

# Vitreoretinal explant

**Commonly used acronym:** VR explant

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## Contact person

Katrien Remaut

## Organisation

**Name of the organisation** Ghent University (UGent)

**Department** Faculty of Pharmaceutical Sciences

**Country** Belgium

**Geographical Area** Flemish Region

## SCOPE OF THE METHOD

<b>The Method relates to</b>	Human health
<b>The Method is situated in</b>	Basic Research
<b>Type of method</b>	In vitro - Ex vivo
<b>Species from which cells/tissues/organs are derived</b>	Bovine
<b>Type of cells/tissues/organs</b>	Retina with vitreous attached

## DESCRIPTION

### Method keywords

intravitreal injection

ocular delivery

retinal delivery

nanomedicines  
vitreous mobility  
inner limiting membrane

### **Scientific area keywords**

ocular delivery  
nanomedicines  
intravitreal stability  
retinal delivery  
bovine eyes

### **Method description**

Retinal gene delivery via intravitreal injection is hampered by various physiological barriers present in the eye of which the vitreoretinal (VR) interface represents the most serious hurdle. We present a retinal explant model especially designed to study the role of this interface as a barrier for the penetration of vectors into the retina. In contrast to all existing explant models, the developed model is bovine-derived and more importantly, keeps the vitreous attached to the retina at all times to guarantee an intact VR interface. After *ex vivo* intravitreal injection into the living retinal explant, the route of fluorescent carriers across the VR interface (vitreous and inner limiting membrane) can be tracked.

### **Method status**

Published in peer reviewed journal

## **PROS, CONS & FUTURE POTENTIAL**

### **Advantages**

Representative vitreous and inner limiting membrane intravitreal injections possible.

### **Challenges**

Only viable for 1-2 days ;  
No vitreal flow or clearance pathways present.

### **Modifications**

Could be adapted to whole eye model with perfusion to mimick vitreal flows.

## REFERENCES, ASSOCIATED DOCUMENTS AND OTHER INFORMATION

### References

Karen Peynshaert, Joke Devoldere, Valérie Forster, Serge Picaud, Christian Vanhove, Stefaan C. De Smedt & Katrien Remaut (2017) Toward smart design of retinal drug carriers: a novel bovine retinal explant model to study the barrier role of the vitreoretinal interface, Drug Delivery, 24:1, 1384-1394, DOI: 10.1080/10717544.2017.1375578

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