

THE **BEOSIGNER**®

A SCIENTIFIC EVALUATION

Study on the beneficial effects of vitalised water with cultured cells. In vitro studies on the effect of the Vitalizer by Vitarights Innovations GmbH.

Summary of the test report dd. September 15, 2019 by Prof. Dr. Peter C. Dartsch, Head of Dartsch Scientific, Institute for Cell-Biological Test Systems

The examinations were conducted with the High Tech Vitalizer, the predecessor of the Beosigner®. All study results can be transferred to the Beosigner® because this device uses the same technology.

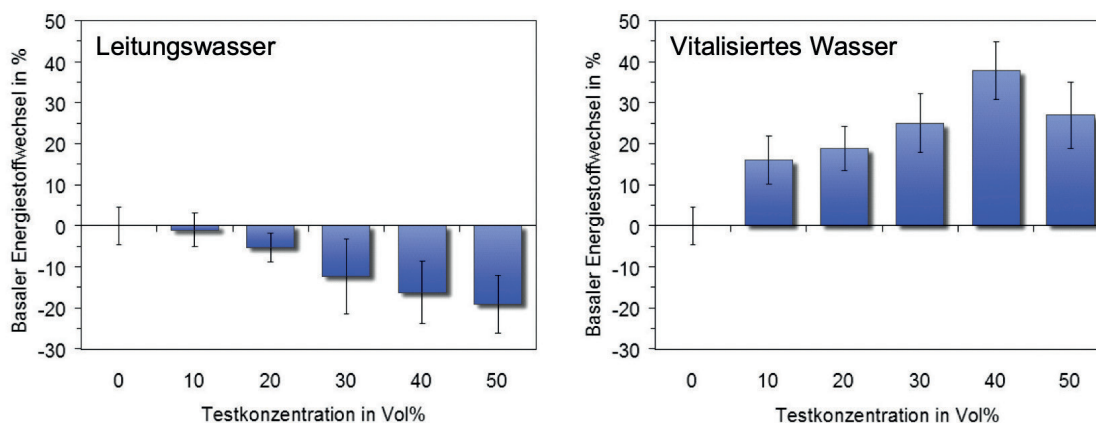
Tap water treated with the Vitalizer was examined. In doing so, first preliminary tests with anonymised water samples were conducted, which means the two water samples (revitalized water and untreated water) were sent to the institute separately, without any knowledge of the respective sample's background. After the first preliminary examinations showed significant differences between the two samples and the institute clearly identified the vitalised sample based on the test results, further examinations were undertaken with local tap water that was vitalised by the institute itself and compared to untreated tap water as corresponding reference. As before, the samples remained anonymous for the testing staff.

In the study, the water sample was treated (vitalised) with the Vitalizer from a distance of approx. 10 mm for 30 seconds. For the subsequent examination of the time dependence, the water was vitalised for up to 120 seconds. The water samples were tested in various dilutions (0 to 50 vol%). As an internal control, the test concentration of 0 vol% was respectively utilised, which means pure culture medium without any supplements. The results were related to the respective water sample without Vitalizer treatment.

Basal energy metabolism of connective tissue cells

The tests were carried out with connective tissue fibroblasts. The behavior of the two water samples was completely different in this test approach (cf. figure). While the tap water decreased the cells' basal energy metabolism with increasing concentration, the treated (vitalised) water showed a concentration-dependent increase of energy metabolism of up to approx. 40% at a concentration of 40 vol%. Even at the lowest test concentration of 10 vol%, the stimulating effect was statistically significant compared to the control concentration ($p < 0.05$; Wilcoxon-Mann-Whitney test).

Effect of the two water samples on the basal energy metabolism of cultivated connective tissue fibroblasts



The reduction in the untreated tap water and the concentration-dependent stimulation by the treated (vitalised) water is clearly evident. The figure shows the mean values and standard deviations of three independent tests.

Cell regeneration with connective tissue cells

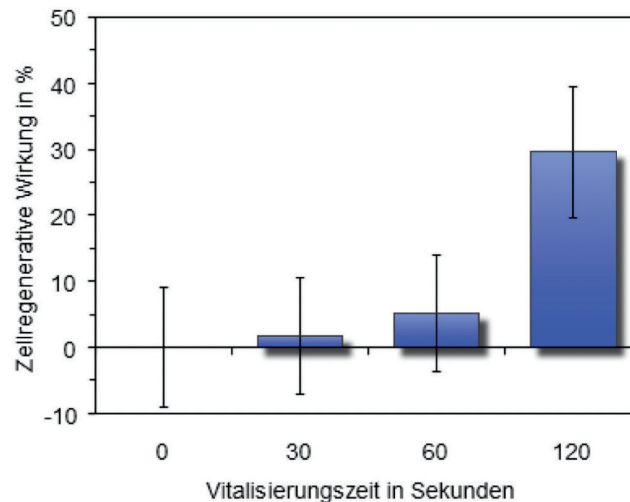
A stimulation of the energy metabolism of connective tissue cells is, as a rule, linked to an increase of cell regeneration, as is also apparent in a partial process (granulation phase) of wound healing. This in particular is characterised by the occurrence of cell migration and cell proliferation. The predominant cell type here is fibroblasts from both the surrounding and the underlying intact tissue. Thereby the restoration of the tissue occurs from the base and the sides and progresses upwards.

In vitro examination in the petri dish

Based on the results from the energy metabolism with a maximum stimulation at 40 vol%, the test concentration in this experimental approach was equally kept constant at 40 vol% and the vitalisation time varied from 0 (= un-treated tap water) to 120 seconds. In total, for each vitalization period, 4 measurements were performed in two independent tests. Subsequently, cell regeneration was calculated and compared to untreated tap water and then displayed graphically. As apparent from the figure below, water that had been vitalised for 120 seconds improved cell regeneration statistically significantly ($p < 0.05$; Wilcoxon-Mann-Whitney test). As a result, it can improve cell regeneration in organisms and support wound healing.

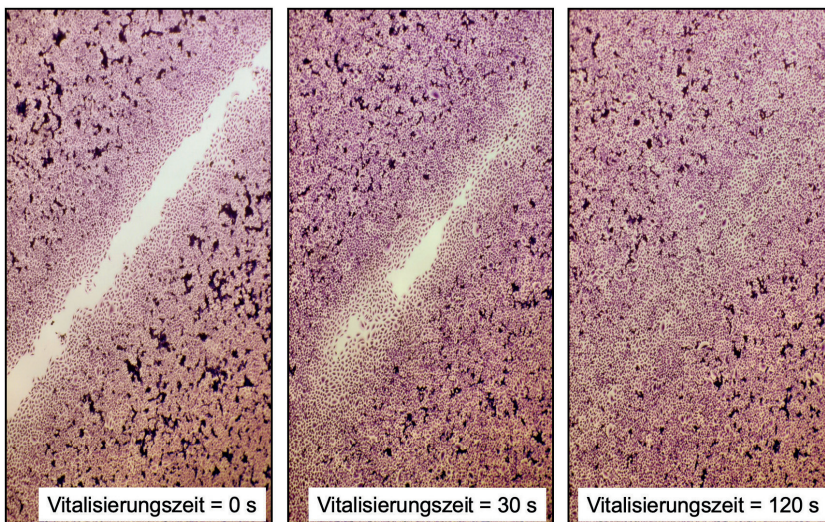
Cell regeneration in connective tissue fibroblasts in dependance on the vitalisation time of water

The figure below indicates mean percentage and standard deviation based on the untreated tap water (equalised to 0) from two separate tests with 4 measurements each.



In a further test, it was examined whether the direct vitalization of the aqueous culture medium instead of adding water at a later time also promotes cell regeneration. The following figure displays the results in form of micro-photographs and clearly shows the time dependence of facilitatory effects on cell regeneration.

Cell regeneration after 24 hours with direct vitalisation of cells



In the control condition without vitalization (= 0 s), a cell-free space is recognised, which disappears with increasing vitalization time. Olympus IX-50 Inverse Microscope with Olympus Planachromat 10x and Olympus E-10 digital camera with 4 Megapixel resolution.

Summary and conclusions

In the present study, experiments were conducted using organ-specific cell cultures as a non-animal alternative. The results indicate the beneficial effects of the Vitalizer, developed by Vitarights Innovations GmbH, 67657 Kaiserslautern. The water treated with the Vitalizer showed a distinctive stimulation of basal energy metabolism of connective tissue cells. As a result, a significant stimulation of cell regeneration of these cells was identified. Equally, the direct treatment of the cells with the Vitalizer was successful, without the indirect route via vitalised water.

Significant stimulation of the energy metabolism of connective tissue cells, both when utilising vitalized water as well as through direct treatment of the cells.

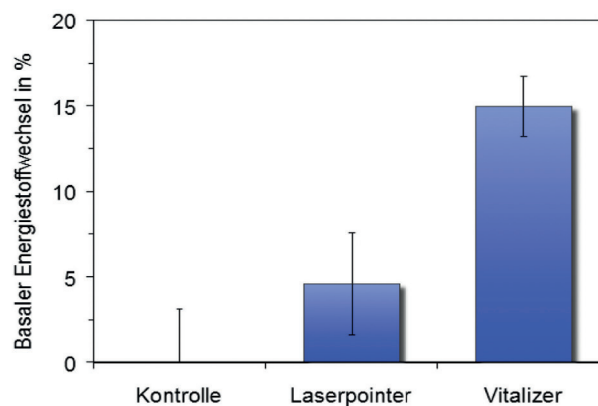
"In summary, the utilisation of the Vitalizer can be highly recommended."

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In a further experiment, in which cells were directly exposed, the application of a Vitalizer in comparison to a conventional laser pointer was examined to assess whether the Vitalizer stimulates the basal energy metabolism of the cells more strongly. For this purpose, the cells in the recesses of a 96-hole culture plate were treated directly for 30 seconds with either a laser pointer or the Vitalizer, respectively. Subsequently, the basal energy metabolism (as described) was recorded and evaluated for up to 5 hours.

As the following figure indicates, the laser pointer showed no significant effect compared to the untreated control. In contrast, the Vitalizer stimulated basal energy metabolism by almost 15 %. This was statistically significant compared to both the untreated control and the effect of the Laserpointer ($p < 0.05$; Wilcoxon-Mann-Whitney-Test).

Laser Pointer versus Vitalizer



On average, the cells treated with the laser pointer behaved like untreated cells. Using the Vitalizer, on the other hand, induced a significant effect in the stimulation of basal energy metabolism.




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