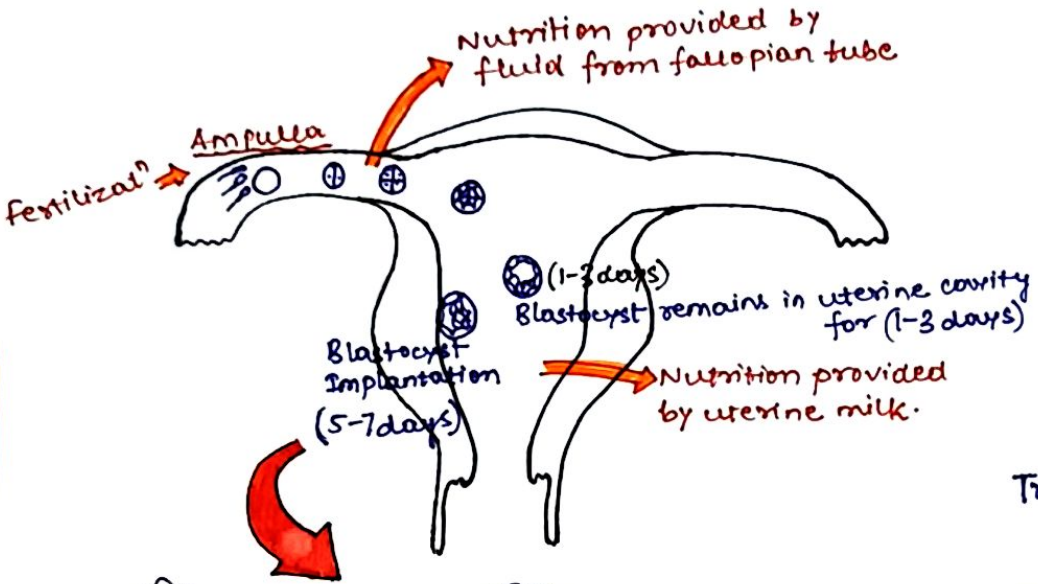
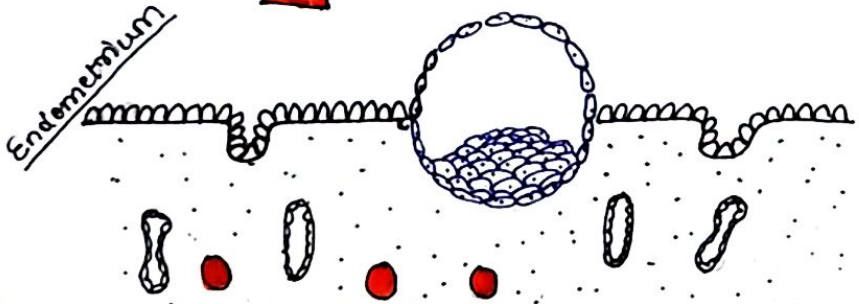




- Some trophoblast cells
- Some Inner cell mass cells
- Some uterine endometrial cells

→ Rapidly proliferation

↓

Placenta formation.

Trophoblast cell

↓ Releases

Proteolytic enzymes

↓

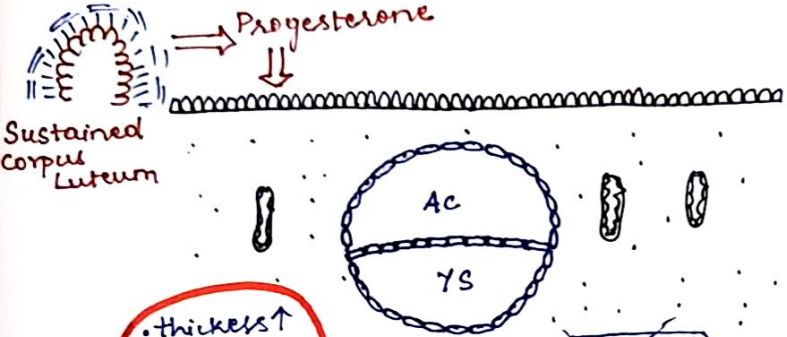
Digests adjacent cells of endometrium

↓

Release of fluid rich in nutrients

↓

Actively taken by blastocyst.



- thickness ↑
- glycogen ↑
- proteins ↑
- lipids ↑

These changes in uterine endometrium in presence of progesterone is K/a

⇓

"Decidual reaction"

~~Stromal cells~~

⇓

Now known as

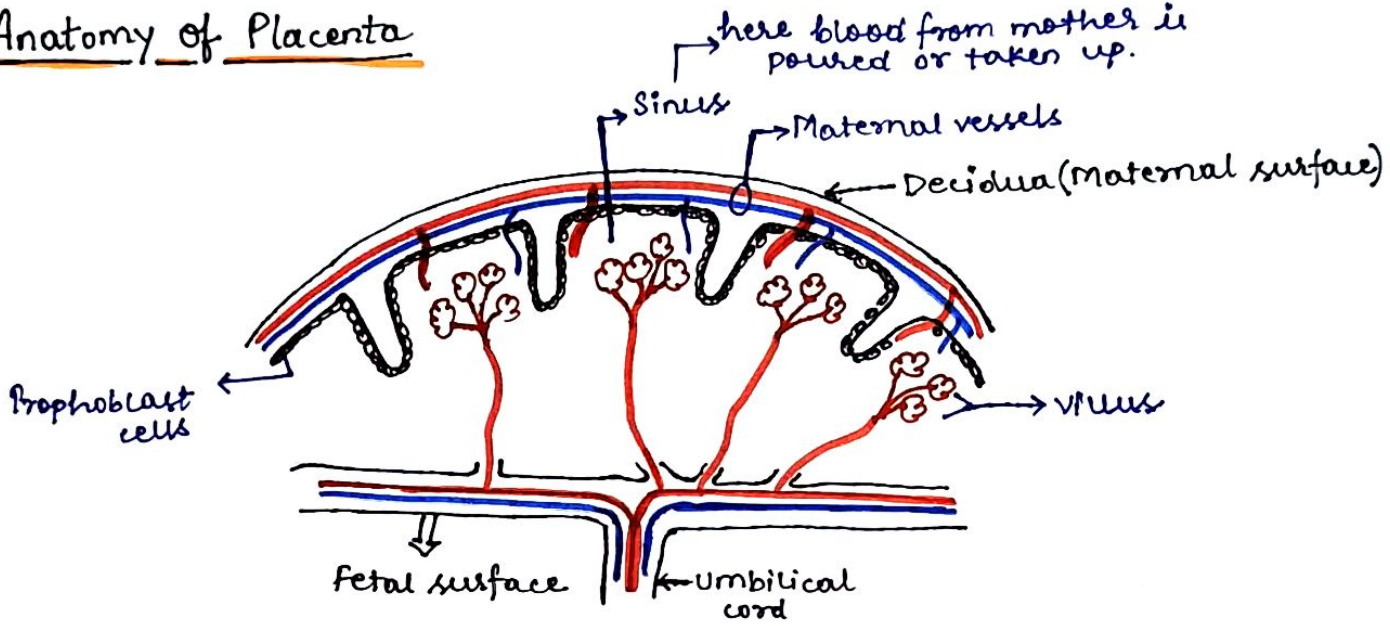
⇓

Decidual cells

[Mass of cells K/a Decidua]

Only source of nutrition for embryo till 1 week after implantation

Anatomy of Placenta



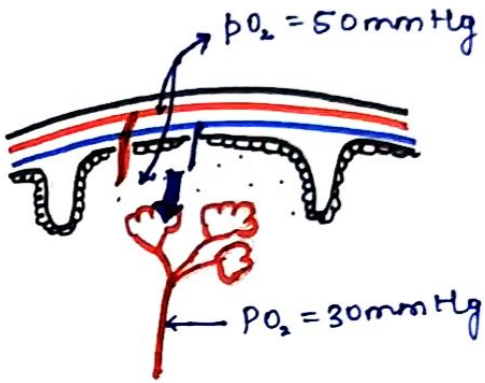
Villi carrying fetal blood are surrounded by sinuses that contain maternal blood.

Functions of Placenta

① Diffusion of Oxygen

Mother's Blood —(By simple diffusion (O_2))→ Fetal Blood

D/t O_2 press. gradient.



pO_2 of 30mmHg is still capable of providing sufficient O_2 to fetal tissues d/t :-

➡ Presence of fetal hemoglobin
⇩
shifts ODC to left (↑ affinity of Hb with O_2)

➡ Conc. of Hb of fetal blood > (50%) Conc. of Hb of mother

∴ Amnt. of O_2 transport ↑ses.

➡ Double bohr effect. [Bohr effect :- ↑ pCO_2 ⇒ Hb dissociation with O_2 ↑
↓ pCO_2 ⇒ Hb association with O_2 ↑]

Fetal blood

↓ pCO_2 ⇒ Hb association with O_2 ↑

B_{CO_2} it gives to maternal blood.

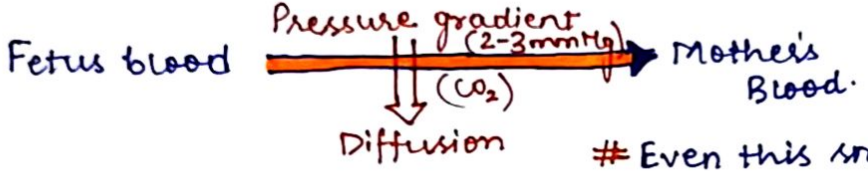
$Hb-O_2$
$Hb-O_2$ ↑

Maternal blood

↑ PO_2 ⇒ Hb dissociation with O_2 ↑

O_2

② Diffusion of carbon dioxide



Even this small pressure gradient is enough to cause adequate diffusion due to extreme solubility of CO_2 (20 times greater than that of O_2)

③ Diffusion of foodstuffs

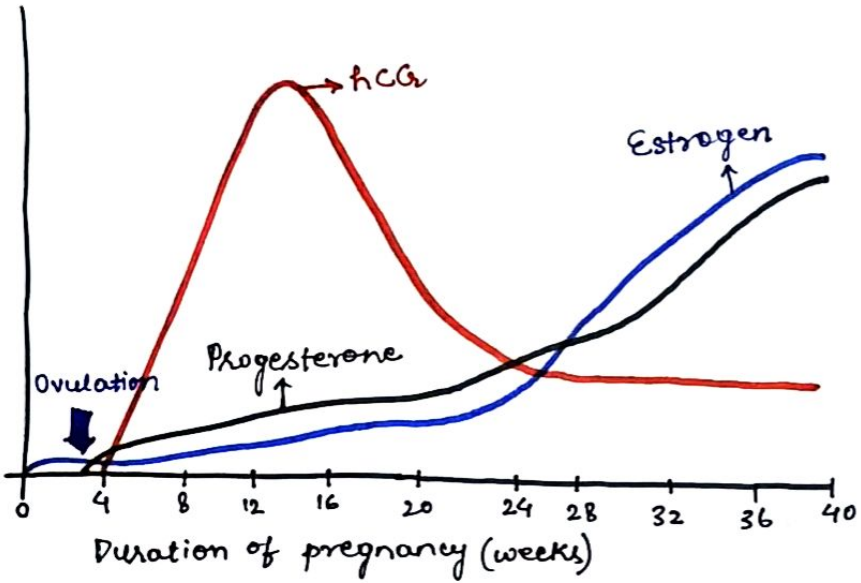
Glucose → Transported by facilitated diffusion through carrier molecules in trophoblast cells.
↓
Main foodstuff.

Fatty acids → Diffuses through membranes.

④ Excretion of waste products

- By diffusion
- Main excreted products :- NPN (Non Protein Nitrogens)
  - ✓ Urea
  - ✓ Uric acid
  - ✓ Creatinine

Hormonal factors in Pregnancy :-



HCG (Human Chorionic Gonadotropin)

- Secreted by placenta
- Appears in blood (8-9 days after ovulation), shortly after implantation.
- Appearance of this hormone in urine is basis of test for pregnancy.
- Reaches at max @ 10-12 weeks
  decreases till 16-20 weeks
  Then remains constt.

Functions of hCG

- Acts as LH
- Prevents involution of corpus luteum
  - Secretes Ⓔ, Ⓟ → maintains decidual nature of endometrium
  - Degenerates @ 13th - 17th week
    - After which placenta takes action of releasing Ⓔ, Ⓟ.
- Prevents sloughing off of endometrium (i.e. prevents menstruation)
- hCG stimulates interstitial cells to release Ⓣ
  - → Dev. of fetal sex organs
  - → Descent of testes.

Estrogen

- Secreted by corpus luteum then → Placenta
- Corpus luteum
  - ↓
  - de novo synthesis from basic substrates
- Placenta
  - ↓
  - [dehydroepiandrosterone, 16-hydroxydehydroepiandrosterone] → Estrogen synthesis.

functions of estrogen

- Generally it has proliferative function on endometrium
- During pregnancy,
  - Enlargement of mother's uterus
  - Enlargement of mother's breast & growth of breast ductal system
  - Enlargement of female external genitalia.