



## Department of Periodontology & Research Group for Microbial Adhesion



### Oral microbiology of humans and animals

- > in vitro and clinical research
- > biofilm development, effect of antibiotics and antiseptics, oral probiotics, bacterial colonization of cells and hard tissues, oral tissue culturing, epithelial inflammatory response

### Breath malodour and breath analysis

- > in vitro and clinical research
- > detection of VOC, differential diagnosis of halitosis, detection of markers for systemic diseases in breath

### Osseointegration of oral implants

- > clinical research

### Guided bone regeneration

- > clinical research

### Key personnel

Marc Quirynen  
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### Staff

2 professors  
2 post-docs  
7 researchers  
5 clinical staf  
4 nursing staf

### Challenges

- > to develop non-antibiotic antimicrobial treatment approaches for periodontal diseases
- > to understand the role of the beneficial oral microbiota en their cross talk
- > to develop techniques for the differential diagnosis of halitosis
- > to develop rapid diagnostic/screening test for systemic diseases based on breath analysis
- > to improve the outcome, aesthetics of implant surgery
- > to increase the speed of osseointegration
- > to develop techniques for horizontal and vertical bone augmentation

Oral microbiology of humans and animals



### Keywords

anti infective agents, oral microbiology, probiotics, dental implants, halitosis, breath analysis, osseointegration, periodontal disease, bone regeneration, guided tissue regeneration

### Collaboration & Users

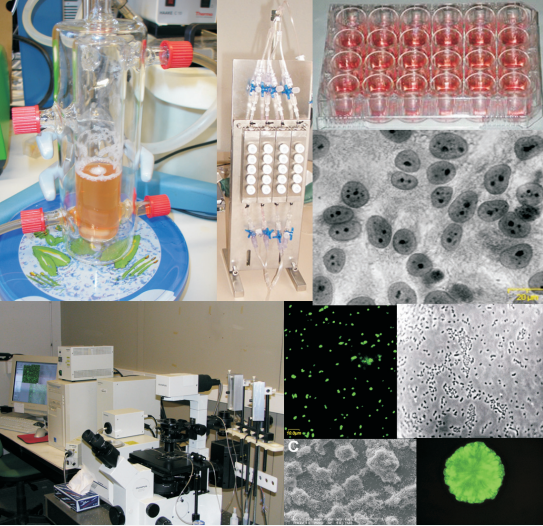
- > Dentaid (Spain), Pfizer Oral Healthcare (USA), Pfizer Animal Healthcare (UK), GABA (Switzerland), Nobel Biocare (Sweden), Strauman (Switzerland), ASTRA Tech Dental (Sweden), Pierre Fabre (France)
- > University Groningen (Netherlands), Forsyth Institute (Boston, USA), Complutense University Madrid (Spain), University of California (USA), University of Vermont (USA), University of Geneva (Switzerland), Ac. Centrum Tandheelkunde Amsterdam (Netherlands), Goteborg University (Sweden), Karolinska Institute (Sweden)

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## Example Projects



Interference of beneficial bacteria

### Interference of beneficial bacteria with periodontopathogen viability, colonization and biofilm development.

Despite a rapidly increasing knowledge on periodontopathogens-host interactions, the role of beneficial bacteria in these interactions is hardly explored. The identification and characterization of beneficial bacteria is of strategic importance for our understanding of (chronic) infections, as well as for the development of preventive and curative therapies (e.g. microbial interference with bacterial pathogen colonization process). The current project aims to identify beneficial bacteria that promote periodontal health. Although there are several distinct ways in which beneficial bacteria can contribute to periodontal health, this project will focus on interference with pathogen viability and its effect on colonization and biofilm development on hard and soft oral tissues.

### Gas Chromatography as differential tool for the diagnosis of halitosis.

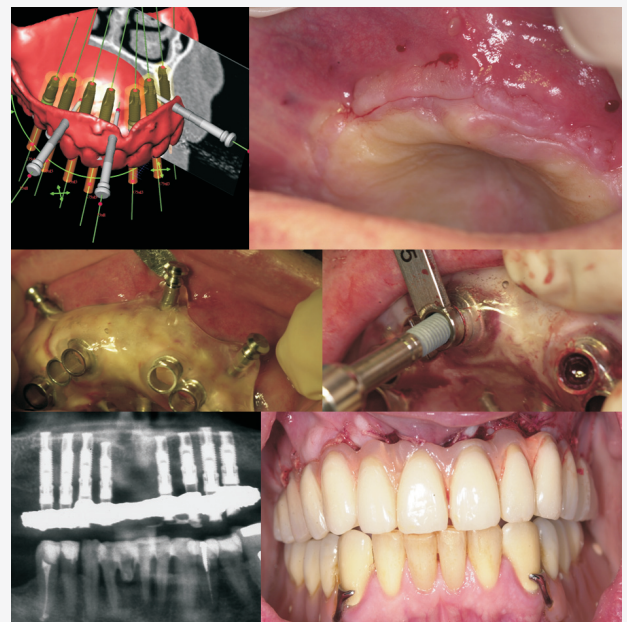
The aim of this project is to develop a new method using gas chromatography mass spectrometry that allows, based on the components in the breath of patients, to make a correct differential diagnosis for bad breath. The project focuses specifically on liver, lung and kidney diseases since these are medically the most important extra-oral causes for halitosis which remain frequently undetected. The method will be used for the objective evaluation of the changes in breath components during treatment and offers by this, perspectives to follow-up the efficiency of treatments and for the screening and diagnosis of liver, lung and kidney diseases.

### Unique infrastructure

Aerobic, CO<sub>2</sub> and/or anaerobic culturing of oral micro-organisms together with identification of species type, qPCR and PCR equipment, cell culturing facilities, biofilm models (Modified Robins Device, laminar flow cell), GCMS, dog models for periodontitis, bead breath clinic, periodontology clinic

### Immediate loading of oral implants by means of a fixed prosthesis placed the same day: the LITORIM approach.

Normally endosseous implants are left unloaded for several months to allow intimate bone apposition on their surface, called osseointegration. Recent data indicate that if sufficient bone quantity and quality is available this can be limited to a few weeks and eventually a few hours. This project investigated the clinical outcome (success rate, jaw function, patient comfort...) of same day implant supported prostheses which have been custom-made on the basis of 3D CT scan images. Presently, on the basis of the successful experience gained in Leuven (10 patients) a prospective international multicentre study is started. LITORIM stand for Leuven Information Technology based Oral Rehabilitation by means of IMplants.



Immediate loading of oral implants