

PhD Project Description

School/Department: Department of Internal Medicine, laboratory for calcium and bone metabolism	
Supervisor information:	<ul style="list-style-type: none"> • Bram C.J. van der Eerden, PhD • Email: b.vandereerden@erasmusmc.nl • Prof. dr. J van Leeuwen • Email: j.vanleeuwen@erasmusmc.nl • Website: <ul style="list-style-type: none"> - https://www.erasmusmc.nl/en/research/researchers/eeden-bram-van-der - https://publons.com/researcher/2698444/bram-cj-van-der-eeerden/ • Personal grants: <ul style="list-style-type: none"> - 2018-2022: Health~Holland, TKI, - 2016-2020: Horizon2020-MCSA-RISE-2015 - 2012-2016: FP7-PEOPLE-2011-IRSES • Most important publications (Total publications, 86; H-index, 25) <ul style="list-style-type: none"> - Fecher-Trost et al. J Bone Miner Res. 2019;34(4):699-710 - Lodberg et al. FASEB J. 2019;33(5):6001-6010 - Brum et al. JBMR Plus. 2018;2(6):341-350 - Mumtaz et al. Sci Rep. 2018;8(1):16975 - Vermeij et al. Nature. 2016;537(7620):427-431 - Brum et al. Proc Natl Acad Sci U S A. 2015;112(41):12711-6
Project Title:	Integrative approach to study fracture healing
Abstract:	<p>Contrary to common belief, bone is a highly dynamic organ with many events taking place, such as continuous bone remodeling, stem cell renewal, hematopoiesis, mineral homeostasis, etc. Osteoporosis, in which often several of these processes are affected, is the most common skeletal disorder, affecting many millions of patients globally. As a consequence, every 3 seconds an individual suffers from a fracture worldwide, of which 10% does not heal well (non-union fractures). Given its complexity and multitude of cell types involved, it is difficult to study specific processes taking place in the regenerating skeleton <i>ex vivo</i>. Organ-on-chip (OoC) microfluidics has become a novel state-of-the-art technology to study cell-cell communication in a physiologically relevant manner. To better understand angiogenesis during bone fracture healing, we have successfully established OoC devices to study the crosstalk of mesenchymal stromal cells and endothelial cells known to crucially interact <i>in vivo</i>. Using this model, we will delineate novel factors involved in angiogenesis of bone and study these <i>in vivo</i>, using murine fracture healing and bone regeneration models. We will combine bone formation, angiogenesis, 3D-printed scaffolds and newly discovered genes/compounds to obtain insights into novel physiologically relevant processes in bone metabolism and provide a better understanding towards the approaches to improve bone regeneration and shorten the burden associated with fractures.</p> <p>The qualified candidate will work within international teams of scientists in an interdisciplinary setting, and will receive both theoretical training and hands-on training in a large range of cutting-edge techniques. PhD students are supported by a supervision committee, participate in scientific and professional skills courses, attend international conferences and receive career development support.</p>
Requirements of candidate:	<ul style="list-style-type: none"> • Background: Cell biology, molecular biology, biomedical, creative, punctual, enthusiastic, communicative • Master degree or MD, animal experimentation permit is preferred. • Scholarship that will, at least, cover subsistence allowance and international air plane ticket (we could help with the scientific part of your scholarship proposal) • English language requirement: <ul style="list-style-type: none"> • English speaking countries & Netherlands: no requirement • Other countries: IELTS 7.0 (min 6.0 for all subs), TOEFL 100 (min 20 for all subs)

Application requirements & Deadlines:

<https://www.eur.nl/en/about-eur/erasmus-university-china-centre/csc-scholarship>

Erasmus MC, ranked world

* No.32 for Clinical Medicine US News 2020:

<https://www.usnews.com/education/best-global-universities/clinical-medicine?page=3>

* No. 30 Nature Index for Biomedical Sciences 2019:

<https://www.natureindex.com/supplements/nature-index-2019-biomedical-sciences/tables/healthcare>