

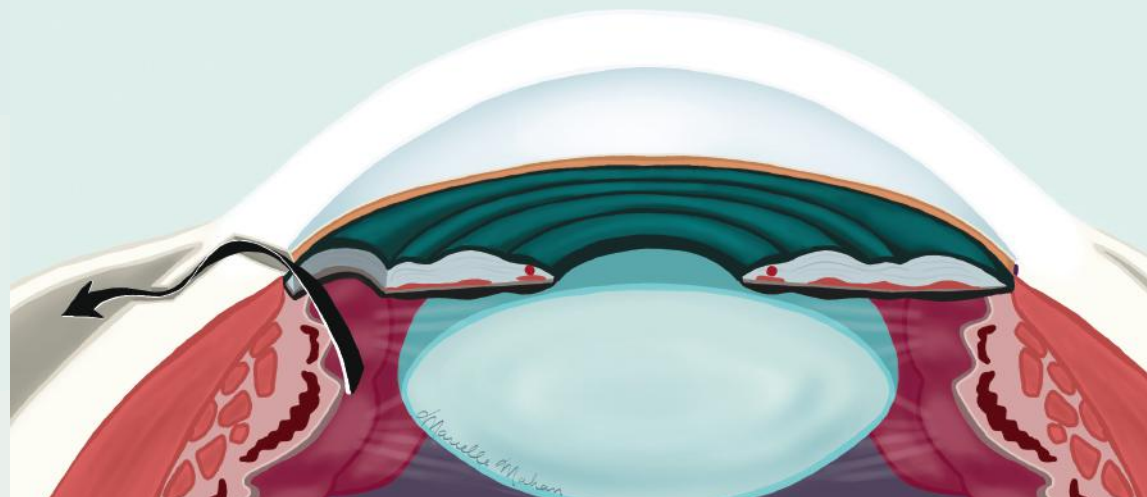
# GLAUCOMA PIPELINE A VIEW INTO ONGOING INNOVATION

2022 SURGICAL

VIEW INTERACTIVE  
VERSION ONLINE



## Filtering Bleb Procedures



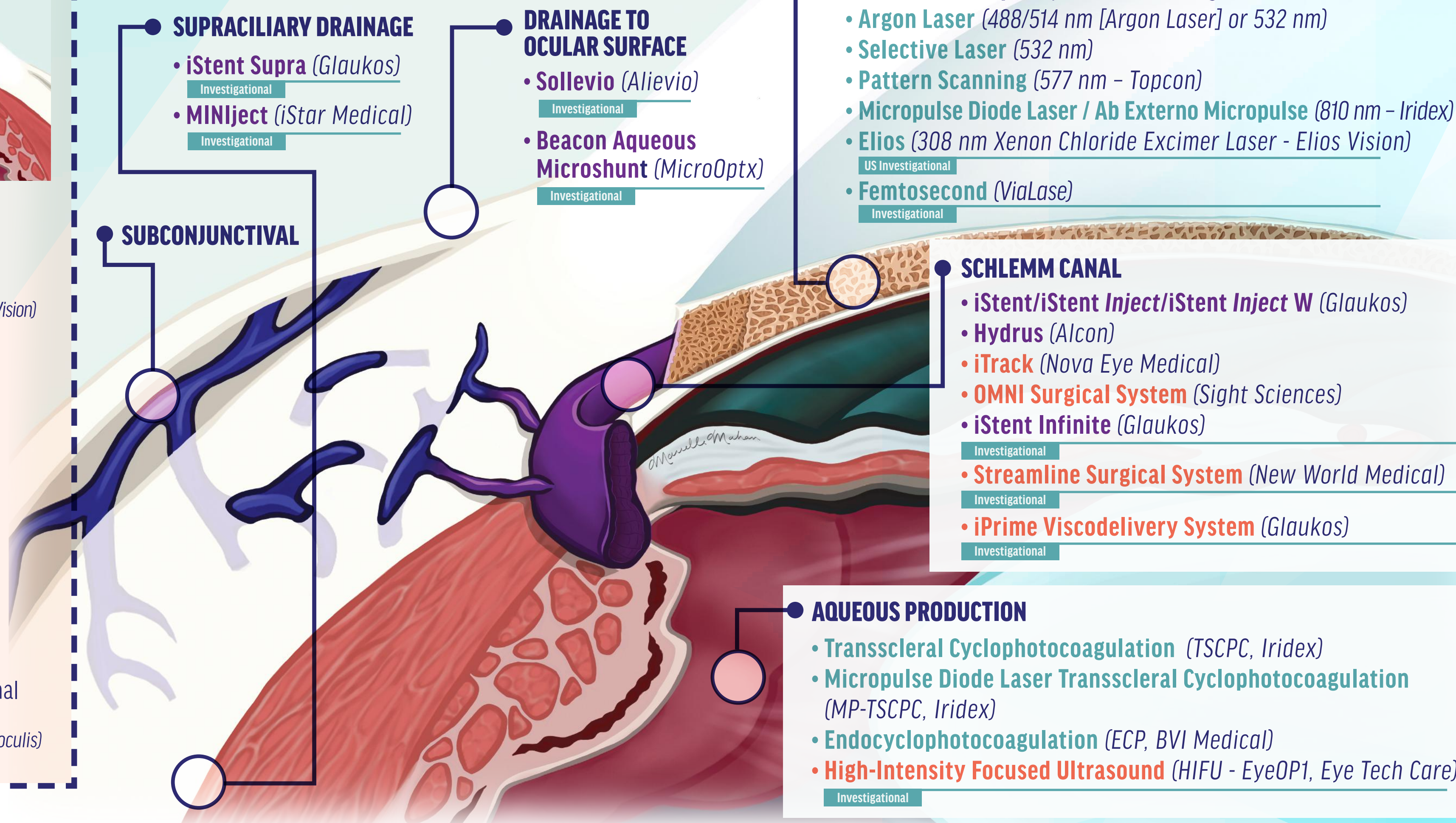
### TRADITIONAL INCISIONAL SURGERIES

- Trabeculectomy
- Aqueous Drainage Devices
  - **Baerveldt Glaucoma Implant** (Johnson & Johnson Vision)
  - **Ahmed Glaucoma Valve** (New World Medical)
  - **Ahmed ClearPath** (New World Medical)
  - **Molteno3** (Molteno Ophthalmic)
  - **Paul Implant** (Advanced Ophthalmic Innovations)  
US Investigational
  - **eyeWatch** (Rheon Medical)  
US Investigational
- **Ex-Press** (Alcon) – external

### MINIMALLY INVASIVE BLEB SURGERIES

- **Xen45 / Xen63 Gel Stent** (Allergan, an AbbVie company) – internal/external
- **PreserFlo MicroShunt** (Santen/Glaukos) – external  
US Investigational
- **Minimally Invasive Micro Sclerostomy** (MIMS, Sanoculis)  
US Investigational

## Procedural Glaucoma Options by Target Within the Aqueous Pathway



COLOR LEGEND  
Implant  
Surgical Device/Instrument  
Laser



**IQBAL IKE K. AHMED, MD, FRCSC**

With new devices recently coming to market, and others in late stages of development, the options are expanding for specialists to intervene across the spectrum of glaucoma severity and subtype with interventions that do not rely on patients' compliance. Owing to their potential to spare or reduce medication use and positively impact quality of life, procedural options also challenge the clinician to rethink the definition of a successful outcome.



**MARIELLE MAHAN, MD**

Dr. Mahan collaborated with Dr. Samples, Dr. Ahmed, and the BMC Vision publications to illustrate original figures for this year's poster.

**CRST** **GT**  
Cataract & Refractive Surgery Today    Glaucoma Today  
**MODERNOPTOMETRY**



## Protecting the World's Vision

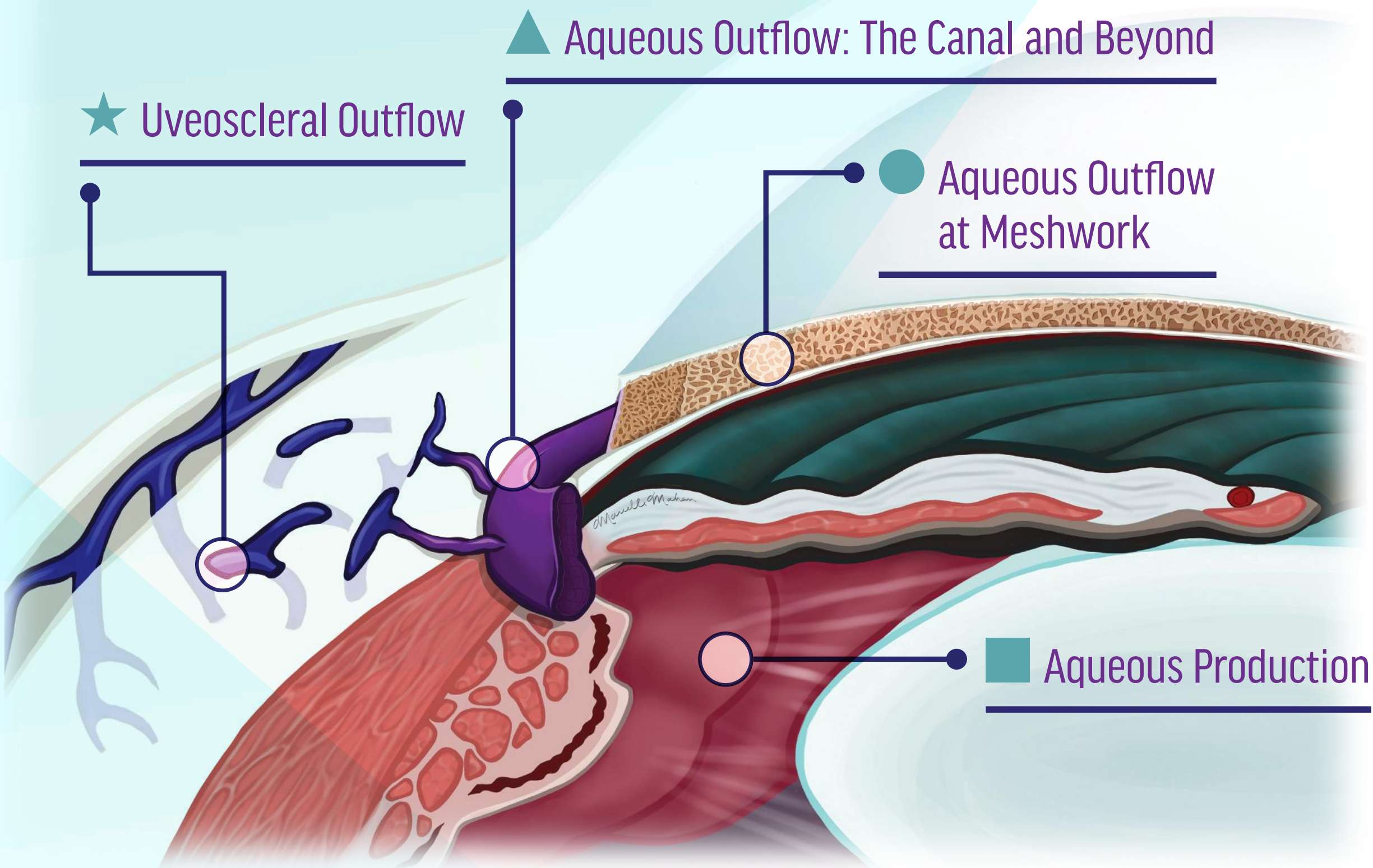
Our Commitment to Eye Care  
Will Always Endure



Imagine Your Happiness



Content guidance and source: John R. Samples, MD; Iqbal Ike K. Ahmed, MD, FRCSC; and Marielle Mahan, MD  
\*Editorially independent content supported by advertising from Santen



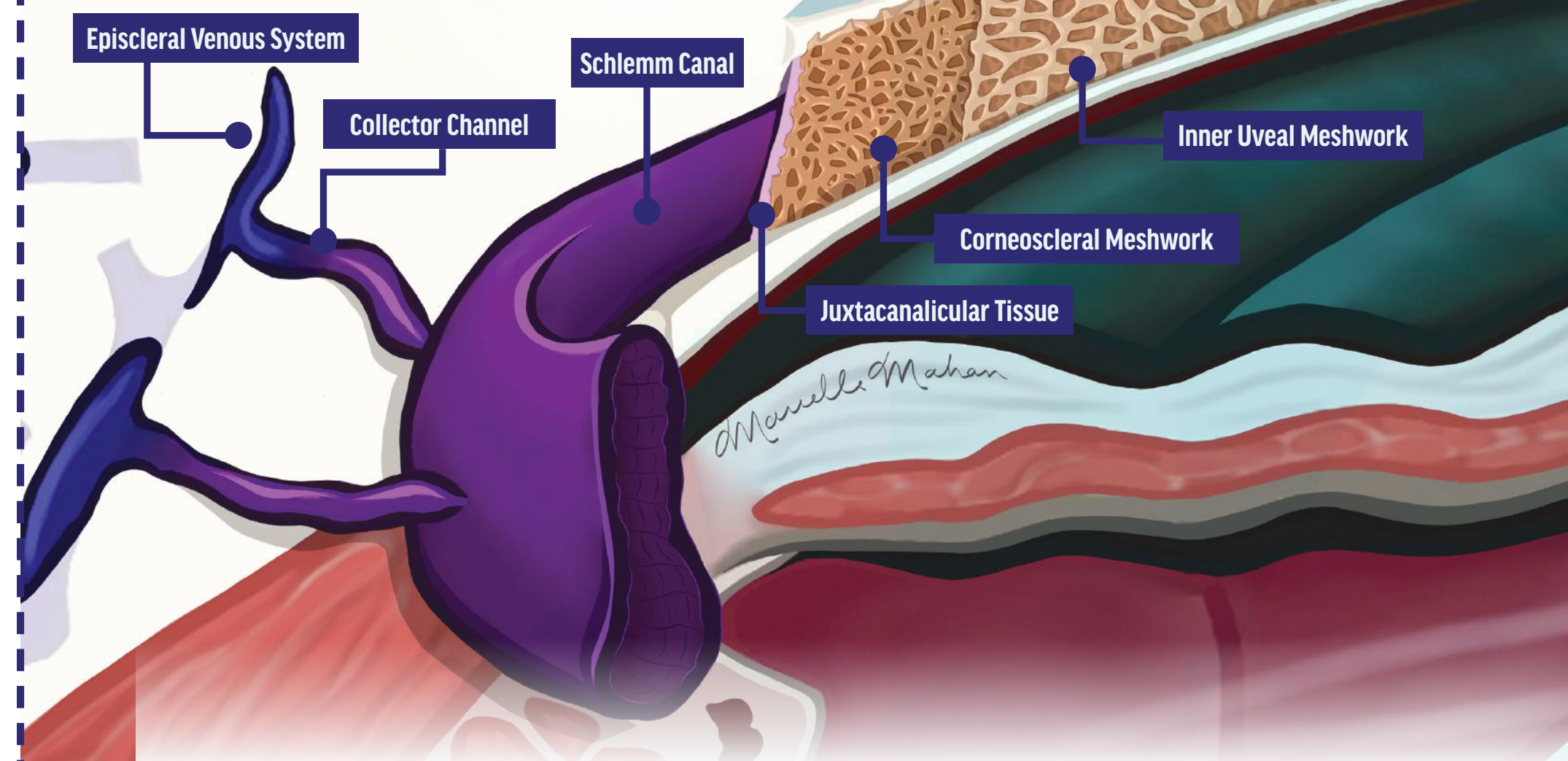
## Addressing the Etiology of High IOP

### TREATING THE CAUSES OF GLAUCOMA

Several lines of research suggest the potential to address the initiating events leading to pressure elevation and damage to the optic nerve. Investigations are ongoing in two broad areas:

1. Reversing structural/functional damage in the TM.
2. Reversing Schlemm canal/juxtacanalicular tissue stiffening.

Within the context of disease modification, there is also significant interest in strategies that address outflow resistance in the ostia/collector channels/episcleral veins.



\* While this image is generally representative of the TM structure as it is currently understood, it cannot properly demonstrate that aqueous outflow is pulsatile and segmental based on the non-uniform appearance of distal outflow structures around the 360° TM.

### GLAUCOMA MEDICATIONS / CLASSES

- ▲ ● ★ Prostaglandins
- ▲ ● ★ Nitric Oxide-Donating Compounds
- ▲ ● Rho Kinase Inhibitors
- ★ Omidenepag Isopropyl (DE-117, Santen) Pipeline
- ▲ ● ★ NCX 470 (Nicox) Pipeline
- ★ Muscarinic Agonists (Miotics)
- Beta-Blockers
- ★ Alpha-Agonists
- Carbonic Anhydrase Inhibitors
- ▲ ATP Potassium Channel Openers Pipeline
- ★ Autotaxin-Lysophosphatidic Acid Pipeline

#### LEGEND

Current drug classes

Novel/Investigational therapy approaches

### COMBINATION MEDICATIONS

(Advantages ↑ compliance, adherence ↓ preservative, copy)

- ▲ ● ★ Rocklatan (Netarsudil and Latanoprost; Aerie)
- Cosopt / Cosopt PF (Dorzolamide HCl & Timolol Maleate; Akorn)
- ★ Combigan (Brimonidine Tartrate & Timolol Maleate; Allergan, an AbbVie company)
- ★ Simbrinza (Brimonidine Tartrate & Brinzolamide; Novartis)

### EXTENDED DURATION OPTIONS

#### Intracameral

DURYSTA (Bimatoprost SR; Allergan, an AbbVie company)

ENV515 (Aerie) Pipeline

iDose (Glaukos) Pipeline

#### External Ocular Insert

Bimatoprost Ocular Ring (Allergan, an AbbVie company) Pipeline

#### Punctal Plug

Evolute (Mati Therapeutics) Pipeline

## Medical Strategies for Neuroprotection

### 1. SUSTAIN RETINA GLIAL CELL VIABILITY

Promote non-amyloidogenic beta pathway

- Brimonidine

Decrease glutamate-induced excitotoxicity

- Memantine
- Brimonidine

Suppress oxidative stress

- Ginkgo biloba extract
- Omega 3

Inhibit mitochondrial dysfunction

- Coenzyme Q10 and Vitamin E
- Ginkgo biloba extract

Stimulate cell survival pathway

- Valproic acid

### 2. PROMOTE REGENERATION

Replace neurotrophin

- Brain-Derived Neurotrophic Factor, Nerve Growth Factor, Ciliary Neurotrophic Factor
- Mesenchymal stem cells
- Umbilical cord serum

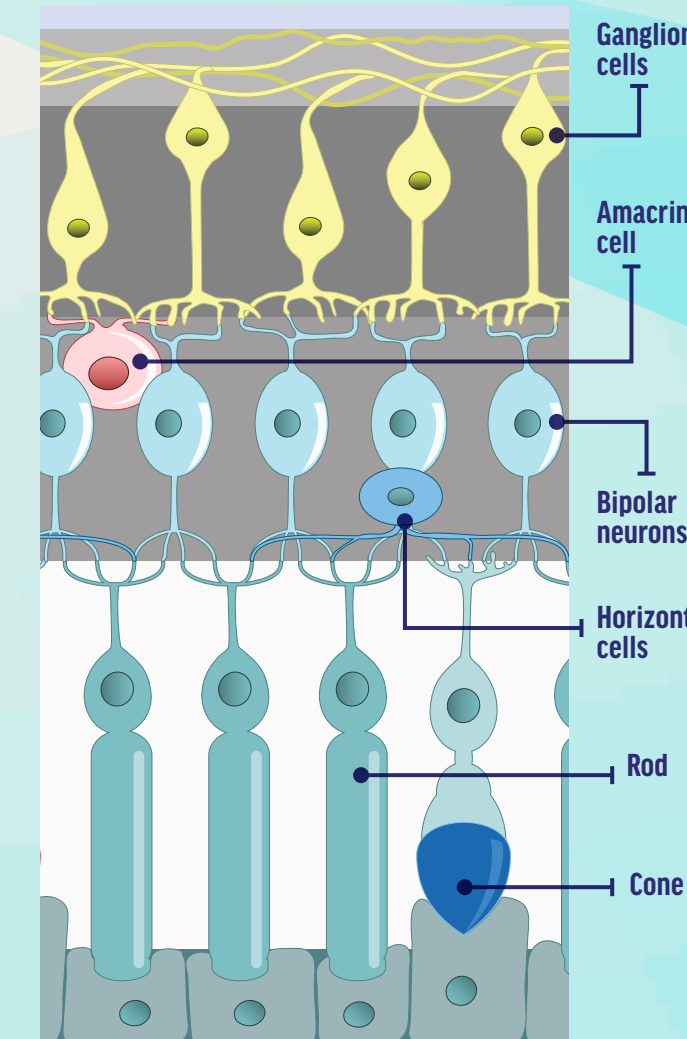
Stimulate non-glutamatergic neurotransmitter synthesis

- Citicoline

### 3. NEUROENHANCEMENT

Block sodium channel

- Phenytoin



### JOHN R. SAMPLES, MD

While targeting IOP as the only known modifiable risk factor for glaucomatous progression remains a viable strategy, there is cautious optimism regarding new therapeutics with truly novel targets. An era in which we seek to modify the glaucoma disease process, treat its root causes, and/or reverse damage may be closer than we think.



### MARIELLE MAHAN, MD

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