



of the European Community for research, technological development and demonstration activities (2007-2013)

Collaborative Project – Large Scale Integrating Project

MAGISTER

Project title: **Magnetic Scaffolds for in vivo Tissue Engineering**

Project number: **214685**

Project coordinator: **Consiglio Nazionale delle Ricerche CNR, Roma, Italy**

FZD participant: **Dresden High Magnetic Field Laboratory**

Starting date: **01.12.2008**

Duration (months): **48**

Summary

The main driving idea of the project is the creation of conceptually new type of scaffolds able to be manipulated in situ by means of magnetic forces. This approach is expected to generate scaffolds with such characteristics as multiple use and possibly multipurpose delivery in order to repair large bone defects and osteocondral lesions in the articular surface of the skeletal system.

The major limitations of the scaffolds for bone and cartilage regeneration nowadays available in the market are related to the difficulties in controlling cell differentiation and angiogenesis processes and to obtain stable scaffold implantation in the pathological site.

Several attempts have been performed over the last years in order to provide scaffolds for tissue engineering, but nowadays there is no way to grant that tissue regeneration take place in the pathological site. The provision in vivo of the scaffold with staminal cells or/and growth factors in order to drive the tissue differentiation process and parallel angiogenesis represents nowadays one of most challenging requests.

The Consortium aims to elaborate, investigate and fabricate new kind of scaffolds – magnetic scaffolds – characterized by strongly enhanced control and efficiency of the tissue regeneration and angiogenic processes. The magnetic moment of the scaffolds enables them with a fascinating possibility of being continuously controlled and reloaded from external supervising center with all needed scaffold materials and various active factors.

Such a magnetic scaffold can be imagined as a fixed “station” that offers a long-living assistance to the tissue engineering, providing thus a unique possibility to adjust the scaffold activity to the personal needs of the patient.