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Budesonide Embedded Sodium Alginate Thin Films For Controlled Release To The Esophagus

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Budesonide embedded thin films for controlled medication release for eosinophilic esophagitis.

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INTRODUCTION

- To develop new methods of localized drug delivery to the esophagus.
- thin films utilizing the mucoadhesive polymer sodium alginate that demonstrate controlled release at varying levels of crosslinking.

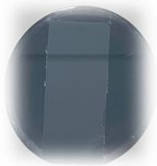
METHOD

- Using a spin coating method deposit thin film layers of 0.25% chitosan then 10 mg/mL budesonide/5% sodium alginate (NaAlg) solution on silicon wafers.
- Crosslink (NaAlg) with calcium chloride ($CaCl_2$) solutions of 50 mM, 100 mM, and 400 mM
- Remove a 3cm x 3cm square of film from the silicon wafer using razor blade.
- To measure drug release the film was placed in 5 mL of artificial saliva at 37°C and 1 mL samples were removed/replaced at time points 1 min, 10 min, 20 min, 30 min, and 40 minutes.

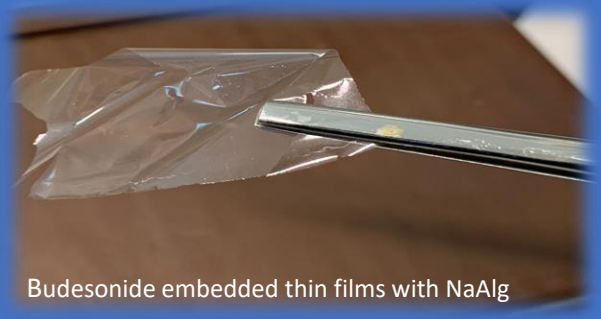
10 mg /mL BUD+5%NaAlg

0.25% Chitosan

Silicon wafer



SCAN ME

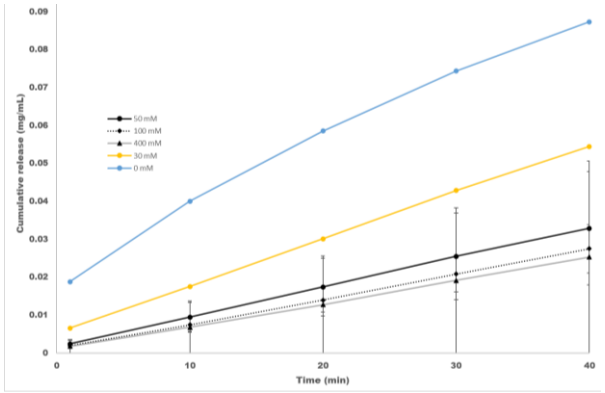


Budesonide embedded thin films with NaAlg

https://www.everydayhealth.com/eosinophilic-esophagitis/

RESULTS

- We successfully fabricated budesonide embedded thin films.
- All $CaCl_2$ concentrations show a steady, controlled release characteristics profile.
- Significant breakdown of the films was not seen until around 1 hour in saliva.
- The lower concentration of $CaCl_2$ for crosslinking resulted in faster release of the budesonide into the surrounding saliva.



Conclusions

- We have successfully fabricated budesonide embedded NaAlg thin films with controlled release characteristics.
- Next steps: budesonide release in an Ex vivo Esophagus Epithelium model.

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