

Endothelial Implantation or Replication.... Which is the future ????

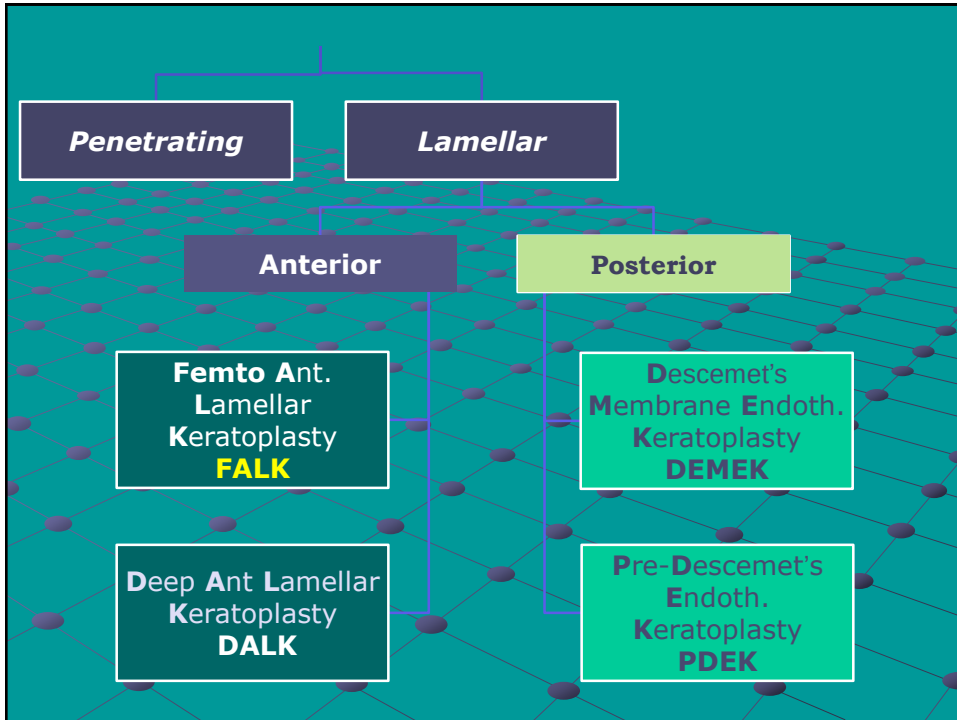
Professor
Mahmoud M. Ismail
Al-Azhar University

More than 120 years ago



- **Von Hippel A.** Eine Neue methode der Hornhaut transplantation. Graefes Arch Ophthal 1888; 34:108-30
- **Zirm E.** Eine erfolgreiche **totale** keratoplastik. Archiv Ophthalmol 1906; 64:580-93

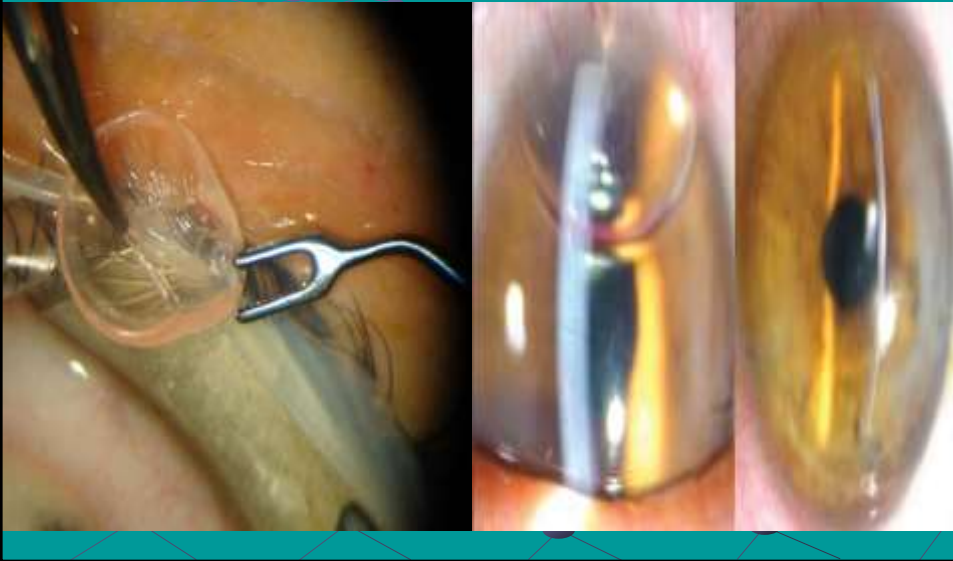
Fotografia del Dr. Hermann Goltz, medico, el qual per la seva feina de la cirurgia ocular, rebé el premi de la Facultat de Medicina de París el 1907.



1ry Graft failure



ESCRS Milan 2012 we presented:
One Donor = **DALK** + Tectonic + **DMEK**



DEMEK / PDEK

- *You still need a corneal graft ..!!!*
- *Training & Surgery time*
- *Not free of complications*



In Vitro “Expansion”

Complete **Failure** but we learned :

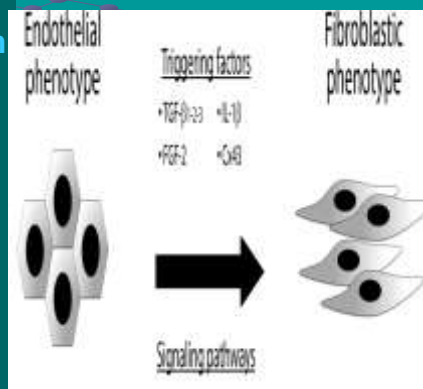
- Peripheral cells +++++
- Expansion can occur In **NON**-inflammatory
- Arrested in **G 1** Mitotic cycle
- Easy Apoptosis



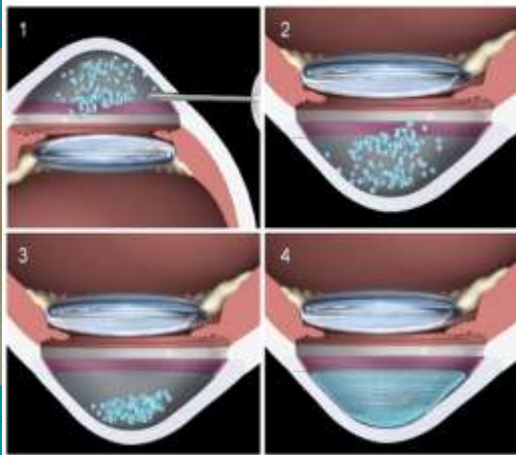
Endothelium is non-regenerative

Endothelial - Mesenchymal Transition = loss of function

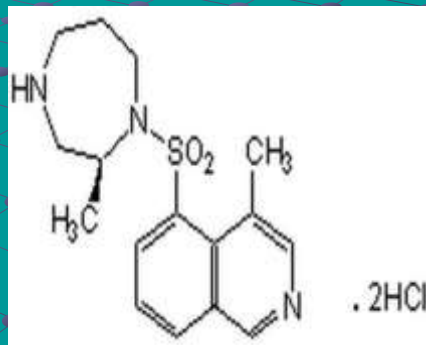
- Change in cell Shape & Mono layer
- Hyper- motility loss of cell junction
- = **Fibroblastic phenotype**



Cultured Endothelial Injection



RHO (Rock) Inhibitor



Can be this the new Frontier ??

Cornea

The ROCK Inhibitor Eye Drop Accelerates Corneal Endothelium Wound Healing

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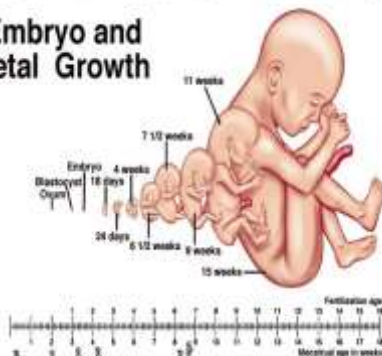
³Research Center for Animal Life Science, Shiga University of Medical Science, Otsu, Japan

Senju
Pharmaceutical



Amniotic membrane ... !!!

Embryo and Fetal Growth



الْفِرْدَوْسَ هُمْ فِيهَا خَالِدُونَ ﴿١١﴾ وَلَقَدْ خَلَقْنَا الْإِنْسَانَ مِنْ
سُلَالَةٍ مِنْ طِينٍ ﴿١٢﴾ ثُمَّ جَعَلْنَاهُ نُطْفَةً فِي قَرَارٍ مَكِينٍ ﴿١٣﴾ ثُمَّ
خَلَقْنَا النُّطْفَةَ عَلَقَةً فَخَلَقْنَا الْعَلَقَةَ مُضْغَةً فَخَلَقْنَا
الْمُضْغَةَ عِظَامًا فَكَسَوْنَا الْعِظَامَ لَحْمًا ثُمَّ أَنْشَأْنَاهُ خَلْقًا
آخَرَ فَتَبَارَكَ اللَّهُ أَحْسَنُ الْخَالِقِينَ ﴿١٤﴾ ثُمَّ لَنُكْرِ بِعَدْدِكَ

Growth Factors, mRNA

- Epidermal growth factor (EGF)
- Transforming growth factor- α (TGF- α)
- Keratinocyte growth factor (KGF)
- Hepatocyte growth factor (HGF)
- Basic fibroblast growth factor (bFGF)
- Transforming growth factors (TGF)- β ¹
- Transforming growth factors (TGF)- β ²
- Transforming growth factors (TGF)- β ³

Amniotic Membrane Eyedrops ... !!!

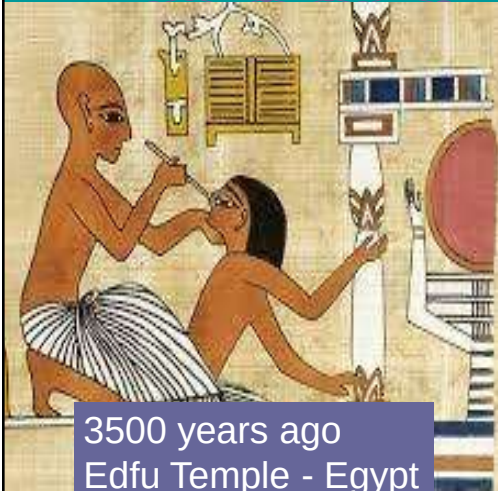
Advantages

- Easy access
- Cheap
- High Compliance

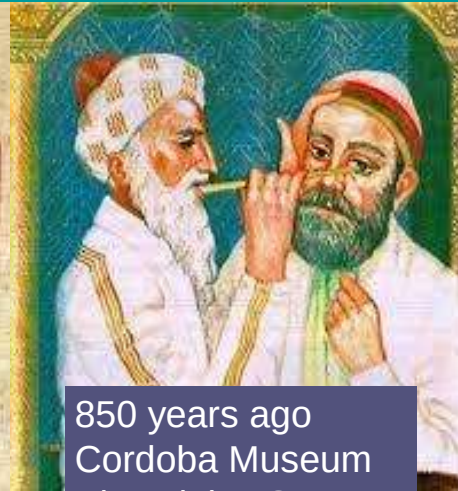
Disadvantages

- Freshly prepared
- Stored +6 degrees
- Free of Hepatitis & AIDs

To be continued ... !!!



3500 years ago
Edfu Temple - Egypt



850 years ago
Cordoba Museum
Al-Andalus SPAIN



THANK YOU

