Accelerating the Growth Cells for Bone for Tissue Engineering Applications.
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Introduction
For tissue engineering applications often a large amount of cells is needed. Since expansion of cells is labor intensive and therefore expensive, the use of an optimal cell expansion system is desirable. The Enhanced Cell Proliferation Reactor (ECPR) developed by Vabrema BV claims to support cell growth during culture by exposing cells to intense short electromagnetic fields. In our research we are interested in cells for the concept of bone tissue engineering. To test if the ECPR device can influence the growth rate of osteogenic cells we initiated testing the device on MC3T3 cells.

Materials and Methods
MC3T3 E-1 cells were exposed for several minutes to an induced pulsed electric field of 10kV/cm, nanosecond pulse duration and frequency of 7 Hz. Different treatment times were chosen to look for optimal growth acceleration. After treatment they were plated at a density of 10,000 cells/cm (n=3) and the growth rate of the cells was measured by cell count (n=3) and the metabolic activity was measured via Alamar Blue (n=3).

Results
After treatment of the cells with the ECPR device they were placed in culture. At day 3 the number of cells was counted and their metabolic activity was measured. As shown in figure 1, the cells treatment by the device grew significantly faster as the control cells (0 min). These findings are supported by the data on the metabolic activity of the cells, as displayed in Figure 2. Their activity is both after day 3 and 7 significantly increased in the treated cells. By microscopic observation the treated and control cells displayed a similar morphology (data not shown). Currently we are evaluating their osteogenic capacity by PCR and we started with testing the effect of the device on the growth rate of MSCs.

Discussion and Conclusions
The ECPR device accelerates cell growth and thereby shows great potential to be used future Tissue Engineering applications for various cell types. Though will still have to demonstrate that the function or differentiation capacity is not affected by the treatment, the first results look promising.