

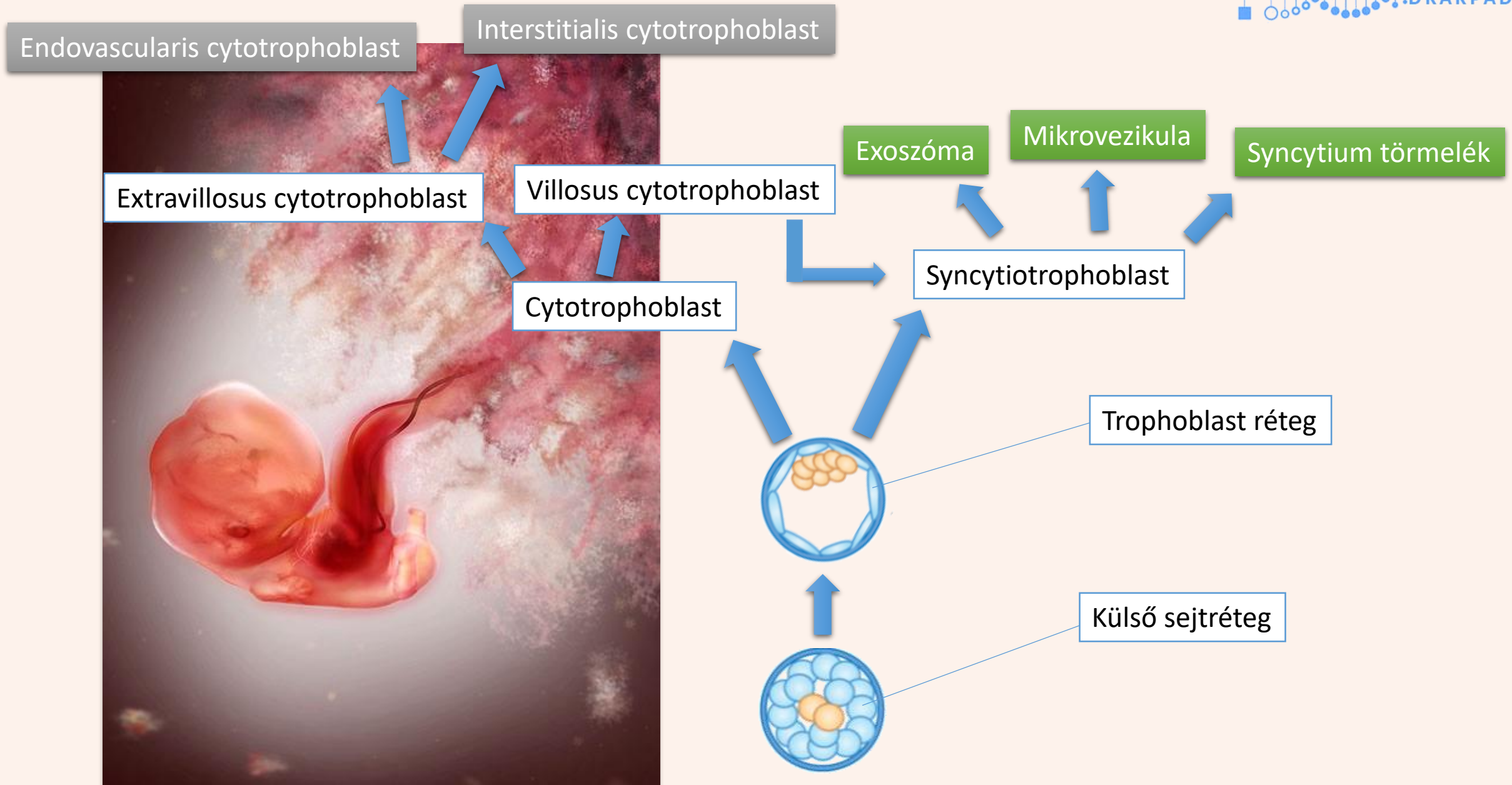


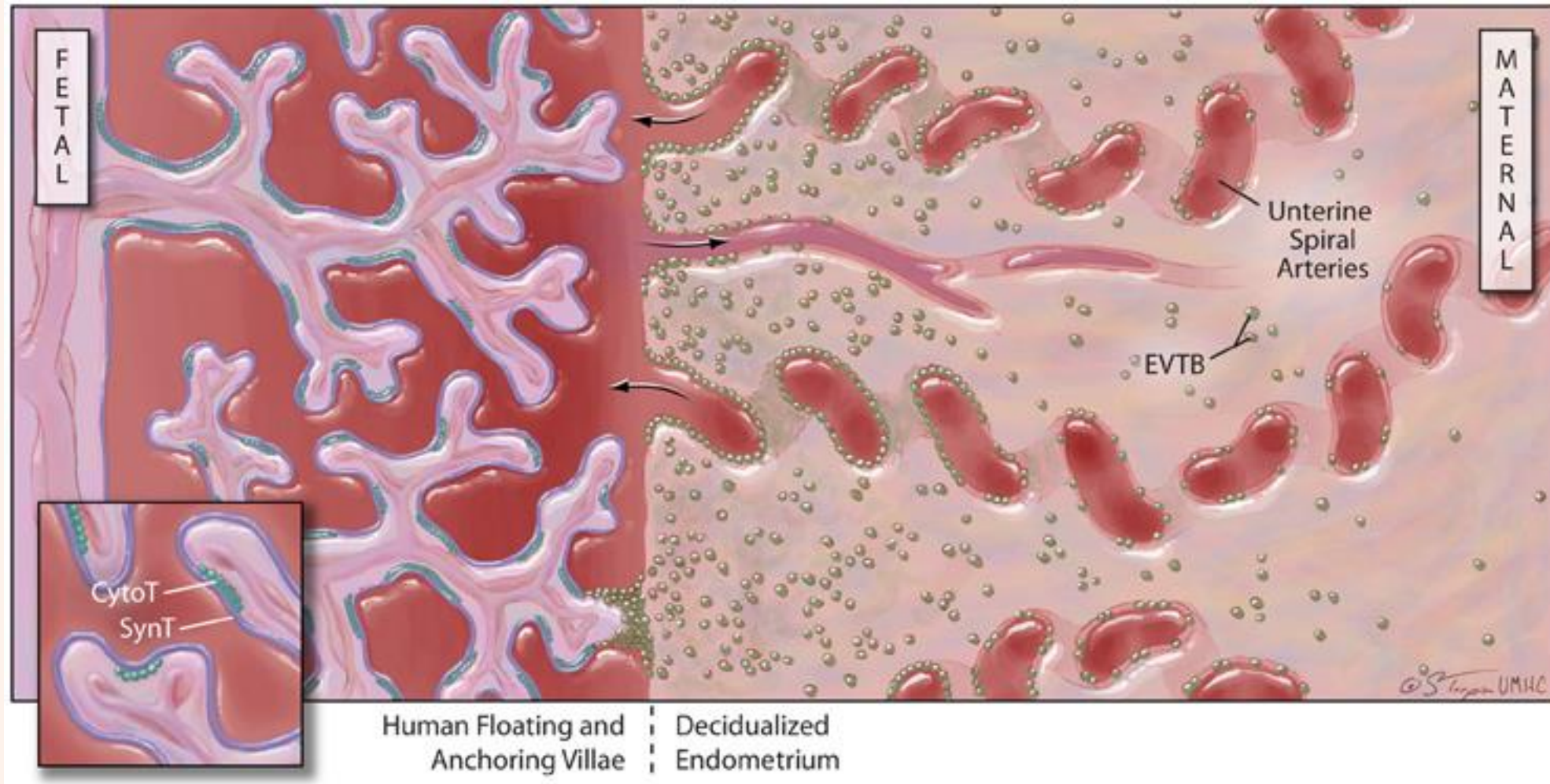
# A trophoblast sejtek kialakulása és dinamikus mikrokörnyezeti interakciói

Dr. Kovács Árpád Ferenc

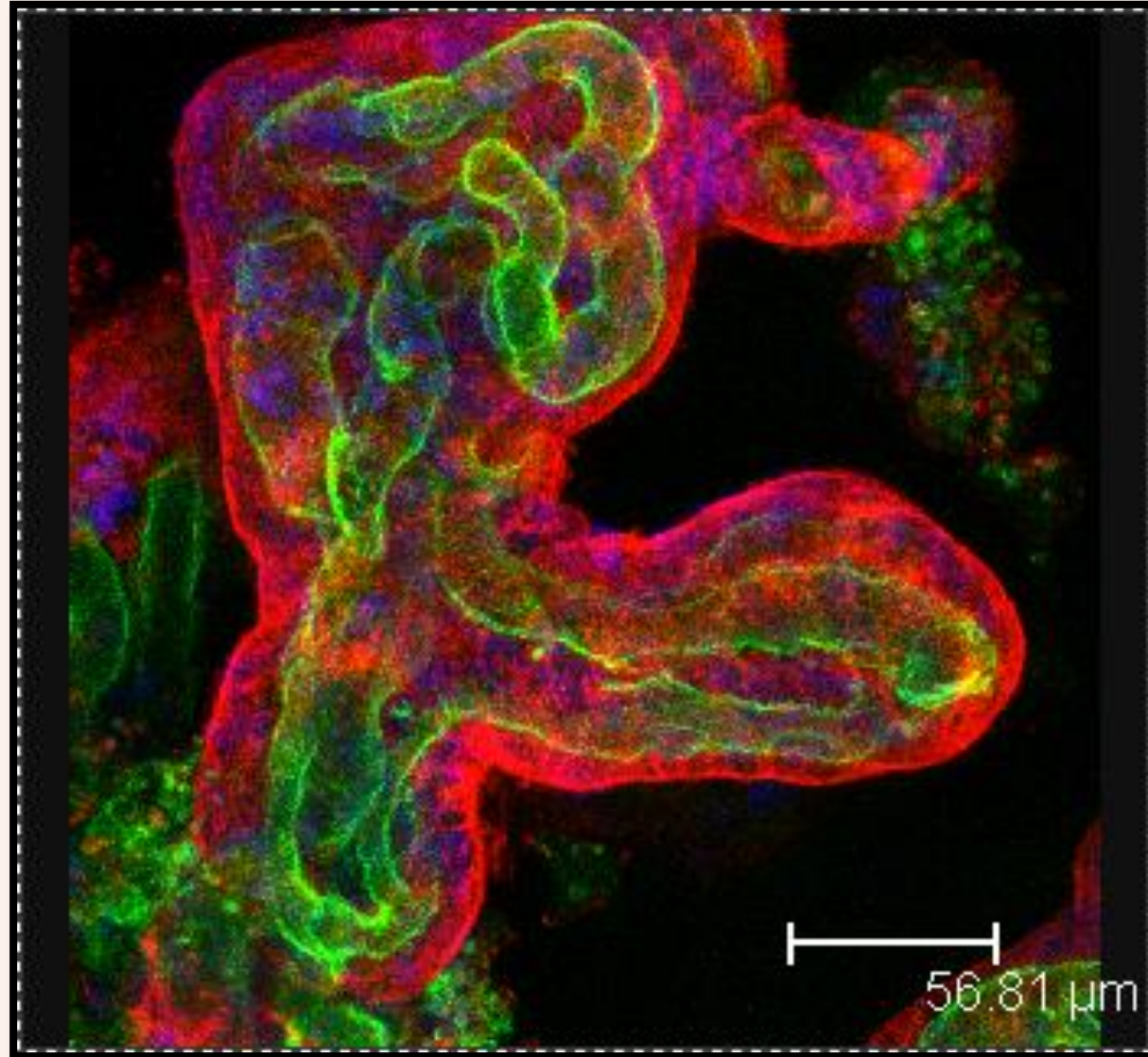
2015. 11. 06





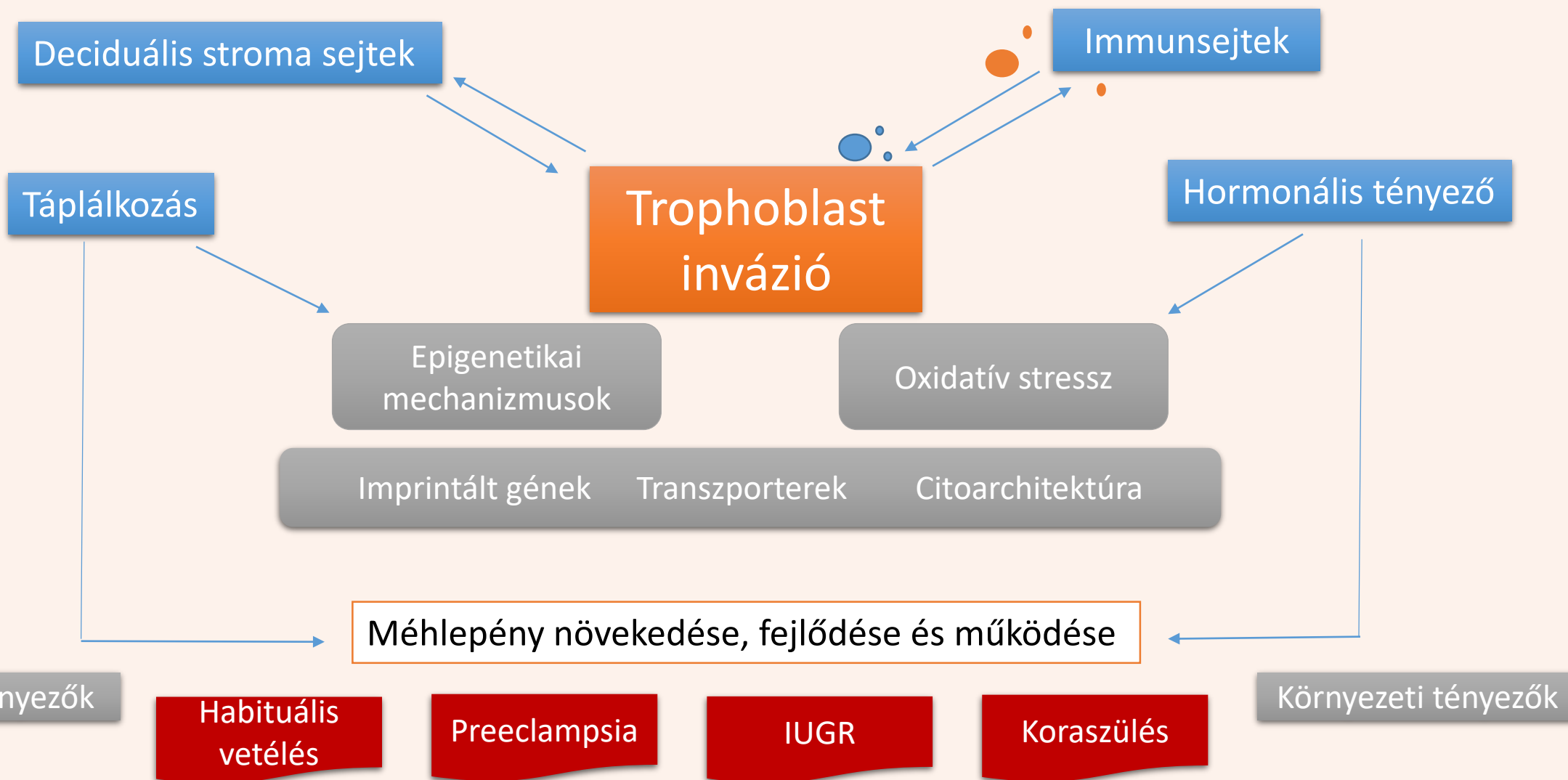


Clark Gary F, Schust Danny Joseph - Manifestations of Immune Privilege in the Human Reproductive Tract , 2013 Frontiers in Immunology

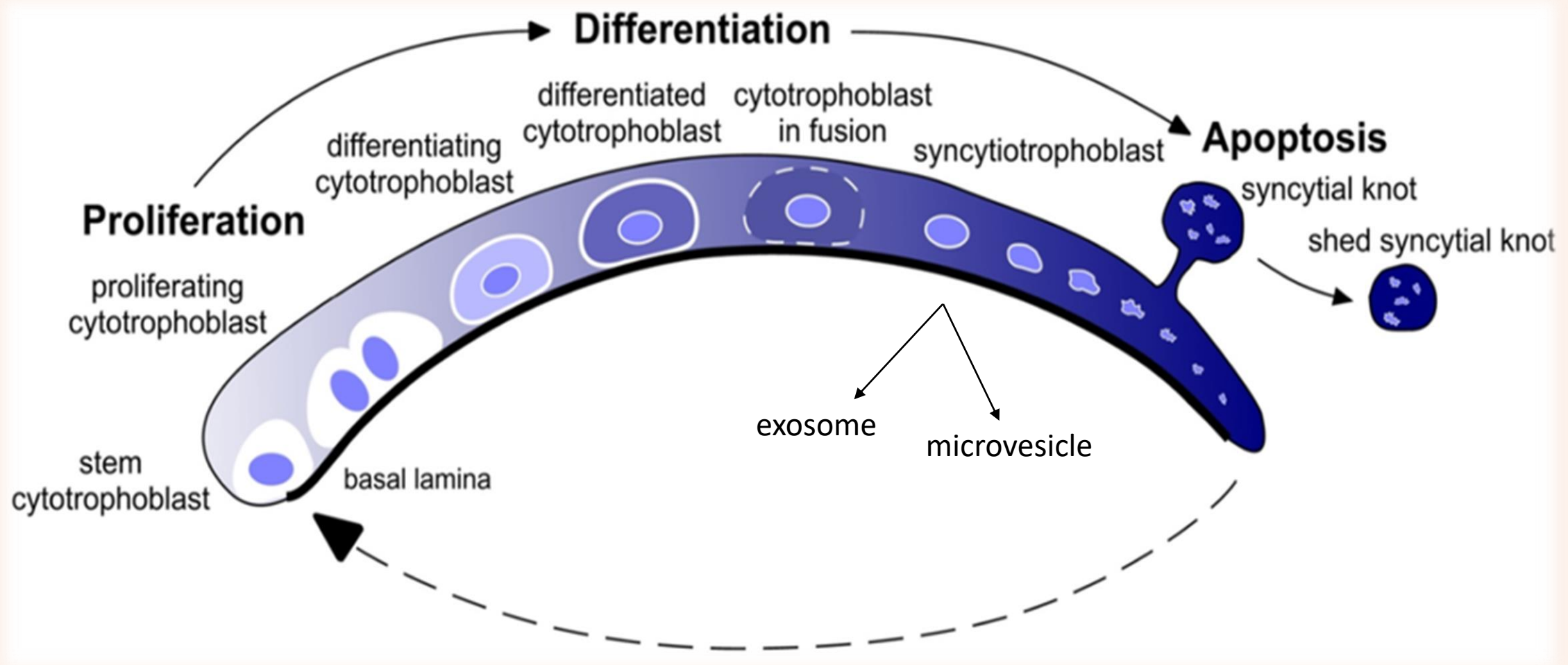


Professor Steve Charnock-Jones' Group, University of Cambridge, School of Clinical Medicine / Department of Obstetrics & Gynaecology / Research

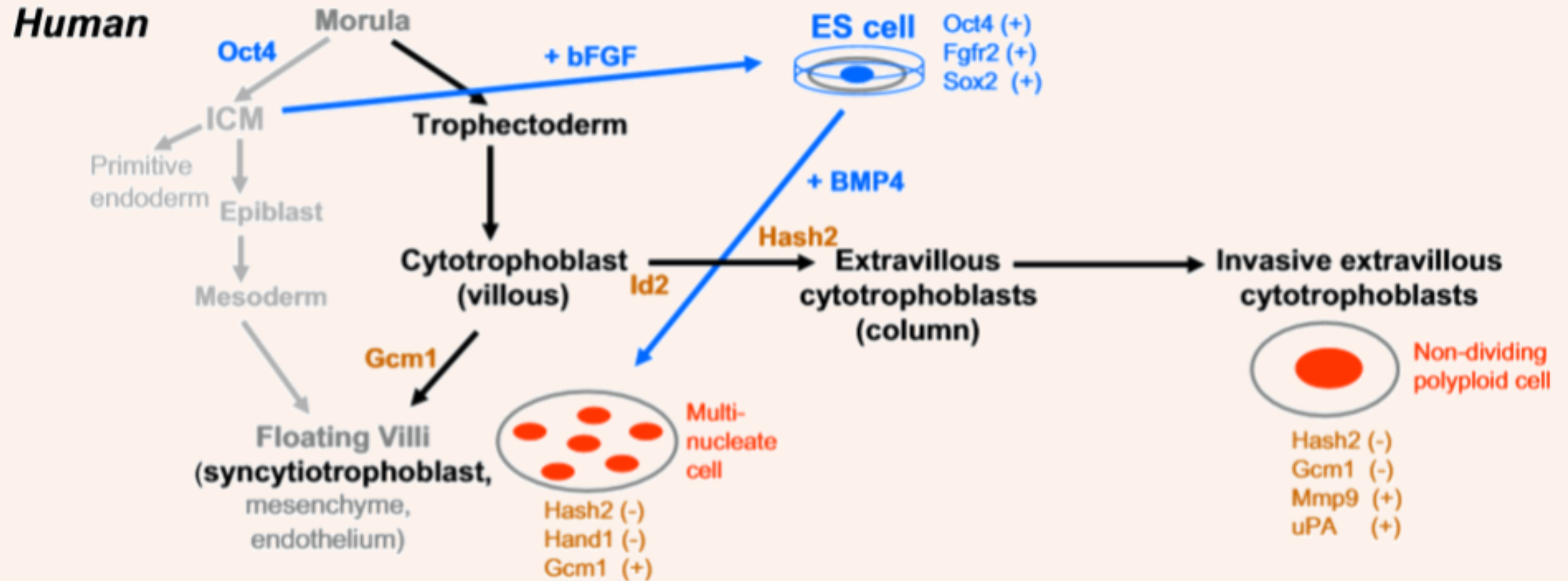
# Trophoblast – a várandósság karmestere



# Trophoblast – differenciálódás (1)

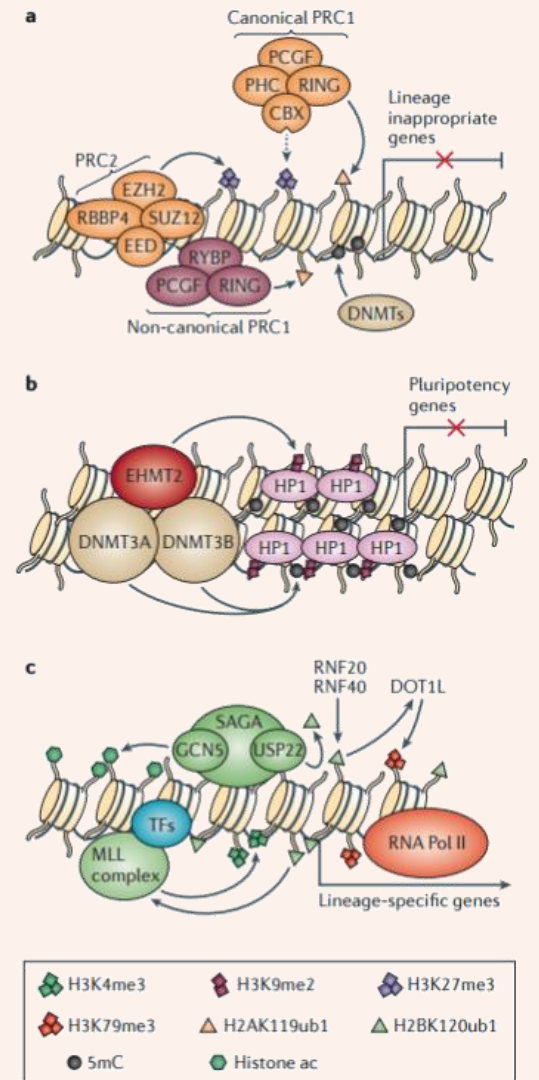
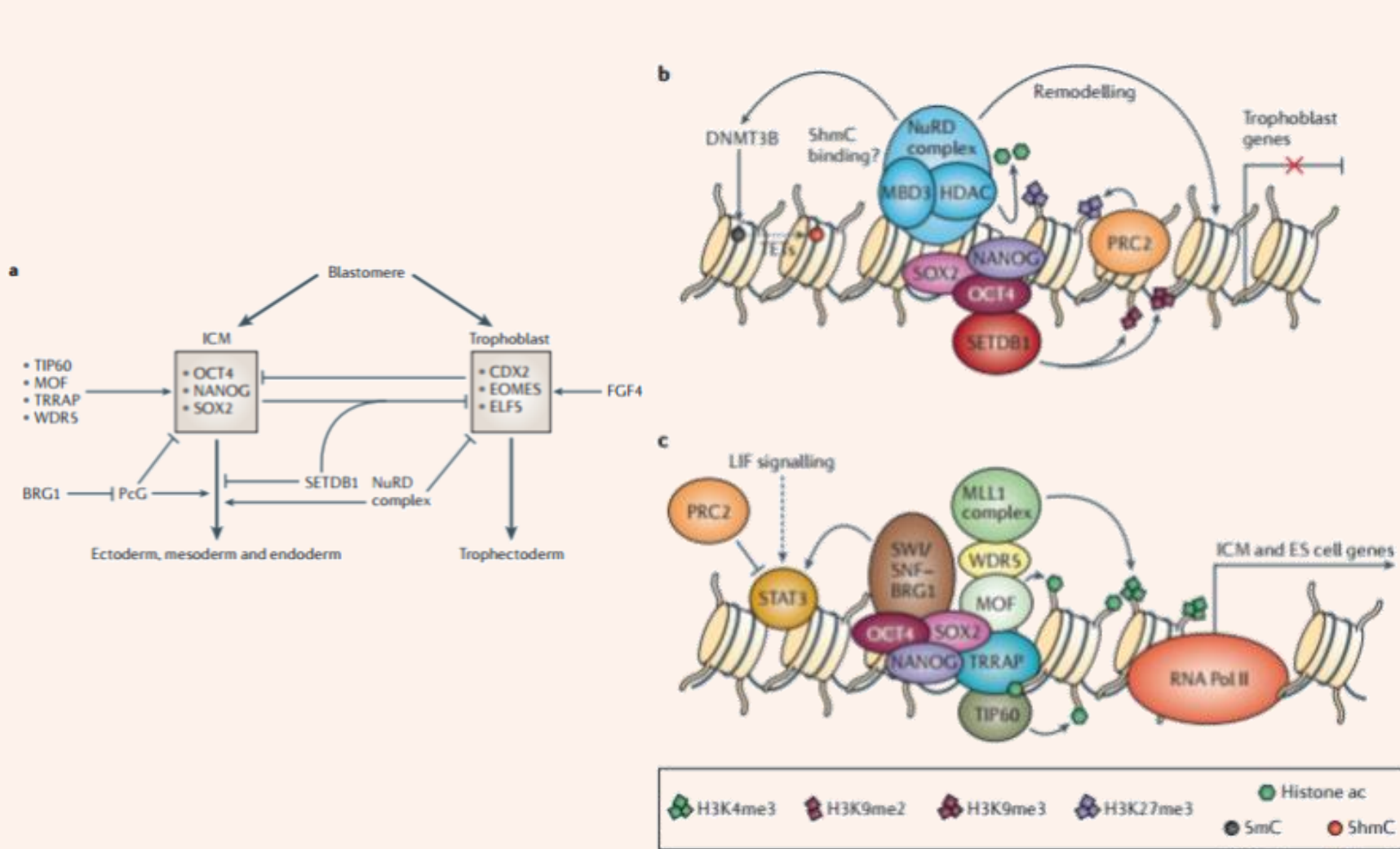


# Trophoblast – differenciálódás (2)



Michael Roberts et al – Trophoblast gene expression: Transcription factors in the specification of early trophoblast, *Repr. Biol. And Endo.* 2004, 2-47

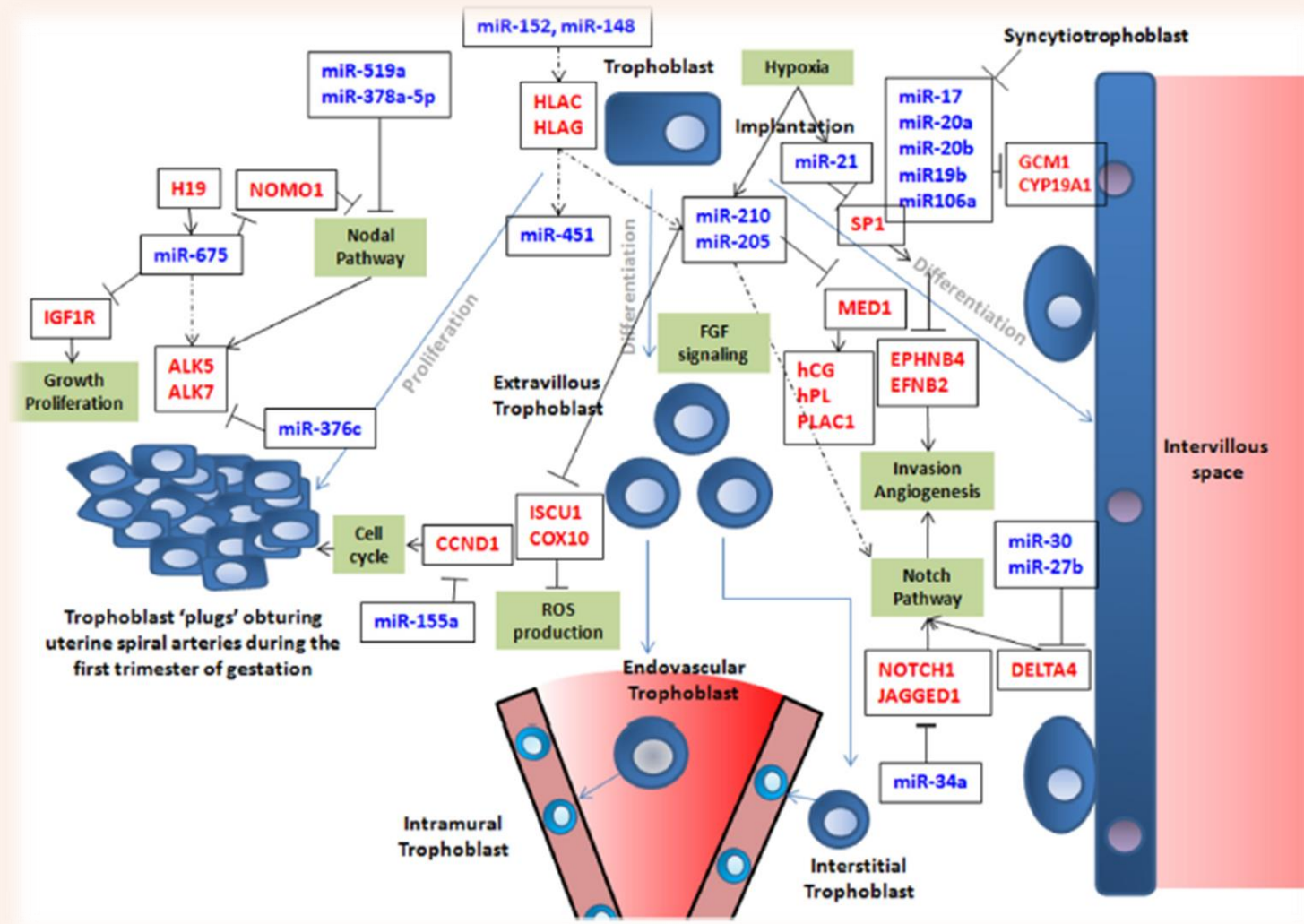
# Trophoblast – epigenetikai szabályozás (1)



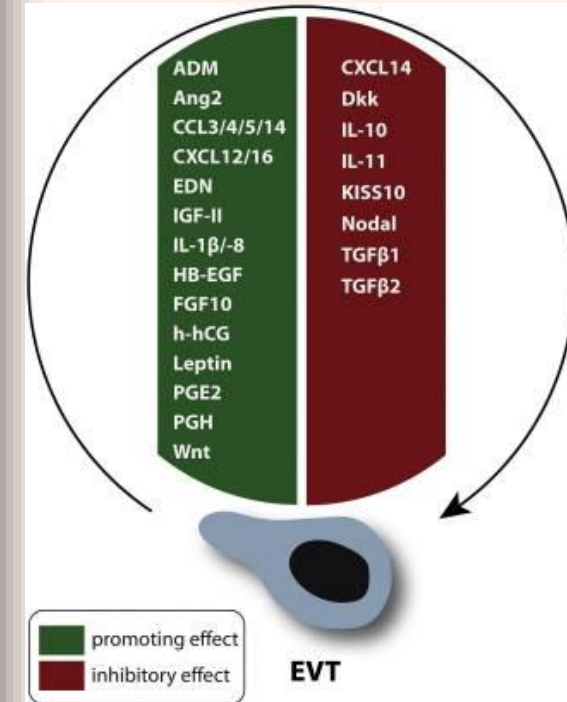
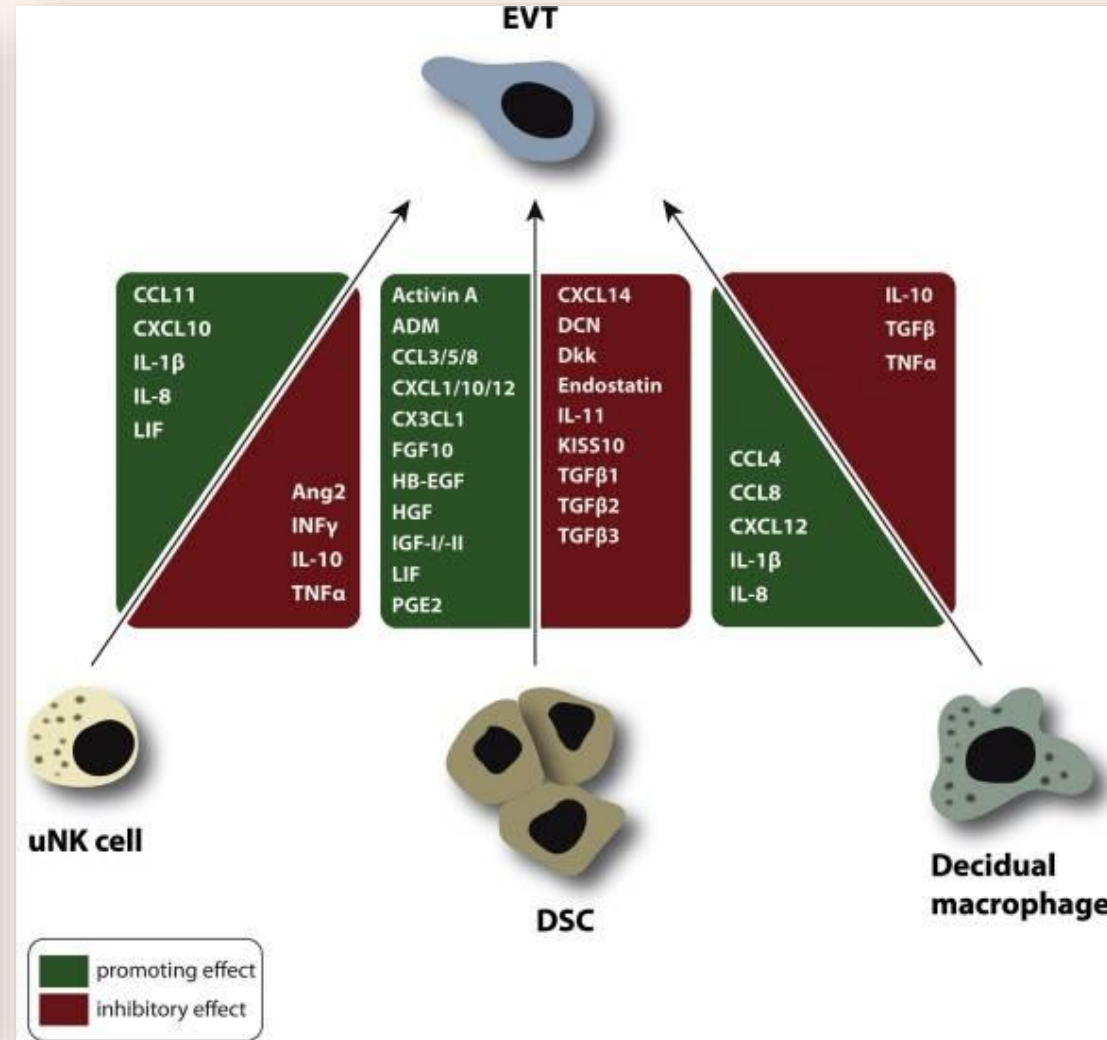
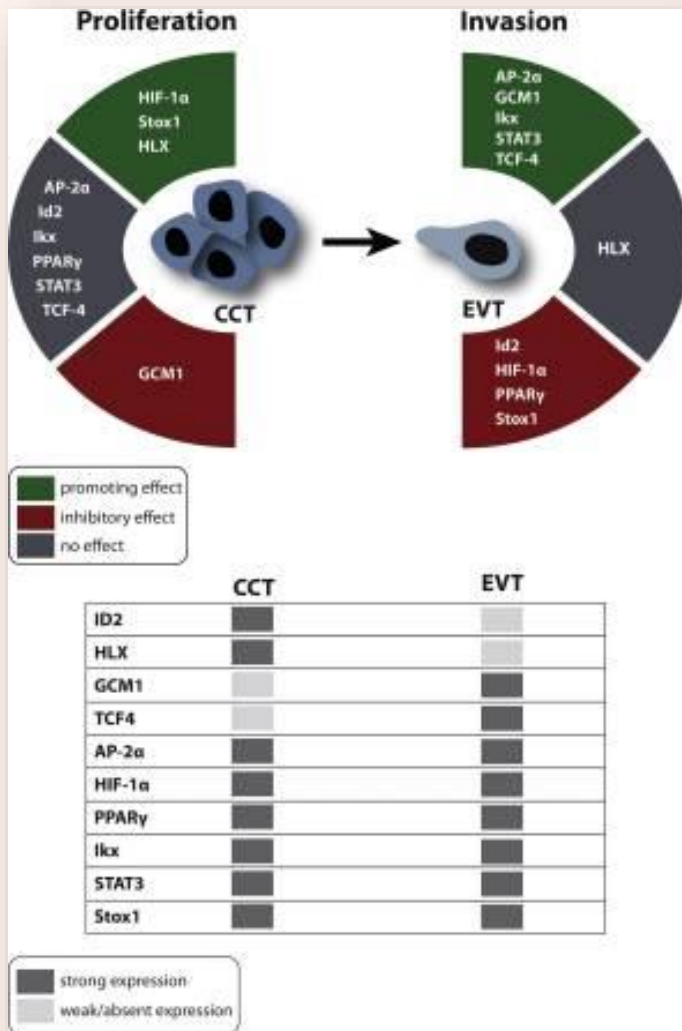
Taipng Chen, Sharon Y. R. Dent - Chromatin modifiers and remodellers: regulators of cellular differentiation, NATURE REVIEWS | GENETICS, 2014



# Trophoblast – epigenetikai szabályozás (2)



# Serkentő és gátló hatások egyensúlya (1)



Knöfler M, Pollheimer J. IFPA Award in Placentology Lecture: Molecular regulation of human trophoblast invasion. *Placenta*. 2012;33(2):S55-S62.

# Serkentő és gátló hatások egyensúlya (2)

## Implantation

### Galectin-1

↑ Blastocyst attachment to uterine epithelium

### Galectin-3

↑ Blastocyst attachment to uterine epithelium

↑ Blastocyst initial rolling

### Galectin-9

↑ Decidual cell migration

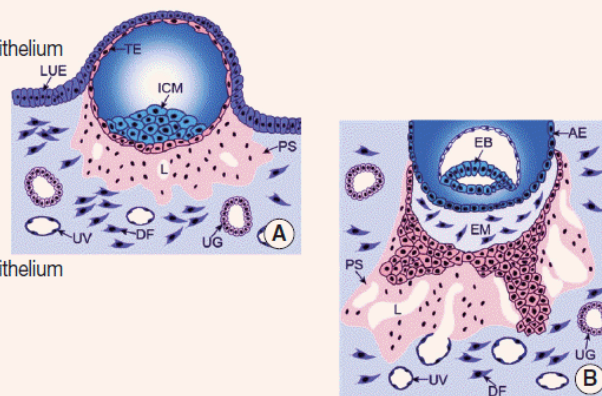
↑ Decidual cell chemotaxis

### Galectin-15

↑ Blastocyst development

↑ Blastocyst attachment to uterine epithelium

↑ Implantation



## Maternal-fetal immune tolerance

### Galectin-1

↑ Apoptosis of activated decidual T cells

↓ T cell proliferation

↑ Induction of tolerogenic DCs

↑ Expansion of CD4+ CD25+ Treg cells

### Galectin-8

↑ Transformation of peripheral NK cells into uterine NK cells

### Galectin-9

↑ Establishment of an immuno-privileged environment for implantation

### Galectin-13, -14, 16, -17

↑ Apoptosis of activated T cells

## Angiogenesis / vascular effects

### Galectin-1

↑ Production of angiogenic factors

↑ Production of MMPs

↑ Vascular development

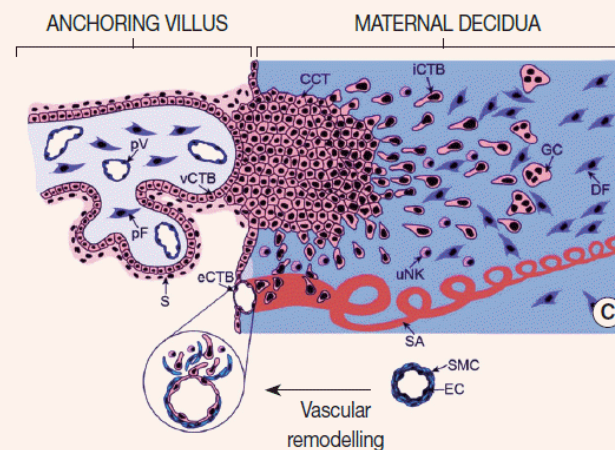
↑ Endothelial cell migration

↑ Endothelial cell adhesion

### Galectin-13

↑ Vasodilatation

↑ Utero-placental perfusion



## Trophoblast invasion

### Galectin-1

↑ Trophoblast invasiveness

↑ Organization of ECM

↑ Cell adhesion in the cell columns

↑ Production of MMPs

### Galectin-3

↑ Organization of ECM

↑ Cell adhesion in the cell columns

### Galectin-8

↑ Organization of ECM

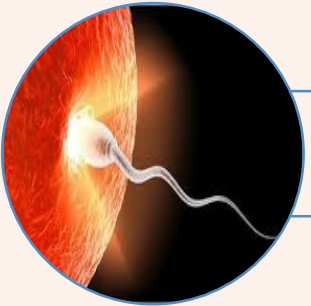
↑ Cell adhesion in the cell columns

### Galectin-13

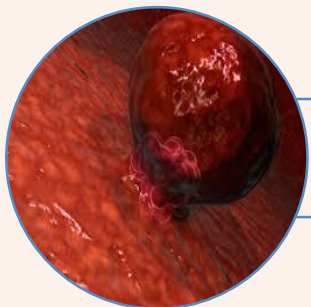
↑ Trophoblast invasion



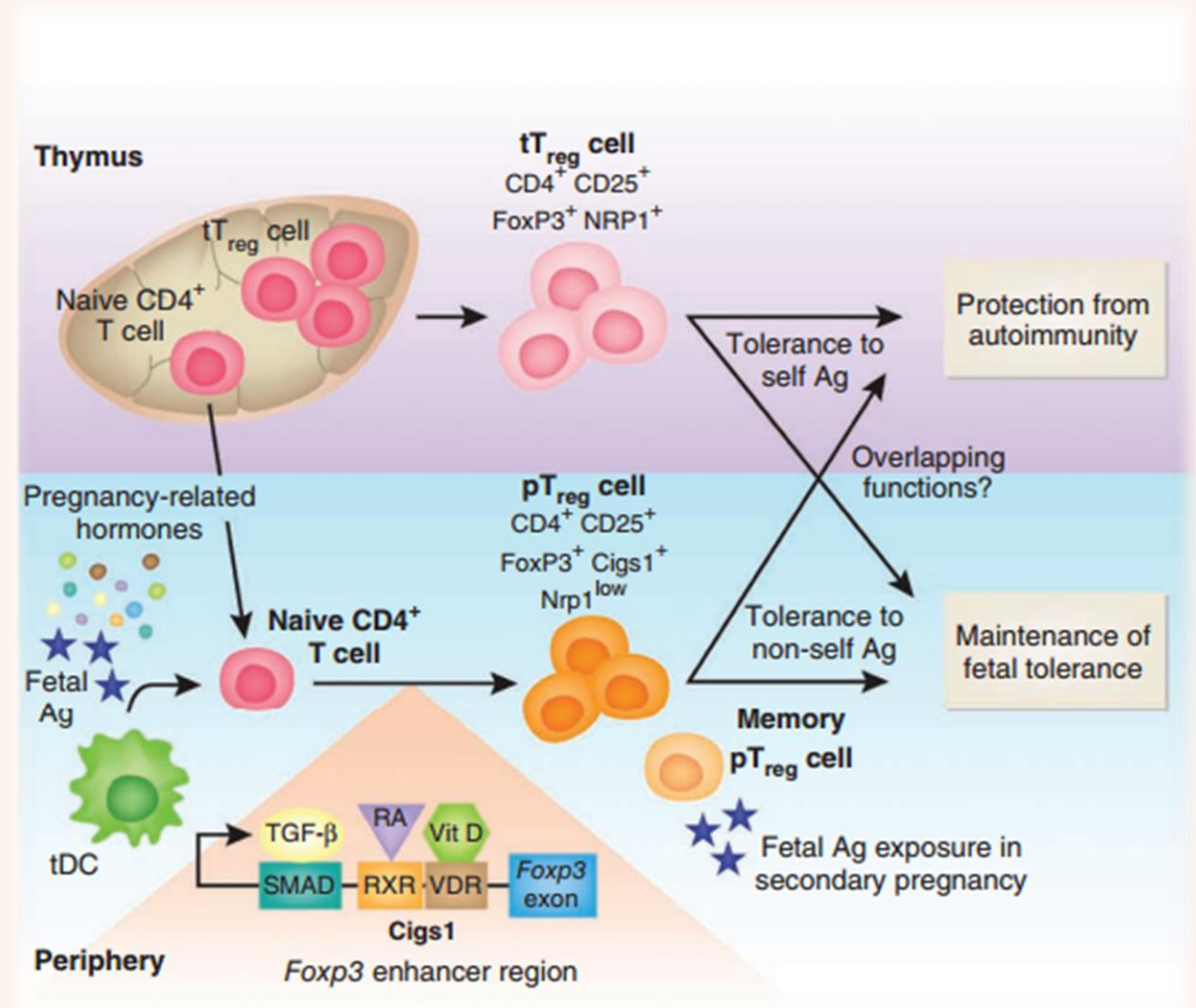
Ovuláció



Megtermékenyítés



Beágyazódás



Arck, P. C. and K. Hecher (2013). "Fetomaternal immune cross-talk and its consequences for maternal and offspring's health." *Nat Med* 99(5): 548-556.



4. Terhességi hét

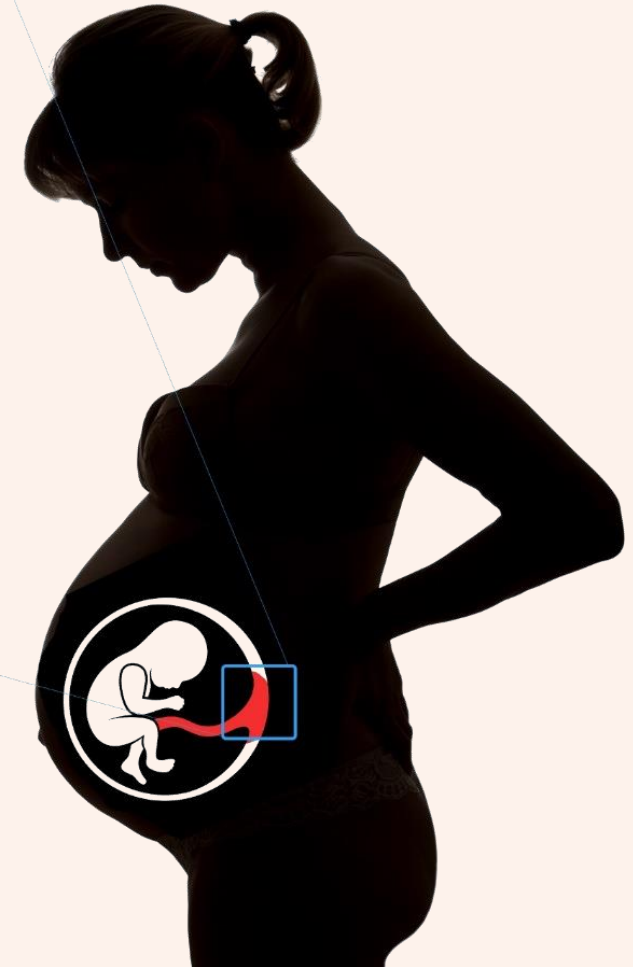
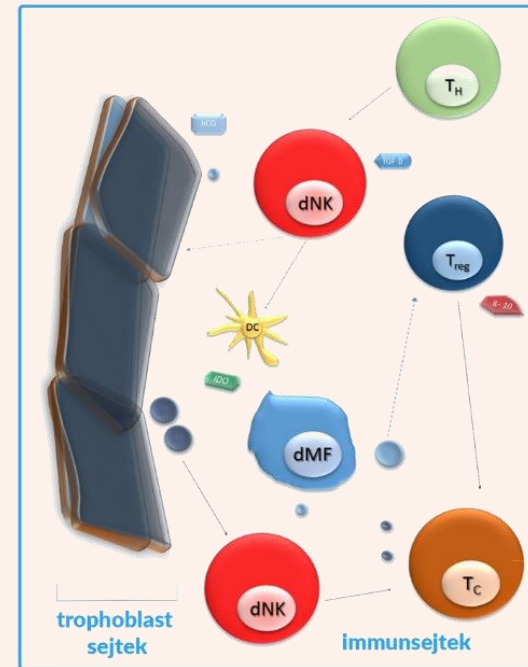


6. Terhességi hét



8. Terhességi hét

### Az anyai immunsejtek és magzati trophoblast sejtek kommunikációja





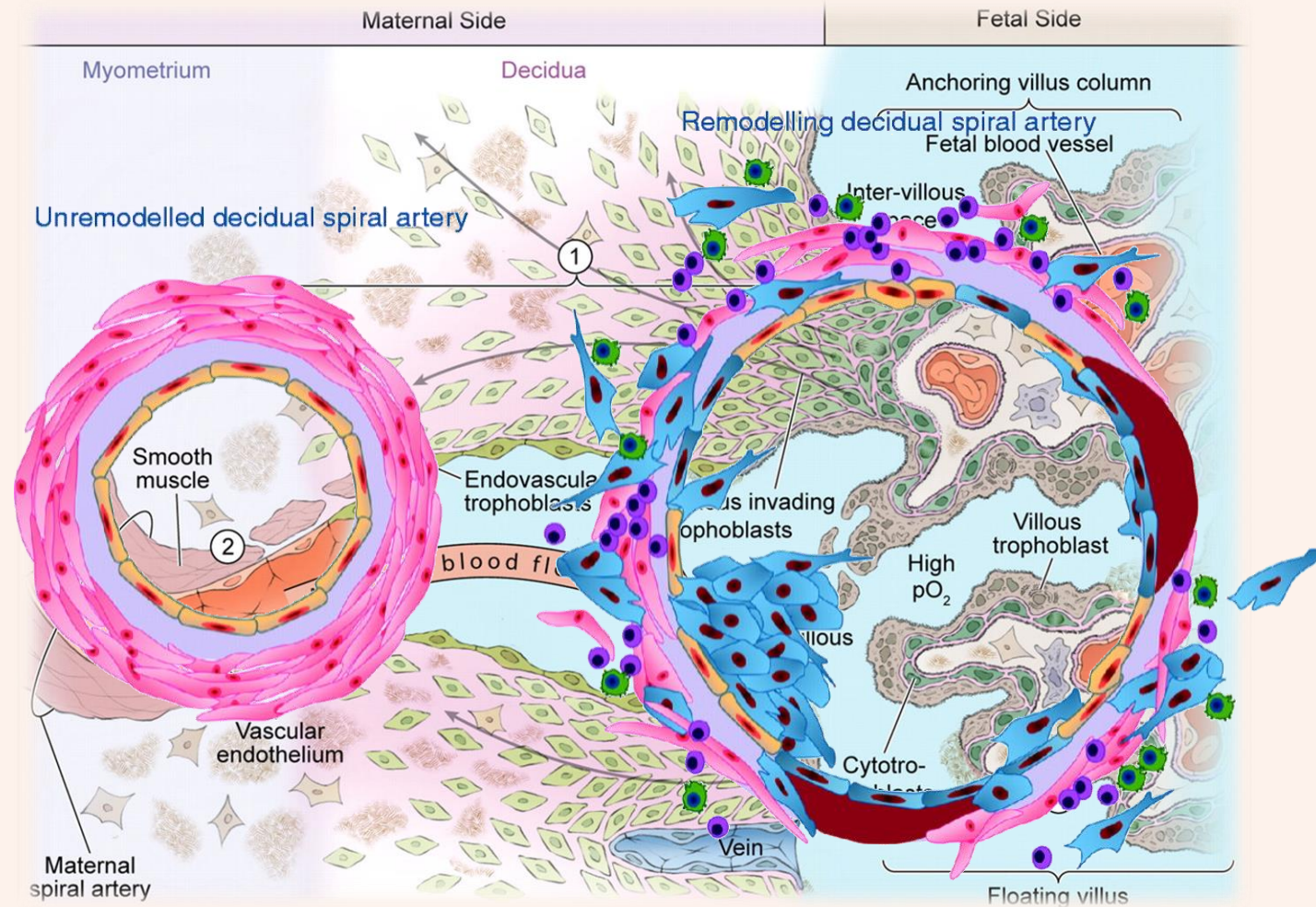
13. Terhességi hét



16. Terhességi hét



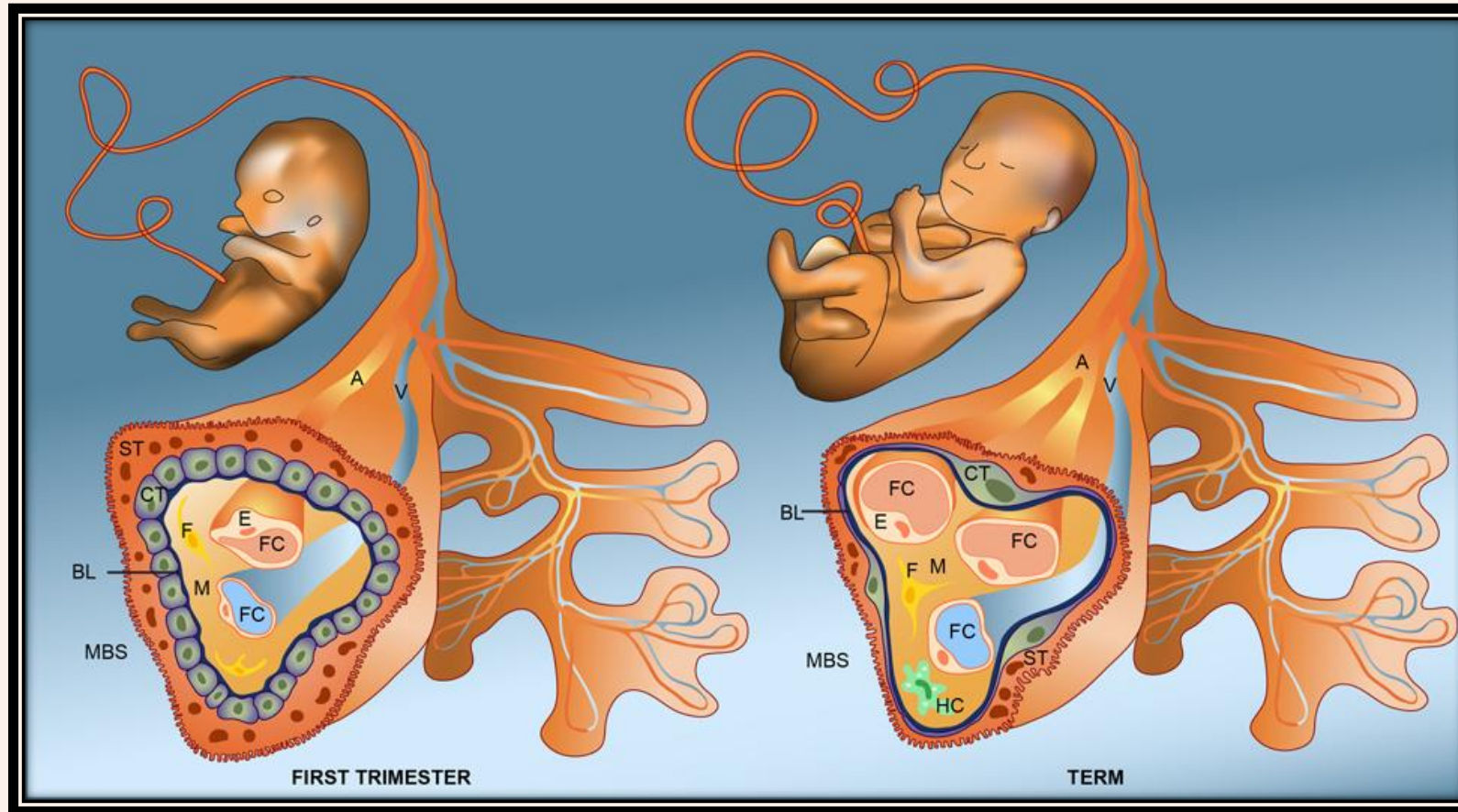
20. Terhességi hét



Judith E. Parkington, Sascha R. Dredel. *Remodelling the placental interface in the higher primate pregnancy*. *Placenta* 2016; 47: 803-813



# 40. Terhességi hét

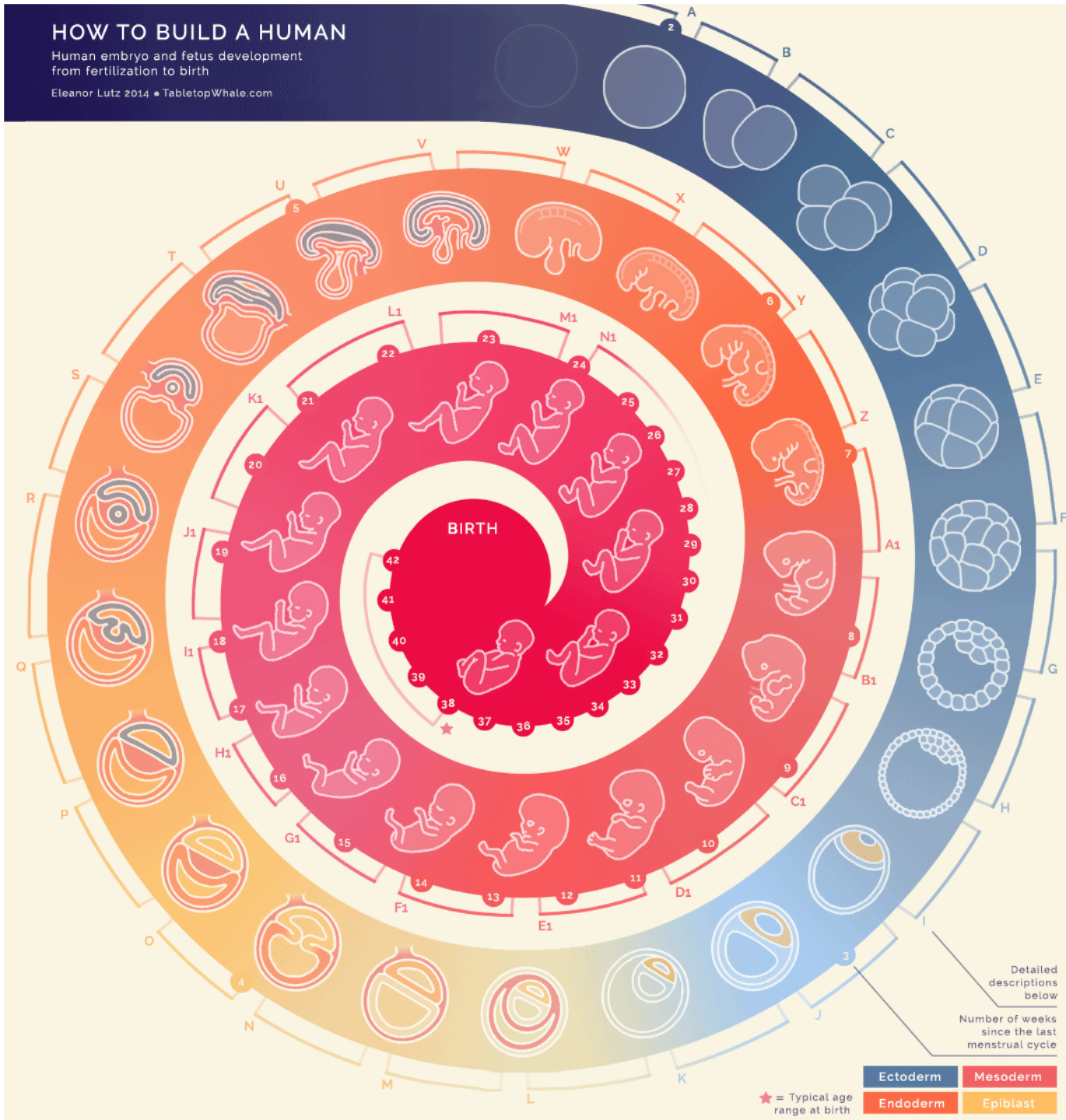


Buerki-Thurnherr: Knocking at the door of the unborn child: engineered nanoparticles at the human placental barrier, Swiss Med Wkly. 2012;142:w13559

# HOW TO BUILD A HUMAN

Human embryo and fetus development  
from fertilization to birth

Eleanor Lutz 2014 • TabletopWhale.com



# Köszönöm szépen a figyelmet!