20|20 OptimEyes Technologies

Mucoadhesive Micelle NanoParticles: A New Dosing Paradigm for Glaucoma Treatment

Frances Lasowski, Heather Sheardown, Renaud Jacquemart
20/20 OptimEyes Technologies

Ben Muirhead, Talena Rambarran, Lina Liu, Aftab Taiyab
McMaster University

Hamilton, ON Canada

Conventional Eye Drops Don’t Work Well

90%

of ophthalmic pathology is treated with eye drops, including glaucoma but...

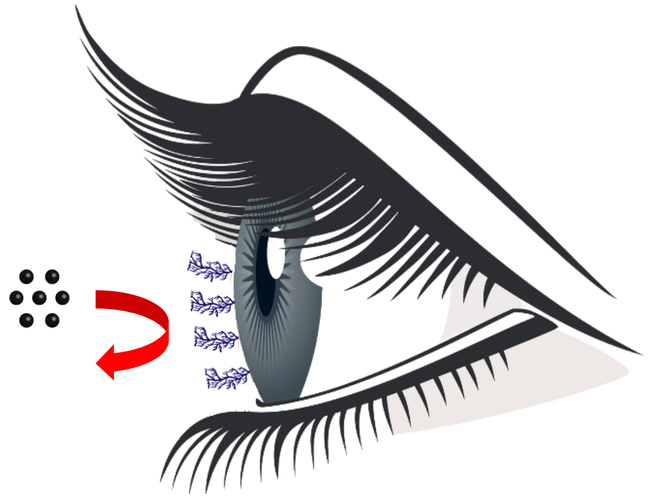
95%
is lost after
the first blink

Low bioavailability
results in wasted drug
and systemic
exposure

Uncomfortable and
irritating formulations
due to low drug
solubilities

Poor patient
compliance from
frequent dosing

Standard of Care



Non-encapsulated APIs
suffer from limited
absorption and retention,
reducing bioavailability

MNPs CAN SOLVE THESE PROBLEMS

Lead Indication: Glaucoma

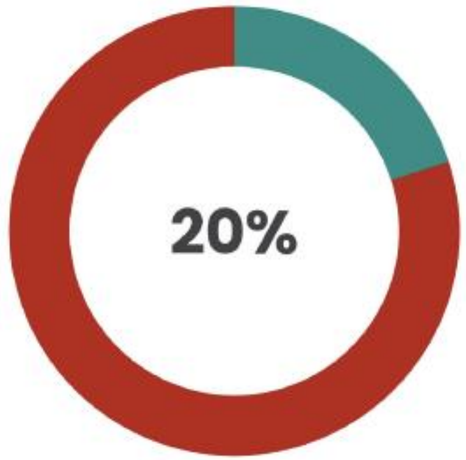
Why Glaucoma? The glaucoma market is:

- large and growing worldwide
- has a major compliance issue:
- addressable by drug delivery

Large & Growing Market

- **60M** people worldwide affected by open-angle glaucoma
- **3%** incidence of glaucoma in the United States
- **22M** people worldwide suffering vision loss due to glaucoma by 2040

Major Compliance Issue



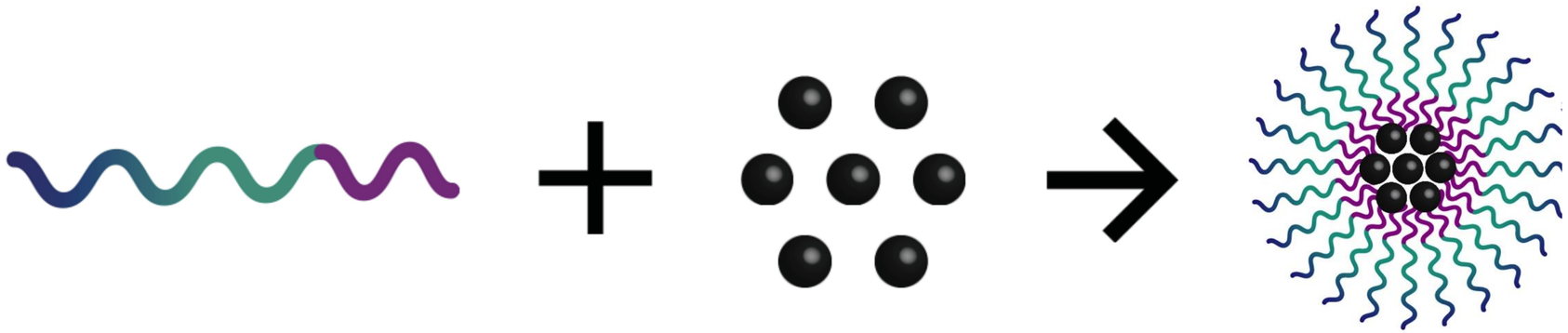
Only 1 out of 5 patients were compliant with their dose

Compliance Issues Addressable by Drug Delivery

- Glaucoma eyedrop adherence studies suggest that fewer drops could be a strategy for improved accuracy, adherence and patient outcomes.
- Payers have confirmed that products that are dosed less frequently could have premium reimbursement.

OptimEyes' Mucoadhesive NanoParticle Technology Platform

Our MNPs are a proprietary next generation drug delivery platform that maximizes the efficacy of new and existing APIs to improve patients' lives



Proprietary Polymer | Hydrophobic Drug | MNPs

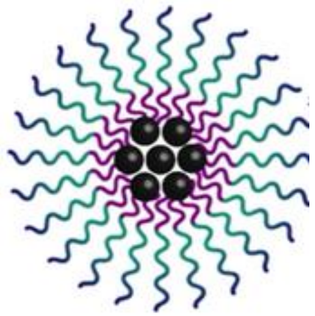
Patents are granted in the US, Europe, Japan and Canada.

MNPs provide a protective micelle environment that enhances drug solubility, stability and absorption at the body's mucosal barriers

A Versatile Platform for Ophthalmic Drug Delivery

OptimEyes' MNP platform represents a paradigm shift in ophthalmic drug delivery:

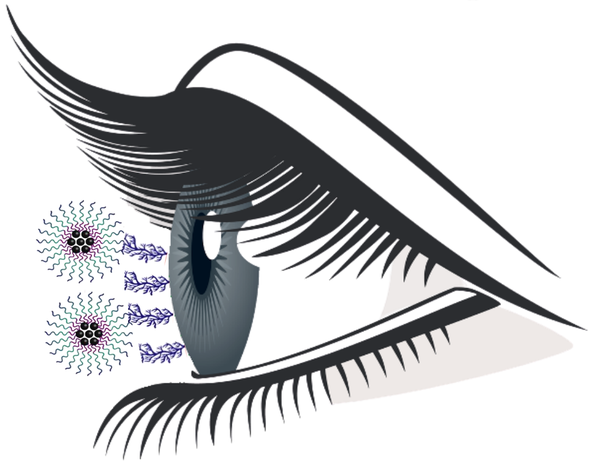
MNPs



Enable sustained release through encapsulation (fewer doses needed)

+

Mucosal Binding



Polymeric micelles adhere to mucosal surfaces

→

- Longer Residence Time
- Increased Drug Loading
- Increased Bioavailability
- Improved Patient Outcomes

Thanks to our platform's unique mucoadhesive properties, our MNPs:

- **Optimize the delivery of topical drugs**
- **Show strong potential for systemic delivery**

Proof of Concept Validation Shows Excellent Safety, Tolerability and Efficacy

INCREASED DRUG LOADING

- 40x Latanoprost
- 3x Cyclosporine A
- Enabled formulation of proprietary drug

IN VITRO EXTENDED DRUG RELEASE

- Latanoprost - 2 weeks
- Cyclosporine A – 1 week

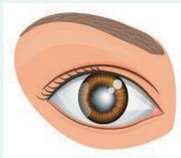
SAFETY

- No adverse events

TOLERABILITY

- Well-tolerated for all drugs at all loadings

EFFICACY: PRECLINICAL PROOF OF CONCEPT

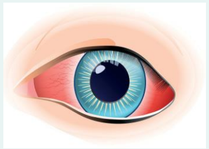


GLAUCOMA

- Reduction of IOP for 3-5 days on single drop
- Increased aqueous humour drug levels

DRY EYE

- One MNP drop every 3 days equivalent to standard of care
- Increased corneal drug levels



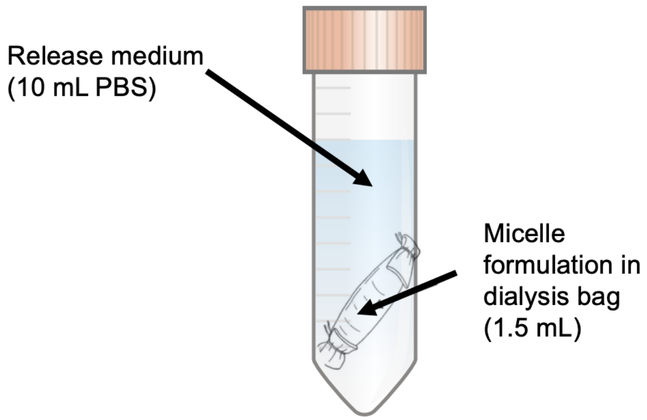
UVEITIS

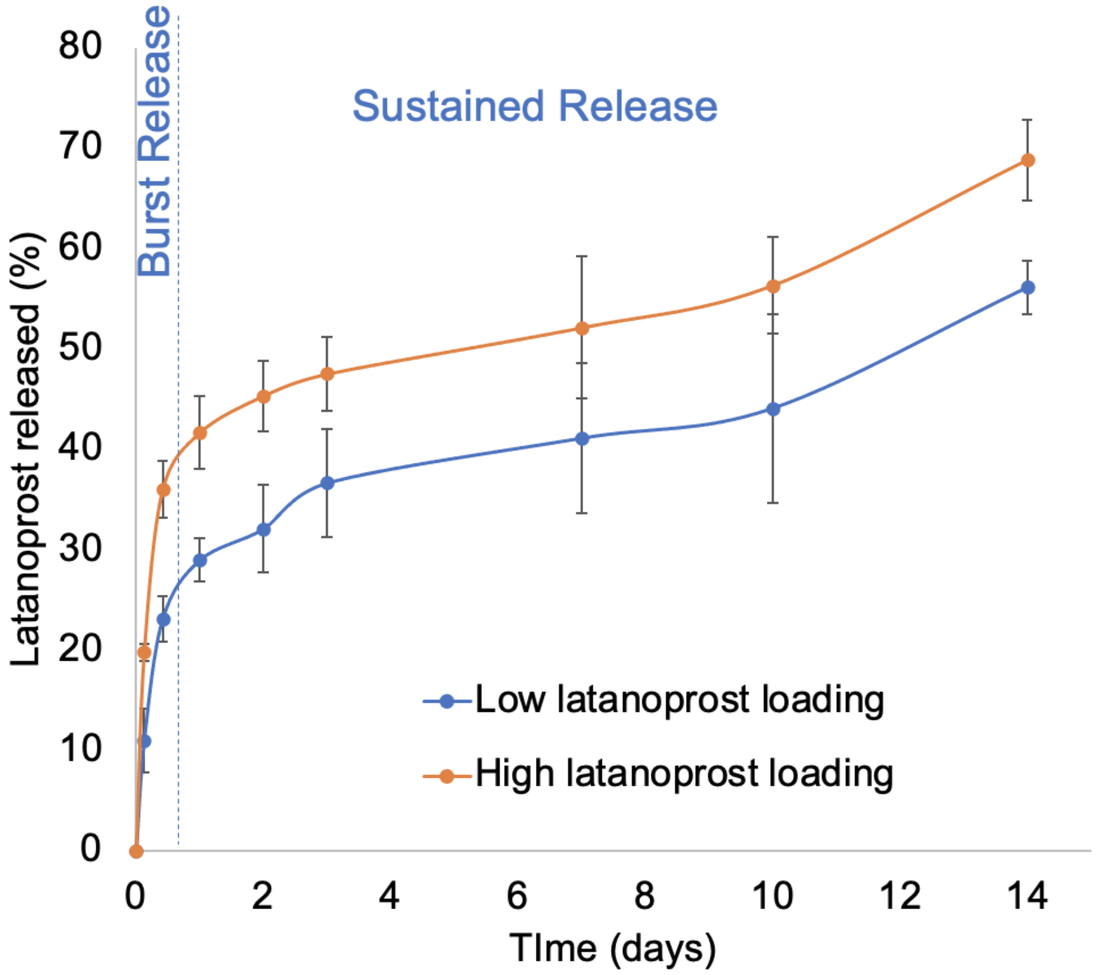
- Novel non-steroidal formulation resolves inflammation faster
- Fewer white blood cells

MNPs DEMONSTRATE SUPERIOR PERFORMANCE TO SOC

Latanoprost Loaded MNPs show Sustained Release up to 2 Weeks

Release medium: 10 mL PBS (pH 7.4, 10 mM)
Temperature: 37°C
Stirring: 100 rpm
Sampling: 1 mL with replenishment
Sampling time points: 3h, 10h, 24h, 48h, 7d, 10d, 14d

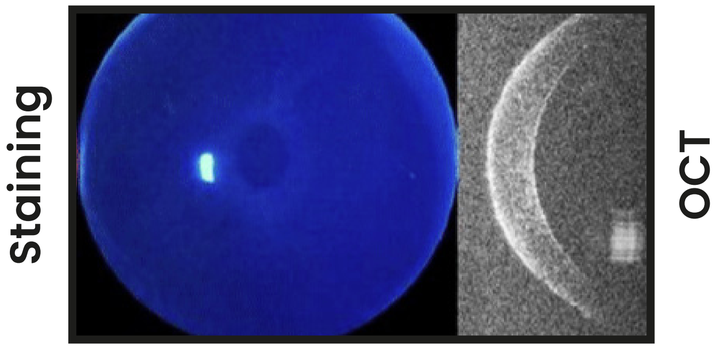




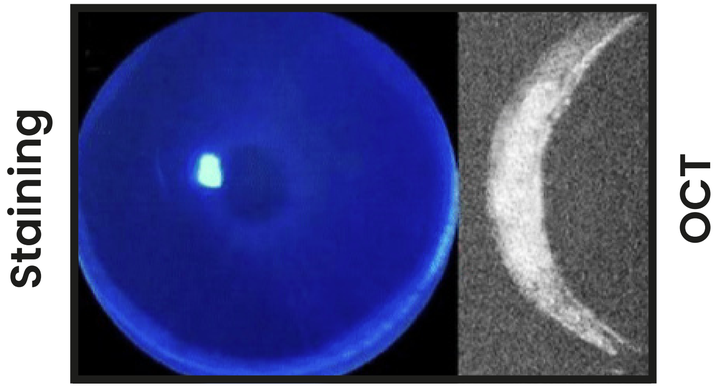
Latanoprost releases initially in a short burst release followed by 2 week sustained release

MNPs Show Excellent Safety and Tolerability in 2 Animal Species

PBS Control

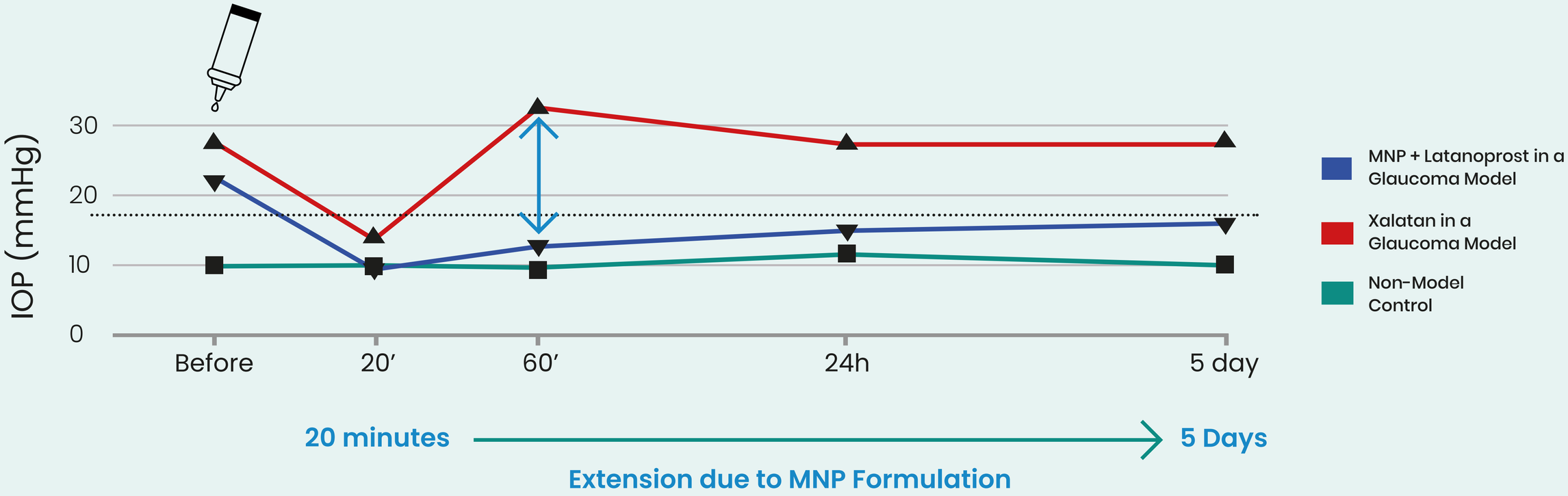


MNP Formulation

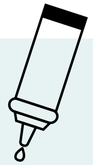


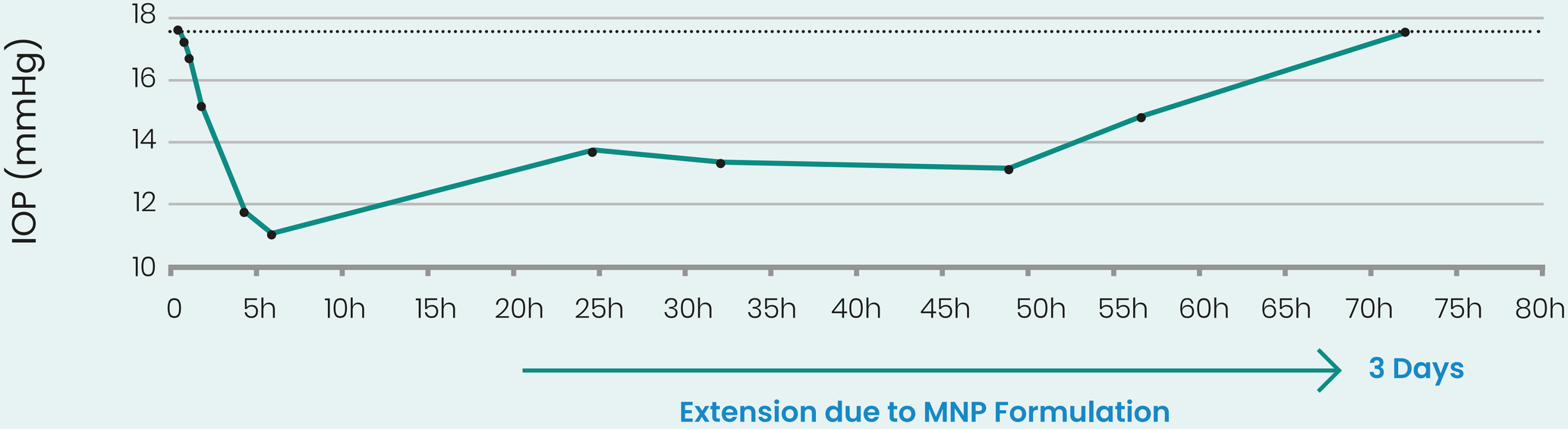
No signs of corneal thickening, morphology changes or irritation at various MNP dose levels

Latanoprost Loaded MNPs Reduce IOP for Over 5 Days with a Single Drop in a Genetic Mouse Model



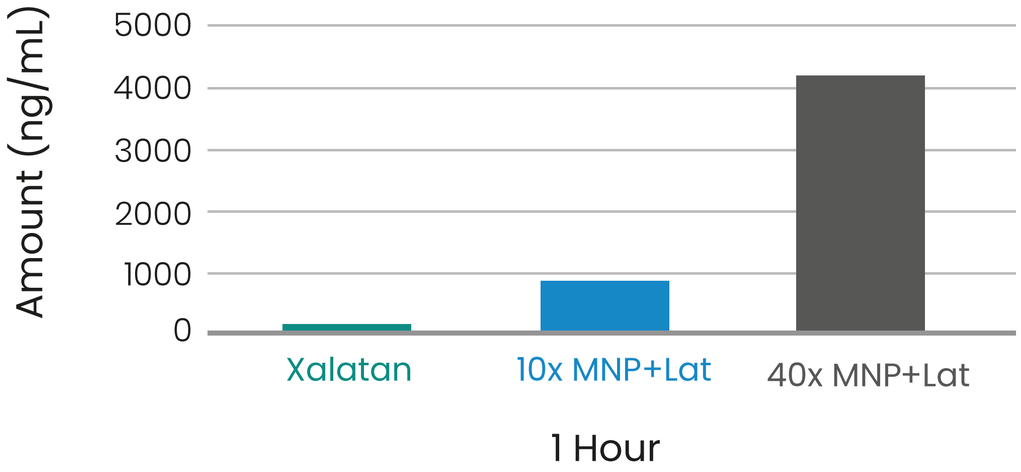
Latanoprost Loaded MNPs Reduce IOP for 3 days in Normotensive Dogs with a single drop

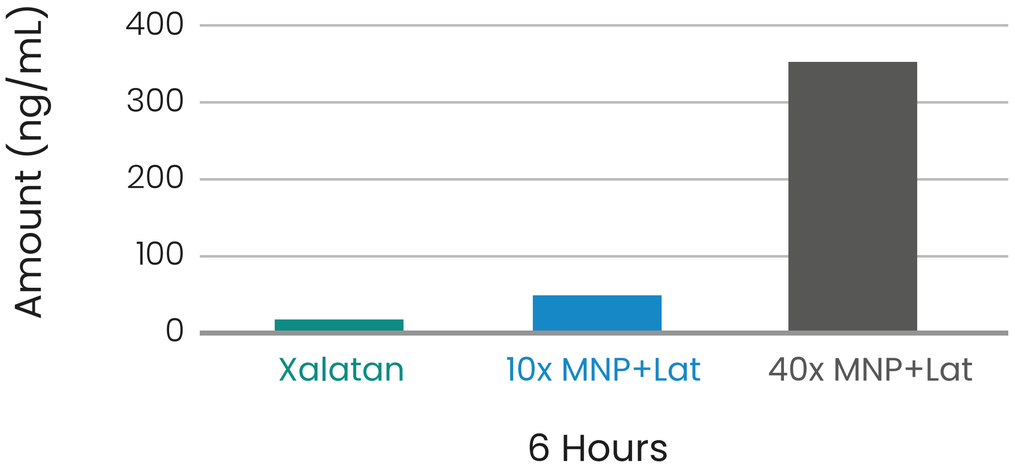




MNPs' Adherence and Sustained Release Provide Greater Aqueous Humour Drug Levels Compared to Current Treatment

Results after single drop in New Zealand White Rabbits





OptimEyes' Team is Working to Move this into Clinic

20|20 OptimEyes Technologies

Fran Lasowski, PhD
Co-Founder & CEO

Heather Sheardown, PhD
Co-Founder & CSO

Renaud Jacquemart, PhD, MBA
Co-Founder & COO

C20|20 INNOVATION HUB

McMaster University

Technical Leads

Talena Rambarran, PhD
Synthesis

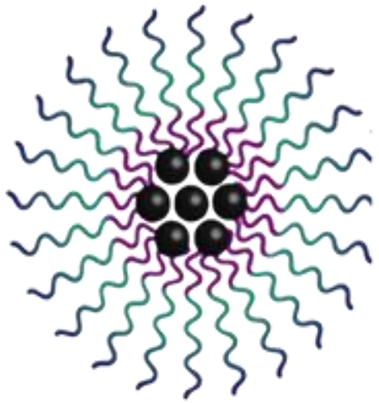
Lina Liu
In Vitro Testing

Ben Muirhead, PhD
In Vivo

Latanoprost Loaded MNPs Can Address Glaucoma Treatment Challenges

PROBLEM

The potential of topical drugs is not fully leveraged- including in glaucoma



SOLUTION

OptimEyes' MNPs maximize the efficacy of new and existing APIs, including latanoprost

- Increased Loading of Drugs - up to 40x Latanoprost
- Sustained in vitro delivery- up to 2 weeks

- Excellent Safety and Tolerability in 4 species
- Efficacy up to 5 days with a single drop
- Greater Bioavailability in Relevant Tissues

- Tested in other ocular conditions
- Applications at body-wide mucosal surfaces

- Scalable platform for human and veterinary health

20|20

OptimEyes

Technologies

BETTER VISION NOW

Frances Lasowski, PhD
905.978.9262
Frances@2020optimeyes.ca

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McMaster University