OsteoMotion: Analyzing the mechanisms and role of osteogenic cell movement in bone development and disease

Fact Sheet

Project information

**OSTEOMOTION**

- **Grant agreement ID:** 282131
- **Status:** Closed project

Funded under: 
FP7-IDEAS-ERC

- **Overall budget:** € 1 499 200
- **EU contribution:** € 1 499 200

Hosted by: 
KATHOLIEKE UNIVERSITEIT LEUVEN

Belgium

Objective

Bone development and homeostasis must incontestably rely on a correct spatial positioning of osteoblasts to generate bone at appropriate sites. A failure of osteoblasts to reach the sites in need of bone formation may contribute to impaired fracture repair and osteoporosis. Conversely, uncontrolled osteogenic cell movement may play a role in diseases involving aberrant placement of bone. Mechanisms of osteoblastic migration and adhesion may even be mimicked by bone-metastasizing tumor cells. Yet, the trafficking of osteogenic cells has been a largely neglected aspect in bone biology. My recent studies abroad for the first time shed light on this process in vivo. Newly generated transgenic mouse models for osteoblast lineage tracing revealed that specifically osteoprogenitors, and not mature osteoblasts, moved to initiate novel sites of bone formation. Intriguingly, osteoprogenitors entered developing and healing bones along with their neovascularization, some being wrapped as pericytes around the blood vessels, suggesting an unprecedented vessel-guided cell movement mechanism.

Implementing these concepts and models, I here propose two angles to elucidate the mechanisms mediating osteoprogenitor motility. In a first approach, we will assess the involvement, in vitro and in vivo, of known candidate molecular targets of (i) cell-matrix interactions pivotal in cell migration, (ii) cell-cell adhesion, and (iii) the association between pericytes and endothelial cells. Secondly, a high-risk high-gain
reverse approach using innovative technologies aims to identify the specific genetic profiles of motile osteoprogenitors and bone-anchored mature osteoblasts. Overall this project will bring novel mechanistic insight in osteogenic cell movement in bone biology and pathology, and add to our broader understanding of cell migration and progenitor properties. The potential to evoke new therapies to widespread skeletal pathologies underscores the study's importance and high impact.

Field of Science

/medical and health sciences/basic medicine/pathology

/medical and health sciences/basic medicine/physiology/homeostasis

/social sciences/sociology/social problems/migration

Programme(s)

FP7-IDEAS-ERC - Specific programme: "Ideas" implementing the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007 to 2013)

Topic(s)

ERC-SG-LS4 - ERC Starting Grant - Physiology, Pathophysiology and Endocrinology

Call for proposal

ERC-2011-StG_20101109

See other projects for this call

Funding Scheme

ERC-SG - ERC Starting Grant

Principal Investigator

Christa Renée Julie Emilia C. Maes (Prof.)

Host institution
<table>
<thead>
<tr>
<th><strong>KATHOLIEKE UNIVERSITEIT LEUVEN</strong></th>
<th><strong>EU Contribution</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Address</strong></td>
<td><strong>Activity type</strong></td>
</tr>
<tr>
<td>Oude Markt 13 3000 Leuven</td>
<td>Higher or Secondary Education Establishments</td>
</tr>
<tr>
<td><strong>Belgium</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Website**

**Contact the organisation**

Principal Investigator: Christa Renée Julie Emilia C. Maes (Prof.)

Administrative Contact: Stijn Delauré (Dr.)

---

### Beneficiaries (1)

<table>
<thead>
<tr>
<th><strong>KATHOLIEKE UNIVERSITEIT LEUVEN</strong></th>
<th><strong>EU Contribution</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Address</strong></td>
<td><strong>Activity type</strong></td>
</tr>
<tr>
<td>Oude Markt 13 3000 Leuven</td>
<td>Higher or Secondary Education Establishments</td>
</tr>
<tr>
<td><strong>Belgium</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Website**

**Contact the organisation**

Principal Investigator: Christa Renée Julie Emilia C. Maes (Prof.)

Administrative Contact: Stijn Delauré (Dr.)

---

**Share this page**

Last update: 21 June 2017

Record number: 100905

Permalink: https://cordis.europa.eu/project/id/282131/en

© European Union, 2019