

OPEN POSITION for a 4-year full-time research scholarship

(leading towards a PhD degree – KU Leuven BIOMAT (University of Leuven), Belgium)

Prof. B. Van Meerbeek, Dr. G. Kerckhofs, Prof. F. Maes, Prof. L. Godderis, Prof. W. Teughels, Dr. J. Snauwaert, Dr. K. Van Landuyt

The open position involves a research project (G.0720.12) funded by the Research Foundation Flanders at KU Leuven BIOMAT of the Department of Oral Health sciences, in collaboration with the Department of Metallurgy and Materials Engineering, the Medical Imaging Center, the research unit Social and Preventive Health Care, and the Department of Chemistry

Title: Towards longer-lasting tooth restorations in composite

Summary of project: Decayed or traumatized teeth are most commonly restored adhesively using tooth-colored composites. However, longevity studies show that dentists need to replace composite restorations too soon. Each intervention leads to further tooth weakening. Such early restoration failure should primarily be ascribed to biodegradation of composite restorations, typically initiated at the restoration margins due to marginal breakdown and micro/nano-leakage. This may eventually lead to new caries. Besides composite-polymerization shrinkage hindering tight marginal adaptation, also cariogenic biofilms appear to adhere easily to composite. In the biomechanical PROJECT-PART 1, early polymerization-shrinkage stress development/distribution within composite restorations will be mapped in 3D using nano-CT (Research Question-1.1). This innovative non-destructive approach will be applied to assess specific clinical conditions like the potential stress-reducing capacity of 'shock-absorbing' intermediate liners (RQ-1.2) and new low-shrinking composites (RQ-1.3). Finally, marginal leakage will be studied in 3D using radiopaque tracers (RQ-1.4). The biological PROJECT-PART 2 aims to elucidate factors that influence early bacterial colonization of composites using an innovative AFM-approach (RQ-2.1), and to analyze composite-degradation products (RQ-2.2) and their interaction with bacteria at the tooth-restoration interface (RQ-2.3). Potential anti-bacterial strategies will be assessed likewise (RQ-2.4). With this exploratory study, KU Leuven BIOMAT aims to improve the clinical success of tooth restorations in composite.

Requirements: The candidate should have a university degree (dentist, physician, biologist, bioengineer, biomedical scientist, etc.). The candidate is strongly motivated to conduct the project towards a PhD degree (4 years) (see <http://www.kuleuven.be/phd/> and <http://gbiomed.kuleuven.be/phd/>). The current salaried position is meant for research primarily with regard to Project Part 2 (see above).

Starting date: as soon as possible.

Selection method: The application requires a written solicitation (motivation), extended CV (including relevant research experience, study curriculum with rankings, English proficiency for foreign students), and contact information for three references. A pre-selection is based on the comparison of the submitted files. The candidate should be prepared to travel to Leuven for an interview.

Solicitation and CV are to be sent electronically to Prof. B. Van Meerbeek bart.vanmeerbeek@med.kuleuven.be before January 30, 2012.