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Chapter

Reduction of Stress and Jet Lag, Improvement of Well-Being, Sleep Quality and Body-Mind Regeneration by Vinci Power Nap® Neuroarchitecture System: Innovative Solution for Leaders, Employees, Travelers

Magdalena Filcek and Mayank Vats

Abstract

The Vinci Power Nap® system is a cutting-edge tool for reducing stress and jet lag effects associated with air travel, allowing for quick body-mind regeneration and improving well-being and the quality of night's sleep. Power naps in a specially designed environment based on interdisciplinary science, can restore homeostasis and work-life balance, release stress and tensions, strengthens focus and efficiency, and recover energy for life to many overtired leaders, employees, and people with sleep disorders. Helpful in the therapy for hypersensitive people, after trauma, in depression, with oncological experiences, and many other diseases. The research made in UN projects at COP24 on leaders, travelers, and UNICEF Ukraine's refugees show extraordinary relaxing properties, harmonizing sleep patterns and internal vital parameters (breath, heartbeat, and brain waves) thanks to zero gravity position, pulsating touch, frequency swinging, calming all senses and neuroarchitectural external conditions. Sleep is the basis of our psychophysical and immune regeneration and preventing errors resulting from stress and fatigue. The Vinci Power Nap® system is crucial for hotels and airports due to its ability to reduce discomfort associated with jet lag, providing great help to travelers such as business leaders, pilots, doctors, drivers, athletes, workers, soldiers, astronauts, tourists, etc.

Keywords: sleep, regeneration, energy, efficiency, stress, jet lag, circadian rhythms, wellbeing, astronauts, pilots, tourists, hotels, depression, trauma, PTSD, airports, aviation, neuroarchitecture, Vinci Power Nap®, histamine, antihistamine, enzyme DAO

1. Introduction

A high quality night's sleep is the basic element enabling the harmonious and efficient functioning of the body and mind during the day, which strengthens overall health, well-being, and productivity and plays a huge role in memory consolidation and cell rejuvenation. Sleep deprivation and stress leads to altered immune function [1] and many diseases, such as increase risk of diabetes, atherosclerosis, and Alzheimer's, among others, very often leading to chronic diseases, frustration, depression, and even suicide; according to prof. A. Perski from Stockholm Stress Clinic, it also may be the cause of cancer. New research shows that a lack of adequate sleep can lead to irreversible DNA damage and cause cancer [2]. The rats prevented from falling asleep, after 3 weeks, died due to systemic inflammatory response syndrome of sepsis [3].

Over 60% of people (children and adults) around the world are currently reporting sleep problems [4, 5]; shift workers, "coronosomnians," and passengers flying long distances, suffering from jet lag, are increasing those numbers [6, 7]. Without sleep, human cognitive abilities and reaction time are very limited. The efficiency of mind decreases significantly; it is difficult to concentrate, and mental work is not possible. The immune system of the body decreases rapidly, and the pain sensations can become more severe. It is also impossible to make rational decisions. A very large number of people do not even realize how lack of sleep reduces the quality and safety of life; the high-risk group includes leaders, businessmen, doctors, drivers, pilots, astronauts, soldiers, travelers, and so on. A 2001 study in the British Medical Journal showed that stressful work, tiredness, and not enough of sleep could double the errors in a doctor's practice [8]. Conclusions from the Biological Rhythms Research Laboratory is that sleep deprivation as well as jet lag symptoms can ruin vacations and impact athletes, musicians, surgeons, and businessmen who are unable to reach their peak [9]. The WHO recognized insomnia and sleep disorders as a disease of civilization that should be treated [10].

Neuroscience and neuroarchitecture advances provide the ability to measure metrics and allow to understand how environmental pollution factors like colors, shapes, smell, light, sounds or silence, changes in electromagnetic field's frequencies, and temperature can affect human perception, emotions, and physiology and even block the way for the best quality of sleep. The same knowledge can be used to change those parameters for the better, to create neuroarchitectural projects, which could help improve sleep and prevent insomnia [11]. The author conducted survey research on support of stress, trauma, sleep, and jet lag reduction through VPN sessions on 465 UN delegates traveling to Poland for COP24 from 58 countries who participated in VPN sessions during the 14 days of the conference; 127 refugee women and children from Ukraine, who participated in UNICEF project to soothe war trauma; 12 pilots; 41 employees of 3M company; 14 people with depression; and 14 soldiers with PTSD experiencing sleep disorders, through polysomnography and observations on analog astronauts and the author's own experience in reducing symptoms of jet lag after traveling from Poland to Tokyo. The results shows that synchronization and restoring harmony and energy for life after a long journey through several time zones can be possible thanks to the latest neuroarchitecture technology of the Vinci Power Nap® system. The interdisciplinary connections of various sciences in the VPN system interacting with each other during the sessions, and the author's deep researches, allow to understand its mechanisms and supportive aspects for sleep medicine, improving human well-being and psychophysical condition, which is confirmed also by official feedback from participants, psychologists, scientists, and global institutions and ministries.

2. The power of sleep and its neuroarchitecture: Asleep or awake

Sleep is a human's superpower—restful deep sleep is time for healing, allowing to regain energy, alertness, focus, creativity, regeneration of physical and mental health, balance homeostasis, and immune system protection, and has antiaging and anticancer properties [12]. “To live well you must sleep well,” N.Rothstein The Ambassador of Sleep.

To make good sleep available, many conditions from different science fields that are involved in sleep nature have to be taken into account [13, 14]. This awareness can be helpful to create interdisciplinary designs of neuroarchitecture for better sleep like, for example, the patented Vinci Power Nap® system. Designers, doctors, and solutions engineers should remember that there are connections between external environmental factors (biological, chemical, and physical) and internal body reactions to them. These external factors and internal reactions can increase histamine levels and disrupt regenerative sleep patterns, consequently dictating physical lifestyle and psychological behavioral.

Asleep and awake are strongly connected with the brain, which is an electrochemical organ, and its activity can be measured as brain waves such as gamma, alpha, beta, theta, and delta; each of them has a different rhythm (frequency) and occurs depending also on the day or night activity of the body and mind [15]. The human brain goes through different brain waves in series during the 7–8-hour sleep patterns creating 5 cycles, each cycle lasting 1.5 hours [16, 17] with REM and N-REM stages [18]. The most regenerative rhythm is the deepest frequency called delta waves (0.1–4 Hz) in N-REM; this part of sleep inhibits the nervous system from conducting the impulses from senses, helping to maintain synaptic homeostasis and allowing hemodynamic oscillations of glymphatic fluid clean beta-amyloids (toxic effects of metabolic transformation) from the brain [19, 20]. The changes in delta wave activity and sleep disorders can lead to Parkinson's, Alzheimer's disease, schizophrenia, narcolepsy [21] chronic illnesses, depression, and so on [22].

There are factors that prohibit the brain from entering this regenerative delta waves, like not enough of melatonin hormone [23] (which synthesis from serotonin and can be disrupted by light's smog, blue light, and also lack of serotonin [24]) and the lack of oxytocin hormone, which occurs from not having hugs and pressure on skin. Also, external factors perceived as stressful by human senses, like too high or too low temperature; noise; light; pressure; metals; chemical; toxic ingredients in food, in water, and in air; and electromagnetic fields, can activate the reaction of mast cells to release histamine [25]. In the case of histamine intolerance, it is mainly heavy metals such as mercury, palladium, cadmium, lead and nickel, as well as wood preservatives, mold, pesticides, and car exhaust fumes, which can contribute to the emergence and development of the disease, which highlights the relationship between pollution environment and histamine intolerance.

Histamine as a hormone, as well as a neurotransmitter, strongly participates in the sleep–wake cycle, because an increase in the amount of histamine significantly hinders the process of falling asleep, and thus, blocking the histamine receptors in the brain causes drowsiness; one of the symptoms of histamine intolerance are problems with falling asleep and maintaining deep, restorative sleep [26]. In addition, histamine can open the blood–brain barrier [27]; changes in histamine levels in the brain are closely related to the central nervous system abnormality or impairment in the function and are believed to contribute to neurological disorders [28–30]. Histamine also can be increased by drugs and chemicals as well as alcohol, caffeine, nicotine, cocaine, opioid, and cannabis [31, 32]; its high level and its receptors H1, H2, H3, and H4 [33]

cause inflammations (in the most serious cases leading to sepsis [25]), which decrease delta waves [33–35]. In opposition, ketogenic diets can increase the delta wave [36]. Stress and biological processes within the body as a reaction to the external world, long air flights, as well as climate change factors, make endocrine changes, which play a role in the desynchronization of the body rhythms, homeostasis, and sleep patterns, causing jet lag's effects and prevention from good quality sleep, especially in big cities [37–40]. An overwhelming environment, sleep disorders, lack of night regeneration leading to fatigue, anxiety, burnout, chronic diseases, frustration, aggression, tendency to accidents, addictions, depression, and suicide generate not only economic but also social costs. It is so important to create interiors, at home and in public, to calm the senses, where a person can feel safe and fall in regenerative sleep, disconnect for a while from hectic world. To prevent chronic disease now and in the cities of the future, the best solution and benefit will be to prioritize sleep [40–42].

2.1 Melatonin, serotonin, and oxytocin: their connections with environment

Scientific studies have shown that the hormone melatonin acts *via* receptors in the modulation and entrainment of biological and circadian rhythms; is engaged in activating lower brain waves and sleep regulation [43]; plays an important role in suppressing inflammation, neuronal and tissue regeneration, and reproduction functions; strengthens immunity and oncostatic systems, and helps to reduce oxidative stress [44].

Melatonin is strongly connected to serotonin as this neurotransmitter is its precursor [45]. The activator for releasing serotonin, dopamine, noradrenaline, and opioids is oxytocin hormone [46], which is why there is a strong connection between melatonin, serotonin, and oxytocin. The synthesis and secretion of melatonin is affected by and also depends on the sunlight exposure to the eyes retina, as the pineal gland [44] converts the light from electromagnetic waves, as signals from the nervous system, to hormonal signals to create chemical communication between the brain and the body as the answer for environmental factors [47–49]. The serotonin–melatonin daily endocrine rhythm is strongly connected with the daily light cycles, and the top pick of melatonin is during the dark, lowering with daylight [50], but also, new studies show that the production of endogenous melatonin can be activated as an answer to the external environmental factors and changes, which are not related to the light/dark cycle [47, 51, 52]. Advances in this field are presenting that in reality, the circadian network is a multiple oscillator system, discovering that different cells/tissues in isolation have the possibility to manage self-sustained oscillations [53, 54], which raises the possibility that the circadian rhythm in various biological processes may be provided by oscillations resulting from local tissue responses to external factors. Following logically, dyssynchrony could occur using both levels, the inter - organ and between environment and organs, until all rhythm processes reset and adjust again to the new light/dark cycle [55, 56], or some other mechanism occurs that will allow all the internal rhythms of the body to be synchronized with the surrounding frequency, giving a sense of harmony [57].

3. Vinci Power Nap®: well-being neuroarchitecture with power to synchronize

Vinci Power Nap®, a patented system awarded the Wellbeing Quality Certificate 2019 for the best place in Poland, recommended by NASA JPL, UN, UNICEF, and so



Figure 1. Patented design interiors of neuroarchitecture of Vinci Power Nap® with human experiencing swinging in zero gravity position, during regenerative session [62].

forth, is bringing back and giving the best well-being experience for humans. It has been designed by Magdalena Filcek—the pioneer of neuroarchitecture biotechnology mechanisms— as a revolution tool for fast stress reduction and body–mind regeneration [58–61] (**Figure 1**). This experience is possible during 20-min energy naps, while a person laying in zero gravity position in a cocoon, which acts as an oscillation generator, swinging in pendulum movement, in a pollutant-free interior environment, calming all senses at once [39, 63–65]. This pendulum movement is allowing for breath, heartbeat, and brain waves synchronization in special “maternal” frequency 0,618 Hz and 1,618 Hz [40], giving the person feelings of safety and bliss, stress reduction, and rest and sleep with deep relax [39]. The tensions in body muscles can be relaxed thanks to the zero gravity position of the body lying in elastic material of cocoon, feeling suspended, weightless, like in mother’s arms.

Swinging in VPN stimulates the vagus nerve, which controls crucial body and mind functions; its activation has the ability to prevent inflammation, rebalance the autonomic nervous system, restore optimal state, and better connect body and mind [66, 67]. The gentle pulsating pressure on skin during cocoon’s swinging in calm environment activate also skin receptors (mechanoreceptors and exteroceptors) on biological, chemical, physical and ions levels [68]. This interaction of art and science in VPN designed system and new approach to neuroscience allows the author to find solutions for neurobiological integrations, night sleep improvement, sense of safety/security, work–life balance, well-being, longevity, stress and jet lag reduction, and the connection of internal body clock with surrounding time as a frequency [57].

3.1 Vinci Power Nap®: to rest, reset and reconnect human “factory settings”

Resetting and reconnecting the senses with body, mind, and environment in one frequency has been relatively overlooked as until now there was no tool to make it happen. The possibility of “factory settings reset”, synchronizing internal human rhythms with external world rhythm, came together with discovering the Vinci Power

Nap® System—as an innovative interdisciplinary mechanism of neuroarchitecture that leads to a revolution in sleep medicine and biotechnology.

The electromagnetic field can be found everywhere in the outside world; every ecosystem on the planet from insects to plants, birds, fish, humans, and other living organisms is immersed in the frequency of harmony [57]. Embryonic life, from the first moment in the womb of mother, experiences rhythmic pulsation from the blood flow of mother's vessels that occurs around the placenta, creating the fluctuation of compression and release on the new body in the fetal water—in the rhythm of mother's heartbeat. Following the standards, normal blood pressure is 120–129/80–84 mmHg (dividing 129/80 is $\sim 1,618$; moreover 80/129 is $\sim 0,618$). What is surprising is that the VPN pendulum period is 1.618 s, and at the same time, its frequency shows 0,618 Hz [50]. These two numbers represent the number of Phi, the golden ratio values, but here they are values with Hz forming a harmonic frequency capable of creating 3-dimension fractals [57, 68].

Similar pulsations of contraction and release, compression, and relaxation of the elastic material occur while a person is swinging in the 0,618 Hz gravitational motion in the VPN cocoon. By electromagnetic induction, this delta frequency (0,1 Hz - 4 Hz) from VPN movement occurs in the brain waves, heartbeat and breathing all together at once together with rhythm of environment. Moreover, this pulsation rhythm of pressure on skin triggers the Ruffini and Pacinian receptors to the secretion of hormones like oxytocin and indirectly dopamine, serotonin, melatonin, and so on [69]. The movement of back-forward swinging generates hydrodynamics of fluids in the body, in special rhythm of delta waves, which activate the stimulation of lymphatic [62, 70–71] and glymphatic systems [72], allowing to remove the toxins and neurotoxins [19], cleansing the immune system, increasing activation of enzymes that are able to neutralize histamine [73, 74], and leading to deeper sleep at night [68]. Reducing the level of histamine (also inflammations) and the overabundance of fluid and substances in interstitial is a key for tissue to keep homeostasis [72]. A VPN system can significantly help keep the lymphatic and glymphatic systems running smoothly through the movement of the pulsating rhythm of the pendulum and changing pressure of the cocoon's material. A person, by swinging in this pendulum, can experience weightlessness/microgravity at the highest point, which allows the cells to stretch and absorb water from the tissues, and upon landing to the lowest point, hypergravity occurs, where the cells compress and excess fluid from them that is pumped into the lymphatic system [71]. During this 20-min VPN swinging session, the person falls asleep/naps in a regenerative frequency of delta waves [40]. This process of reset and reconnection is made in the “factory setting” frequency of symmetrical harmony, which rhythm humans can feel physically and mentally pleasant, like in harmoniously combined sounds. The author creates the hypothesis that there is universal rhythm of electromagnetic waves, which feels like gravitation and which is influenced by and interacts with environmental factors and senses with endogenous oscillations, described deeper in article [57]. The ability to synchronize all of the body's internal rhythms with the surrounding frequency can lead to a wonderful feeling of peace, relaxation, rest, bliss, and love, like “coming home,” as well as changing the mood and behavior to a more calm and harmonized one, which is exactly what participants say they experience in the VPN session.

The observations from author's research show the importance of the understanding that the biological clock is working with synchrony of the endogenous circadian rhythm together with environmental factors—interacting endocrine systems and human behavior—influencing psychophysical condition. In science, there is a huge

progress in understanding chemical and mechanical aspects of cell and tissue, explaining interconnection between the gradients of electromagnetic field (EMF) and cellular reactions, which could be found in research connected with physiology, embryology, and molecular biology—it is showing the correlation between the physical factors and the observed organic, cellular changes [75] together with oscillations of the circadian clock [76] in mammals and plants [77].

4. Jet lag and desynchronization of circadian rhythm—Impact for travelers

Jet Lag Disorder (JLD) is mainly connected with long airplane travels, crossing more than 3 time zones [78, 79]; scientists describe it as desynchronization of the internal rhythms of body's internal clock with the rhythm of day and night cycle in the arrived place. Symptoms of jet lag may be different in every person but mainly cause night's sleep problems, tiredness, fatigue and drowsiness during the day, and problems with performance both physical and mental, associated with gastric and somatic issues for few days or even weeks, as described by Stanford University's Center for Sleep Sciences and Medicine [80–82]. According to a study by Eastman published in *Sleep Medicine Clinics* in 2009, the impact of jet lag on human body is serious and people who fly often can experience long-term health risks and chronic diseases like cardiovascular illness, type II diabetes, and even cancer. This risk is increasing with age following research of the American Academy of Sleep Medicine [9, 82].

The circadian rhythm was found in different kind of organisms as a biological process of endogenous oscillation of hormones, generated by external environment, for example, by temperature, light, and redox in 24-hours cycle. Advances in science show that in living organisms, there are various kinds of clocks, like molecular, chemical, neuronal, and hormonal, where each one is aligned with the others in a bigger or smaller scale [83]; this internal clock regulates body temperature, metabolism, hormone levels, sleep, and behavior [84, 85] and can be disrupted by genetic and/or environmental factors [55, 86].

Hormones' communication is essential for the maintenance of homeostasis and adaptation to environmental changes that stress mast cells into releasing histamine, leading to inflammations [57]. The same stressors are connected with shift work, as the sleep/wake cycle is in this case significantly different from the path of our evolution, where dark and light is in constant and reliable cycle, connected with geophysical patterns. Those disruptions in circadian rhythm have biological consequences and could be linked with higher risk for cancers like colorectal, breast, lymphatic, and prostate, as well as with diabetes, obesity, gastric ulcers, coronary heart disease, atherosclerosis, stroke and heart attack, and so forth [1]. The mechanism for these correlations with exposure to static, flexible, extended, and rotating shift work and frequent international travels by flight crews or travelers across several time zones leads to jet lag symptoms [50]; inflammations and diseases, in author hypothesis, can be connected to mast cells and histamine and its receptors—as pathophysiologic mechanism of sepsis discovered by author and published in [25]. In the complex cycle of sleep and wakefulness, the harmonization of the central histaminergic system plays an important role by promoting and perpetuating the excitability of the cerebral cortex during wakefulness and concentration [1, 73, 87]. The people were defenseless before jet lag as there was no single cure for jet lag [88] and sepsis, until now. The author's research on Vinci Power Nap® allows for understanding the deep connection

and interactions between environment, physics, electromagnetic rhythms, and neurobiology/biotechnology of human body, which can give the answer of the mechanism of jet lag and its possible prevention and treatment. This knowledge is a key for any travelers, pilots, astronauts—to let them keep well-being, sleep, and health in better condition and allow to enjoy the trip, work, and vacations.

4.1 Stress in the shift work of a pilots, astronauts, flight controllers, and drivers

Specific lifestyle and shift work exposure are connected with circadian and sleep disruptions leading to psychosocial stress. The great responsibility is on the shoulders of the pilots, astronauts, drivers, and flight controllers, as their work is essential to avoid performance errors, but very often, their works' environmental factors, like shift work, huge stress, work overload, noise, changes in temperature (cold or warm), radiation, electromagnetic fields and light intensity, elevated CO₂ levels, changes in time zones and gravitational acceleration, vestibular changes, and weightlessness [89–91], are challenging for the body and mind. These environmental stressors lead to the dysregulation of the immune system, multi-organ inflammations, circadian desynchronization, cumulative sleep loss, tiredness, fatigue, and decreased alertness and performance in long-haul flight crews [1]. Moreover, The Center for Disease Control and Prevention classifies airline crew members as “radiation workers” [92, 93] together with ICEMAN project [94]. “The characteristic reaction to electromagnetic radiation consists of tightening in the fascia surrounding the muscles, which in turn causes biochemical failure of the body [75, 95], in particular, disruption of the functioning of cell membranes” [96], changing the probability of ion-channel on/off switching events [97]; this compression, stressful pressure on tissue can activate mast cells to release bigger doses of histamine, and its higher level in blood can create clots in the veins (often occurs after flights), causing poor transportation of oxygen to organs, tiredness, headache, sleep disorders, drowsiness, and other symptoms similar to jet lag [98]. Those effects can be very dangerous during airplane flights and space exploration missions [99–103], together with sleep deprivation, which can double error rates [8]; moreover, another study shows that driving tired or sleepy is as dangerous as drunk-driving [104, 105]. Dr. Mark R. Rosekind is Admin. of the National Highway Traffic Safety Administration [106]; his research and reports for NASA show the physiological, psychological effects on flight crews, which are related to stressful flight operations [107]. He has found the operational significance of these effects and presented that effectiveness and operational safety can be lower in the case of the pilot tiredness. He had found that napping is the best operational prevention and the best method to minimize the effects of circadian disruption, sleep loss, and fatigue during the flight operations and has the ability for temporarily reducing stress and physiological sleepiness [108–110]. His studies present that pilots who could take a short power nap increase response time by 54%, in comparison to those who could not take a regenerative sleep during the day; He also notices and provides a very important conclusion: the nap can be shorter but not longer than 26 min [111, 112].

Erin Flynn-Evans, from NASA's Ames Research Center in California's Silicon Valley, is researching how sleep environment disturbances affect the quality of astronauts' sleep during the spaceflight, as astronauts have reported fatigue during missions and deficit of sleep [113]. According to NASA's Human Research Roadmap, there are evidence points to the risk of performance degradation and adverse health effects associated with space exploration missions [114, 115]. The NCAA, in 2016, released a study research of the work environment performed in commercial civilian aviation

in Norway, which shows that 72% of pilots and 85% of cabin crew experience physically exhausted after the completion the period of a work [116]. Those high numbers of people with fatigue point to the need for improvement in legislation and real-life practices as “there is an interest in improving both the wellbeing and overall safety of crew, passengers and other relevant stakeholders in the aviation industry” [116]. So far, recommendations have been to report fatigue more often, encouraging people to increase their willingness to report fatigue, try to work less (e.g., 80% instead of 100%), go to bed at decent hours, maintain good sleep hygiene, and allow for napping on the flight deck; a healthy diet and regular physical activity are also very important [116].

The researchers are looking for how to improve performance, determine effectiveness and alertness in flight operations, and plan cockpit rest period and tools.

Great solutions for pilots and astronauts have been found by the author and described broadly in a previous science article titled “Cutting edge solution for effective and safe missions - neuroarchitecture system of Vinci Power Nap® - revolution in fast stress reduction, regenerating body & mind which can help you, pilots, astronauts: before, during and after space travels” [68]. NASA is working to look for the improvements that could increase the astronaut crew’s health and prevent illnesses during the spaceflights [117]; following this need, NASA is interested in implementing the VPN system—the innovatively designed environment for fast human regeneration. On May 20, 2019, Manager of NASA JPL/Caltech—Mr. Artur Chmielewski—wrote that he hopes to open the rooms with VPN systems in all NASA centers [118].

4.2 Vinci Power Nap® rhythm—The discovery of stress and jet lag relief

The study shows that VPN system can bring remarkable effects regarding relief from stress and jet lag, as it helps in the synchronization of the internal clock with the environment rhythm at the journey destination. Better effects to help for overcoming jet lag symptoms, stress, and tiredness can be achieved by using VPN system as soon as possible after arrival—at the airport or in the hotel. Power nap, in the best calming body and mind environment in zero gravity position, allows not only to sleep deeply and to reduce stress and tensions but also swinging in VPN cocoon with 0,618 Hz frequency during the relaxing session that can, from a biotechnological point of view, help to accelerate enzymatic processes. Research of DSc Lukasz Szymanski, prof. Polytechnic in Lodz, show that the induction of alternating low frequencies of the electromagnetic field can make positive changes in the spin of ferromagnetic atoms, resulting in changes in the properties of some human body substances, such as enzymes, which, in this case, can be helpful in neutralizing the level of histamine, relaxing muscles, faster regeneration of damaged cells, and a positive change in their structure, for instance, increasing the density of bone tissue [119], which is very important prophylaxis for astronauts.

Moreover, during swinging in VPN cocoon, apart from healing activation of vagus nerve [66, 67], the body’s active hydrodynamic fluctuations might affect the acceleration of enzymatic catalysis [74] because in the presence of the enzyme, the activation energy for the reaction is less than in its absence; it means that the enzymes can speed up the reaction [74]. For example, swinging in VPN synchronization system [120] for 20 min power nap accelerates enzymes (also as DAO and HMNT) [121], which neutralizes endogenous and exogenous histamine, which can help to prevent and reduce inflammations and its manifestations that are very similar to jet lag symptoms. What showed the pilot research on man 52 years that after 10 VPN sessions, conducted

ENZYM DAO - BEFORE AND AFTER 10 VINCI POWER NAP® SESSIONS:				
Biochemistry before				
Name of study	Test result	Reference range	Reference range	sex, age
material: venous blood, serum, date and time. Downloads: 05-06-2023 08:27, date and time admissions: 07/06/2023 11:20				
Diamine Oxidase DAO (serum)	9,8 U/ml	> 10	BELOW NORMAL	man 54 years
Biochemistry after				
Name of study	Test result	Reference range	Reference documents	sex, age
material: venous blood, serum, date and time. Downloads: 22-06-2023 08:27, date and time admissions: 26/06/2023 12:24				
Diamine Oxidase DAO (serum)	15,2 U/ml	> 10	NORMAL	man 54 years

Table 1.
Levels of enzyme DAO before and after 10 VPN sessions.

VITAMIN D - BEFORE AND AFTER 10 VINCI POWER NAP® SESSIONS:				
Immunochemistry before				
Name of study	Test result	Reference range	Reference range	sex, age
material: venous blood, serum, date and time. Downloads: 05-06-2023 08:27, date and time admissions: 05/06/2023 14:55 the tests were performed using the direct chemiluminescence method (CMIA) on the Alinity ci analyzer from Abbott				
Vitamin 25(OH)D Total (091)	28,7 ng/mL	< 20 deficiency 20–30 concentration insufficient 30–50 optimal concentration 50–100 high concentration 100–200 potentially toxic concentration > 200 toxic concentration	BELOW NORMAL TOO LOW	man 54 years
Immunochemistry after				
Name of study	Test result	Reference range	Reference documents	sex, age
material: venous blood, serum, date and time. Downloads: 22-06-2023 08:27, date and time admissions: 22/06/2023 13:05 the tests were performed using the direct chemiluminescence method (CMIA) on the Alinity ci analyzer from Abbott				
Vitamin 25(OH)D Total (091)	32,4 ng/mL	30–50 optimal concentration	NORMAL - OPTIMUM	man 54 years

Table 2.
Levels of vitamin D before and after 10 VPN sessions.

between June 5, 2023 and June 22, 2023, there was increase of enzyme DAO from 9,8 to 15,2 U/ml (the minimum level of norm is from 10 U/ml); also, the level of vitamin D3 increased from 28,7 to 32,4 ng/mL (the minimum level of norm is from 30 ng/mL) (Tables 1 and 2).

The author has hypothesized that neurotechnology of VPN sessions strengthened together with vitamins D3, B6, and C; zinc; enzyme DAO; and antihistamines for H1, H2, H3, and H4 applied before, during, and after the flight or space trip [39] can be a great prevention for pilots, astronauts, and passengers to overcome jet lag, tiredness, and stress, as well as can be helpful in rehabilitation and prevention from organs transplantation rejection [121]. The author has concluded that thanks to VPN system by its identifying the reset mechanism of the internal oscillators and the frequency of hydrodynamic, there is a possibility to balance the endocrine body's interaction on the external environmental factors. This discovery can not only help to bring a better understanding of the circadian biology but also provide insight into more general aspects of controlling biophysics, biochemistry, neurobiology, transplantology, as well flight and space medicine.

4.3 Benefits for travelers, pilots, astronauts—Hotel and airport improvement

To not destroy the first days of the vacations or important business negotiation after a long flight trip when few times zones were crossed, to reduce jet lag and improve energy for life, it is recommended to have a 20-minute rest or power nap in Vinci Power Nap® system just after arrival—to reduce symptoms of travel-related body and mind stress [122] and to harmonize the internal rhythm with environmental rhythm at the destination [123].

The best airports and hotels with well-being care for world travelers and their shift-working crew can implement jet lag reduction—reset—energy naps rooms of VPN system as the cutting-edge tool, which is bringing new value in the prevention of human health, as well as performance and energy in space missions.

One part of the VPN system—the cocoon—called the generator of oscillations, is already installed at the AATC (Analog Astronaut Training Center) and is helpful for analog astronauts experiencing sleep deprivation [124]. VPN can be created in space-ships, in future human habitats created on the Moon or on planet Mars. For daytime rest, the author is proposing design of VPN heartbeat frequency pressure cocoon or suit (with changing the pressure on the body in the rhythm of the pendulum VPN movement recorded data from Earth) and for nighttime, a suit with compressed air that exerts gentle pressures on the human body with (0,618 Hz - 1,618 Hz) frequencies, as it is in a mother's womb on Earth [68]—to accelerate the regeneration of cells, release enzymes, and increase bone tissue density [119]. The discoveries of revolutionary properties of VPN system can bring new applications and innovations into sleep medicine, aviation and space medicine, physiology, psychology, and neuroscience.

5. The research, subjects, methodology, and results

The author has done interdisciplinary research between March 12, 2018 and January 27, 2023 on hundreds of participants of different groups, showing the real

impact of relaxation of VPN sessions on interconnected multilevel human body–mind systems.

The studies were using the measurements for sleep/pulse/brainwaves/heart and HRV tests, laboratory blood, treadmill exercise, and mind performance tests, as well as doctors’ and psychologists’ deep interviews, surveys, feedback, and observation. Here, only a few from all of the studies are presented, and more are described in another of the author’s science articles.

Participants: delegates, leaders, travelers, employees, students, soldiers, pilots, and so on.

5.1 Survey on stress and jet lag on Climate Change Conference COP24 2018

The research was done during 14 days of COP24 in Poland, on 465 UN delegates as travelers came from all around the world (different time zones, climate, and culture), suffering also from stress and jet lag. Leaders, 277 women and 179 men, from 58 countries, age range from 15 to 72 years, attended the relaxation session of VPN system. After 20 minutes of VPN sessions, participants filled out the survey, marking their experience and subjective feelings. Based on the results of the data analysis, VPN sessions during COP24 had a significant impact for reducing the symptoms of jet lag in 80% of participants, as decreased fatigue from traveling, relief of stress 98%; bliss and safety 94%; refreshing mind 98%; happy and relaxed 97%, sustainable body and mind 96%; relief from headache and back and neck pain 80%; relief from anxiety 88%; calm/peace, feeling of being loved 96%; and multisensory experience 94% (**Table 3**). The complete survey methodology of research and VPN positive impact on UN delegates is described in [39].





   	
465 UN DELEGATES WERE REGENERATED BY VINCI POWER NAP® AT COP24 UNFCCC	
ATTENDEE SUMMARY:	
HOW DO YOU FEEL AFTER VINCI POWER NAP® SESSION	BETTER
REFRESHING MIND	98%
SUSTAINABLE / BALANCED BODY & MIND	96%
RELIEF OF STRESS	98%
FEELING BLISS & SAFETY	94%
FEELING HAPPIER & RELAXED	97%
RELIEF OF HEADACHE, BACK, NECK PAIN	80%
RELIEF OF ANXIETY	88%
MULTI-SENSORY EXPERIENCE	94%
FEELING OF CALM/ PEACE AND BE LOVED	96%
RELIEF OF JET LAG	80%

Table 3. Results of surveys from 465 UN Delegates on COP24, source: [39].

5.2 UNICEF project: Sleep and stress of women and children with war trauma

The 127 beneficences of UNICEF project for women and children refugees from Ukraine with war stress and trauma attended 300 VPN sessions, a few sessions per person. From 146 filled surveys, the study showed decrease by 86% of the level of stress for 125 people and increase by 87% of the level of feeling safety for 127 people.

The improvement of better night's sleep after the VPN sessions was also reported by UNICEF project participants.

5.3 Patterns of sleep and stress for travelers: pilots, soldiers, analog astronauts

There are collected data that show the improvement in fields of sleep, quality increase, and stress reduction for:

Analog astronauts: "Analog Astronaut Training Center confirms that the oscillation generator as a part of the Vinci Power Nap® system is used by sleep-deprived analog astronauts as part of their daily routine in the habitat..(...)" Dr. A. Kolodziejczak [124].

12 international pilots of hot air balloons: using VPN session in Wroclaw—survey (Table 4).

41 employees of 3M company: using VPN session in Wroclaw—survey (Table 5).

14 people with depression from clinic: VPN session in Wroclaw—survey (Table 5).

18 Business Henley School international students: VPN Wroclaw—survey (Table 5).

14 soldiers with PTSD: from 10th BkPanc of Polish Army sent by the Ministry of Defense, soldier of special forces GROM, VPN session in Wroclaw—survey (Table 4).

Soldier with PTSD: deep interdisciplinary physiology, psychology study, and more info about the details of this research are in article [50]. The pilot study on a soldier with PTSD was conducted during 10 days of VPN sessions (everyday session); participant reported increasing quality of refreshing sleep, reducing sense of stress from 10 to 6 level, and unblocking in the senses of smell and taste, and most importantly, he had 2 nights without waking up, which was a big success as flashbacks, insomnia, nightmares, fatigue, recurring thoughts, fears, and so forth were waking him up every night since many years after a war mission, as he reported.

Sleep pilot report of polysomnograph conducted on night's sleep of a soldier with PTSD on dates: June 17, 2020 and June 26, 2020; Dr. W. Kucharski from Centrum Serca Lumina Cordis Clinic in Wroclaw, before and after 10 VPN everyday sessions wrote that lever of REM was from 20,13 to 22,45% and deep sleep from 17,56 up to 18,19%; slightly increased RDI (9,3) was recorded with correct AHI (3,2) and ODI (2,8). No sleep apnea was recognized; light sleep dominated as well as correct % of REM sleep (Figure 2).

5.4 Heartbeat changes after VPN sessions

Heartbeat measurement by pulse oximeter during COP24 on 176 participants and summary chart from the Samsung Health app on a woman experiencing VPN session for the first time. The woman reported serious problems with sleeping before coming to the VPN session; after this session, on the next day (June 26, 2022), she noticed and wrote a comment that she slept 6 hours at night without waking up; it was positively surprising for her because she could not sleep for more than 4 hours every night and it happened for many months before (Figure 3).

The results of Holter research before and after 10 VPN sessions showed decreased HR MID from 63 to 60 points and tachycardia from 19 to 8 for the soldier with PTSD

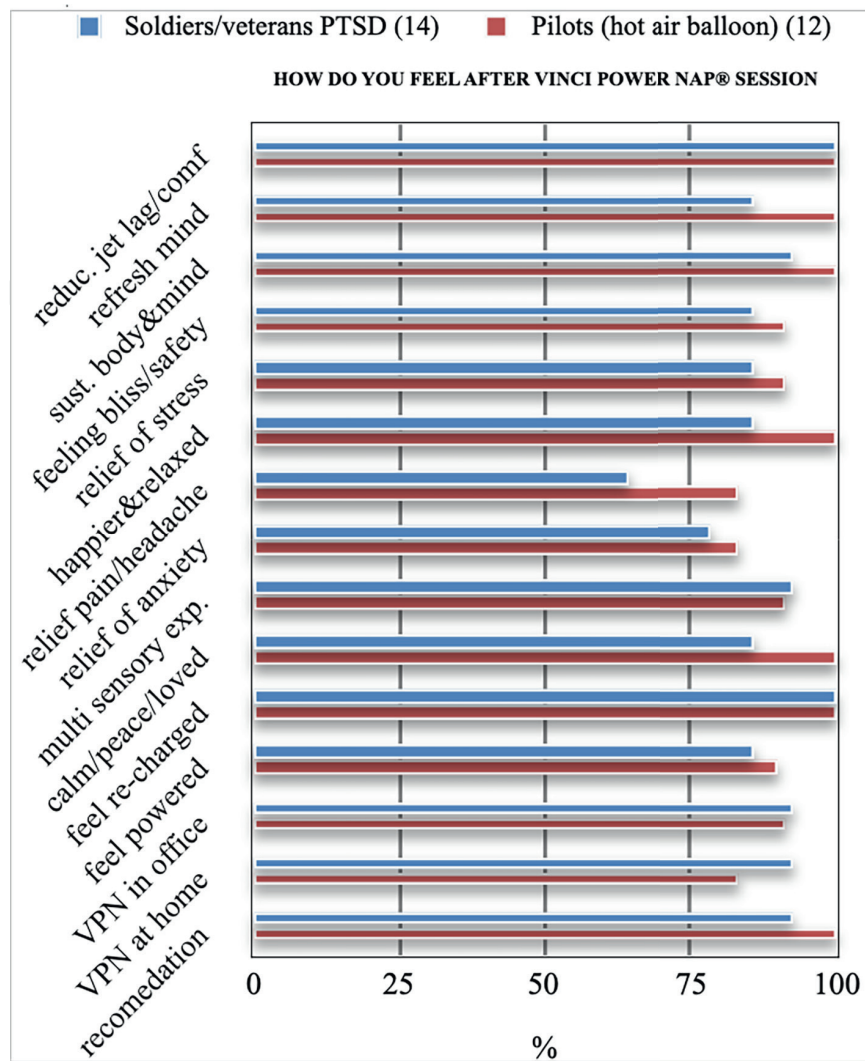


Table 4. Survey result levels of stress reductions after VPN sessions: Pilots (12) and soldiers with PTSD (14), source [68].

and HR MID from 88 to 80 points and tachycardia from 1146 to 382 for the woman in trauma, in both increased HRV showing improvement in relaxation. More details of this research are in [40].

5.5 Increasing delta waves during the VPN session and rhythm of breathing

During 20 min VPN session for the soldier with PTSD and woman in trauma, the delta and theta waves increased—measured by the neurobiofeedback device, more in [68].

Together with rhythm of VPN movement, the breathing synchronized; rhythm of inhalation and exhalation was with 0,618 Hz frequency in 1,618 s period.

5.6 Increasing hormones after VPN sessions

Oxytocin, serotonin, dopamine, prolactin, and testosterone serum increased after VPN sessions—the data and other hormones can be found in study [40] and in [68].

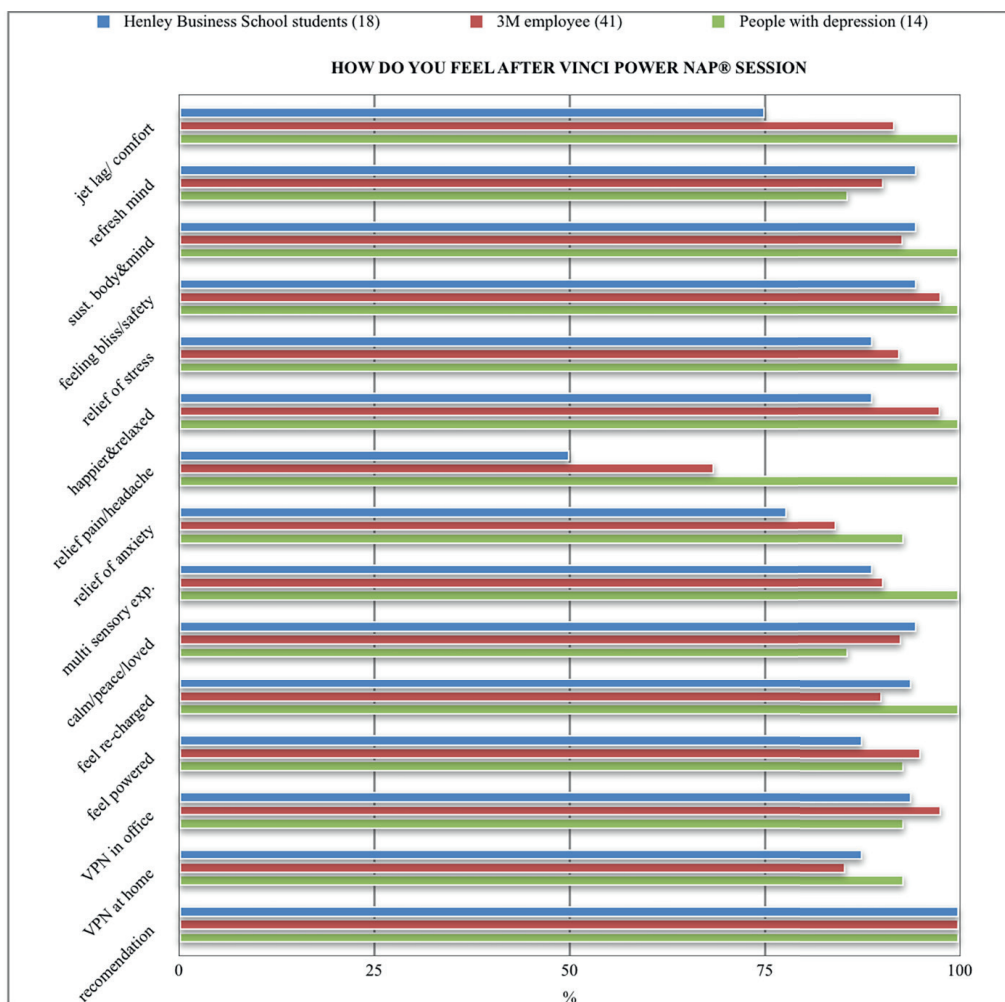


Table 5. Survey result levels of stress reductions after VPN sessions: Employees of 3 M company (41), BHS students (18), people with depression (14), source [40].

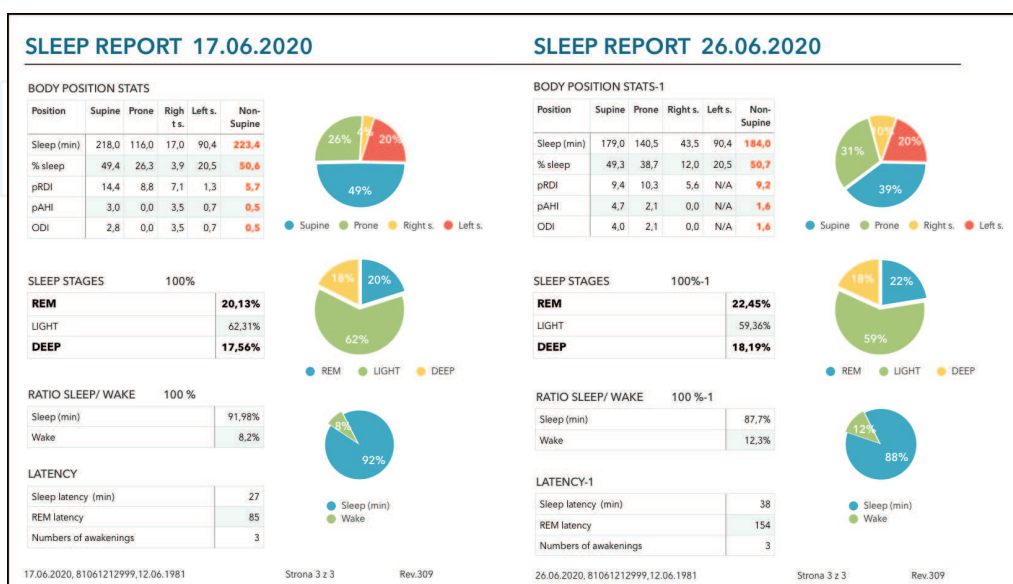


Figure 2. Sleep report from polysomnograph measurements of sleep on a soldier with PTSD during two nights, at the beginning and the end of 10 day VPN treatment.

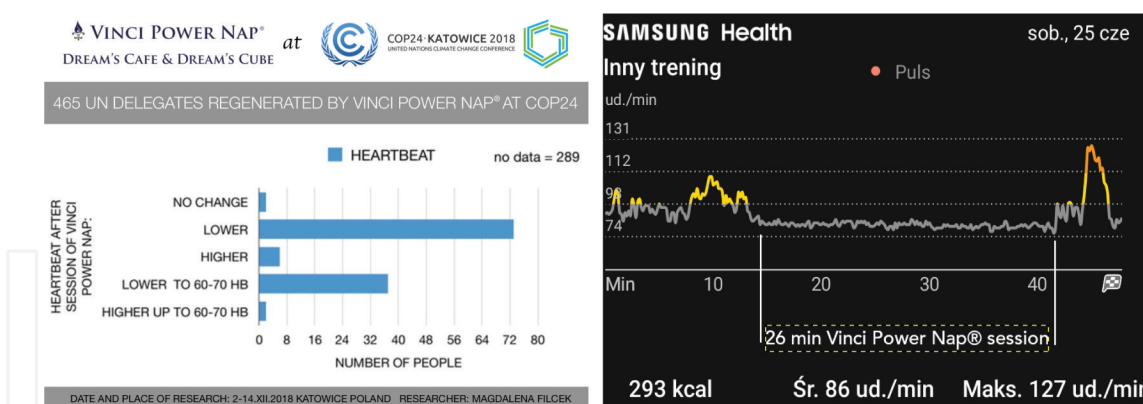


Figure 3. Heartbeat measurement of 176 UN delegates on COP24 [39] and end user.

5.7 Experiment with reducing jet lag with VPN during Warsaw—Tokyo travel

The author experimented while traveling from Warsaw to Tokyo; shortly after landing, the author took a 20-minute nap while swinging in VPN cocoon. During the entire stay in Tokyo, she felt no jet lag at all, while the other conference attendees complained of severe time zone changing—jet lag symptoms throughout the whole week.

5.8 Feedback from top doctors in sleep medicine, scientists, and end users

Prof. P. Zimbaro—from Stanford University in California, USA—wrote that VPN allowed him for totally relax, deep sleep, and refresh energy; he is sure that this idea have to be translated into a global movement—which allows to help people in every age to unite heart, mind, spirit, and body. May 23, 2023 [124, 125].

Dr. M. Skalski, Specialist of Sleep Medicine and Sleep Disorders, Treatment Clinic and Warsaw Medical University, wrote that after the first VPN session, he let go of the physical and mental tensions, which made confirmation for his beliefs in this unique method—to achieve quick and deep relaxation. October 25, 2019 [124].

Dr. Mayank Vats, Senior Specialist, Intensivist, and Sleep Physician, Interventional Pulmonologist in Rashid Hospital and Dubai Health Authority in Dubai, UAE wrote in the letter to WHO and UN that as a COVID frontline warrior, he strongly recommend implementation Vinci Power Nap® system in every hospital to help reenergize the HCPs and reduce the physical and mental fatigue—it will allow them to work with fresh energy and efficiency. July 1, 2020 [124].

Dr. J. Koberda Neurologist/Neuromodulation/QEEG/Brain mapping from Department of Air Force Headquarters in Florida wrote that Vinci Power Nap® system could be potentially a part of Invisible Wounds Center at Eglin AFB. 10 June 2022 [124].

Director Mr. R. Juchniewicz—Head of the Pedagogical and Psychological Counseling Center of the Vilnius Region in Lithuania—wrote that after VPN session, he for the first time in many years felt calm, peace, deep relaxation, and rest after only 26 min. March 27, 2019 [124].

Dr. L. P. M. Klim from Bayer wrote that VPN is a great solution for any type of sleep disorder. July 7, 2020 [125].

ZEN Master Mr. A. Poraj—the creator of “Empty Cloud”—wrote that it is a great solution to take care of ourselves and rest—to be able help others. July 25, 2018 [125].

The owner of the Association of Space Relaxation Techniques wrote that VPN can give priceless feeling of withdrawal of the senses and regeneration on every level. January 10, 2019 [125].

Mrs. M. Maj—the mother of a child with sleep disorder—wrote that the VPN sleep therapy is working brilliantly. January 10, 2023 [125].

Mrs. K. Majka wrote that VPN is a unique place where people can be reborn again, where mind and soul can become calmer. January 23, 2020 [125].

Mr. A. Kudelski, businessman from Zug, Switzerland, wrote that he feels that he was reborn after 20 min of VPN session and it was unique experience. August 7, 2022 [125].

Mr. Yuki Mitani, luxury taxi driver from Tokyo, wrote that it will be wonderful if VPN room could be implemented in a taxi company. June 11, 2019 [125].

NASA/JPL Flight Project Manager—Mr. A. Chmielewski—wrote that he trained many astronauts in his life, but he has never been on ISS, the space station; nevertheless during VPN session, he could feel how it is in space in zero gravity position. June 7, 2022 [125].

Mr. J. Skrzypczynski—top leaders' coach—wrote that in today's world, people are in rush, hurry, and stress, and for development, the most important is to relax; it is basic to have achievements in very field: in sports, work, medicine, learning, and even in making love. Vinci Power Nap is a great tool for fast relaxation as benefit for yourself, your family, and colleagues. June 2, 2020 [125].

Ministry of Environment of Poland—Mr. M. Kurtyka wrote that 465 delegates of UN had the possibility to regenerate body and mind and achieve great success in negotiations during COP24, recommending this technology for conferences, trainings, and workshops. March 10, 2019 [124, 125].

Director Conference Affairs Services, United Nations Climate Change Secretariat, Mrs. L. Lopez wrote that VPN brought peaceful interlude during the hectic conference period and had great impact on people, recommending for other UN conferences in future. March 11, 2019 [124, 125].

And many more recommendations and feedbacks are in VPN Guest Books.

VPN system was presented all around the world on many top conferences—in subjects of sleep on “Sleep Expo” in Dubai in 2019, “Somnex” 2018 in London, a conference called “Smart Cities Powered by People” in New York in 2018, “Resilient and Responsible Architecture and Urbanism” in Malaysia 2019, “Future Smart Cities” in Kuala Lumpur 2020, and many more. VPN was presented as the great solution tool and help leaders, employees, shift workers, soldiers, drivers, pilots, astronauts, travelers, and others.

6. Conclusion

The author's pioneering interdisciplinary evidence-based research and end user feedbacks from thousands of hours of sessions confirm that Vinci Power Nap® neuroarchitecture system provides remarkable positive results in the reduction of fatigue, stress, and jet lag, allowing for synchronization of circadian rhythm, regeneration of body and mind, and increase in the well-being, quality of night's sleep, and energy for life. The VPN system-based discoveries empower understanding the relationship between environment stressors and the body's neurobiological reaction to them, which also triggers the release of histamine from mast cells, emphasizes the role of enzymes, as well as impacts these two on human psychophysical conditions related to inflammation, sleep, and emotions.

Vinci Power Nap® is a revolution system for balance and harmonization of: circulatory, respiratory, endocrine, lymphatic, and immune systems, has the ability to calm the brain waves and heart rhythm disorders (also tachycardia), and could help to restore homeostasis, increasing vitality and hormones oxytocin, serotonin, dopamine, testosterone, indirectly melatonin, and so on. All of this shows that VPN can be a wonderful tool using for prevention and as a help in the treatment for burnt-out, overtired, overwhelmed, depressed, traumatized, insomniac people; this innovation can also be helpful for people with Alzheimer's, Parkinson's disease, and so forth.

Vinci Power Nap®'s oscillation properties allow for synchronizing body rhythm systems, hydrodynamic pulsation accelerating enzymatic catalysis, and faster regeneration of damaged cells and their structure like increasing bone tissue density, which are also revolutionary findings for human space travels. VPN biological regulation functions have positive effect also for pilots and passengers of airplanes by helping to reduce stress, tiredness, and jet lag symptoms; recover sleep architecture; and improve cognitive/physical performance, focus, and efficiency.

Conclusions strongly highlight the need of implementation VPN solutions in the real world, for example, at travel-related facilities like hotels, airports, ships, spaceships, and Martian and Lunar habitats, as well as at hospitals, clinics, schools, trains, and so on; it will help to improve the well-being of travelers and inhabitants of future smart cities. Providing 20-min restorative power naps in innovative neuro-architecture allows for boosting energy during the day, memory, mental clarity, body regeneration, rejuvenation, and work-life balance and reducing stress, jet lag, risk of heart attacks, and so forth. VPN technology and its neurosensomotor stimulation is an exceptional form of napping in the right conditions, providing revolutionary tool to support sleep, well-being and health for decision-makers, leaders, employees, managers, students, surgeons, commanders, soldiers, pilots, astronauts, travelers in space, and all humankind on Earth. The author's suggestion is that VPN sessions and additional antihistamines H1 and H2; vitamins D3, C, B6; zinc; cooper; and the DAO enzyme before, during, and after space travels, long and fast journeys, may provide prevention and therapeutic effects and could also help to fall asleep faster and maintain a good night's sleep.

The interdisciplinary aspects of neurophysiological VPN system can help restore the mind-body connection; sleep and wake patterns in infants, children, adults, and seniors; and be applicable for fast restorative relaxation, prevention, and therapies, as well as bring a new perspective for future research with reference to sleep medicine, aviation and space medicine, interior design, neuroarchitecture, neuroscience, circadian rhythm, nervous systems, psychology, physiology, transplantology, molecular biology, embryology, longevity, harmonization of homeostasis, and other systems of human body.

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References

- [1] Castanon-Cervantes O et al. Dysregulation of inflammatory responses by chronic circadian disruption. *Journal of Immunology*. 15 Nov 2010;**185**(10):5796-5805
- [2] Cheung V et al. The effect of sleep deprivation and disruption on DNA damage and health of doctors. *Anaesthesia*. 2019;**74**(4):434-440
- [3] Moldofsky H et al. Effects of sleep deprivation on human immune functions. *The FASEB Journal*. 1989;**3**(8):1972-1977
- [4] Colten HR et al. Sleep Disorders and Sleep Deprivation: An Unmet Public Health Problem, 3Extent and Health Consequences of Chronic Sleep Loss and Sleep Disorders. Committee on Sleep Medicine and Research, National Acad. of Sciences; 2006
- [5] Suni E, Truong K. 100+ Sleep Statistics. Sleep Foundation. 2022. Available from: <https://www.sleepfoundation.org/how-sleep-works/sleep-factsstatistics>
- [6] Akerstedt T et al. Shift work and napping. In: Dinges DF, Broughton RJ, editors. *Sleep and Alertness: Chronobiological, Behavioral and Medical Aspects of Napping*. New York: Raven Press; 1989. pp. 205-220
- [7] Fry A, Singh A. Coronasomnia: Definition, Symptoms, and Solutions. Sleep Foundation. 2023. Available from: <https://www.sleepfoundation.org/covid-19-and-sleep/coronasomnia>
- [8] Watkins T. Researchers Urge Doctors to Disclose Sleep Fatigue before Surgery. CNN; 2010
- [9] Locker M. *The Scientific Secrets to Preventing Jet Lag*. Time; 2018
- [10] Sleep Foundation. Available from: <https://www.sleepfoundation.org/> [Accessed: 2023-01-20]
- [11] Matoso M. Neuroarchitecture: How your Brain Responds to Different Spaces. ArchDaily. 2022. Available from: <https://www.archdaily.com/982248/neuroarchitecture-how-your-brainresponds-to-different-spaces>
- [12] Dr Cherry N. EMF/EMR Reduces Melatonin in Animals and People. New Zealand: Human Sciences Department Lincoln University Canterbury; 2002
- [13] Huffington A. *The Sleep Revolution: Transforming Your Life, One Night at a Time*. Harmony Books. New York, NY: Crown Publishing Group and Penguin Random House LLC.; 2016. ISBN 978-1-101-90400-8
- [14] Walker M. *Why We Sleep*. Scribner. 3 Oct 2017
- [15] McCormick DA et al. Thalamocortical oscillations in the sleeping and aroused brain. *Science*. 1993;**262**(5134):679-685
- [16] Kayaba M et al. Energy metabolism differs between sleep stages and begins to increase prior to awakening. *Metabolism: Clinical and Experimental*. 2017;**69**:14-23
- [17] Liu Y et al. Prevalence of healthy sleep duration among adults—United States, 2014. *MMWR. Morbidity and Mortality Weekly Report*. 19 Feb 2016;**65**(6):137-141
- [18] Bernardi G et al. Regional delta waves in human rapid eye movement sleep. *Journal of Neuroscience*. 3 Apr 2019;**39**(14):2686-2697

- [19] Collins F. Discovering the Brain's Nightly "Rinse Cycle". 5 March 2020. Available from: <https://directorsblog.nih.gov/2020/03/05/discovering-the-brains-nightly-rinse-cycle/>
- [20] Fultz NE et al. Coupled electrophysiological, hemodynamic, and cerebrospinal fluid oscillations in human sleep. *Science*. 1 Nov 2019;**366**(6465):628-631
- [21] Jaekyung K et al. Competing roles of slow oscillations and delta waves in memory consolidation versus forgetting. *Cell*. 3 Oct 2019;**179**(2):283-578
- [22] Carey B. Sleep therapy seem as an aid for depression. 2013. Available from: <https://www.nytimes.com/2013/11/19/health/treating-insomnia-to-heal-depression.html>. [Accessed: 2023-01-20]
- [23] Khullar A. The role of melatonin in the circadian rhythm sleep-wake cycle. *Psychiatric Times*. 2012;**29**(7):2012
- [24] Green A et al. Evening light exposure to computer screens disrupts human sleep, biological rhythms, and attention abilities. *Chronobiology International*. 2017;**34**(7):855-865
- [25] Filcek M. Discovery of the Mechanism of COVID19, SIRS and SEPSIS, Defense and Treatment. Mast cells and Histamine Storm an Overlooked Aspects in COVID19 and in Ventilated Patients Potential Role of Antihistamine. *MAR Pulmon*.3.5
- [26] Haas H et al. The role of histamine and the tuberomamillary nucleus in the nervous system. *Nature Reviews. Neuroscience*. 2003;**4**(2):121-130
- [27] Butt AM et al. Effect of histamine and antagonists on electrical resistance across the blood-brain barrier in rat brain-surface microvessels. *Brain Research*. 8 Jan 1992;**569**(1)
- [28] Fernandez-Novoa L et al. Histamine function in brain disorders. *Behavioural Brain Research*. 15 Oct 2001;**124**(2):213-233
- [29] Nuutinen S et al. Histamine in Neurotransmission and Brain Diseases. In: *Histamine in Inflammation*. Springer. 2010
- [30] Karpati A. et al. Histamine elicits glutamate release from cultured astrocytes. *Journal of Pharmacological Science*. Jun 2018;**137**(2):122-128
- [31] Ebrahim IO et al. Alcohol and sleep I: Effects on normal sleep. *Alcoholism: Clinical and Experimental Research*. Apr 2013;**37**(4):539-549
- [32] Garcia AN et al. Polysomnographic sleep disturbances in nicotine, caffeine, alcohol, cocaine, opioid, and cannabis use: A focused review. *The American Journal on Addictions*. Oct 2015;**24**(7):590-598
- [33] Okamoto-Mizuno K et al. Effects of thermal environment on sleep and circadian rhythm. *Journal of Physiological Anthropology*. 2012;**31**(1):14
- [34] Cherry K. Deep Sleep and the Impact of Delta Waves. 6 October 2021
- [35] Abbas AB et al. Innate immunity. In: *Basic Immunology. Functions and Disorders of the Immune System*. 3rd ed. Saunders (Elsevier); 2009
- [36] St-Onge M-P et al. Effects of diet on sleep quality. *Advances in Nutrition*. Sep 2016;**7**(5):938-949
- [37] Edlund MJ. Want to Treat Depression? Get People to Sleep. Fix

insomnia and better things happen. 21 November 2013. Available from: <https://www.psychologytoday.com/us/blog/the-power-rest/201311/want-treat-depression-get-people-sleep> [Accessed: 2023-01-20]

[38] Soojung-Kim PA. Rest—Why You Get More Done When You Work less. Penguin Books Ltd. 16 Jul 2018. ISBN: 9780241217290

[39] Filcek M. Innovative Vinci Power Nap® neurotechnology system—to reset and reconnect the senses, body and mind; reducing stress, improving performance, sleep, health and quality of life. In: Resilient and Responsible Smart Cities. Springer. 2022. pp. 249-264

[40] Filcek M. The neuroarchitecture technology of Vinci Power Nap: A revolution in fast stress reduction, newborns protection, well-being and sleep regeneration also for people with trauma, depression and PTSD in smart cities. *Journal of Psychiatry and Psychiatric Disorders*. 2022;**6**(2):61-104

[41] Sleep Education Archive. Sleep in the city: big-city living may cause insomnia, sleep loss. 2008. Retrieved November 12, 2020. Available from: <http://sleepeducation.org/news/2008/09/26/sleep-in-the-city-big-city-living-may-cause-insomnia-sleep-loss>

[42] Stevenson S. Sleep Smarter: 21 Essential Strategies to Sleep Your Way to a Better Body, Better Health, and Bigger Success. United Kingdom: HAY House; 2016

[43] Zhao D. et al. Melatonin Synthesis and Function: Evolutionary History in Animals and Plants. 2019

[44] The Pineal Gland and Melatonin. VIVO Pathophysiology, Pathophysiology of the Endocrine System, Fundamental

Concepts in Endocrinology; Nov 2018. Available from: <http://www.vivo.colostate.edu/hbooks/pathphys/endocrine/otherendo/pineal.html>

[45] Xie Z et al. A review of sleep disorders and melatonin. *Neurological Research*. Jun 2017;**39**(6):559-565

[46] Mottolese R et al. Switching Brain Serotonin with Oxytocin. In: Leslie GU, editor. Proceedings of the National Academy of Sciences of the United States of America. Biological Science. Bethesda, MD: National Institute of Mental Health; 29 Apr 2014

[47] Suofu V et al. Dual role of mitochondria in producing melatonin and driving GPCR signaling to block cytochrome c release. *Proceedings of the National Academy of Sciences of the United States of America*. 19 Sep 2017;**114**(38):E7997-E8006

[48] Ketchum A. The More you Hug your Kids, the More their Brains Develop. 2019 Baby Chick. Parenting; Jul 21 2023. Available from: <https://www.baby-chick.com/themore-you-hug-your-kids-the-moretheir-brains-develop/>

[49] Sohal VS. Serotonin gives oxytocin a helping hand. *Science Translational Medicine*. 16 Oct 2013;**5**(207):207ec172

[50] Tsai LL et al. Repeated light-dark shifts speed up body weight gain in male f344 rats. *American Journal of Physiology. Endocrinology and Metabolism*. Aug 2005;**289**(2):E212-E217

[51] Gardner MJ et al. How plants tell the time. *The Biochemical Journal*. 1 Jul 2006;**397**(Pt 1):15-24

[52] Tan DX et al. Melatonin: A hormone, a tissue factor, an autocoid, a paracoid, and an antioxidant vitamin. *Journal of Pineal Research*. Jan 2003;**34**(1):75-78

- [53] Yoo SH. et al. Period2::Luciferase real-time reporting of circadian dynamics reveals persistent circadian oscillations in mouse peripheral tissues. *PNAS. Biological Sciences*. 12 Feb 2004;**101**(15):5339-5346
- [54] Yamazaki S et al. Resetting central and peripheral circadian oscillators in transgenic rats. *Science*. 28 Apr 2000;**288**(5466):682-685
- [55] Gamble KL et al. Circadian clock control of endocrine factors. *Nature Reviews. Endocrinology*. Aug 2014;**10**(8):466-475
- [56] Cambras T et al. Circadian desynchronization of core body temperature and sleep stages in the rat. *Proceedings of the National Academy of Sciences of the United States of America*. 1 May 2007;**104**(18):7634-7639
- [57] Filcek M. Frequency of harmony and the unified theory of everything. Across the Universe towards Human Body and Mind with Discovery of Neuroarchitecture Vinci Power Nap® Pendulum as the Biotechnology of the Future. *Journal of Biotechnology and Biomedicine*. 2022
- [58] Fiedorowicz A. et al. Drzemka za biurkiem? Pracodawca powinien je zalecać. 2018. Available from: <https://www.focus.pl/artykul/drzemka-za-biurkiem>. [Accessed: 2023-01-20]
- [59] Howell E. Weightlessness and its effect on astronauts. 2017. Available from: <https://www.space.com/23017-weightlessness.html> [Accessed: 2023-01-20]
- [60] Littlehales N. *Sleep: Redefine Your Rest, for Success in Work, Sport and Life*. Penguin Life; 2016. ISBN 10: 0241975972
- [61] Powell A. Sleeping your Way to Heart Health. A Nap a Day May Keep the Cardiologist Away, Study Finds. *The Harvard Gazette*; 15 February 2007. Available from: <https://news.harvard.edu/gazette/story/2007/02/sleeping-your-way-to-heart-health/>
- [62] Liao S et al. Lymphatic function and immune regulation in health and disease. *Lymphatic Research and Biology*. Sep 2013;**11**(3):136-143
- [63] Gardner EP. Touch. New York University School of Medicine. 2010. Available from: <https://www.cns.nyu.edu/~david/courses/sm12/Readings/Gardner-ELS2010.pdf>
- [64] Viens A. Global Health. Are you Sleeping Enough? This Infographic Shows How you Compare to the Rest of the World. 16 Aug 2019. Available from: <https://www.weforum.org/agenda/2019/08/we-need-more-sleep>
- [65] Hongzhong L et al. The allergy mediator histamine confers resistance to immunotherapy in cancer patients via activation of the macrophage histamine receptor H1. *Cancer Cell*. 2022;**40**(1):36-52. E9
- [66] Porges S. The polyvagal theory: New insights into adaptive reactions of the autonomic nervous system. *Cleveland Clinic Journal of Medicine*. Apr 2009;**76**(Suppl. 2):S86-S90
- [67] 9 Fascinating facts about the Vagus nerve. 12 April 2021. Available from: <https://www.mentalfloss.com/article/65710/9-nervy-facts-about-vagus-nerve?fbclid=IwAR0QJ6wkYo3HKMDnMpPnlrD0QVpwuacFKVwliG1S1O5uaCEQC2P6DHbNqrE>
- [68] Filcek M. Cutting edge solution for effective and safe missions - neuroarchitecture system of Vinci

power nap® - revolution in fast stress reduction, regeneration, regenerating body and mind, which can help you, pilots, astronauts: Before, during and after space travels. In: 71st International Astronautical Congress 2020. 2020. Available from: <https://dl.iafastro.directory/event/IAC-2020/paper/56737/>

[69] Martín-Alguacil N et al. Somatosensation: End organs for tactile sensation. In: Pfaff DW, editor. *Neuroscience in the 21st Century*. New York, NY: Springer; 2013

[70] Deli MA. Histamine and the blood-brain barrier. In: *Histamine: Biology and Medical Aspects*. Karger; 2004

[71] The lymphatic system how to improve it natural recommendations. *Natural Ways of Lymphangitis*. 1932

[72] Re:Re. The Glymphatic System - CSF와 림프액의 순환. 20 June 2020. Available from: <https://m.cafe.daum.net/panicbird/OU8N/164>. [Accessed: 2023-01-20]

[73] Alstadhaug KB. Histamine in migraine and brain. *Headache. The Journal of Head and Face Pain*. 16 Jan 2014;**54**(2):246-259

[74] Tripathi AK et al. Acceleration of enzymatic catalysis by active hydrodynamic fluctuations. *Communications on Physics*. 2022;**5**:10

[75] Richard HW et al. *Effects of Electromagnetic Fields on Cells: Physiological and Therapeutical Approaches and Molecular Mechanisms of Interaction a Review*. Dep. of Anatomy, University of Technology, Dresden, Germany *Cells Tissues Organs*; 2006

[76] Rand DA et al. *Uncovering the design principles of circadian clocks:*

Mathematical analysis of flexibility and evolutionary goals. *Journal of Theoretical Biology*. 7 Feb 2006;**238**(3):616-635

[77] Dodd AN et al. Plant circadian clocks increase photosynthesis, growth, survival, and competitive advantage. *Science*. 2005;**309**:630-633

[78] Eastman CI et al. How to Travel the World without Jet Lag. *Sleep Medicine Clinics*. 1 Jun 2009;**4**(2):241-255

[79] Bin YS et al. What works for jetlag? A systematic review of non-pharmacological interventions. *Sleep Medicine Reviews*. Feb 2019;**43**:47-59

[80] Cingi C et al. Jetlag Related Sleep Problems and their Management. *Travel Medicine and Infectious Disease*. Jul-Aug 2018;**24**:59-64

[81] Sack RL. The pathophysiology of jet lag. *Travel Medicine and Infectious Disease*. Mar 2009;**7**(2):102-110

[82] American Academy of Sleep Medicine. AASM sets standards and promotes excellence in sleep medicine health care, education, and research. Available from: <https://aasm.org/>

[83] Golombek DA et al. Minutes, days and years: Molecular interactions among different scales of biological timing. *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences*. 5 Mar 2014;**369**(1637):20120465

[84] Bragazzi NL et al. Planetary sleep medicine: Studying sleep at the individual, population, and planetary level. *Frontiers in Public Health*. 2022;**10**:1005100

[85] El-Esawi MA. *Circadian Rhythms and their Molecular Mechanisms*. London, UK: IntechOpen; 2018

- [86] Collins B et al. Keeping time without a clock. 4 May 2006;**50**(3):348-350
- [87] Michinaga S et al. Selective histamine H₂ receptor agonists alleviate blood-brain barrier disruption by promoting the expression of vascular protective factors following traumatic brain injury in mice. *Journal of Pharmacological Sciences*. 3 Nov 2022;**150**(3)
- [88] Vosko AM et al. Jet lag syndrome: Circadian organization, pathophysiology, and management strategies. *Nature and Science of Sleep*. 19 Aug 2010;**2**:187-198
- [89] Dijk DJ et al. Sleep, circadian rhythms, and performance during space shuttle missions. *The Neurolab Spacelab Mission: Neuroscience Research in Space: Results from the STS-90 Neurolab Spacelab Mission*. NASA- SP 2003-353. 2013
- [90] Buxton OM et al. Sleep disruption due to hospital noises. 7 August 2012
- [91] Boyle R et al. Challenges to the central nervous system during human spaceflight missions to Mars. *Advances in Vestibular Research: A Tribute to Bernard Cohen*. *Journal of Neurophysiology*. May 2020;**123**(5):2037-2063
- [92] Chu J. MIT Engineers Fly First-Ever Plane with no Moving Parts. The Silent, Lightweight Aircraft doesn't Depend on Fossil Fuels. *MIT NEWS*; 21 Nov 2018. Available from: <https://news.mit.edu/2018/first-ionic-wind-plane-no-moving-parts-1121>
- [93] DeBaun DT. Ways to reduce EMF exposure while flying in an airplane. *EMF Protection & Safety, Travel*. 2019 updated 13 May 2022 by Daniel T. DeBaun: Engineer, Author & Telecommunications Executive 7 Aug 2019. Available from: <https://defendershield.com/doesflying-airplane-increase-emfradiation-exposure>
- [94] #PowiedzSprawdzam: Raki w samolocie. Available from: <https://www.gov.pl/web/5g/powiedzsprawdzam-raki-w-samolocie>. [Accessed: 2023-01-20]
- [95] Stratton D et al. Extremely low-frequency magnetic fields significantly enhance the cytotoxicity of methotrexate and can reduce migration of cancer cell lines via transiently induced plasma membrane damage. *Biochemical and Biophysical Research Communications*. 2022;**626**:192-199
- [96] Indii. Szkodliwe skutki promieniowania elektromagnetycznego i pól elektromagnetycznych. 11 Octob 2016. Available from: <https://sklep.qtherm.pl/pl/n/34>
- [97] Zablotskii et al. How a high-gradient magnetic field could affect cell life. *Scientific Reports*. 2016;**6**:37407
- [98] Goldstein DS. Stress-induced activation of the sympathetic nervous system. *Bailliere's Clinical Endocrinology and Metabolism*. 1987;**1**(2):253-278
- [99] NASA Human Research Program. Risk of performance decrements and adverse health outcomes resulting from sleep loss. Circadian Desynchronization, and Work Overload. Human Research Program Behavioral Health and Performance Element Approved for Public Release: National Aeronautics and Space Administration Lyndon B. Johnson Space Center Houston, Texas. Apr 11 2016. Available from: <https://humanresearchroadmap.nasa.gov/evidence/reports/sleep.pdf>
- [100] van Dongen HPA, et al. The cumulative cost of additional wakefulness: Dose-response effects on

neurobehavioral functions and sleep physiology from chronic sleep restriction and total sleep deprivation. *Sleep. Journal of Sleep and Sleep Disorders Research*. 2003;26(2):117-126

[101] Sleep Oscillations in Space. 29 Aug 2019. Available from: https://www.esa.int/gsp/ACT/projects/sleep_oscillations_in_space/. [Accessed: 2023-01-20]

[102] Fatigue Management Guide for Airplane Operators. II ed. Airlines magazine. The International Air Transport Association (IATA). 2015. Available from: https://www.iata.org/contentassets/39bb2b7d6d5b40c6abf88c11111fcd12/fatigue-managementguide_airline20operators.pdf [Accessed: January 20, 2023]

[103] Flight crew Fatigue Recommendations for airlines on reducing and preventing crew fatigue. Delft University of Technology Faculty of Technology, Policy and Management Safety Science Group Raymond Dijkshoorn Student number: 9211477. 2008

[104] Dacey J. Yawning drivers urged to power nap. 11 March 2011. Available from: <https://www.swissinfo.ch/eng/yawning-drivers-urged-to-power-nap/29695114>

[105] Huffington A. Take the Pledge to Not Drive Drowsy. #TakeABreakToStayAwake change.org. Available from: <https://www.change.org/p/take-the-pledge-to-not-drive-drowsy-takeabreaktostayawake>

[106] Kauffman L. On the road to fewer fatigue crashes. *Commercial Transportation. Sleep Review*. 2015. Available from: <https://sleepreviewmag.com/practice-management/lawsregulations/commercialtransportation/>

road-fewer-fatiguecrashes-mark-r-rosekind-phd-nhtsa/

[107] Young JA. The Effects of Life-Stress on Pilot Performance. NASA/TM-2008-215375. National Aeronautics and Space Administration. Moffett Field, California: Ames Research Center. 2008

[108] Rosekind MR et al. Factors in Flight Operations IX: Effects of Planned Cockpit Rest on Crew Performance and Alertness in Long-Haul Operations (NASA Technical Memorandum 108839). California: NASA Ames Research Center; 1994

[109] Rosekind MR et al. Alertness management: Strategic naps in operational settings. *Journal of Sleep Research*. Dec 1995;4(S2):62-66

[110] Rosekind MR et al. Alertness management in aviation operations: Enhancing performance and sleep. *Aviation, Space, and Environmental Medicine*. Dec 2006;77(12):1256-1265(10)

[111] Selby B, et al. NASA helps pilots combat fatigue during long flights. 2014. Available from: <https://www.nasa.gov/home/hqnews/1994/94-177.txt>. [Accessed: 2023-01-20]

[112] Stanford University. The Facts of Napping. *Stanfordsdprod*. 2013. Available from: <https://youtu.be/vAETBvj14gQ>

[113] Stein L. Napping may be good for your heart. *Scientific American*. 12 Feb 2017. Available from: <https://www.scientificamerican.com/article/napping-good-for-heart/>

[114] Clément G. *Fundamentals of Space Medicine*. Springer; 2011

- [115] Kanas N et al. *Space Psychology and Psychiatry*. The book Springer. 2008
- [116] Tambala NJ. Fatigue on the flight deck. In: *Challenges & Mitigations Concerning Fatigue in the Norwegian Aviation Sector*. IE&TM; June 2017
- [117] Williams K. NASA Research Reveals Biological Clock Misalignment Effects on Sleep for Astronauts. Ames Research Center; 7 Jan 2016
- [118] NASA JPL Recommendations for Vinci Power Nap® from Artur Chmielewski, Menager NASA JPL. Available from: <https://vincipowernap.asysto.pl/strona/8791-nasa-jpl-recommendation>
- [119] Szymański L. Wpływ fal elektromagnetycznych na organizmy. 5G Centrum Kompetencji Polytechnic Lodz. Available from: <https://centrumkompetencji5g.pl/index.php/home/11-sample-articles/39-demo-article-2>
- [120] Beh SF et al. Air travelers' experiences and understanding of jetlag and perceptions of management strategies: A qualitative study. *Ergonomics*. Apr 2022;**65**(4):642-658
- [121] Tan Z et al. Advances in the clinical application of histamine and diamine oxidase (DAO). *Activity: A Review*. *Catalysts*. 2023;**13**(1):48
- [122] Perski A. *The Book: Stress*. Kielce: Poradnik na trudne czasy; 2022
- [123] Shah P et al. Travel and sleep. *American Thoracic Society*. *American Journal of Respiratory and Critical Care Medicine*. American Journal of Respiratory and Critical Care Medicine ATSS Patient Education Series © 2021 American Thoracic Society. 2021;**203**:P1-P2. Available from: <https://www.thoracic.org/patients/patient-resources/resources/travel-and-sleep.pdf>
- [124] Recommendations for Vinci Power Nap® from UN, UNICEF, NASA, Polish and US ARMY, Professors, Doctors, etc. Available from: <https://vincipowernap.asysto.pl/strona/8346-recommendation>. [Accessed: January 20, 2023]
- [125] Filcek M. Vinci Power Nap® synchronization technology - Neuroarchitecture for better sleep, adding energy for life, reducing stress and jet lag, improving wellbeing and body-mind regeneration. Helpful for leaders, doctors, soldiers, children, drivers, pilots, astronauts, people traveling on earth and beyond. *Journal of Biotechnology and Biomedicine*. 2023;**6**:105-128