Oral candidosis is a common problem in immunocompromised patients, and whilst Candida albicans is regarded as the principal cause of infection, other Candida species are increasingly being recognized as human pathogens. Moreover, relatively little is known about the role of Candida species in oral infections. Thus, this work aimed to examine Candida species infection of oral epithelium, and to assess their ability to colonize, invade and damage an oral epithelium.

The ability of C. albicans, C. glabrata, C. tropicalis and C. parapsilosis to colonize and invade a reconstituted human oral epithelium (RHOE) was examined by confocal laser scanning electron microscopy (CLSM). Simultaneously, the levels of lactate dehydrogenase (LDH) release by the epithelium cells were determined to access the extension of tissue damage. In addition and in order to determine the role of secreted aspartyl proteinases (SAP) in tissue invasion, SAP gene expression of yeast cells interacting RHOE was determined. CLSM images showed that all Candida species were able to colonize RHOE however in a species dependent manner. Low invasion of RHOE occurred with C. parapsilosis cells after 12h, whereas extensive tissue damage was evident after 24h when assessed by histological examination and LDH determination. Conversely, C. tropicalis and C. albicans cells exhibited higher tissue invasion after 12h, with extensive tissue damage occurring at 24h. Molecular analysis of SAP gene expression, for C. tropicalis and C. parapsilosis, suggested that Saps are not involved in invasion. In addition, pepstatin A (Sap Inhibitor) was unable to inhibit the invasion of RHOE by both species. Furthermore, after 24h of infection it was evident that a reduction of tissue damage occurred in case of C. parapsilosis, but not in case of C. tropicalis. These findings suggest that Saps could play an important role in tissue damage induced by C. parapsilosis. C. glabrata single infection studies revealed no invasion of the RHOE. Moreover, mixed infections showed that C. albicans enhanced the invasiveness of C. glabrata, and led to an increase of LDH released by the RHOE, which paralleled the observed histiological damage.

Overall, this work demonstrated that Saps are not involved in the invasion of RHOE by C. tropicalis and C. parapsilosis but seems to be highly responsible for tissue damage by C. parapsilosis. In addition we were able to demonstrate that C. glabrata alone is not able to invade RHOE however in presence of C. albicans it causes significant tissue damage.