

# Novel Injectable Otic Drug Delivery Systems for Local Retention and Sustained Release

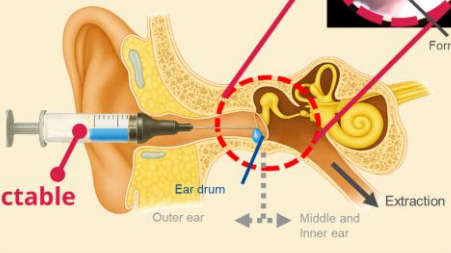
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## INTRODUCTION

Therapeutic options for ear diseases are limited, requiring effective local drug delivery; however, achieving injectability, retention of formulations at the site, and controlled drug release remains challenging. We developed new temperature-responsive, thixotropic otic formulations to achieve them spontaneously.

Retention and Controlled drug release



## REFERENCES

WO2021020535, WO2022065404

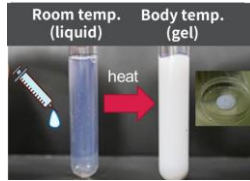
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## Formulation A

Thermo-activating ear injectable and retentive gel



- Liquid at room temperature for easy administration
- Rapid gelation at body temperature
- Tunable injectability, retention, and drug release through adjusting polymer concentration and modifiers

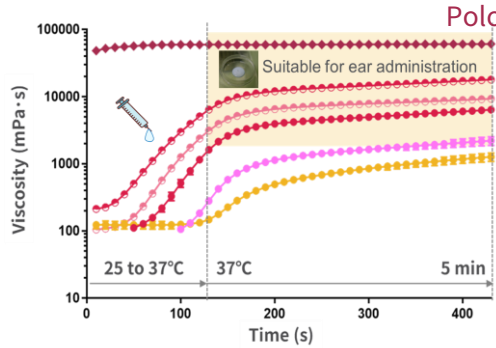


Fig 1. Gelation profile

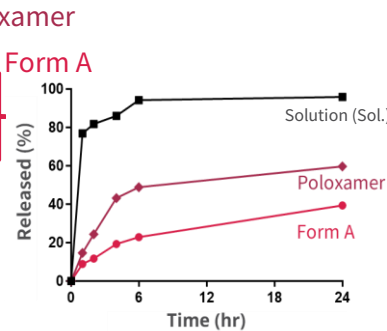


Fig 2. In vitro drug release (FITC dextran)

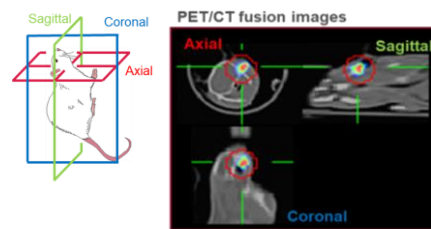


Fig 3. Retention in external auditory canal

In mice, Form A prolonged retention at the ear and improved healing rates.

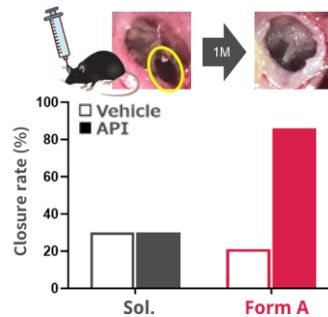
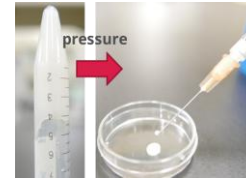


Fig 4. Efficacy in CTMP\* model  
\*chronic tympanic membrane perforation

## Formulation B

Thixotropic ear injectable and retentive gel



- Shear-responsive flow: easy injectability
- Viscosity recovery immediately after administration
- Applicable to deeper administration sites compared with temperature-responsive gel
- Tunable injectability, retention, and drug release through polymer concentration

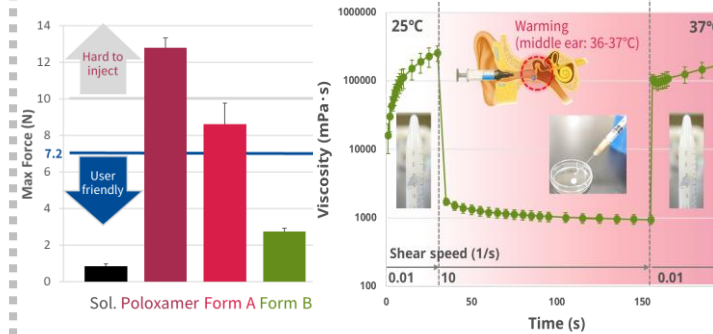


Fig 5. Injectability and viscosity recovery profile

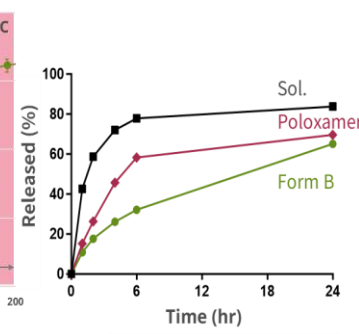


Fig 6. In vitro drug release (FITC dextran)

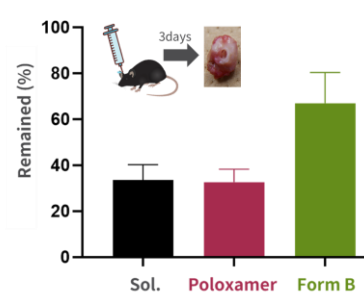


Fig 7. Intratympanic retention

Form B achieved lower injection force and improved ear retention compared with temperature-responsive gels.

## CONCLUSION

Novel otic formulations enable easy administration and sustained local drug delivery. This platform supports effective and practical treatment of ear diseases.

