Using Bioactive Compounds to Develop an Alternative to Control Candida spp.

Valoto, Maria Vitoria (School: Colegio Interativa de Londrina)

Fungal multi-resistance refers to the capacity of fungi to multiply even with antimicrobials. The project's objective was to identify natural substances to be used as treatment against infections caused by antimicrobial-resistant Candida strains. For this, the LV bacterium, prospected from an orange orchard, was used. The bacteria were grown in constant aeration for 10 days, the final product was centrifuged and its supernatant was tested against Candida albicans and Candida glabrata. Dichloromethane was used as solvent for the compounds extraction, generating a crude fraction (FD) from which 13 different fractions were obtained through Vacuum Liquid Chromatography. Just F4A fraction showed inhibitory potential against Candida. The sample underwent Flash Chromatography, generating 4 pure compounds: PCA, PCN, Indolinone and OAC. These samples had their purity levels confirmed through HPLC. The most effective compound was OAC. At this stage, two other strains were added to the project: C. krusei and C. dubliniensis. OAC's Minimum Inhibitory Concentration tests were conducted, resulting in MICs of 0.078 µg/mL for C. albicans and 0.156 µg/mL for other strains. The molecule identification was performed by Nuclear Magnetic Resonance, Infrared Spectroscopy, X-Ray, Mass Spectrometry and the identification of the LV bacterium by the rRNA 16s technique. The OAC was identified as Fluopsin C and LV as a Pseudomonas aeruginosa. A cytotoxicity test was performed and the result was that OAC isn't toxic to animal cells. OAC's inhibitory halos were compared to those of the commercial drug Fluconazole and ranged from 0 to 19 mm for the latter and from 44 to 48 mm for the former, showing that the molecule found has greater inhibition potential than the drugs available in the market.

Awards Won:

Third Award of $1,000