

# Researcher develops bioreactor for cultivation of bone cells

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A new bioreactor system for cultivating bone cells reduces the number of actions that need to be taken in the process, and so lowers the cost of tissue culture. Frank Janssen of the University of Twente (The Netherlands) developed this new bioreactor. With the new system the cells can be closely monitored during their growth, so that they grow as well as possible.

Sometimes a piece of bone has to be replaced by a new bone fragment, for example after an accident or illness. [Bone tissue](#) culture, where stem cells from the patient's [bone marrow](#) are combined with a suitable carrier material, is a promising technique for this. The method is used as an alternative for a bone transplant. There were a number of disadvantages to the bone tissue culture technique, however. Frank Janssen of the University of Twente therefore developed a special bioreactor in which [stem cells](#) from the bone marrow can grow into [bone cells](#). He expects that the new system will be ready for clinical use in 5 to 10 years.

The new bioreactor for bone tissue culture drastically reduces the number of steps in the procedure, and therefore lowers its cost. The bioreactor is a closed system, connected to a computer, so the cultivation conditions such as oxygen use, acidity and temperature can be tracked online, allowing much better monitoring of cell growth.

Until now, a piece of bone was replaced by an autologous bone transplant, or by using bone tissue grown in culture jars. In an autologous bone transplant a piece of bone is removed from another part of the

patient's body and placed in the defective area in a surgical operation. This is a major operation, with a fairly high risk of infection. Bone tissue culture is a good alternative, but it also has many disadvantages, because it is carried out in culture jars. These are plastic jars in which a limited number of cells can be cultivated. The technique also requires many human actions, and the cells cannot be closely monitored during their growing phase.

Janssen obtained his PhD on 28 May from the faculty of Science and Technology.

Provided by University of Twente

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