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Oral microorganisms: how do they communicate?

Many oral diseases are related to the interaction between microorganisms in the oral cavity. These microbial interactions are necessarily associated with the development of dental plaque and can lead to oral diseases including dental caries and perhaps oral cancer. It is estimated that up to 70% of people with a healthy oral cavity possess *Candida albicans* in their mouth. This normally does not harm the individual, however, in the event of disease, *C. albicans* may cause harm especially in those with a high carbohydrate diet, tobacco smoking or drug abuse. The objective of our study was to understand the communication between the most important oral microorganisms, the yeast, *C. albicans* strains, and bacteria, *A. naeslundii* and *S. mutans*.

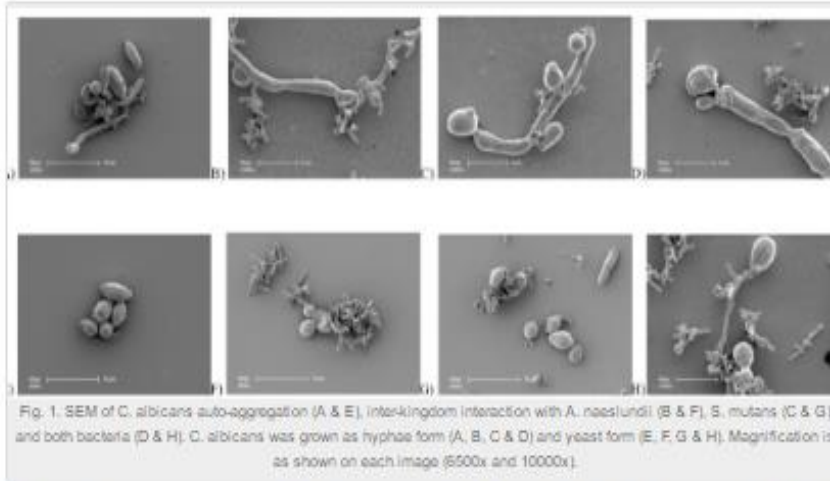


Fig. 1. SEM of *C. albicans* auto-aggregation (A & E), inter-kingdom interaction with *A. naeslundii* (B & F), *S. mutans* (C & G) and both bacteria (D & H). *C. albicans* was grown as hyphae form (A, B, C & D) and yeast form (E, F, G & H). Magnification is as shown on each image (5500x and 10000x).

To study this interaction, *C. albicans* that was grown as either long branching filaments (hyphae) as well as single budding yeast, and with *A. naeslundii* and *S. mutans* were suspended in separate sterile tubes containing buffer. The suspension was incubated for an hour at room temperature and the turbidity at 1 hour was measured using a spectrophotometer. The yeast auto-aggregated more when grown as hyphae than yeast for the majority of *C. albicans* strains. Further, co-aggregation of *C. albicans* with *A. naeslundii* and/or *S. mutans* was variable among *C. albicans* strains. Finally, scanning electron microscopy images showed that *A. naeslundii* and *S. mutans* co-aggregated with *C. albicans* (Figure 1). We can conclude that *C. albicans* communicate with *A. naeslundii* and *S. mutans* and this may contribute to the development of oral diseases such as dental caries.

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Publication

Coaggregation of *Candida albicans*, *Actinomyces naeslundii* and *Streptococcus mutans* is *Candida albicans* strain dependent.

Arzmi MH, Dashper S, Catmull D, Cirillo N, Reynolds EC, McCullough M
FEMS Yeast Res. 2015 Aug

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