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TITLE: Impairment of *Candida albicans* adhesion on dielectric surfaces (SiO₂) containing or not AgNPs by adsorbed proteins

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(main body of abstract should be 300 words maximum)

Introduction: Surfaces in contact with physiological fluids, like medical devices (MD) for humans, are firstly covered by adsorbed proteins. This conditioning film is considered crucial regarding microorganism adhesion then biofilm formation. Among microbial cells implicated in infections, especially nosocomial infections linked to the colonization of MD surfaces, yeasts of the genus *Candida*, i.e. *C. albicans*, are frequently involved.

Hypothesis and aims: Regarding our previous results on the interactions between thin dielectric layers of SiO₂ with tailored by silver nanoparticles (AgNPs) properties and proteins, our aim was to evaluate the shear-induced detachment of *C. albicans* in contact with a thin silica layer, containing or not AgNPs, at low shear stresses using a shear stress flow chamber.

Methodology: The study focuses on the shear-induced detachment of the yeast *Candida albicans* IP48.72 in contact with a thin silica layer ± AgNPs covered by adsorbed Bovine Serum Albumin (BSA) or Fibronectin (Fn) at low shear stresses using a shear stress flow chamber. The experimental arrangement is designed to address large range of shear stresses, up to 80 Pa, with specific attention paid to the low shear stress domain (0.01 Pa).

Results: Regarding *C. albicans* IP48.72 and SiO₂ alone, 27% of the cells remained stuck to the surface. In the same time, BSA induced a significant reduction of adherent cells (14%), while Fn favored the adhesion (84%). In all the tested conditions, adhesion level was maintained to 5 Pa. AgNPs deposited on the SiO₂ surface induced an increase in *C. albicans* adhesion level.

Conclusion: We demonstrated the impairment of *C. albicans* adhesion forces regarding the protein adsorbed on silica layer. This was also the first demonstration of a positive impact of AgNPs on *C. albicans* adhesion.

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