



SOCIETAT
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TRASPLANTAMENT

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CONGRESO
BARCELONA

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Human adult adipose derived mesenchymal stem cells (ADS): Immunomodulatory properties in cell therapy approaches for the ocular surface

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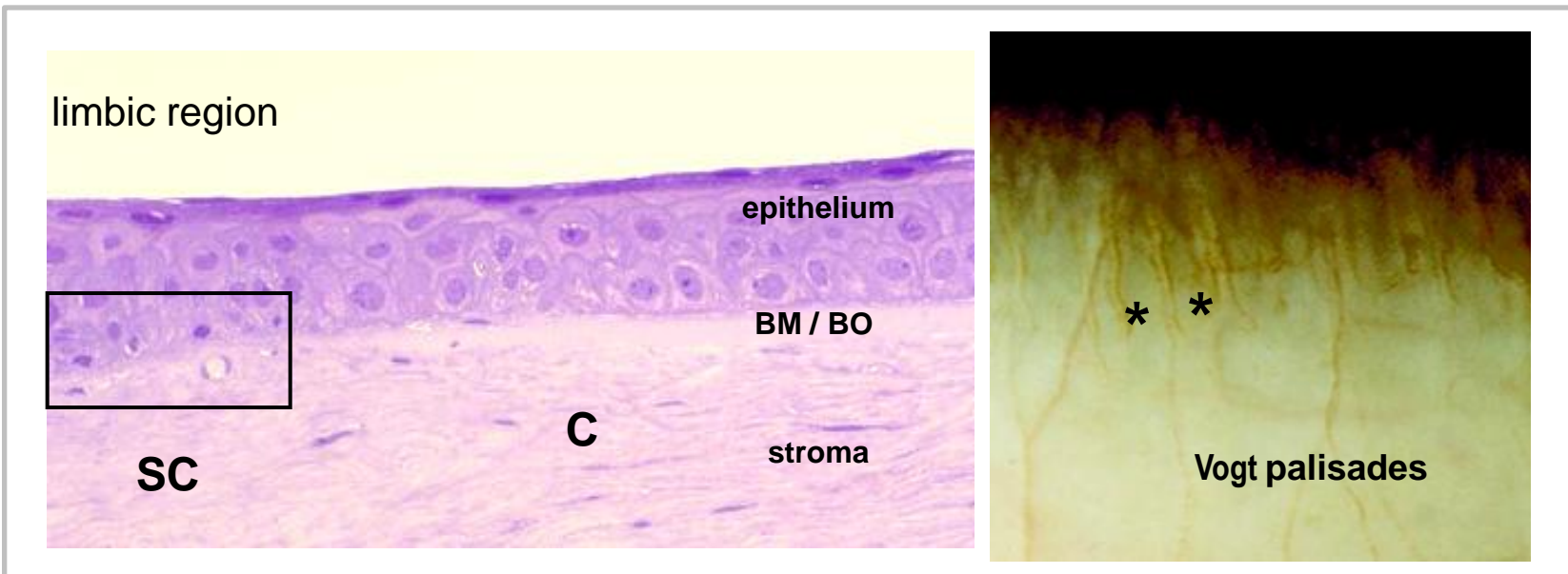


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- sclerocorneal limbus
- limbus
- limbic region



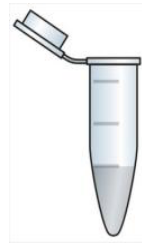
- limbic deficiency
- perilimbal ischemia (alkali burns)
- loss perilimbal cells



- “conjunctivalization”
- new vessels formation
- inflammation
- loss of transparency



Techniques for LSCs *ex vivo* expansion



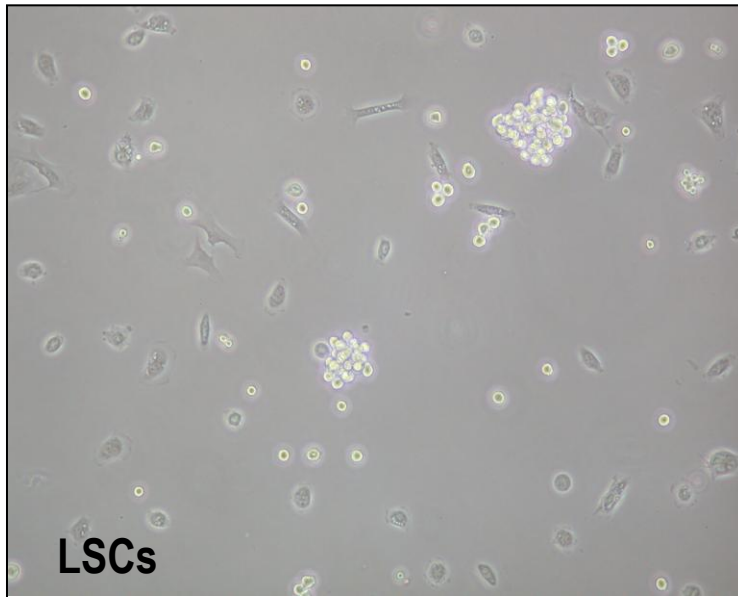
disperse



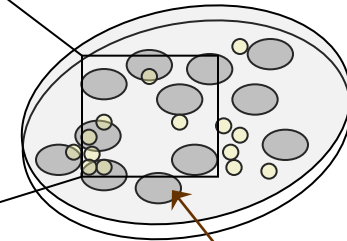
trypsin



cellular suspension

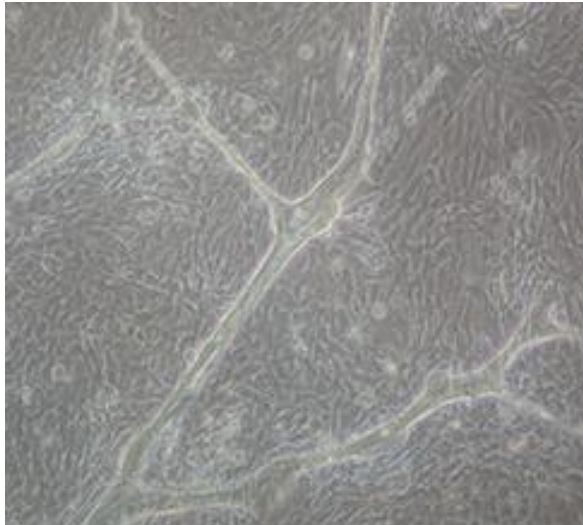
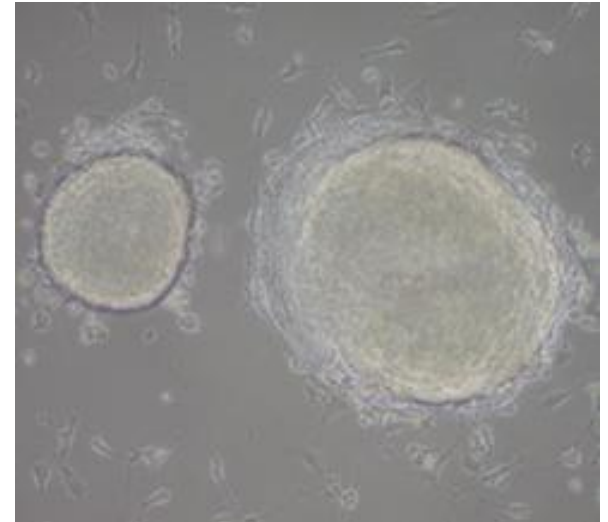
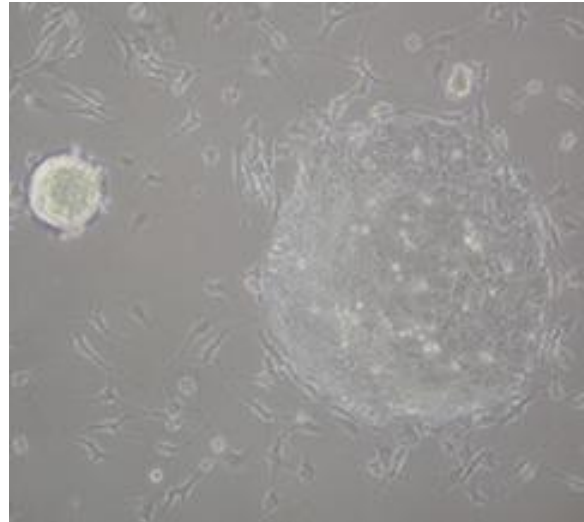
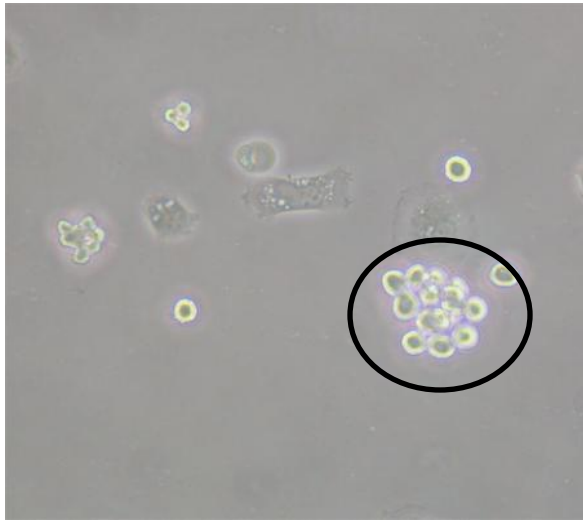


LSCs



feeder layer with 3T3 cells irradiated or mmC inactivated

Techniques for LSCs *ex vivo* expansion



- Embryoid-like bodies
- Clonal capability
- Progenitor characteristic cells

EL TRATAMIENTO

- 1** Se extrae una pequeña porción (1x2 mm) de tejido del limbo del ojo sano...

← **Tamaño real del tejido extraído**

OJO SANO

- 2** Mediante enzimas se separan las células madre contenidas en el fragmento

- 3** Las células madre obtenidas son cultivadas...

... junto a células inactivadas

Ambas células crecen juntas (cocultivo)

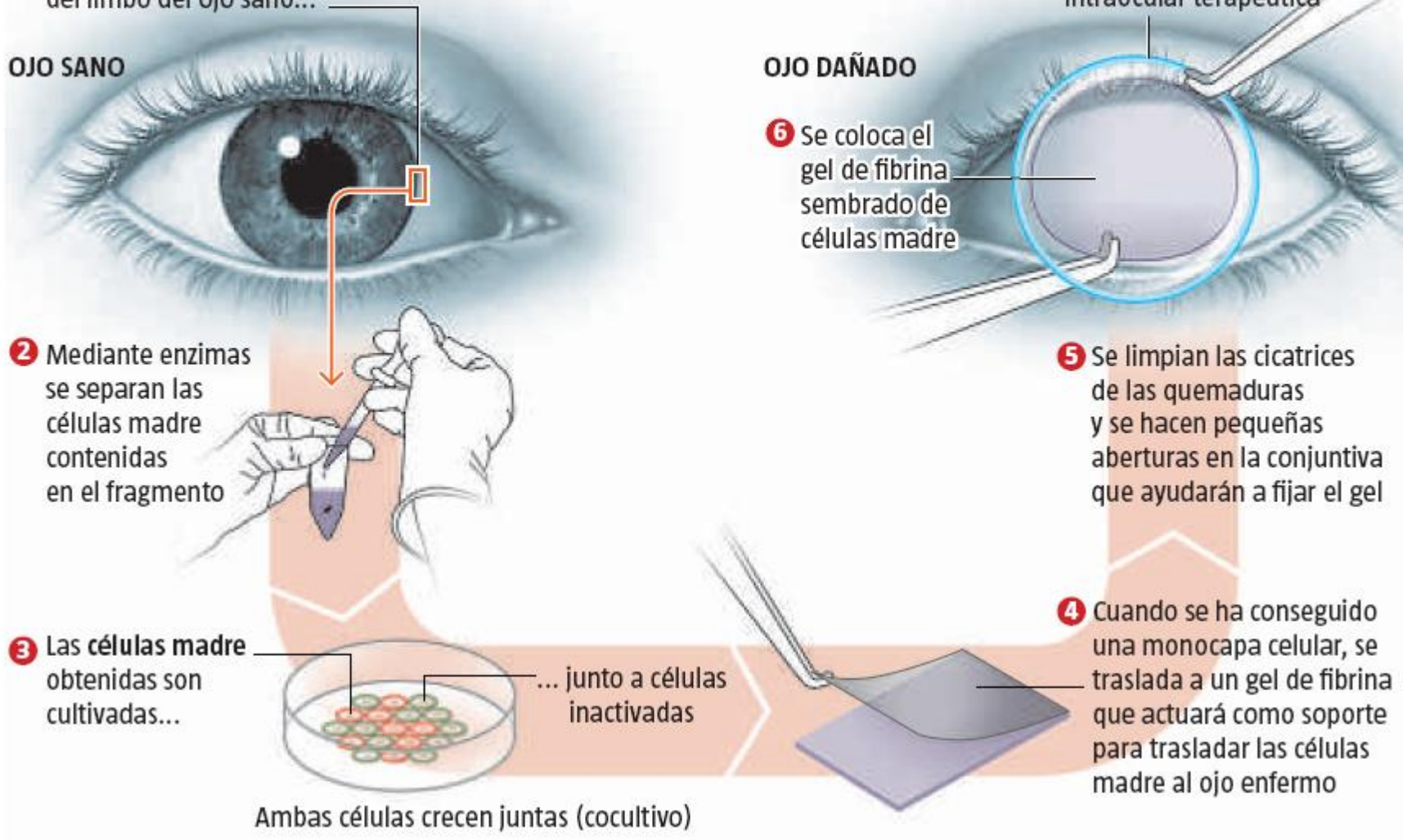
OJO DAÑADO

- 6** Se coloca el gel de fibrina sembrado de células madre

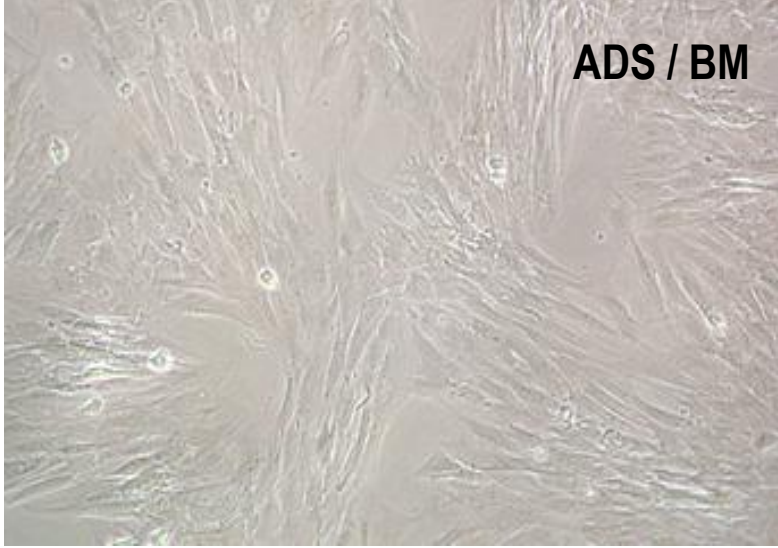
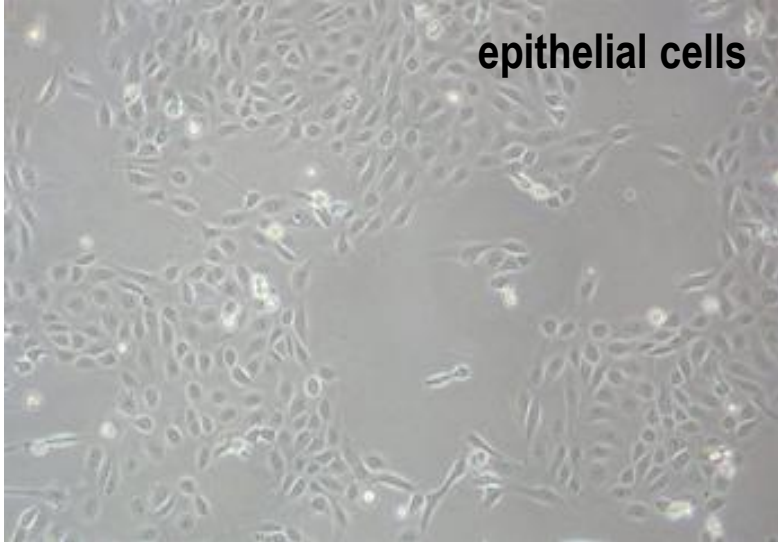
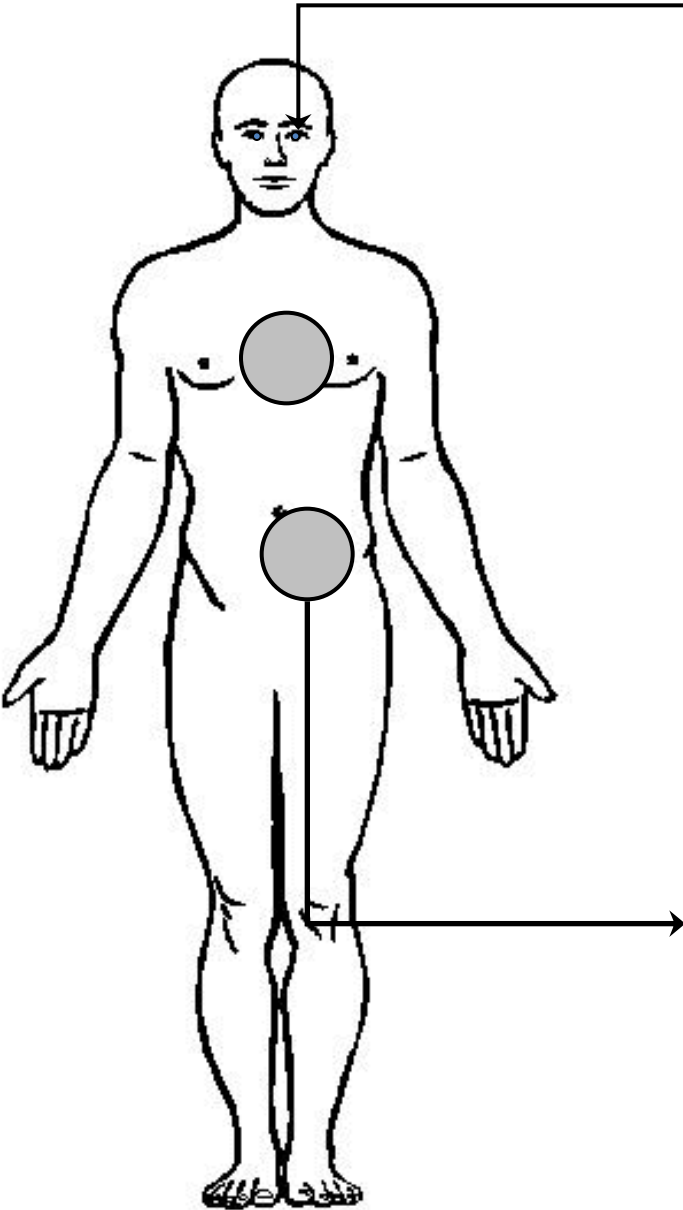
- 7** Sobre el implante de gel se coloca una lente intraocular terapéutica

- 5** Se limpian las cicatrices de las quemaduras y se hacen pequeñas aberturas en la conjuntiva que ayudarán a fijar el gel

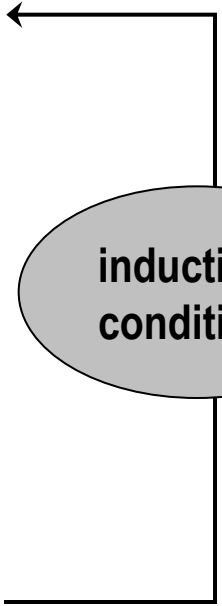
- 4** Cuando se ha conseguido una monocapa celular, se traslada a un gel de fibrina que actuará como soporte para trasladar las células madre al ojo enfermo



Ex vivo cell therapy: Adult stem cells



induction conditions



To study the anti-angiogenic and anti-inflammatory properties of human adult adipose derived mesenchymal stem cells (ADS) in an *in vivo* model of limbal stem cell deficiency

- Pool of human ADS (ISCT criteria characteristics)
- *In vitro* epithelial induction (specific cell culture treatment)
- Human amniotic membrane: carrier
- *In vivo* model of LSC deficiency: N-heptanol + limbectomy
- Cell therapy approach: 30 days
- mRNA expression by qRT-PCR:
 - Angiogenic markers: VEGF, MMP2
 - Pro-inflammatory markers: MCP-1, IL6
 - Anti-inflammatory markers: IL10, TGF- β

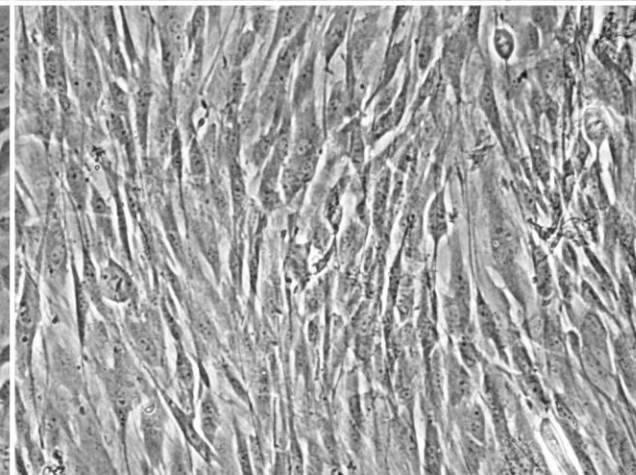
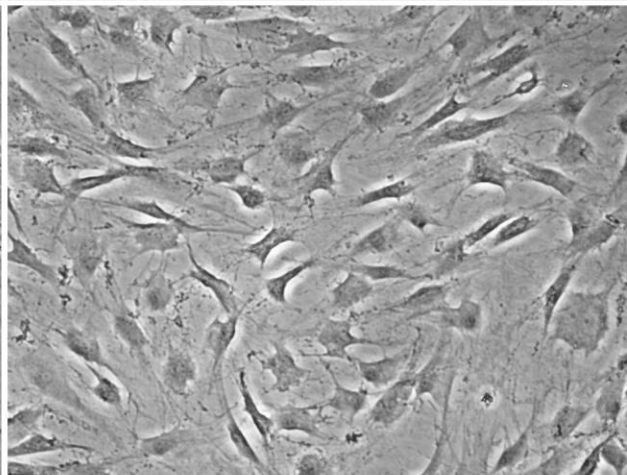
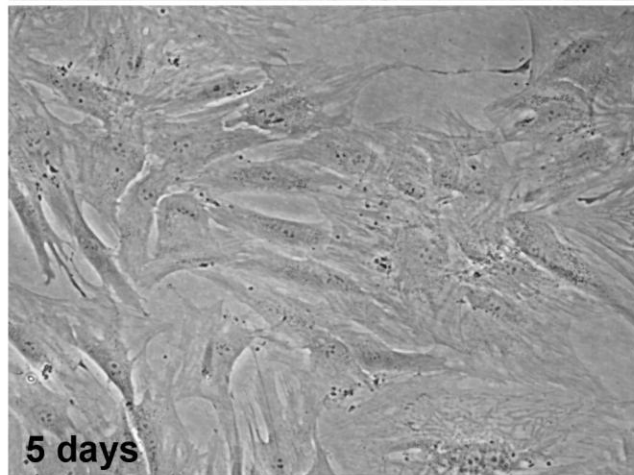
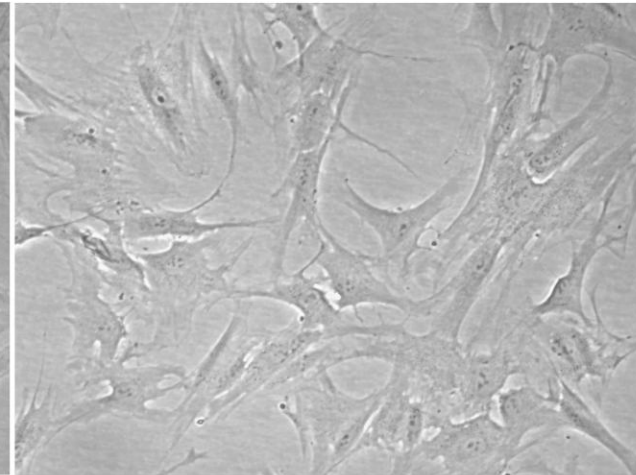
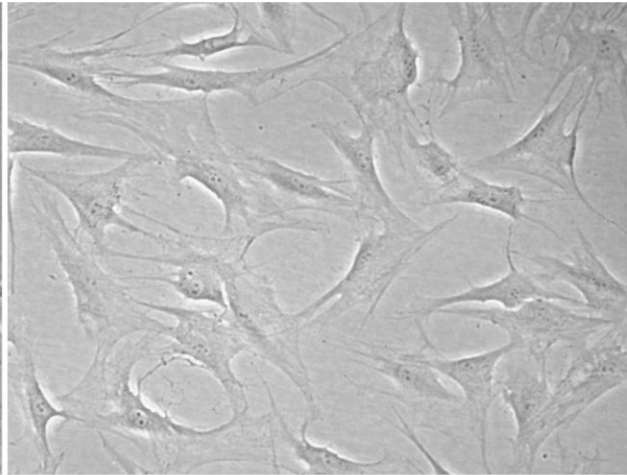
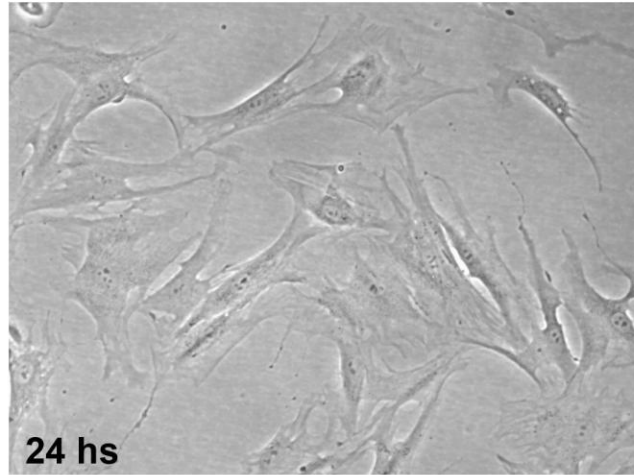


Adipose Derived Stem Cells (ADS)

ADS

CnT30

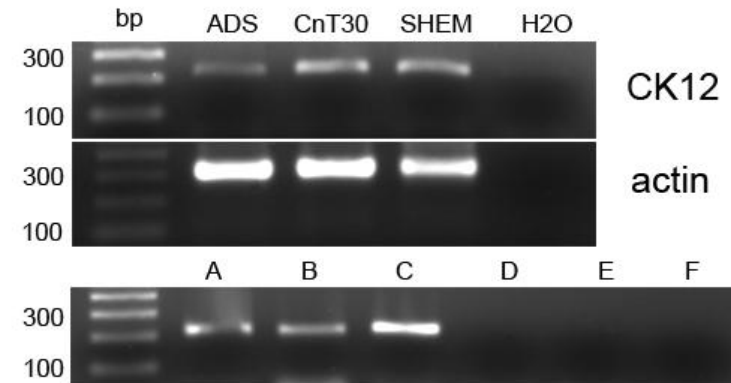
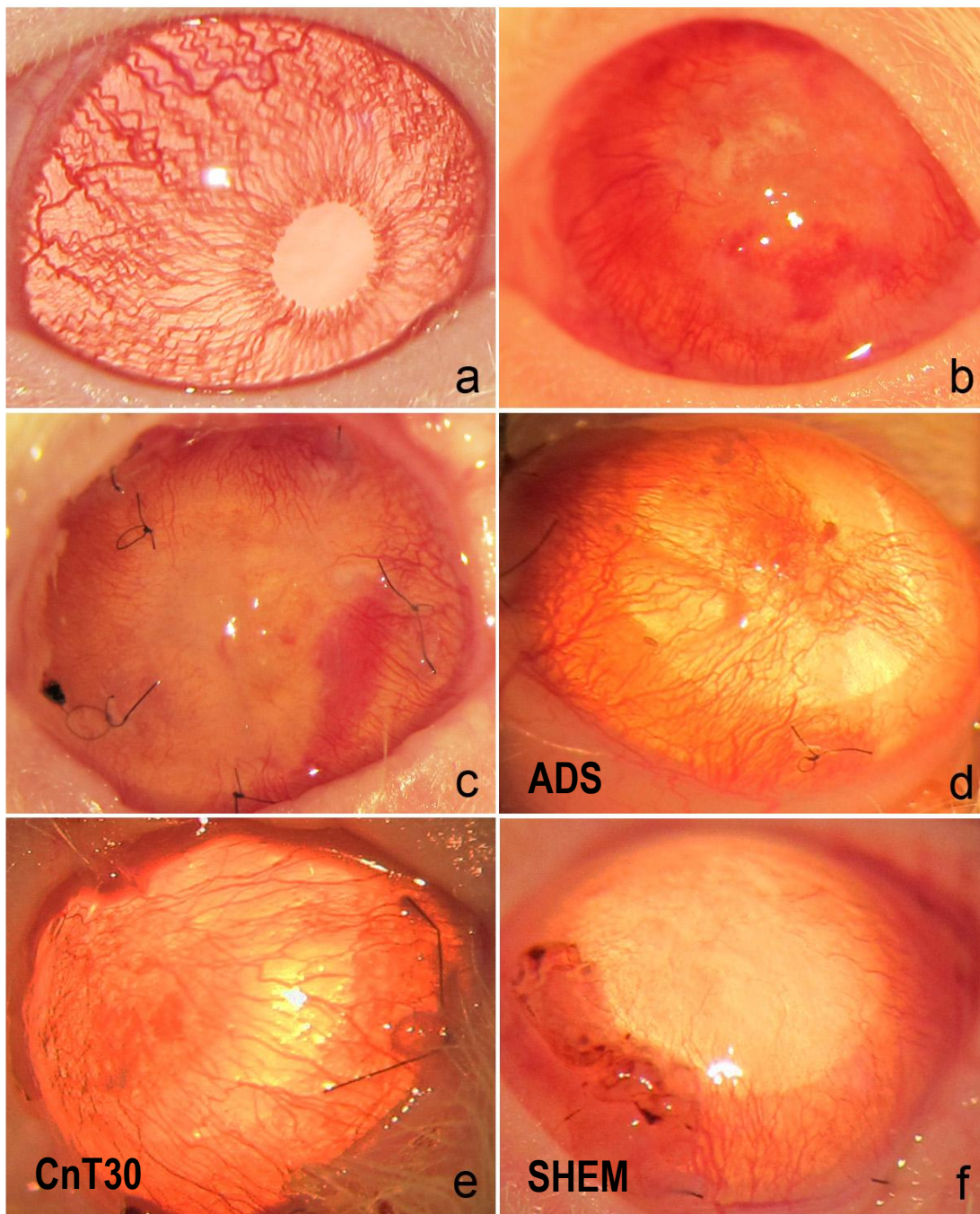
SHEM



24 hs

5 days

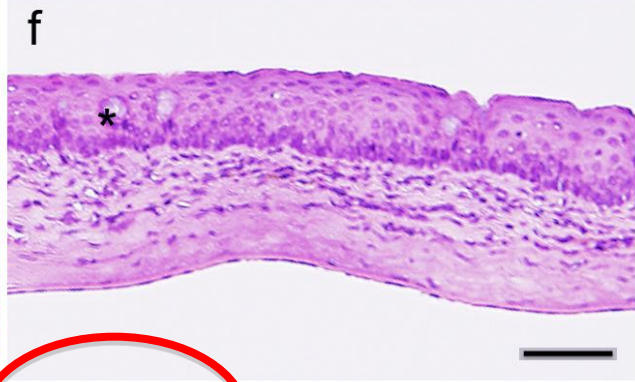
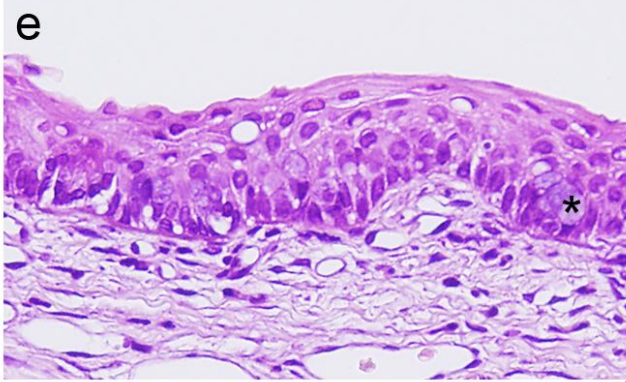
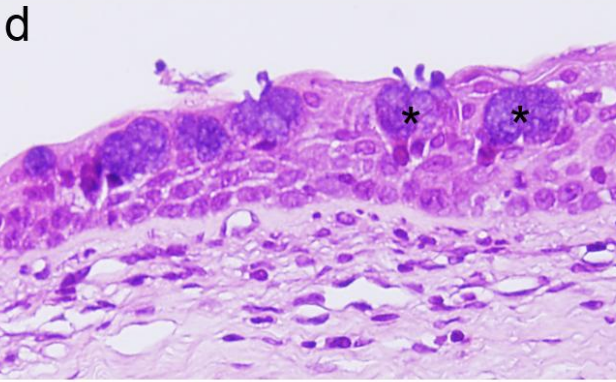
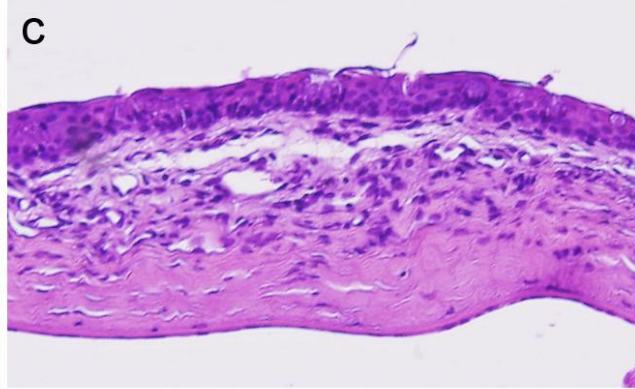
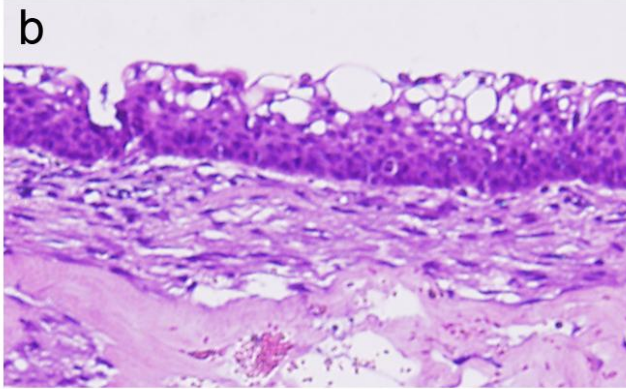
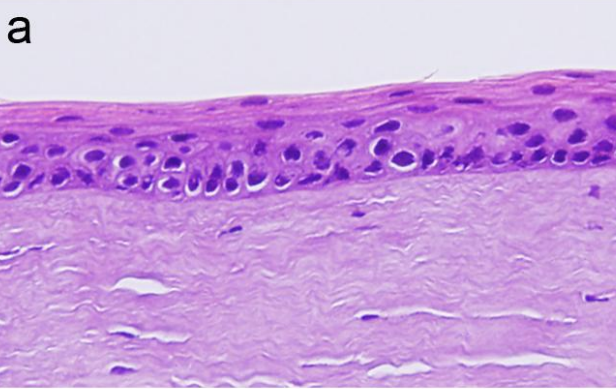
In vivo model for LSCD



KRT12	7	TACCTTATATCCCTCTGGACCTGGAGTAGTCTTTTAACGAACITTCCTCTGGTAACCCGG	66
mRNA CK12	4291843	TACCTTATATCCCTCTGGACCTGGAGTAGTCTTTTAACGAACITTCCTCTGGTAACCCGG	4291784
KRT12	67	AATATTTTTTAATCATAGAGCTTTAATCAAGTAGTATTGTTTTAATAGAGTTAATTGTAA	126
mRNA CK12	4291783	AATATTTTTTAATCATAGAGCTTTAATCAAGTAGTATTGTTTTAATAGAGTTAATTGTAA	4291724
KRT12	127	TAAAAGATGAATGGTAATAATGTGAAATGTATGCCTTGATTCCAACAAGAATGTCAAGAG	186
mRNA CK12	4291723	TAAAAGATGAATGGTAATAATGTGAAATGTATGCCTTGATTCCAACAAGAATGTCAAGAG	4291664
KRT12	187	CATAGAGAGAAGT	199
mRNA CK12	4291663	CATAGAGAGAAGT	4291651

Wistar Rat model for LSCD

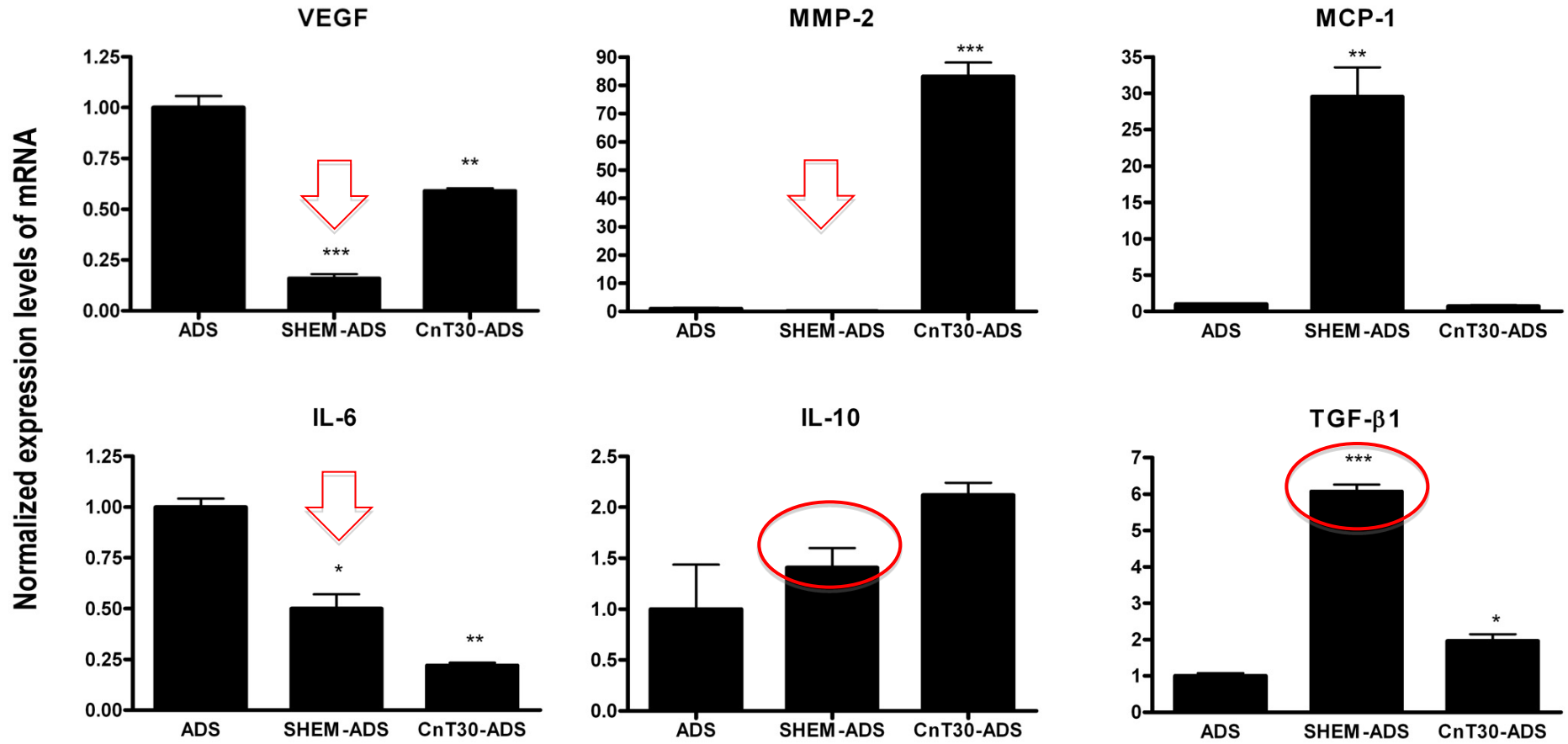
Control



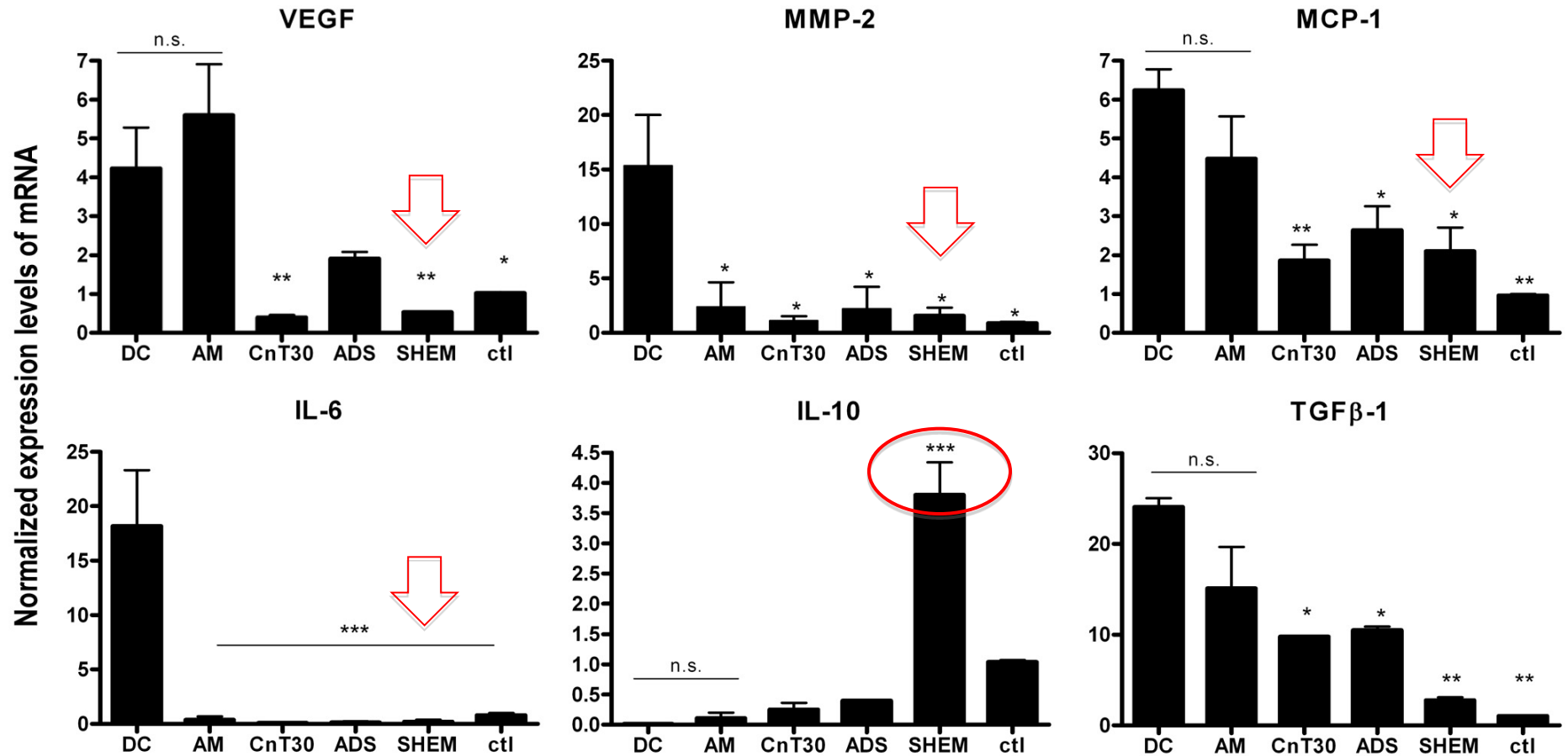
ADS

CnT30

SHER



mRNA expression (qRT-PCR): in vivo model



- ADS cells could be a valid option for cell therapy of the ocular surface.
- ADS cells have anti-angiogenic and anti-inflammatory *in vitro* proprieties.
- ADS cells have anti-angiogenic and anti-inflammatory *in vivo* proprieties.
- Anti-angiogenic and anti-inflammatory proprieties could be modulate *in vitro* by specific treatment of cell culture.