ERASMUS UNIVERSITEIT ROTTERDAM

Erasmus University Rotterdam, the Netherlands
CSC PhD 2015 Project Description

School/Department:	Erasmus MC, Department of Internal Medicine Calcium and bone metabolism laboratory
Project Title:	Understanding the molecular and cellular mechanisms of tumor cell metastasis in bone
Abstract:	Metastasis to the bone occurs in all types of cancer, but particularly in prostate and breast cancer. Once these metastases occur, there is no cure possible. The cancer cell growth is unstoppable and the cancerous cells attack the bone through which the quality of life will drastically deteriorate. We have set up a complete human co-culture model with osteoblasts (bone forming cells) and prostate metastases to study cellular cross-talk and migration of tumor cells. Depending on differentiation stage of the osteoblast, the interaction with metastatic tumor cells is either stimulatory or inhibitory. The aim of the PhD project is to identify and characterize osteoblast genes that are functionally involved in the interaction with metastatic cells during different stages of osteoblast development and may form the basis of new therapeutics. Therefore we will perform gene arrays on osteoblasts and metastatic tumor cells after cell-cell contact, silence candidate genes or proteins and perform functional assays.
Requirements of candidate:	Background: Cell biology, molecular biology, interest in cancer research, creative, punctual, enthusiastic, communicative Master degree: Yes IELTS Grade: 7.0 (minimal 6.0 per component) or TOEFL: 100 (minimal 20 per component)
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	Van Driel M, van Leeuwen JPTM. Cancer and bone: A complex complex. Arch Biochem Biophys. 2014 Van Driel, M, van Leeuwen JPTM. Vitamin D endocrine system and osteoblasts. Bonekey Rep. 2014 Alves RD, Eijken M, Bezstarosti K, Demmers JA, van Leeuwen JPTM. Activin A suppresses osteoblast mineralization capacity by altering extracellular matrix (ECM) composition and impairing matrix vesicle (MV) production. Mol Cell Proteomics. 2013 Van Dijk SC, de Herder WW, Kwekkeboom DJ, Zillikens MC, Feelders RA, van Schaik RH, van Driel M, van Leeuwen JPTM. 5-HIAA excretion is not associated with bone metabolism in carcinoid syndrome patients. Bone. 2012 Bruedigam C, Driel Mv, Koedam M, Peppel Jv, van der Eerden BC, Eijken M, van Leeuwen JPTM. Basic techniques in human mesenchymal stem cell cultures: differentiation into osteogenic and adipogenic lineages, genetic perturbations, and phenotypic analyses. Curr Protoc Stem Cell Biol. 2011 Alves RD, Eijken M, Swagemakers S, Chiba H, Titulaer MK, Burgers PC, Luider TM, van Leeuwen JPTM. Proteomic analysis of human osteoblastic cells: relevant proteins and functional categories for differentiation. J Proteome Res. 2010