J Material Sci Eng 2020, Volume 09

Antifungal activity of loaded chitosan nanoparticles with S-nitrosomercaptosuccinic acid against *Candida sp.*

Gabriela Jesus Moron Atencio, Zurita Macalupu and **Susana**

Cayetano Heredia Peruvian University, Peru

Introduction: Candida sp species are fungal pathogens that affect patients with risk pathologies. Due to the change in their conventional drug susceptibility patterns, it is necessary to investigate therapeutic alternatives. It is proposed to evaluate the antifungal potential of nitric oxide (NO), by administering it in the donor s-nitrosomercaptosuccinic acid (MSA-NO), encapsulated in chitosan nanoparticles (Np) to improve its bioavailability and inhibit the growth of Candida albicans, glabrata, krusei and parapsilosis.

Methods: Three batches of nanoparticles loaded with mercaptosuccinic acid (MSA-Np) were synthesized by ionic gelation. The effective particle diameter and polydispersity index were analyzed by dynamic light scattering and encapsulation efficiency by the Ellman reaction. After adding NaNO2, MSA-NO Np. The minimum inhibitory concentration (MIC) against species of Candida sp. iwas determined by microdilution and the NO release profile was estimated by UV spectrophotometry.

Results: The MSA Np presented optimal values of effective particle diameter (241.69 ± 18.95 nm), polydispersity index (0.274 ± 0.015) and encapsulation efficiency (97.52 ± 0.07%). The MIC values of C. glabrata and C. albicans were 0.28 mg / mL and 2.25 mg / mL, respectively. The lowest CMI corresponded to C. krusei while C. albicans was the least susceptible to NO. The results did not vary significantly batch to batch.

Conclusions: A procedure of synthesis of MSA-NO Np with antifungal activity on Candida sp was validated. The antifungal potency varied according to the species. The chitosan of MSA-NO Np was useful as a polymer matrix for NO controlled release.

Notes: