Dartsch Scientific GmbH · Auf der Vosshardt 25 · D-49419 Wagenfeld

Photonic Shield Limited
Suite 770, Unit 3a, 34-35
Hatton Garden
Holborn, London EC1N 8DX
United Kingdom

Auf der Vosshardt 25
D-49419 Wagenfeld, Germany

Fon: +49 5444 980 1322
Mobil: +49 151 2272 1294
Email: info@dartsch-scientific.com
Web: www.dartsch-scientific.com

4th June 2024

Test report
Efficacy of the BIO NEXUS device in the reduction of oxidative stress

Background
Environmental pollutants, such as heavy metals, particulate matter, xenobiotics, pesticides, ultraviolet (UV) radiation or electromagnetic and geopathic interference fields are well-documented sources or inducers of oxidative stress. Oxidative stress occurs when there is an imbalance between the production of reactive oxygen species (ROS) and the body's ability to detoxify these harmful intermediate products or repair the resulting damage. This imbalance can cause cellular and tissue damage, contributing to a range of diseases and health issues.

Question of the study
Three different cell types from connective tissue, intestine and liver were used to investigate whether the BIO NEXUS device causes a reduction of ROS present in the culture medium, i.e. in the direct environment of the cells. The bioassay used here is an animal-free test assay which is accepted in conventional medicine and in international scientific research as one mainstream approach to healthcare.

BIO NEXUS device
According to the manufacturer, the BIO NEXUS device generates modulated electromagnetic signals for „natural radiation correction, amplification and synchronization of body functions and (biological) systems“. The BIO NEXUS device was only used in electromagnetic feedback mode (= mode 1; EMF F.B.).

Cell culture
The following cell types were used for this study: (1) Intestinal epithelial cells (cell line IPEC-J2); (2) Connective tissue fibroblasts (cell line L-929); (3) Liver cells (cell line Hep G2). All three cell lines were from Leibniz Institute, DSMZ, Braunschweig, Germany. Cells

were routinely cultivated either in RPMI 1640 medium or DMEM/Ham's F12 medium containing 10% growth mixture and 0.5% gentamycin. Cells were cultured as mass cultures in an incubator at 37°C in an atmosphere of 5% CO_2 and 95% air at nearly 100% humidity.

Experimental design

Cells were seeded in two cell densities (100,000 cells/well and 50,000 cells/well) into 96-well plates and allowed to attach and spread for 24 hours. Then, fresh cultue medium was added containing different concentrations of hydrogen superoxide (= ROS) ranging from 0 (= control) to 3 mM. After 24 hours of ROS exposure, a reaction mixture with fresh culture medium and a water-soluble tetrazolium dye (XTT reagent; Xenometrix, Schwitzerland) was added to the wells. The change in optical density of the dye in the reaction mixture due to the viability of the cells was measured by a difference measurement ΔOD at 450 and 690 nm at specific time points with an Elisareader (BioTek ELx 808 with software Gen 5/3.00) and calculated using Microsoft Excel. In all tests, the device was placed continuously on the multiwell culture dishes for 24 hours (Fig. 1) with 4 to 6 parallel wells per test and cell type and 4 independent tests (n = 4) with different cell densities.

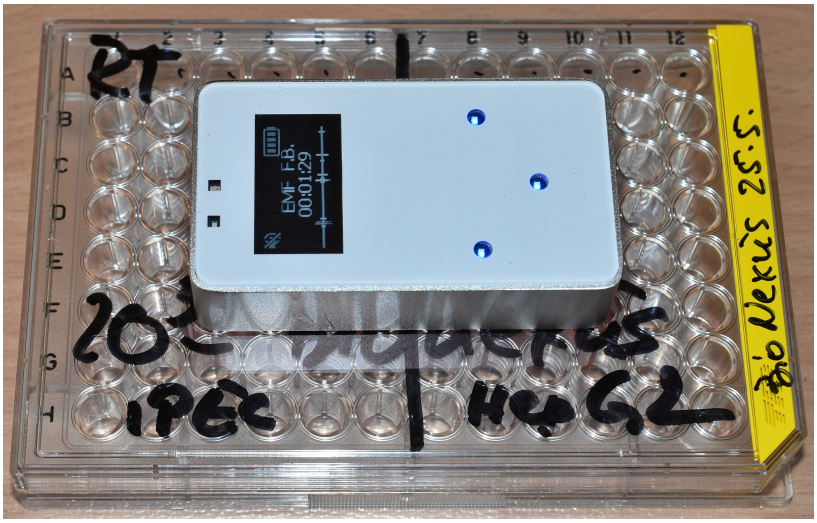

Fig. 1: Experimental design for EMF F.B. recording and exposure of cells to the modulated electromagnetic signals of the BIO NEXUS device. Exposure was done for 24 hours. The back side of the device was placed towards the cells.

Results

We found a concentration-dependent reduction in cell viability caused by the presence of hydrogen superoxide in the culture medium. However, there were different sensitivies between the three cell types used. Liver cells were the most sensitive cell type, whereas the intestinal cells were least sensitive. Connective tissue fibroblasts were in the middle of both. The use of the BIO NEXUS device resulted in a protective effect for all cell types and cell densities (Fig. 2)

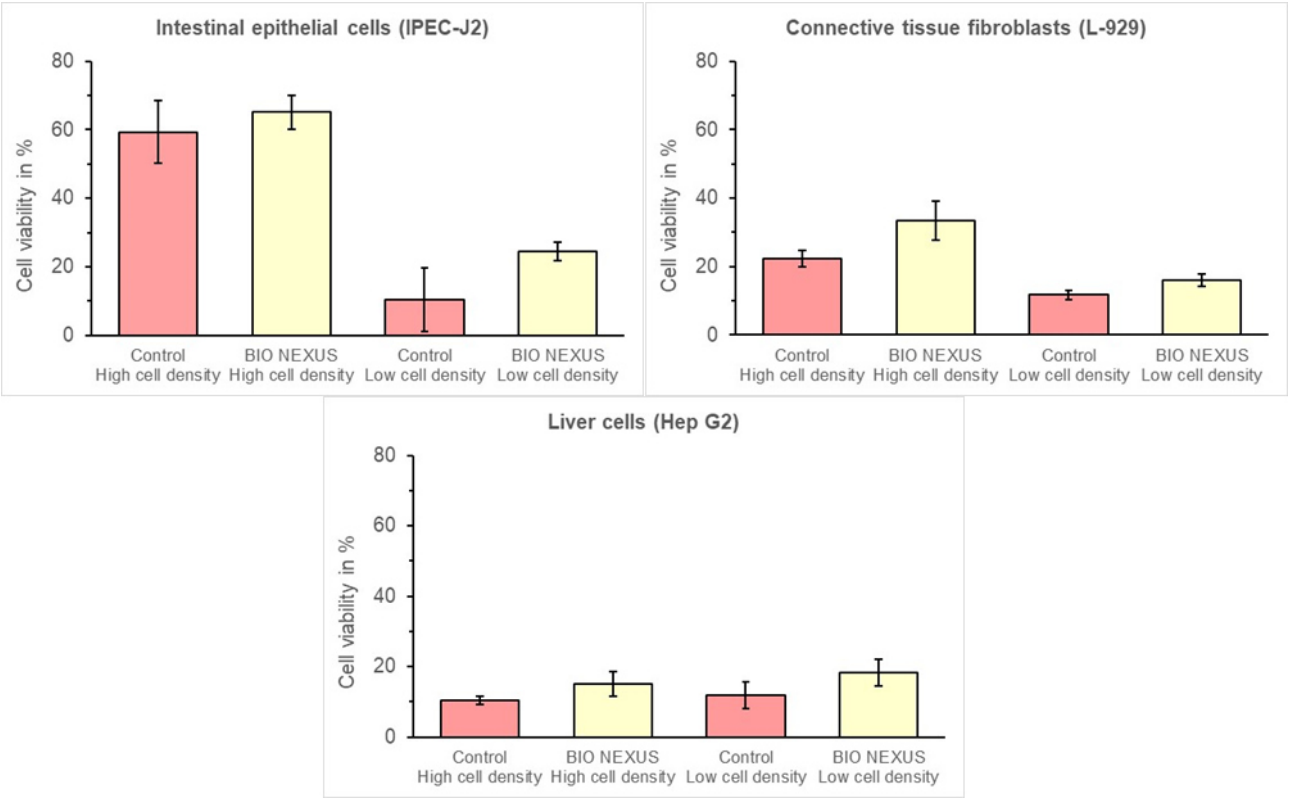

Fig. 2: Viability of the three different cell types after exposure to 3 mM hydrogen peroxide for 24 hours. Note the different sensitivity of the three cell types used and that the BIO NEXUS device (yellow columns) had a protective effect in all experiments with high and low cell densities. Data represent mean values ± standard deviations of 4 independent experiments with 4 to 6 parallel wells per test.

Conclusions

The potential of the BIO NEXUS device in the protection against oxidative stress coming from environmental pollutants has been shown in this cell biological study. Although the different cell types have a different basal sensitivity against reactive oxygen species, the BIO NEXUS device is able to reduce the unwanted cellular effects by increasing the viability of the cells after exposure to oxidative stress.

CELL-BIOLOGICALLY TESTED PRODUCT
dartsch SCIENTIFIC
PRODUKT ZELLBIOLOGISCH GEPRÜFT

Prof. Dr. Peter C. Dartsch
Certified Biochemist