

Exploring the Antimicrobial Activity of Essential Oils Against *Candida albicans*

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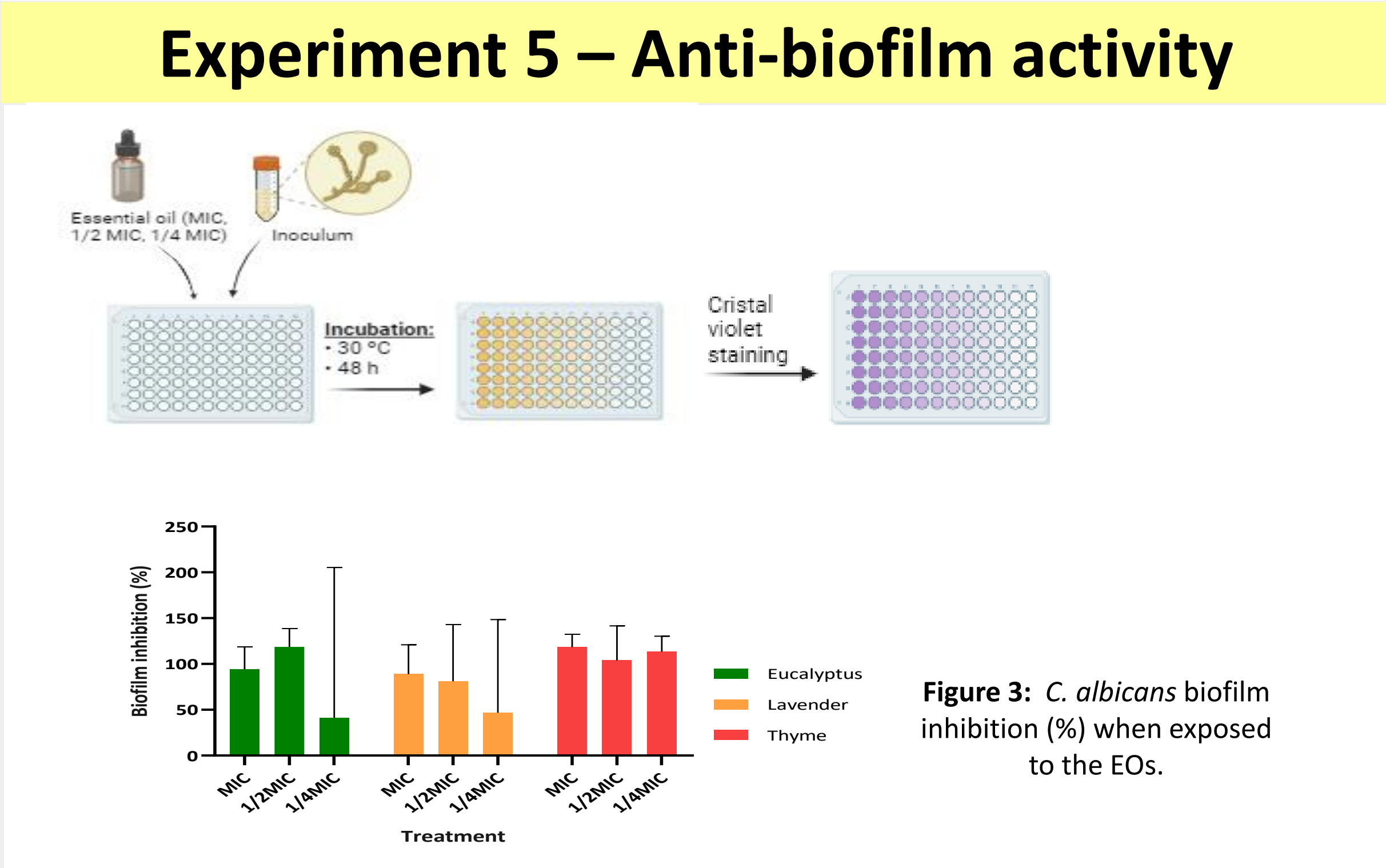
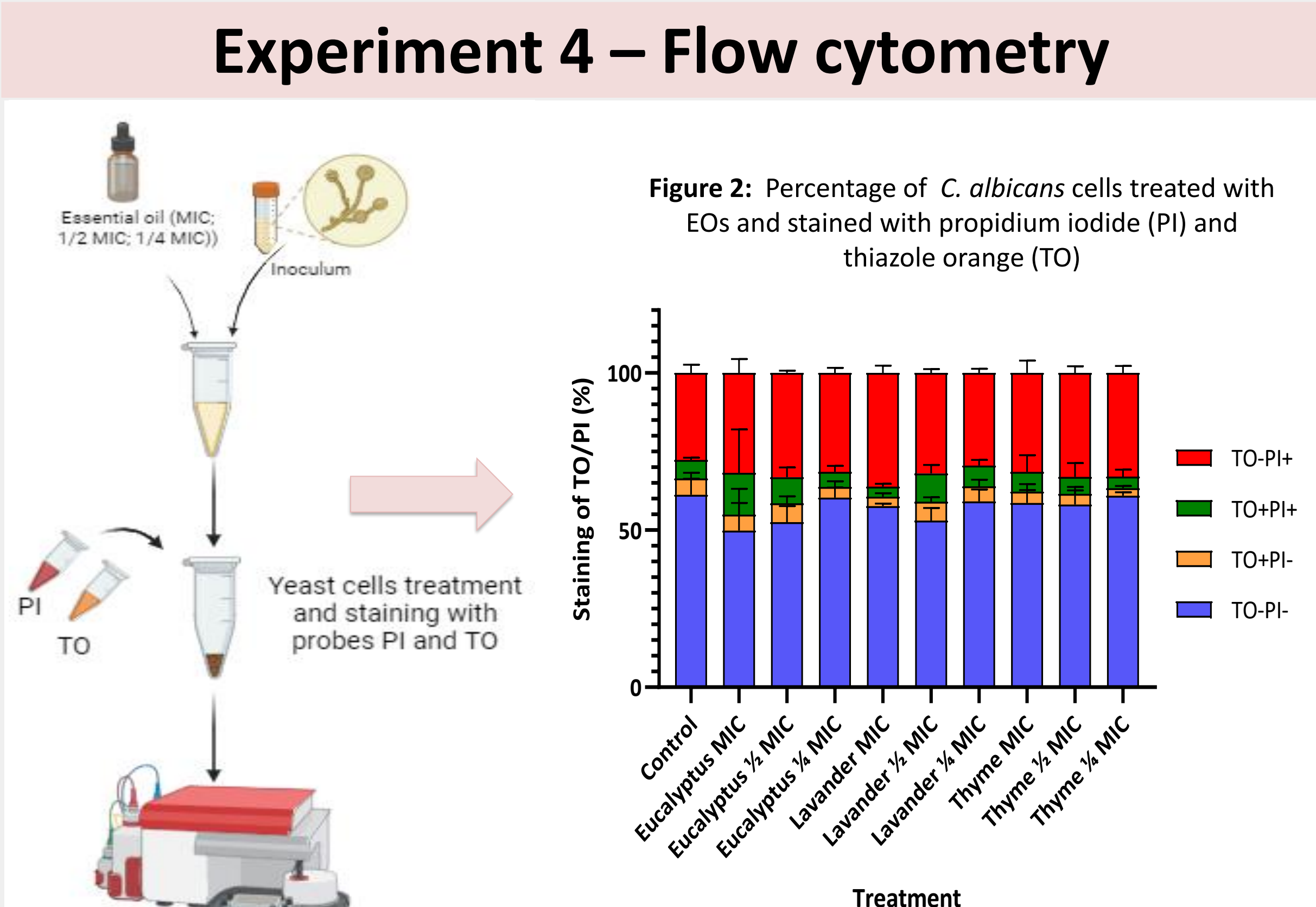
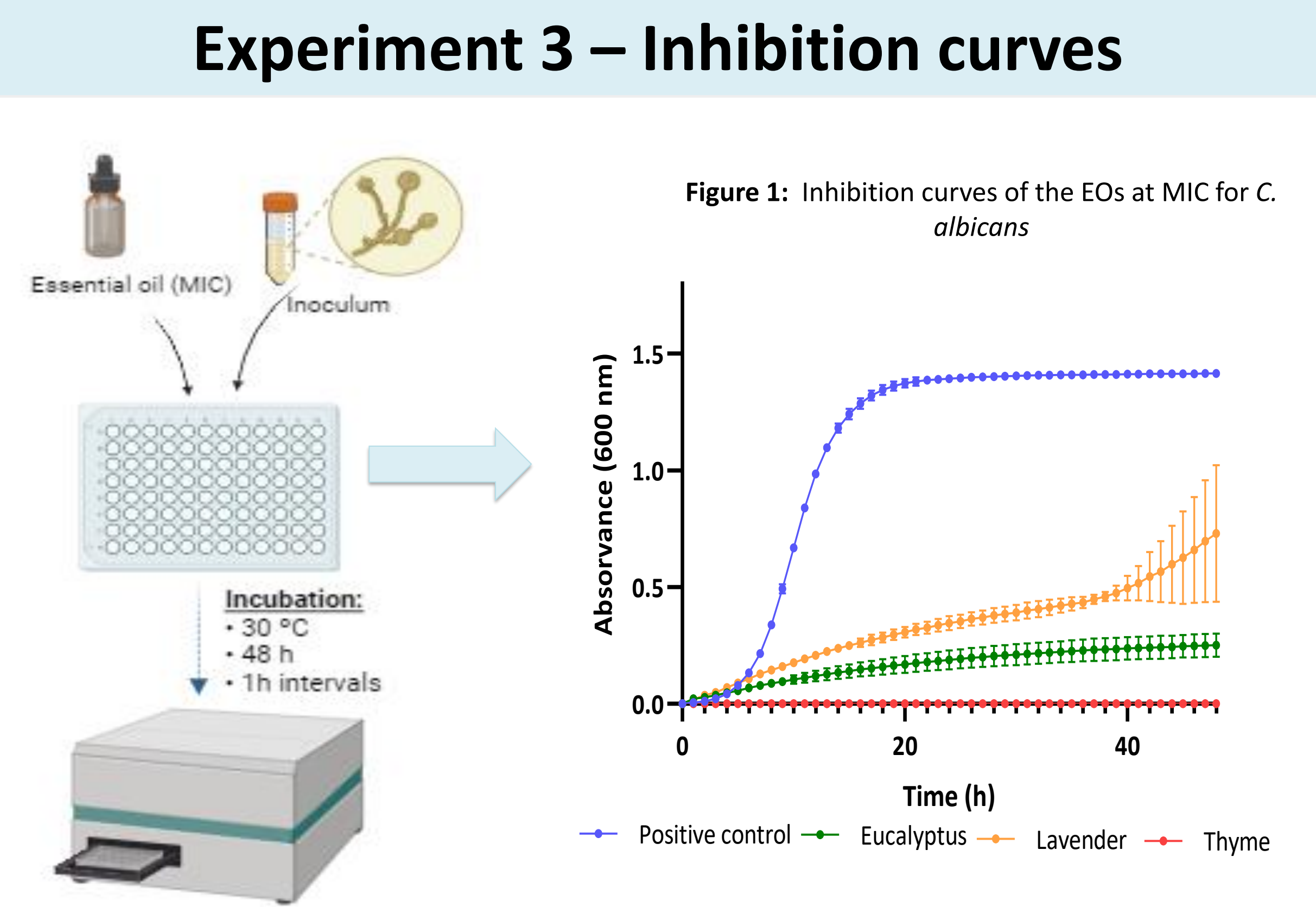
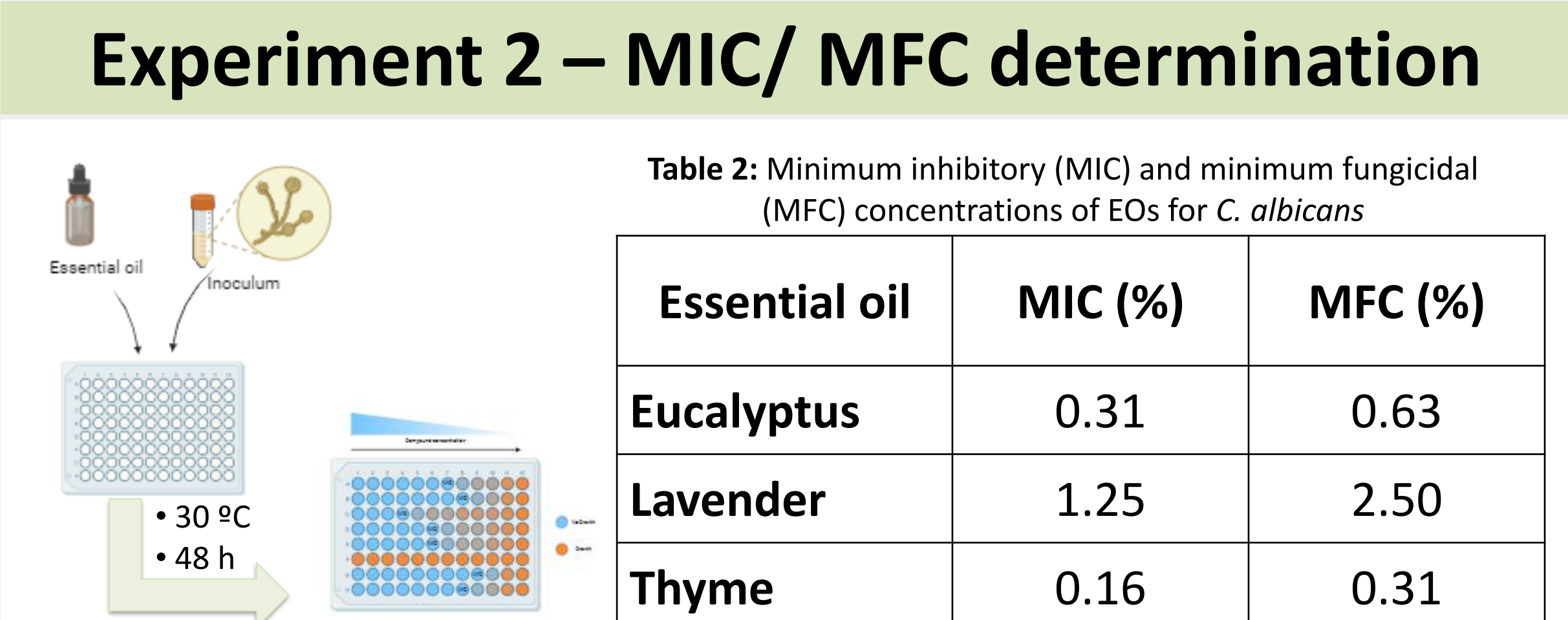
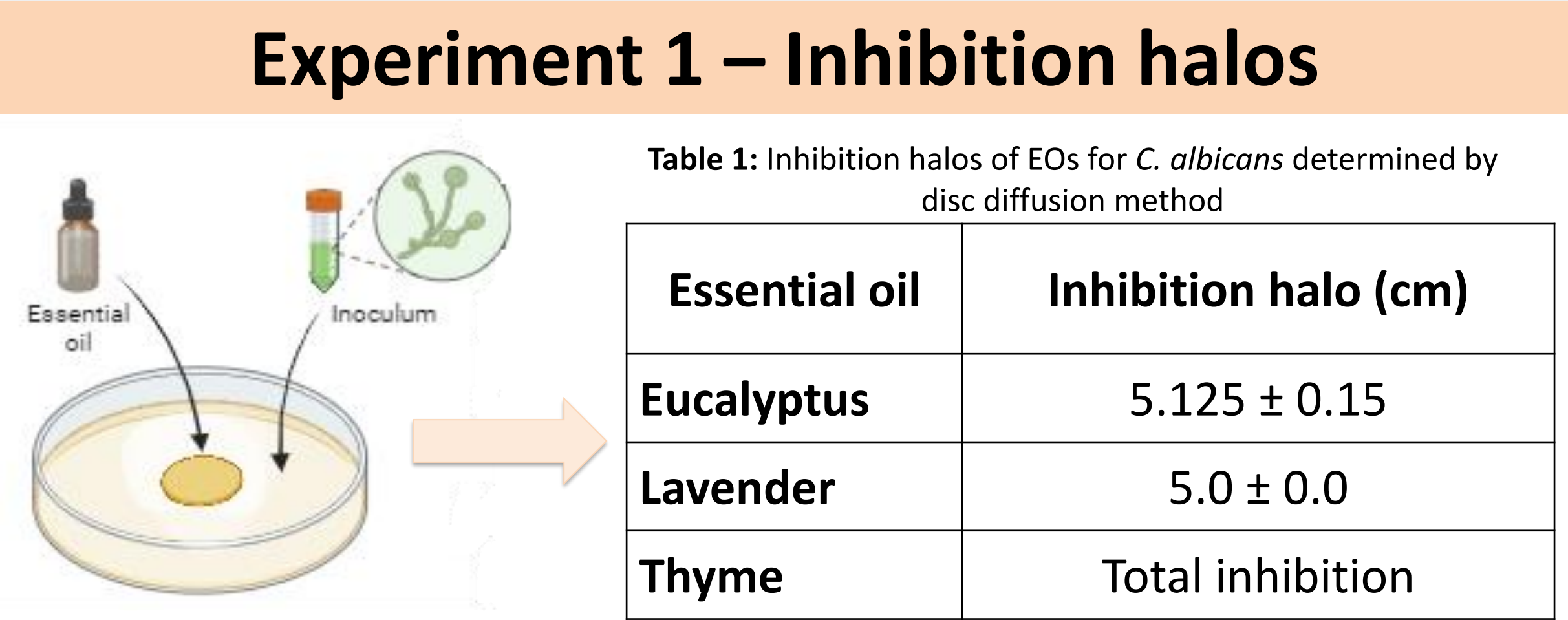
Introduction

Candida spp., a group of commensal yeasts typically found on the skin and mucous membranes of humans and animals, is responsible for most of the invasive fungal infections worldwide (Lopes et al., 2024). Mucocutaneous candidiasis, a common fungal infection, usually affects the skin folds in the axillae, inguinal, genital, and perigenital areas, hands, fingernails, skin beneath the breasts in women, and mucous membranes. The primary etiological agent is *Candida albicans* (*C. albicans*), accounting for 80–90% of the cases (Lopes et al., 2024). Mucocutaneous candidiasis is typically treated with antifungals such as azoles and polyenes. However, these substances often have undesirable side effects, and resistance to these drugs is also an increasing concern (Rai et al., 2017). Essential oils (EOs) are natural compounds made of terpenes and terpenoid molecules. Their antimicrobial activity results from the effect upon several cell targets, thus making the appearance of resistances unlikely (Zuzarte et al. 2011). They can, therefore, be considered as a potential natural treatment for candidiasis.

Objective

To study the antimicrobial activity of three EOs (eucalyptus, lavender, and thyme) on the yeast *Candida albicans*.

Antimicrobial activity determination



Conclusions

- Eucalyptus, lavender and thyme EOs present antifungal activity against *C. albicans*.
- Thyme possesses the lowest MIC while lavender has the highest MIC; the inhibition curves corroborated these results.
- The flow cytometry assay showed that all oils were able to damage the cell membrane of the yeast (positive PI staining); thyme oil presented the highest cell damage percentage.
- All EOs also showed anti-biofilm activity; thyme presented the highest anti-biofilm activity when compared to eucalyptus and lavender.

Thyme essential oil was the one with the best antifungal activity.

References:
Lopes, A.I., Pintado, M.M., Tavaría, F.K., 2024. Possible plant-based solutions for skin yeast infections. *Fungal Biol Rev* 48, 100354.
Rai, M., Ingle, A., Pandit, R., Paralikar, P., Gupta, I., Anasane, N., Voljé, M., 2017. Nanotechnology for the Treatment of Fungal Infections on Human Skin. In: *The Microbiology of Skin, Soft Tissue, Bone and Joint Infections*. pp. 169–184.
Zuzarte, M., Gonçalves, M., Canhoto, J., Salgueiro, L., 2011. Antidermatophytic activity of essential oils. In *Science Against Microbial Pathogens: Communicating Current Research and Technological Advances* 1167–1178.

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