

Poster Communication 1

From *In Silico* Screening to Biofilm Disruption: Insect-Derived Peptides Against *Candida* spp.

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Abstract

Background: The global increase in antifungal resistance and spread of *Candida* spp. infections represent a growing clinical challenge and highlight the urgent need for alternative therapeutic strategies [1]. Natural compounds, such as insect-derived peptides, have been widely explored as potential antimicrobial agents, representing one of the most promising bioactive compounds [3,4].

Objective: In this perspective, our study aims to evaluate the antifungal potential of insect-derived peptides against *Candida* spp. using a combined *in silico* and *in vitro* experimental approach [2].

Methods: A total of 37 insect-derived peptides were screened through molecular docking analysis to evaluate their interactions with *Candida albicans* enzyme targets, including lanosterol 14-demethylase (LDM), secreted aspartic proteinase-5 (Sap-5), *N*-myristoyltransferase (NMT), and dihydrofolate reductase (DHFR). *In vitro* assays included Minimum Inhibitory Concentration (MIC), Minimum Fungicidal Concentration (MFC) in planktonic cells and biofilm structures of ATCC strains of *C. albicans*, *C. tropicalis*, *C. glabrata* and *C. parapsilosis*. Additionally, the three-dimensional structures of each biofilm were analyzed after treatment, via Confocal Laser Scanning Microscopy (CLSM).

Results: In *in silico* assays, Blap-6 and Gomesin demonstrated to be good candidates for drug development. Following, in *in vitro* studies, Gomesin achieved complete biofilm eradication in three out of four *Candida* species, while Blap-6 showed moderate but consistent reduction across all species. However, *C. tropicalis* demonstrated resistance to complete eradication by both peptides [2]. In three-dimensional analysis, *C. albicans* demonstrated the highest loss of integrity in the biofilm matrix with absence of intact cells. *C. glabrata* showed some resistance in biofilm extracellular matrix disruption, without compromising cell disturbance [2]. **Conclusions:** These findings highlight insect-derived peptides as promising antifungal candidates and support their potential development as alternative therapeutic agents or templates for the design of novel peptide-based antifungal drugs targeting *Candida* infections.

Keywords: *Candida* spp.; insect peptides; antifungal activity; biofilm

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