

# DESIGN OF HYDROXYCOBALAMINE MICROCAPSULES FOR INJECTABLES IN THE OCULAR TREATMENT OF HOMOCYSTINURIA WITH METHYLMALONIC ACIDURIA

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## Background

- \* **Methylmalonic acidemia with homocystinuria (CbIC): severe congenital disorder of vitamin B12 metabolism. It can be treated with hydroxocobalamin.**
- \* **Hydroxocobalamin (HCB) has limited ocular efficacy due to poor blood-ocular barrier permeability.**
- \* **Topical therapy is ineffective; many patients develop blindness and reduced quality of life.**

## Aim and Objectives

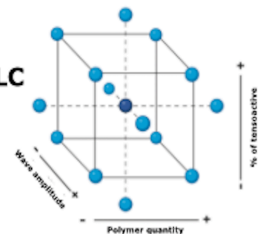
To develop a sustained-release intravitreal formulation using HCB loaded 1500PEOT/PBT microcapsules to improve ocular drug delivery.

## Materials and Methods

- 1 **Microcapsules were prepared by ultrasound-assisted double emulsion (W/O/W) solvent evaporation. Tenoactive used was PVA.**
- 2 **Structure: aqueous core (hydroxocobalamin) + polymeric sustained-release shell.**

- 3 **Characterization by SEM. Determination of HCB concentration was made by HPLC**

- 4 **Rotational design (23 experiments) and ANOVA to enhance homogeneity and encapsulation efficiency.**



## Results

- Optimal formulation achieved higher drug loading, better release profile, and improved size homogeneity.**
- Best conditions: lower polymer weight and intermediate agitation speed.**
- In vivo ocular viability still needs evaluation.**

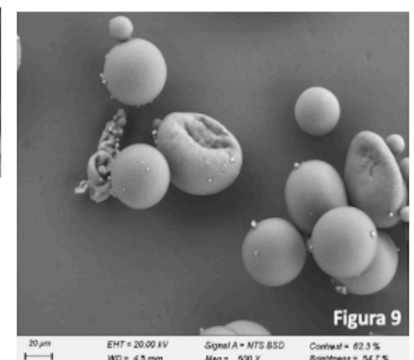
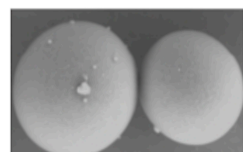
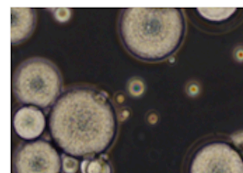


Figura 9

## Conclusions

- \* **PEOT/PBT microcapsules are a promising strategy for ocular treatment of CbIC.**
- \* **Further long-term release and in vivo studies are required before clinical application.**

