



General description: The core activities of Erasmus MC are patient care, education and research. At the hospital, patient care is the core activity; the core activities at the medical faculty are education and research. Every medical department has an educational purpose and also conducts scientific research. There are approx. 12,000 employees and 2500 medical students. Erasmus MC's research covers the entire spectrum from fundamental non-clinical research to patient related research. Our knowledge covers a broad field of interests that stretches from illness to health, and from individual to community healthcare.

Website: www.erasmusmc.nl

Expertise: The Connective Tissue Cells and Repair group of the department of Orthopaedics and the department of Otorhinolaryngology performs translational research from a cell biological view point. The central research question of the group is: "what drives cells in degenerating and regenerating connective tissues?" The focus lies on anabolic processes in tissue repair with main interest in cartilage and growth factors in degenerative diseases like osteoarthritis where repair is not appropriate as well as in repair of lesions where we apply principles of tissue engineering and regenerative medicine. We have all standard equipment necessary for cell and tissue culture, viral transfections, histology, biochemistry and molecular biology available in our own laboratory.

Facilities: University hospital (possibilities to do clinical trials) / Animal facilities (small animals, pigs and primates) / GMP cell culture facilities / Core facility genomics and core facility proteomics.

Other European projects: European Science Foundation - Research networking programme -

REMEDIC - May 2008 to April 2013 - 06-RNP-128. Programme PEOPLE - Call ID FP7-PEOPLE-2007-2-1-IEF – Panel LIF - Proposal N°221345 - Acronym: IVANG. Euronanomed program of FP7 - Ear Tissue Regeneration Using Human Cells and Novel Nano-Cellulose Scaffolds (EAREG) - 13N11075, 13N11076.

Role in the project: Our focus in the project will be cartilage repair. We will study the effect of TGF- β on chondrogenesis of human adult bone marrow derived stem cells in culture. Human bone marrow is used routinely in our laboratory (ethical protocols in place) and all analytical methods required for this task are available. Except for our knowledge on growth factors in cell differentiation and cartilage matrix production, our knowledge on osteoarthritis is of importance for the project. We have almost 2 decenia of experience in osteoarthritic research. We use small animal models for osteoarthritis as well as samples from human patients. The research did not only focus on cartilage changes but also on interaction with subchondral bone as well as inflammation components. There is also involvement in clinical studies on osteoarthritis.

Workpackages responsibility: Ex vivo (organ model) and in vivo analysis of organ repair [WP01](#), [WP02](#), [WP03](#), [WP04](#), [WP05](#), [WP06](#), [WP07](#), [WP08](#) (bold = WP leader; WP = Workpackage)

Key personnel

[Gerjo J.V.M. van Osch](#) : PhD (F) Medical Biologist, received her PhD in 1994 on animal models for osteoarthritis and was involved in cartilage tissue engineering from 1994 on. Her main focus is the role of growth factors for chondrogenic differentiation and matrix formation. She is presently appointed as associate professor and leader of the Connective Tissue Cells and Repair group (approx. 12 people).

[P. Koen Bos](#) : MD PhD (M). Orthopaedic surgeon with osteoarthritis and joint reconstructions as main area of interest. Received his PhD in 2006 for basic science on cartilage wound healing and integrative repair with emphasize on growth factors. He will be involved in discussion on clinical applications of GAMBA modules.

[Yvonne M. Bastiaansen-Jenniskens](#) : PhD (F). Studied Health Sciences and received her PhD in 2009 for research on extra-cellular matrix formation by chondrocytes, using growth

factors amongst other agents. She will be either appointed directly on the project or get a key role in daily supervision.

[Marloes de Vries-van Melle](#) : IR (F).

Publications:

1.

van Osch GJ, GJ, Brittberg M, Dennis JE, Bastiaansen-Jenniskens YM, Erben RG, Kontinen YT, Luyten FP. Cartilage repair: past and future. *J Cell Moll* 2009 May 15 [epub ahead of print]

2.

Farrell E, van der Jagt OP, Koevoet W, Kops N, van Manen CJ, Hellingman CA, Jahr H, O'Brien FJ, Verhaar JA, Weinans H, van Osch GJ. Chondrogenic Priming of Human Bone Marrow Stromal Cells: A Better Route to Bone Repair? *Tissue Eng Part C* 2009 Jun;15(2):285-95.

3.

Botter SM, Glasson SS, Hopkins B, Clockaerts S, Weinans H, van Leeuwen JP, van Osch GJ. ADAMTS5^{-/-} mice have less subchondral bone changes after induction of osteoarthritis through surgical instability: implications for a link between cartilage and subchondral bone changes. *Osteoarthritis Cartilage*. 2009 May; 17(5): 636-645.

4.

Bos PK, van Osch GJ, Frenz DA, Verhaar JA, Verwoerd-Verhoef HL. Growth factor expression in cartilage wound healing: temporal and spatial immunolocalization in a rabbit auricular cartilage wound model. *Osteoarthritis Cartilage*. 2001 May;9(4):382-9.

5.

van Osch GJ, van der Veen SW, Buma P, Verwoerd-Verhoef HL. Effect of transforming growth factor-beta on proteoglycan synthesis by chondrocytes in relation to differentiation stage and the presence of pericellular matrix. *Matrix Biol*. 1998 Oct;17(6):413-24.

Specific awards and certifications: Dr van Osch received the ICRS-Genzyme award for excellence in cartilage research (2007), an Euler Young Investigator award (1993) and a Frye stipendium for promising female researchers (1993). Under supervision of dr van Osch, at least 15 presentation or abstract awards have been given to PhD students.