**P012**

Antibiotic activity of staphylococcal peptide derivative(s) against Candida auris biofilms in vitro and in an animal model of catheter-associated infection

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Poster session 1, September 21, 2022, 12:10 PM - 1:30 PM

**Objective:** Candidate auris has emerged as a major multidrug-resistant nosocomial pathogen worldwide. The organism exhibits a persistent, colonizing phenotype, usually associated with biofilms formed on hospital surfaces, medical equipment, and indwelling medical devices. Biofilm formation by C. auris can further aggravate the infection outcome, and owing to its drug-resistant nature, it is associated with nosocomial and antifungal drug resistance. The present study aimed to evaluate the preventive and therapeutic efficacy of select peptide derivative(s) from staphylococcus against C. auris biofilms in vitro and in a murine model of catheter-associated infection.

**Methods:** Three potentially antimicrobial, staphylococcal alpha-helical amphipathic peptides (9-21 amino acids) were evaluated for antifungal and antibiotic activity against clinical isolates of C. auris. The antifungal activity against C. auris planktonic strains was determined by the broth microdilution method (CLSI M27-A3) and the Clinical and Laboratory Standards Institute. Biofilm assays were performed in 96 well, flat-bottom microtiter plates in RPMI-1640, and the effect of the test agents on biofilm formation (MBEC, minimum biofilm eradication concentration) was determined. The minimum biofilm eradication concentration of the peptides was noted. The study was repeated twice to ensure reproducibility.

**Conclusion:** The present study demonstrates that a 19 amino acid, alpha-helical staphylococcal peptide derivative exhibit antimicrobial activity against C. auris, particularly in preventing biofilm formation, in vitro and in vivo as a model of nosocomial catheter-associated infection.

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**P013**

Green synthesis of silver nanoparticles using Tithonia Giovanni and its antifungal potential against Candida auris

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**Objective:** This paper aimed to evaluate the antifungal and antifungal activity of silver nanoparticles synthesized using Tithonia gradivora. A reputed medicinal and aromatic plant found in the Himalayan region of India, C. auris has been reported to be causing nosocomial infections worldwide. The present study was to determine the antifungal activity of silver nanoparticles using T. gradivora and to evaluate their potential against C. auris.

**Methods:** Silver nanoparticles (AgNPs) were synthesized using a green approach. Optimization and characterization of AgNPs were carried out using UV-Vis spectroscopy, TEM, and FTIR. Minimum inhibitory concentration (MIC), minimum fungicidal concentration (MFC), and the antifungal activity of AgNPs were determined by the broth microdilution method (CLSI M27-A3) and the Clinical and Laboratory Standards Institute, respectively.

**Conclusion:** The results revealed that AgNPs synthesized using T. gradivora show significant antifungal activity against C. auris at sub-inhibitory concentrations. Hence, it can be concluded that T. gradivora may have potential for the production of AgNPs with antifungal activity and could be explored as a potential plant-based antifungal agent against C. auris.

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**P014**

Prevalence and antifungal susceptibility of Wickerhamiella anomala in a tertiary care center

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**Objective:** The spectrum of yeast species causing fungemia has been expanding with emergence of many unusual pathogenic species. One such species is Wickerhamiella anomala which has been recognized as an important cause of meningococcal infections in neonates and pediatric patients. We evaluated antifungal susceptibility and the burden of W. anomala in W. anomala.

**Methods:** Species identification of the isolate was performed using MALDI-TOF MS. Antifungal susceptibility testing was done according to the CLSI broth microdilution method following the M27-A3 protocol. The polypeptide ATCC28228 and C. glabrata ATCC24432 were used as quality control strains. The lowest x:6 (chloramphenicol) and penicillin) were used to determine the minimal inhibitory concentration (MIC) for each antifungal agent.

**Conclusion:** The results indicated that W. anomala was susceptible to chloramphenicol and penicillin and resistant to amphotericin B and flucytosine. This indicates that W. anomala should be included in the list of unspecified Candida species that should be routinely tested against azole antifungals.

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**P015**

A study to demonstrate heterogeneity and tolerance in Candida tropicale

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**Objective:** Candida tropicale easily exhibits a trailing growth phenomenon in vitro; antifungal susceptibility testing (MSP) of these isolates is considered as ‘sensitive’ or ‘resistant’ criteria. The phenomenon has been linked to drug tolerance, and such isolates are termed as drug-tolerant. The present study aimed to observe the trailing phenomenon in C. tropicale isolates and evaluate the antifungal susceptibility.

**Methods:** A total of 247 clinical isolates of C. tropicale collected over a period of 7 months (September 2021 to March 2022) from PGIMER, Chandigarh were included in the study. Identification was done by MALDI-TOF MS and antifungal susceptibility testing was done following the CLSI M27-A3 protocol. The trailing growth phenomenon was considered for further characterization. Cells from the trailing growth of each isolate were used to prepare serial peptide stock solutions (2 mg/ml) to observe for phenotype variations with and without fluconazole. The zone area under the population analysis (PA) curve (AUC) was performed to determine the degree of heteroresistance. Yeast cells within the range of 10^2-10^6 cells were spotted in six replicates each on a gradient of fluconazole (0.01-16 mg/ml) in YPG agar and incubated at 37°C for 7 days to determine the viable colony forming units (CFU).

**Results:** Out of the 225 fluconazole susceptible C. tropicale isolates, 10 (4.4%) were found to exhibit a trailing growth phenomenon. A dose-response relationship showed a multipolar distribution pattern in these isolates with varying degrees of resistance. The zone area (AUC) that ranged from 71±24 to 371±148 was calculated from the growth at the highest fluconazole concentration (64 mg/ml) exhibited a similar MIC (t=2.5-fold difference) as that of the isolate tested individually. Hence the heterogeneity range that determines a fold difference breakdown of the isolates varied from 16× to 256×.

**Conclusions:** An organismic population of cells under the effect of fluconazole could give rise to phenotypically different subpopulations. With repeated exposure to the drug, these seemingly susceptible isolates can emerge as fully resistant population. Clinically, the implications include relapse, treatment failure, and persistent chronic infections, owing to which this condition needs attention. Current CLSI guidelines do not provide any criteria to separately classify these isolates from the susceptible and resistant varieties. Hence, a definitive cut-off is warranted to identify the IE and tolerant subtypes. The AUC-PA method could be refined further for discriminating heteroresistance from true resistance.

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**P016**

Selected trans-Himalayan medicinal plants and their nanoparticles express potent antifungal and antibiofilm activity against Candida auris and Candida glabrata

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**Objective:** Normal microbial turndown opportunistic pathogens Candida glabrata and Candida auris are becoming major healthcare concerns across the world. The present study was to evaluate the antifungal activity and antibiofilm activity of selected trans-Himalayan medicinal plants and their nanoparticles against Candida auris and C. glabrata.

**Methods:** Microbial strains Candida glabrata and Candida auris were used in this research. Antibiofilm activity of the medicinal plants and their nanoparticles were determined by crystal violet and XTT assay. Nanoparticles were characterized using UV-VIS, FTIR, and TEM.

**Results:** From the medicinal plants, the antifungal activity of the 10 medicinal plants and their nanoparticles was determined. In the crystal violet assay, the concentrations of 1 mg/ml of the extracts were found to have a significant reduction in the number of colonies, and in the XTT assay, the concentration of 1 mg/ml was found to be the most effective in reducing the number of colonies.

**Conclusion:** The results showed that the trans-Himalayan medicinal plants and their nanoparticles have the potential to be used as a therapeutic/natural agent.