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Place and date: Ljubljana, January 20, 2021
No.: 3/21

ANALYTICAL REPORT ON TESTING ENERGY INFLUENCE ON HUMAN ORGANISM

FOR THE PRODUCT

bodyDOT

Customer

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1 INTRODUCTION

1.1 GENERAL

A fundamental research area at the BION Institute represents measuring the effects/influences of physically as yet undefined and unrecognized (subtle) field(s). Conventional measuring devices cannot measure these fields. However, in the majority of cases, even various unconventional devices, purportedly measuring the subtle field, are not yet capable of measuring this kind of field (influences) reliably enough, although the technology is steadily improving. Mostly, these fields and their effects cannot be explained by commonly accepted theoretical interpretations, even though some scientists have offered possible explanations that span from the quantum vacuum to dark matter.

In many years of research and testing, the BION Institute developed an alternative path that enables us to use the *human organism* as a reliable detector of such weak or subtle influences. We learned how to express these detections via easily measurable general physiological effects monitored through electrophysiological measurements. Hence, we can reasonably assess the alleged biological influence or non-influence of devices based on a subtle fields' impact. The latter may represent a stimulating factor or a protective shield against supposedly harmful radiation from the environment. If we find the effects of the supposed emission statistically significant, we issue the appropriate certificate.

1.2 SPECIFIC

The company Global EMF Solutions LTD ordered testing an alleged subtle field-based energy influence of the product bodyDOT (Figure 1). The customer claims this frequency technology disc named bodyDOT has an energy influence on the human organism and wanted these claims to be validated. By using methodology grounded on clinical research conditions, we verified the supposed energy effect of the disc by exposing volunteers to the supposed subtle field energy effect of the disc when the volunteer is unexposed to any other specific non-ionizing radiation. We monitored various physiological parameters (heart rate, muscle tension, skin conductance, respiration rate and finger temperature) by electrophysiological measurements.

Figure 1: bodyDOT frequency technology disc used in testing.

Figure 2: Test setup during testing the supposed energy influence of the bodyDOT on the human organism. After all the electrodes were attached to a volunteer, he/she sat for 40 minutes while electrophysiological parameters were measured.

Volunteers were arranged into **two testing situations**. The first situation represented the *control* with a sham working bodyDOT (Figure 3-right) applied. Its purpose was to show regular dynamics in the measured physiological parameters. The second situation represented the effect group with a *working* bodyDOT (Figures 1 and 3-left). A comparison to the control testing situation should disclose an energy effect of the bodyDOT on the human organism. We tested each volunteer in both situations, but neither volunteers nor the test assistant knew whether a truly working bodyDOT or a sham working one was used (a double-blind test methodology).

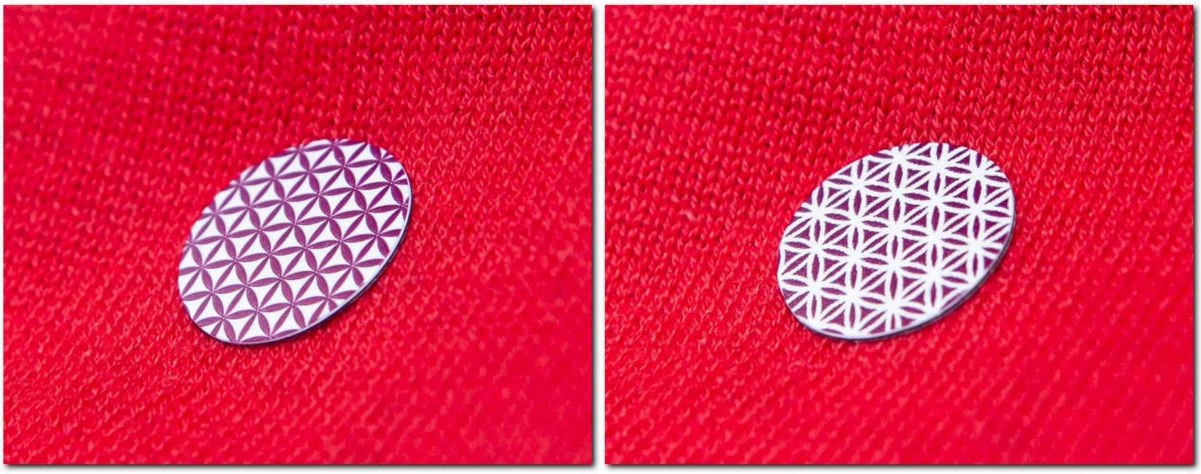

Figure 3: Working bodyDOT (left) and sham-working bodyDOT (right) used in testing.

2 MATERIALS AND METHODS

2.1 TEST DESIGN

Manufacturer's claims were validated by a scientific test including 12 volunteers based on principles of clinical testing. This means that the tests were:

- **prospective** (general criteria for the efficiency of the product's influence were determined in advance);
- **with placebo effect ruled out** (volunteers didn't know whether they were exposed to the product's influence or not);
- **double-blind** (even the test assistant didn't know whether the working or sham working bodyDOT was used);
- **randomized** (the decisions about the order of different situations were made randomly).

We tested the energy influence of the bodyDOT on the electrophysiological parameters of volunteers. Volunteers were subjected to two different experimental situations in random order:

- **bodyDOT situation**: volunteers wore a working bodyDOT. Every volunteer was given his/her own working bodyDOT product.
- **Control situation**: volunteers wore a sham working bodyDOT. Every volunteer was given his/her own sham working bodyDOT product.

Tests were conducted from the 4th to 8th of January 2021 at the BION Institute with 12 volunteers aged 33 to 71 (four females and eight males). Before the tests, we instructed the volunteers not to eat a big meal at least one hour before the test and not to drink coffee, alcohol, or energy drinks at least three hours before the test. We tested each person twice on two different days, every time at the same time of the day. This ruled out the effects of other factors as much as possible (e.g., the volunteer could be tired after many hours of work, but is expected to be more or less at the same level of fatigue at the same time of day). Random order of both situations was applied to every volunteer (the principle of randomization). Volunteers sat for 40 minutes in a comfortable wooden chair. During this time heart rate, muscle tension, skin conductance, respiration rate, and finger temperature were measured as presented in Figure 2. An 8 channel Biosignalsplux device was used to measure mentioned physiological parameters. Both, the working bodyDOT and the sham working one looked the same so that neither volunteers nor the test assistant could tell one from the other. Either the working or the sham-working bodyDOT was placed on the bottom of the volunteer's chest (see the position in Figure 2). The vast majority of volunteers have long-term testing experiences involving various devices and tend to be quite indifferent regarding different testing situations. When measurements started, the test assistant left volunteers alone in the room.

2.2 MEASUREMENT OF PHYSIOLOGICAL PARAMETERS

Measurements of physiological parameters by electrophysiological methods enable us to monitor dynamic responses to any influencing agent working on the human organism in real-time. We measure the following parameters: heart rate, muscle tension, skin conductance, finger temperature, and respiration.

- **Heart rate** (frequency of heartbeat, HR) is calculated from the electrocardiogram (ECG).
- **Muscle tension** (electromyogram, EMG) is measured on the right forearm. The EMG shows us any artefacts that could appear on the ECG due to arm movements.
- **Skin conductance** (SC) is measured on the fingertips of the right hand, where skin conductance varies the most. Skin conductance measurements are part of lie detectors because both, sweating as well as the blood flow affect skin conductance and are regulated by the parasympathetic nervous system. The latter is a part of the autonomic nervous system that is not controlled by our consciousness, so we cannot regulate it just by simple intention. In general, skin conductance is higher when a person is under stress (more sweating, higher blood flow), but sometimes the response may be much more complex.
- **Respiration rate** (RR) is calculated from thorax expansion (TE) that is measured with a special extendable elastic belt.
- **Finger temperature** (TEMP) is measured on the tip of the middle finger on the right hand.

3 DATA ANALYSIS

After the measurements, the raw data with the sampling frequency of 1000 samples per second were imported into *Matlab*. Within *Matlab*, the electrocardiogram (ECG) data were analyzed with the Pan-Tompkins algorithm from which the inter-beat interval (IBI) data was obtained. Heart rate was derived from IBI data. Analysis of the thorax expansion data gave us the respiration rate (RR). All data were then resampled to one-second intervals by averaging the inter-second data points. The first five minutes of the measurements were cut to account for the time needed for the volunteer to calm down at the beginning of the measurements. Then a geometric median of all volunteers was calculated for each measured physiological parameter. These medians were resampled so that they represent the whole length of the measurements in 30 steps. Afterward, the data were renormalized to an average of the first five minutes. Since physiological parameters may vary with time, we divided the whole session into two equal parts and evaluated statistical parameters for each part separately. The first part is named **Part A**, and the second one **Part B**.

To check for the difference between both test situations we used the Wilcoxon signed-rank test. The results of all statistical tests were corrected with the Holm-Bonferroni correction for multiple comparisons.

4 RESULTS WITH DISCUSSION

An overview of the Wilcoxon signed-rank test results demonstrates that there are statistically significant differences between the two experimental situations for finger temperature parameter (TEMP) in both parts of the measurement (see Table 1). There is also a significant difference in Part A for the respiration rate (RR) if the Holm-Bonferroni correction is not used and can be consequently treated as a trend.

Table 1: Summary of Wilcoxon signed-rank test corrected with and without Holm-Bonferroni correction for multiple comparisons. Values shaded in green represent statistically significant differences between two experimental situations ($p < 0.05$). Values shaded in light green represent values close to statistically significant differences between two experimental situations ($0.05 < p < 0.1$). Marks: HR – heart rate, EMG – muscle tension, SC – skin conductance, RR – respiration rate and TEMP – finger temperature.

	Without Holm–Bonferroni correction		With Holm–Bonferroni correction	
	Part A	Part B	Part A	Part B
HR	0.1466	0.5897	0.8795	1.0000
EMG	0.3837	0.4553	1.0000	1.0000
SC	0.2290	0.0620	1.0000	0.4338
RR	0.0421	0.9010	0.3369	1.0000
TEMP	0.0028	0.0000	0.0254	0.0001

In the following, we represent bar graphs for each measured parameter, belonging to both situations and both measurement's parts. The height of bars represents normalized averages (to the first five minutes) so that all parameter measurements can be compared.

In the first part of Figure 4, we can see an accelerated heart rate of volunteers exposed to bodyDOT vs. sham exposed ones (control). This may also be observed in the second part. However, the difference is covered by the dispersion of data.

In the second part of Figure 5, we may observe that the exposed group was more relaxed than the control one; however, the difference is covered by the dispersion of data and is therefore statistically insignificant.

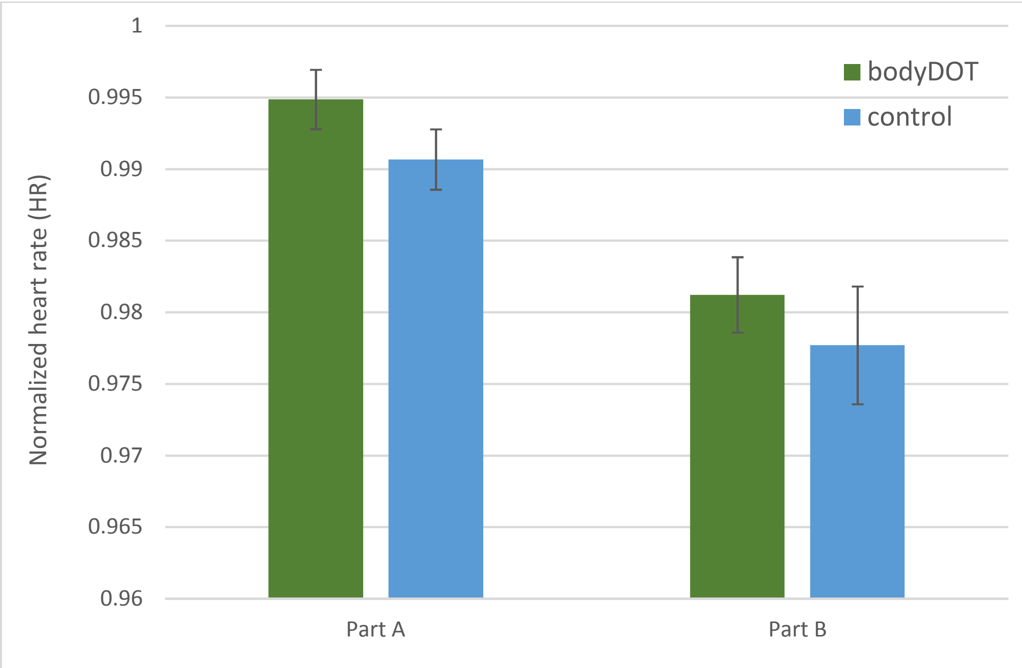

Figure 4: Normalized heart rate (HR) from twelve volunteers during two parts of measurements for two test situations (*bodyDOT*: bodyDOT on the bottom of the volunteer's chest, *control*: sham bodyDOT). Mean values ± standard error (N = 12) are shown.

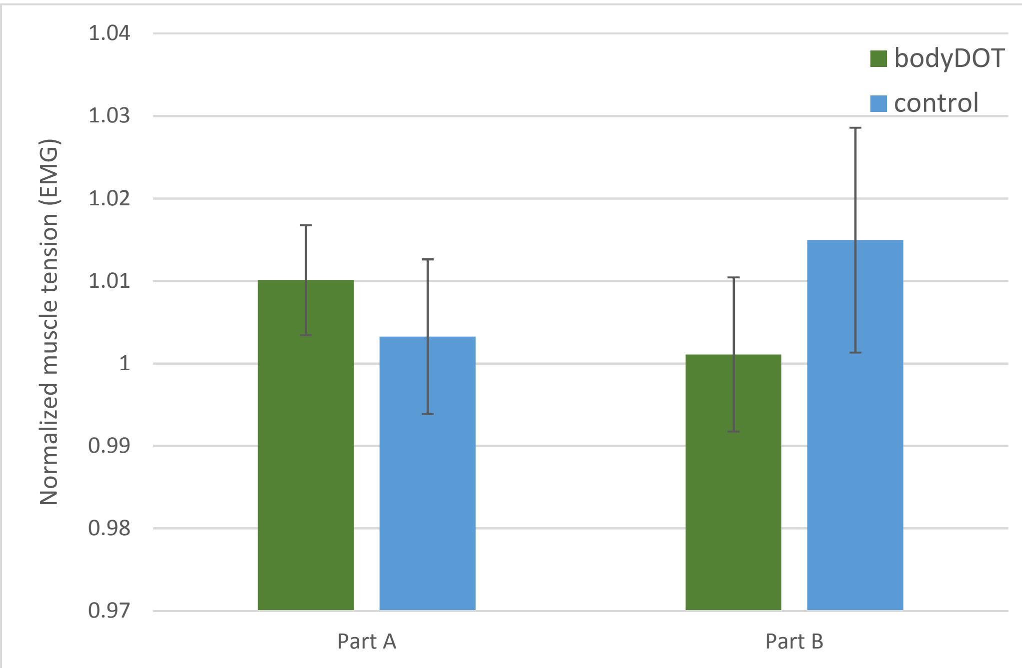

Figure 5: Normalized muscle tension (EMG) from twelve volunteers during two parts of measurements for two test situations (*bodyDOT*: bodyDOT on the bottom of the volunteer's chest, *control*: sham bodyDOT). Mean values ± standard error (N = 12) are shown.

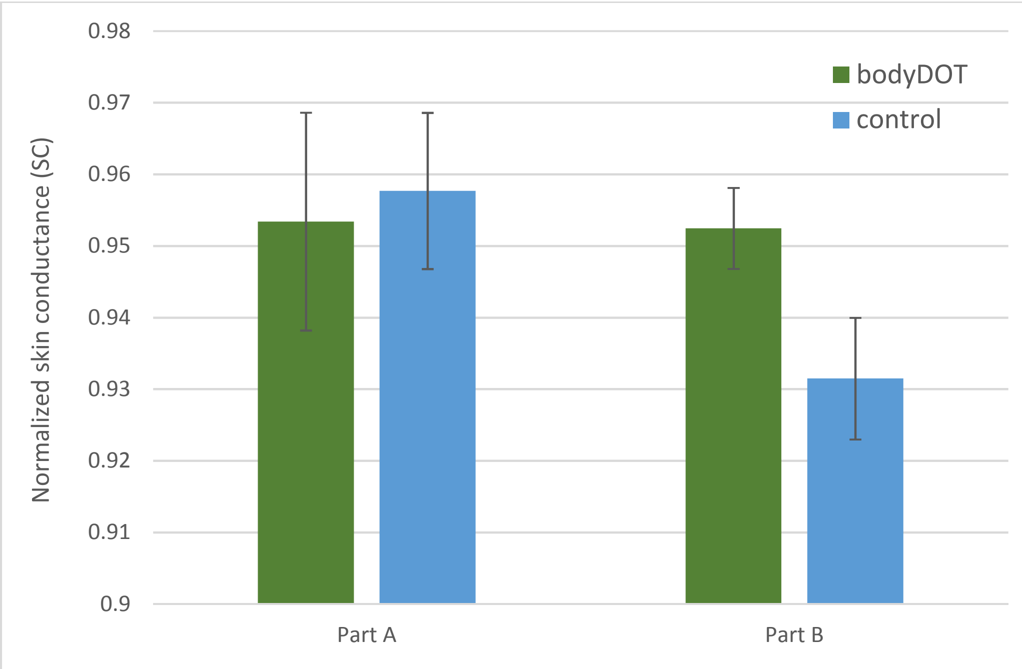

Figure 6: Normalized skin conductance (SC) from twelve volunteers during two parts of measurements for two test situations (*bodyDOT*: bodyDOT on the bottom of the volunteer's chest, *control*: sham bodyDOT). Mean values ± standard error (N = 12) are shown.

While in Figure 6, it is evident that in the first part we cannot observe any influence, in the second part an almost significant difference ($p = 0.062$, without Holm-Bonferroni correction) in the direction of energizing or higher alertness may be seen.

In the first part of Figure 7, the bodyDOT exposed situation demonstrated a conspicuously faster rhythm of breathing. We may again speak of energizing or alerting effect but in distinction to skin conductance, here, it was displayed in the first part and cleared up in the second.

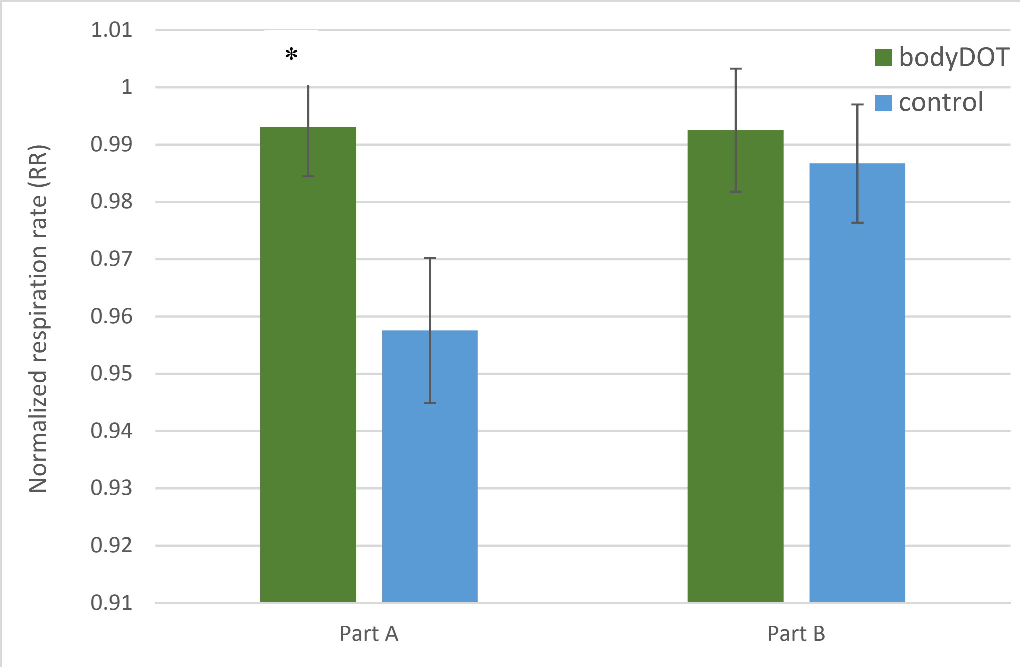

Figure 7: Normalized respiration rate (RR) from twelve volunteers during two parts of measurements for two test situations (*bodyDOT*: bodyDOT on the bottom of the volunteer's chest, *control*: sham bodyDOT). Mean values ± standard error (N = 12) are shown. A single asterisk (*) represents a statistically significant difference between two parameters with $p < 0.05$, without the Holm-Bonferroni correction.

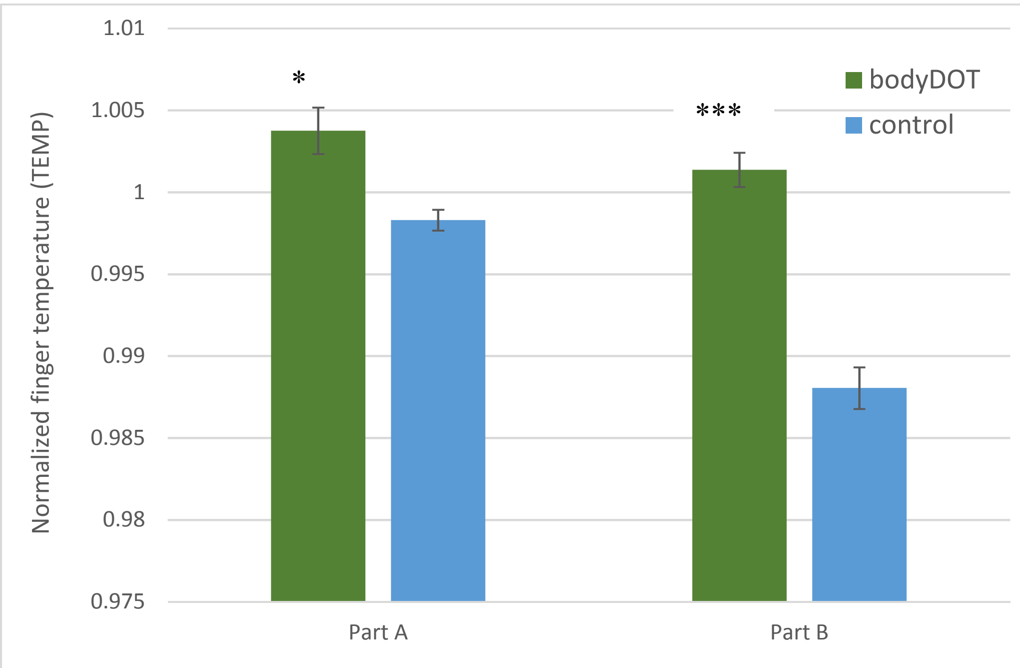

Figure 8: Normalized finger temperature (TEMP) from twelve volunteers during two parts of measurements for two test situations (*bodyDOT*: bodyDOT on the bottom of the volunteer's chest, *control*: sham bodyDOT). Mean values ± standard error (N = 12) are shown. A single asterisk (*) represents a statistically significant difference between two parameters with $p < 0.05$ and a triple asterisk (***) represents a very high statistical significance with $p < 0.001$.

In Figure 8, we may observe that the TEMP significantly increased in the exposed situation (vs. control) in both parts. The difference remains statistically significant even after the Holm-Bonferroni correction. There may be various reasons for the effect. In the first approximation, this would mean a relaxing effect with the dilatation of peripheral capillaries. However, taking into account the results from skin conductance where in the second part the shift indicates higher perspiration (which means higher heat dissipation), it is more certain that this signifies a heightened metabolic rate. It would again connote an energizing effect, which is in line with the other prominent results (HR (A), SC (B) and RR (A)).

Besides statistical differences, we also calculated the standardized effect size, which speaks about the magnitude and the sign (direction) of the influence. To calculate the standardized effect size, we used Cohen's D with color-coding for the intensity and the direction of influence. The values are presented in Table 2.

Table 2: Overview of the Cohen's D effect size on different physiological parameters. Two different comparisons between two test situations are presented. Negative values (blue color) signify that the first situation decreased the parameter compared to the second situation, while the positive values (red color) signify an increase of the parameter. Values with an underlined black font signify parameters yielding a statistically significant difference between two chosen situations, the values written in grey are not statistically significant, at least after the Holm-Bonferroni correction. The intensity of the background color signifies the intensity of change (an absolute value less than 0.2 indicates a *small change*, an absolute value between 0.2 and 0.8 indicates a *medium change*, an absolute value between 0.8 and 2 indicates a *large change* and an absolute value above 2 indicates a *huge change*). Marks: HR – heart rate, EMG – muscle tension, SC – skin conductance, RR – respiration rate and TEMP – finger temperature.

	HR	EMG	SC	RR	TEMP
Part A	0.517	0.217	-0.084	0.849	<u>1.280</u>
Part B	0.263	-0.306	0.751	0.143	<u>2.952</u>

Table 3: Effects in parts. The nature of the effect of the exposed situation as compared to the control one, when the differences indicate at least a trend. *Red*: a difference in the direction of stimulation, *pale red*: a difference in the direction of a weak stimulative effect.

	HR	EMG	SC	RR	TEMP
Part A					
Part B					

As may be observed from Table 3, all more or less prominent differences point in the direction of a stimulative (energizing) effect.

5 CONCLUSION

As seen in various graphs and tables, and particularly in Table 3, the overall influence of the product *bodyDOT* as monitored by physiological testing, demonstrated a significant difference between the situations in the direction of energizing or heightened alertness. The effect may somewhere be observed in the first part of testing (HR, RR, TEMP) or the second part (SC, TEMP).

Based on sufficient statistically significant differences between bodyDOT situation and Control situation demonstrated in the testing of the energy influence of the product *bodyDOT*, we acknowledge that the product meets all the criteria required to obtain the *Certificate of Energy Influence on Human Organism* No. 0263, which is announced on webpage http://bion.si/en/testing-certificates.

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