

The adhesion strength of *Candida albicans* yeast cells to tooth enamel quantified by Fluidic Force Microscopy

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Caries is one of the most prevalent diseases worldwide, which is characterized by a degradation of the mineralized tooth enamel. The opportunistic pathogen *Candida albicans* is considered as a major causal agent for caries in children.⁽¹⁾ Although tooth enamel specimens have been well characterized by atomic force microscopy,⁽²⁾ this technique has not been used yet to study the adhesion strength of *C. albicans* on the same material.

We applied Fluidic Force Microscopy-based single-cell force spectroscopy to determine the key adhesion parameters “maximum adhesion force”, “rupture length” and “de-adhesion work” of single yeast cells on tooth enamel with or without adsorbed salivary molecules, in presence and absence of human saliva on the yeast cell surface.

We observed maximum adhesion forces in the lower nanonewton range for all tested conditions. Significant increases in all adhesion parameters, however, were noticed for naïve and saliva-pretreated yeast cells probed on saliva-pretreated, and on *in situ*-formed pellicle of the enamel when compared to the uncovered enamel surface. These data suggest that the initial adhesion of naïve *C. albicans* yeast cells to tooth enamel occurs through strong interactions between yeast cell wall-associated adhesins and the salivary pellicle formed on teeth, through which this fungus might be well adapted to the conditions seen in the oral cavity.

[1] J Xiao et al., Caries Res. 52 (2018).

[2] M Hannig et al., Colloid & Polymer Science, 279.5 (2001).