70 CONGRESO NACIONAL
SOCIEDAD ESPAÑOLA DE FARMACIA HOSPITALARIA
MÁLAGA 15-17 OCT 25

Sapere Aude
Reflexión ante nuevos retos

5 hitos en las Terapias avanzadas e investigación en Oftalmología

Dr. Pastor-Idoate, PhD, FEBO

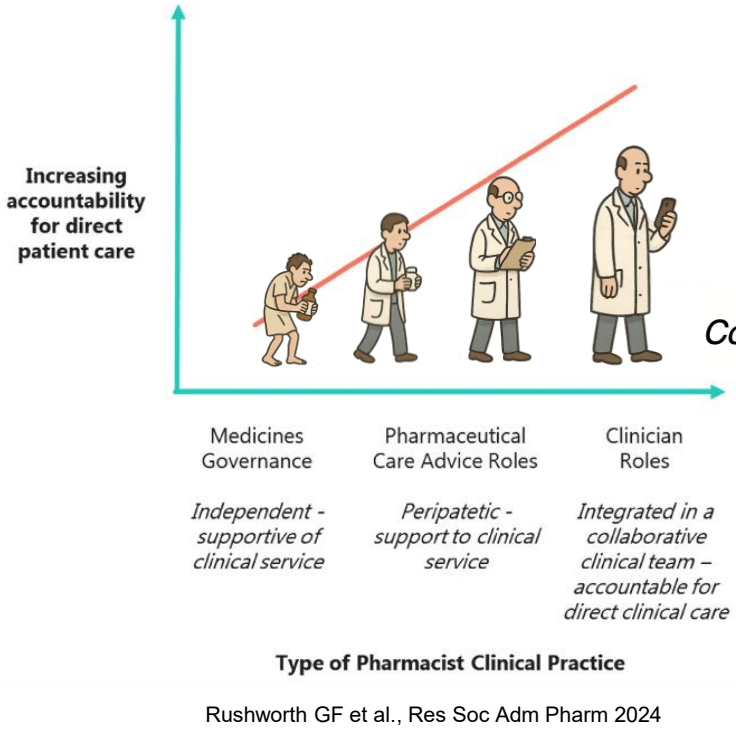
sefh Sociedad Española de Farmacia Hospitalaria
SEO Sociedad Española de Oftalmología
HC UV
ioba Instituto Universitario de Oftalmobiología Aplicada

Apply the Law of Three

Do what you can, with what you have, where you are

~Theodore Roosevelt~

From Governance to Collaborative Clinical Care



Rushworth GF et al., Res Soc Adm Pharm 2024

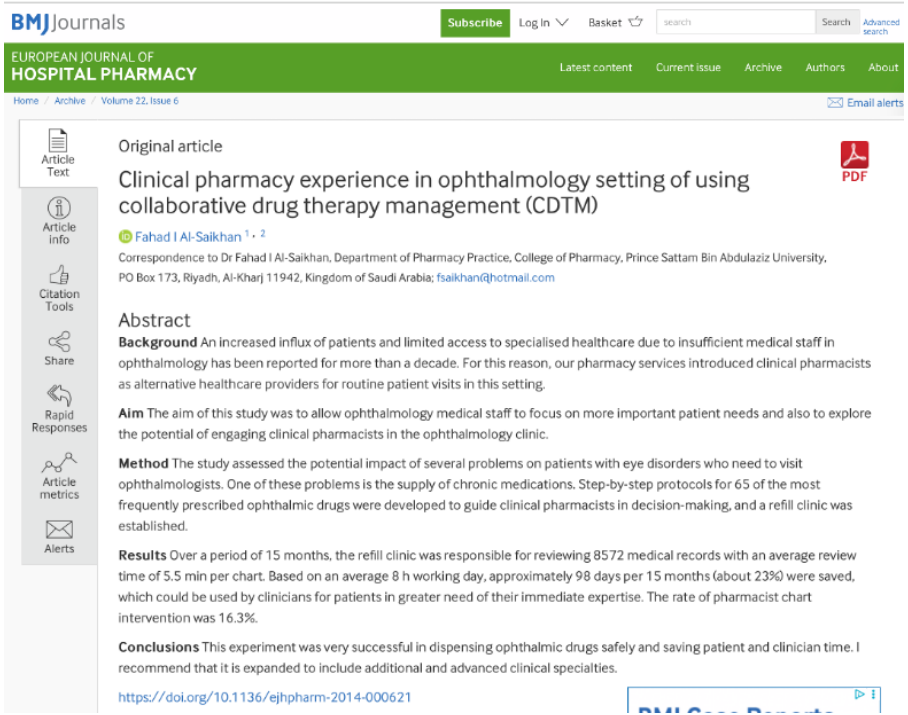
Collaboration & Integration

Networking

Evolving role: from governance to direct accountability in patient care

Objective: creating a collaborative network between pharmacists and ophthalmologists

Don’t worry… we are not suggesting this 😅



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Clinical pharmacy experience in ophthalmology setting of using collaborative drug therapy management (CDTM)

Fahad I Al-Saikhan [1, 2]

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Abstract

Background An increased influx of patients and limited access to specialised healthcare due to insufficient medical staff in ophthalmology has been reported for more than a decade. For this reason, our pharmacy services introduced clinical pharmacists as alternative healthcare providers for routine patient visits in this setting.

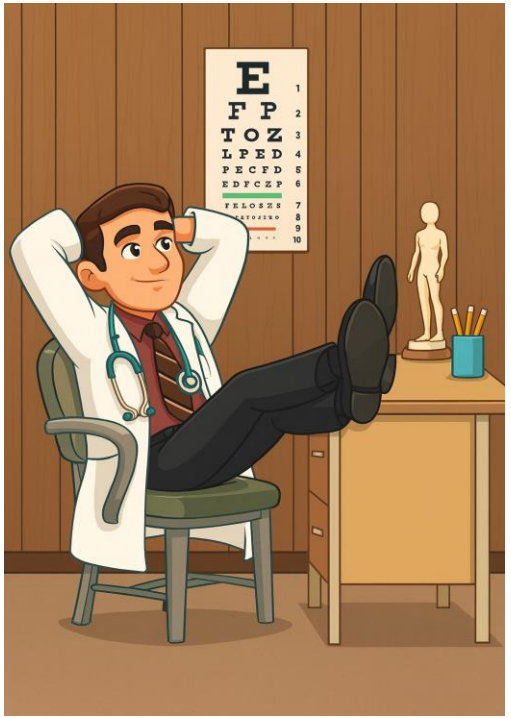
Aim The aim of this study was to allow ophthalmology medical staff to focus on more important patient needs and also to explore the potential of engaging clinical pharmacists in the ophthalmology clinic.

Method The study assessed the potential impact of several problems on patients with eye disorders who need to visit ophthalmologists. One of these problems is the supply of chronic medications. Step-by-step protocols for 65 of the most frequently prescribed ophthalmic drugs were developed to guide clinical pharmacists in decision-making, and a refill clinic was established.

Results Over a period of 15 months, the refill clinic was responsible for reviewing 8572 medical records with an average review time of 5.5 min per chart. Based on an average 8 h working day, approximately 98 days per 15 months (about 23%) were saved, which could be used by clinicians for patients in greater need of their immediate expertise. The rate of pharmacist chart intervention was 16.3%.

Conclusions This experiment was very successful in dispensing ophthalmic drugs safely and saving patient and clinician time. I recommend that it is expanded to include additional and advanced clinical specialties.

https://doi.org/10.1136/ejhpharm-2014-000621



In Saudi Arabia, Clinical pharmacists even started running ophthalmology refill clinics!

China Unveils World's First AI-powered hospital, Agent Hospital, with 14 AI Doctors and 4 AI Nurses, Boasting 93.06% Accuracy Rate and Potential to Treat 10,000 Patients in Days!

05 - MILESTONES

Personalised Medicine

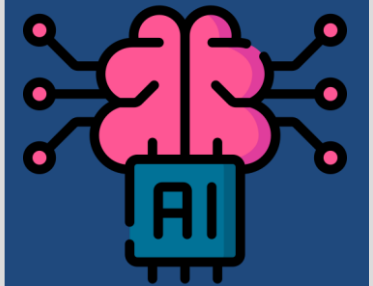
Gene Therapy

01

Stem Cell Therapy

02

05



ARN Therapy

03

Drug Delivery Systems

04

Importance of Gene Cell replacement therapy

2.2 Billion people have vision impairments

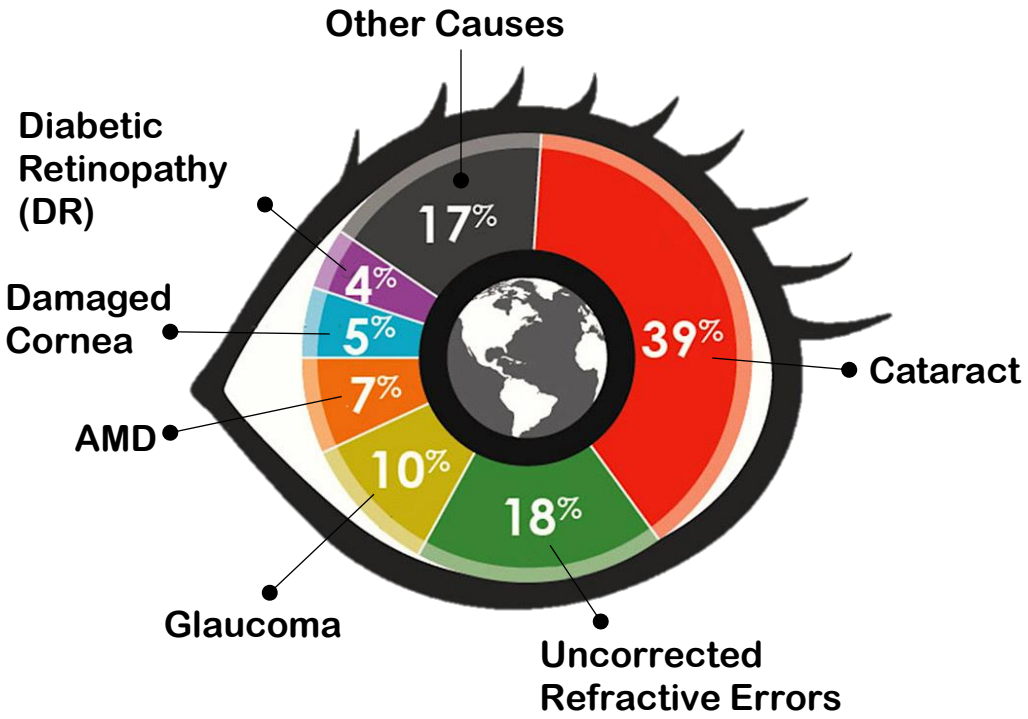
In at least **1** billion could have been prevented

400 million people due to AMD, glaucoma, DR, Stargardt and RP

Global financial burden US$ **411** billion

World Health Organization

Leading Causes of Blidness Around the World



European Reference Networks

Funded by the European Union

ERN-EYE

European Reference Network
for rare or low prevalence complex diseases
Network Eye Diseases (ERN-EYE)

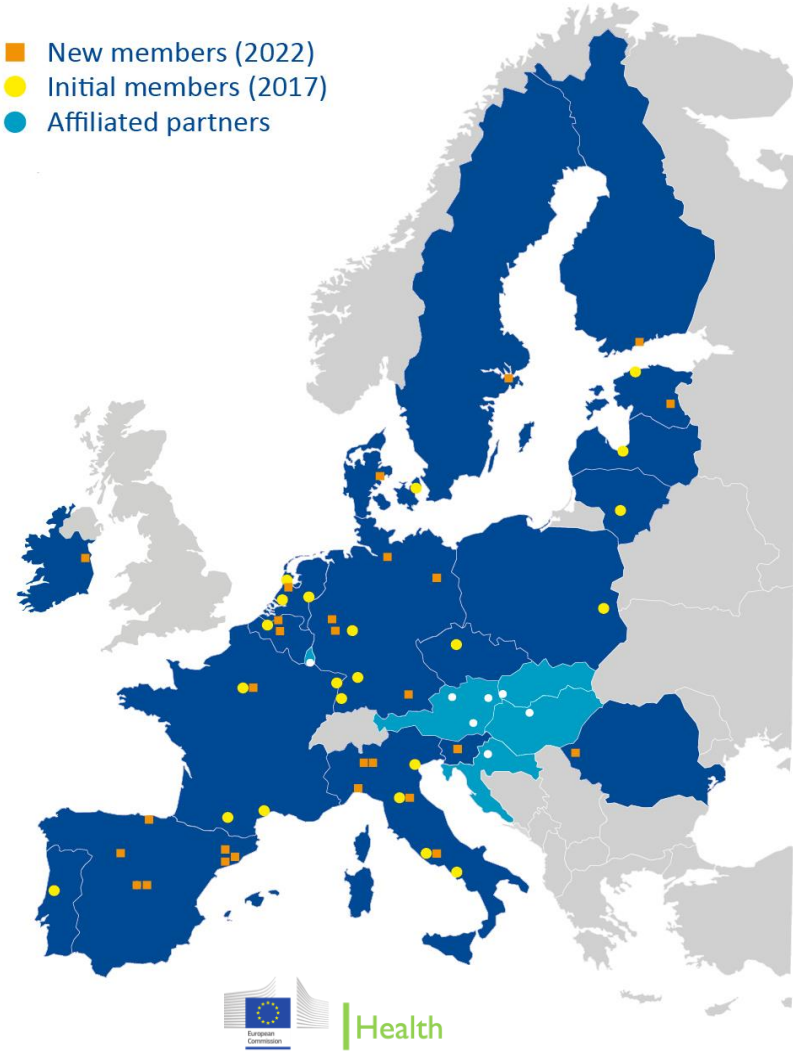
THE EUROPEAN REFERENCE NETWORK DEDICATED TO RARE EYE DISEASES

13 founding countries

29 Hospitals

900 Rare Eye Diseases

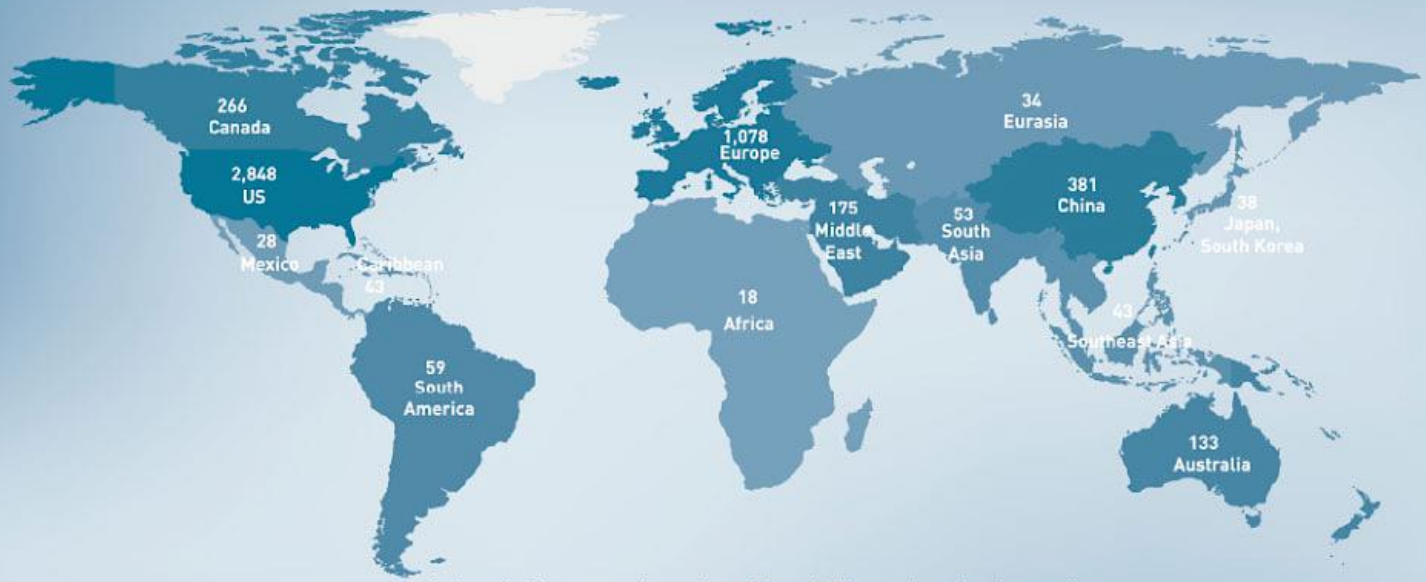
24 000 patients in our centers



European Commission | Health

Who's Leading the Global Stem Cell Race?

A global snapshot of which regions and countries house the most stem cell studies

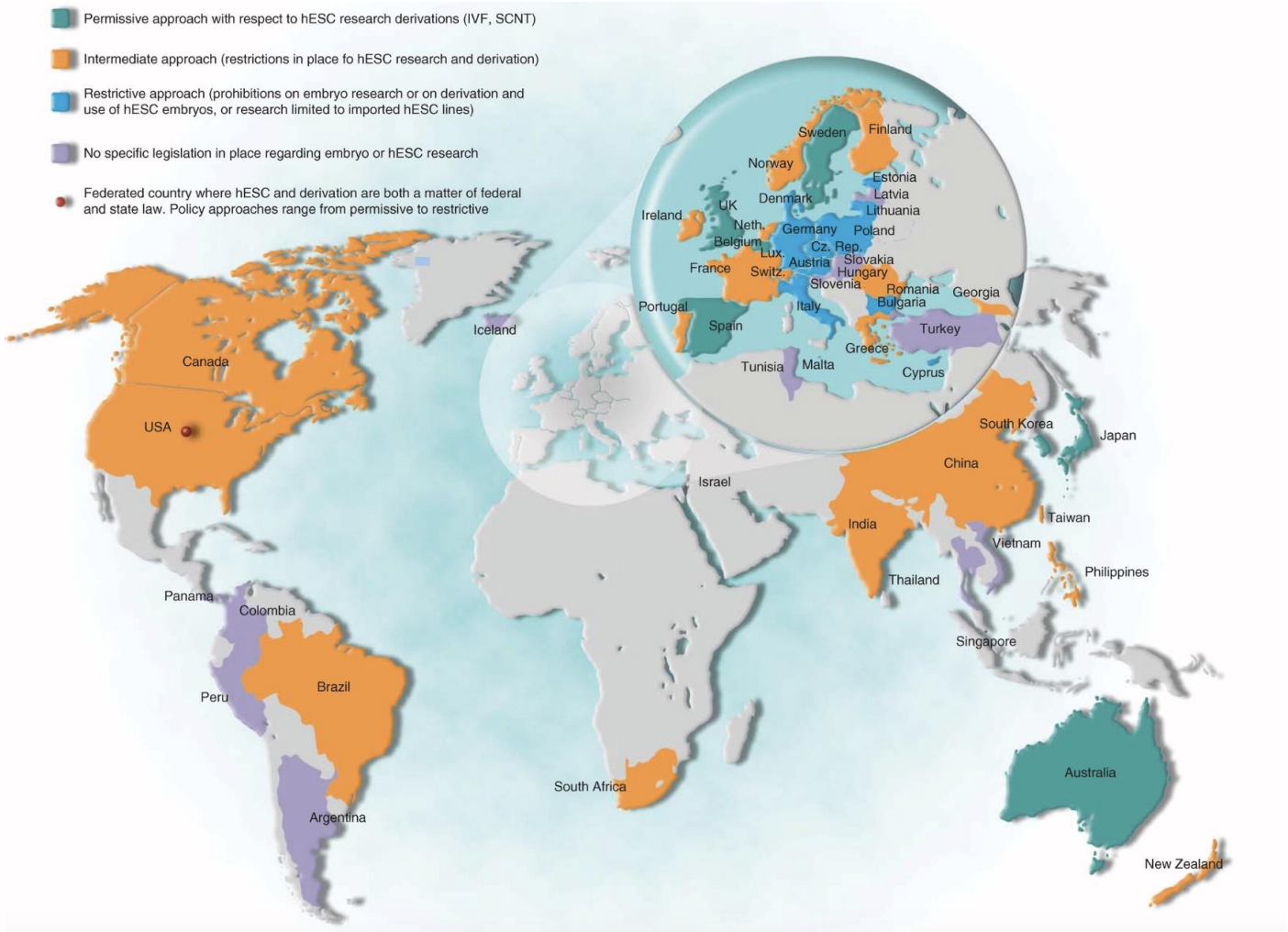


Colors indicate number of studies with locations in that region

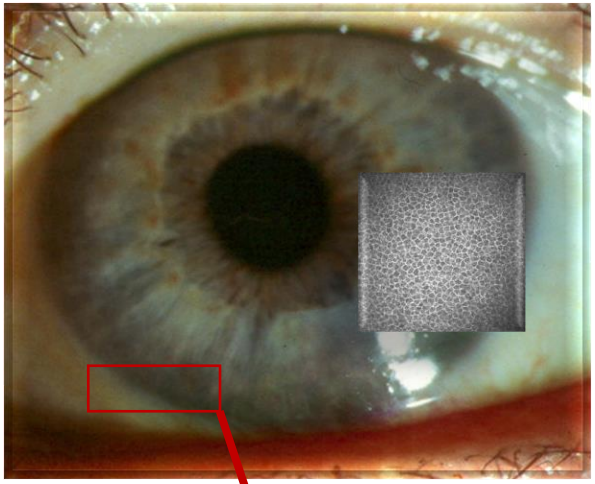
Least — Most

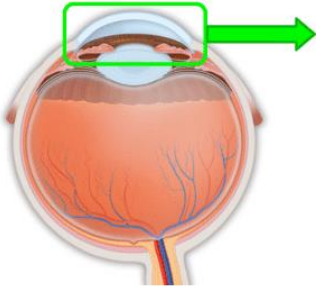
Labels give exact study count

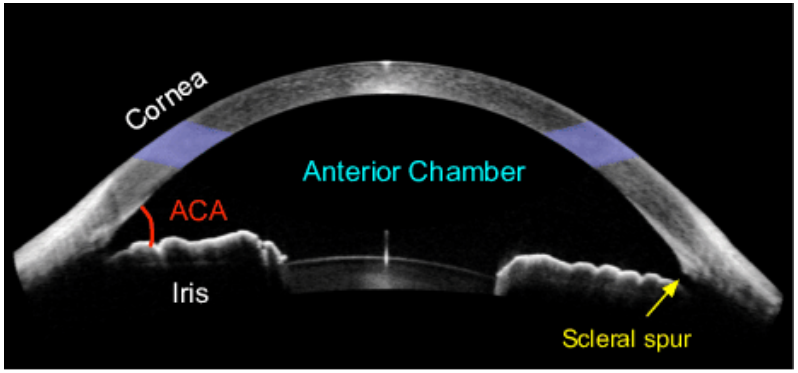
Source: UC Davis School of Medicine Professor Paul Knoepfler's blog

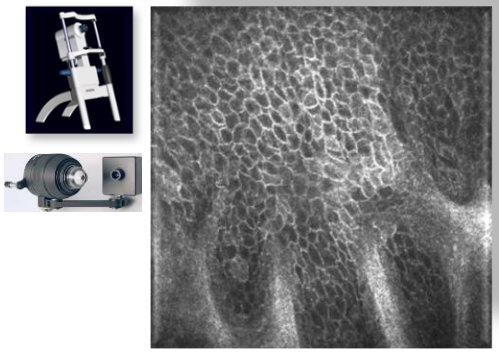

Permissive approach with respect to hESC research derivations (IVF, SCNT)
Intermediate approach (restrictions in place fo hESC research and derivation)
Restrictive approach (prohibitions on embryo research or on derivation and use of hESC embryos, or research limited to imported hESC lines)
No specific legislation in place regarding embryo or hESC research
Federated country where hESC and derivation are both a matter of federal and state law. Policy approaches range from permissive to restrictive
Sweden
Finland
Norway
Estonia
Latvia
Lithuania
Denmark
Ireland
UK
Neth.
Germany
Poland
Belgium
Cz. Rep.
Lux.
Austria
Slovakia
France
Switz.
Hungary
Slovenia
Romania
Georgia
Bulgaria
Portugal
Italy
Spain
Turkey
Greece
Tunisia
Malta
Cyprus
Iceland
Canada
USA
South Korea
Japan
China
Israel
India
Taiwan
Vietnam
Philippines
Thailand
Singapore
Panama
Colombia
Brazil
Peru
Australia
South Africa
Argentina
New Zealand

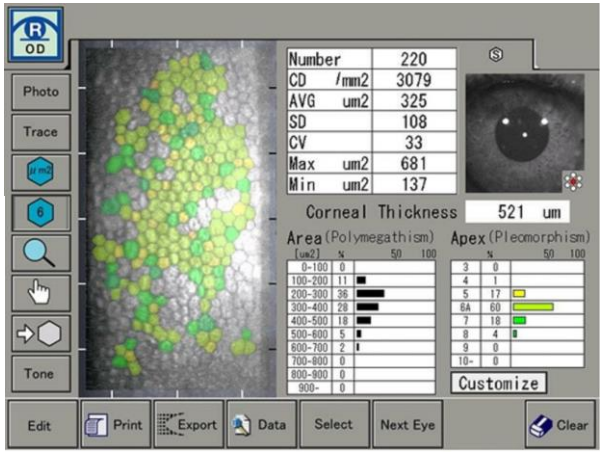
Non-invasive imaging of the ocular lesions

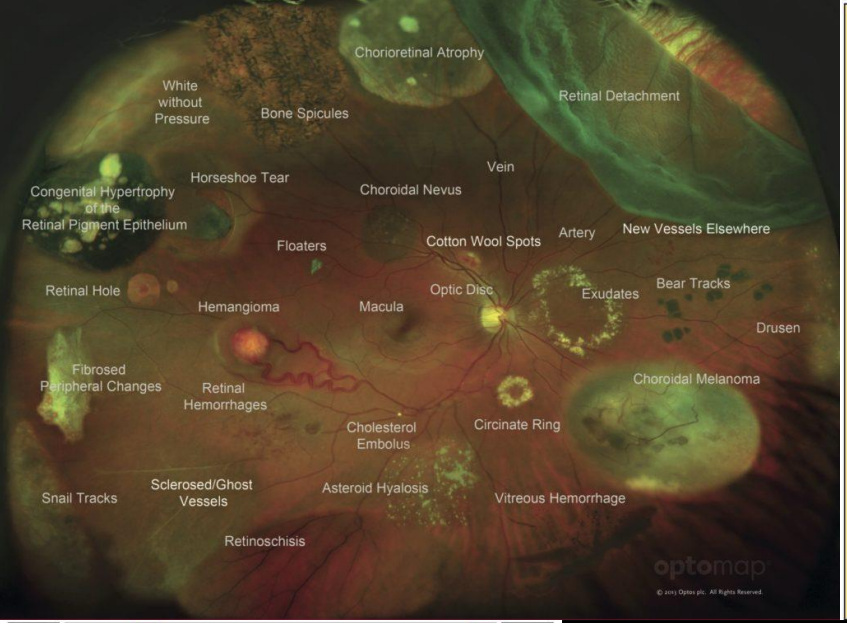


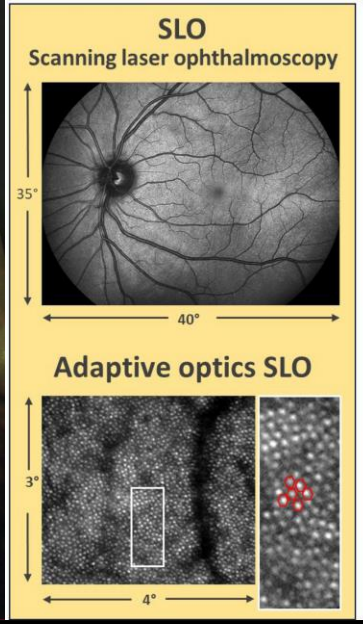


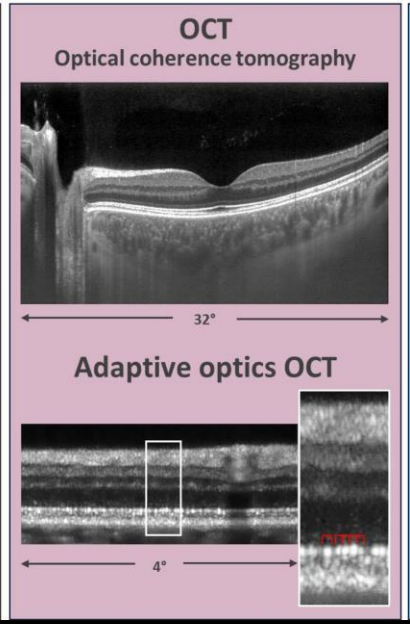


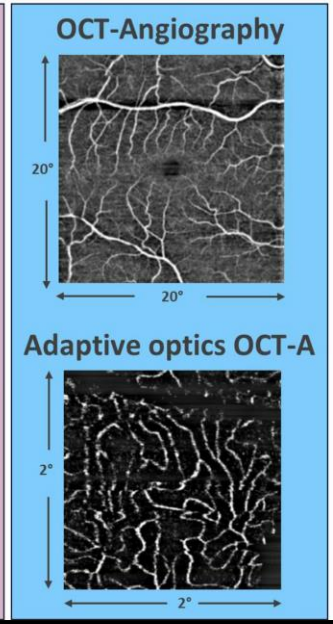


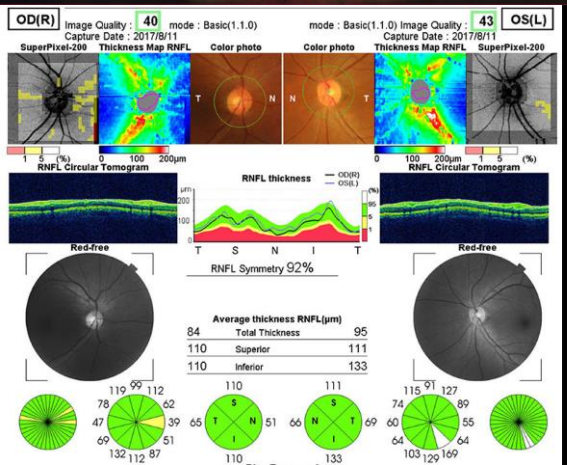


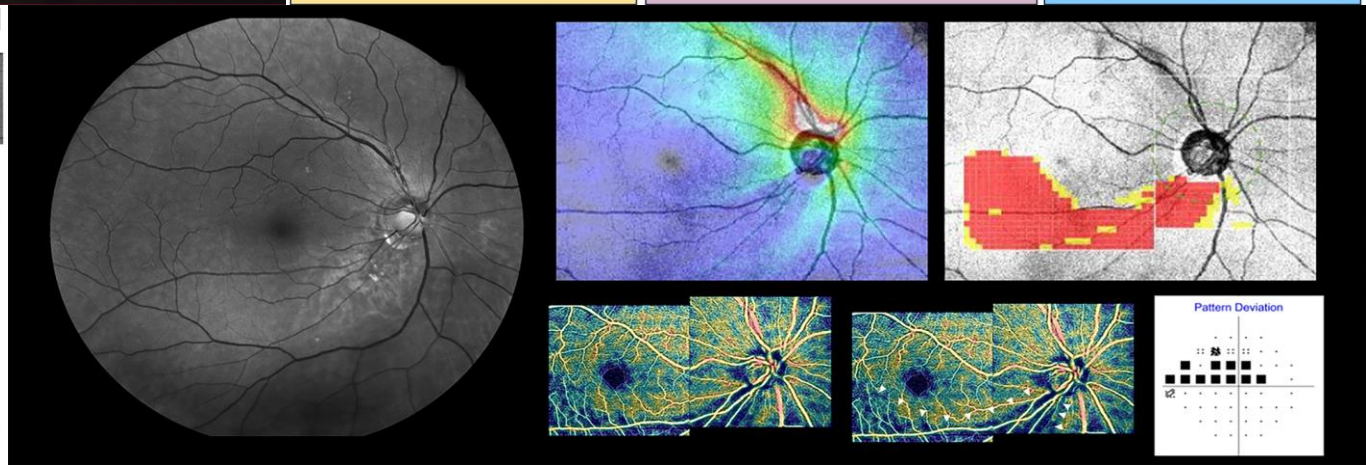

Chorioretinal Atrophy
White without Pressure
Bone Spicules
Retinal Detachment
Vein
Horseshoe Tear
Choroidal Nevus
Congenital Hypertrophy of the Retinal Pigment Epithelium
Floaters
Cotton Wool Spots
Artery
New Vessels Elsewhere
Retinal Hole
Optic Disc
Exudates
Bear Tracks
Hemangioma
Macula
Drusen
Fibrosed Peripheral Changes
Choroidal Melanoma
Retinal Hemorrhages
Cholesterol Embolus
Circinate Ring
Snail Tracks
Sclerosed/Ghost Vessels
Asteroid Hyalosis
Vitreous Hemorrhage
Retinoschisis
optomap


SLO
Scanning laser ophthalmoscopy
35°
40°
Adaptive optics SLO
3°
4°

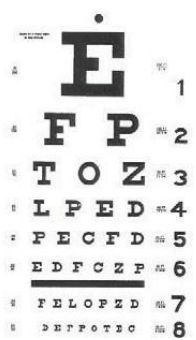

OCT
Optical coherence tomography
32°
Adaptive optics OCT
4°

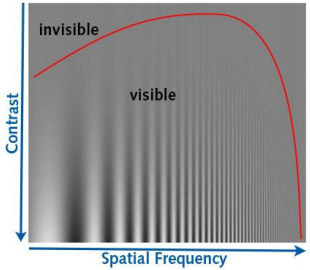

OCT-Angiography
20°
20°
Adaptive optics OCT-A
2°
2°

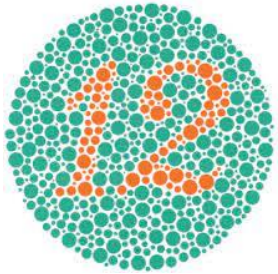

OD(R)
Image Quality : 40
mode : Basic(1.1.0)
Capture Date : 2017/8/11
SuperPixel-200
Thickness Map RNFL
Color photo
RNFL Circular Tomogram
RNFL thickness
Red-free
RNFL Symmetry 92%
Average thickness RNFL(μm)
84 Total Thickness 95
110 Superior 111
110 Inferior 133
OS(L)
Image Quality : 43
mode : Basic(1.1.0)
Capture Date : 2017/8/11

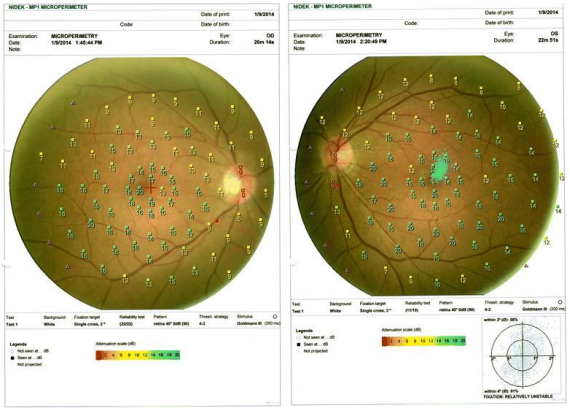

Pattern Deviation

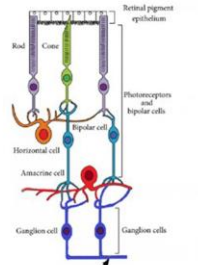
Non-invasive Functional Vision Assessment





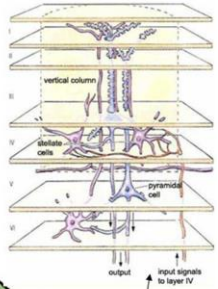


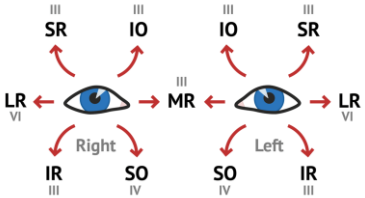


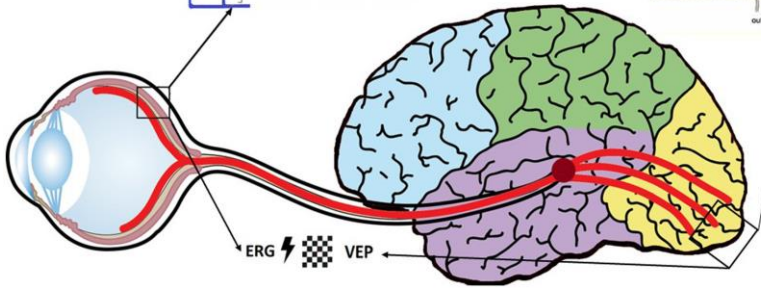


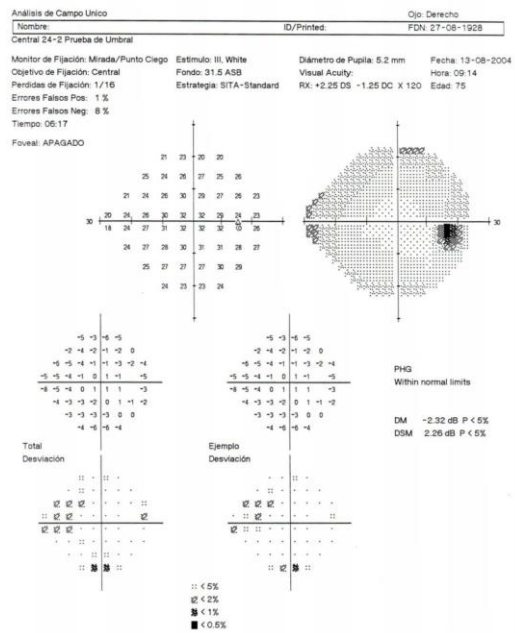
Retina

Primary Visual Cortex (PVC/V1)









The Eye: an ideal target for Gene and Cell Therapy

Accessible target organ

- ✓ *Topical*
- ✓ *Intracameral*
- ✓ *Intravitreal*
- ✓ *Suprachoroidal*
- ✓ *Subretinal*

Relative immune privilege

- ✓ *Limits immune response to injected genetic material*
- ✓ *Blood Retinal Barrier – limits systemic spread*

Good progress

Single gene defects / IRD's

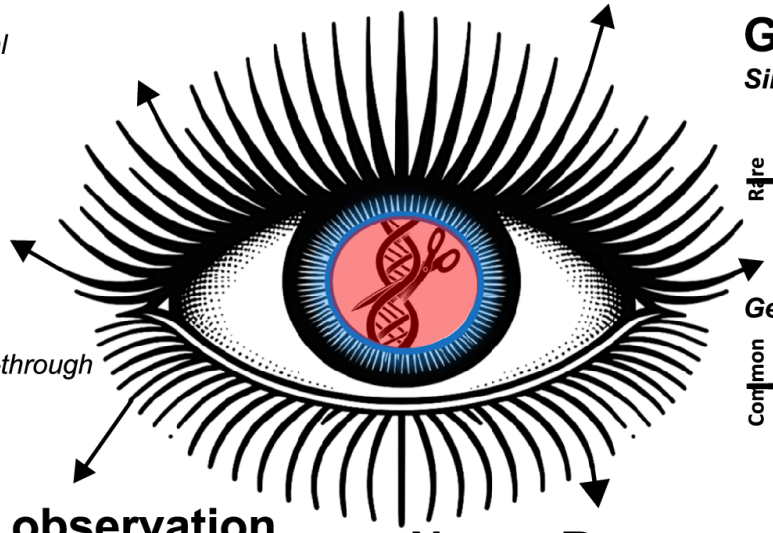
Rare
- *Leber's Congenital Amaurosis (Luxturna)*
- *Retinitis Pigmentosa*
- *Stargardt Disease*

Genetically heterogenous

Common
- *Glaucoma*
- *Age-related Macular Degeneration*
- *Diabetic Retinopathy*

Emerging therapies

- ✓ *Gene Specific*
- ✓ *DNA editing*
- ✓ *RNA therapies*
- ✓ *Translational Read-through*
- ✓ *Stem Cell*
- ✓ *Optogenetics*



Direct observation

- ✓ *Advanced imaging enables noninvasive monitoring of both **efficacy** and **safety***
- ✓ *Can observe contralateral eye as an **in-vivo control***

Neuro-Regenerative potential

- ✓ *Cell reprogramming*
  - ✓ *Photoreceptors*
- ✓ *Axon Regeneration*
  - ✓ *Optic Nerve*

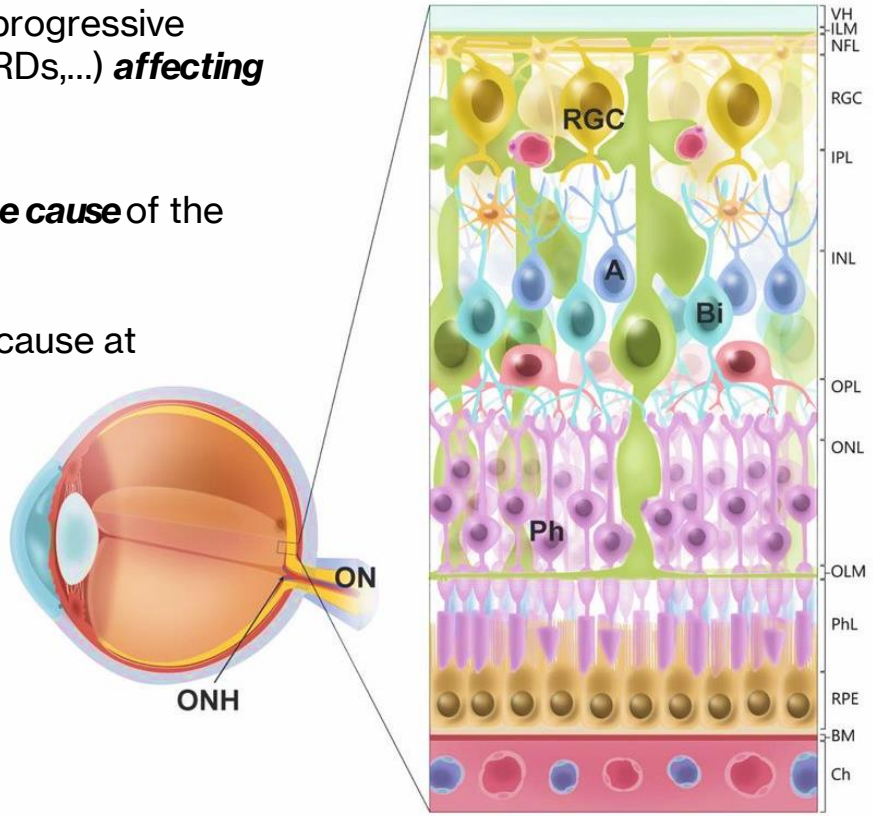
Genetic engineering and the eye. *Eye* **39**, 57–68 (2025)

Limitations of current therapies in clinical use

- ✓ The most common ocular causes of vision loss are progressive chronic eye diseases (LSCD, AMD, DR, Glaucoma, IRDs,...) ***affecting different types of cells at the same time***
- ✓ Treatment options only ***treat the consequence, not the cause*** of the pathology
- ✓ There are hardly any treatment to restore vision, because at present, ***lost cells can not be replaced***
- ✓ There's over ***300 genes*** that are important for how the retina works and for which misspellings can cause retinal conditions

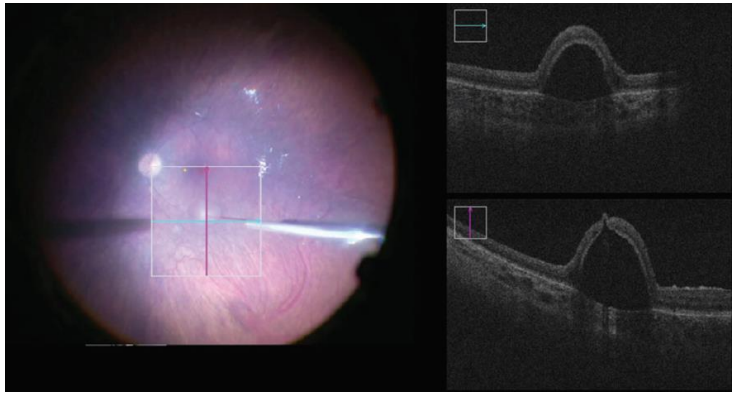
↓

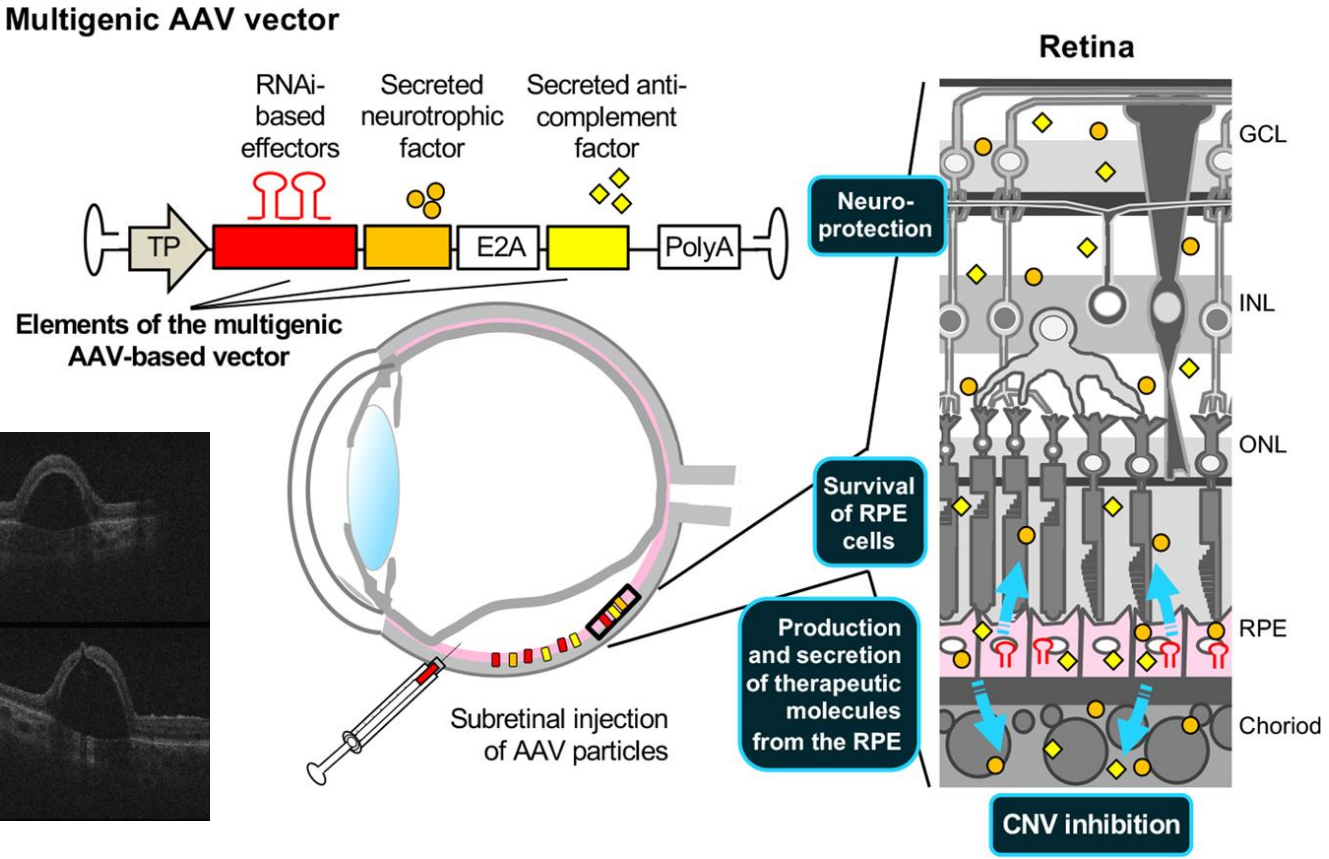
IRDs: ***Heterogenicity and genetic variability***



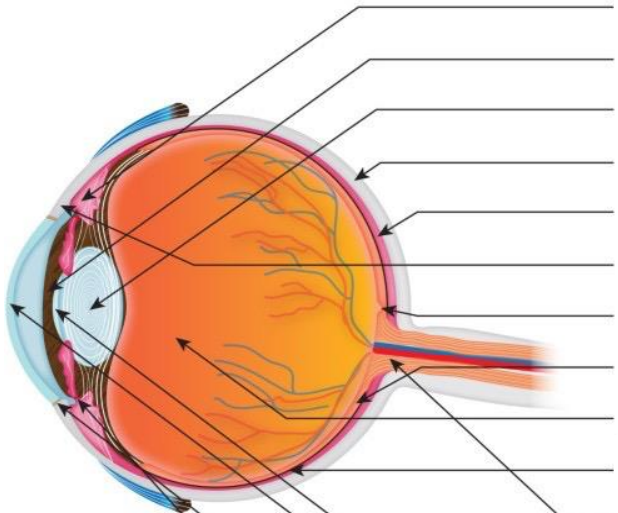
01. Gene therapy as the first clinical milestone in ophthalmology

LUXTURNA™
voretigene neparvovec-rzyl
for subretinal injection





02. Ocular Stem Cell niches and current clinical stage



Ocular región	Stem cells	Disease	Therapeutic/ experimental stage
Ciliar body	Ciliar body stem cells	Ciliary body detachment	Still under study
Iris	Iris pigment epithelial cells	Iritis/nAMD	Clinical application
Lens	Lens stem cells	Cataractogeneis	Still under study
Sclera	Mesenchymal originated stem cells	Myopia	Still under study
Choroid	Mesenchymal originated stem cells	Ocular neurodegenerative diseases	Still under study
Conjuntiva	Globet and epitelial cells	Conjuntival scarring, dry eye, cicatricial pemphigoid	Clinical application
Fovea			
Retina	Retina cells	Inherited retinal distrophy, Dry-AMD	Clinical application
Vitreo			
RPE	RPE cells	Inherited retinal distrophy, Dry-AMD	Clinical application
Optic nerve			
Cornea	Corneal stromal stem cells	Corneal scar-like disruption	Still under study
Pupil			
Limbus	Limbal epithelial stem cells	Limbal stem cell deficiency	Clinical application
Trabecular Meshwork	Mesenchymal and endothelial cells	Intraocular pressure	Still under study

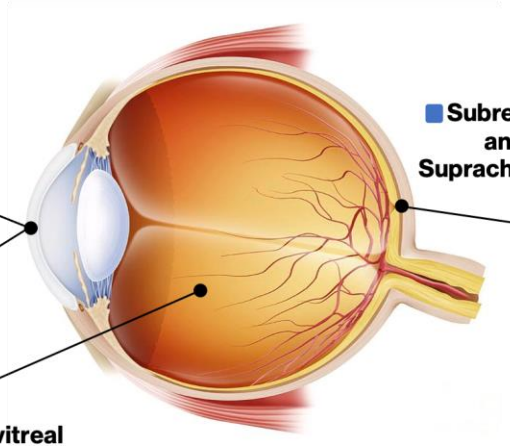
Types of Stem Cells currently used for Eye?

Source of stem cells

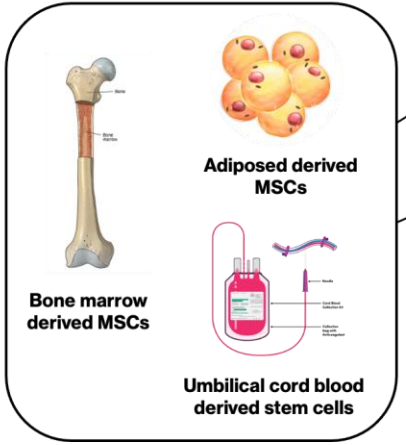
Limbal epithelial stem cells | Oral epithelial stem cells | MSCs

Diseases Corneal diseases

Ways of delivery



- Corneal
- Subretinal and Suprachoroidal
- Intravitreal



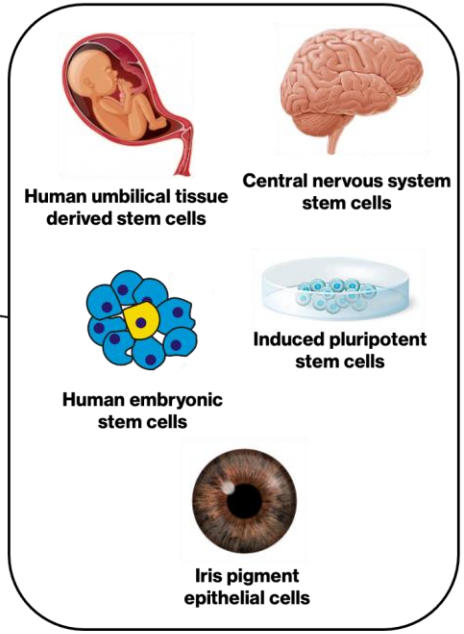
Bone marrow derived MSCs

Adiposed derived MSCs

Umbilical cord blood derived stem cells

Diseases Retinal and Optic disorders

Source of stem cells



Human umbilical tissue derived stem cells

Central nervous system stem cells

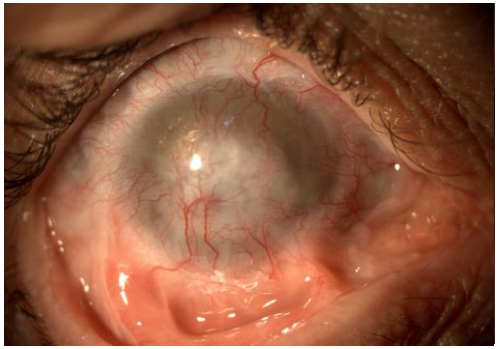
Induced pluripotent stem cells

Human embryonic stem cells

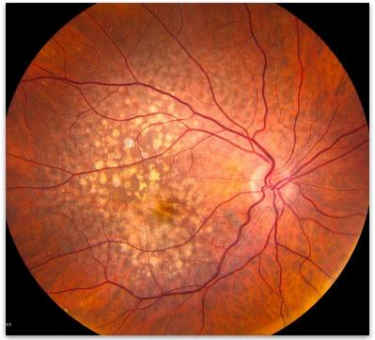
Iris pigment epithelial cells

Diseases Retinal and macular degenerations

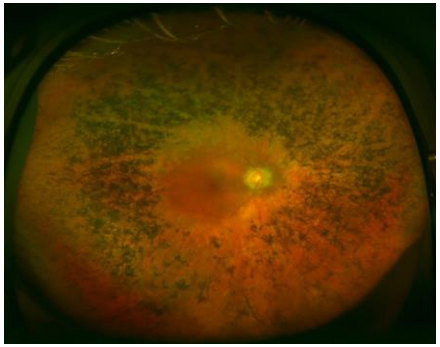
THE 8 EYE DISEASES CURRENTLY TARGETED FOR STEM CELL-BASED THERAPIES



Corneal Disorders
Limbal stem cell deficiency (LSCD)



Macular Degeneration
(nAMD, Dry-AMD)



Inherited Retinal Distrophy
(RP, Stargardt)

Retinal Vascular Diseases (DR)

Optic Nerve Disorders
(Glaucoma, optic neuritis)

ioba
Instituto Universitario de Oftalmobiología Aplicada

20 years
Of Stem Cell Advances

Our experience: from bench to bedside

1-Stem cell-based therapy for corneal failure

2-Intravitreal MSCs for optic neuropathies

Terav ISCIII
Red Española de Terapias Avanzadas - TerCel
Financiado por la Unión Europea NextGenerationEU

CMRTC
Centro en Red de Medicina Regenerativa y Terapia Celular de Castilla y León

GOBIERNO DE ESPAÑA
MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD
MINISTERIO DE CIENCIA E INNOVACIÓN

ciber-bbn
Centro de Investigación Biomédica en Red
Bioingeniería, Biomateriales y Nanomedicina

Junta de Castilla y León

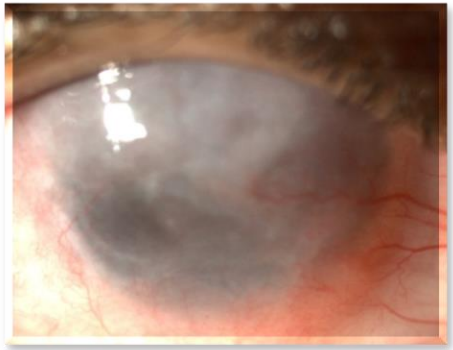
CLET: Cultured Limbal Epithelial Transplantation - 11 autologous, 9 allogeneic

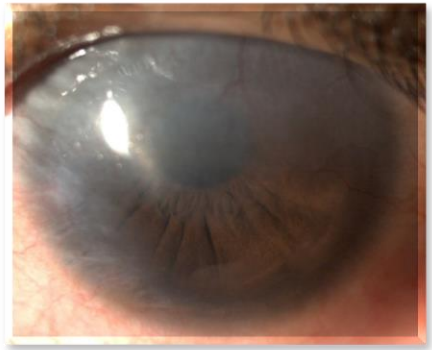
Clinical Trial > Biomed Res Int. 2015;2015:408495

Stem Cell Therapy for Corneal Epithelium Regeneration following Good Manufacturing and Clinical Procedures

Beatriz E. Ramírez,[1] Ana Sánchez,[2] José M. Herreras,[1,3] Itziar Fernández,[1,3] Javier García-Sancho,[2] Teresa Nieto-Miguel,[1,3] and Margarita Calonge[1,3]

[1]Institute of Applied Ophthalmobiology (IOBA), University of Valladolid, Campus Universitario Miguel Delibes, Pas 47011 Valladolid, Spain
[2]Institute of Molecular Biology and Genetics (IBGM), University of Valladolid, Valladolid, Spain
[3]Networking Center for Biomedical Research in Bioengineering-Biomaterials and Nanomedicine (CIBER-BBN), Carlos III National Institute of Health, Spain

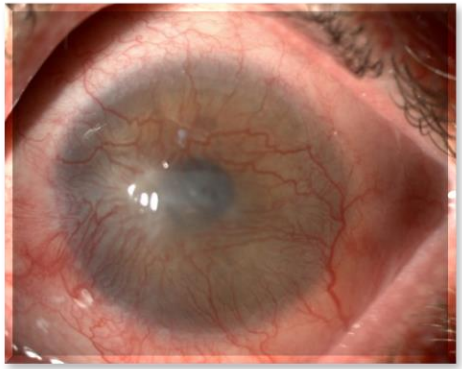


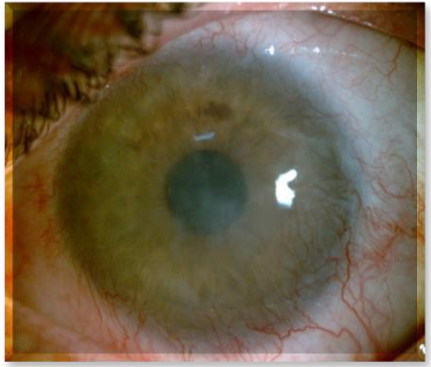


PRE

Chemical burn alloCLET

POST 12 m





SUCCESS

- **80% after 1 & 2 years**
- **75% after 3 years**

✓ **No difference between autologous and allogeneic transplants**

First clinical trial world-wide showing safety / efficacy of MSC in the eye

Calonge et al

AT A GLANCE COMMENTARY
Calonge M, et al.

Background

The current approach to corneal epithelial stem cell deficiency must be the replacement of stem cells. This randomized, controlled, and double-masked proof-of-concept clinical trial provides the first evidence that allogeneic bone marrow-derived mesenchymal stem cell transplantation (MSCT) to the ocular surface is as safe and as effective as allogeneic cultivated limbal epithelial cell transplantation (CLET), at facilitating recovery of potentially blinding corneal pathology due to limbal stem cell deficiency.

Translational Significance

This initial clinical success warrants the economic expenditure necessary for extensive evaluation of the mechanism of action of both CLET and MSCT before proceeding with multicenter clinical trials.

Clinical Trial > Transl Res. 2019 Apr;206:18-40.

A proof-of-concept clinical trial using mesenchymal stem cells for the treatment of corneal epithelial stem cell deficiency

MARGARITA CALONGE, INMACULADA PéREZ, SARA GALINDO, TERESA NIETO-MIGUEL, MARINA LóPEZ-PANIAGUA, ITZIAR FERNáNDEZ, MERCEDES ALBERCA, JAVIER GARCíA-SANCHO, ANA SáNCHEZ, and JOSé M. HERRERAS

VALLADOLID, SPAIN

SUCCESS 1st year

- **CLET - 78%**
- **MSCT - 86%**

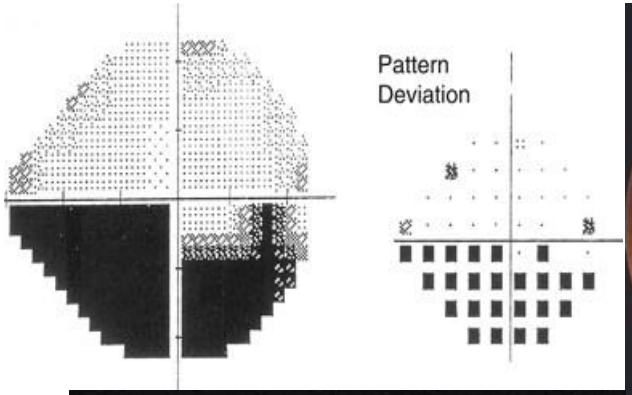
Non-Arteritic Ischemic Optic Neuropathy (NA-AION)

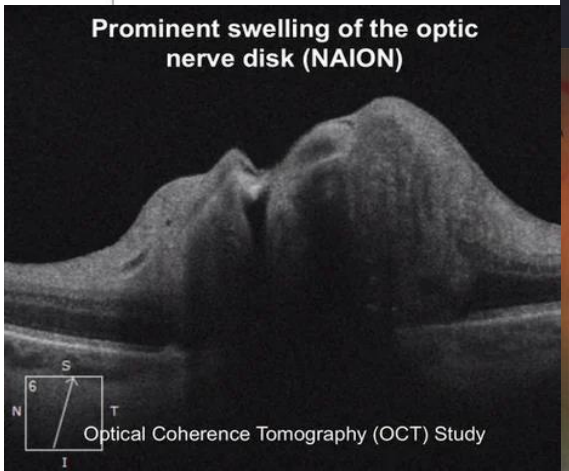
Optic nerve head infarct followed by inflammation

Clinical features:

- Acute, painless monocular visual loss
- Visual field defects
- Dyschromatopsia

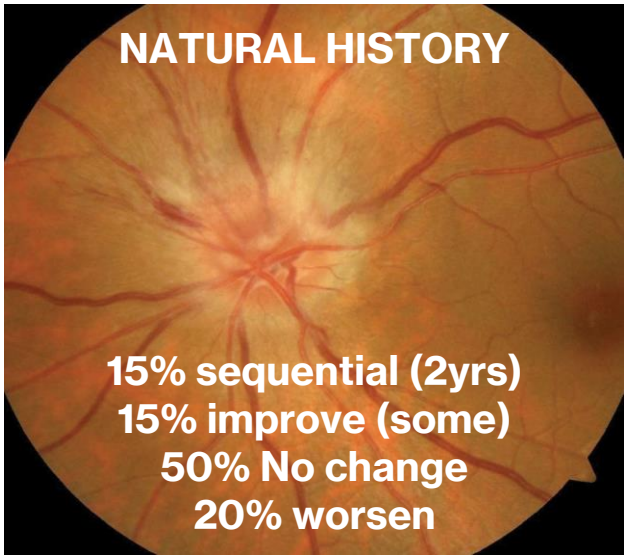
≥50 yo (61±12.3yo) (Hayreh SS et al., 2007)





Why alternative therapeutic approaches?

- Up to 30% spontaneous improvement (limited)
- 5-29% deterioration continues
- Recurrence in affected eye 6% (2 yrs), 8% in 3 yrs
- Fellow eye: 15-25% at 5 years (Beri et al. 1987; Newman et al. 2002)
- Treatments **(No effective treatments and no prevention for fellow eye):**
  - Antiplatelet agents (Aspirin®) (Kupersmith MJ et al. 1997; Beck RW et al. 1997)
  - Corticosteroids (Hayreh SS & Zimmerman MB, 2008)
  - Fenestration (Ischemic optic neuropathy decompression trial research group, 1995)
  - Diphenylhydantoin (Ellenberger C et al. 1974)
  - Levodopa (Beck RW et al. 2000; Hayreh SS, 2000)
  - Brimonidina (Wilhelm B et al. 2006)
  - Oestrogen (Bernstein SL et al. 2007)
  - Erythropoietin (Modarres M et al. 2012)



ioba
Instituto Universitario de Oftalmobiología Aplicada

Preclinical
***in vitro and ex vivo* testing**

Preclinical
in vivo testing

Clinical testing

From *in vitro* research to clinical trials

Organotypic neuroretinal cultures

iovs investigative ophthalmology & visual science — Leading clinical and laboratory ophthalmology and vision research — ARVO

Invest Ophthalmol Vis Sci. 2022 Apr; 63(4): 27. PMCID: PMC9055551
Published online 2022 Apr 29. doi: 10.1167/iovs.63.4.27 PMID: 35486068

Retinal Neuroprotective Effect of Mesenchymal Stem Cells Secretome Through Modulation of Oxidative Stress, Autophagy, and Programmed Cell Death

Ricardo Usategui-Martín,[1,2,3,4] Kevin Puertas-Neyra,[1] Nadia Galindo-Cabello,[1,5] Leticia A. Hernández-Rodríguez,[1] Fernando González-Pérez,[6] José Carlos Rodríguez-Cabello,[2,6] Rogelio González-Sarmiento,[7,8,9] José Carlos Pastor,[1,2,3,4] and Ivan Fernandez-Bueno[1,2,3,4]

Exp Eye Res. 2019 Aug:185:107671. doi: 10.1016/j.exer.2019.05.011. Epub 2019 May 17.

Mesenchymal stem cells provide paracrine neuroprotective resources that delay degeneration of co-cultured organotypic neuroretinal cultures

Sonia Labrador-Velandia [1], Maria Luz Alonso-Alonso [1], Salvatore Di Lauro [2], Maria Teresa García-Gutierrez [1], Girish K Srivastava [3], José Carlos Pastor [4], Ivan Fernandez-Bueno [5]

Affiliations + expand

PMID: 31108056 DOI: 10.1016/j.exer.2019.05.011

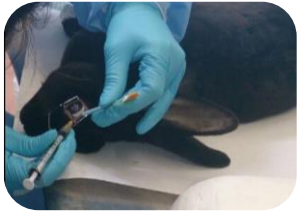
Mol Ther Methods Clin Dev. 2020 May 13:17:1155-1166. doi: 10.1016/j.omtm.2020.05.003. eCollection 2020 Jun 12.

Human Mesenchymal Stem Cell Secretome Exhibits a Neuroprotective Effect over *In Vitro* Retinal Photoreceptor Degeneration

Ricardo Usategui-Martín [1], Kevin Puertas-Neyra [1], María-Teresa García-Gutiérrez [1], Manuel Fuentes [2,3], José Carlos Pastor [1,4,5,6], Ivan Fernandez-Bueno [1,5,6]

Affiliations + expand

PMID: 32514411 PMCID: PMC7267685 DOI: 10.1016/j.omtm.2020.05.003



Graefes Arch Clin Exp Ophthalmol. 2018 Jan;256(1):125-134. doi: 10.1007/s00417-017-3842-3. Epub 2017 Nov 22.

Biocompatibility of intravitreal injection of human mesenchymal stem cells in immunocompetent rabbits

Sonia Labrador Velandia [1,2], Salvatore Di Lauro [1,2], Maria Luz Alonso-Alonso [1], Soraya Tabera Bartolomé [3], Girish Kumar Srivastava [1,4,5], José Carlos Pastor [1,2,4,5], Ivan Fernandez-Bueno [6,7,8]

Affiliations + expand

PMID: 29168045 DOI: 10.1007/s00417-017-3842-3

ClinicalTrials.gov NCT03173638

Ramirez *et al.* Biomed Res Int. 2015:408495

Clinical Trial > Stem Cell Res Ther. 2023 Sep 21;14(1):261. doi: 10.1186/s13287-023-03500-7.

Intravitreal allogeneic mesenchymal stem cells: a non-randomized phase II clinical trial for acute non-arteritic optic neuropathy

Jose C Pastor [1 2 3 4], Salvador Pastor-Idoate [5 6 7], Marina López-Paniagua [1 2 3 8], Marta Para [1], Francisco Blazquez [1 3], Esther Murgui [1], Verónica García [3 9 10], Rosa M Coco-Martín [1 2 3]

Affiliations + expand

PMID: 37735668 PMCID: PMC10512539 DOI: 10.1186/s13287-023-03500-7

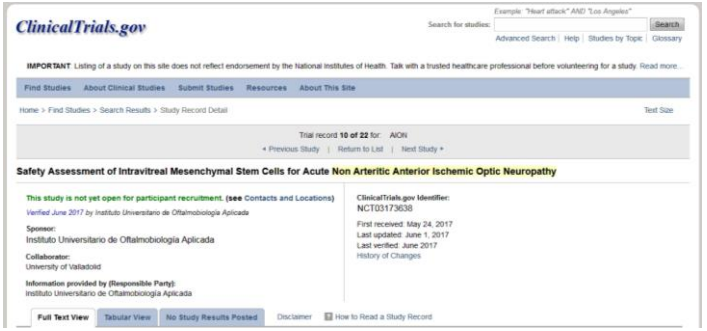
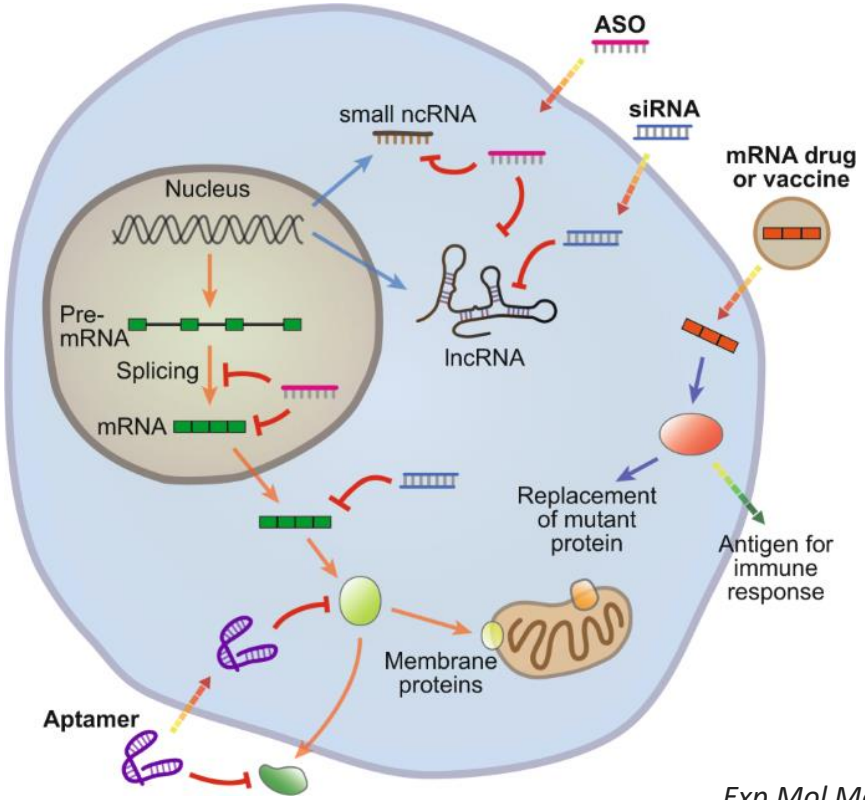
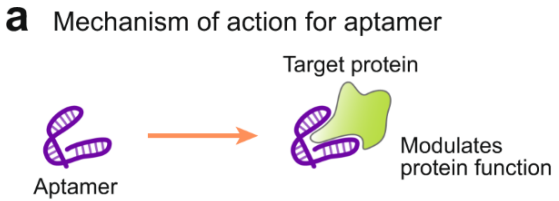


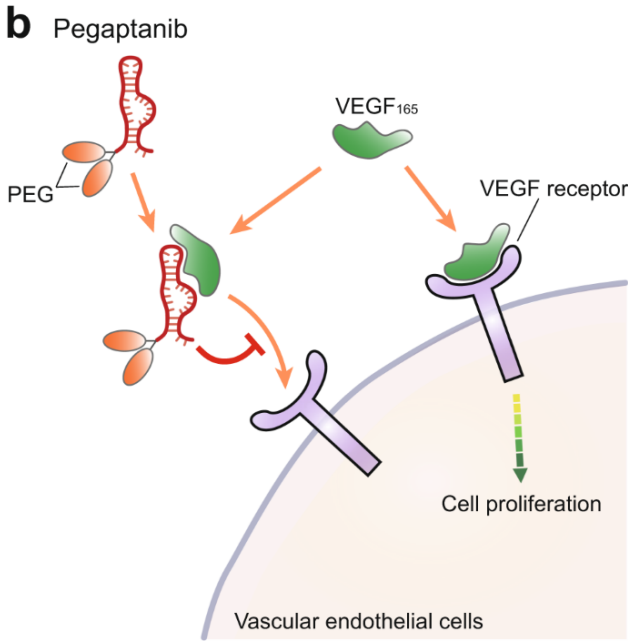
Table 1. Demographic Characteristics and BCVA Data (Letters)

Patient	Age Range	Gender	Eye	Date of Onset	Date of Injection	Systemic Risk Factors	Basal BCVA	BCVA 1 Month	BCVA 3 Months	BCVA 6 Months	BCVA 12 Months	Lens status
1	80s	Female	RE	25/11/2020	3/12/20	HBP, cardiopathy	17	26	25	23	27	Cataract progression from C1N1 to C1N2PSC1
2	60s	Male	LE	28/01/2021	8/2/21	No	0	35	54	63	54	Cataract progression from C1N1 to C1N2PSC3
3*	70s	Female	RE	8/03/2021	23/03/21	HCh	24	33	1	2	0	Pseudophakia needed
4	60s	Female	RE	19/02/2021	8/03/21	HBP, HCh	25	73	80	80	67	Cataract progression from C1N1 to C2N2PSC1
5	50s	Male	RE	15/03/2021	29/03/21	HBP	14	36	51	48	57	Pseudophakic

03. RNA-BASED THERAPEUTICS IN OPHTHALMOLOGY: OPPORTUNITIES & CHALLENGES

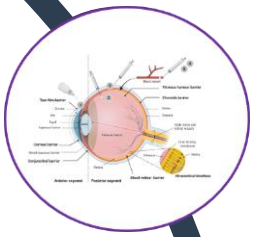






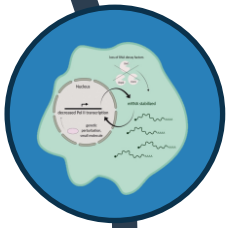
Exp Mol Med **54**, 455–465 (2022)

LIMITATIONS OF RNA THERAPY IN OPHTHALMOLOGY



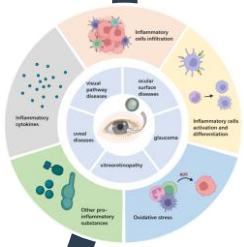
01 –OCULAR BARRIERS

- **Topical limitations**
- **Posterior segment targeting**: IRD
- **Invasive delivery:** i.e, intravitreal



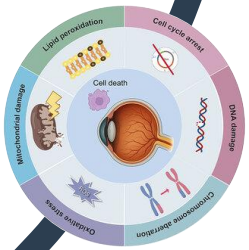
02 -DEGRADATION

- **Need for repeated treatments**
- **Short duration of action**
- **Patient burden**



03 -INNATE IMMUNITY

- **Activation of the innate immune system**



04 -UNINTENDED EFFECTS

- **Unintended silencing: unwanted gene silencing and cell death**
- **Potential off-target effects on non-targeted cells**

Academic Departments

Ophthalmology

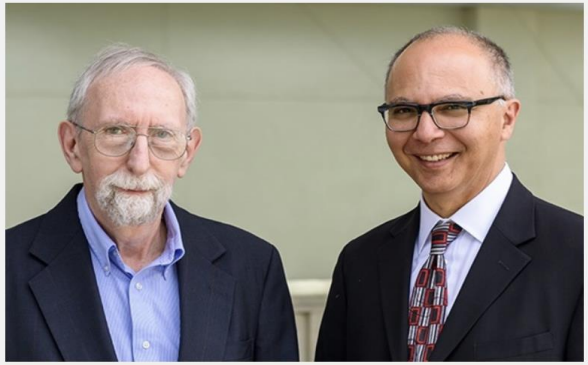
About Us

News

Welcome from Bennie Jeng, MD and Departmental News Articles

RNA Therapy Reverses Blindness in Patient After One Dose

RNA Therapy Reverses Blindness in Patient After One Dose



From left to right: Samuel G. Jacobson, MD, PhD, Artur V. Cideciyan, PhD

By Rebecca Salowe

Scheie Vision Annual Report 2021

In a recent publication in ***Nature Medicine***, Scheie researchers showed that a patient with a genetic form of childhood blindness gained vision that lasted for more than one year after receiving a single injection of an experimental RNA therapy. This study was led by **Artur V. Cideciyan, PhD** and Samuel G. Jacobson, MD, PhD, Professors of Ophthalmology and co-Directors of the **Center for Hereditary Retinal Degenerations**.

The patient was a participant of a larger international clinical trial for patients with Leber congenital amaurosis due to a *CEP290* mutation, which is a commonly implicated genetic cause for this disease. Patients with this mutation typically have severe visual impairment that begins in infancy.

Durable vision improvement after a single treatment with antisense oligonucleotide sepofarsen: a case report. *Nat Med* **27**, 785–789 (2021)

Clinical Pharmacists in Gene Therapy & ATMPs

EDUCATION & COUNSELING

Educate patients, caregivers, and healthcare staff on complex gene and cellular therapies

TOXICITY MANAGEMENT

Monitor and manage acute (CRS, neurotoxicity) and long-term toxicities (cytopenias, immune dysfunction)

OPERATIONAL OVERSIGHT

Ensure safe product handling, system onboarding, and coordination across treatment centers

PHARMACOVIGILANCE

Contribute to evolving standards in follow-up, vaccination, and long-term safety registries

FINANCIAL & ACCESS CHALLENGES

Navigate ultra-high therapy costs, insurance barriers, and support cost-effectiveness evaluations

COLLABORATION

Act as a bridge across multidisciplinary teams: physicians, nurses, finance, case managers, and regulators

The role of hospital pharmacists in supporting the appropriate and safe use of CGT/ATMPs: a scoping review of current insights., BMC Health Serv Res (2025)

EAHP Position on Advanced Therapy Medicinal Products (ATMPs)

Core Responsibilities 1

Hospital pharmacists are responsible for the safe use of ATMPs, both in clinical trials and routine practice

Education & training 2

Urgent need for harmonised European training on ATMPs (undergraduate & continuing education)

Pharmacoeconomics & assessment 3

Pharmacists' expertise is critical for evaluating cost-effectiveness and added value

Collaboration 4

EAHP calls for cooperation with scientific societies, patient organisations, and EU authorities

Ophthalmology relevance 5

Joint statement with the European Alliance for Vision Research highlights the pharmacist's role in gene therapy for rare eye diseases

EU|EYE

EU Trans Reg ID: 221589017973-83

A A A

EUROPEAN ALLIANCE FOR VISION RESEARCH & OPHTHALMOLOGY

Inspiring the next generation of ophthalmologists

EUROPEAN EYE BANK ASSOCIATION

EURETINA

EVER

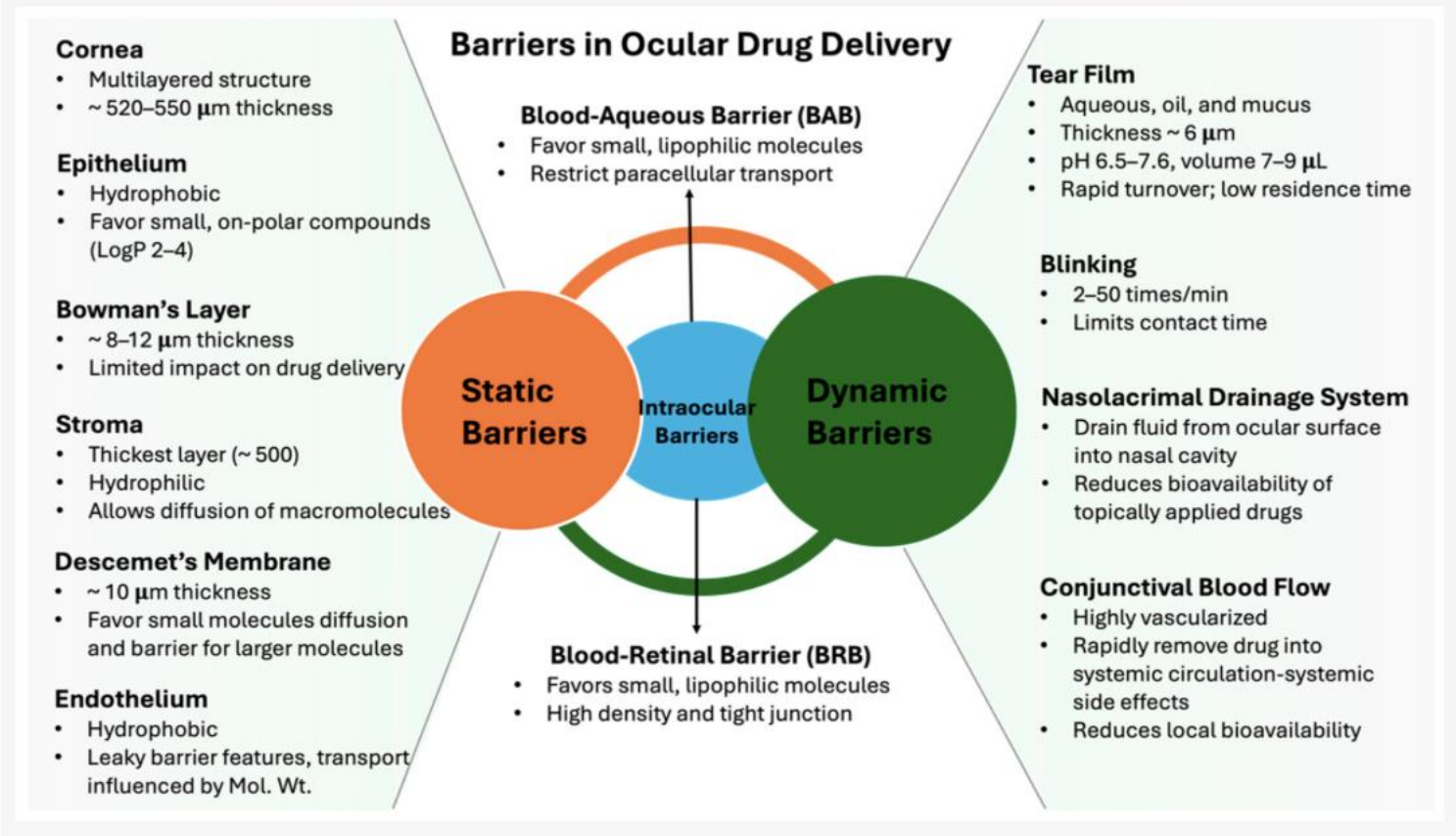
EGS

EASD

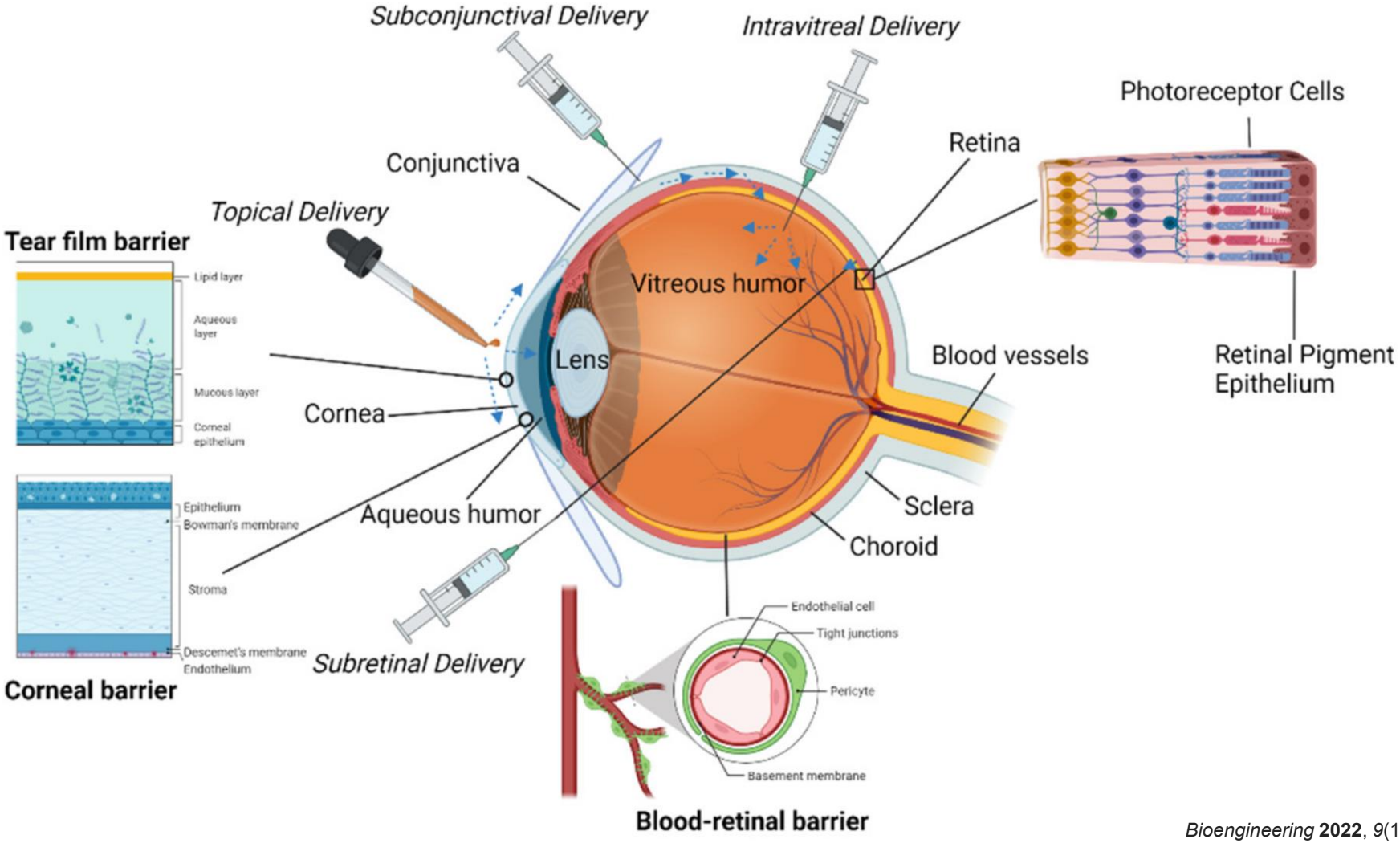
EVICR.net

aniridia-net.eu

04. Emerging Drug Approaches

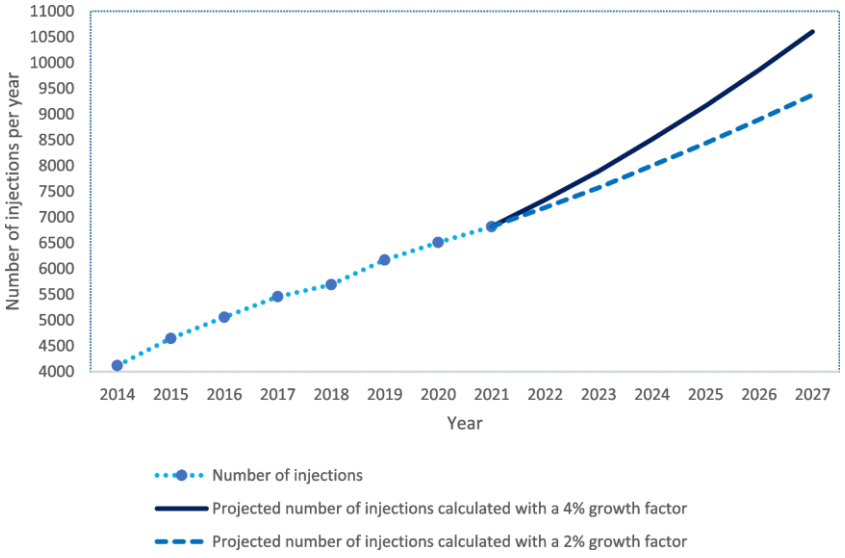


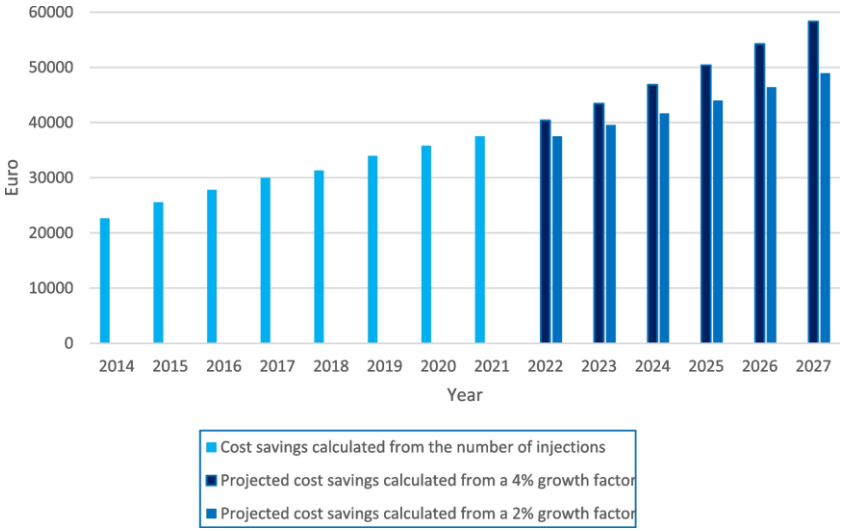
Pharmaceutics **2024**, *16*(10), 1325



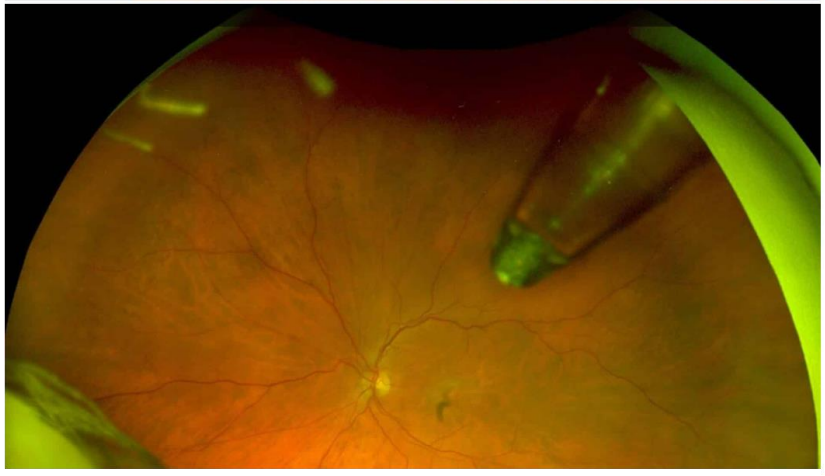
Bioengineering **2022**, *9*(1), 41

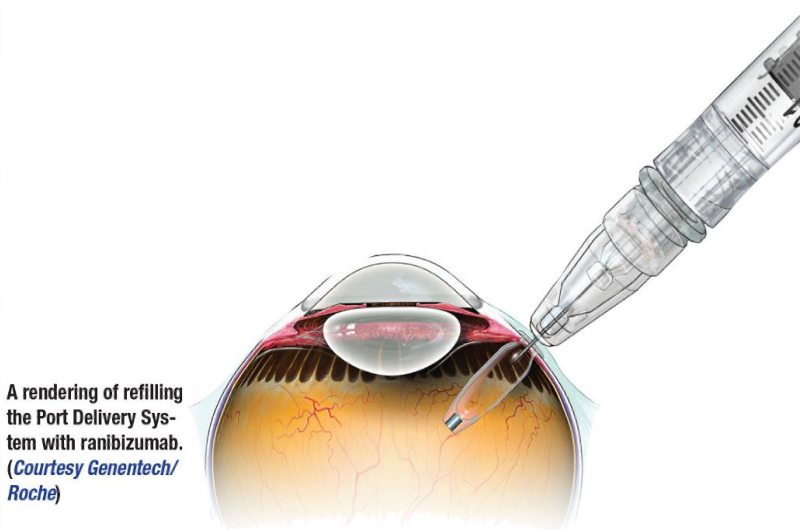
Cost Consequences of Task-Shifting Intravitreal Injections in a Norwegian Tertiary Hospital





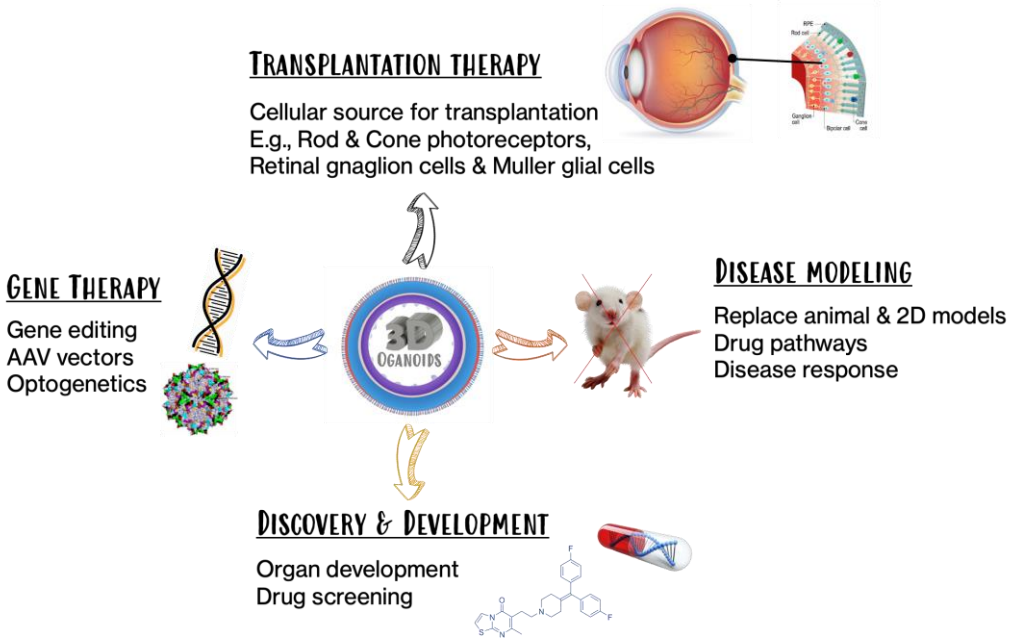
. *BMC Health Serv Res* **23**, 229 (2023). https://doi.org/10.1186/s12913-023-09186-0



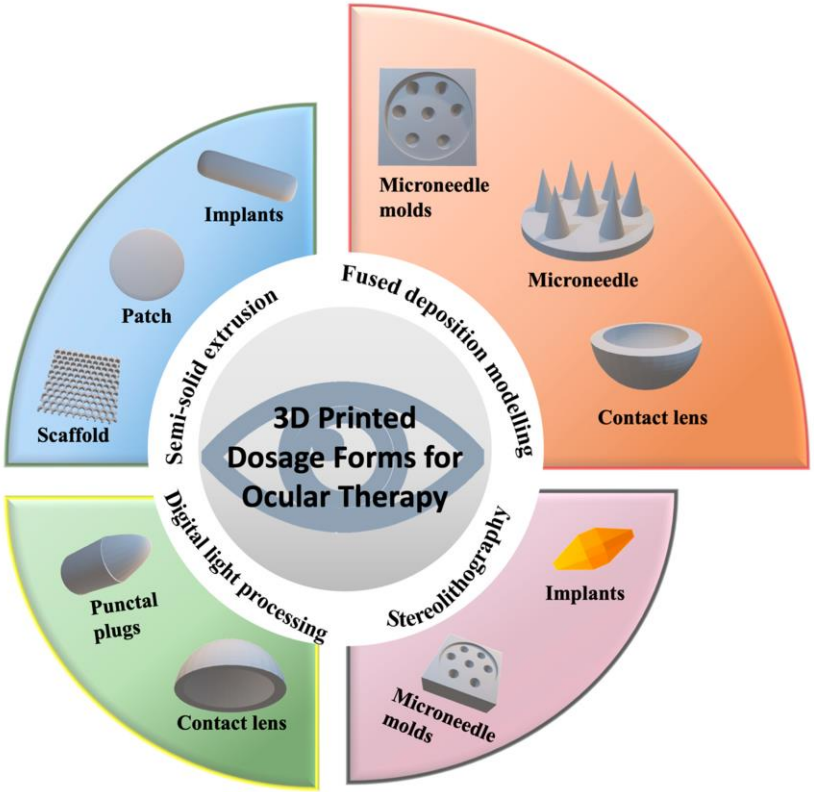


A rendering of refilling the Port Delivery System with ranibizumab. (*Courtesy Genentech/Roche*)

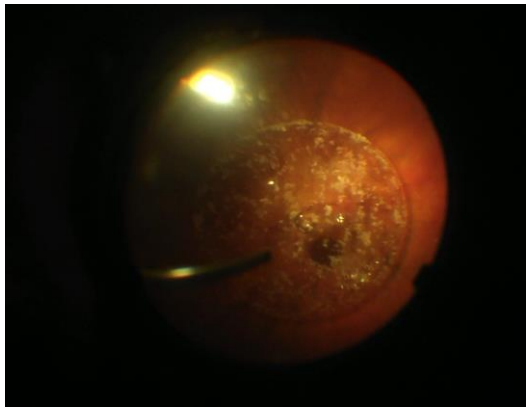
04. Emerging Biotech Solutions for Personalized Ocular Drug Delivery



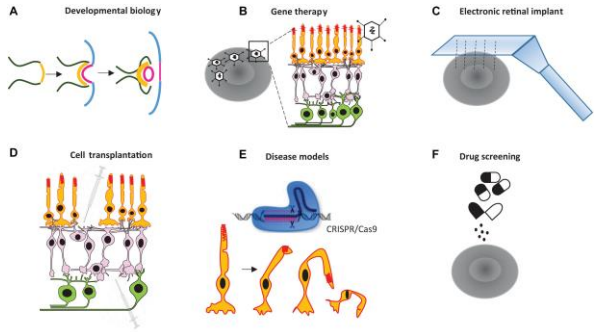
Adapted from Cells **2022**, *11*(21), 3429



Pharmaceutics **2024**, *16*(10), 1325



Toxicity Screens in Human Retinal Organoids for Pharmaceutical Discovery



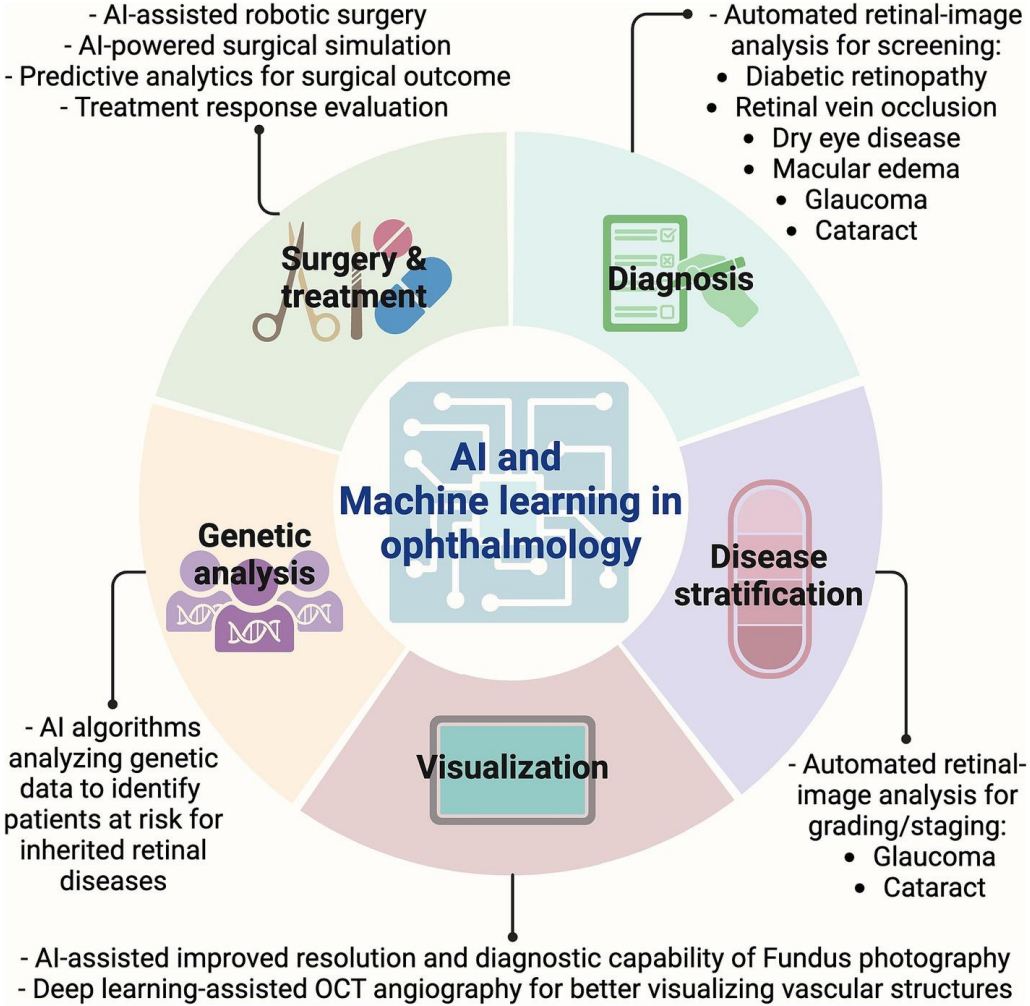
01

PROYECTO RETINA -4

FINANCIACIÓN

- **Proyecto PID2020-114585RA-I00**
- **Proyecto RD21/0002/0017**
  Grupos relacionados: GR10, GR11, GR14, GR32, GR41, GR52

05. AI



Front. Med., 28-4; 12, 2025

PRESCRIBING THE FUTURE: THE ROLE OF ARTIFICIAL INTELLIGENCE IN PHARMACY AND HEALTHCARE MAIN THEME

Key Areas of AI Impact:

- **Drug Discovery:** Faster new drug development.
- **Clinical Trials:** Optimized recruitment & analysis.
- **Medication Management:** Better dosing & tracking.
- **Personalized Care:** Tailored treatments.
- **Efficiency & Innovation:** Improved workflows & decisions.

Challenges & Considerations:

- Data Privacy & Security
- Algorithmic Transparency
- Regulatory Compliance
- Adoption Resistance

The Future of AI in Pharmacy:

- AI in healthcare drives innovation, reduces costs, and better dosing
- Pharma, regulators, and tech developers need to collaborate.
- Standardized AI frameworks ensure fairness, reliability, and compliance.

CHI PO NON VO,
CHI VO NON PO
CHI SA NON FA,
CHI FA NON SA
ET COSÌ IL MONDO MAL VA

Ascoli Piceno- A.D. 1529

En definitiva, las terapias avanzadas en oftalmología **no solo** requieren innovación científica, sino también ***integración real entre especialidades***

El farmacéutico hospitalario y el oftalmólogo ***no pueden actuar en paralelo,*** sino como engranajes de un mismo sistema terapéutico

Sapere Aude Reflexión ante nuevos retos

Gracias

Salvador.pastor@uva.es

CONGRESO NACIONAL
SOCIEDAD ESPAÑOLA DE FARMACIA HOSPITALARIA
MÁLAGA 15-17 OCT 25

sefh Sociedad Española de Farmacia Hospitalaria

SEO Sociedad Española de Oftalmología