

## Acoustotaxis - manipulation of cell proliferation and migration using surface acoustic waves [Abstract]

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**P-684****Acoustotaxis – Manipulation of cell proliferation and migration using surface acoustic waves**

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After an injury and during wound healing, the damaged bone or tissue layer has to be reassembled and regenerated by cell proliferation and migration. To speed up this regeneration either after an injury or in the context of tissue engineering, any type of externally enhanced cell growth would be highly relevant. To study such an external wound healing parameter, we use surface acoustic waves (SAW) for dynamic in vitro manipulation of living cells in a precise and controllable manner. We irradiate osteoblastic Saos2 cells with SAW for 72 hours on a SiO<sub>2</sub> covered piezoelectric LiNbO<sub>3</sub> substrate. Employing a conventional wound healing assay, the SAW – treated cells exhibit a significantly increased proliferation and migration, respectively, as compared to control samples. Apart from quantifying our experimental findings, we also demonstrate the biocompatibility and biofunctionality of our SAW reactor by using LDH assays. We can exclude parasitic and possibly beneficent side effects such as the influence of increased substrate temperature and nutrient flow by thoroughly monitoring the temperature and the flow field using infrared microscopy and micro particle image velocimetry. Our results show that the SAW induced dynamic mechanical and electrical stimulation obviously directly promotes the cell growth.