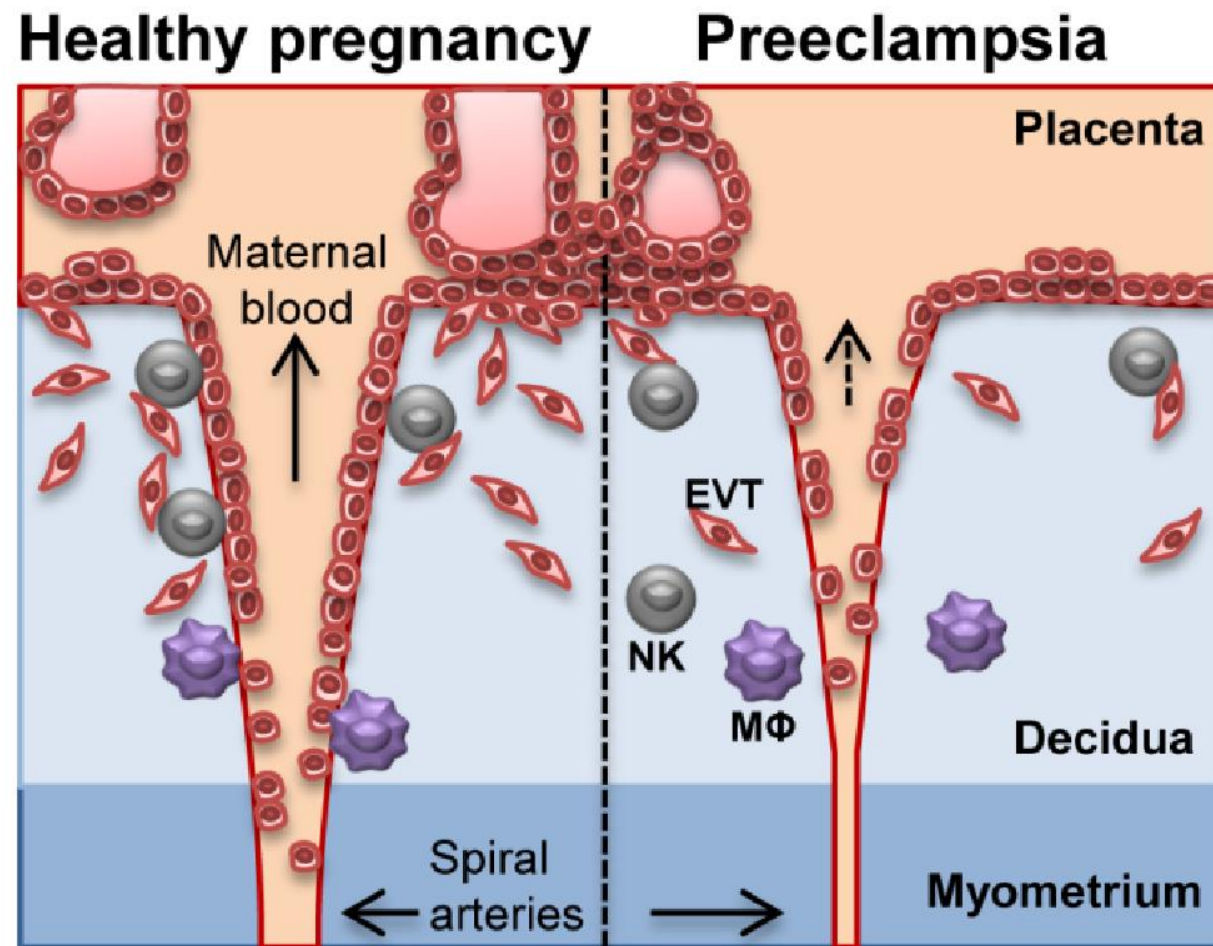






Pre-eklampsie

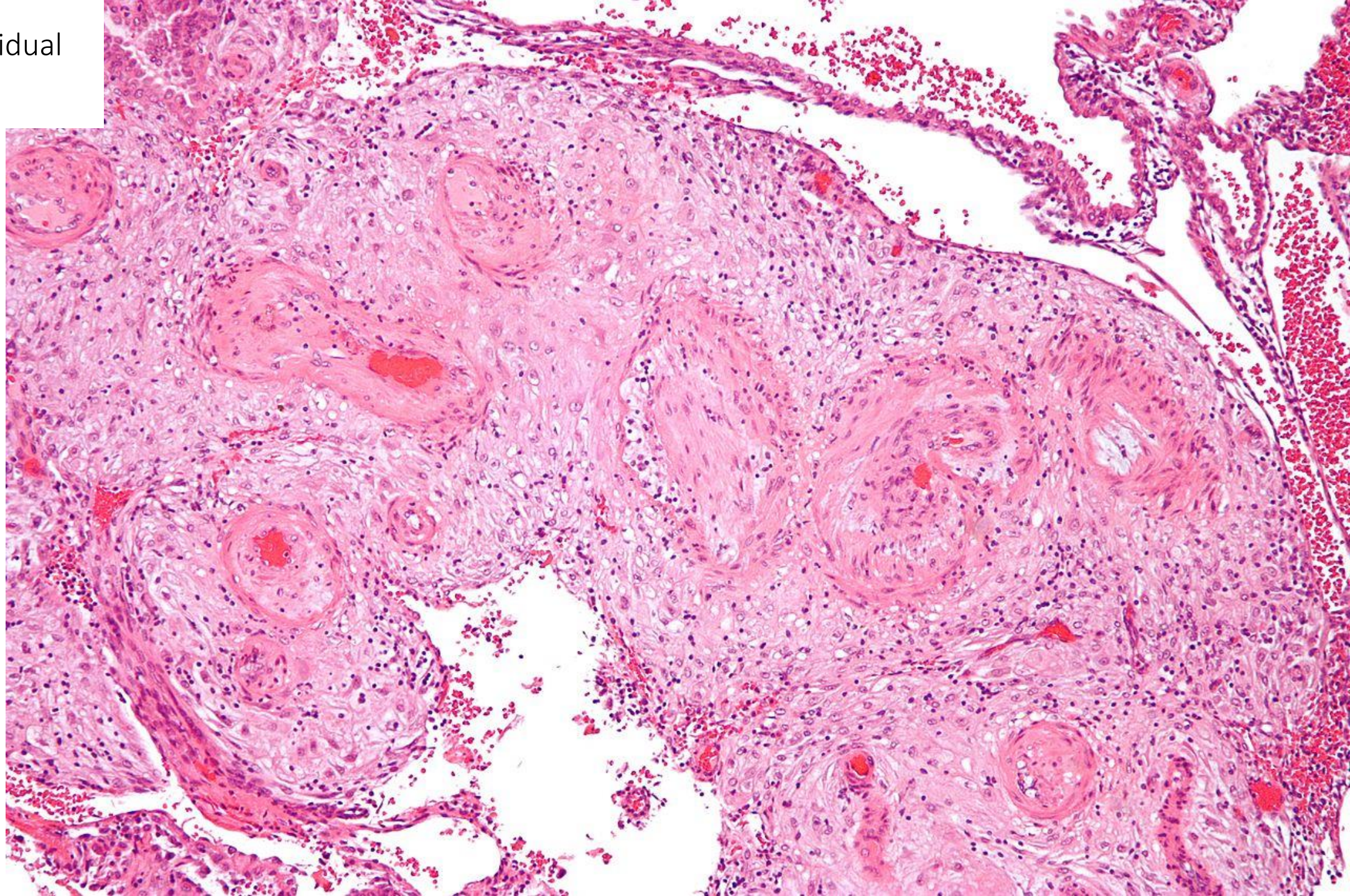
- Začátek většinou po 20. týdnu
- Vysoký krevní tlak, proteinurie
- Trombocytopenie, hepatopatie, výpotky, bolesti hlavy, nauzea, poruchy visu...
- Porucha vývoje placenty vede k endoteliální dysfunkci



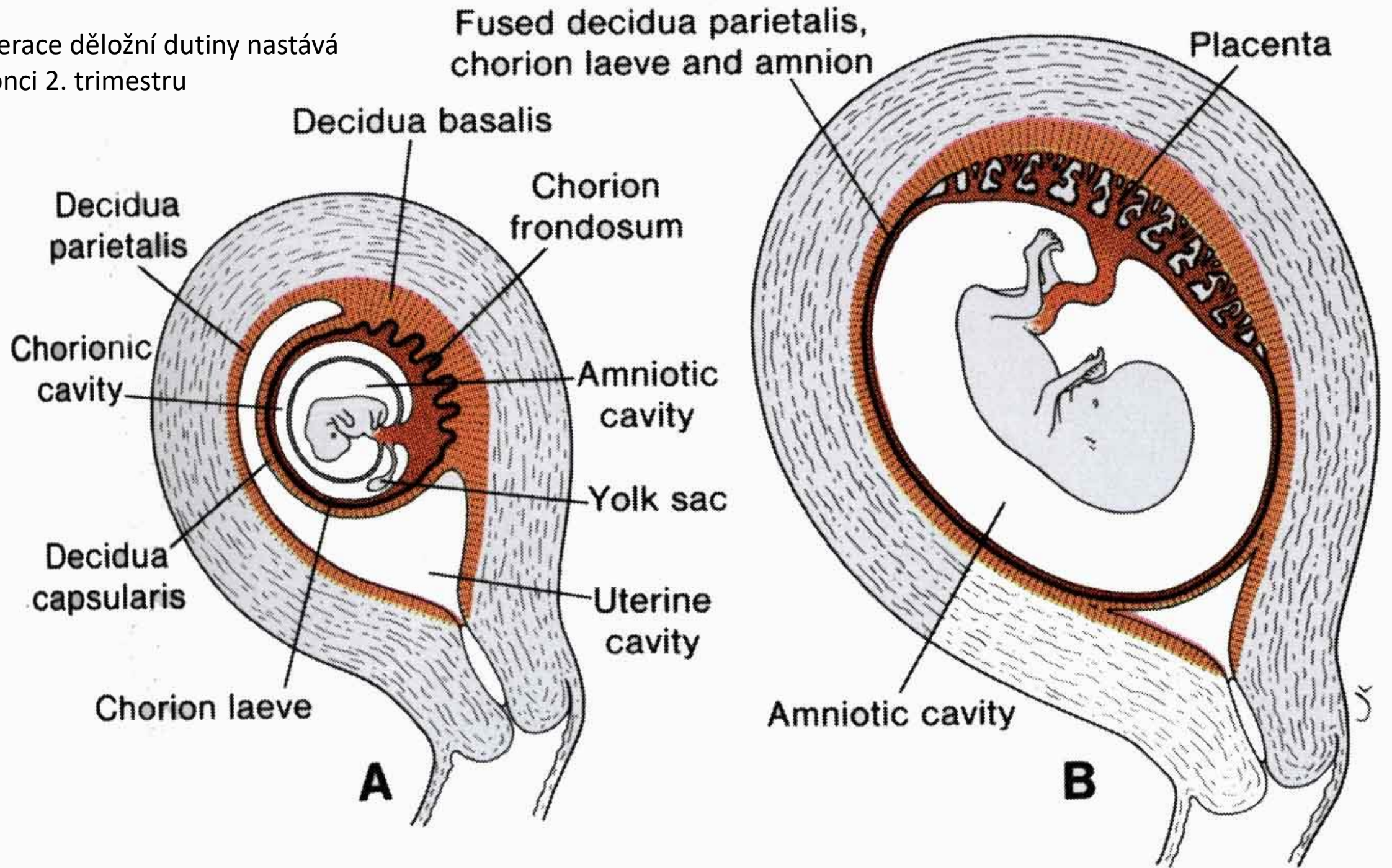
Immune regulation at the fetal-maternal interface with focus on decidual macrophages, Svensson-Arvelund, Judit (2015)

Mázlovi mají odletět do Řecka na dovolenou, ale zmeškají letadlo. Díky svému zmatkářství tak může být Mázl odvolán ke Zdeně, jejíž stav se [*kvůli pre eklampsii*] prudce zhorší. Bude nutné přistoupit k předčasnému porodu císařským řezem. (350. díl Ordinace v růžové zahradě 2)

Hypertrophic decidual
vasculopathy



Obliterace děložní dutiny nastává
na konci 2. trimestru



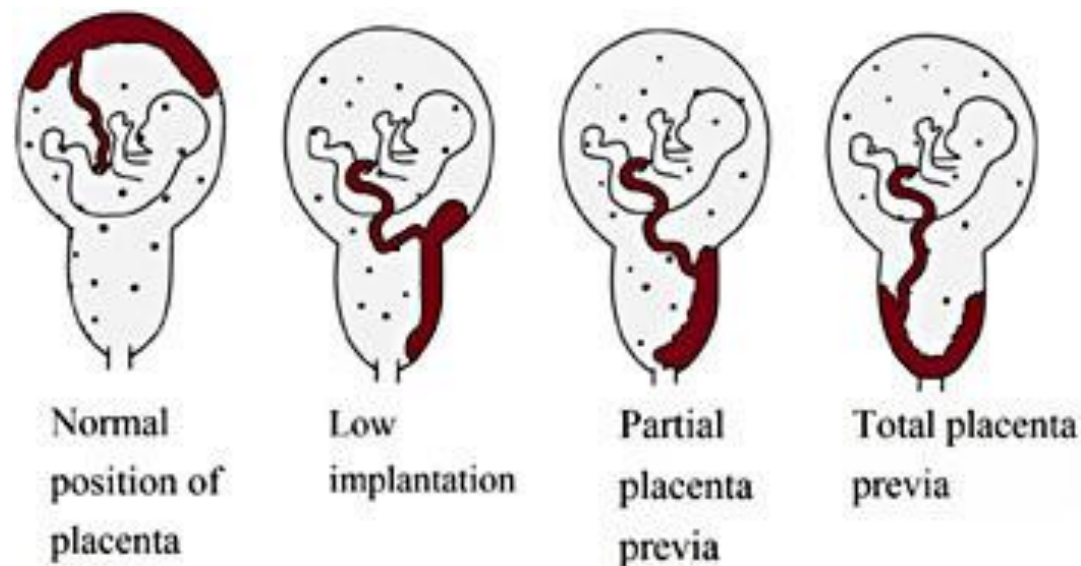
Placenta – klinické souvislosti

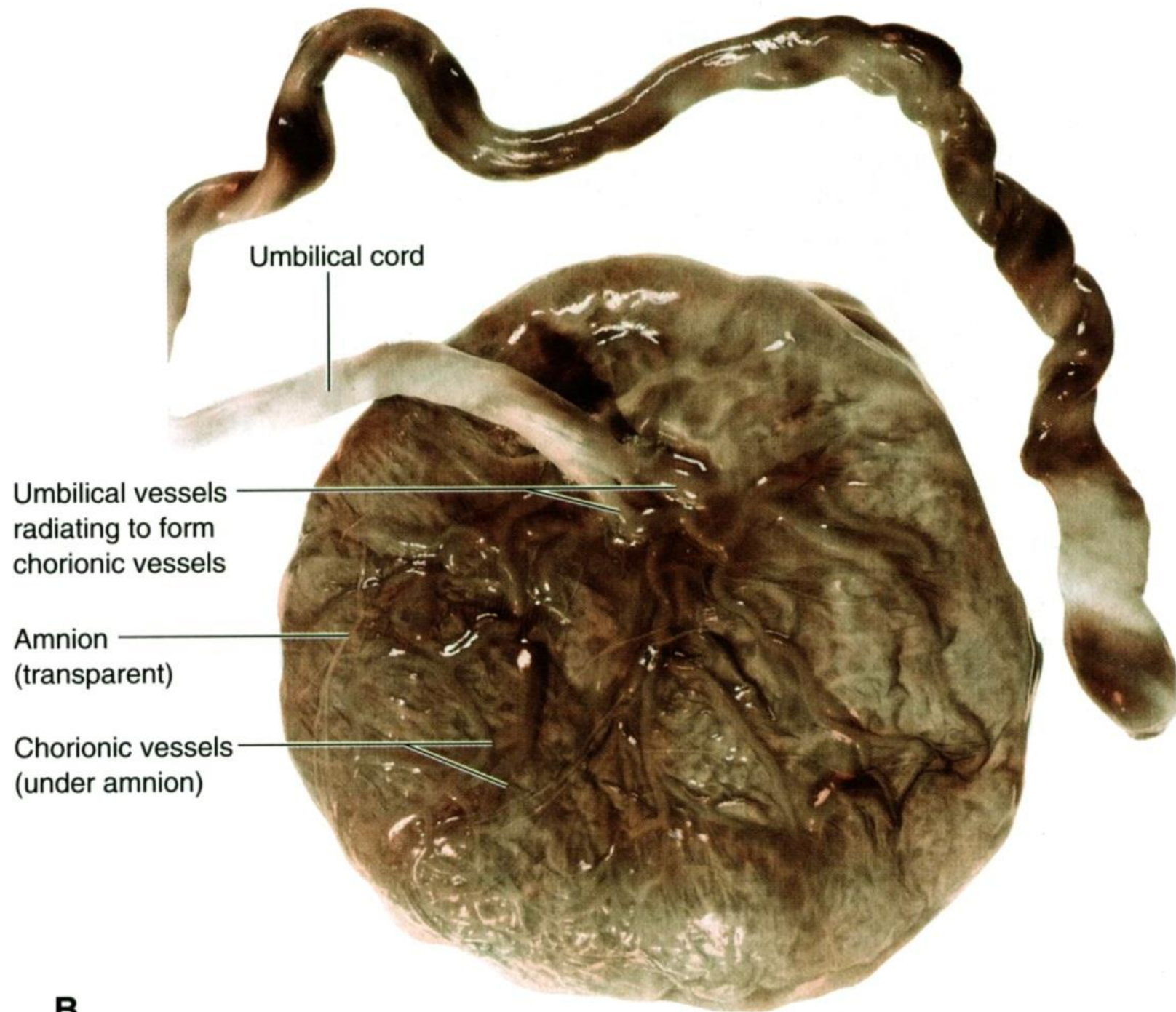
- Poloha

- situs dorsalis placentae
- situs lateralis placentae
- situs ventralis placentae
- situs fundalis placentae

- Placenta praevia

- včasně lůžko, pozdní krvácení v těhotenství, překážka porodu
- placenta praevia centralis, lateralis, marginalis





B

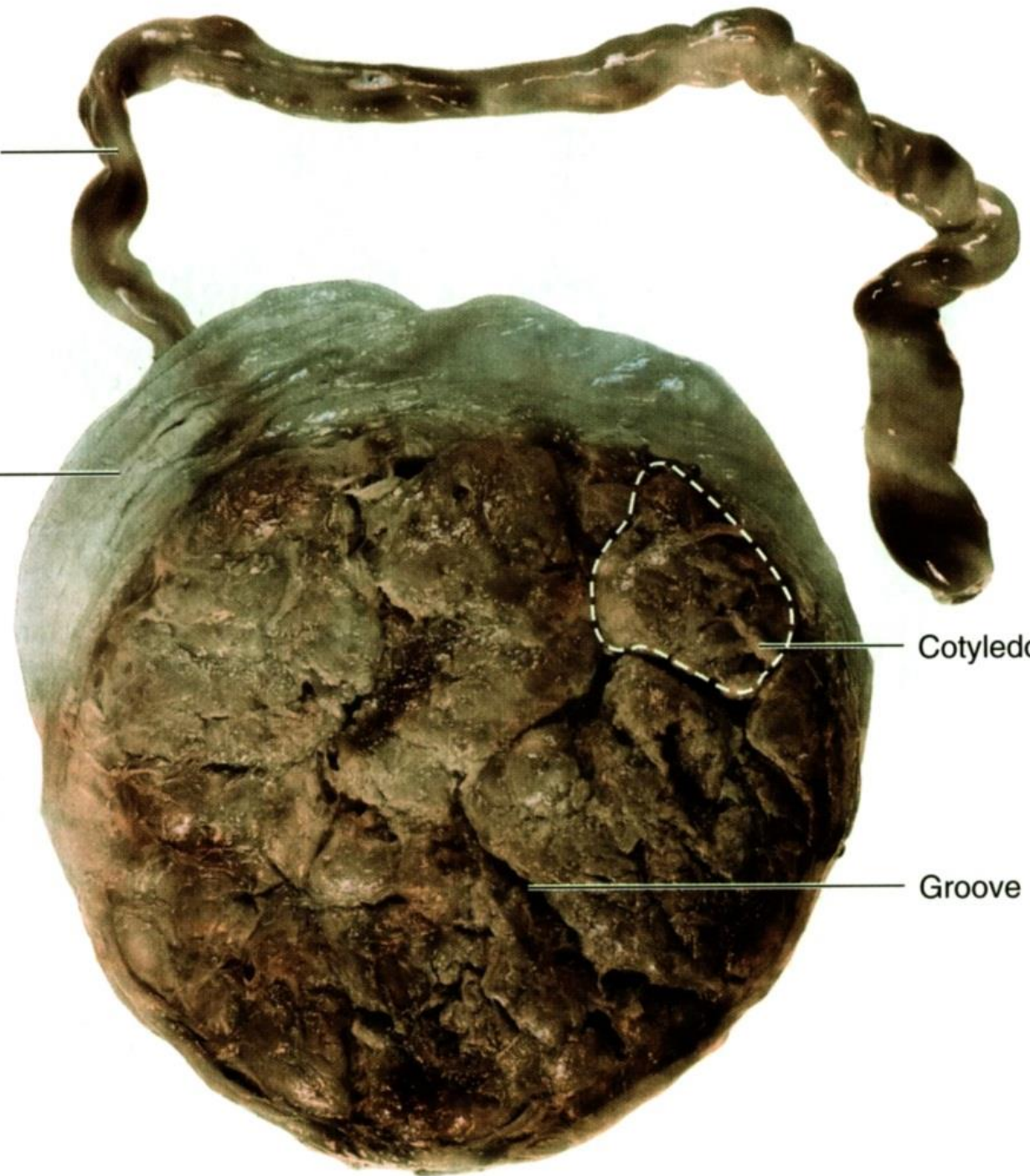
Umbilical
cord

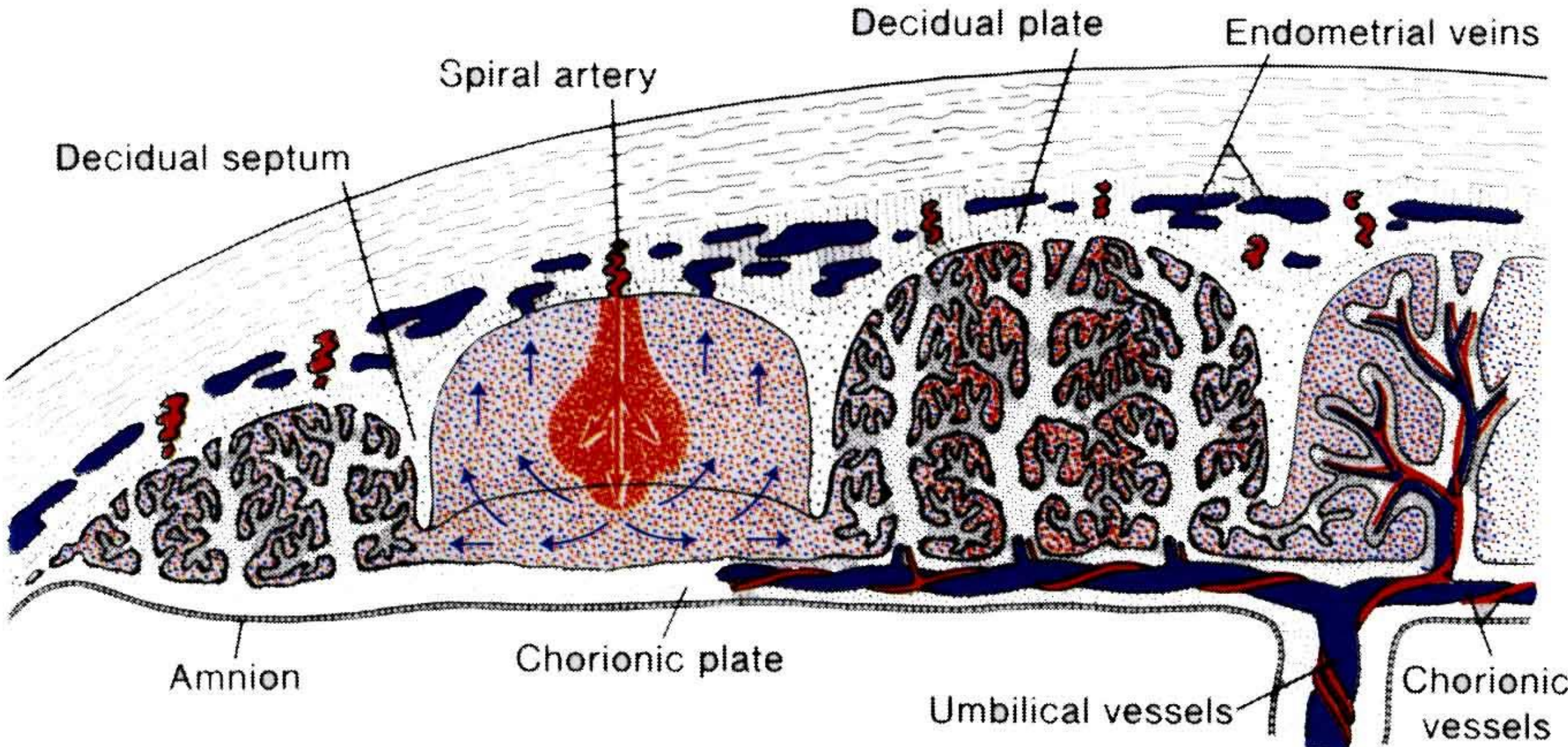
Smooth
chorion

Cotyledon

Groove

A





Decidual plate

Endometrial veins

Spiral artery

Decidual septum

Amnion

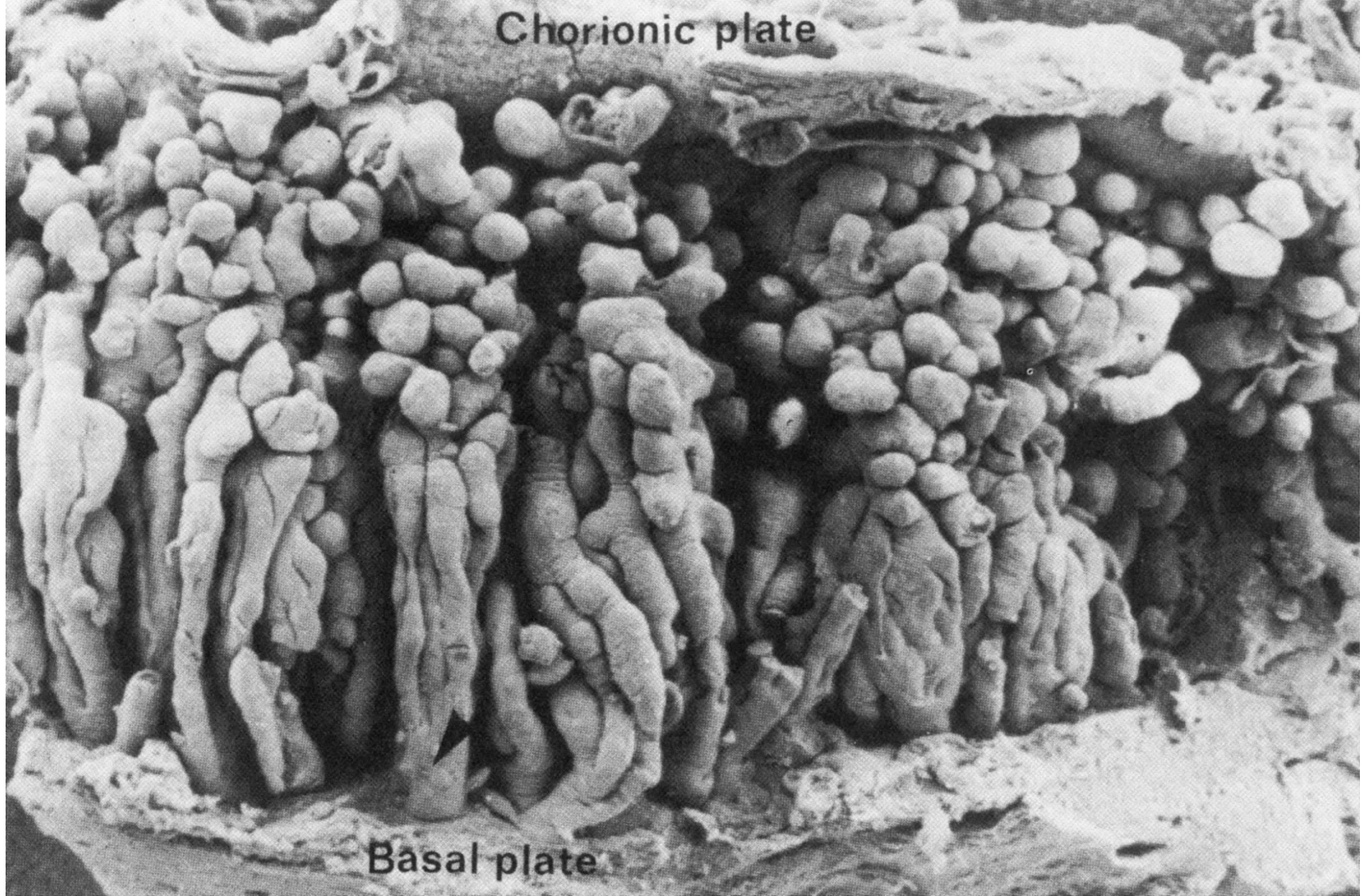
Chorionic plate

Umbilical vessels

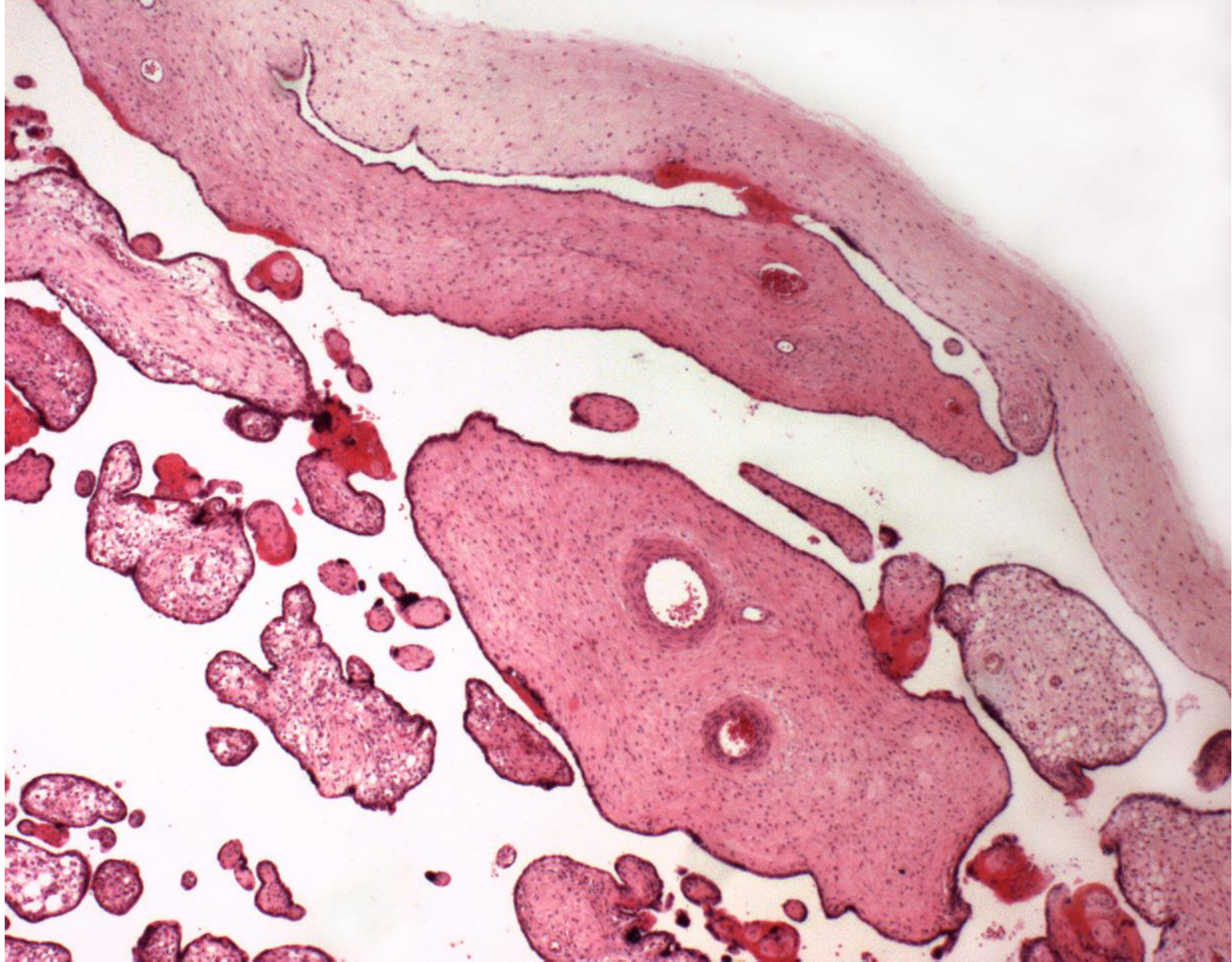
Chorionic vessels



Chorionic plate

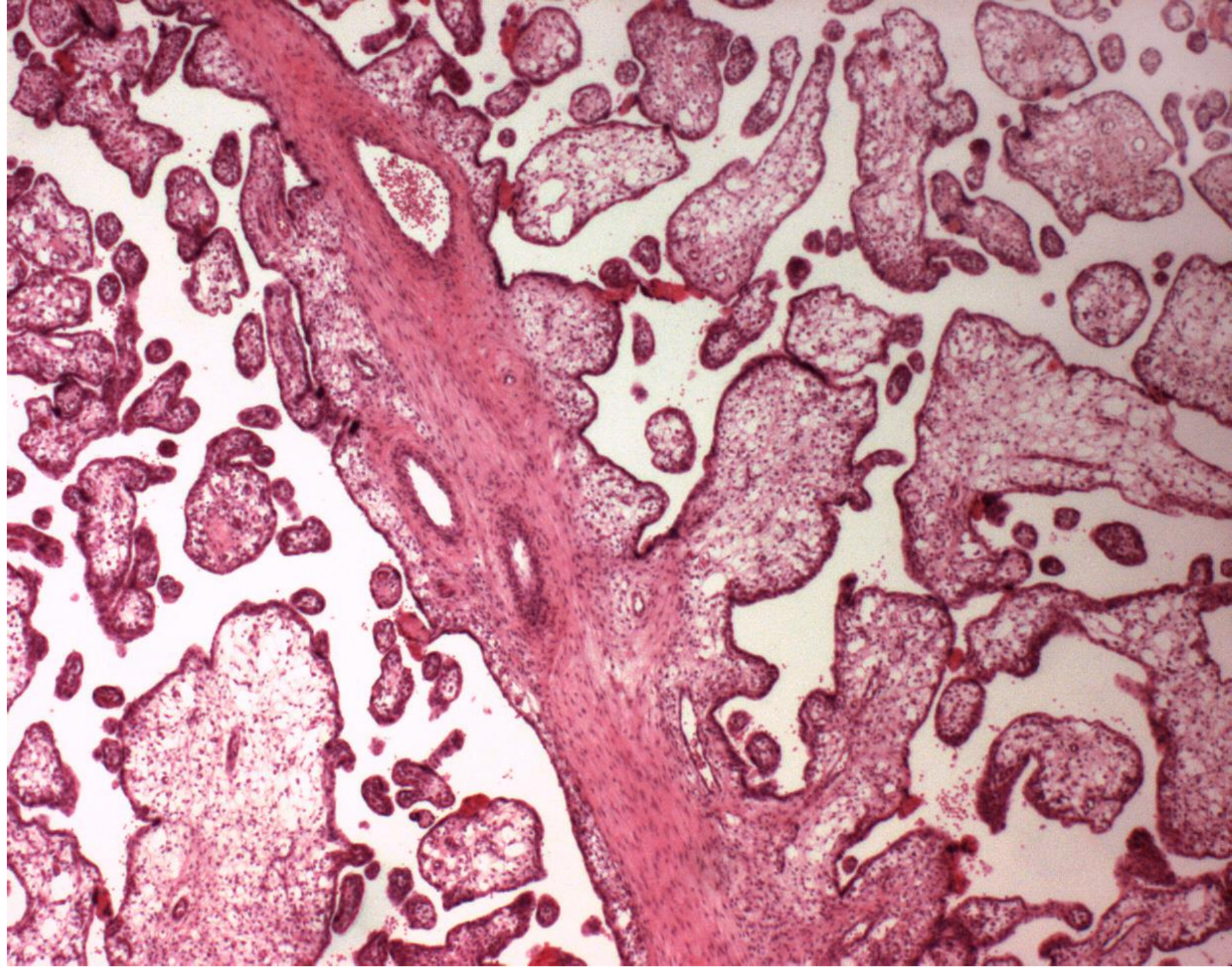


Basal plate

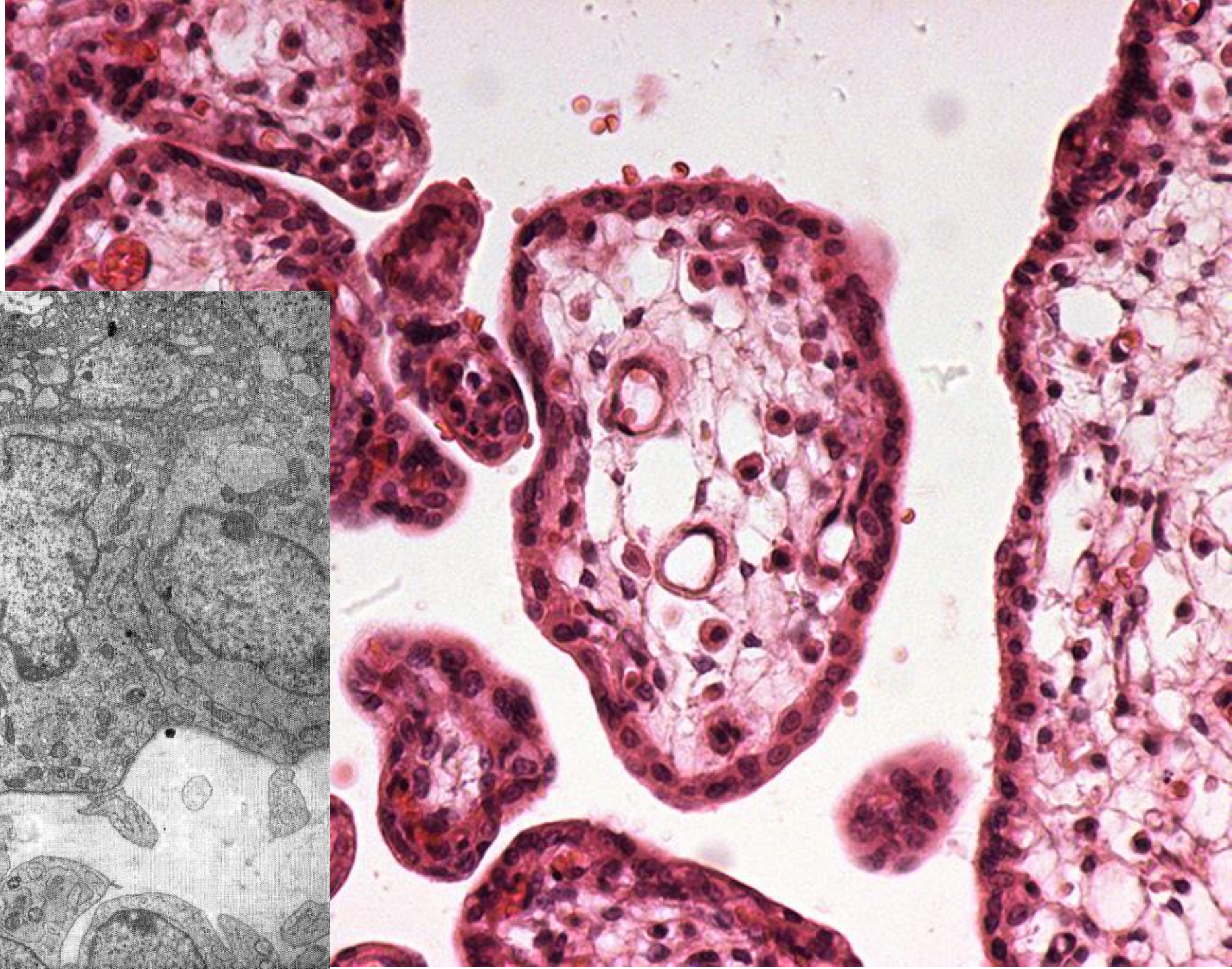
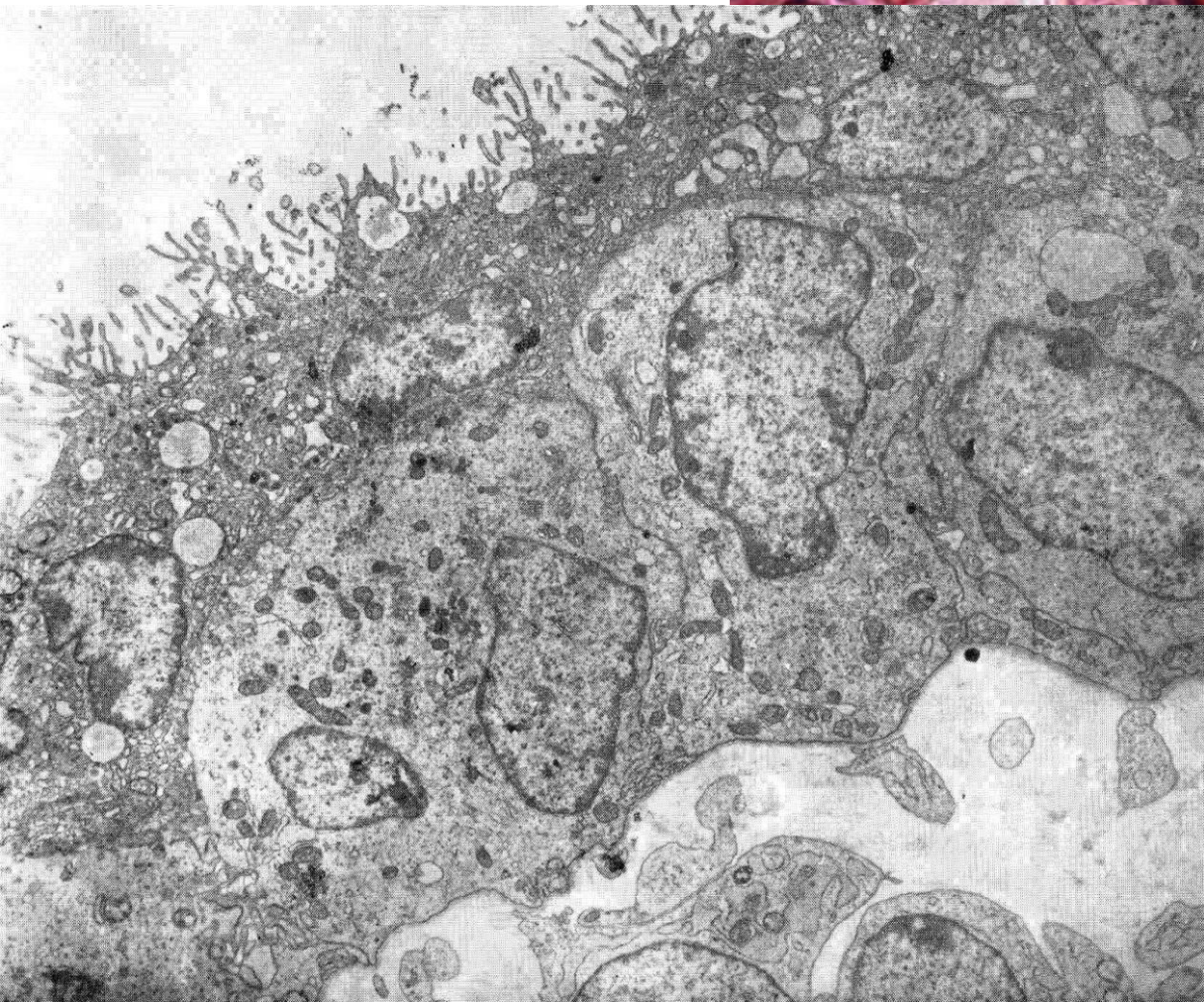


Villus

- anchorans
- intermedius
- liber



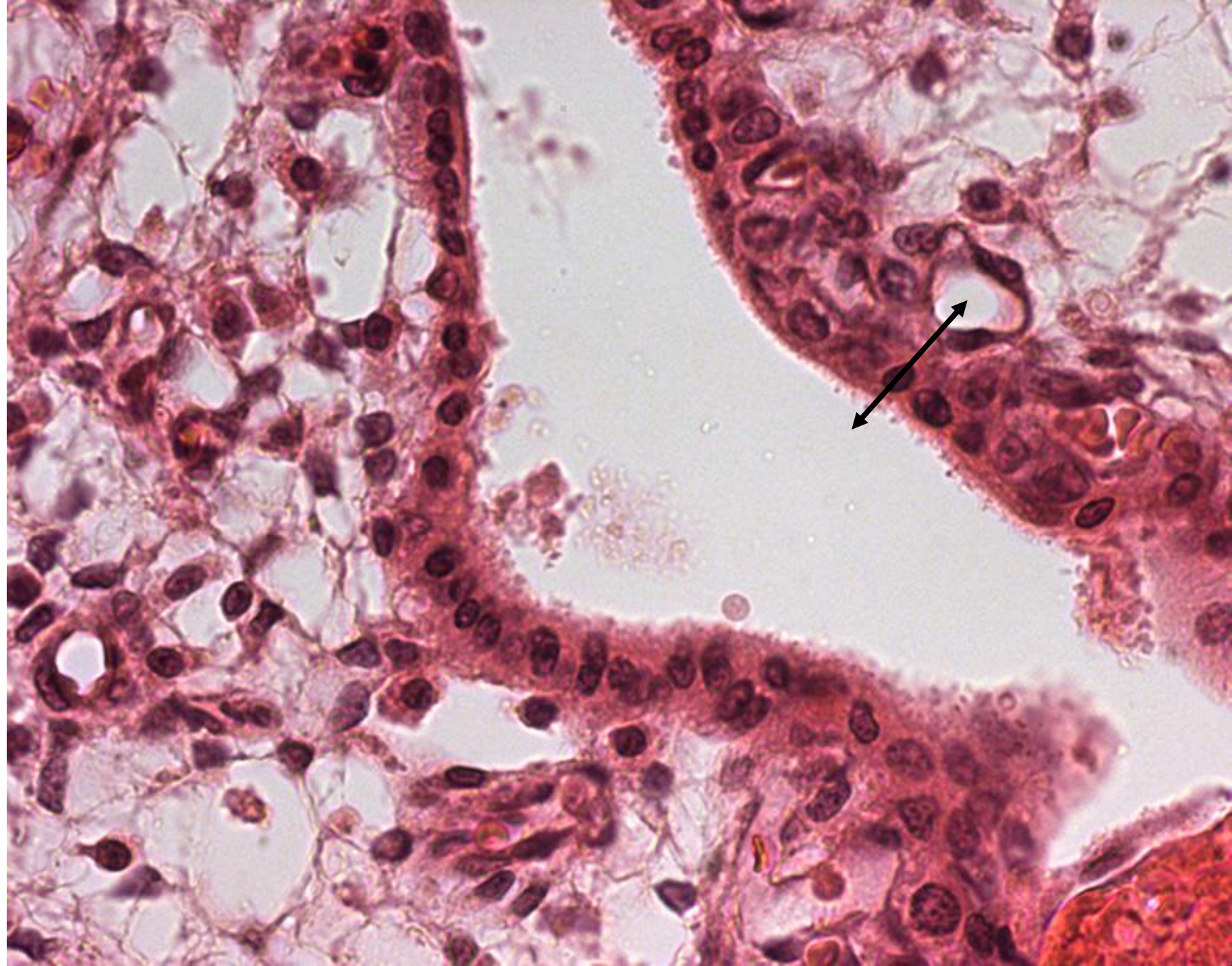
Hofbauerovy buňky =
makrofágy
Langhansovy buňky =
cytotrofoblast

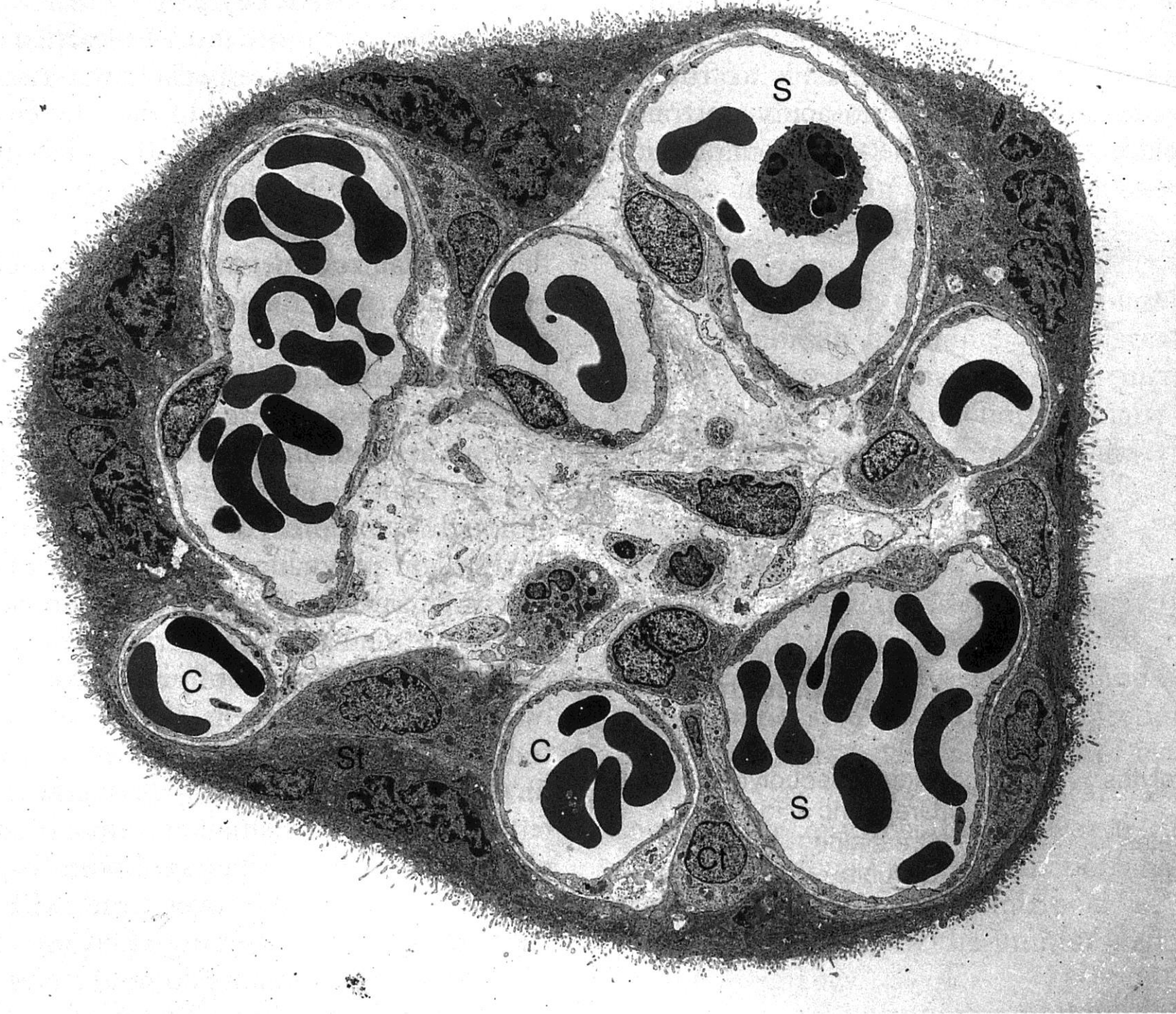


Funkce
syncytiotrofoblastu:
produkce hCG
(imunohistochemický
průkaz)



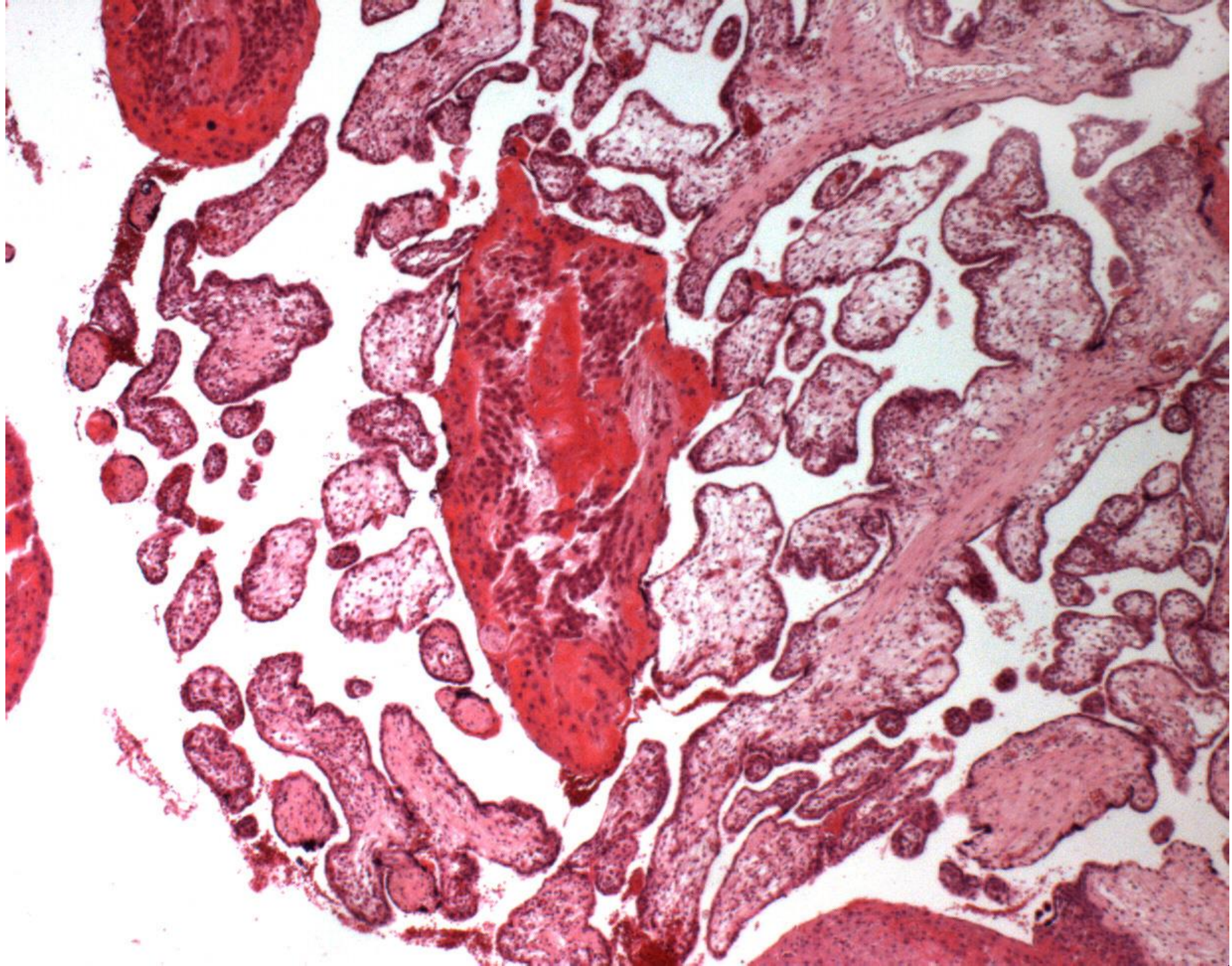
Funkce
syncytiotrofoblastu:
podílí se na
placentální bariéře

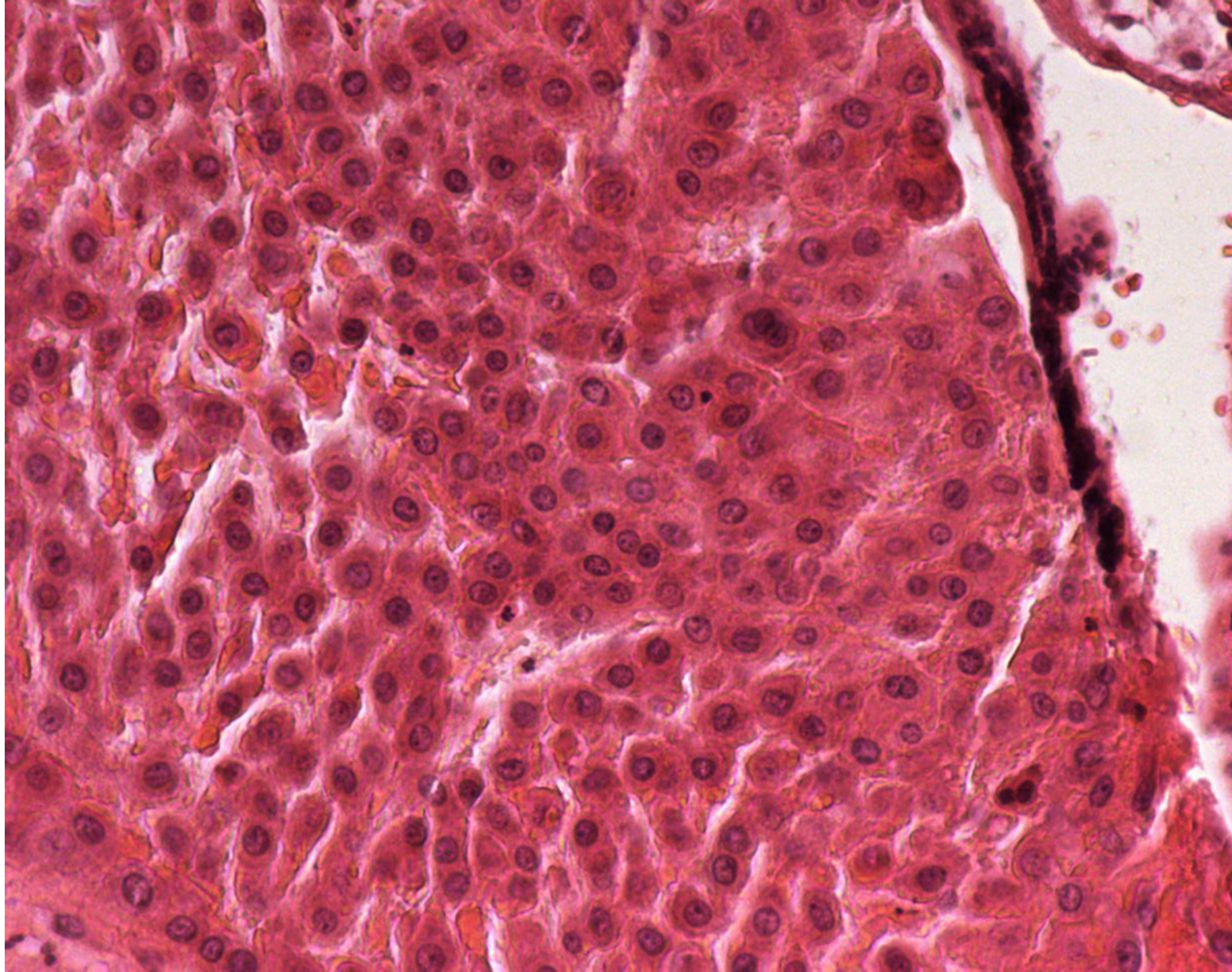




Placentární bariéra člověka

- Syncytiotrophoblast
- Cytotrophoblast
- Basální lamina trophoblastu
- Vrstvička pojiva
- Basální lamina endotelu
- Endotel





Placenta accreta spectrum (PAS)

Normal (Decidua)

Stratum basalis
of endometrium

Myometrium

Increta (17%)

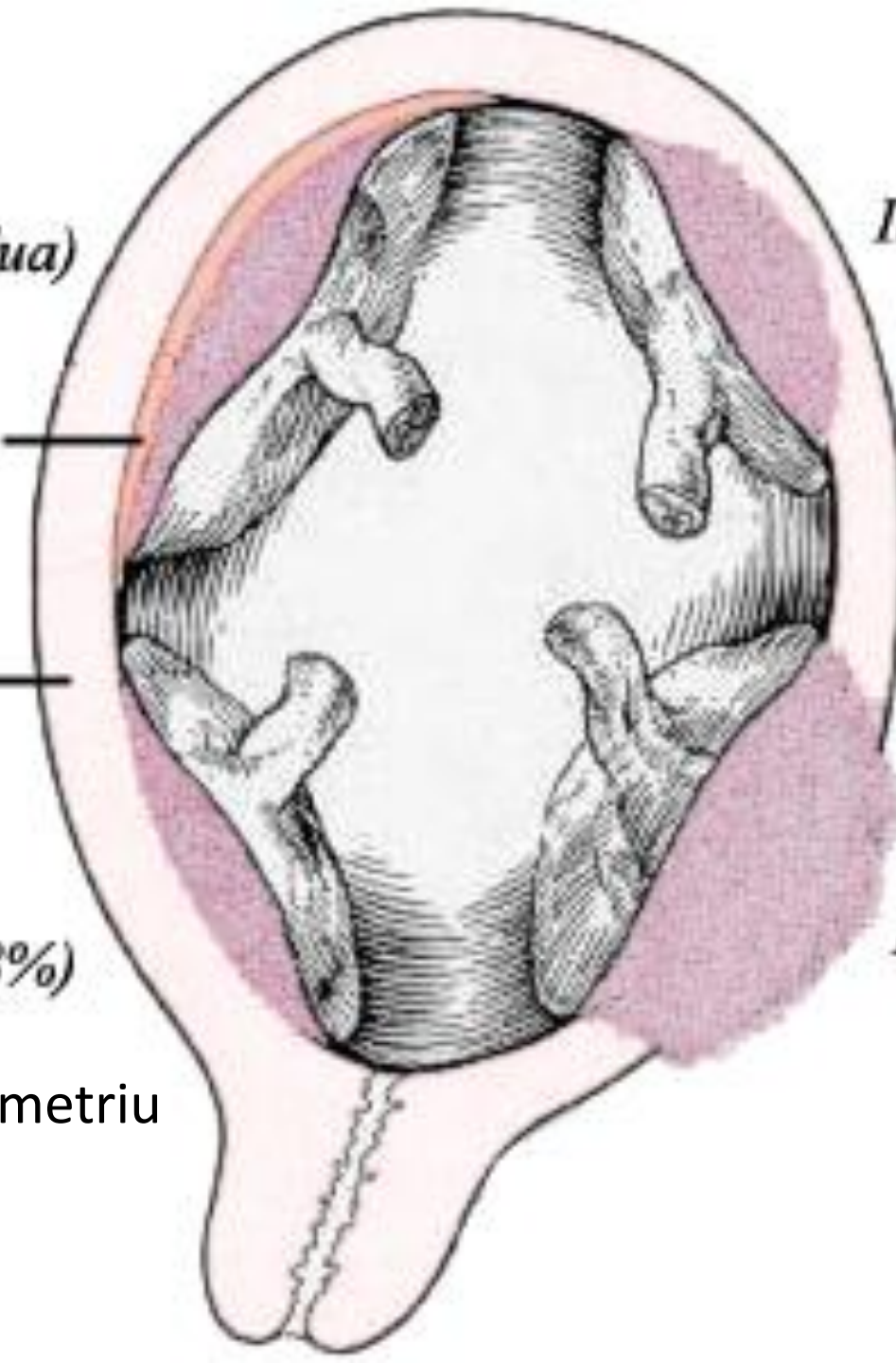
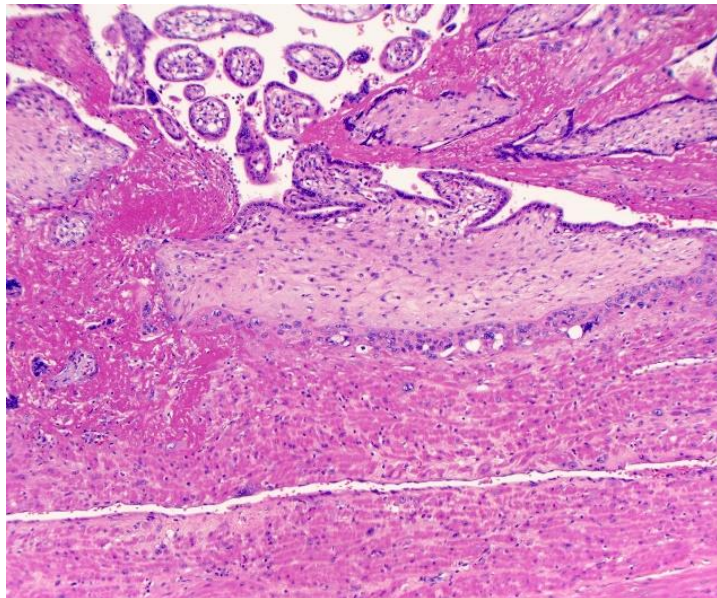
Průnik do
myometria

Accreta (75-78%)

Průnik až k myometriu

Percreta (5%)

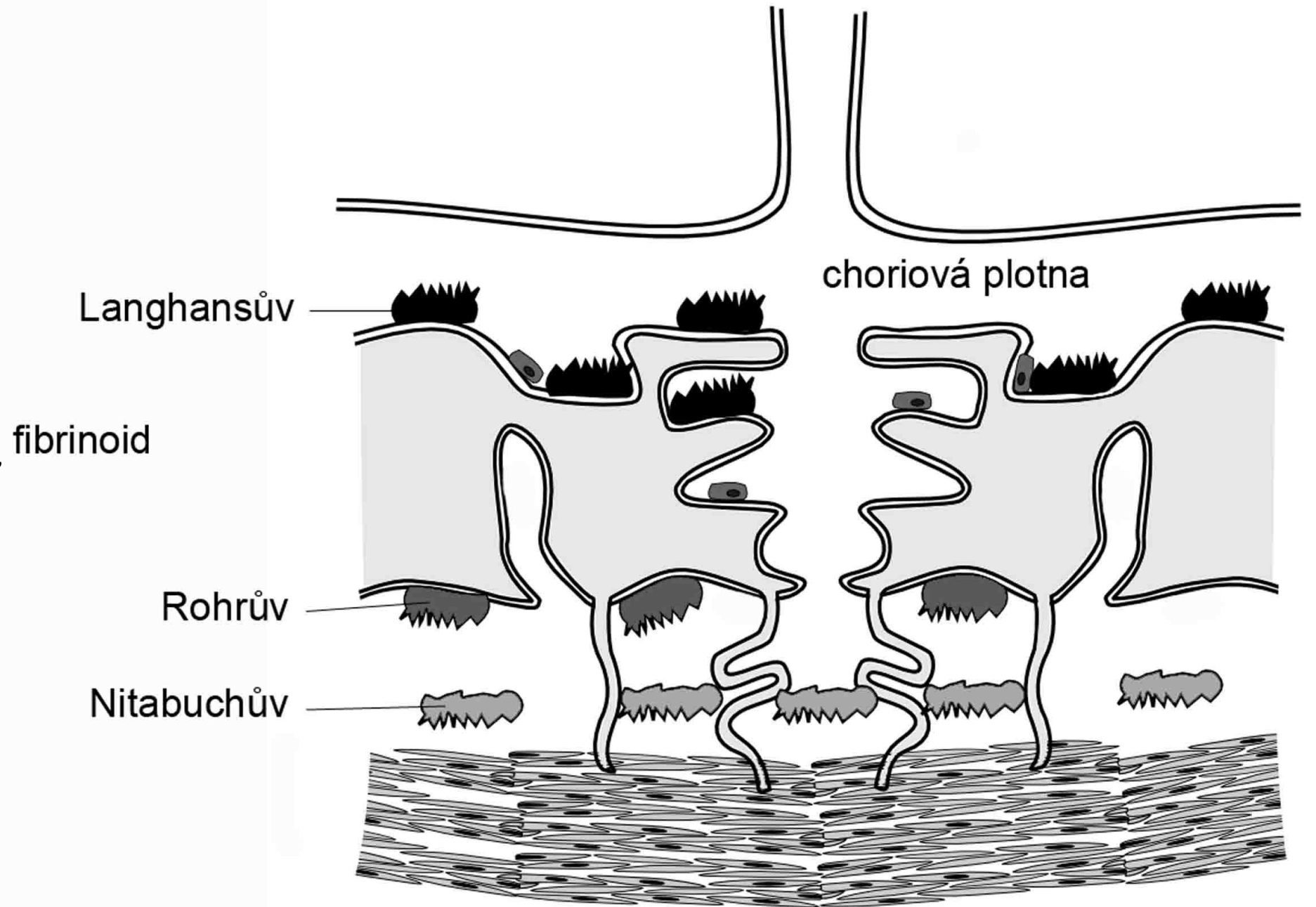
Průnik do
perimetria
a někdy i do
okolních
orgánů

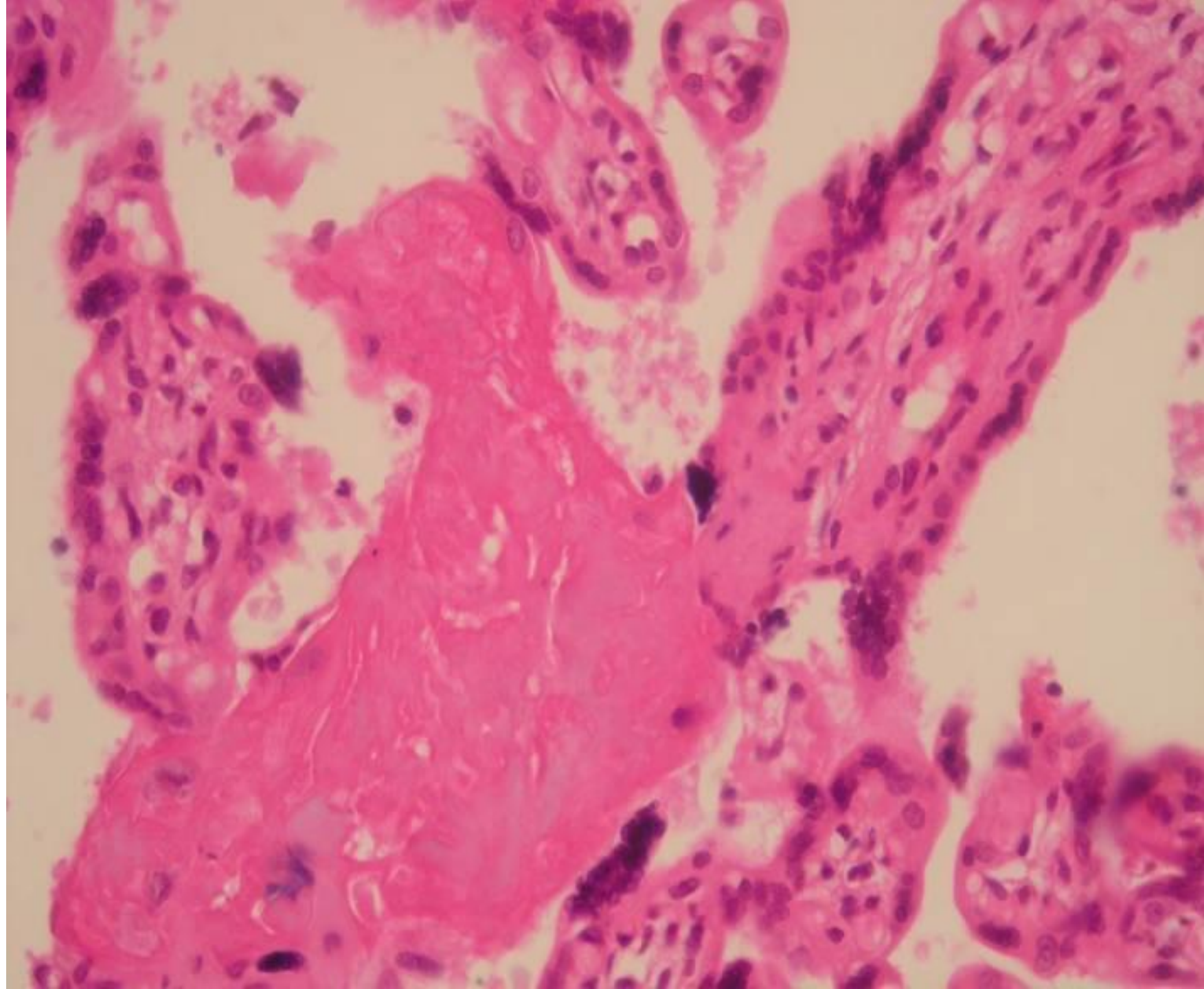


Fibrinoid

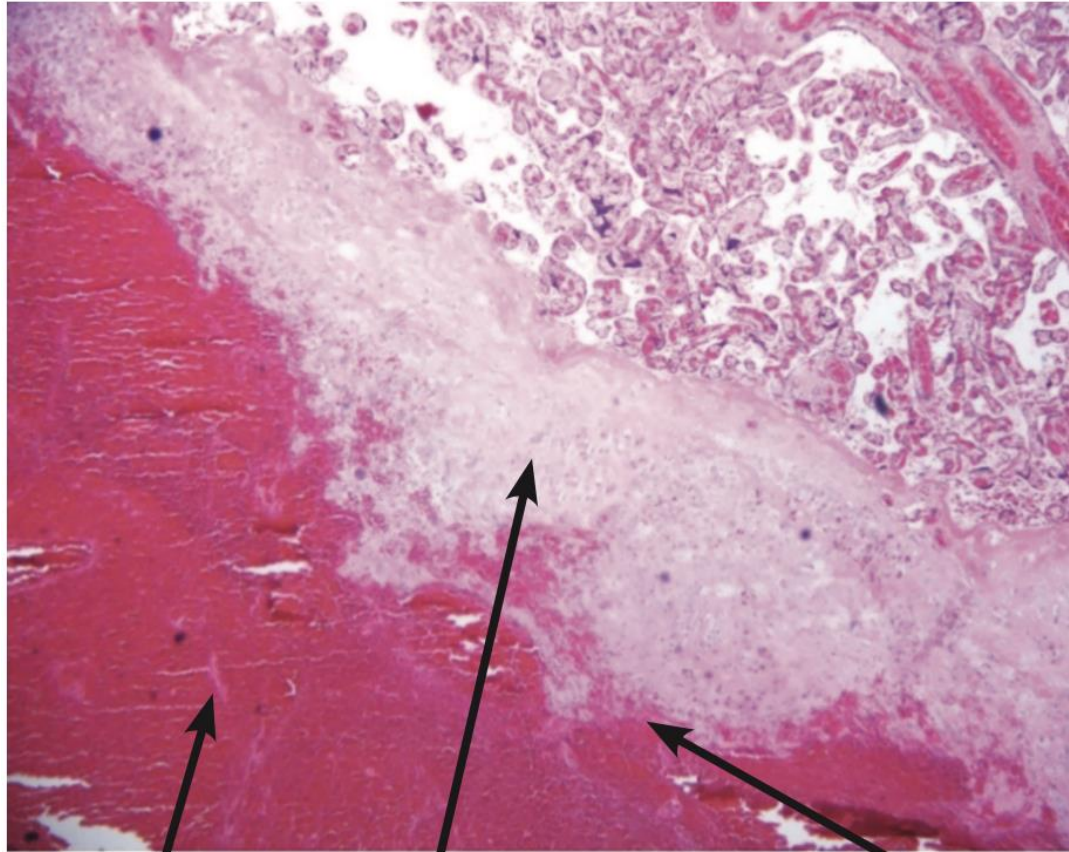
Any of one or more poorly characterized substances staining like fibrin, found normally in the placenta as well as in various diseased tissues. Also attributive, as fibrinoid degeneration, fibrinoid necrosis.

From: Oxford English dictionary, oed.com





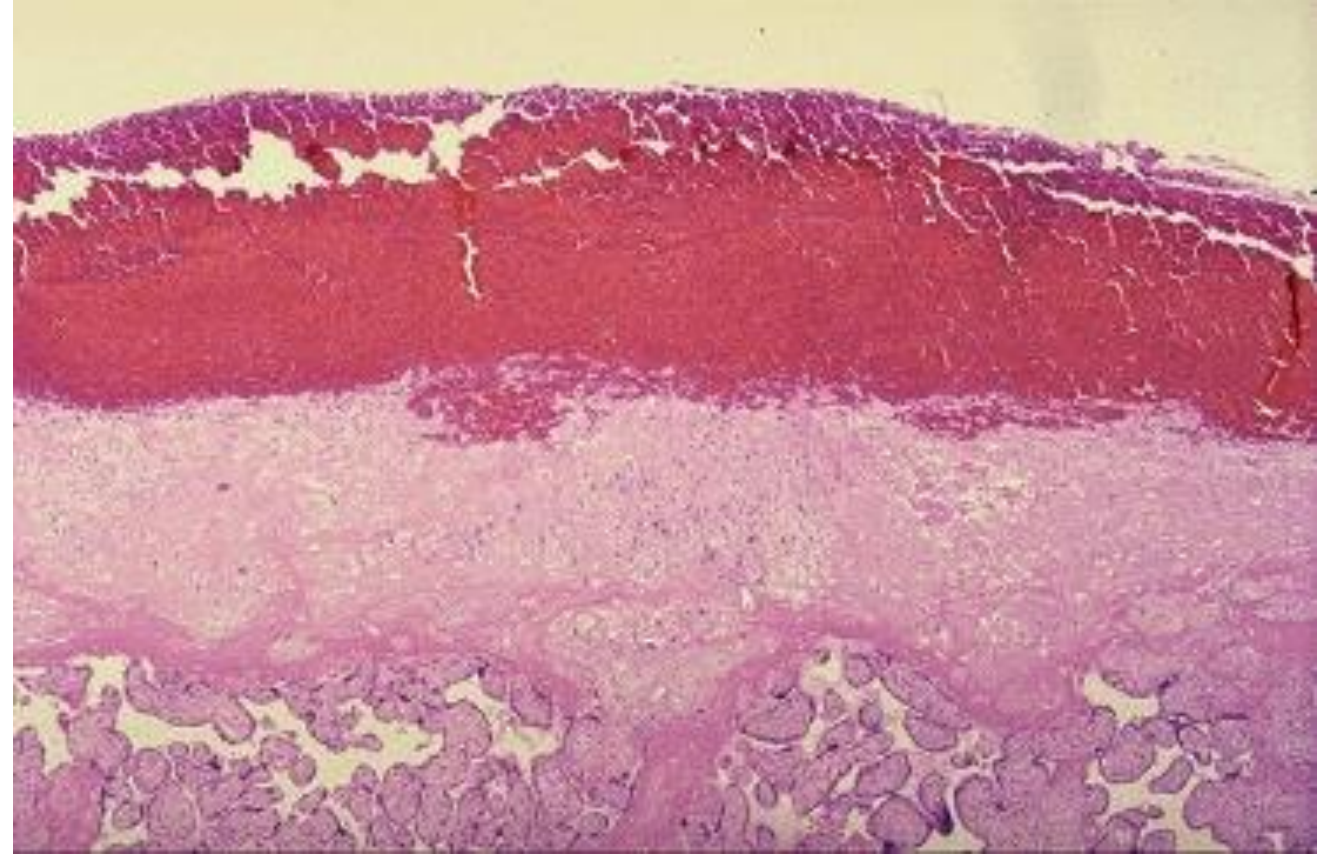
Abrupce placenty



koagulum

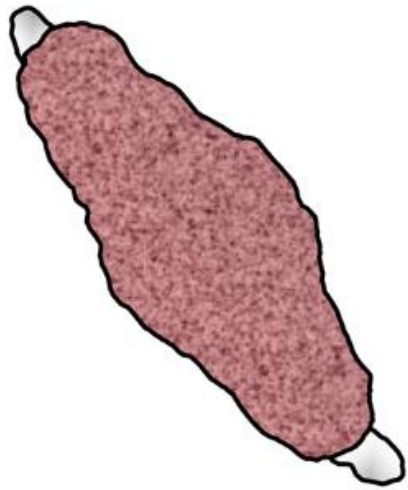
decidua basalis

horionske resice

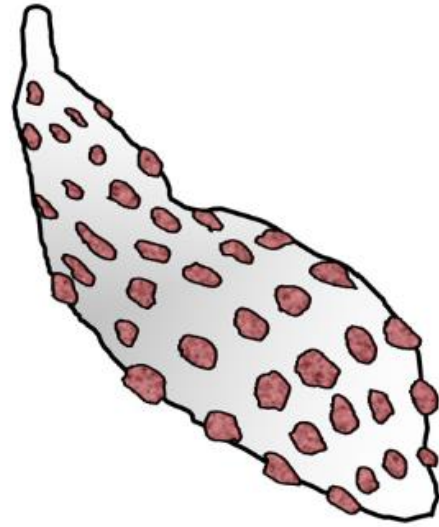


<https://smj.rs/en/volume-3-no-4/the-main-features-of-placental-abruption-clinical-presentation-and-treatment>

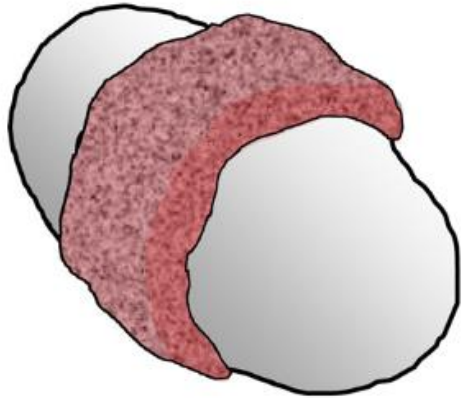
<https://webpath.med.utah.edu/PLACHTML/PLAC014.html>



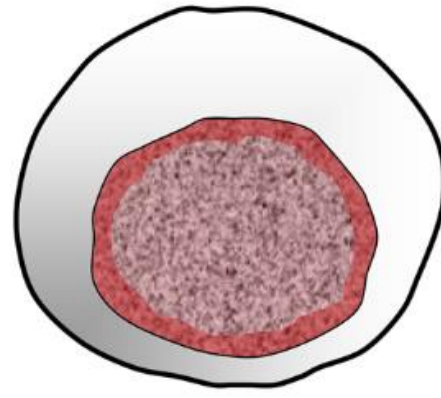
a. Diffuse



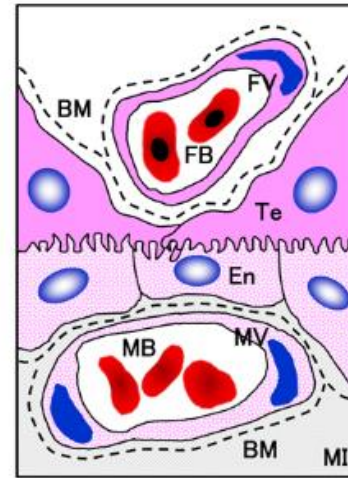
b. Multicotyledonary



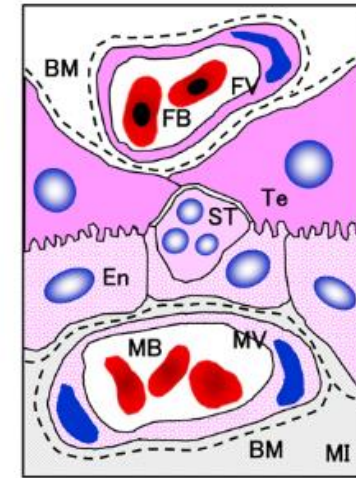
c. Zonary



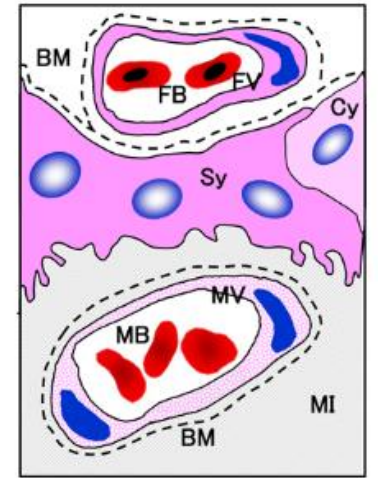
d. Discoid



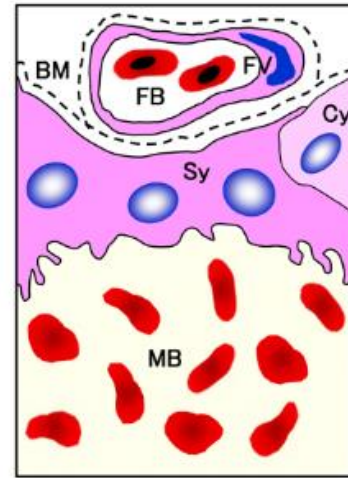
a. Epitheliochorial type



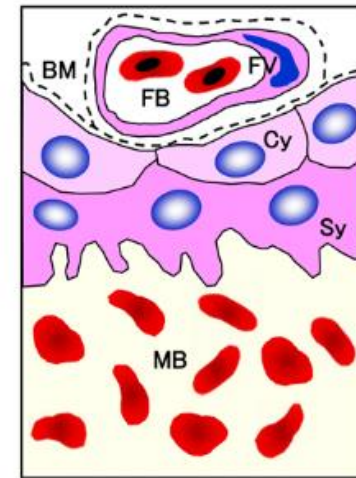
a'. Syndesmochorial type



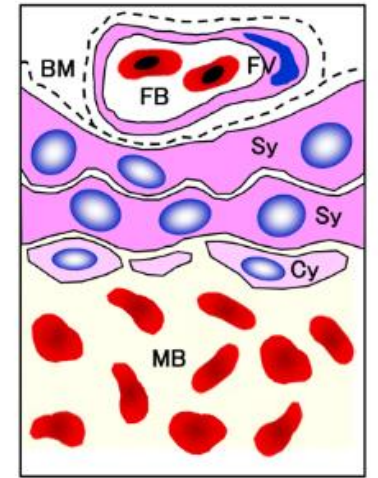
b. Endotheliochorial type



c. Hemochorial type
(Hemomonochorial)

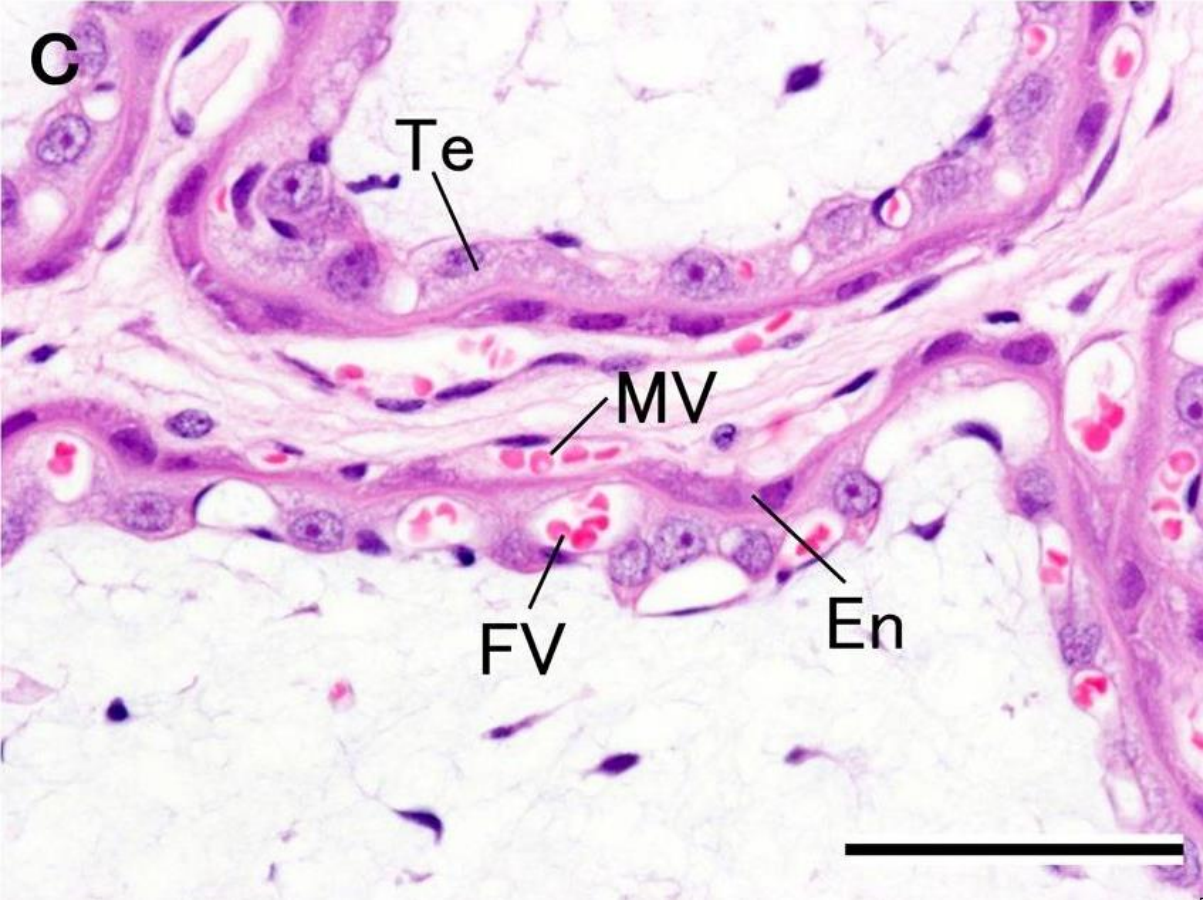


c. Hemochorial type
(Hemodichorial)



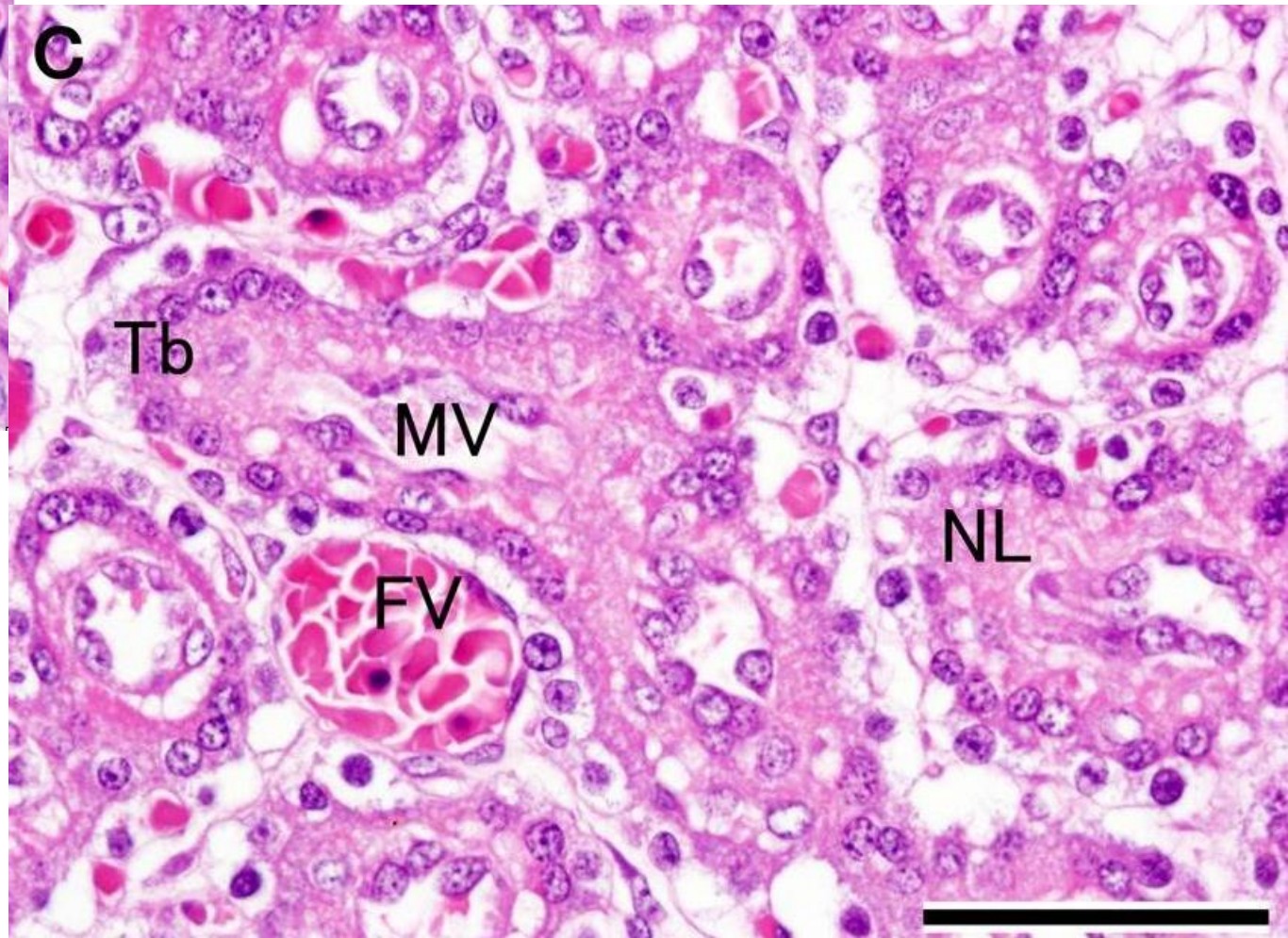
c. Hemochorial type
(Hemotrichorial)

Furukawa S, Kuroda Y, Sugiyama A. A comparison of the histological structure of the placenta in experimental animals. *J Toxicol Pathol.* 2014 Apr;27(1):11-8. doi: 10.1293/tox.2013-0060. Epub 2014 Apr 30. Erratum in: *J Toxicol Pathol.* 2016 Jan;29(1):74. PMID: 24791062; PMCID: PMC4000068.



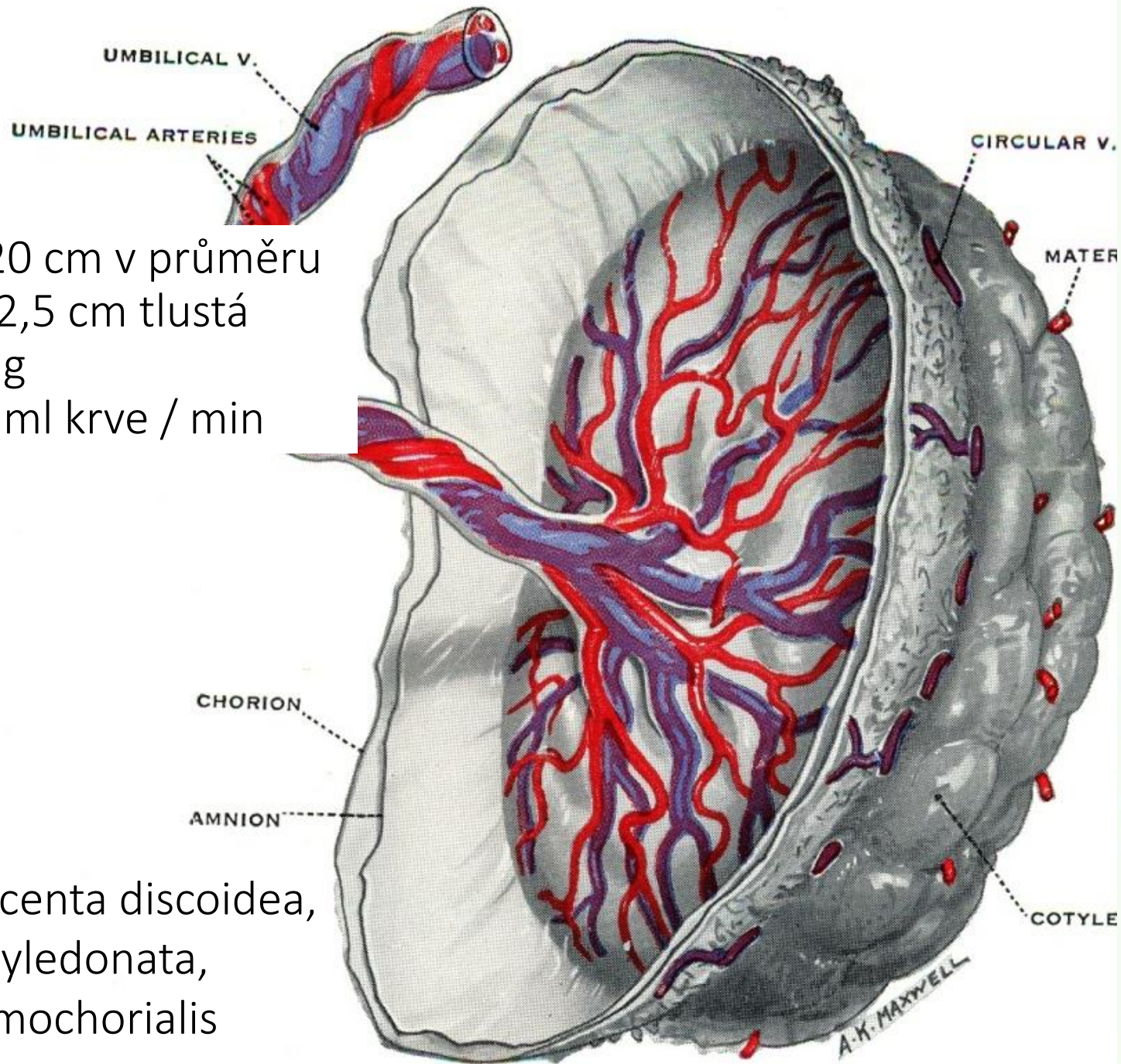
Pes -
endotelochoriální

Prase -
epitelochoriální

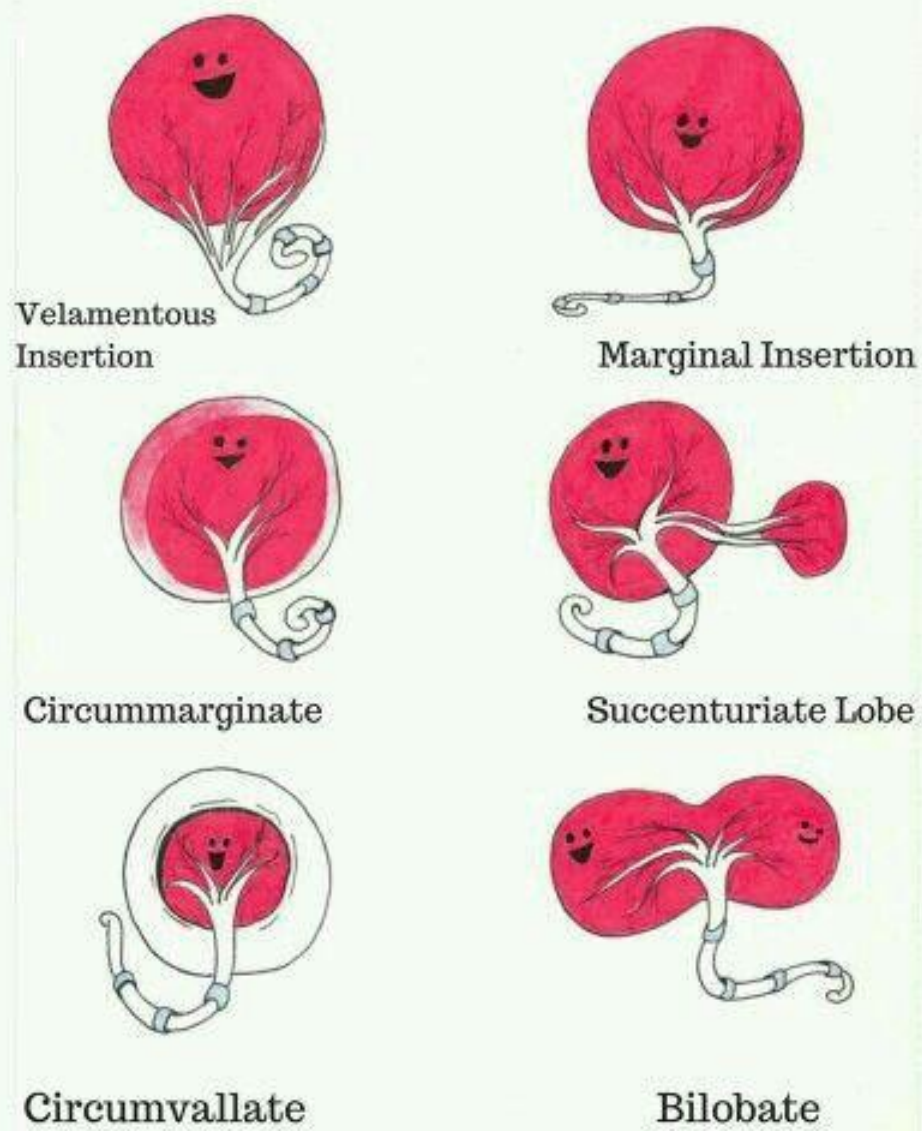


Placenta Variations

15-20 cm v průměru
1,5-2,5 cm tlustá
500 g
500 ml krve / min



placenta discoidea,
cotyledonata,
hemochorialis



Funkce placenty

- **metabolická**
 - syntetizuje glykogen, cholesterol, MK (zdroj výživy pro plod)
- **placentární transport**
 - prochází O₂, CO₂, aminokyseliny, glukóza, hormony štítné žlázy, steroidy, IgG, alkohol, drogy.....
 - neprochází heparin, IgM, většina proteinů.....
- **endokrinní funkce**
 - **hCG**, hPL, cACTH, relaxin a další peptidové hormony + tvorba progesteronu v trofoblastu přímo a estrogenů konverzí DHEAS z fetální kůry nadledvin

Infekce procházející placentou

- **Toxoplasma gondii** (mikrocefalie, mentální retardace, slepota)
- **Rubeola** (mikrocefalie, mentální retardace, katarakta, hluchota, srdeční vady)
- **Cytomegalovirus** (hepatosplenomegalie, mentální retardace)
- **Coxsackie viry** (mentální retardace)
- **Varicella zoster virus** (mentální retardace)
- **Spirochety** - bakterie (např. syphilis – *Treponema pallidum*, vrozená příjice – hluchota, slepota, postižení zubů)
- **Herpes virus** je součástí zkratky TORCH, ale většinou je infekce perinatální



placentofagie



URUOI MEGAMI PLACENTA



Co-medical+

URUOI MEGAMI PLACENTA うるおい女神プラセンタ

年齢に負けない
ハリ・ツヤのある毎日に

プラセンタ
エキス粉末 **100** mg

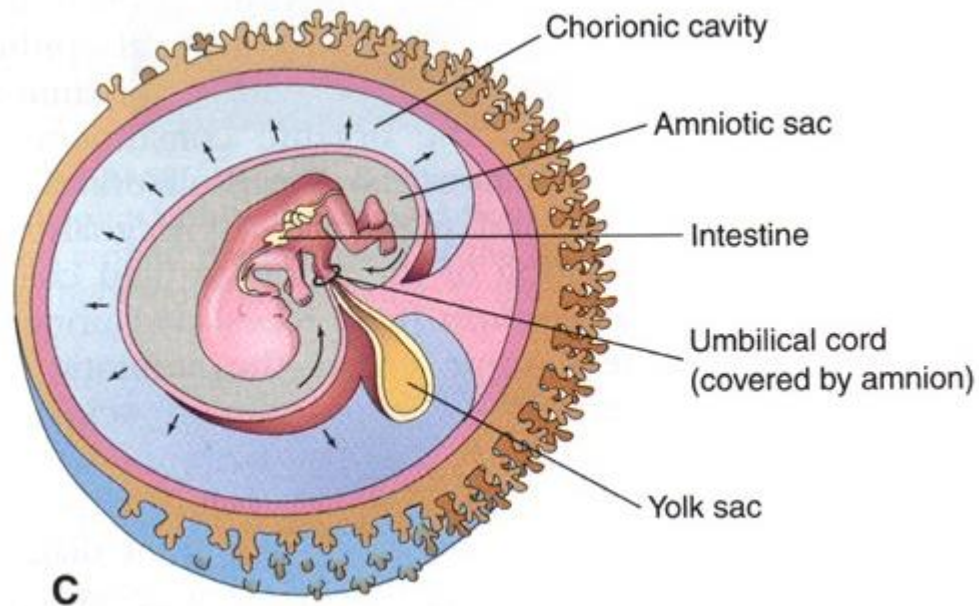
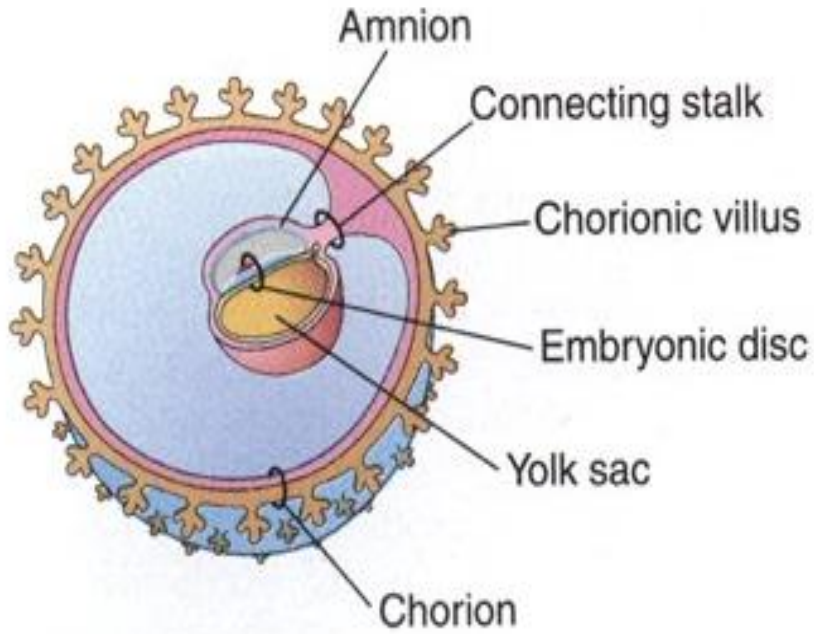
What is beauty?
As one answer to that question, we came up with the idea of
creating confidence and vitality. We aim to be the brand
that supports as many people as possible to overcome their
beauty concerns by providing holistic treatment to enhance
their beauty, inside-out.

500 ML (16.9 FL. OZ.)
MADE IN JAPAN

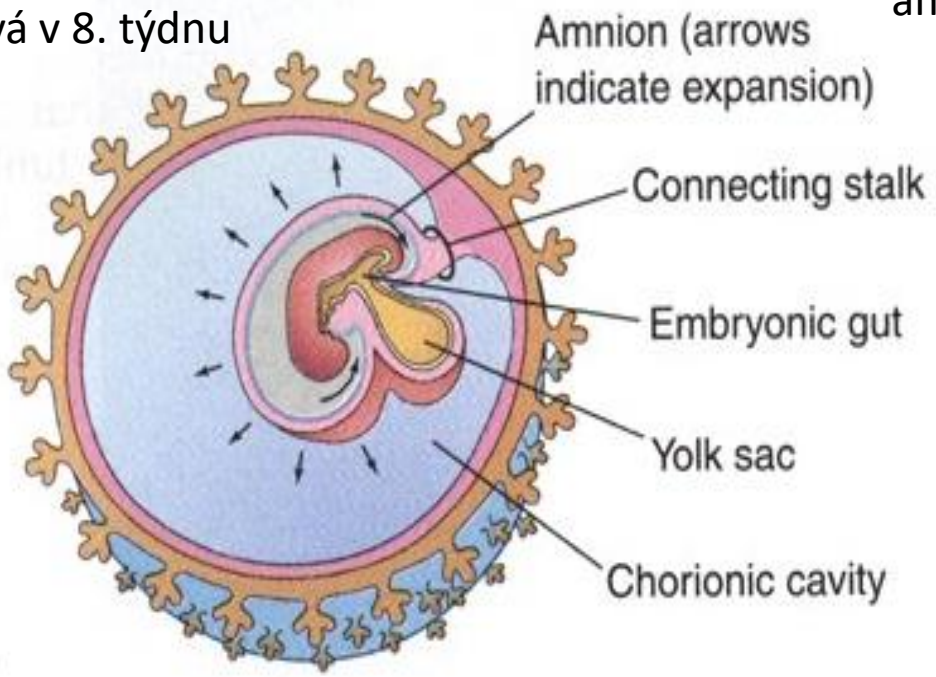


プラセンタ&ローヤルゼリー&ポリフェノール

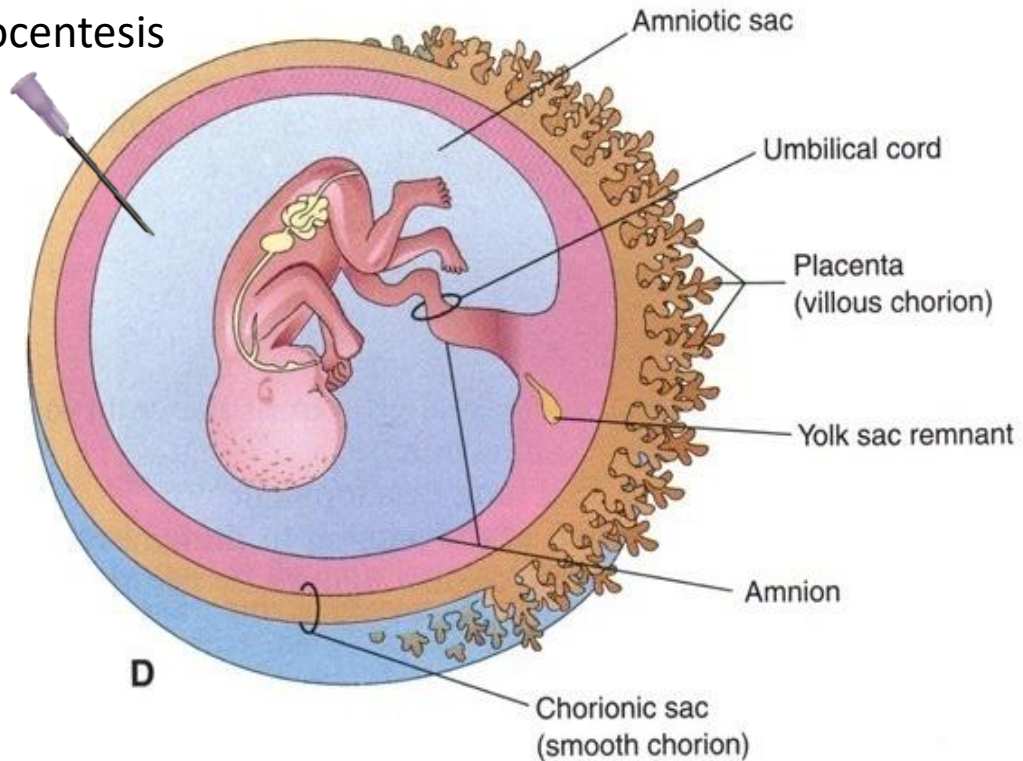
うるおい女神プラセンタエキス粉末



Obliterace choriové dutiny nastává v 8. týdnu

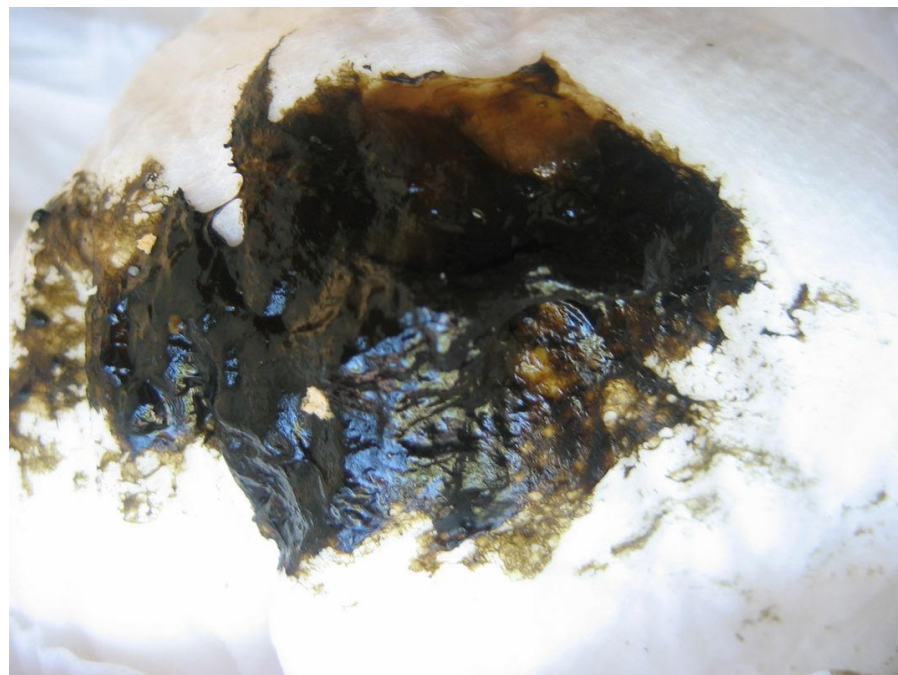


amniocentesis



Amniová tekutina

- Přispívá k ní moč plodu
- Důležitá pro vývoj dýchacího systému
- Plod ji také polyká – mekonium



Amniová tekutina – klinické souvislosti

- Polyhydramnion
 - Etiologie: obstrukce GIT (atresie jícnu), Bartterův syndrom, aneuploidie...
 - Může způsobovat dušnost matky, předčasný či komplikovaný porod
- Oligohydramnion
 - Etiologie: renální selhání plodu, poruchy placenty, PROM, aneuploidie...
 - Sekvence Potterové (renální selhání, oligohydramnion, malformace obličeje a končetin, hypoplasie plic)

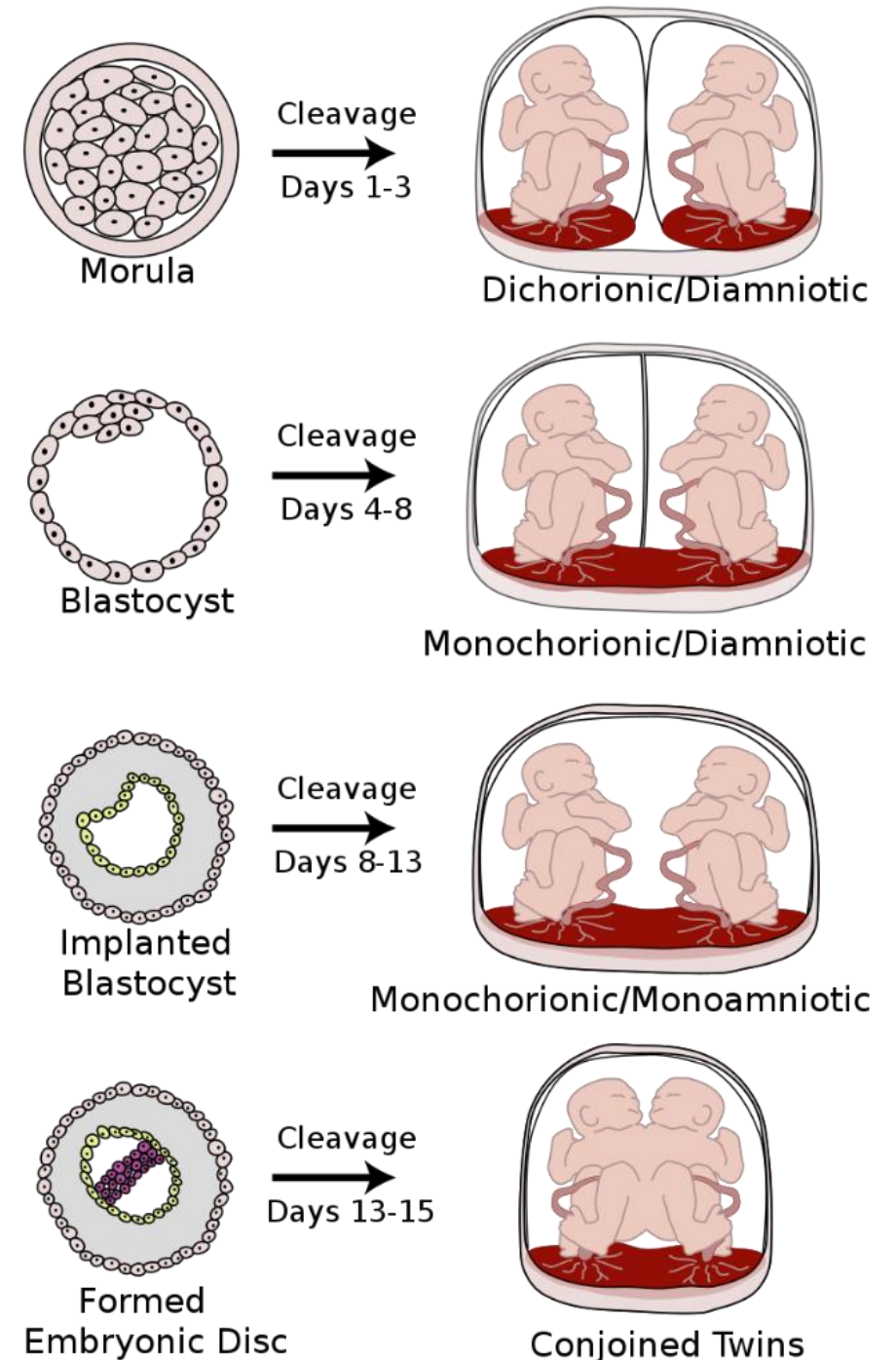
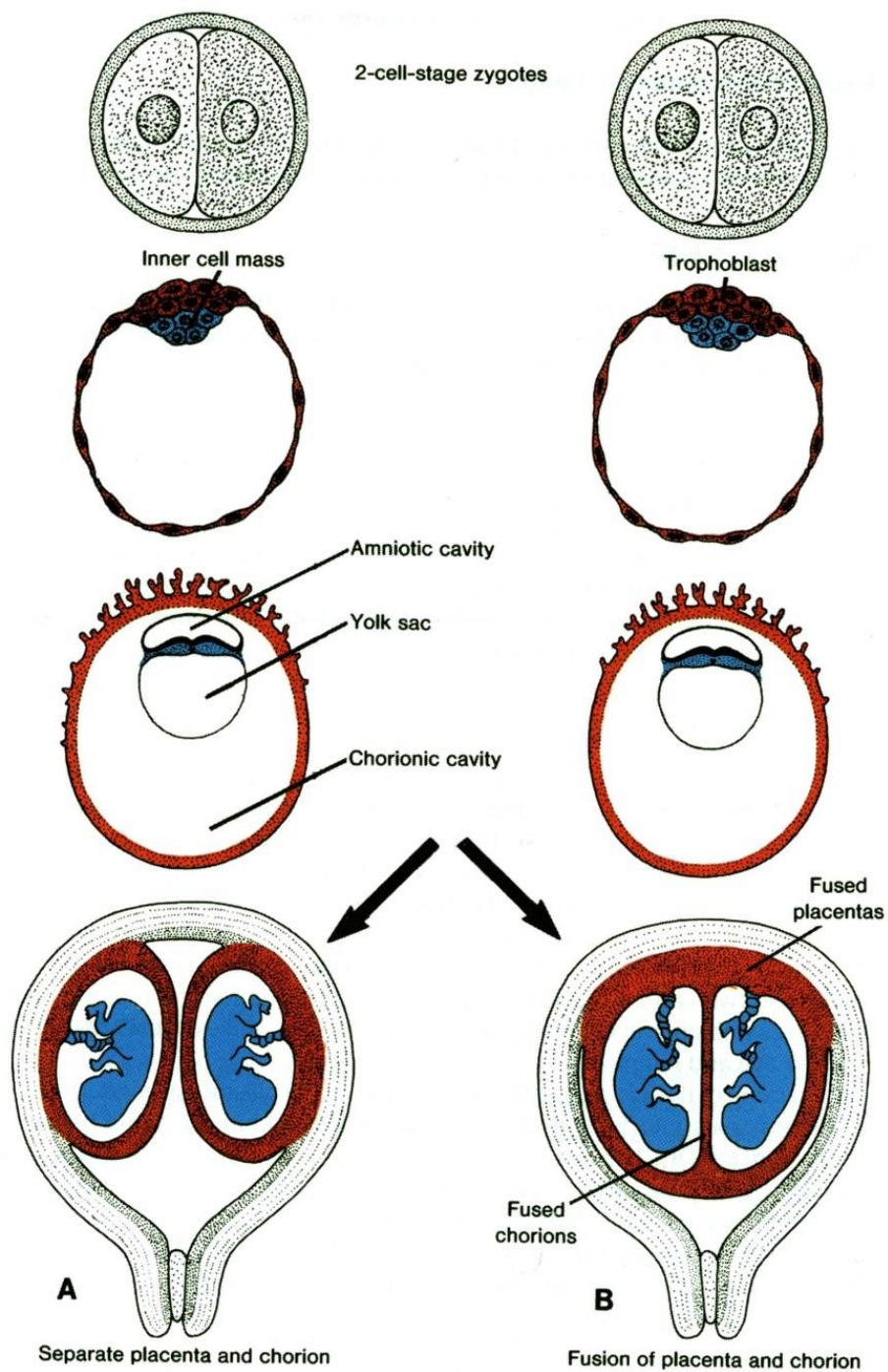


Shastri SM, Kolte SS, Sanagapati PR. Potter's Sequence. J Clin Neonatol. 2012 Jul;1(3):157-9. doi: 10.4103/2249-4847.101705. PMID: 24027716; PMCID: PMC3762025.

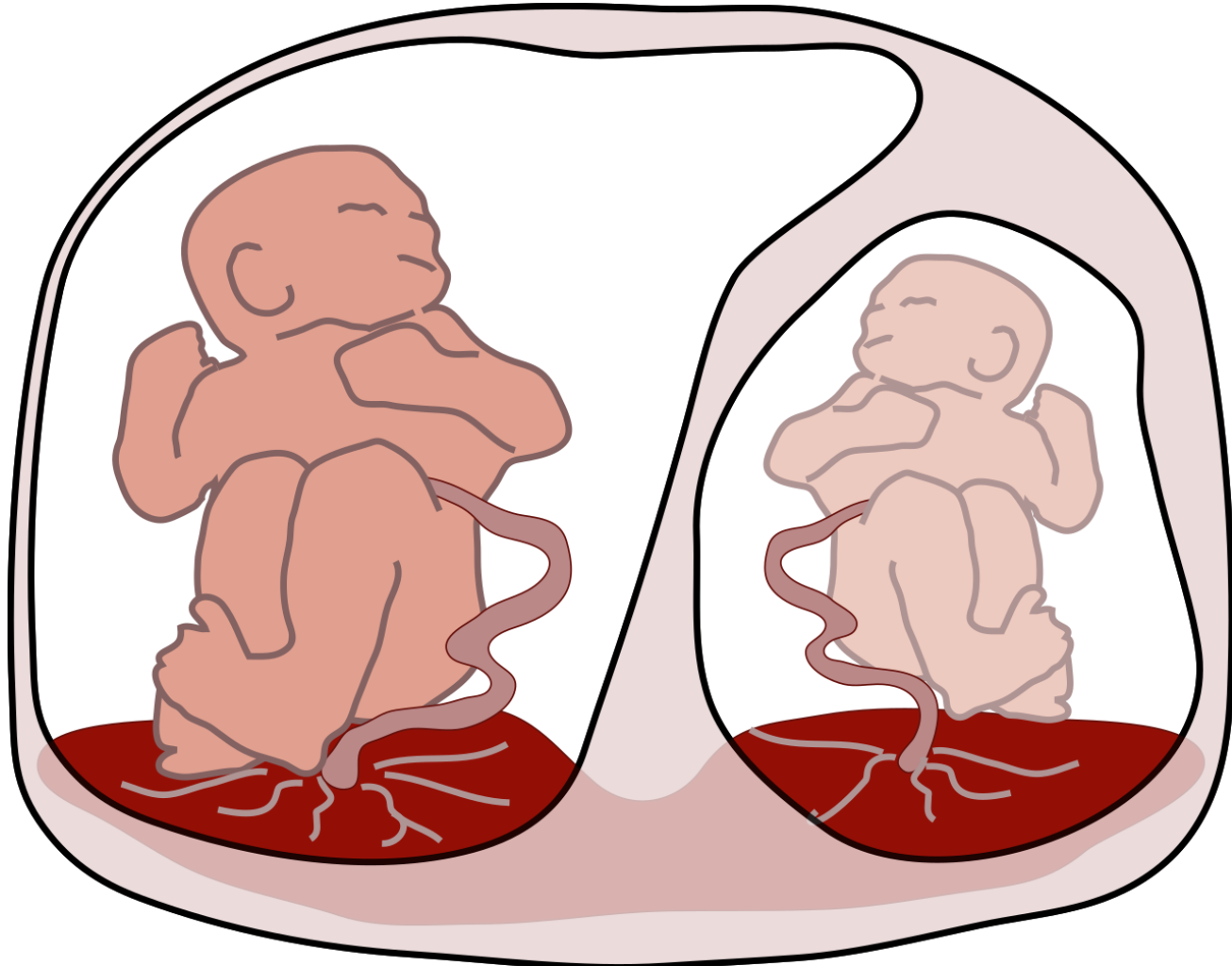
Vícečetná těhotenství

Který typ je častější?

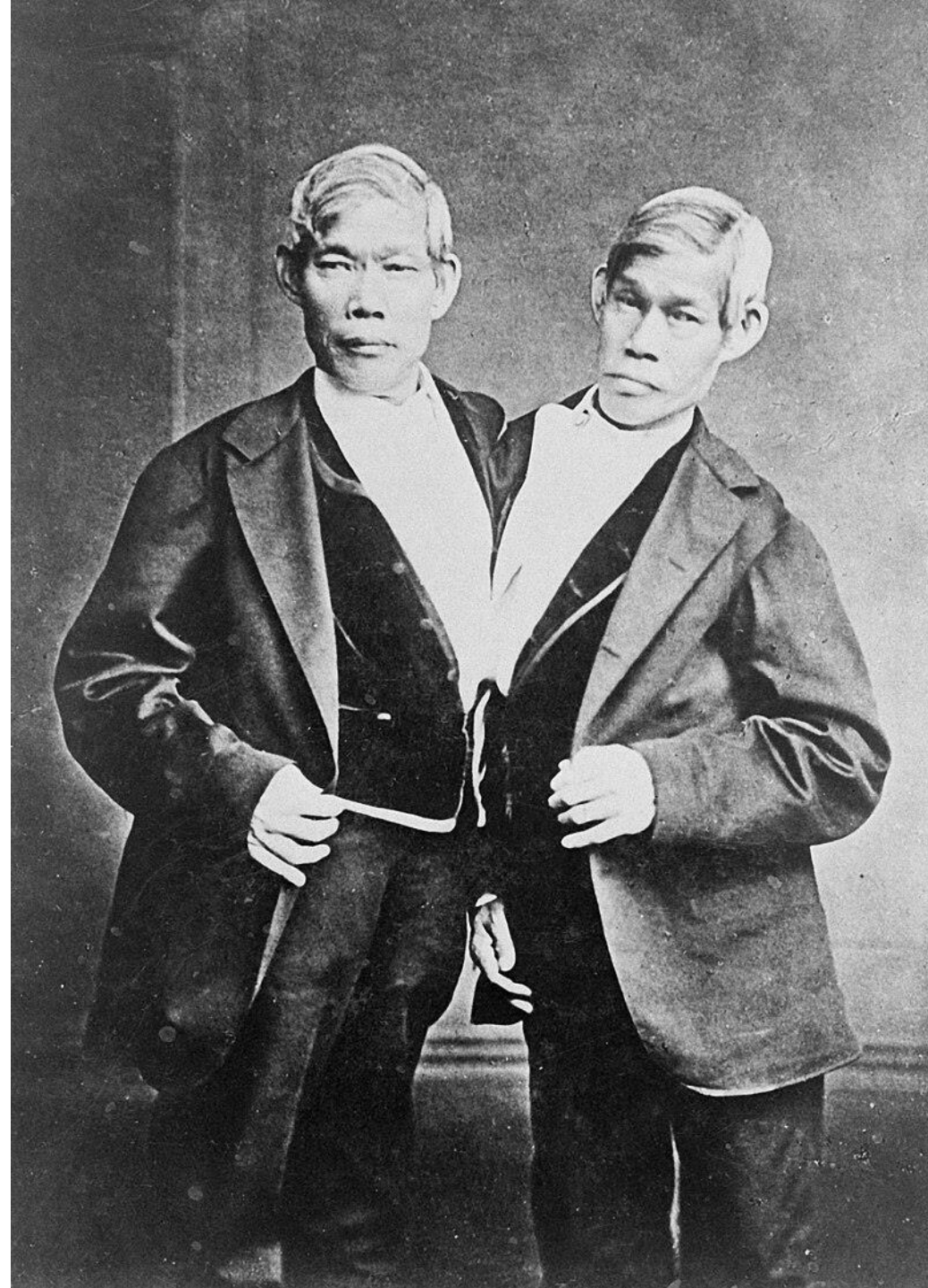
Jak se v poslední době změnila jejich frekvence?



Twin-to-twin transfusion syndrome

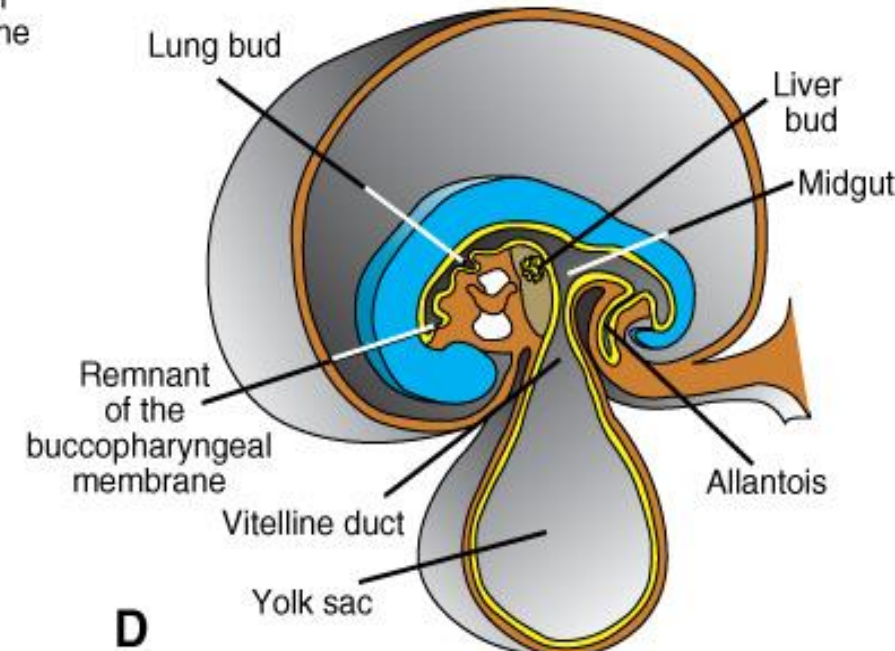
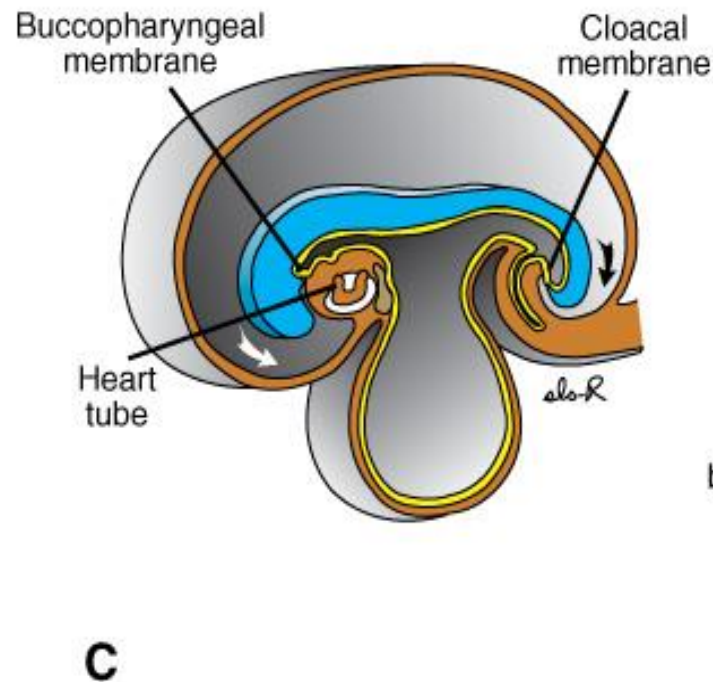
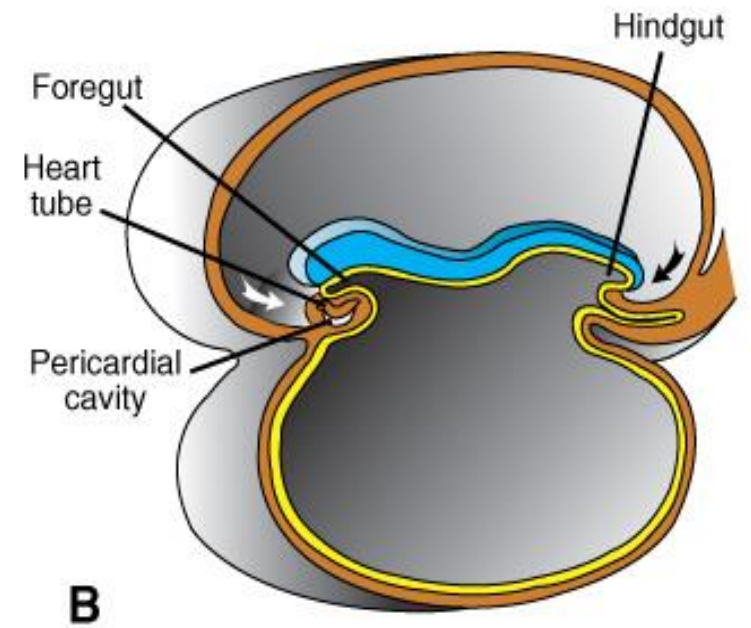
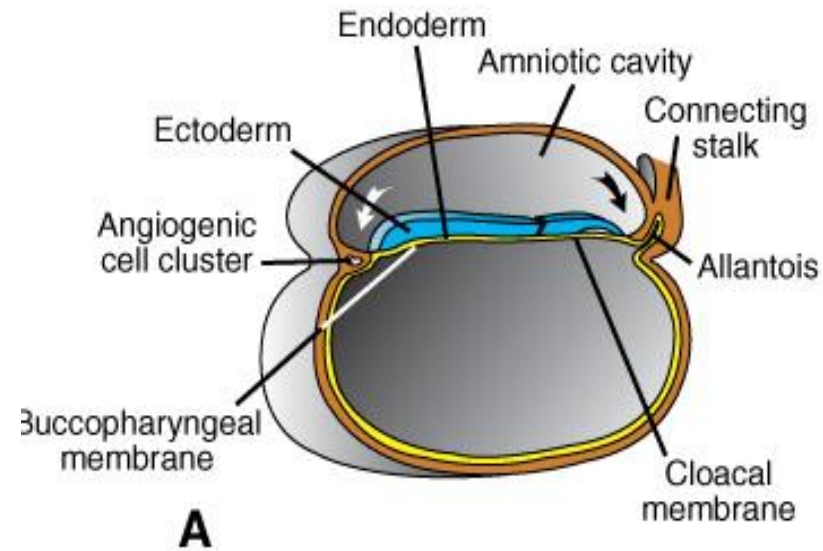


Chang a Eng Bunkerovi



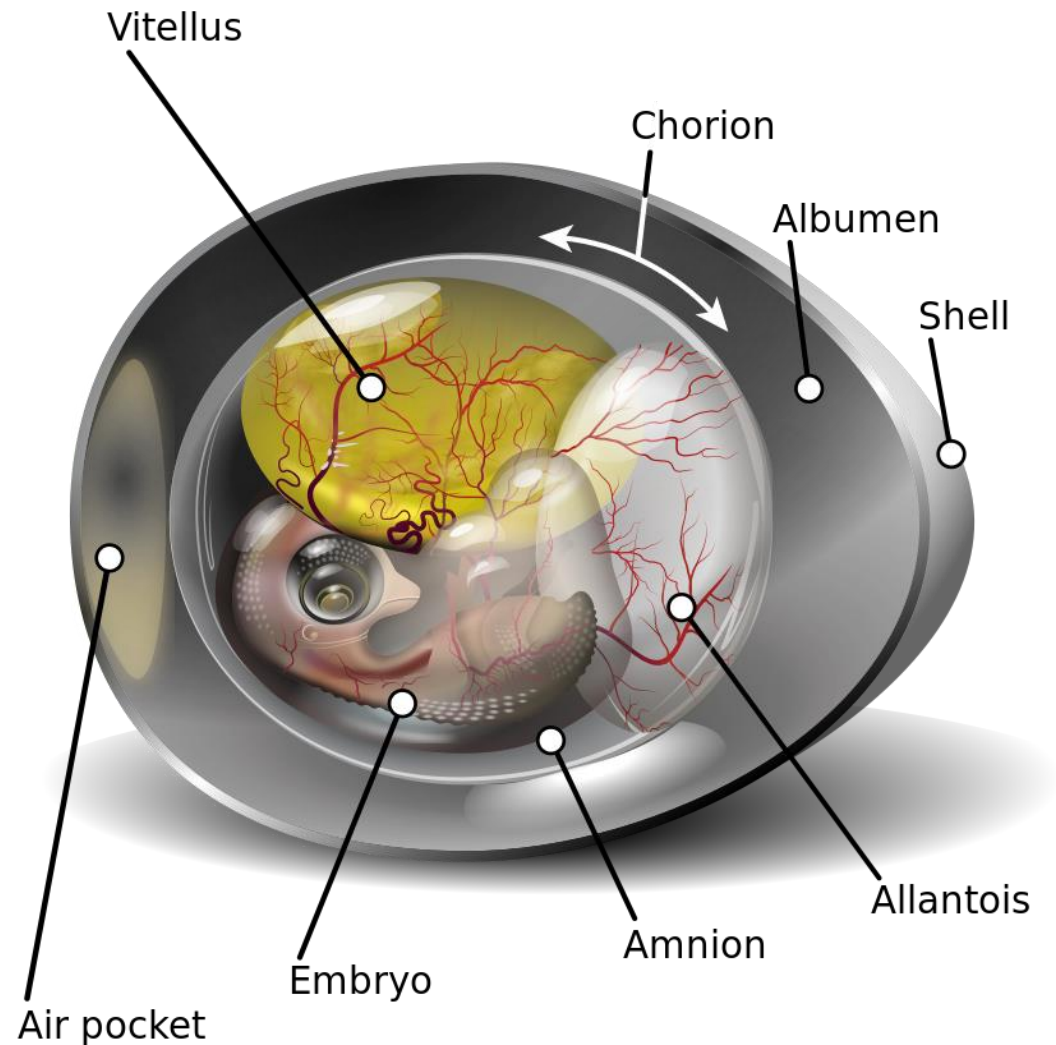
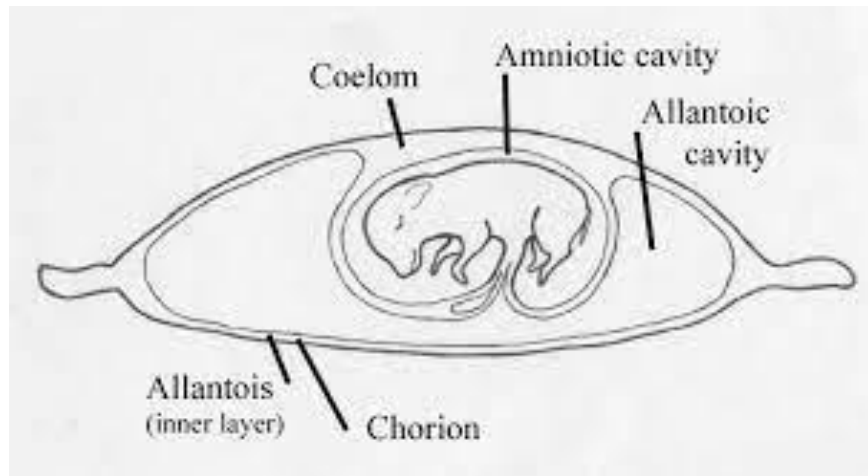
Allantois

- (allas = salám, jitrnice, klobása)
- výchlípka kaudální části stěny žloutkového vaku vybíhá do zárodečného stvolu
- později se ústí přesune do kloaky



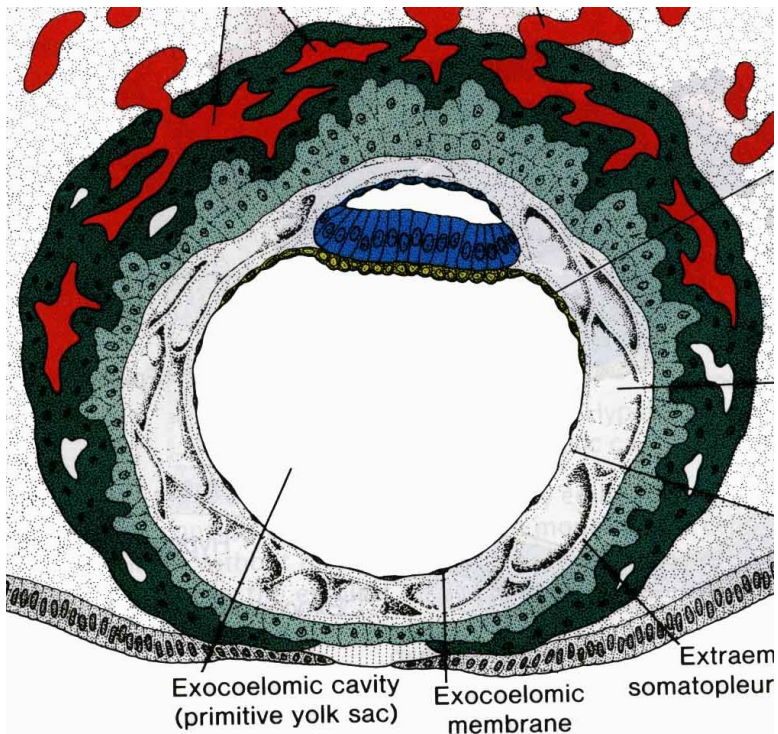
Funkce allantois

- Výživa a vylučování
- Krvetvorba (3. – 5. týden)
- Vasa allantoica (přispívají k vasa umbilicalia)
- Urachus (přispívá k močovému měchýři)

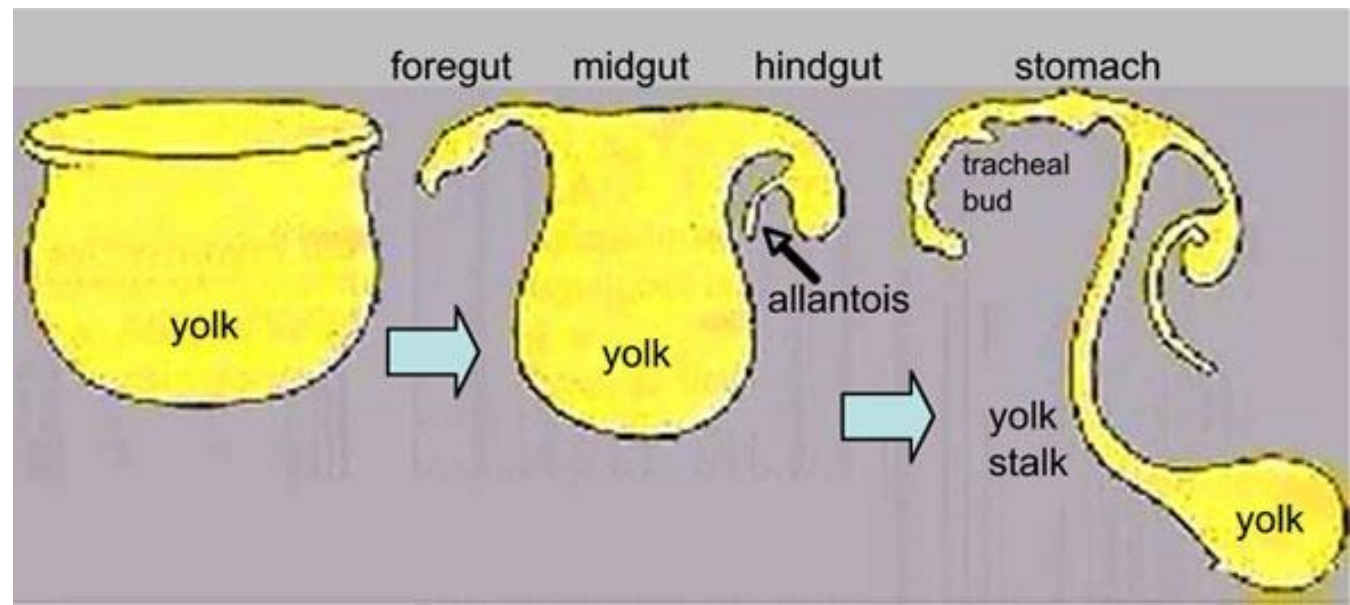


Žloutkový váček

blastocystová dutina →
exocoelom = **primární
žloutkový váček**

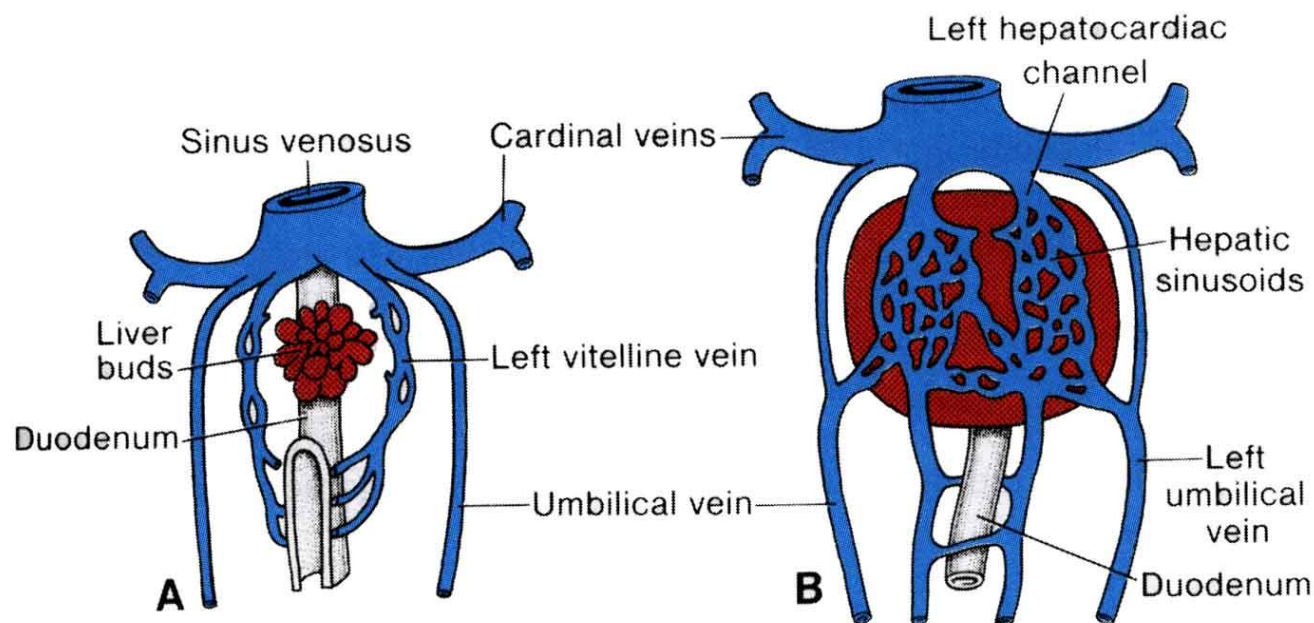
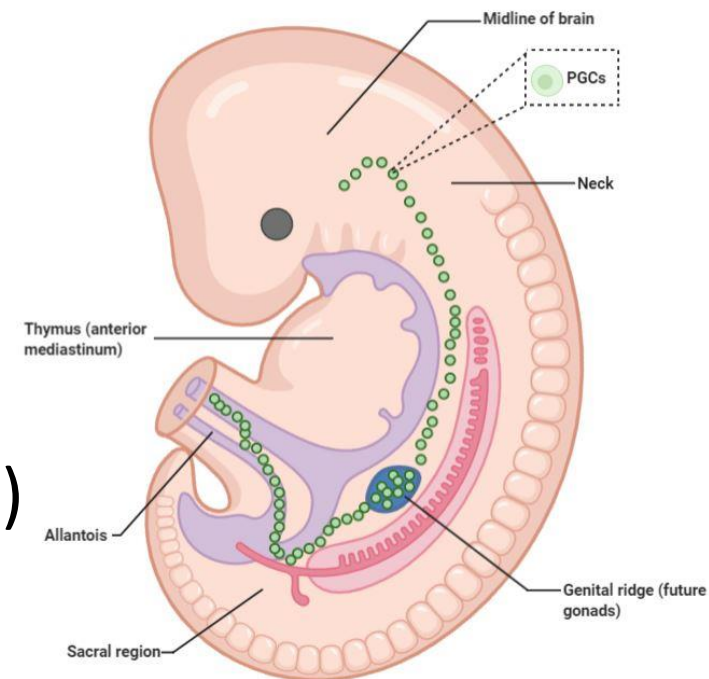


sekundární žloutkový váček - dutina spojená s
primitivním střevem – extraembr. endoderm (z
hypoblastu) a extraembr. splanchnický
mezoderm, zánik v 11. týdnu

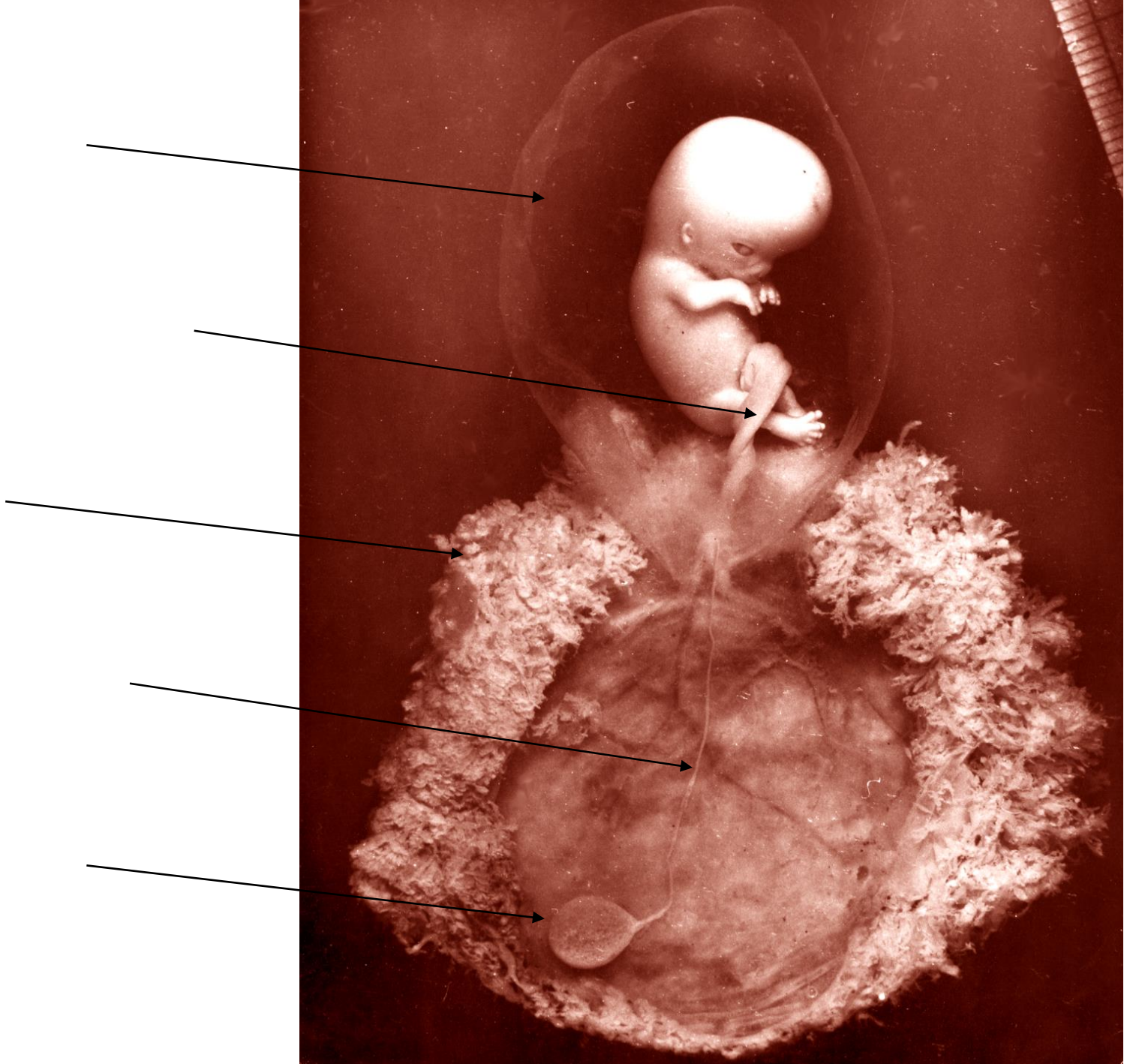


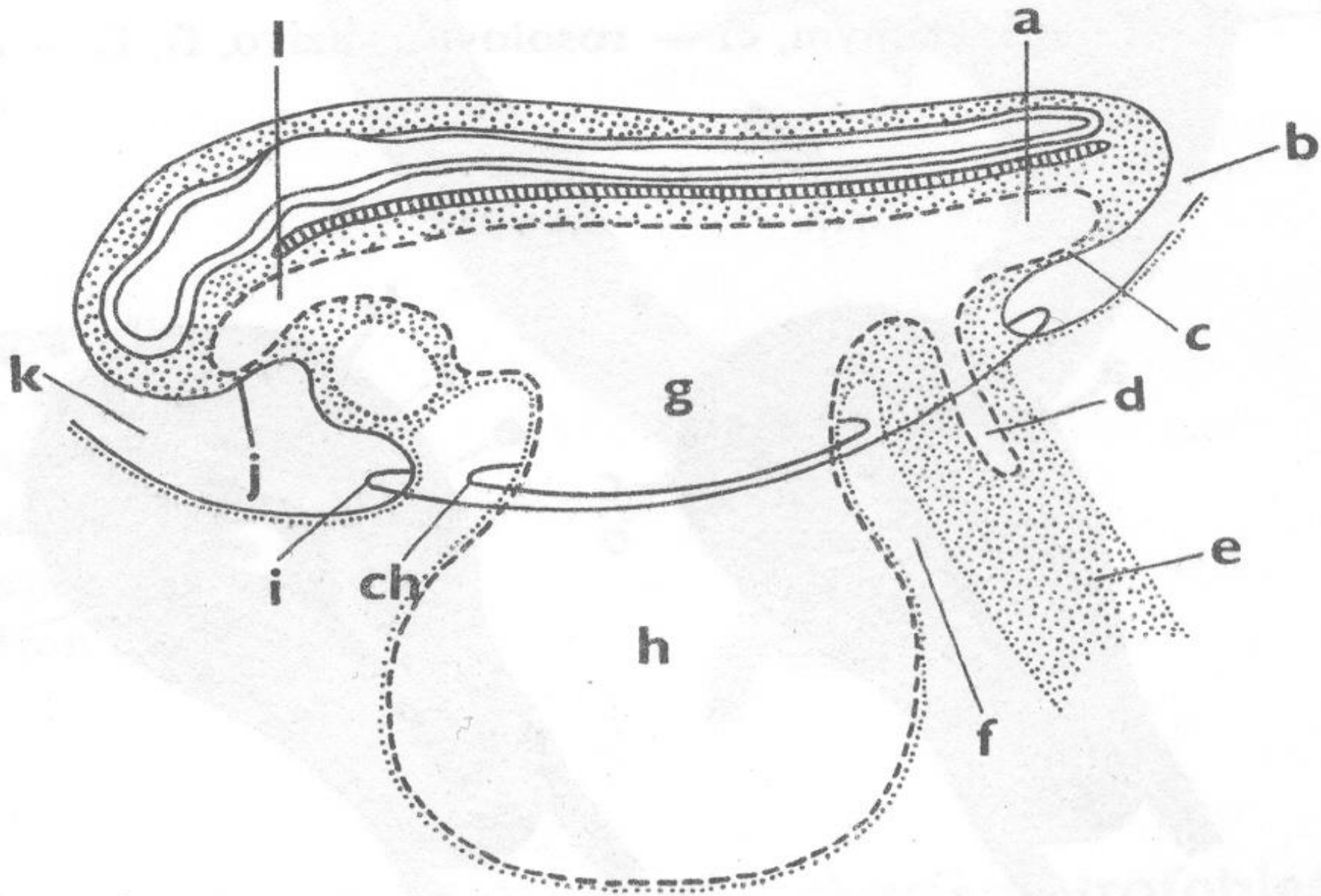
Funkce žloutkového váčku

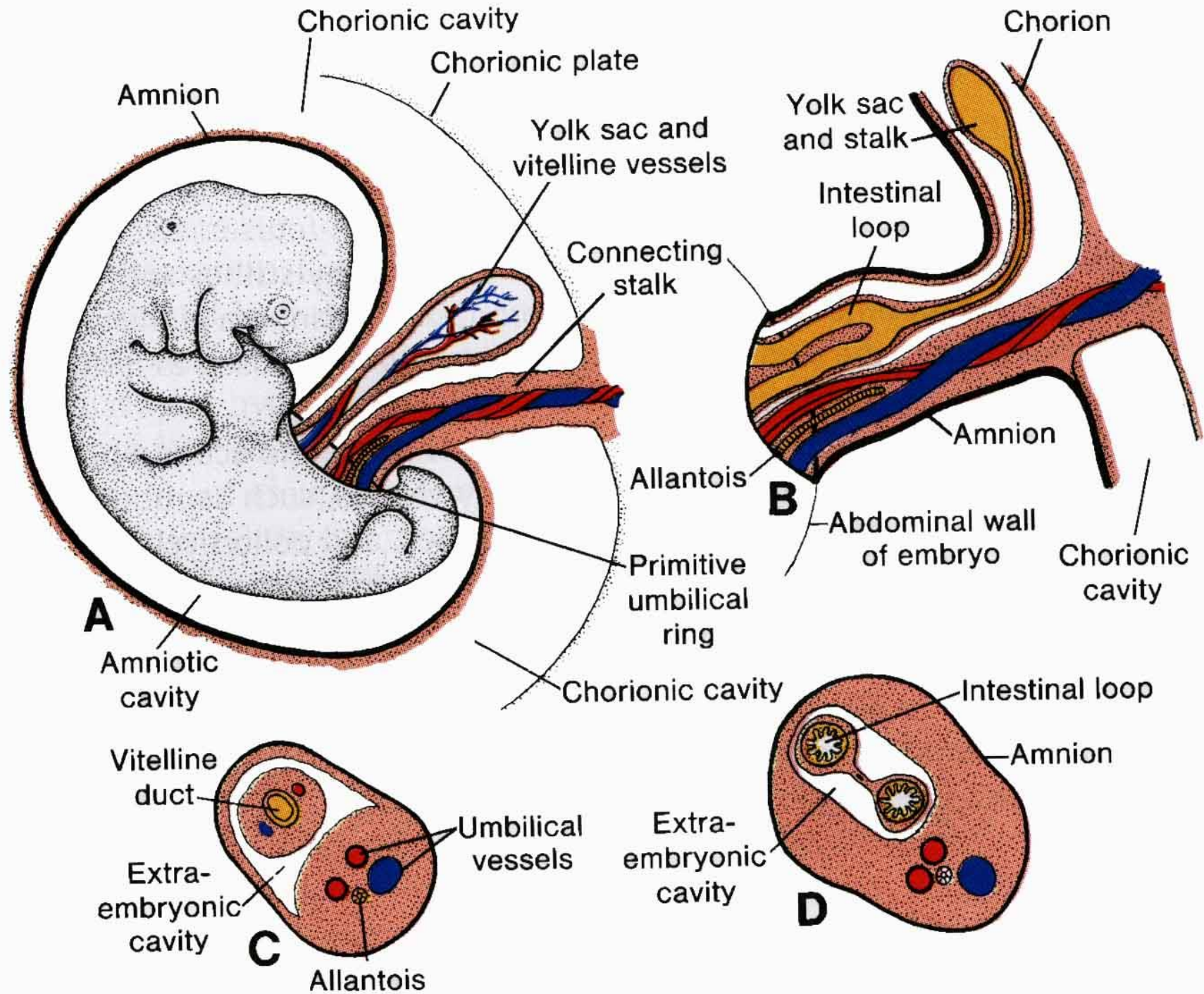
- První místo krvetvorby (v 3. a 6. týdnu)
- Vasa omphaloenterica (řečiště jater a vena portae)
- Prvopohlavní buňky
- V raných fázích výživa
- Meckelův divertikl

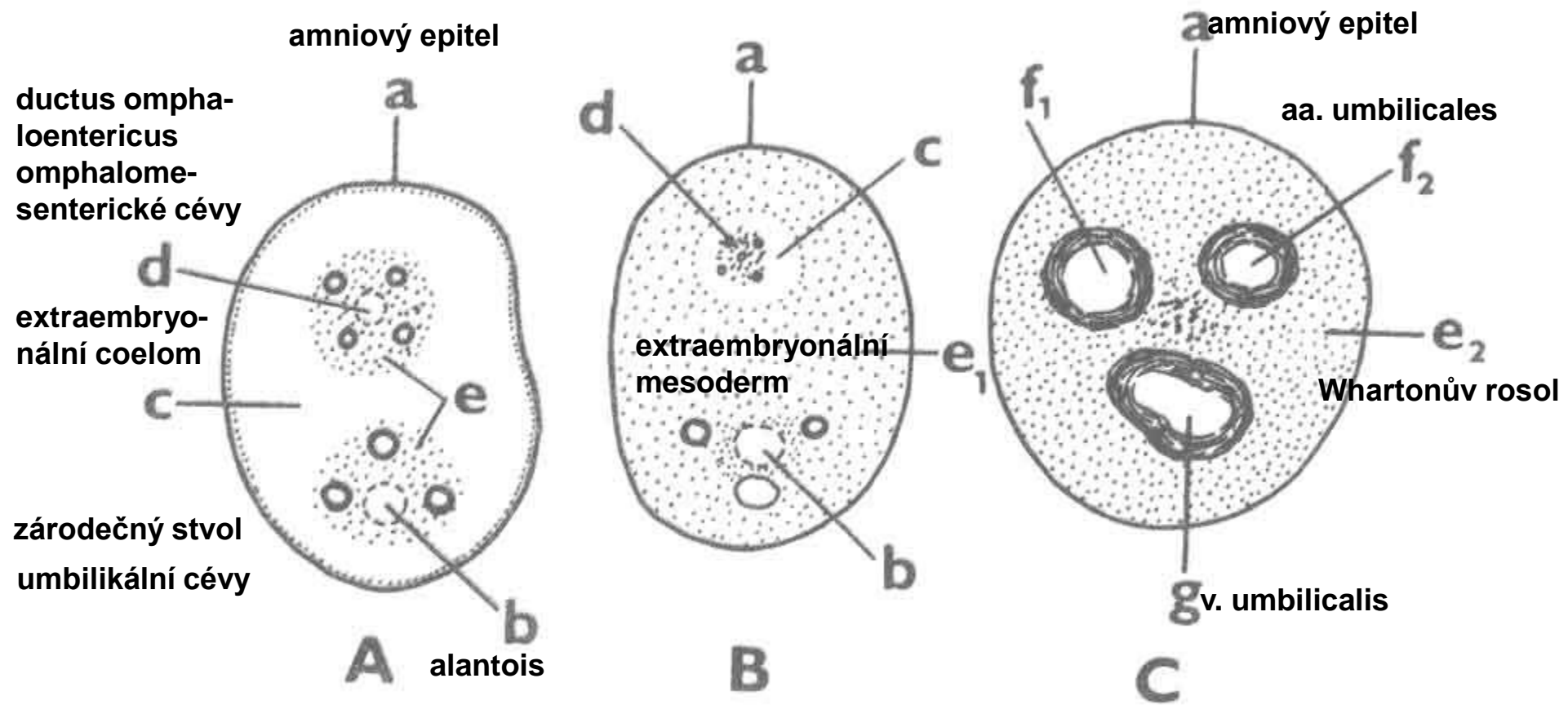


?











Zdroje obrázků: Langman's medical embryology, wikimedia.org, ÚHE 2.LF UK