data indicate that associative learning paradigms may be used as complementary treatment strategy for reducing the dosage of chemotherapeutic agents.

http://dx.doi.org/10.1016/j.bbi.2019.08.173

Abstract #4397

Early-life immune insult results in sex-specific quantitative and qualitative differences in ultrasonic vocalizations

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Neuroinflammation during the neonatal period has been linked to various neurodevelopmental disorders including autism and epilepsy. Early-life immune insult is associated with heightened epileptic seizure susceptibility, increased neuronal damage following seizures, and the development of an autistic-like behavioral phenotype in adulthood. In this study, we investigated the early-life behavioral effects of a single lipopolysaccharide (LPS) injection in mice on postnatal day (PD) 10. To assess potential autistic-like communication deficits, we measured quantitative and qualitative aspects of ultrasonic vocalization behavior on PD12. Seizure susceptibility was determined by latency to flurothyl-induced generalized seizure on PD15. Regarding early-life autistic-like behavior, we found that LPS-treated female mice emitted significantly more ultrasonic vocalizations (USVs) than LPS-treated male mice ($p = 0.003$). However, vocalization quantity did not significantly differ between control and LPS males ($p = 0.153$) or between control and LPS females ($p = 0.058$). We also observed sex-specific differences between control and LPS-treated mice in qualitative aspects of vocalizations, supporting an interaction of sex and early-life inflammation in the development of autistic-like behaviors. No significant differences were found between control and LPS-treated mice regarding seizure latency or survivability. These results emphasize the key role of the immune system in the developing brain and imply an effect of sex in the development of autistic-like communication deficits in response to early neonatal immune activation.

http://dx.doi.org/10.1016/j.bbi.2019.08.174

Abstract #4399

Immune function improvement after sleeping on a system of insulation against electromagnetic fields

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Immune system, as a homeostatic system, contributes to an appropriate function of the organism, being an excellent marker of health. Some studies have shown that long-term exposure of electromagnetic fields (EMF) produced by modern technology cause inhibitory effects on the immune response. The aim of the present study was to investigate the effect of resting on an EMF insulating system in the function of immune system, state of wellness and the rate of aging (biological age). Several relevant immune functions were analyzed in isolated peripheral blood neutrophils and mononuclear cells of 30 men and women before and after two months of using for sleeping on a bed of the patented HOGO system, which insulates against EMF. A group of 12 persons used a bed without this property (placebos). The biological age was calculated using a mathematical formula developed with the immune function parameters. In addition, patients answered a wellness questionnaire. The results showed a significant improvement of immune functions (phagocytosis $p < .05$; neutrophil and lymphocyte chemotaxis $p < .01$; *Natural Killer* activity $p < .01$; PHA-stimulated lymphoproliferation $p < .01$) after using the HOGO system. A decrease of biological age ($p < .001$) and a negative correlation between biological age and wellness ($r = -0.126$; women: $r = -0.336$ $p < .01$) were also observed. The placebo group did not show changes. In conclusion, two months of resting on a bed insulated against EMF improves the wellness, immunity and biological age.

http://dx.doi.org/10.1016/j.bbi.2019.08.175

Abstract #4400

Sleeping isolated from electromagnetic fields decreases cortisol levels and improves redox and inflammatory states

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Technology simplifies daily life, but its deleterious effects on the body due to the electromagnetic fields (EMF) created during its use, are well known. Thus, exposure to EMF results in oxidative stress, which is associated with inflammatory stress and with the over-activation of the hypothalamus-hypophysis-adrenal (HHA) axis, thus increasing the risk of diseases. This work examined the impact of sleeping on a bed with a patented HOGO system, that isolates against EMF, on several inflammatory-oxidative stress parameters, as well as on several stress-induced HHA hormones. 30 healthy subjects (53 ± 10 years-old) slept for 60 days in HOGO beds ($N = 20$) or in normal beds ($N = 10$; placebo group). Before and after the 60 days sleeping period, several antioxidant defenses [catalase (CAT) and glutathione peroxidase (GPx)], oxidizing compounds [oxidized glutathione (GSSG) and malondialdehyde (MDA)], pro-(TNF-α, IL-6) and anti-(IL-10, IL-4)-inflammatory cytokines and hormones [cortisol and dehydroepiandrosterone (DHEA)] were analyzed in blood cells or plasma. Sleeping 60 days in HOGO beds resulted in a significant increase of CAT and GPx activities ($p < .01$) and IL-10 and IL-4 levels, as well as a marked decrease of GSSG ($p < .001$), MDA ($p < .01$), TNF-α and IL-6 levels. Moreover, a marked decrease of cortisol and increase of DHEA levels ($p < .01$) were also observed. In conclusion, the avoidance of EMF while sleeping, improves redox and inflammatory states and may contribute to a lower emotional stress.

http://dx.doi.org/10.1016/j.bbi.2019.08.176

Abstract #4401

Transcriptional changes to glia during peripheral influenza infection are revealed by scRNA-seq

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