

# **Magnetic nanoparticles as a carrier enhancing chlorhexidine activity against *Candida* species**

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## **Introduction**

Most human oral mycosis is caused by *Candida* species. These pathogens preferentially adopt a biofilm pattern of growth associated with increased resistance to antifungal treatment. Chlorhexidine is characterized by a wide range of antibacterial and fungicidal activity. This compound is frequently used to reduce dental plaque and assist in the treatment of periodontitis and oral infection.

## **Aim**

The aim was to assess the antifungal properties of CHX attached to the surface of nanoparticles against isolates of *Candida*.

## **Materials and methods**

The experiments were performed using clinical isolates of *Candida* obtained from patients diagnosed with oral mycosis. To determine MIC and MFC, a microdilution method was performed. To evaluate the ability of this new nanosystem to prevent *Candida* biofilm formation, cells were grown for 48 h at 37°C with and without the presence of tested agents (0.5 - 50 µg/mL). The effect on mature biofilm was determined spectrophotometrically using a crystal violet staining method.

## **Results**

CHX attached to magnetic nanoparticles (MNP@CHX) possess a stronger ability to prevent *Candida* biofilm growth compared to free agent.

## **Conclusion**

The use of MNPs as a drug delivery system for chlorhexidine has great potential to enhance its fungicidal activity. Grants nr: UMO-2012/07/B/NZ6/03504 to RB and UMO-2014/15/D/NZ6/02665 to KN.