Antifungal activity of novel formulations based on terpenoid prodrugs against *C. albicans* in a mouse model

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Introduction

Vulvovaginal candidiasis (VVC) refers to vaginal and vulval symptoms caused by yeasts. VVC is commonly known as, "Vaginal Yeast Infection." Females with HIV frequently are prone to VVC and often develop drug resistance [1]. Therefore, there is an urgent need for new antifungal drugs. Recent studies have suggested that oregano oil has antifungal activity. The main component of oregano oil is carvacrol (CAR), a phenolic aromatic monoterpenoid. CAR has poor water solubility and in the present study, CAR and 3 water soluble analogs WSCP1-3 (Fig. 1) were tested for antifungal activity using a mouse model of VVC.

Study Objective/Aim/Contribution

Our lab has repurposed CAR and its prodrug WSCP1-3 with an aim to maximize its intravaginal efficacy [2]. We developed and tested locally delivered formulations of CAR and WSCP1. Each of the formulations exhibited antifungal activity in the mouse model.

Origanum vulgare, also known as the oregano plant [3], is a good source of CAR.

Results

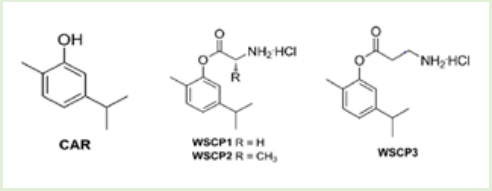

Fig.1 Chemical Structures of CAR and its prodrugs.

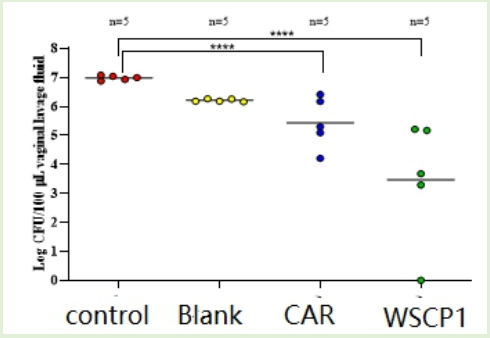

Fig. 2 Effect of CAR and WSCP1 on VVC in a mouse model

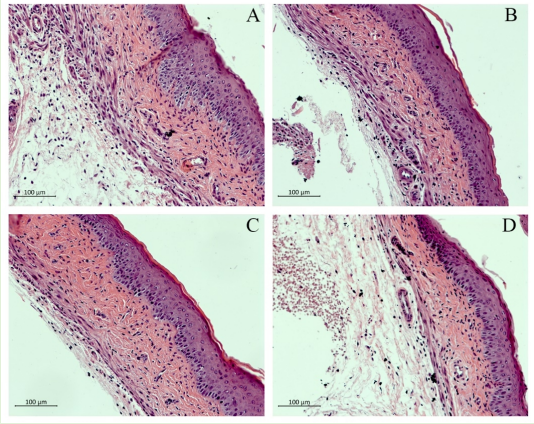

Fig. 3 Histopathological analysis of mouse vaginal tissues. Panel A, control; Panel B, Blank; Panel C, CAR; Panel D, WSCP1.

Conclusion

- The WSCP1 exhibited better antifungal efficacy than CAR in the mouse model, showing a remarkable decrease of yeast infection.
- Both CAR and WSCP1 were safe to the vaginal epithelium.
- Future study should be carried out to optimize the dose of WSCP1 in the model.

Acknowledgements

The authors thank the Department of Pharmaceutical Sciences (College of Pharmacy and Health Sciences) for providing the funding for these experiments.

References:

[1] Achkar JM, Fries BC. Candida infections of the genitourinary tract. Clin Microbiol Rev. 2010 .

[2] Acciatore I, Fornasari E, et al. Carvacrol codrugs: a new approach in the antimicrobial plan. PLoS One 2015.

[3]https://www.pngwing.com/en/free-png-vdjes