

La manipolazione dell'endotelio corneale

Vito Romano



UNIVERSITY
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Donor tissue

Whole endothelium:

~110 mm² (≈ 11 mm \emptyset)

DMEK graft zone: **~50 mm²**

(≈ 8 mm \emptyset)

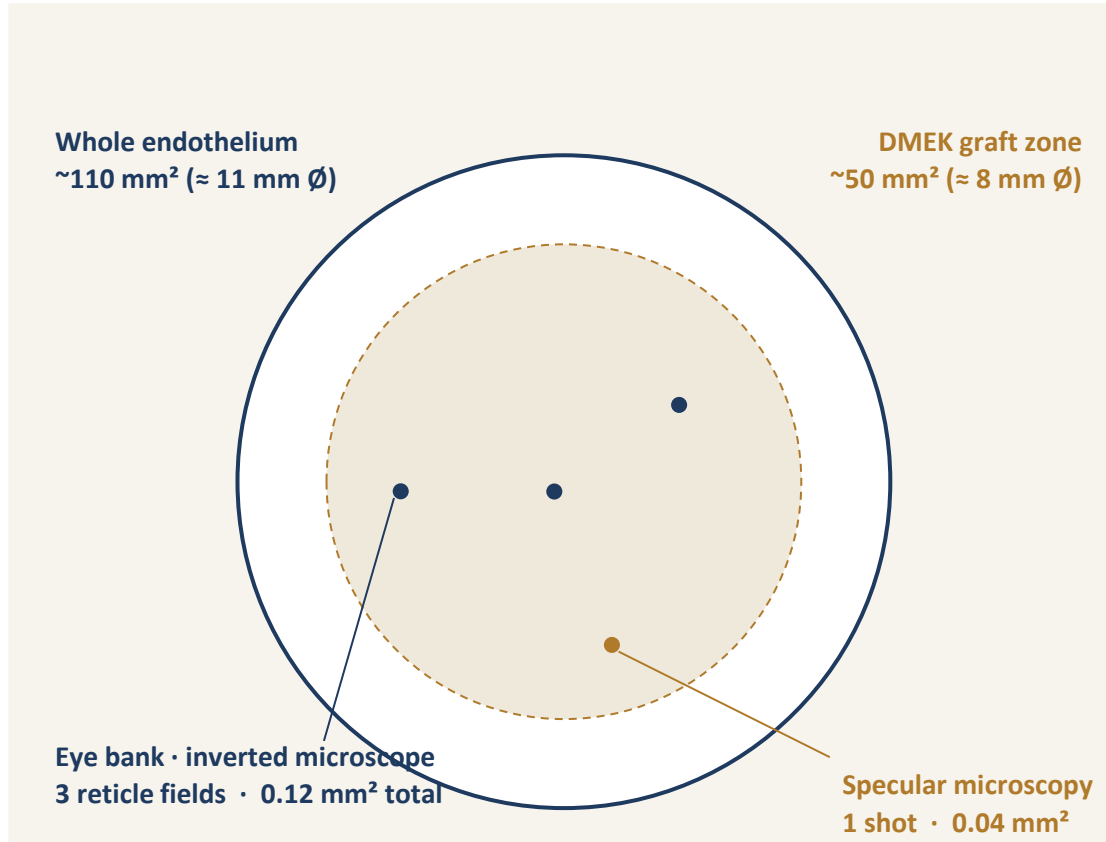
Eye bank inverted
microscope

3 reticle fields: **0.12 mm²**
total

Specular microscopy

1 shot: **0.04 mm²**

HOW MUCH ENDOTHELIUM WE COUNT?



Specular **0.036 %**

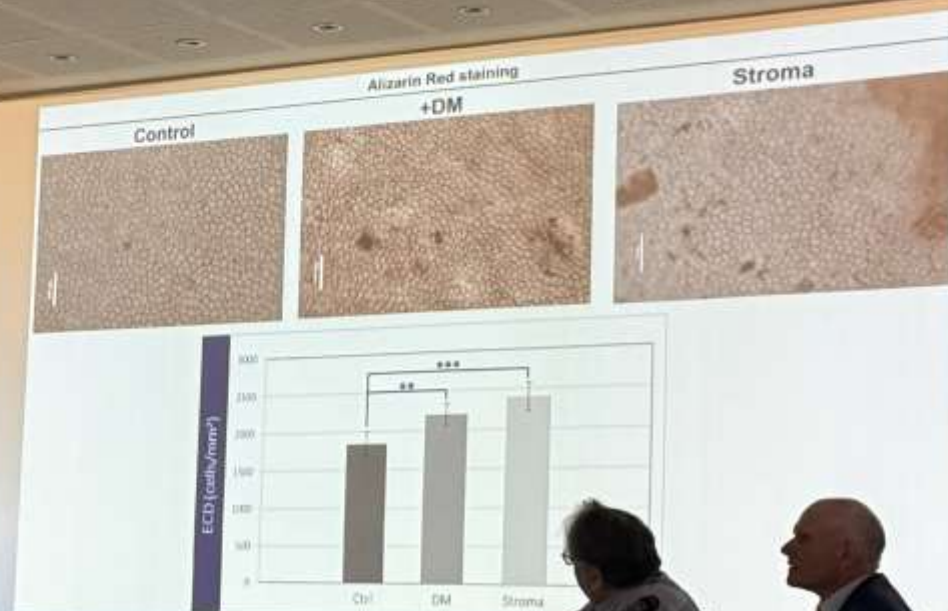
Eye bank (3 fields) **0.11 %**

of ~110 mm² of
endothelium

5-6 GIUGNO
2026



M I L A N O



L. CAPASSO

R. CECCUZZI

G. GENITTI

P. SANTORO

XVIII CORSO NAZIONALE



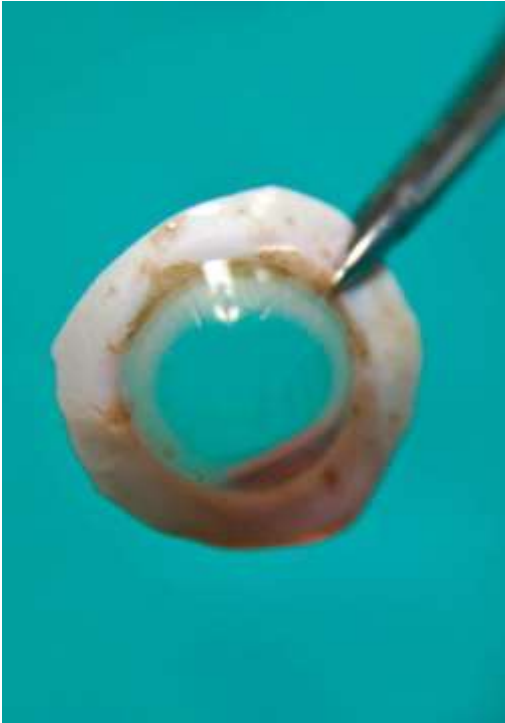
+ Task operator dependent

CARATTERISTICHE DEL TESSUTO

Diametro utile (mm)	> 9	Trasparenza	buona
Spessore	60	Epitelio	presente
Densità Endoteliale (cell/mm)	2700	Pieghe periferiche	assenti
Pieghe Centrali	lievi	Mortalità su Pieghe	<2%
Mortalità Diffusa	0%	Margini	irregolari
Mosaico	lieve polimorfismo	Pieghe scoperte	assenti
Guttae	assenti		
Note	CAP IN SEDE		
Punteggio	79	Qualifica	DSAEK
Modalità di conservazione	temperatura ambiente		
Liq. di Conserv.	Carry-c	Lotto	P23020005



you want to know **endothelial cell viability** of your graft



V-CHECK

Viability -

Control of **H**uman **E**ndothelial **C**ells before **K**eratoplasty

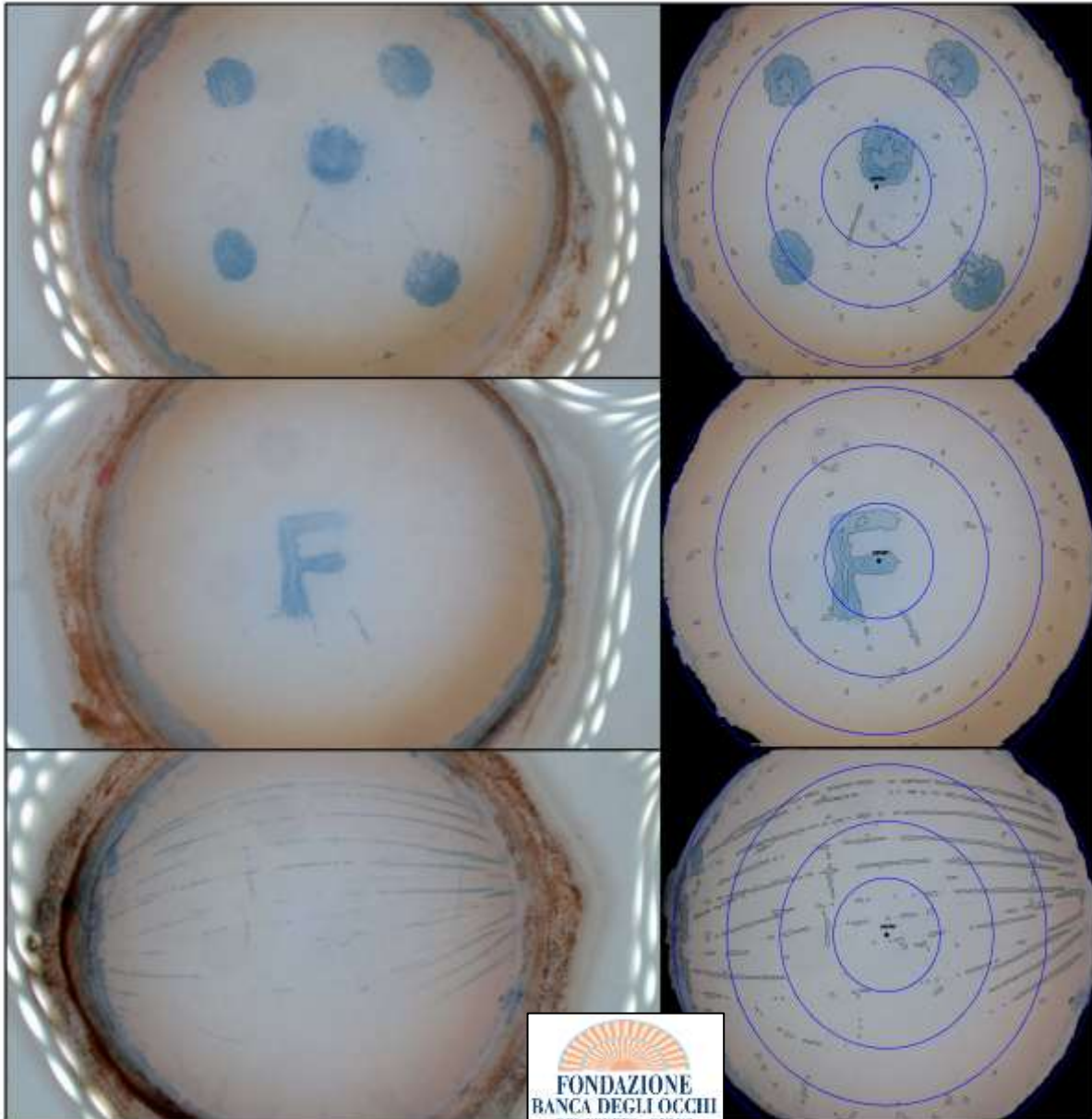


Beyond ECD — a global viability map

47



Preoperative tissue evaluation **V-CHECK**

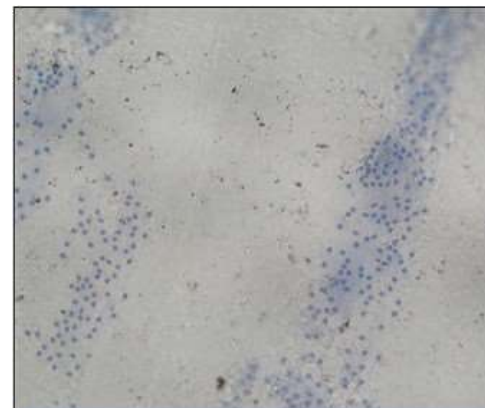


tvst

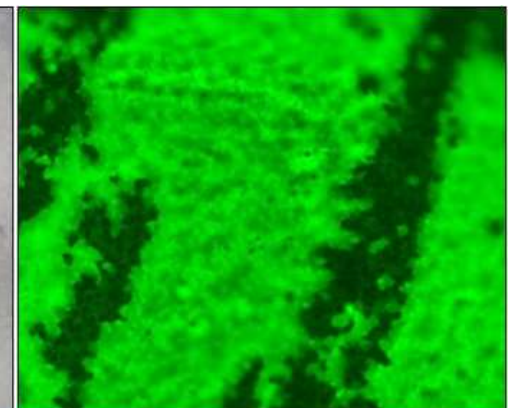
Cornea & External Disease

Validation of a Deep Learning-Assisted Evaluation of Total Corneal Endothelial Cells Viability

Matteo Airaldi¹⁻³, Filippo Airaldi⁴, Zhuangzhi Gao³, Alessandro Ruzza⁵, Mohit Parekh⁶, Diego Ponzin⁵, Stephen Kaye^{2,3}, Francesco Semeraro^{7,8}, Stefano Ferrari⁵, Yalin Zheng³, and Vito Romano^{3,7,8}

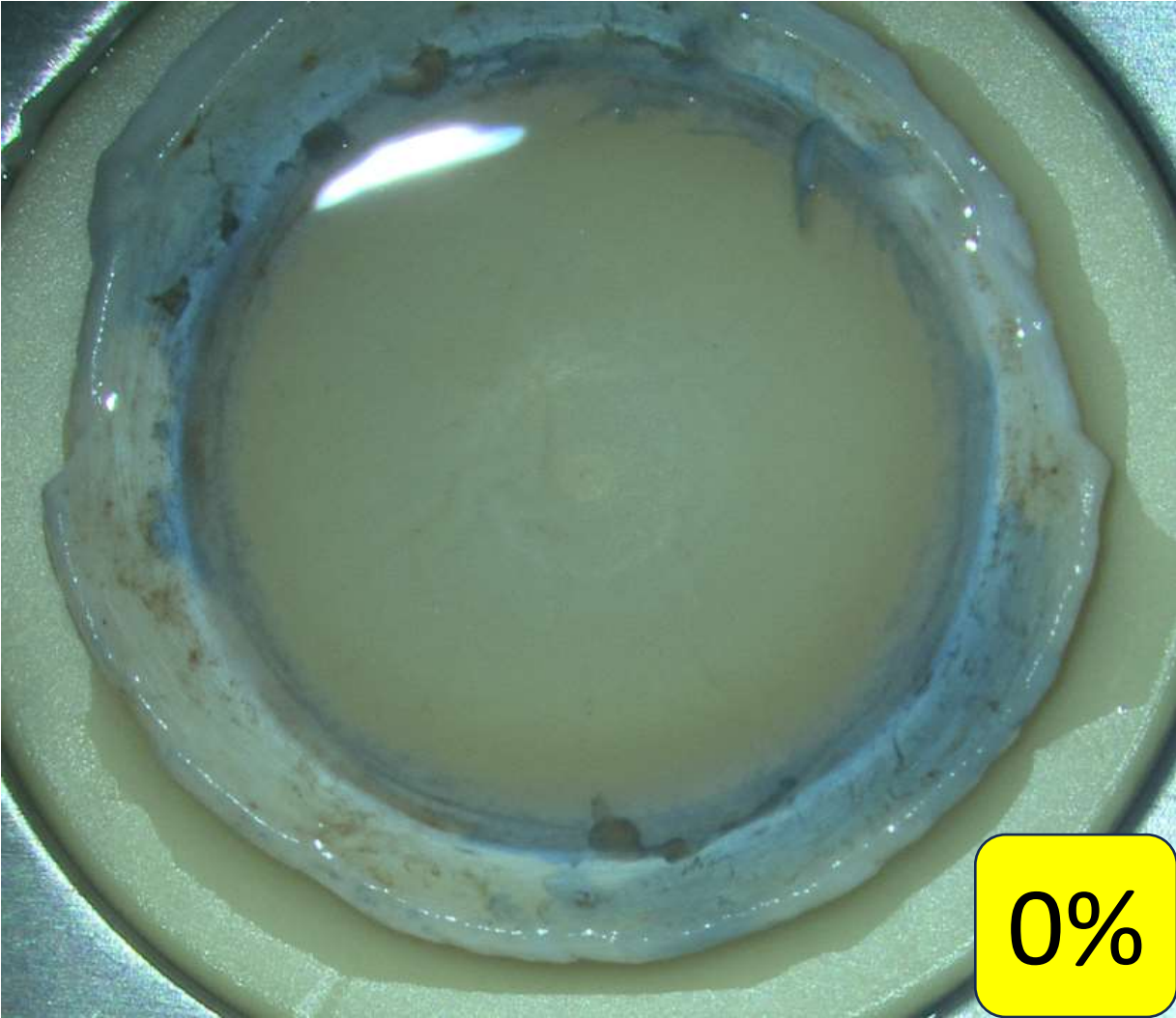


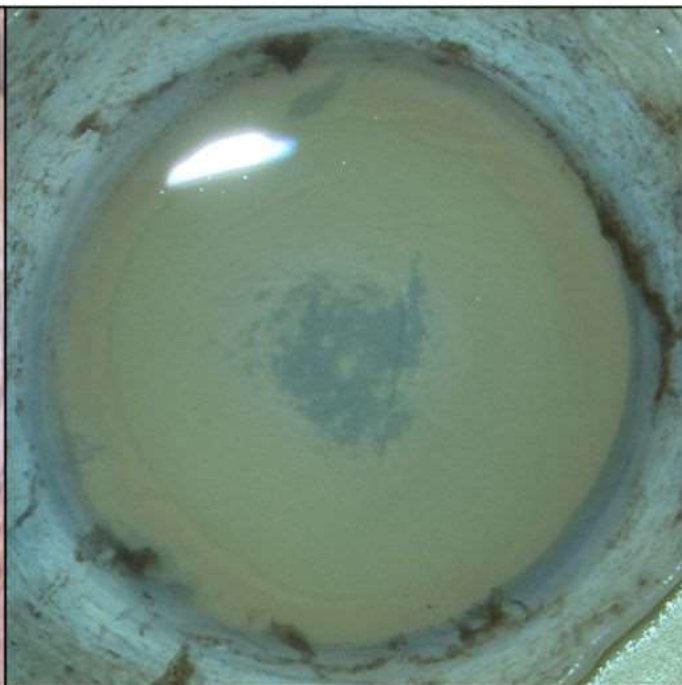
TRYPAN BLUE 0.05%

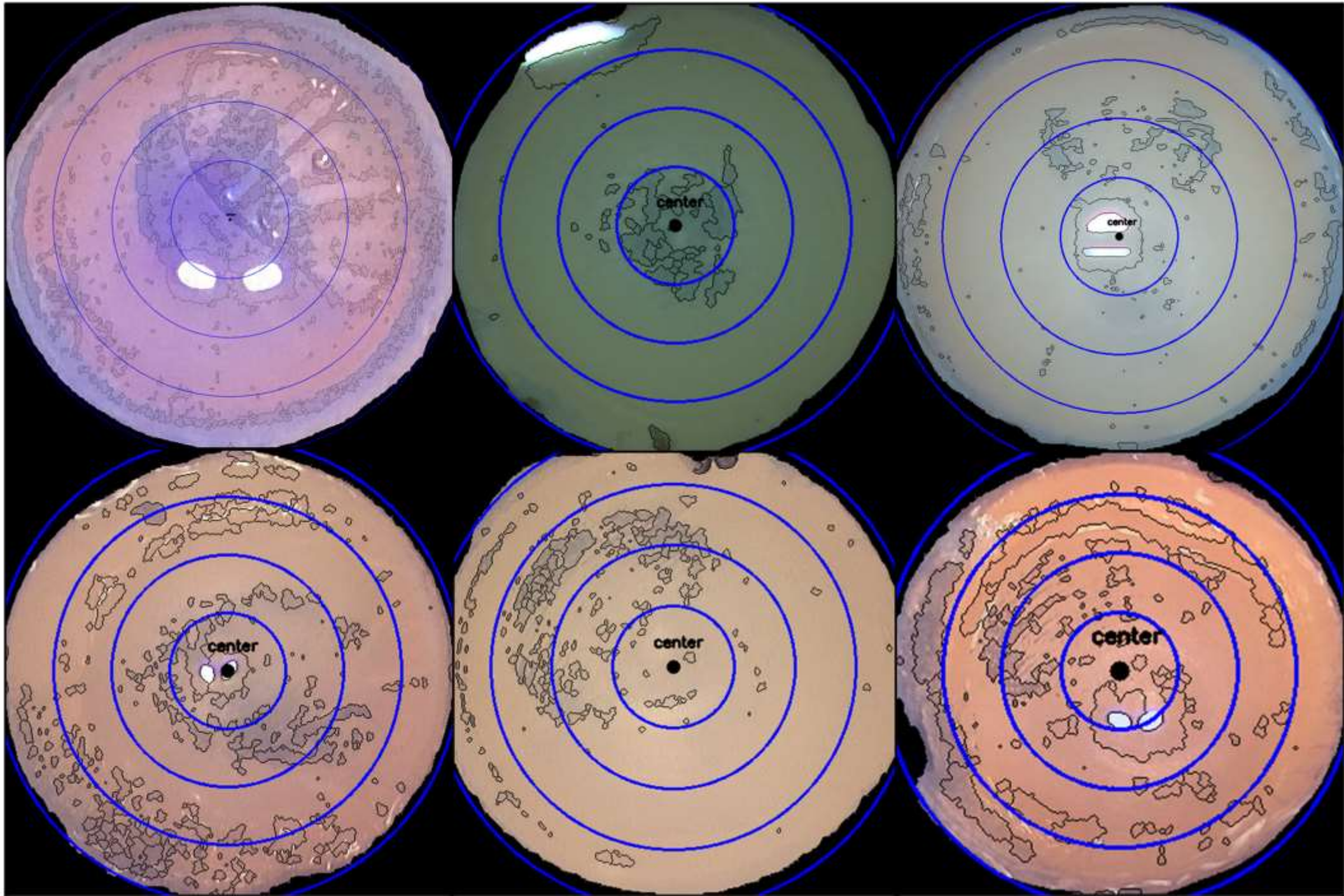


CALCEIN AM

V-CHECK


























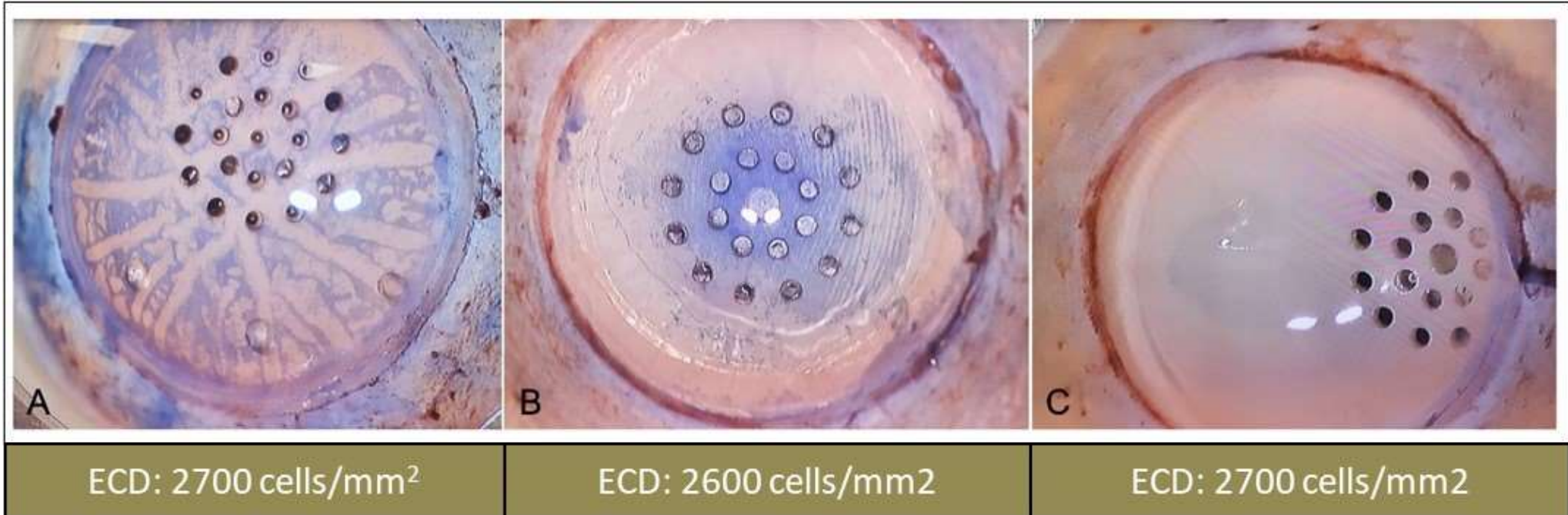




Running clinical trial

V-CHECK

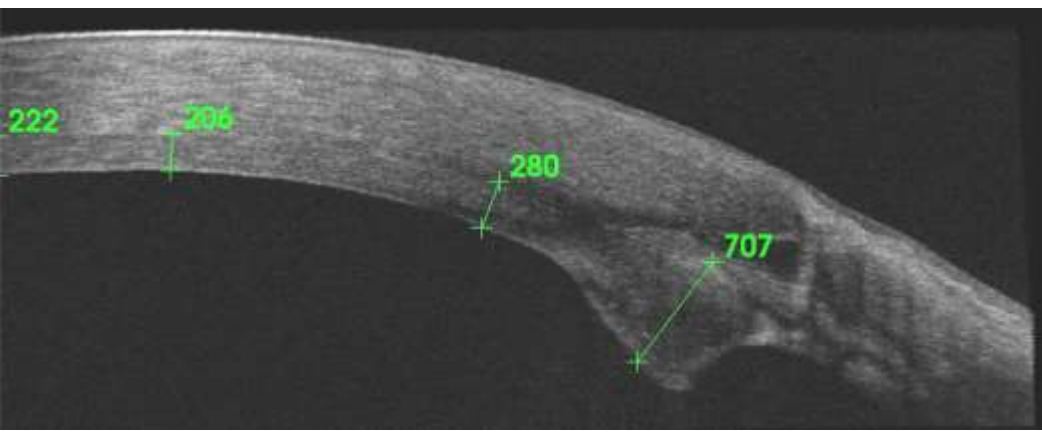
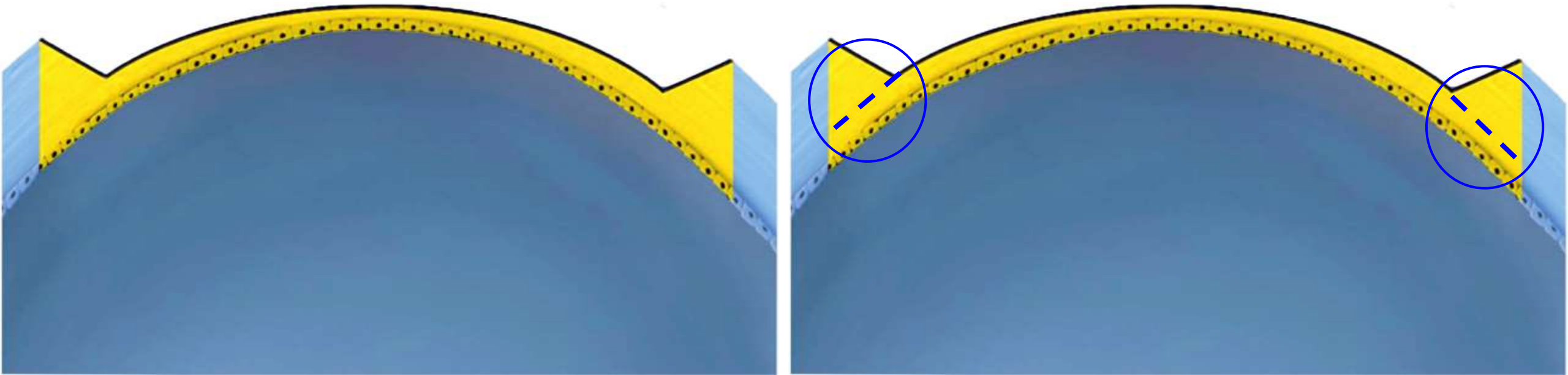
Matteo Airaldi ^{1,2} Yalin Zheng ³ Francesco Aiello ⁴ Björn Bachmann ⁵
Lamis Baydoun ^{6,7} Sorcha Ní Dhubhghaill ^{8,9} Mor M Dickman ^{10,11}
Stephen B Kaye ^{2,3} Luigi Fontana ¹² Kunal A Gadhvi ²
Antonello Moramarco ¹² Marina Rodriguez Calvo de Mora ^{13,14,15}
Carlos Rocha de Lossada ^{13,14,15,16} Vincenzo Scorcìa ¹⁷ Pietro Viola ¹⁸
Stefano Calza ¹ Hannah J Levis ³ Mohit Parekh ¹⁹
Alessandro Ruzza ²⁰ Stefano Ferrari ²⁰ Diego Ponzin ²⁰
Francesco Semeraro ²¹ Vito Romano ^{3,21}

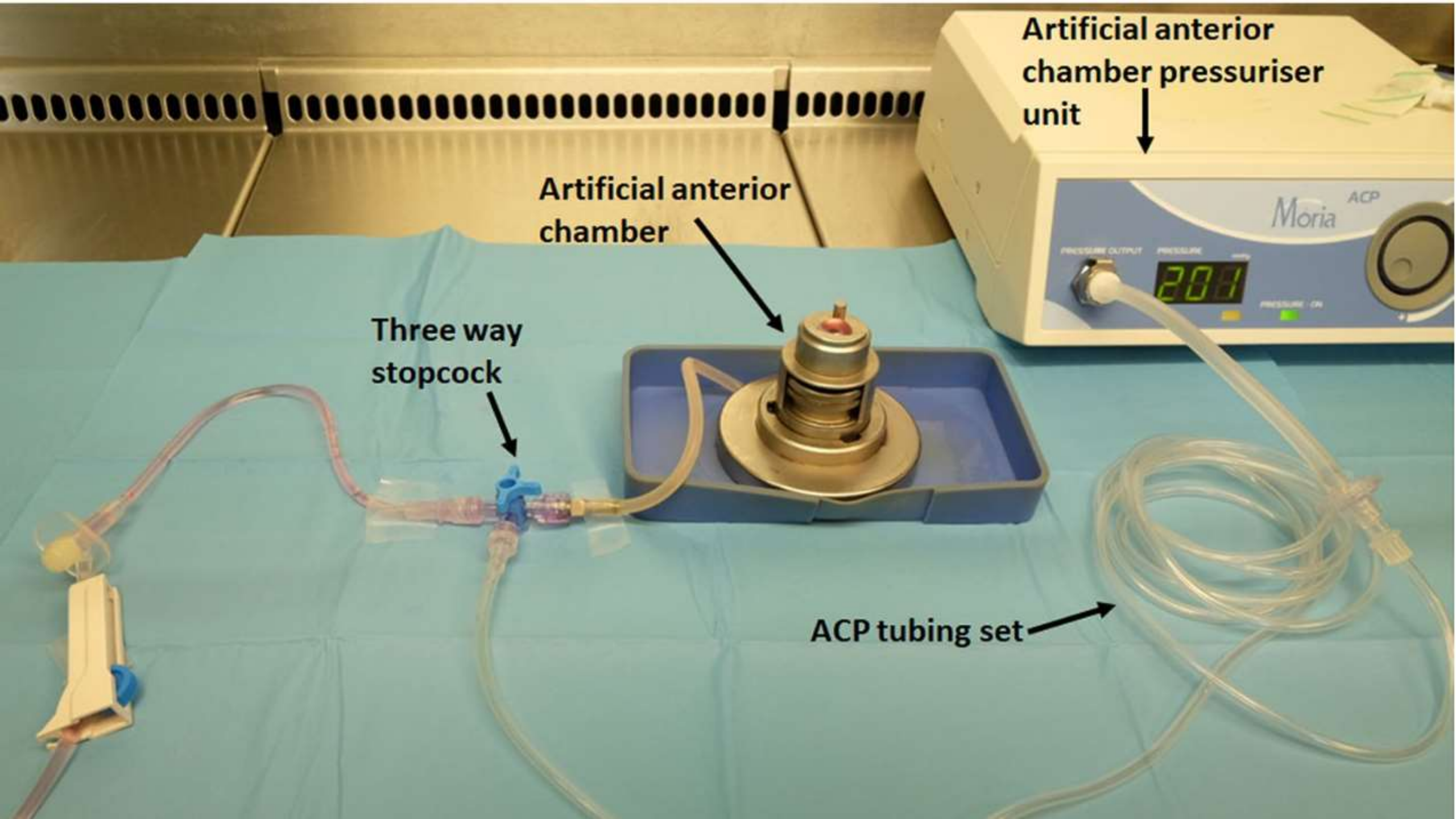


For the first time we have a
reproducible, pan-corneal viability metric
usable in the eye bank and in the OR



UT-DSA EK - Manual dissection





Artificial anterior chamber pressuriser unit

Artificial anterior chamber

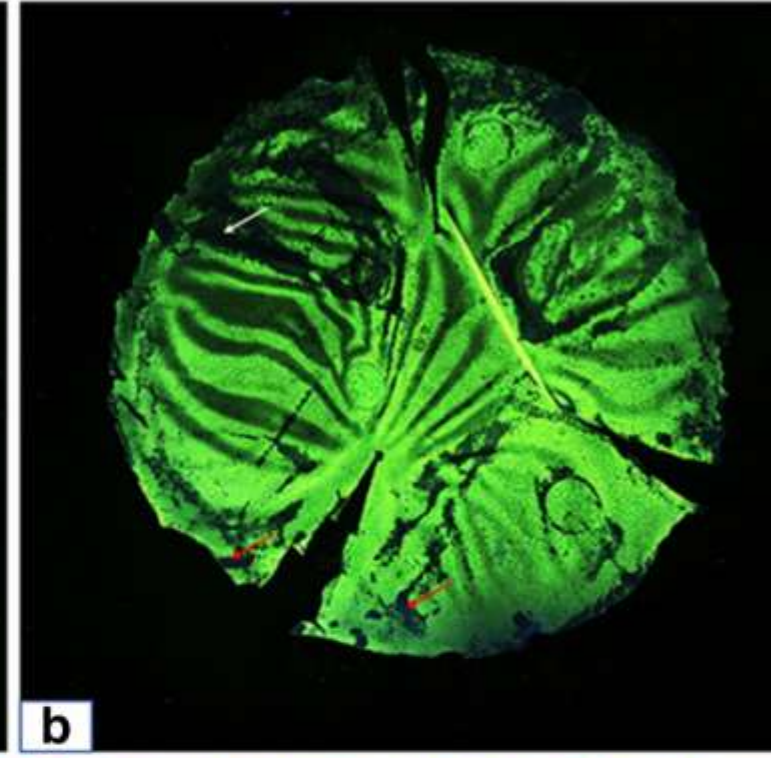
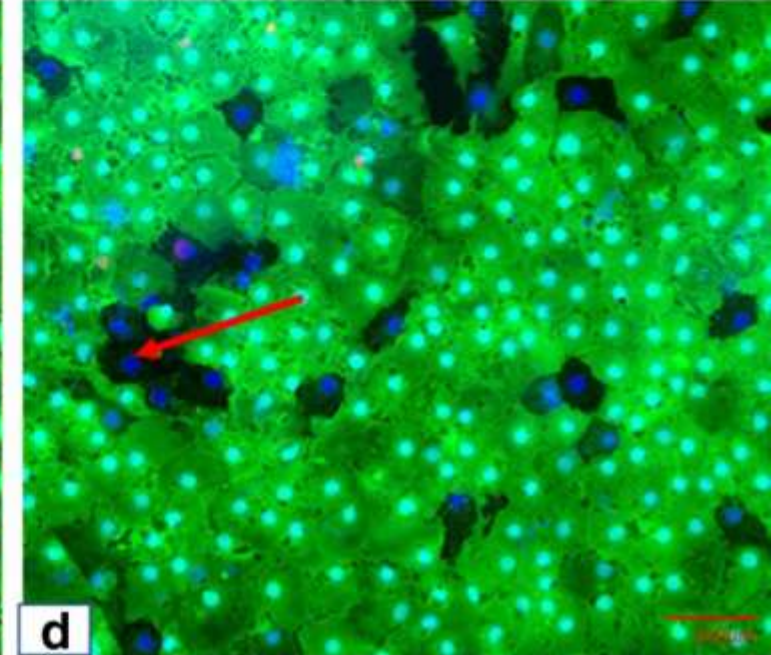
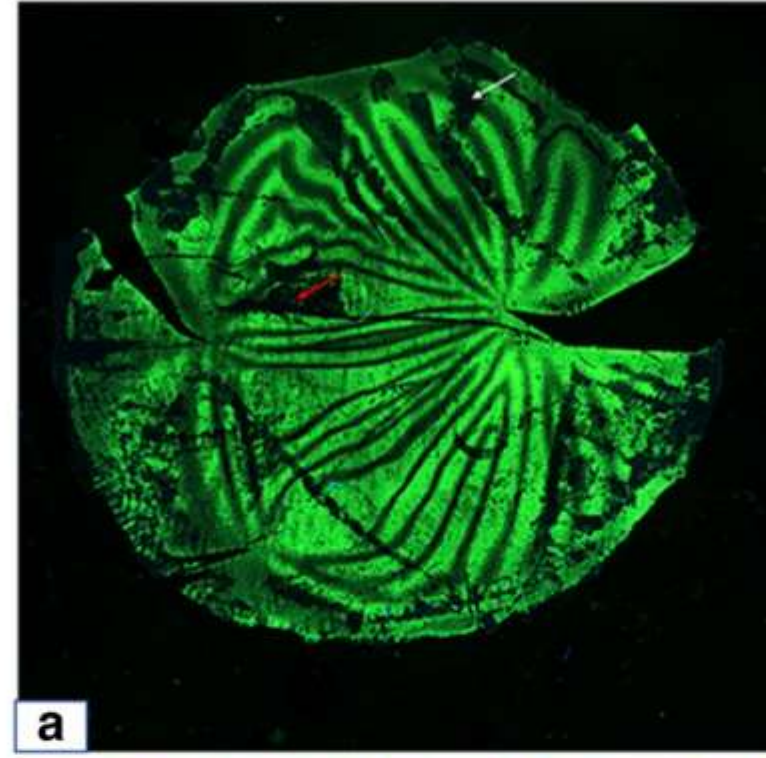
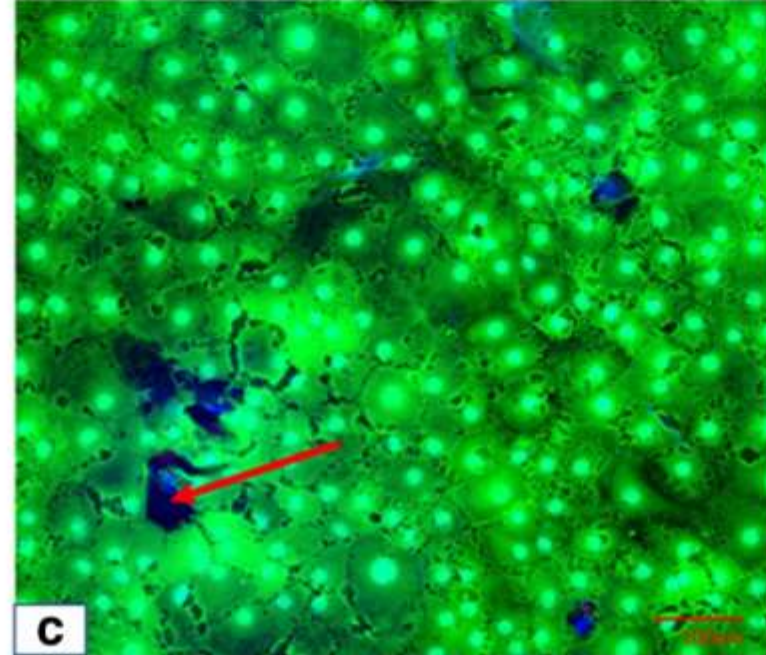
Three way stopcock

ACP tubing set

Ultra-thin DSAEK using an innovative artificial anterior chamber pressuriser: a proof-of-concept study

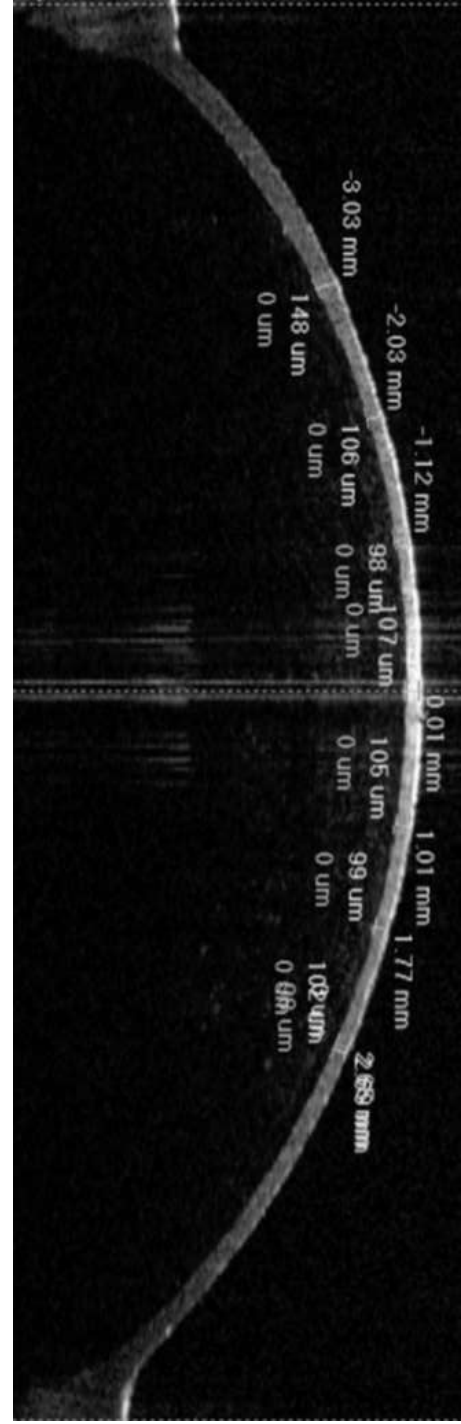
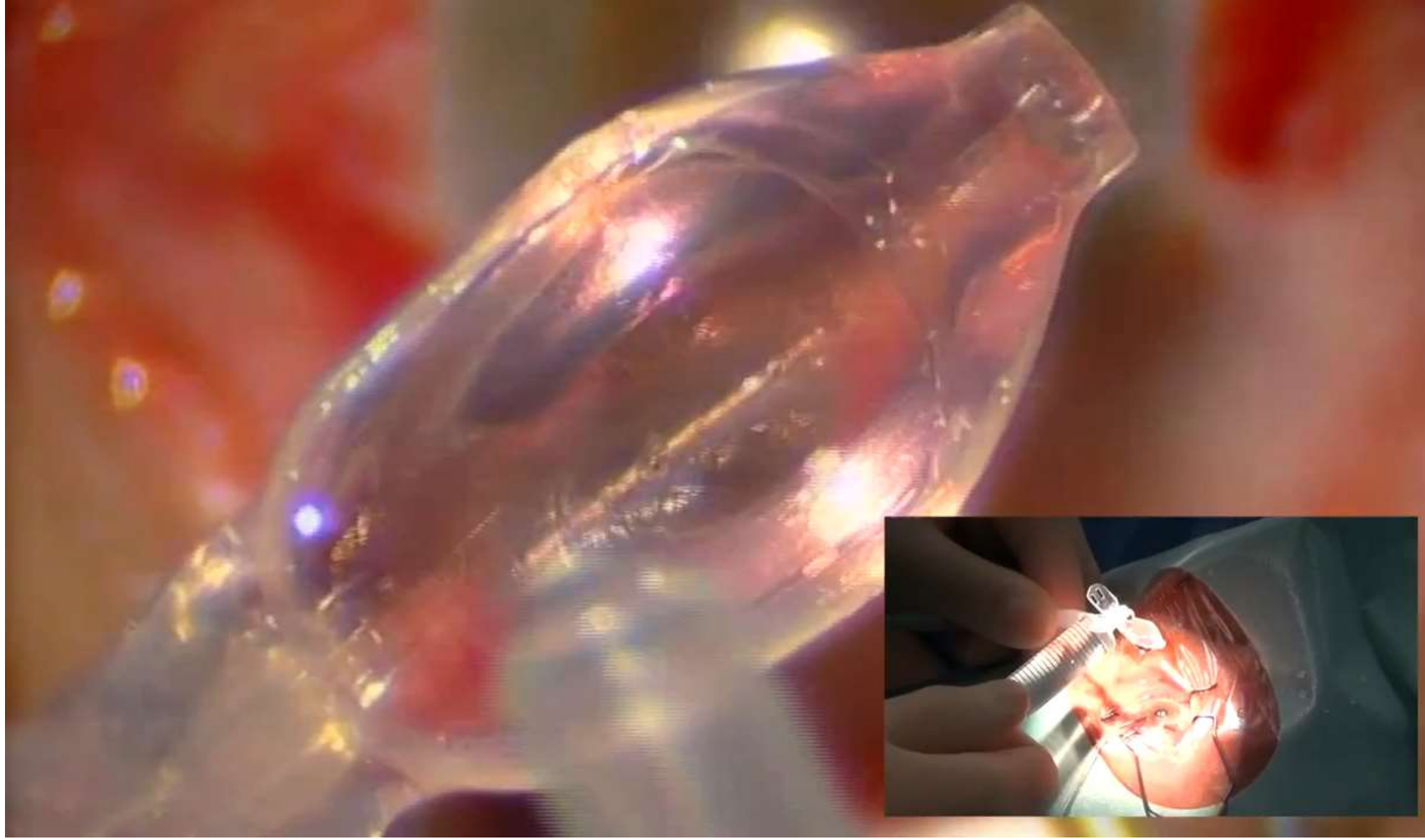
Alessandro Ruzza¹ · Mohit Parekh^{1,2} · Luca Avoni³ · Gabriela Wojcik¹ · Stefano Ferrari¹ · Ludovic Desneux⁴ ·
Diego Ponzin¹ · Hannah J. Levis⁵ · Vito Romano^{5,6,7}

Fig. 2 Live/dead analysis on a flat-mounted cornea using HEC staining after the tissues were treated with **a** 70 mmHg and **b** 200 mmHg pressure. Higher magnification images of cells treated with HEC following **c** 70 mmHg and **d** 200 mmHg pressure. White arrow indicates degenerated area and red arrow indicates apoptotic cells (green = calcein Am-live cells; blue = Hoechst-nuclei)



Cross-Country Transportation Efficacy and Clinical Outcomes of Preloaded Large-Diameter Ultra-Thin Descemet Stripping Automated Endothelial Keratoplasty Grafts

Mohit Parekh, PhD,*† Alessandro Ruzza, BSc,* Bernhard Steger, MD,‡ Colin E. Willoughby, MD,§
 Salwah Rehman, MBChB,¶|| Stefano Ferrari, PhD,* Diego Ponzin, MD,*
 Stephen B. Kaye, MD,¶|| and Vito Romano, MD,¶||**



Conclusions

Check the viability of donor endothelial cells (V-CHECK)

Look at AS OCT of your graft

Thank you
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