Review Article

BIOMEDICAL Journal of Scientific & Technical Research

ISSN: 2574 -1241

DOI: 10.26717/BJSTR.2024.56.008922

Beneficial Health Effects of the Combined Application of the Qi Quant BRIGHT Energy Plate and the Qi Quant Regeneration Plate 3.0

Peter C Dartsch*

Dartsch Scientific GmbH, Institute for Cell Biological Test Systems, Germany

***Corresponding author:** Peter C Dartsch, Dartsch Scientific GmbH, Institute for Cell Biological Test Systems, Auf der Vosshardt 25, D-49419 Wagenfeld, Germany

ARTICLE INFO

Received: May 28, 2024

Published: June 05, 2024

Citation: Peter C Dartsch. Beneficial Health Effects of the Combined Application of the Qi Quant BRIGHT Energy Plate and the Qi Quant Regeneration Plate 3.0. Biomed J Sci & Tech Res 56(5)-2024. BJSTR. MS.ID.008922.

ABSTRACT

Background: Recently we have demonstrated the effectiveness of the Qi Quant Regeneration Plate 3.0 which was able to reduce oxidative stress acting on intestinal epithelial cells. Moreover, we could also show a marked anti-inflammatory potential. In the present study we examined whether the combination of two plates, Qi Quant BRIGHT Energy Plate (application for 5 minutes) and Qi Quant Regeneration Plate 3.0 (application for 10 minutes), might result in even more pronounced beneficial effects at the cellular level.

Experimental: By using cultured connective tissue fibroblasts, we examined the basal cell metabolism and the regeneration/wound healing process with and without the combination of the two plates. Moreover, we also examined the anti-inflammatory potential of the combined application with functional neutrophils.

Results: The basal cell metabolism of the connective tissue fibroblasts was significantly improved by 12.3 ± 1.2% (mean value ± standard deviation; $p \leq 0.01$; Wilcoxon-Mann-Whitney test) by the single exposure to the combination of Qi Quant BRIGHT Energy Plate and the Qi Quant Regeneration Plate 3.0 when compared to the untreated control. In accordance with this result was the stimulation of regeneration of connective tissue fibroblasts which was significantly improved by 25.2 ± 5.6% (mean ± standard deviation; $p \leq 0.01$; Wilcoxon-Mann-Whitney test) by this combined exposure. The basal cell metabolism of the functional neutrophils was significantly increased by 54.2 ± 8.7% (mean ± standard deviation; $p \leq 0.01$; Wilcoxon-Mann-Whitney test) by the combination of the Qi Quant BRIGHT Energy Plate and the Qi Quant Regeneration Plate 3.0, we observed a significant inhibition of endogenous radical production and thus an anti-inflammatory effect of 26.8 ± 3.8% (mean ± standard deviation; $p \leq 0.01$; Wilcoxon-Mann-Whitney test) when compared to the untreated control.

Conclusions: The combined application of the Qi Quant BRIGHT Energy Plate and the Qi Quant Regeneration Plate 3.0 has demonstrated its beneficial effects on cellular level. The features examined in the present investigation show that this combination might be very effective for maintaining and improving systemic health and individual well-being.

Keywords: Vital Field; Energy Plate; Regeneration Plate; Connective Tissue Fibroblast; Functional Neutrophil; Inflammation; Oxidative Burst; Cell metabolism; Regeneration; Tissue Repair; Health

Introduction

Cell metabolism is a fundamental process that plays a critical role in maintaining vitality and overall health in the body. Within the complex network of cells, various metabolic pathways work together to produce energy, synthesize essential molecules, and regulate cellular functions. One key player in this process is the connective tissue fibroblast, a type of cell that is essential for maintaining the structural integrity of tissues and organs [1,2]. The metabolic activity of fibroblasts is essential for maintaining the health and function of connective tissues throughout the body. By producing energy through processes such as glycolysis and oxidative phosphorylation, fibroblasts ensure that tissues have the necessary resources to repair and regenerate when needed. Additionally, fibroblasts are involved in the synthesis of collagen and other extracellular matrix components, which are essential for tissue repair and maintenance [3]. In addition to their structural role, fibroblasts also play a role in cell metabolism by secreting growth factors and cytokines that regulate cellular activities such as proliferation, differentiation, and inflammation [4-6].

Especially the inflammatory process is a fundamental physiological response of the body to injury, infection, or harmful stimuli. It serves as a protective mechanism aimed at eliminating the initial cause of cell injury, clearing out damaged cells and tissues, and establishing a repair process. This complex biological response involves the activation of neutrophils as inflammation mediating cells which invade the inflamed tissue after the release of cytokines and other mediators [7-9]. Recently we have demonstrated the effectiveness of the Qi Quant Regeneration Plate 3.0 which was able to reduce oxidative stress acting on intestinal epithelial cells [10]. Moreover, we could also show a marked anti-inflammatory potential by reducing the generation of superoxide anion radicals by functional neutrophils. In the present study we examined whether the combination of both plates, Qi Quant BRIGHT Energy Plate and Qi Quant Regeneration Plate 3.0, results in even more pronounced beneficial effects at the cellular level.

Materials and Methods

Qi Quant BRIGHT Energy Plate

According to the information of the manufacturer, the new intelligent energy plate named BRIGHT supplies our body with energizing vital frequencies. By supplying the optimum vital frequency spectrum of the Qi Quant Technology, the energy potential of the cells is immediately charged. As the absorption capacity varies from user to user depending on their current situation, the Qi Quant BRIGHT Energy Plate has a special measuring module that analyses the user's present energy potential. This enables the user to supply the system with a precise and harmonized energy level. This adjustment takes place during the entire application time. This ensures that neither over-energization nor an energetic undersupply can occur. For the experiments described here, the BRIGHT Energy Plate powered by Qi Quant Technology was kindly provided by Qi Life Energy GmbH, A-8775 Kalwang, Austria.

Qi Quant Regeneration Plate 3.0

According to the manufacturer, the Qi Quant Regeneration Plate 3.0 should be positioned under the bed. The plate produces a vital field with a frequency pool containing all important regeneration frequencies within a radius of 90 cm. The body's own energy field only resonates with those frequencies that are required for an optimal supply of energy to the cells. The field strength of the vital field is adjusted in such a way that the energy system cannot be over-energized. The effect of the regeneration plate on the user can only be seen energetically and includes all known recovery support of energetics such as deep restful sleep, harmonization for body, mind and soul, removal of energetic blockages, opening of the energy flow, and, finally, protection against unwanted environmental pollution and influences such as geopathogenic interference zones, electromagnetic fields and others. Thus, the energy potential of the cells is gently built up again during sleep. For the experiments described here, the Regeneration Plate 3.0 powered by Qi Quant Technology was kindly provided by Qi Life Energy GmbH, A-8775 Kalwang, Austria.

Cell Culture

The studies were performed with two different cell lines:

(1) Connective tissue fibroblasts (cell line L-929, ACC-2; Leibniz Institute DSMZ, Braunschweig, Germany).

(2) Human promyelocytes (cell line HL-60; ACC-3; ECACC 98070106; Leibniz Institute DSMZ, Braunschweig, Germany).

Cells were routinely cultured in RPMI 1640 supplemented with 10% growth mixture and 0.5% gentamycin in incubator at 37°C and an atmosphere of 5% CO_2 and 95% air at almost 100% humidity.

Basal Metabolism of Connective Tissue Fibroblasts

For the experiments, cells from mass cultures were seeded in 96-well culture plates (200µl culture medium/well) at a cell density of 50,000 cells/well and incubated for 24 hours until the cells had completely adhered. The cell cultures were first placed on the Qi Quant Energy Plate for 5 min and then immediately on the Qi Quant Regeneration Plate for 10 min. The untreated control cultures were simultaneously placed for 15 minutes about 7 meters away and separated by several house walls. Cells were incubated for 24 hours. Thereafter, a reaction mixture consisting of phosphate buffered saline with 10 mM glucose as an energy source and the tetrazolium dye WST-1 (Sigma-Aldrich, Taufkirchen, Germany) was added to the cells. The cleavage of the dye is directly proportional to the mitochondrial dehydrogenases activity and the cellular energy metabolism.

Finally, the optical density was measured as a difference measurement ΔOD = 450 – 690 nm at definite time points by an Elisareader (BioTek ELx808 with software Gen 5 version 3.00) and analyzed using Microsoft Excel. A total of three independent experiments with duplicate wells were performed (n = 3).

Regeneration of Connective Tissue Fibroblasts

Connective tissue fibroblasts were seeded at a density of 100,000 cells/ml into the four compartments of a silicone frame (4 well-culture inserts; ibidi, Gräfelfing, Germany). The individual compartments are separated from each other by a 500 µm thick silicone bar. Because of the special adhesion area of the silicone frame, it adheres firmly to the bottom of a culture dish and forms a defined cell-free space that the cells can colonize by proliferation and migration after the frame has been removed. After reaching confluency within 48 hours after cell seeding, the silicone frames were removed with tweezers. A sharp wound edge was obtained between the four compartments of the frame. Immediately, after removing the silicone frame, the cell cultures were first placed on the Qi Quant BRIGHT Energy Plate for 5 minutes and then immediately on the Qi Quant Regeneration Plate for 10 min. The untreated control cultures were simultaneously placed for 15 minutes about 7 meters away and separated by several house walls. After further incubation in the incubator for 24 hours, the cells were washed with phosphate buffered saline, fixed with methanol p.a., stained with Giemsa methylene blue solution and air-dried. The width of the remaining cell-free area was documented micrographically under the microscope of at least 4 points per cell culture. Analysis of the data was done using a software with artificial intelligence (Ikosa AI, KML Vision, Graz, Austria). A total of three independent experiments were performed (n = 3).

Superoxide Anion Radical Generation by Functional Neutrophils

The non-adherently growing promyelocytes were routinely cultivated as mass cultures in suspension and were subculture twice a week. By addition of 1.5% dimethylsulfoxide to the culture medium, cells were differentiated over a period of 6 days into functional neutrophils, which are capable to generate superoxide anion radicals after stimulation by a phorbol ester in vitro [11-13]. For the examination of endogenous radical formation, the culture flasks with the functional neutrophils were first placed on the Qi Quant BRIGHT Energy Plate for 5 minutes and then immediately on the Qi Quant Regeneration Plate 3.0 for 10 minutes. The untreated control cultures were simultaneously placed for 15 minutes about 7 meters away and separated by several house walls. Then, after centrifugation at 190 x g and repeated washings in phosphate buffered saline, the functional neutrophils were stimulated to generate superoxide anion radicals by adding a phorbol ester to the reaction mixture. The radicals caused a cleavage of the tetrazolium dye WST-1 (Sigma-Aldrich, Taufkirchen, Germany), which was also added to the reaction mixture. The cleavage of the dye was directly related to the amount of oxygen radicals, i.e. the more reactive radicals were present in the reaction mixture, the more pronounced was the cleavage of the dye and the change in optical density (= color change of the dye). The optical density was recorded at t = 0 and at definite time points with the Elisareader (BioTek ELx808 with software Gen 5 version 3.00) and analyzed using Microsoft Excel. A total of three independent experiments with triplicate wells were performed (n = 3).

Statistical Analysis

Statistical analysis was done using the parameter-free two-tailed Wilcoxon-Mann-Whitney rank sum test.

Results and Discussion

The basal cell metabolism of the connective tissue fibroblasts was significantly improved by 12.3 ± 1.2% (mean value ± standard deviation; $p \leq 0.01$) by the single exposure to the combination of the Qi Quant BRIGHT Energy Plate and the Qi Quant Regeneration Plate 3.0 when compared to the untreated control. In accordance with this result was the stimulation of regeneration of connective tissue fibroblasts which was significantly improved by 25.2 ± 5.6% (mean ± standard deviation; $p \leq 0.01$) by this combined exposure (Figure 1). Connective tissue fibroblasts play a pivotal role in the maintenance of tissue integrity and function. These specialized cells are integral to the wound healing process, orchestrating a series of complex metabolic activities that facilitate tissue repair and regeneration [1]. Fibroblasts are highly dynamic cells that respond to injury by undergoing metabolic activation and proliferation as well as migration. The multifaceted process of wound healing can be broadly divided into four overlapping phases: haemostasis, inflammation, proliferation, and remodelling. In the in vitro model used here, we simulated the proliferation phase, which is characterized by the formation of new tissue. Connective tissue fibroblasts migrate and proliferate into the wounded area and synthesize collagen and extracellular matrix, providing structural support and accelerating the regeneration process [14,15].

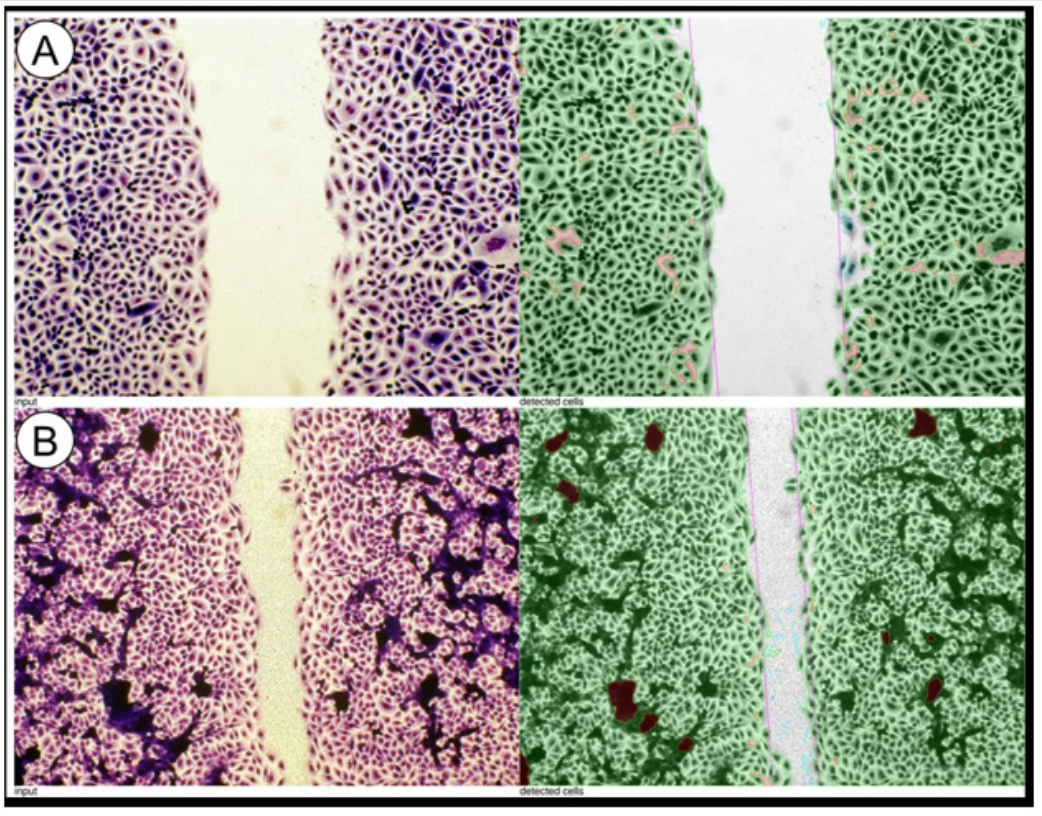

Figure 1: Representative micrographs of the fixed and stained connective tissue cell cultures after 24 hours of regeneration by colonization of the cell-free area.

A. Untreated control cells and

B. Cells after the single exposure to the combination of the Qi Quant BRIGHT Energy Plate (application for 5 minutes) and the Qi Quant Regeneration Plate 3.0 (application for 10 minutes). The difference in the colonization area of the cell-free space is clearly visible. Each left micrograph shows the original view and each right micrograph shows the graphical analysis result of the Ikosa AI software with marked migration front lines. Olympus IX 50 inverted microscope at brightfield illumination, a planachromate 10x and an Olympus E-20P digital camera at 5 megapixel resolution.

Our results have demonstrated that the combination of the Qi Quant BRIGHT Energy Plate and the Qi Quant Regeneration Plate 3.0 is able to promote both described physiological functions of connective tissue fibroblasts, namely basal cell metabolism and wound healing/regeneration, in a statistically significant manner. Although the stimulation of the basal cell metabolism itself was moderate, the colonization of the cell-free area was much more pronounced. Possibly the synergistic promotion of cell proliferation and cell migration accentuates the effect of the increased metabolic state of the connective tissue fibroblasts. Even though the basal cell metabolism of functional neutrophils was significantly increased by 54.2 ± 8.7% (mean ± standard deviation; $p \leq 0.01$) by the combination of the Qi Quant BRIGHT Energy Plate and the Qi Quant Regeneration Plate 3.0, we observed a significant inhibition of endogenous radical production resulting in an anti-inflammatory effect of 26.8 ± 3.8% (mean ± standard deviation; $p \leq 0.01$) when compared to the untreated control. Neutrophilic granulocytes (also called polymorphonuclear neutrophils or PMN) constitute the largest group of leukocytes and form the first line of defense against pathogenic microorganisms. They combat these pathogens through phagocytosis, the release of antimicrobial molecules, and the generation of reactive oxygen species via an oxidative burst [16].

Attracted by chemical substances such as specific chemokines or cytokines released during the inflammatory process, these cells can migrate from the blood into inflamed tissue and produce superoxide anion radicals [17,18]. These radicals contribute to tissue destruction (necrosis) in the inflamed area and may cause a progression of the inflammatory process, potentially slowing wound healing. For an overview of the role of neutrophils in health and disease, see [19]. We utilized an in vitro model representing one specific aspect of the inflammatory process, namely the influence of reactive oxygen radicals. We investigated whether the combination of the Qi Quant BRIGHT Energy Plate and the Qi Quant Regeneration Plate 3.0 could reduce endogenous superoxide anion radical generation more effectively than

in untreated control cells. The reduced radical generation of functional neutrophils is comparable to an anti-inflammatory effect in the tissue. The results indicate that exposure to the combination of the Qi Quant BRIGHT Energy Plate and the Qi Quant Regeneration Plate 3.0 led to a decrease in endogenous radical generation by functional neutrophils by more than 50%. This suggests that the plate combination has an anti-inflammatory action, contributing to improved regeneration and health. However, the effect is within a range that should not significantly impact the innate immune system's ability to defend against microbial pathogens in vivo [20].

References

1. Ross R (1968) The fibroblast and wound repair. Biological Reviews 43: 51-91.
2. Maksim V Plikus, Xiaojie Wang, Sarthak Sinha, Elvira Forte, Sean M Thompson, et al. (2021). Fibroblasts: origins, definitions, and functions in health and disease. Cell 184: 3852-3872.
3. Ross R (1975) Connective tissue cells, cell proliferation and synthesis of extracellular matrix - a review. Philosophical Transactions of the Royal Society of London. B, Biological Sciences 271: 247-259.
4. Baker BL, Abrams GD (1955) The physiology of connective tissue. Annual Review of Physiology 17: 61-78.
5. Asboe-Hansen G (1963) Connective tissue. Annual Review of Physiology 25: 41-60.
6. Wlaschek M, Maity P, Makrantonaki E, Scharffetter-Kochanek K (2021) Connective tissue and fibroblast senescence in skin aging. Journal of Investigative Dermatology 141: 985-992.
7. Nathan C (2002) Points of control in inflammation. Nature 420: 846-852.
8. Schmid-Schönbein GW (2006) Analysis of inflammation. Annual Review of Biomedical Engineering 8: 93-151.
9. Ahmed AU (2011) An overview of inflammation: mechanism and consequences. Frontiers in Biology 6: 274-281.
10. Dartsch PC (2023) Regeneration Plate 3.0 improvement and maintenance of intestinal health by reduction of oxidative stress and inflammation. Applied Cell Biology 11: 82-88.
11. Tan AS, Berridge MV (2000) Superoxide produced by activated neutrophils efficiently reduces the tetrazolium salt WST-1 to produce a soluble formazan: a simple colorimetric assay for measuring respiratory burst activation and for screening anti-inflammatory agents. Journal of Immunological Methods 238: 59-68.
12. Olga Teufelhofer, Rosa-Maria Weiss, Wolfram Parzefall, Rolf Schulte-Hermann, Michael Micksche, et al. (2003). Promyelocytic HL60 cells express NADPH oxidase and are excellent targets in a rapid spectrophotometric microplate assay for extracellular superoxide. Toxicological Sciences 76: 376-383.
13. Dartsch PC (2006) TIIOS-a sensitive and cell-based test assay for the screening of biologically active substances for their antioxidant potential. Innovations in Food Technology 32: 72-75.
14. Eming SA, Martin P, Tomic-Canic M (2014) Wound repair and regeneration: mechanisms, signaling, and translation. Science Translational Medicine 6.265: 265sr6.
15. Cialdai F, Risaliti C, Monici M (2022) Role of fibroblasts in wound healing and tissue remodeling on Earth and in space. Frontiers in Bioengineering and Biotechnology 10: 95838.
16. Weiss SJ (1989) Tissue destruction by neutrophils. New England Journal of Medicine 320: 365-376.
17. Mortaz E, Alipoor SD, Adcock IM, Mumby S, Koenderman L (2018) Update on neutrophil function in severe inflammation. Frontiers in Immunology 9: 2171.
18. Hellebrekers P, Vrisekoop N, Koenderman L (2018) Neutrophil phenotypes in health and disease. European Journal of Clinical Investigations 23: e12943.
19. Selders GS, Fetz AE, Radic MZ, Bowlin GL (2017) An overview of the role of neutrophils in innate immunity, inflammation and host-biomaterial integration. Regenerative Biomaterials 4: 55-68.
20. Nathan C (2006) Neutrophils and immunity: challenges and opportunities. Nature Reviews Immunology 6: 173-182.

ISSN: 2574-1241

DOI: 10.26717/BJSTR.2024.56.008922

Peter C Dartsch. Biomed J Sci & Tech Res