

Postdoctoral position in Bone Regenerative Biomaterials available in the Dental-Biomaterials Research Unit

General Information:

The loss of one or more teeth, usually due to trauma or infection, can lead to functional (chewing) or social difficulties. The treatment of choice is to replace the lost tooth with a dental implant. However, in order to be permanent, the placement of implants requires a sufficiently large volume of bone to present. As the loss of a tooth results in bone loss, regeneration of the alveolar bone is a necessary step before the implants can be placed. Clinicians specialized in implantology use bone substitute biomaterials as a basis to guide bone regeneration. Many such biomaterials exist, both from natural and synthetic origin, but effective regeneration of the entire volume remains a challenge due to suboptimal physicochemical properties of the materials.

There is a growing interest in synthetic bone regeneration biomaterials with a customized three-dimensional (3D) shape, perfectly adapted to the patient's bone defect. In the B2BONE project, the academic partners continue a successful collaboration on the development of such novel biomaterials, by merging clinical expertise (Dentistry School d-BRU team of Prof. France Lambert & Dr. Dorien Van hede) with in silico tissue engineering expertise (team of Prof. Liesbet Geris @ GIGA In Silico Medicine). In this previous collaboration, a computer model used was developed to optimize the internal design of the 3D printed biomaterial. In vivo experiments in a standard alveolar bone regeneration model demonstrated the superiority of the developed biomaterial over the current clinical gold standard (link: <https://doi.org/10.1002/adfm.202105002>).

In the B2BONE project, the objectives are to continue this research, focusing on improving complex pore architecture, microtexture, 3D printing technology and clinical usability, using a combination of in vitro, in vivo and in silico technologies. In the scope of this project, one postdoctoral position is available for a highly motivated interdisciplinary candidate. The candidate will work in close collaboration with a PhD student and another postdoctoral researcher also hired on the project, as well as with the colleagues of the Belgian Ceramic Research Centre (BCRC) who are experts in 3D printing and microtexturing of ceramic materials.

Hiring Institution and Research Unit

Hiring institution: University of Liège (<https://www.uliege.be>)

Official address:
Université de Liège
Place du 20-Août, 7
4000 Liège – Belgique

Type of contract: temporary (3 years (year contracts))
Job status: full-time
Hours per week: 38 hours
Offer starting date: 01/10/2022

Research unit: dental-Biomaterials Research Unit (<https://www.d-bru.uliege.be>).

Profile

We are looking for a highly motivated researcher with a PhD degree (in Biomedical Sciences or equivalent) and a high interest in medical device and bone regeneration. **He/she should have strong experience in cell culture, histology, histomorphometry and high resolution-computed tomography.** Fluency in oral and written English (at least B2 level), an independent, creative mind yet with a good team spirit and excellent organizational skills are essential requirements. Researchers defending their PhD thesis in late 2022/beginning 2023 are encouraged to apply.

We offer

- A research project that will be organized together with excellent academic partners (Prof. France Lambert and Prof. Liesbet Geris), research center (CRIBC) and industry (Wishbone SA.)
- A modern, international and well-equipped research environment with state-of-the-art technological platforms
- Up to 48 months full-time employment (in year contracts)
- A monthly salary determined by the university barema (around 2600 EUR net, depending on seniority and family situation).

How to apply ?

Please send the following documents in English to dorien.vanhede@uliege.be before 07/09/22

1. A motivation letter (no more than two A4 pages)
2. Curriculum vitae, including your grades & publication list
3. Three reference letters

The title of the application email should be "postdoc position d-BRU" in order to ensure correct processing.

Selection Criteria

The selection committee uses a number of indicators to evaluate the applicant's preparedness, motivation and potential.

1st phase, remote pre-selection:

The Scientific, Technological & Academic excellence will be considered at first, based on:

- Quality of the CV, in general
- Any demonstrated research experience, particularly if supported by evidences such as scientific publications, patents, participation in scientific congresses, ...
- Undergraduate performance: overall, with a special focus on relevant field-specific courses
- Any demonstrated previous recognitions (grants, awards, ...)
- Reference letters provided by professors and senior scientists: Three reference letters are expected. At least two letters must be issued by scholars. The third letter can be provided either by a scholar or by a relevant professional of the industrial sector. Referees are asked to address analytical capabilities, technical proficiency, ability to work independently and motivation/commitment. If your references prefer

to send their letters directly to us upon request, mention this clearly in the application.

- Statement of purpose: past research experience, motivation for applying to this particular PhD project, academic fit, contribution of the project to the candidate's future careers plans, ...
- Additional relevant skills (field-specific): demonstrated, e.g. through previous projects, and or through previous participation in scientific contests, trainings, ...

2nd phase, interview(s):

Should the candidate be preselected at phase 1, a second phase will consist in at least one interview through which the motivation, the proactive behaviour, the capacity to work collaboratively, the organizational skills, the communication skills and the capacity to engage in a scientific discussion and manage problems, will be assessed, among other aspects.

The final decision will be the result of a consensus of an evaluation committee that will take into account the results of both recruitment phases 1 and 2. The candidate will be informed of the section results by email.

References

- De Carvalho, B., Rompen, E., Lecloux, G., Schupbach, P., Dory, E., Art, J.-F., & Lambert, F. (2019). Effect of Sintering on In Vivo Biological Performance of Chemically Deproteinized Bovine Hydroxyapatite. *Materials*, 12(23), 3946. <https://doi.org/10.3390/ma12233946>
- Lambert, F., Bacevic, M., Layrolle, P., Schüpbach, P., Drion, P., & Rompen, E. (2017). Impact of biomaterial microtopography on bone regeneration: Comparison of three hydroxyapatites. *Clinical Oral Implants Research*, 28(10), e201- e207. <https://doi.org/10.1111/clr.12986>
- Le Guéhennec, L., Van Hede, D., Plougonven, E., Nolens, G., Verlée, B., De Pauw, M.-C., & Lambert, F. (2019). In vitro and in vivo biocompatibility of calcium-phosphate scaffolds 3D printed by stereolithography for bone regeneration. *Journal of Biomedical Materials Research. Part A*, 108, 412- 425. <https://doi.org/10.1002/jbm.a.36823>
- Van hede, D., Liang, B., Anania, S., Barzegari, M., Verlée, B., Nolens, G., Pirson, J., Geris, L., & Lambert, F. (2022). 3D-Printed Synthetic Hydroxyapatite Scaffold With In Silico Optimized Macrostructure Enhances Bone Formation In Vivo. *Advanced Functional Materials*, 32(6), 2105002. <https://doi.org/10.1002/adfm.202105002>