PSiO®

free your mind !

Sciences
&
PSiO Technologies

Preface

Welcome to the world of therapies with PSiO®technologies!

Over the past 30 years, I have developed a tool that is easy for patients to use and covers a wide range of topics.

It contains hours of programs of all kinds for the benefit of your patients: guided meditations, turbo naps with colorful music, and voice-guided relaxation, the famous "Audio-Medicine®" approved by the Belgian Ministry of Health. A world first!

Our company's vision is to make PSiO® glasses not only a common relaxation tool, but also a true companion for the mind (PSI = mind in Greek) and a reinforcement tool for therapists.

In our opinion, the working philosophy for a therapist is to introduce PSiO technology to their patients and then rent or sell the PSiO device for regular use at home.

The PSiO glasses thus become a true extension at home of the emotional care initiated in the consultation room. In this way, while waiting for their next appointment, patients can be cared for with standardized sessions whenever the need arises. The therapist will be able to personalize their treatments at their leisure during consultation appointments and apply their healing skills throughout the course of the sessions. This is something that PSiO technology cannot replace.

Once you have passed the PSiO certification(s), you will be able to use PSiO to its full potential and, above all, explain the technology used. By informing your patients as fully as possible, the effect will be faster and more profound.

Another important tip before offering PSiO glasses to your patients: practice several times yourself, at least each category of recording, so that you can experience these different experiences and be able to discuss the subject.

It is also advisable to place PSiO Magazine in the waiting room. This is a clever way to inform patients about the seriousness of PSiO technology. The magazine presents the pioneers, the original actions of ambassadors, studies that explain the effects of certain applications, and the philosophy of the PSiO® network.

To complement the action of PSiO® glasses, you will also find here a description of the main accessories, the PSiO® noise-reducing headphones, and the musical & olfactory pillow. The PSiO® range has been developed to OPTIMIZE the mind. Recently, a new technology has been added for physical relaxation: the "vibroacoustic" chair, a distillation of vibroacoustic science, offering natural relaxation through sound. This is the "body-mind" concept, harmoniously synchronized with PSiO® glasses. If you have not yet had the time or opportunity to try out this complementary technology, please contact the company. The results are amazing!

Finally, our "CAP ZEN" smartphone APP allows you to access the entire range via audio streaming only, at a very affordable price. This is of interest to companies and clinics that want to offer an audio relaxation tool to their employees who already have access to a relaxation room equipped with the chair and glasses. The same goes for hospitals, where a PSiO poster at reception can direct patients to the smartphone APP so they can use it during their stay. The APP offers 10 days of free access.

I wish you all the best with your PSiO certification!

Stéphane Dumonceau
PSiO Technologies Designer


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SUMMARY


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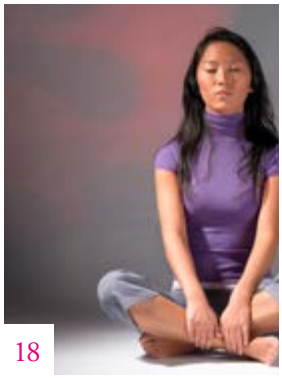
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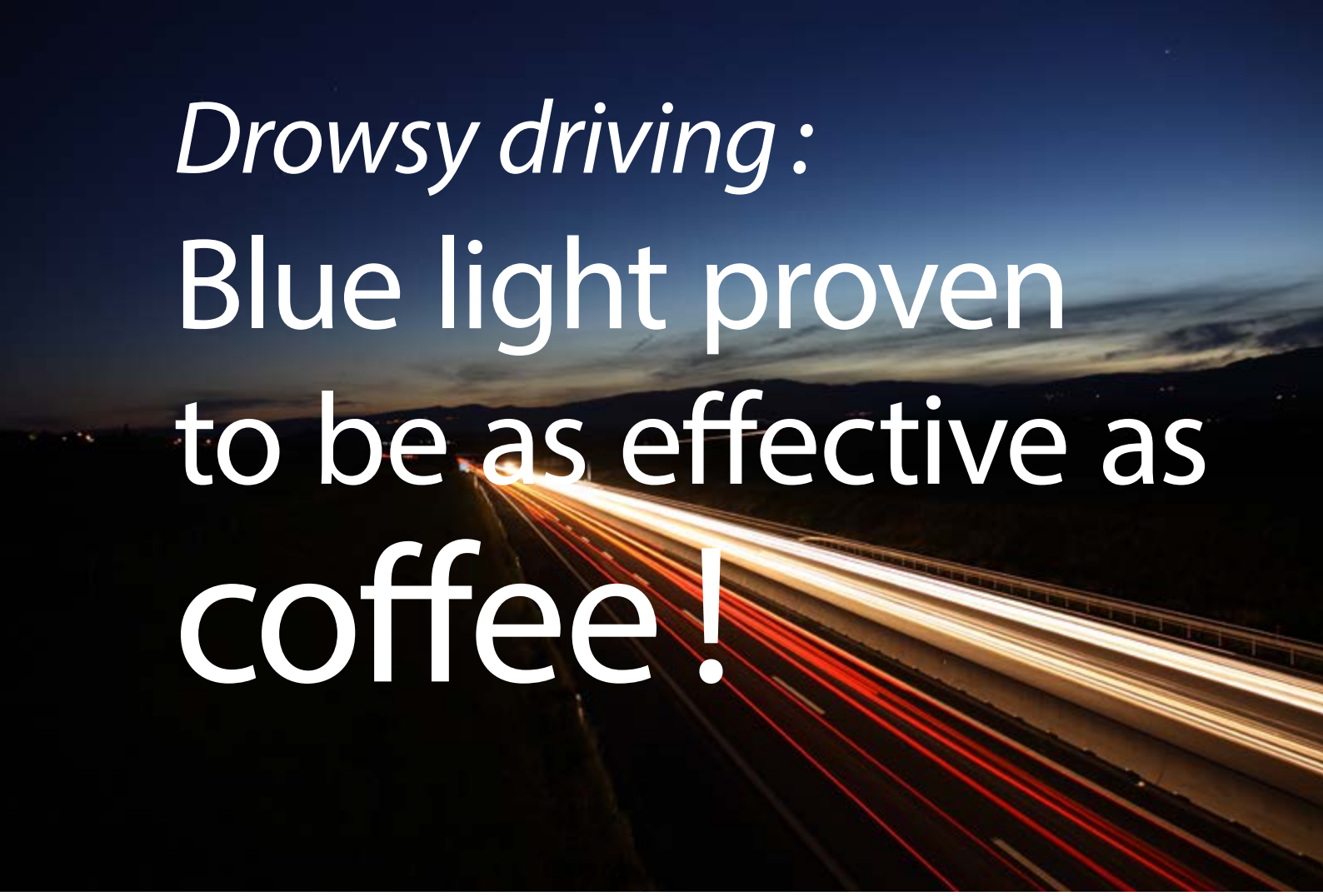


Drowsy driving : Blue light proven to be as effective as coffee !

Researchers from the "sleep, attention and neuropsychiatry" Laboratory (CNRS / University Bordeaux Segalen), in collaboration with Swedish scientists, recently demonstrated that a continuous emission of blue light is as effective as coffee to improve alertness and thus safe driving at night, for the first time in driving tests.
Published in the journal PLoS One, these findings could lead to the development of an anti-drowsiness electronic system integrated into vehicles. More scientific examination is necessary to test this and other benefits of the device.
Induced by sleep deprivation, drowsy driving at night reduces alertness, reflexes and visual perception of the driver. It is the cause of one third of fatal accidents on motorways.

Besides the opportunity to take a nice "power nap" with the light emitted by the PSiO® and avoid an accident on the highway, the PSiO® acts as an alternative to coffee or other biochemical stimulants that have harmful side effects. It is known that blue light increases alertness by stimulating special nerve cells in the retina, the membrane localized at the back of the eyes: the ganglion cells of the retina (IRGC). These cells are connected with the areas of the brain that control our ability to stay awake. Their stimulation by an exposure to blue light halts the secretion of melatonin, the hormone responsible for decreased alertness at night.
The positive effect of blue light on the nocturnal vigilance has been known since 2005, thanks to American studies. But these studies were conducted only during simple cognitive tasks, like pressing a button if one perceives a light stimulus. Driving is a much more complex task.

To study the effectiveness of blue light during night driving, researchers have thought to test it in the cockpit of an experimental vehicle, where a special LED lamp was mounted on the central dashboard, emitting continuous blue light. Then they asked 48 healthy male volunteers of an average age of 33.2 years to drive for 3 nights with a break of at least a week between trials, for 400 miles on the highway.
The driving period was always between 1 am and 5 :15 am, with a 15 minute break halfway through. During each of the 3 nights, each volunteer received either continuous exposure to blue light, or two cups containing 200 mg of caffeine, before departure and during the break. They were also tested for placebo effects on the third night with two cups of decaffeinated coffee.

It is important to note that their sleep was not affected after driving under continuous emission of blue light. The researchers then analyzed a criterion that reflected a decrease in vigilance : the number of inappropriate line crossings side (emergency lane and overtaking line).

Results

It appeared that the average number of inappropriate crossing was 15 with blue light, against 13 for coffee and 26 with placebo. Continuous exposure to blue light while driving is, therefore, as effective as coffee to fight against drowsy driving as long as the driver is not bothered by this light. Indeed 8 of 48 volunteers (17%) were dazzled by blue light and could not perform the test.
Scientists are now stepping up to verify that these initial results can be reproduced on a larger number of men, but also women and elderly people. One application could be the design of an anti-drowsiness embedded system in the vehicle. One imagines that the implementation of a vigilance maintenance system will take time for manufacturers of trucks and cars. Moreover, the effect of the " PSiO® POWER NAP " is not only defined by the projection of blue light (with the right wavelength of 470 nm) but also the immediate peace of mind. A complete shutdown of neurons is welcomed to allow the brain areas assigned to monitoring the road to be able to rest especially after driving for over 5 hours ! So our advice is : use the PSiO® when traveling by car, particularly on long journeys that take you on vacation !

Reference

Nocturnal In-Car Blue Light Exposure Improves Driving Motorway : A Randomized Controlled Trial. Jacques Taillard, Aurore Capelli, Patricia Sagaspe, Anna Anund, Torbjorn Åkerstedt Peter Philip. PLoS One, October 19, 2012.

It is known that blue light increases alertness by stimulating special nerve cells in the retina. After experimentation, continuous exposure to blue light while driving is as effective as coffee to fight against drowsy driving.

Stimulation by light can relieve from depression

Is coming out of depression arriving in utopia?

Current neuroscience research have revealed that depression metabolism is specifically addictive. This characteristic makes addressing depression a difficult challenge.
Positive thinking and the regular use of PSiO® applications practically induce a state of mind with soothing emotions. The use of the PSiO® is pleasant and environmentally friendly. Finally, apart from the decision to use the PSiO® and take time for yourself, the mind is thrown into an automatically redeeming universe, thanks to images, generated emotions, and soothing breath. The mind naturally begins to think positively using this simple method. This is where the imaging power of imagery come into play! The gymnastics of the neurons lead step by step to positive thinking. Gradually, the metabolism changes, and modifies the quality of neurotransmission.
In addition to suggestions and soothing images that are tirelessly distributed by this small companion for the mind that is the PSiO®, light is projected to the bottom of your retina, when you want and where you want. If this light is such a powerful vitamin that it modifies the secretion of neurotransmitters metabolism of joy and good humor, then it becomes easy to understand why it can be affective, not only on winter depression but also on all types of depression.
The results of a recent Canadian study lead in this direction. Stimulation by light can address depression and not just the winter blues. A Canadian study suggests that light therapy, long used to help improve people's winter blues when the days get darker and shorter, can also treat non-seasonal depression. " This study is the first to show that light therapy alone is effective compared to placebo, and the first to compare a combination of light and pharmaceuticals to

Positive thinking combined with light! This is THE treatment of choice if you want out of a depression state without having to ingest destructive chemicals. A Canadian study shows the effectiveness of light therapy against placebo in depression. A real bargain for those looking for an elegant and natural way to place their mind in good hands!

light alone," said lead study author, Dr. Raymond Lam of the University of British Columbia.

122 depressed individuals (non-seasonal) were randomly divided into four groups:

1. Medication alone group (+ placebo)
2. Single therapy group (+ placebo)
3. Mix Group: medication + Light therapy
4. Control Group/placebo (both types of treatments are inactivated)

Whichever the group, participants received medication to take and a box that emits light. According to the group, some had received either active drug or placebo and either an active or a modified light box with an inactive radiation in terms of melanopsin receptors. The control group received both placebo pill and the inactive device. I would, therefore, say that this is a great placebo group, controlling for both medication and light therapy.

"It is the combination of light therapy and antidepressants, which was the most effective" confirmed Dr. Lam.

"However, some people may prefer to try a non-drug treatment first, and may choose to start with light therapy."

Active treatments of the study included a daily dose of 20 milligrams of fluoxetine (Prozac) and daily exposure to fluorescent light for 30 minutes after waking each morning. At the beginning of the study, the researchers used a standard questionnaire to assess the severity of depression by questioning participants about their sadness, inner tension, reduced sleep, decreased appetite, concentration difficulties, lack of energy, inability of feeling and of pessimistic or suicidal thoughts. On average, participants had scores on the Scale of Assessment of Depression Montgomery-Asberg (MADRS) of about 26-27 at the start of the study, signs of moderate depression.

After eight weeks, the group receiving both medication and light therapy had the largest drop in depression scores, with 16.9 points decline, the researchers reported in JAMA Psychiatry, published online November 18. People who received

light therapy only had a decrease of 13.4 points in depression scores, while those under medication only had a decrease of 8.8 points, and the control group who only had access to inactive treatments were down 6.5 points. The exact reason why light therapy can alleviate depression is unknown; it may have contributed to a time reset of the biological clock in the brain or circadian rhythms, according to researchers' hypothesis. Or, consider that light can play a role of activator of certain hormones related to endogenous depression. In all cases, this finding is a breakthrough for the treatment of depression. A limitation to the study is that the researchers lacked data about the level of human exposure to natural light during the study, which the authors acknowledge.

Nevertheless these results are encouraging, and the PSiO® application can resolutely be added to the solving of DEPRESSION including one that is not winter related. Furthermore, the PSiO® light therapy is complemented by voice recordings to guide you to attain a calm mind. Both continuous mode and pulsed mode proposed by the PSiO® can no doubt be a significant aid in the treatment of depression in addition to medication. Unlike other therapies, there are no contraindications for our methods. Similarly, there is no need for a prescription to acquire PSiO® for private use!

After eight weeks, the group receiving both medication and light therapy had the largest drop in depression scores, with a decrease of 16.9 points. However those receiving only light therapy also had a significant reduction: 13.4 points in depression scores, which ultimately was a small difference with the group that took more antidepressants.

The protocol of PSiO® applications

How to use the PSiO® to catalyse a change in behaviour?

A researcher who wore glasses that inverted his environment often ran into furniture at first, but he was soon able to ride a bicycle. Let's take a look at how the brain adapts to new information and incorporates new behaviour.

Theodor Erismann's experiment in 1962

The experiment was carried out in the middle of the 20th century by Theodor Erismann, a professor at the University of Innsbruck (Austria), who modified the field of vision of his assistant and student Ivo Kohler, so that he would see everything upside down. Both men wrote about the topic and even made a short documentary film (https://youtu.be/jKUVpBJalNQ).

Professor Kohler wore a pair of handmade glasses. They had mirrors inside which reversed the light that reached his eyes. Top became bottom and inversely. At first, Kohler acted quite erratically and feverishly when he tried to take an object presented to him, to move around a chair or to go down stairs. In a fight with wooden swords, Kohler would lift his stick when attacked low and lower it when the attack was high. When holding a teacup to be filled, he would turn it upside down when he saw the water coming (upwards, apparently). The sight of smoke rising from a match or of a helium balloon at the end of a string could trigger an instant change in his sense of direction, telling him what was up and where down really was.

However, by the next week, Kohler was adapting by fits and starts, then more smoothly to what he was seeing. After ten days, he was so used to always seeing the world around him upside down that, paradoxically and, fortunately, everything

became nearly normal to him. After three weeks, Kohler could carry out his daily activities in public without a problem : walk along a packed side walk and even ride a bicycle.

Experiment on neural adaptation to inverted vision

Erismann and Kohler carried out other experiments, which were also done by other scientists. They believed that most of us are able to make this kind of "adjustment". Images reach the eyes in a special way and if it is compatible, a person's visual system will eventually adjust to interpret them, perceive them and see them as if they were completely normal.

Kohler wrote : "After several weeks of wearing glasses that inverted right and left, a person becomes so at ease in their inverted world, that they are able to right a motorcycle in Innsbruck while wearing the glasses !"

The study published in 1962 appeared later in peer-reviewed publications : "Experiments with goggles" and on the website of the German University of Würzburg : "The impressive abilities of our perceptions".

Evolution of the adaptation to disorientation in space (NASA)

A few years ago, NASA conducted a experiment with a group of astronauts to study the psychological and physiological effects of disorientation in space. The astronauts were each given a pair of glasses which inverted their vision and which they had to wear day and night. Everything was upside down ! In the beginning the experiment caused extreme stress and anxiety, as expected.

However, after 21 days, one of the astronauts began to feel his vision moving upwards to the right, as if it had rotated 180 degrees.
After that, he was able to see everything normally again, as if everything was right side up. By the 30th day, all of the astronauts experienced the same phenomenon.

The experiment clearly showed that after 21 to 30 days of consistently receiving a new flow of information, the astronaut's brains created enough new neuron connections to completely rewire their brains. As a result, their visual and spatial perception was working 180 degrees opposite of the way their brains originally saw things.

To validate the experiment, NASA did it again with another group of astronauts. However, this time, after 15 days, they asked some of the astronauts to remove the inverted glasses for a day. As a result, it took another 30-day cycle to change their vision again. The second experience demonstrated that just one day without the inverted glasses reinitialised the adaptation process. It had to be started all over again !

The experiment confirmed that, ideally, it takes 21 days to a month to integrate new spatial and visual behaviour and that repeatedly listening to messages with imagery targeting the conscious and subconscious minds could be inspired by these experiments. The repeated listening to messages in the Audioceuticals, and the dosage of Audioceuticals, takes this theoretical time-frame into account.

Audioceuticals dosage

Programme n°1 : "Letting go"

- *Before going to sleep*
- *Everyday for a week.*

Programme n°2 : your choice depending on the theme

- *Before going to sleep*
- *Every day for three weeks, then*
- *three times a week for two months, then*
- *Once a week for a month.*

Tips for use

- *With a stereo player (headset or ear buds) on PSiO®, Smartphone, MP3 reader or CD player.*
- *Listen in a quiet place.*
- *Take a half hour for yourself.*
- *Let yourself go, don't focus on the stories.*
- *Two parts : 10 min relaxation ; 20 min suggestion.*

Relaxation & digestion

or why relaxing can help with weight management

There are two nervous systems that regulate the body's automatic activities.

One of the two systems mobilizes all resources to provide maximum effort and triggers the hormones and neurotransmitters responsible for our ability to fight or flee in the event of danger.

This is the principle of survival of the species. Thanks to this ingenious nervous system, the human species is still alive today. In this strategy developed by evolution, digestion, which is untimely and energy-intensive, is stopped.

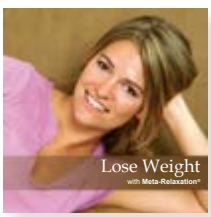
The other nervous system, on the other hand, triggers a return to calm and... digestion.
Relaxation and digestion are therefore constantly activated together. This creates confusion at the unconscious level: digestion = relaxation.

Thus, without always realizing it, the frequency with which we open the refrigerator door is generally closely correlated with the need for relaxation. Many people unconsciously turn to food (and digestion) because they are familiar with the feeling of RELAXATION that comes with it.

Learning to relax regularly and enjoyably with a tool such as PSiO® makes it easy to achieve a state of relaxation. From then on, it is no longer necessary to systematically turn to food to experience this state of relaxation.

People who listen to "Audio-Medicine" and practice automatic relaxation with PSiO® say that they are better able to manage their bulimia and the amount of food they used to literally gorge themselves on.

This explains the five tracks for managing your weight more easily.



How the PSiO® applications can influence…

the genes

"The emotional environment can alter the expression of genes responsible for the behavioral and neuroendocrine reactions to stress and subtly rewrite the course of our life story as well as indirectly that of our health"

A very ambitious title

PSiO® applications can affect our emotional dimension and act on our health that is led by our genes. First, the PSiO® diffuses sessions by voice to start the day in a great spirit. These are the morning sessions, designed for exercises to sustain attention. The thematic visualizations help guide the thoughts in breathing and positive emotion.
The "power naps" designed for mid-day or afternoon are purely musical performances, mostly il-

luminated with the famous wavelength of 470 nm that promotes positive mood and removes melatonin, the hormone of winter depression.

Finally, the third category of sessions (sessions designed to be experienced before sleep) cause a rapid letting go and are composed of suggestions to appease the subconscious. The voices are sweet with whispering caring tone. While some resist to let go and find them ridiculous, others find them so delicate and so nice that they soon will find themselves back into the world of their childhood, a period filled with attention on them where their parents were whispering gentle rhyme or tender words into their ears, imbued with unconditional love.

Thanks to this technological wealth supplemented by various thematic applications, the PSiO® glasses are, humbly, a breakthrough in the daily emotional burden of urban living. It is easy to have a day turn into real emotional desert with no free time and filled with the obsessions of accumulation of money and material.
Let's see how regular sessions of this kind may well influence the expression of our genes, and therefore, not only our health but in addition that of our descendants.

From genetics to epigenetics

In humans, as in other organisms, the genes were scrutinized in laboratories worldwide. Recently we began to understand how DNA fragments modulate living organisms. And today, the forefront of DNA research is posing questions in another direction in epigenetics! Epigenetics explore complex mechanisms around how changes in organisms are caused by modification of gene expression rather than the change in the genetic code itself.

Canadian researchers Michael Meaney, PhD, and Gustavo Turecki, M.D., Ph.D., Douglas Institute, have thus proved in turn the influence of environment on mental and physical health. What they found is truly revolutionary: it was known that genes were controlled by a series of "switches" that are activated or not with the food we swallowed, the air we breathed but… what we did not know is that getting a hug could be a switch as well!

The study is extremely interesting. The baby rats lick their mom often (licking among rats has the same function as the caress in humans) are calmer than the neglected baby rats. By analyzing the brains of young rats, the researchers attempted to analyze the physiological imprint of mothering.
The results are revealing: licking influences the activity of a gene that protects rats against stress. This gene, NRC31, produces a protein that helps to reduce the concentration of stress hormones in the body. A specific portion of the gene still has to be activated, through an epigenetic switch. The analysis of the brains of rats that did not receive a sufficient ration of licking shows that the "switch" related to NRC31 gene was defective in the neurons in the hippocampus of rats. The result: even in the absence of disturbing elements, they live in a constant state of stress. One might well ask how the abuse or lack of emotional interactions would affect the brain of children. But can we extrapolate reliably from rats to humans?

From rats to humans, similar mechanisms

But studies show that these mechanisms are similar in rats as in humans. Michael Meaney and colleagues conducted an ambitious study: MAVAN project (Maternal Adversity Vulnerability and Neurodevelopment), which aims to assess the development of some children whom have a mother who suffers from serious depression over a period of six years. As depressed mothers often have trouble creating emotional bonds with their children, they are less likely to coax their babies than non-depressed mothers in the control group. They measured levels of stress hormones in children, and observed what was happening in their brains through brain imaging techniques. The levels of stress hormones were higher in those with a depressive mother.

In order to measure the epigenetic effect on the human brain more effectively, Douglas Institute researchers have completed another study, this time on the brains of dead people. They targeted the same gene in rats, to demonstrate that the quality of family interactions did indeed alter the brain activity. The study was conducted on 36 brains following 12 suicide victims who had suffered childhood abuse, 12 other suicide victims who had not suffered abuse from individuals and 12 control brains. The results were practically written in the brain: the abuse leads to epigenetic changes that, in turn, affect the operation of NR3C1 gene. As in rats, the glands that secrete human stress hormones are constantly alert. This makes abused individuals particularly susceptible to anxiety, depression and possibly suicide.

Preliminary conclusions

Unlike genetic mutations that are irreversible, epigenetic marking may be changed by the emotional environment. Some drugs would repair the "defective switches." But a simple change of emotional environment could yield interesting results if we believe the rat studies: the little rat that misses the affection from his mother, if entrusted to the care of a foster mother who licks often, can eventually develop normally. The fate of a baby rat or a baby human is never permanently sealed in its DNA.

Practicing applications such as those compiled in the PSiO® are, undoubtedly, a way of subtly rewrite the course of our life story and indirectly that of our health. Of course, the PSiO® applications are not a panacea. They are a complement to other activities such as massage, yoga, meditation, not always easy to implement activities in everyday life. But one thing at a time. These applications are certainly a way to open our minds to emotional dimension often lacking in this western society of poor living.

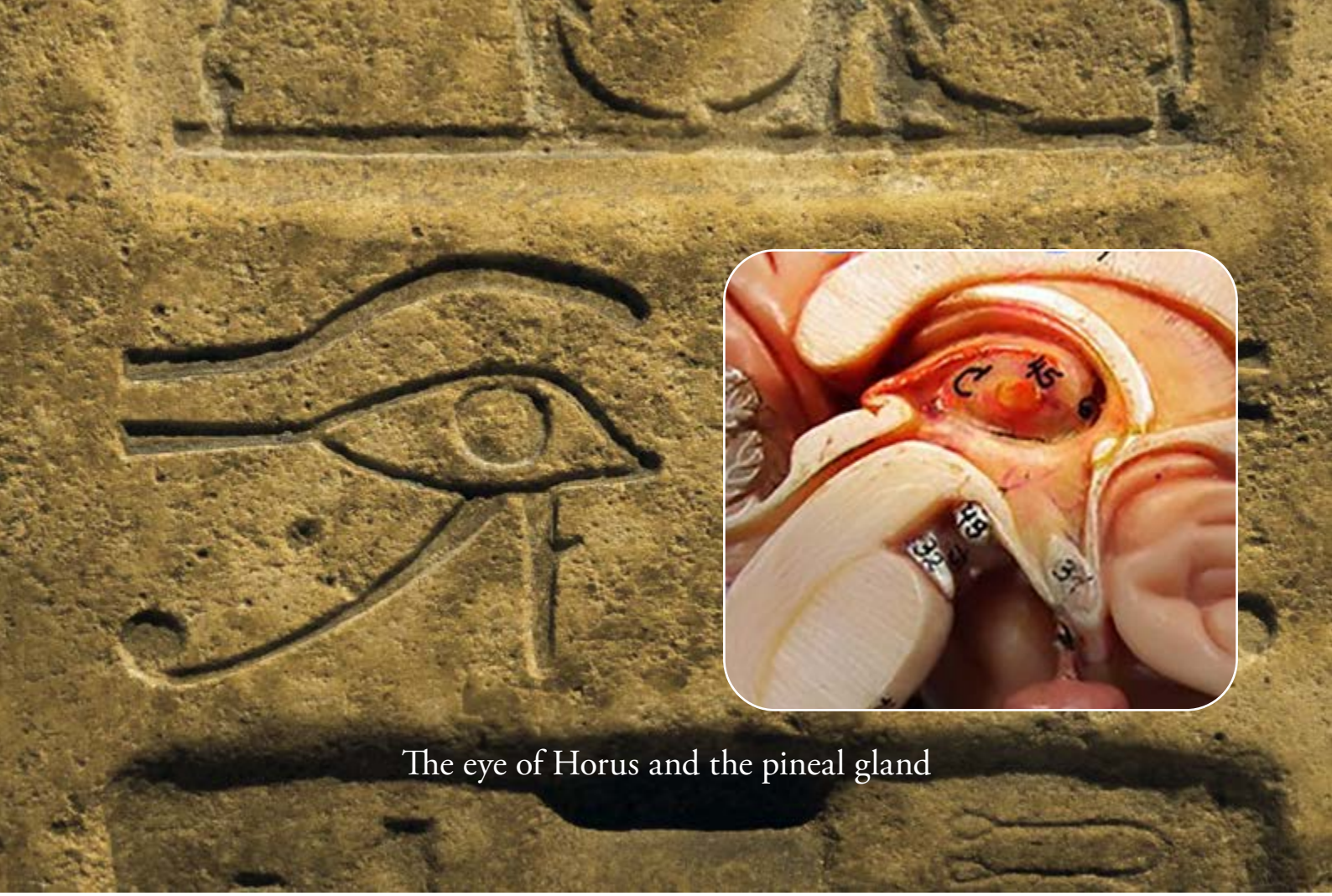
Summaries of the research comes from the bibliography of Michael Meaney, C.M., Ph.D., C.Q, Director of the Research Program on behavior, genes and environment at McGill University in Montreal.

Individual differences in maternal care can modify the cognitive development of a child, as well as its ability to cope with stress later in life. Michael Meaney, PhD, was one of the first researchers to highlight the importance of maternal care in the expression of genes responsible neuroendocrine and behavioral responses to stress and hippocampal synaptic development.

Currently, Michael Meaney and his team working in several research areas:

- Molecular mechanisms by which maternal care alters gene expression, particularly those that contribute to the regulation of endocrine responses to stress, such as the glucocorticoid receptor and decorticoliberin production systems paraventricular nucleus and amygdala, which are part of the hypothalamic-pituitary-adrenal
- Effects of environmental enrichment on the development of the hippocampus and prefrontal cortex (based research stimulated synaptogenesis NMDA)
- Epigenetic programming through maternal behavior
- Epigenetic regulation of glucocorticoid receptor in the human brain have suffered childhood trauma.

Michael Meaney has authored over 180 articles and has made presentations to representatives of research institutes and specialized government agencies in health, and at scientific conferences around the world.



The eye of Horus and the pineal gland

The third eye, the pineal gland

An amazing new discovery about the circadian system was made recently. It highlights two new hormones which orchestrate the entire circadian system.

Professor Fourtillan

The Frenchman, Professor Jean Bernard Fourtillan is behind this scientific breakthrough. He is an honorary Professor of therapeutic chemistry at the Poitiers Faculty of Medicine and Pharmacy. The study focused on the activity of the epiphysis cerebri, or pineal gland, which is also called the third eye. Although it doesn't provide sight (cones and rods in the retina) it is like a third, non-visual organ which regulates the "sleep-wake" cycle based on light and, in particular, as has already been known for about 15 years, on the 470 nm wavelength. The relationship between the pineal gland and the optical path also explains why it has been given the name third eye. However, this is also because its nerve cells are the same as the cells of the retina. The third eye has, therefore, been rediscovered by modern science. Despite the fact

that they can't see, the pineal gland regulates the sleep-wake cycle of the blind.

In the second century of our era, the great Galen (131-201), the successor to Hippocrates, called it κουκουνάρια in Greek or conarium or kornarion (which resembles a cone) which means pine cone. He dissected cadavers, in particular brains, and had noticed this tiny appendage, which resembled a pine cone. Although the pineal gland is located in the brain area, it is not actually a part of it. It is outside of the blood-brain barrier.

Descartes located the pineal gland at the intersection of the soul and the body. The soul influences the body and the body also influences the soul. Also interesting is the fact that the pineal gland may have other functions. For example, at the intersection between the world in 4D (3D and time) decoded by awareness and consciousness & the subconscious world connected to the living and to the multiverse. To be continued...

Anatomy of the third eye and its location

It is located at the base of the brain, below the cerebral hemispheres, above the cerebellum and, therefore, above the brain stem, behind the pituitary gland. It is located below the area where the optic nerves cross in the brain. This area is known as the "optic chiasm". It is at the very centre, on the median line, behind the hypothalamus, at less than a centimetre. It is in direct contact with the centre of the brain and the central basal ganglia of the thalamus and hypothalamus. Its two hemispheres are fused. It processes the information from a certain type of light (primarily 470 nm) and from the absence of this specific light, into hormonal secretions. It operates somewhat on a "1 or 0" basis which is why we experience the untimely fluctuations of night hormones during the daytime if we don't get enough of this very important wavelength, which tells us whether it's day or night. It also explains the chronic fatigue syndrome experienced by people who work in light which is low in the 470 nm wavelength.

The influx from the outside passes through the nuclei located above the intersection of the optical nerves in the brain. These are the suprachiasmatic nuclei of the biological clock. It manages our circadian rhythm, i.e. our 24-hour cycle. The nuclei are very fine structures about the size of the tip of a pencil. They contain several tens of thousands of neurons each. They are located at the base of the hypothalamus and transmit sensory information from the retina via special nerve fibres of the autonomic nervous system.

The pineal gland converts the "day/night" rhythm transmitted by the suprachiasmatic nuclei into three hormones, which its cells make at night, and which are called "pinealocytes"

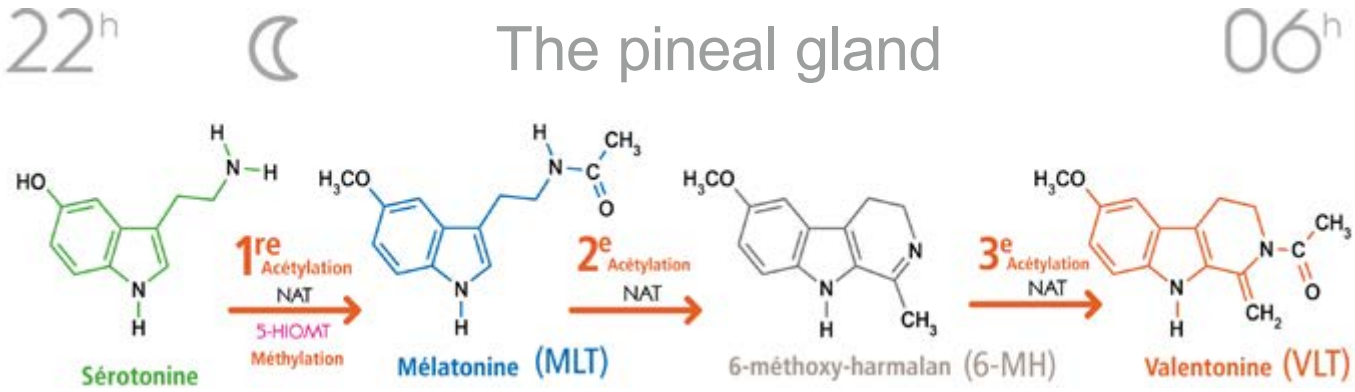
The gland is outside of the brain's protective barrier (the blood-brain" barrier) which enables it to distribute the hormones it makes throughout the organism according to needs and without being hindered. It is 8 to 10 mm high, the size of a small cone, in a median position behind one of the brain's ventricles, i.e., the third one, which makes the cephalo-rachidien fluid (CRF).

Evolution over time

The gland grows until the age of one to two, then stabilises. It begins to grow again somewhat at puberty. Note that, with age, calcification appears which decreases its effectiveness and hormone production. These are calcified concretions due to the excess calcium in our diets (primarily from dairy products).

Arteries, veins and nutritional needs

The pineal gland is highly vascularised via the posterior cerebral artery, which provides an extensive network of small veins around it, and, in particular, by the pineal artery. The blood from the venous return is collected in the "great cere-



bral vein," also known as the vein of Galen, which recovers the blood deep in the brain. It is in surrounded by cephalo-rachidien fluid (CRF) like the entire periphery of the brain and doesn't receive any particular innervation.
The essential precursor to its functioning is the tryptophan (royal jelly, eggs, fish, cashews, dates, bananas, pumpkin and water melon seeds, almonds, peanuts, etc.). It needs at least 200 mg/day of tryptophan of which only a small portion is transformed into serotonin.

A conductor gland

The pineal gland is an endocrine gland which appears to act as a conductor for hormonal symphonies. When it is over-active, it can impede the thyroid gland via direct action on the thyroid-stimulating hormone, the parathyroids and even the adrenal medula. It can also decrease the production of the hypophyseal growth hormone. It manages the production of:

- Melatonin
- 6-Methoxyharmalan
- Valentonin

History and functionality

1. Melatonin: a neuron protector

This hormone was discovered in 1958 by Aaron Bunsen Lerner (1920-2007), a professor of biochemistry and dermatology at Yale University in the United States. He published his discovery in the Journal of the American Chemical Society (80, 2587, 1958). Contrary to what many scientists believed, melatonin is NOT the sleep hormone. On the other hand, it is a powerful neuron protector which prevents their ageing. It protects them against the destructive action of what is known as "free radicals", molecules which oxidise the neurons.

2. 6-Methoxyharmalan: the waking-state and cognition hormone

William M Mac Isaac and his colleagues discovered this second hormone in 1961. They published their finding in the Science journal (134, 674-675, 1961).
He notes that a lack of melatonin results in a deficit of a well-known substance similar to LSD (10), "harmala alkaloid, 6-Methoxyharmalan" which is known for its intense psycho-stimulant properties.

3. Valentonin: the true sleep hormone

In 1994, Jean Bernard Fourtillan finally discovered the sleep hormone, which he called "Valentonin", and the sleep-wake regulation system. Prior to this, in 1993, together with his team, he had developed an extremely sensitive dosing method (0.1 pictograms per ml of blood) for melatonin by coupling gas chromatography with mass spectrometry. (Published in Biol. Mass Spectrum, 23, 499-509, 1994).

The valentonin discovered in the pineal gland was in very small concentrations (30 to 50 picograms per gram of tissue). The discovery was not published immediately for intellectual property rights issues (patents) while waiting for the approval of

The third eye of some frogs and snakes is found at the top of their skull at the front of their head. In humans, it is fused with the retina.

national and international patents from 1995 to 2015. As a result, it has only started to be disseminated since 2015.

All three, i.e. melatonin, 6-Methoxyharmalan and valentonin, constitute and regulate the sleep-wake system and provide cells with protection from oxygenated free radicals. In particular, the nervous cells in the brain, the heart and the nervous system in the digestive tract as well. They regulate the psychic and autonomic states of the body during the 24-hour cycle.

The biological cascade finally discovered

This cascade is described in Professor Fourtillan's book entitled *"La Glande Pinéale et le Système Veille-Sommeil – Applications thérapeutiques"* (The Pineal Gland and the Sleep-Wake system. Therapeutic Applications) The cascade of three hormones manufactured by the pineal gland begins with tryptophan. Two enzymes (hydroxylase and decarboxylase) transform it into serotonin. Beginning at 10 in the evening, the latter is transformed into melatonin thanks to 2 additional enzymes, N-acetyltransferase and 5-hydroxyindole-O-methyltransferase. Melatonin then becomes 6-Methoxyharmalan by acetylation. Another simultaneous acetylation transforms it into valentonin.

Conclusion :

Starting with the retina's exposure to the 470 nm wavelength, via the ganglion cells containing the photosensitive pigment melanopsin, the bioelectric nervous influx is transmitted via the suprachiasmatic nuclei and the optical chiasm to the pineal gland, which becomes active and regulates both day and night hormones.

More information is available on the **fonds-jose-fa.org** website of professors Joyeux and Fourtillan and, notably, the videos :

- **"Professor JB Fourtillan answers questions from Professor H Joyeux"** **youtu.be/3PkX8boc4RU** - 1 hour
- **"The Pineal Gland and the Sleep-Wake system. Therapeutic Applications"** **youtu.be/j63t_HC0X3w** - 37 minutes
- **"The sleep-wake system in Creation"** **youtu.be/Ys50zcWqfEQ** - 14 min. 35 sec. + 2 min. 13 sec.

Sources

Professor Jean-Bernard Fourtillan. *"The Pineal Gland and the Sleep-Wake system -Therapeutic Applications"*

The different fields of consciousness

Blue : the visual field
Purple : the auditory field
Red : the kinesthetic field
Orange : the olfactory field
Green : the taste field

The different levels of controls

In the foreground : the anticipatory level
The central plan : the present level
The background : the remembered level

Aphantasy and hyperphantasy

To view or not to view

Consciousness remains a field rarely studied and far from solving. However, it is essential to better understand how our mind works. Why is it essential? Well… First of all… we need a better understanding of how we perceive objective reality. So that we can better utilize the personal development programs. The Psioplanet catalog offers dozens of meditation, visualization, or relaxation programs. Most are created using brain imaging data.

A recent discovery turns these methods of relaxation or visualization training upside down. It turns out that some people have an inability (or reduced ability) to conjure up mental images. A study published recently in the journal Cortex, names this condition "aphantasy" after the Greek word "phantasia" used by Aristotle to describe the power of imagery or the visual imagination.

In 2010, Adam Z.J. Zeman from the University of Exeter in the UK and his colleagues conducted a study. After New York Times reporter Carl Zimmer popularized this study by reporting it to Discover magazine. The researchers were contacted by more people who could relate to the description of this "blindness of the imagination." Some of them reported that family members also had the same deficit. It was then that Zeman and his colleagues conducted a more in-depth study in to "aphantasy".

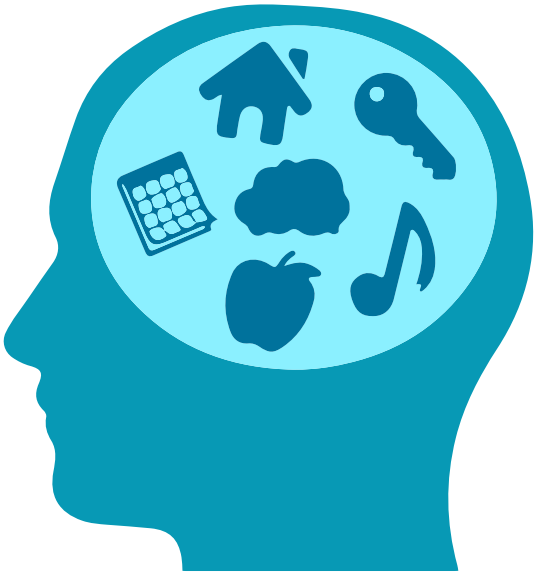
Aphantasy, as its name suggests, characterizes "a defect of imagination" or an inability to form mental images. When you have this characteristic, you experience a sort of inability to search for data captured in your visual field of consciousness: impossible to imagine a place, a person and/or a scene. It is precisely an inability to recall visual data by will. The ability to create mental imagery allows you to discover all the facets of an idea, concept or representation in your mind so that you can examine it in detail to solve a problem or recall a detail. This is a completely normal process for most of us. But not for everyone!

People who have aphantasia will never realize that they cannot access mental images. They live naturally without having access to this data. It should be noted that there have not yet been enough studies that exactly define this mental profile. Also, I started to study it on several people in my close circle.

V=visual | A=auditory | S=sensory | O=olfactory
G=taste | K=kinesic | E=balance

Missing visual memory, no imagery, or a deficit in imagery generation?

It is necessary to differentiate the visual memory which in some cases is preserved but with absent visual recall. The remembered field of consciousness is present but the capacity to generate an image is not working or not well. So, we see that there is a great variety in mental profiles. Previous clinical studies have suggested that there are two main types of visual imaging deficits: 1) visual memory impairment, causing both visual agnosia and loss of imagery, and 2) visual impairment only "imagery generation".



Different types of profiles in the fields of consciousness

The most common cases are voluntarily unable to recall visual data and/or form a mental imagery. There are also people who are unable to remember a melody, a tactile sensation, or the atmosphere of a particular place. There are also people who cannot remember a taste or a smell. And finally, there is still the inability to remember any movement or orientation in space. It makes a lot of difference in appreciating the field of "remembered consciousness" and diversity within.

One more proof that the subconscious does indeed exist!

Either way, we are in the realm of conscious memory. Visual data stored in the visual field of consciousness may or may not be called upon.

Aphantasia blocks or hinders access to this data on a voluntary basis. However, a person with aphantasia will be able to recognize a face, even a face seen once two years ago… She will be able to dream even in color and in the event of coma, see pictorial scenes.

This is irrefutable proof that unconscious or subconscious memory exists if some still hesitate to admit it today! The subconscious does indeed exist, and we have proof found in face recognition. Visual data totally inaccessible to the conscious mind due to aphantasia. The data exists but it is not accessible through the mechanism of voluntary attention.

An illness or another way of thinking?

However, people with aphantasia can do a creative jobs for example, a job that requires constant creative effort to invent and improve software. How would it be possible? They would compensate for the lack of memory access by orienting themselves rationally in a network of concepts and reasoning. Where does aphantasy come from? Is it a neurological defect, a degenerative disease, a functional problem or a structural problem? A combination of psychological and neuropathological factors? Researchers are struggling to say precisely, due to a lack of a sufficient number of subjects to study. It must be said that people who are have aphantasia have the unfortunate tendency to never become aware of their condition, since apparently, one can live a perfectly normal life without ever mobilizing mental images. This explains why this sighting was not highlighted earlier. In 2009, a study of 2,500 subjects evaluated the proportion of individuals claiming not to have a visual imagination at 2.1 - 2.7%, but more rigorous studies will have to be awaited to be able to be sure.
The diagnosis of "inability to visualize" has been around for a long time; we find the first traces in the literature through the descriptions of Galton in his work Statistics of mental imagery published in 1880. In addition, doctors agree on one fact: there is not a clear separation of people with a "mental eye" on the one hand and people who "do not have a mental eye" on the other. The most probable is there is a gradient in the sharpness of the mental images we are able to form.
Most likely, there is a gradient in the sharpness of the mental images we can form. Some will be able to scroll through real HD movies in their minds, while others will only be entitled to diffuse, blurry, evanescent images. In the case of aphantasy, obviously, you do not see anything at all.

In 2010, Zimmer and colleagues published this study by asking subjects to take a Vividness of Visual Imagery Questionnaire: Visualize a friend or loved one you see often. How precise are the contours of his face, head, shoulders and body? Visualize a sunrise and examine the details of your mental picture carefully. How accurate is the depiction of the sun rising above the horizon in a hazy sky? Although it will not be enough to draw conclusions about the forms of aphantasy and its etiological and epidemiological characteristics, the answers of the subjects remind us of an essential fact: we tend to believe that our way of thinking, reasoning and to perceive is universal. However, it is not. Behind each brain hides an imagination that is unlike any other.

Imagination and visualization

The capacity to imagine exists in varying degrees: from vague images to very precise images to animated imagery capacities such as 3D films with scenarios in which the characters can be placed in virtually any purely fictitious situation. Until then everything is going "normally". The person who is able to have mental imagery does not suffer from this and those around him simply know that he is often in deep thought. We therefore speak of "remembered visual field" and "anticipatory visual field".

Hyperphantasy

As with every field relating to the human psyche, there is an extreme version of this characteristic and if this involuntary capacity develops abnormally, this can, according to some, make it a pathology: researchers describe a so-called excessive, maladaptive or compulsive daydreaming disorder ("Excessive daydreaming", "Compulsive fantasy"). After the publication in 2009 by psychologists Cynthia Schupak and Jesse Rosenthal of a study describing a case history and discussing "excessive daydreaming", as well as the publication in 2002 of a study by Eli Somer on "maladaptive reverie", "A multitude of online forums and web pages have proliferated, on which thousands of anonymous people around the world testify to have secretly suffered from the same symptoms for years", reported Cynthia Schupak and Jayne Bigelsen in 2011.

Many express their surprise and relief to discover that they are not alone in with their predicament. Many also report having made repeated attempts to obtain psychological help, but mental health professionals admitted to being rather helpless in

the face of this problem. Many felt their distress was not understood, being told that daydreaming is creative and beneficial and that they should not worry. Their confusion is amplified, the researchers say by their inability to convey to the clinical community that there is a type of reverie, which consists of chronic immersion in imaginative episodes that are " overwhelming, enduring and compulsive, " which is experienced as an addiction and which carries a heavy psychological burden and limitations in the ability to invest normally in life.

Schupak and Bigelsen conducted a study with 90 people to learn more about this disorder and distinguish it from normal daydreaming. The study describes several characteristics concerning the nature of fantasies or imagined scenarios, their triggers and their functions. The lack of control and the difficulty in limiting daydreaming activity in appropriate periods of time is the main concern expressed by the participants. Most of the latter also indicated that they had acquired this habit at a very young age. Future research should be carried out to better understand the phenomenon stated by researchers and especially to study potential methods to reduce the distress and functional impairment experienced by " excessive dreamers ".

Meditation or visualization?

Regarding the PSiO® Planet catalog, it is good to question the suitability of listening to some programs more than others depending on the characteristics of one's field of consciousness profile: Pure meditation exercises will work best for people who are unable to visualize images. Indeed, these mental exercises help shutting down the comparative and analytical cortex and encourage thinking about sensory feelings and breathing. On the contrary, exercises offering a visualization of nature or scenes of holidays or peaceful states in childhood will better suit the mental profile possessing an imagery capacity. These findings were verified with cardiac coherence software on approximately five hundred people I had the opportunity to coach during my emotional management seminars from 2007 to 2013. Failed visualization attempts can even stress people who are unable to view images. There are really two profiles for the rapid entry into cardiac coherence: those who directly use meditation and those who go straight to visualization. The choice of purely sensory meditation is therefore good for people who are not very good at visualization.

Relaxation through visualization or through sounds & lights?

The exercises in "letting go" evoke situations of relaxation in soothing environments then suggestions by the image will undoubtedly work less well than sessions of rhythmic sounds or music with light flashes causing the abandonment of the at-

tention leading the subject towards non-thought on the verge of sleep. It is therefore best to test several types of sessions to check which one(s) will work best and fastest for you. However, for relaxation programs, the difference is not clear. Indeed, let us not forget that the aphantasy does not have access through voluntary attention to imagery, but that his subconscious has access to it. The "Audioceuticals" programs mainly built on subconscious suggestion will therefore work equally well for both profiles. In any case, this is my conclusion so far after 30 years of observing thousands of subjects.

MEDITATION

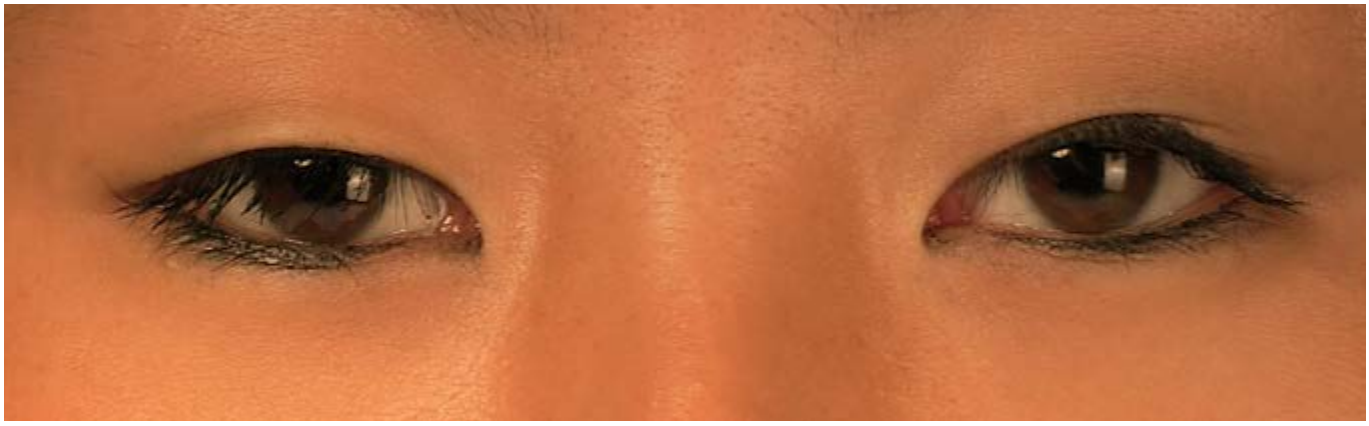
« Aphantasy »

VISUALIZATION

« Hyperphantasy »

Survey

A questionnaire allows you to find out your level of aphantasy or hyperphantasy online :
https://aphantasia.com/vviq/



A study shows **the direct relationship** between *immunity* and *positive emotions*

The physiological effects of positive and negative feelings - Glen Atkinson & Mc Craty - 1995, The Journal of advancement in Medicine.

The salivary immunoglobulin (S-IgA) is the principal class of antibodies in mucosal secretions. It provides the first line of defense against pathogens in the upper respiratory tract, the gastrointestinal tract and urinary tract. The rate is a standard measure of the secretory immunity. An increase in S-IgA is associated with a decreased incidence of disease and susceptibility to infections.
Similarly, NK (natural killer) cells are lymphocytes able to lyse foreign cells.
Various studies (1,2) showed increased NK cell activity and higher S-IgA levels even in times of stress in a population with positive emotions such as compassion and love for others.
And conversely, reduction of S-IgA levels, inhibition of NK cell activity and a general decrease in the number of cells are correlated with negative emotions. (3,4)

The study by Glen Atkinson and McCraty, published in the Journal of advancement in Medicine in 1995 on 30 subjects (13 men and 17 women, average age 38 years) shows the influence of cardiac coherence biofeedback technique as stress management on the rate of S-IgA.

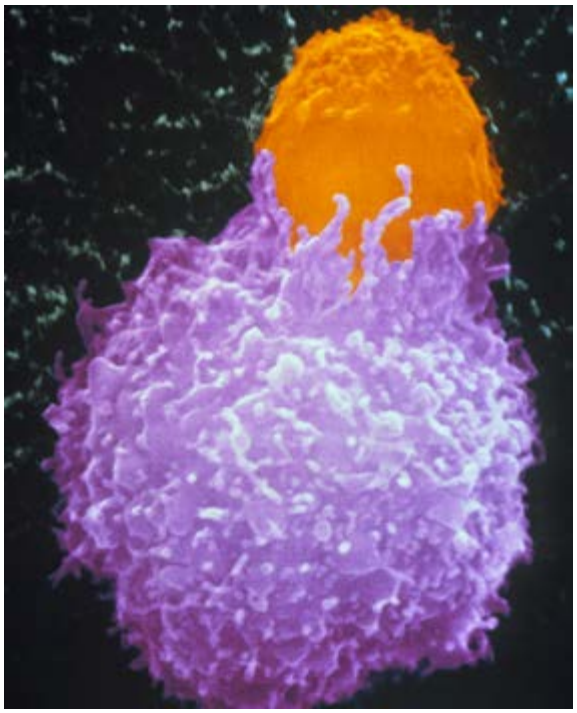
Negative feelings and positive feelings have a direct influence on immunity, and therefore, on our health! A 5 minute exposure to empathy and compassion immediately increase antibody levels in contrast to the anger and frustration.

Experimentation

Two groups were created for this study and a control group. The first experimental group was subjected to a positive emotional state (compassion / empathy), the second in a negative emotional state (anger / frustration) and 5 min. Two induction method were tested : the first was a method of self-induction (supplemented by Biofeedback) and the second an external induction method (by viewing videos).

Saliva samples were taken before and after the experiment and every hour for 6 hours.

A control group listened to emotionally neutral music.



Lymphocytes T cells " cells that clean intruders "

Results

A 5 minute exposure to empathy and compassion immediately increase S-IgA levels unlike anger and frustration. Furthermore we note that S-IgA levels remained low for the group subjected to the anger and frustration for 5 hours after the experiment, while those subject to empathy and compassion showed increased S-IgA values for several hours after the experiment.

Conclusion

The increase in salivary IgA after of positive emotion was mainly observed with the technique of self-induction and endured for 6 hours while that using videos showed no or little variation. Instead, the group experiencing negative emotions such as anger and frustration showed at first an immediate increase of S-IgA followed by a sharp decline, which remained for 5 hours !

The results of this study confirm those of previous studies on the effects of immune strengthening of positive emotional states and indicate the need for effective management of immunosuppressive effects of negative emotions.

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Relaxation

or

meditation ?

S. Dumonceau

First of all I would like to say a few words on "Zen' philosophy that surrounds and justifies the different applications proposed on Psioplanet® and I would also like to give some explanation of the concepts of relaxation and meditation. We have developed some simple tools over the years to return more easily towards equilibrium, independently. Meditation and relaxation with voice are indeed the beginning of distancing maneuvers towards enlightenment. Pompously called "spiritual awakening", this state of consciousness can be reached via these relatively simple techniques. But it would be good, first of all, to understand the difference between meditation and relaxation. Something that is easily understood, is easier to implement, and everything comes naturally after. But too few people know how these two paths differ.

Relaxation

Relaxation is a path that starts with learning how to let go and stop chattering thoughts. Dozens of records are available on Psioplanet® to allow you to easily reach this state. Various techniques all lead to the equilibrium state. Gradually, simple breathing exercises and muscle contraction / relaxations help relax the body. Then comes the turn of the mind to enter gradually into a state of calm. The "multi-evocations" (several voices talking to you at the same time) contained in our "Audioceuticals" actively help in calming the mind because they cause a progressive drop of one's attention.

You let yourself be guided at the edge of sleep, but you are still conscious, to a highly regenerative state. It is a state where one might expect to sleep but if someone touches you, you realize then that you were not sleeping. The neuronal area that manages vigilance is thus in total rest. It "hears" but does not "listen" anymore. This "subconscious" listening state is specially soothing for the mind and body as it is a state of homeostasis.

With soothing images and metaphors in the stories one hears in our programs, the subconscious literally does its shopping and integrates the images it needs to find some inner peace. In general, relaxation exercises are practiced lying down to allow vigilance to decrease gradually and deliberately move towards this famous border state on the edge of sleep.

Meditation

Straightened, high concentration, meditation methods are very different from relaxation. We learn, for example, to focus on one point of the body or a sensation and while breathing adequately, we ensure the end of compulsive flow of chattering thoughts. In general, meditation exercises are practiced upright to avoid dozing off and remain focused on the sensation. Gradually, thoughts decrease and yet if they manifest themselves again, it is advisable to radically refocus attention on the sensation. We listen no longer, we hear. We no longer look, we see. We no longer interpret any data from the senses. We live through the emotional brain that alone remains active. This is the famous "Samadhi" state that led the "Buddha" in its search for the "truth" to the "illumination", the Union with everything, a state of contemplation through non-thinking. Most people think that "meditators" do not think anymore, when in reality they continue to think, but their brain activity is shifted to the emotional areas and no longer in the superficial cortex. If we measure the

brain waves of meditators, we naturally see little activity in the cortex, which is altogether normal when we understand the purpose of this discipline and the means to reach this state.

Understanding these two methods

Most people mix the understanding of these two methods because they both stop cortical thoughts. As you can see, the way to achieve this is yet very different, even if the goal (stopping thoughts) is substantially the same. Indeed, for relaxation, consciousness is at rest while for meditation vigilance is required.

For relaxation, no more control is needed and it is proposed to our attention to be placed in rest mode. In meditation, we must remain in control and focus our mind in the sensation (not the one that thinks) that compares the data and analyzes tirelessly.

The cortex

This part of the brain involved in the analysis of reality is built in an architecture that consists of connections in successive loops. We have a comparing cortex. His way of understanding reality is to compare the data and constantly refine and measure. The short- and long-term memories are greatly stressed and all this activity can sometimes be very tiring. Understandably, some people prefer the relaxation methods while others prefer those of meditation. A person who is stressed and exhausted will be oriented more towards relaxation while one who wants to gain control of the mind through discipline and has energy to spare, will be oriented more towards meditation.
For some, control is a fundamental characteristic of their personality and meditation will reassure them. While for others, the fact of letting go, "going with the flow" is on contrary safer and they prefer relaxation.

> "To solicit attention then promotes the relaxation of it. Such as a muscle that relaxes more easily after a contraction, the mind relaxes more easily after concentrating."

Whether with passive relaxation records like "Audioceuticals" or with active state meditation recordings, the idea is to focus on yourself first.
Demanding attention first is followed by the relaxation of the mind. It functions like a muscle that relaxes more easily after contraction. The mind also relaxes easily after concentrating.

Meeting of the two methods

It is also good to engage in both types of approaches. Indeed, it appears that soliciting attention promotes the release thereafter. Like a muscle that relaxes more easily after contraction, the mind also relaxes easily after concentrating. This resembles a bit like a mental gymnastics.

These actions of the mind, if performed regularly, allow a change in the level of consciousness, and gradually, the ability to discipline the mind. This form of gymnastics allows a form of automatic distancing with any kind of worries. The "DOUBLE YOU" series is a research in this direction.
The goal of the "Double You" series is specifically to merge the two approaches (meditation and relaxation). "Double You" means approaching the "INNER SELF" via a dual approach, which I called the "double listening". The exercises are done first in a conscious mode, in high vigilance, followed by a subconscious mode, zero vigilance. We start the sessions in the sitting position followed by the lying position in the second part of the recording. This method is the culmination of my humble research to access the equilibrium state more easily and as quickly as possible. Experiencing this state regularly creates a balance of the mind which naturally leads to the balance of voluntary and involuntary nervous systems (the one that regulates the functioning of all organs and immunity), what is known as autopilot.

How does PSiO® adapt to these two methods?

Simultaneously promoting advice by voice, it broadcasts sequences of colored lights whose main function is to either increase the concentration or to decrease it, according to the setting. Indeed, recordings enriched with continuous blue light (470 nm) increase alertness while those enriched with flashing red light (625 nm) promote decreased alertness.

Immediate effect?

The PSiO® allows you to practice both techniques (RELAXATION & MEDITATION) which in different ways (advice, flash frequency or continuous light, wavelength of light) lead to the same result: attention at rest. Did you know that it is not necessary to practice for hours to feel the benefits? Even a few minutes a day will induce real improvements in your daily life: inner peace, enhanced intellect, quicker recovery from fatigue, better sleep, soothing and serene dreams at night are the first benefits that you will experience the first days of use. Over the weeks, the PSiO® become, as its name suggests (PSI = mind), "the little companion of your mind."

S. Dumonceau

"A different type of light: the recordings enriched with continuous blue light (470 nm) increase alertness while those enriched flashing red light (625 nm) promotes reduced alertness"

Noise & REM sleep

This headset is more than just a PSiO® accessory; it is a creation in itself as a great solution for insomnia, frequent nighttime awakenings and can even aid the recovery period from sleep!

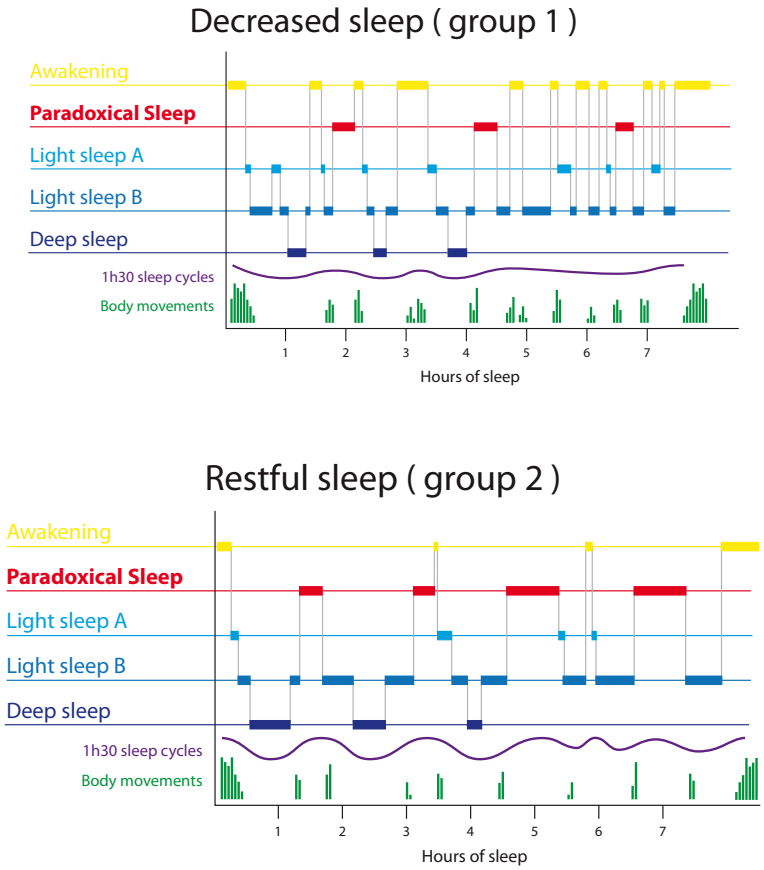
Since 1994, sleep studies have proven the importance of noise in reducing sleep quality; noise reduction improves the qualitative part of sleep (the so-called paradoxical sleep), and 70% of its users show a better quality of life thanks to a more sound sleep.

Noise pollution

Research shows that noise is a real nuisance, because during the day it significantly disrupts the recovery period from sleep during the night before. The REM sleep is reduced in proportion to the noise perceived, even unconsciously, during the day prior to sleep.

1. Passive Noise Cancellation

The PSiO® headphones already provide some form of isolation from ambient noise thanks to the closed ear cups (head sets) in which the speakers are located. We therefore speak of 'closed' headsets as opposed to open headsets that make it possible to listen to both ambient sound and the sound coming from the speakers.



Group 2: more REM sleep, more deep sleep, less light sleep, and fewer bodymovements.

2. Active Noise Cancellation

In addition, the PSiO® headset includes a built-in anti-noise device. How does that work? A microprocessor analyses the external ambient noise using a microphone and produces a sound wave with an inverted pattern. This results in the suppression of ambient noise and the elimination of noise pollution.

3. Listen

The user now has the choice to stay in this oasis of peace (eg to work or travel in peace without being bothered by environmental noise). Or take the opportunity to listen undisturbed to your favourite music or to a meditation session…

From that moment on you will fall asleep automatically.

Quality and high reliability

The PSiO® headphones are of the same quality as leading brands in the field of environmental noise cancelation. In addition to this, you will find that the sound reproduction is superior! The result of PSiO® is astonishing! Total tranquility ensures a good night's sleep and a serene night…

How does sound affect sleep quality?

The graphs below show the effect of ambient noise on sleep quality at night. We clearly see here that there is a reduction in REM sleep for the group exposed to significant environmental noise (Group 1).

Thousands of users around the world have been using this technology ever since1994.

Thanks to regular sessions with the PSiO® headset, you can sleep more peacefully, work more comfortably and in peace and listen to your favourite music without being disturbed by environmental noise, whether at work, on a plane, during a relaxation session or while listening to your favourite playlist.


PSiO® technology
designed for
Good Sleep

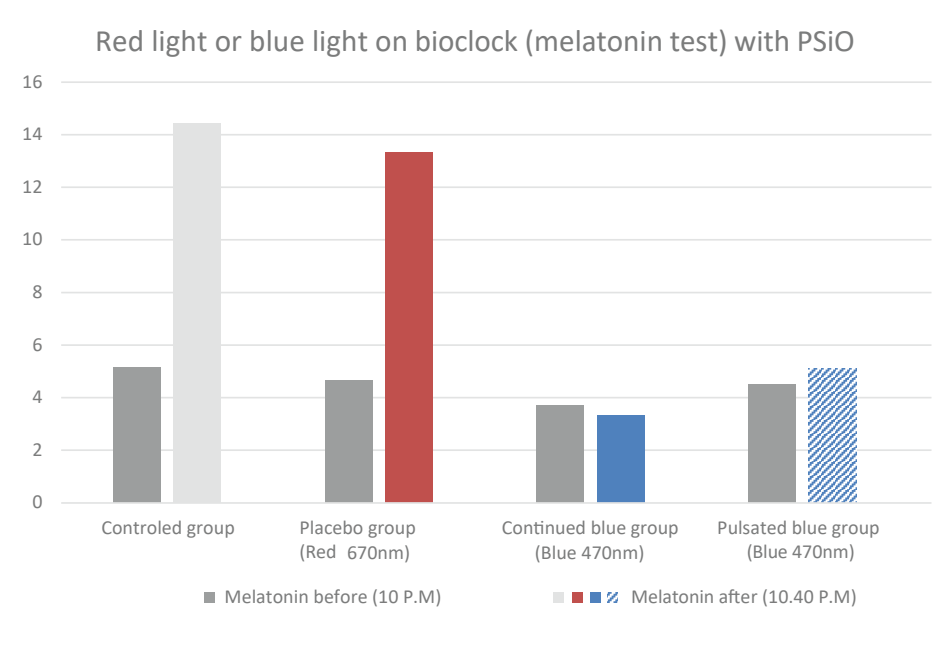
The PSiO® technology can regulate sleep disorders at two levels. It can first help fall asleep, and it can also prevent awakening at night.

Falling asleep

Sleep may be affected because of the famous " brain chatter ", these thoughts that come back and seemingly never stop. The cortex is composed of several layers of neurons that communicate with each other and that are responsible for all analytic and comparative thoughts. In this part of the brain, a special area is responsible for the faculty of attention. It is at this level that the PSiO® technology can intervene by acting as a powerful attention " distractor ". While it is clear that the absence of light promotes sleep, darkness unfortunately does not stop chronic over thinking. On the contrary, the thousand thoughts generally arise in the dark and quiet of the night, often generated by stress or anxiety. The originality of the approach proposed by the PSiO® device is to paradoxically use light to distract one's attention !

Light as an Attention 'Distractor'

But not just any kind of light ! A study was conducted in 2014 on 100 students (1). The study showed that red light, at a 625 nm wavelength, has no significative influence on the retina receptors involved in the 'biological clock' activity. As evidence, melatonin secretion is in no way altered by a light emission of this kind. It is thus thanks to red light diffused homogeneously in opalescent glasses that the PSiO® operates.

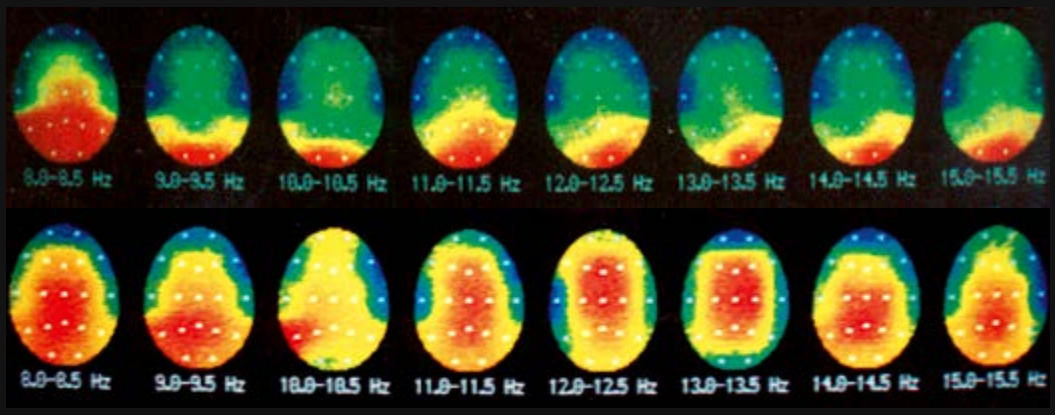


The chart shows the concentration of salivary melatonin on the control group (in white), on the group exposed to red light (in red) and on the two groups exposed to continuous and pulsed blue light respectively (in blue). It is clear that the red group does not have a significant impact (statistically speaking) on melatonin inhibition while blue light eradicates melatonin secretion. PSiO Technologies Laboratory

How does light distract the attention?

Variable frequency light stimulations between 5 to 12 cycles / second have been found to have no equal in distracting one's attention. These stimulations have the particular feature of producing an immediate hypnagogic effect. Shapes and kaleidoscopic colors are spontaneously generated by the visual areas of the cortex that cannot manage to treat this flow of stimuli without meaning. The attention thus moves from inner thoughts to the external distracting light stimuli emitted by PSiO®. The level of attention eventually starts to drop gradually to ultimately reach a state of total rest. At this moment, eyes drift into orbits, visual scenes become uniform in orange tones that resemble the glow of flames from a wood fire which fades out slowly.
If the person is tired, (s)he will fall asleep naturally. At the cortical level, the result is similar to a 'zero' level of attention, similar to the state reached through meditation, except in this case it is achieved effortlessly.

In order to ensure the person reaches this state of total relaxation at the border of sleep, a MP3 player has been placed in the PSiO® device. Thus, the device broadcasts audio messages simultaneously with the action of red light that will complement the overall action to relax the person. Soft music starts in combination with a pulsed light session followed by the broadcast of two voices alternately succeeding each other. A man and a woman talk and offer the person simple relaxation exercises. They first raise awareness on the different segments of the body, followed by muscle contraction & release, long expirations, etc. At certain specific points in the recording, two stories are told simultaneously in the right and left ear. This is a method which prevents the person's critical and analytical faculties from concentrating on the suggestions and completes the action of pulsed light to generate an even deeper "letting go" of the attention. This method of indirect suggestion was invented by the famous Dr. Erickson in the 1970th. As a general rule, the person's conscious "gives up" and stops paying attention to the two stories. The attention moves then to total rest and the mind which is still awake, finds itself for a time on the edge of sleep. It is a border state where one "hears" but does not "listen" anymore. At the end of the recording, the auditory level automatically decreases and shifts to whispered suggestions. Once the person has reached the state where his or her attention is "switched off", soothing messages are conveyed in the form of stories, fairy tales, legends, texts coming from other types of therapy and stories inspired from everyday life. It is usually at this time that the mind switches to a restful sleep. The ingredients of dreams are often borrowed to the last hours before falling asleep, and we empirically notice that people experience serene nights and pleasant dreams. A feeling of subjective rest in the morning is also regularly reported.



This view of the brain illustrates the alpha waves associated to relaxation (in red color). On the top row, before the use of PSiO®, Alpha waves are located at the back of the brain. After 10 minutes exposed to PSiO® pulsed lights, Alpha waves spread to all the areas of the encephalon (lower row). This proves the influence of the PSiO® technology in inducing a drop of the attention.
Stéphane Krsmanovic
1995

Dr. Lemoine, France

Dr. Patrick Lemoine – The PSiO® in Sleep Labs

This system has been used with great success in sleep laboratories for over twenty years in Belgium and particularly in Brugmann Clinic (Dr. Hoffman) and Saint Elisabeth Clinic (Dr. Lachman). Dr. Patrick Lemoine (sleep specialist, PhD in Neuroscience, Research Director at the Claude Bernard University in Lyon, France and professor at the Beijing Medical University in China) personally uses the PSiO® for jet lag regulation during his many travels. According to him, "it is hard NOT to fall asleep" with the PSiO®. So he naturally introduced it as part of his medical consultations and started prescribing the PSiO® with his most severe insomniac patients with often surprising results. He said: "The system has changed the way I treat my most severely affected patients" (5).

Waking up at night

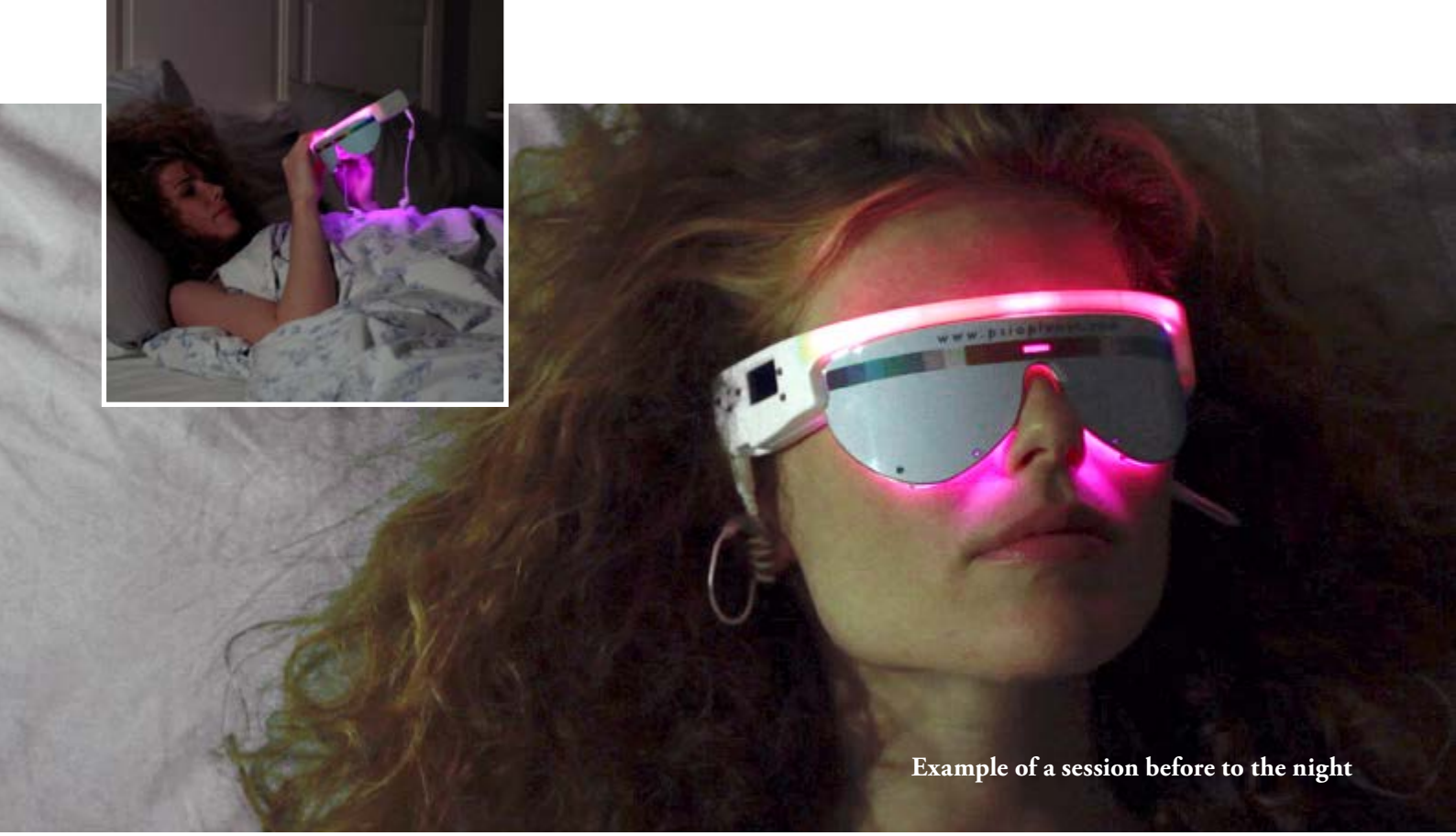
Among the many causes of insomnia, one of them can also be positively regulated by the PSiO® technology: awakenings at night due to high inner stress pursuing people even in their sleep. Indeed, after several hours of sleep and some already acquired rest, the person wakes up at night and cannot go back to sleep because of the high level of accumulated inner tension. Repeated use (it takes 3 weeks minimum) of the PSiO® relaxation sessions can, in the long term, play an effective role in ending these sleepless night. How? It is simply a matter of creating a conditioning to relaxation by using the PSiO® every night. There is probably a deep relation between the subconscious and the emotional brain. It articulates the relationship with the sympathetic and parasympathetic nervous system responsible for the regulation of all automatic functions, including sleep. Therefore, with the regular use of PSiO®, we empirically found that night awakenings decrease or disappear if the cause of these awakenings are due to anxiety or to significant stress.

In contrast to drugs, this method has proven to have no side effects. PSiO® is also certified by the French National Measurement Laboratory (LNE) to be completely safe for the eyes. It is an effective tool that combines many techniques and technologies which, put together, generate a synergy. The PSiO® therefore positions itself as a complement to medication. In Belgium, the Ministry of Health has classified the Audio recordings contained in the PSiO® as an alternative to the overconsumption of sleeping pills and antidepressants and integrated them in the general practitioner's manual.

Awakening

Awakening is somewhat correlated to sleep. In regards to awakening, the PSiO® technology proposes a different kind of light: blue light set at a 470 nm wavelength.
The company PHILIPS which is especially interested in the development of light therapy lamps and several authors of various scientific studies on the subject (1), (2) & (3), confirmed the influence of this frequency range on photosensitive receptors different than of those dedicated to vision, but also located in the retina. These receptors linked to the biological clock are specifi-

"Dormir sans médicaments... ou presque"
Dr. Lemoine



Example of a session before to the night

cally responsible for the regulation of circadian rhythms and pupillary responses. These cells are in fact particularly sensitive to light and in particular to blue light (470 nm). By using the morning programs configured in continuous blue light, the PSiO® user will wake up gently with the appropriate light. This radically blocks melatonin secretion and stimulates other hormones needed for daily activity. The various audio programs proposed complementarily are meditation sessions or visualizations sessions, also guided by voice. These are programs full of light and colors to start the day feeling great!

Power naps

PSiO® has completed the range of applications by creating an original concept: the power naps in music & light. Specially designed for environments impoverished in natural daylight or for northern countries drastically lacking light part of the year, power naps are short pulsating light sessions combined with music therapy. Different types of music are available (new age, Latin jazz, lounge, rock, nature sounds, etc.) to offer users the choice. In addition to being efficient, the PSiO® is cool and fun to use.

NASA has bought the PSiO® at the Consumer Electronics Show in 2014. Currently, a validation plan is discussed with sleep expert, Steven Lockley, Associate Professor of Medicine at Harvard Medical School, Division of Sleep and Circadian Disorders. Another study had to be planned this year with a specialist in pulsed light and sleep researcher at Stanford University, Jamie M. Zeitzer, PhD, of the Center for Sleep Sciences and Medicine (4). The PSiO® firm is relocating to California this year to conduct new research and development.

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1. Study of the efficacy of PSiO® glasses on inhibition of melatonin - Stéphane Krsmanovic et Nicolas d'Offay - PSiO Technologies Laboratories - 2014
2. Phototransduction in ganglion-cell photoreceptors - Dr. David Berson at Brown University - European Journal of Physiology© Springer-Verlag 200710.1007/s00424-007-0242-2.
3. Blue Light improve cognitive performance - Dr. Lehrl & collegues - Journal of neural transmission. Department of Psychiatry and Psychotherapy, University of Erlangen-Nuremberg, Erlangen, Germany. Published online: January 25, 2007.
4. Response of the human circadian system to millisecond flashes of light.
5. "Sleeping without drugs… or almost" - Dr. Patrick Lemoine - Robert Laffont Edition - 2015.

Vibroacoustic science

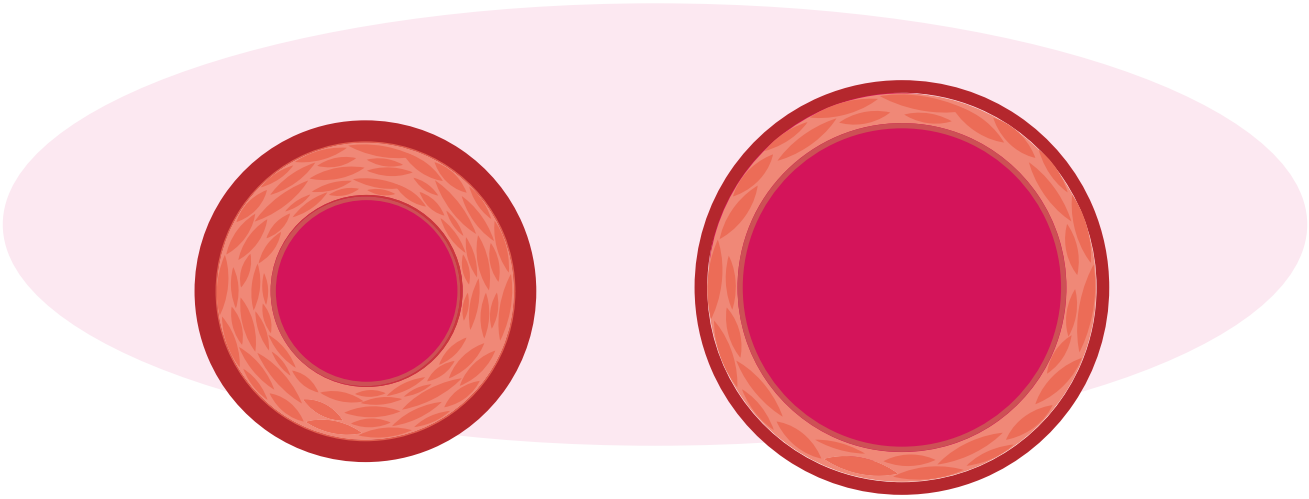
VASODILATATION

Effects of 40 Hertz vibration on :

- **blood circulation**
- **blood pressure**
- **cardiovascular health**

Why does relaxation induce vasodilation of blood vessels?

Relaxation methods generally cause blood vessels to dilate for several physiological reasons.



Vasoconstriction

Vasodilatation

Vasodilation of micro blood vessels means the widening of these vessels, allowing more blood to flow through them.

Contributing factors:

Stress reduction

When you are stressed or anxious, your body releases stress hormones such as cortisol and adrenaline. These hormones can cause blood vessels to constrict (vasoconstriction), limiting blood flow. By relaxing, you reduce the release of these stress hormones, allowing the blood vessels to dilate.

Activation of the parasympathetic nervous system

Relaxation promotes the predominance of the parasympathetic nervous system, which promotes vasodilation by relaxing the smooth muscles surrounding the blood vessels, thereby widening their diameter.

Decreased muscle tension

Deep muscle relaxation can reduce muscle tension. Tense muscles can compress blood vessels, limiting blood flow. By relaxing the muscles, you allow the vessels to dilate and increase blood flow.

Release of nitric oxide

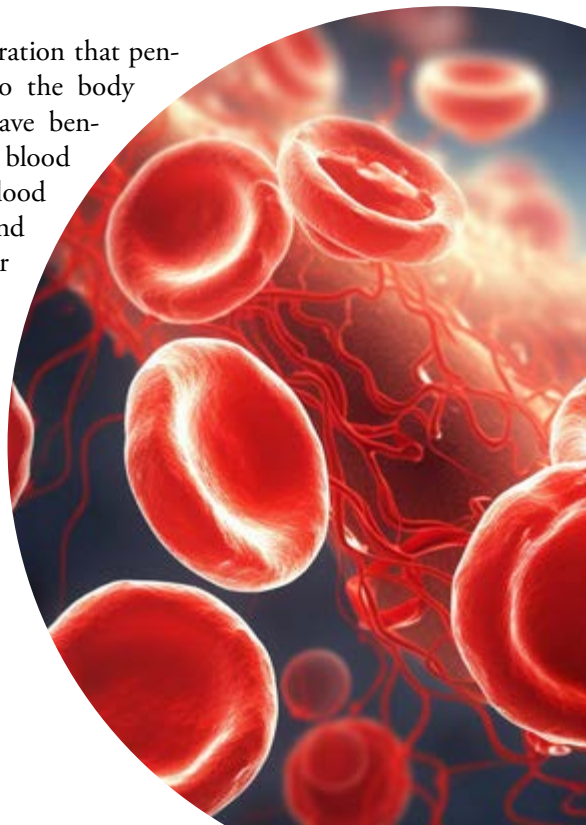
Relaxation can promote the release of nitric oxide (NO) in the blood vessels. Nitric oxide is a chemical messenger that relaxes the walls of blood vessels, causing them to dilate.

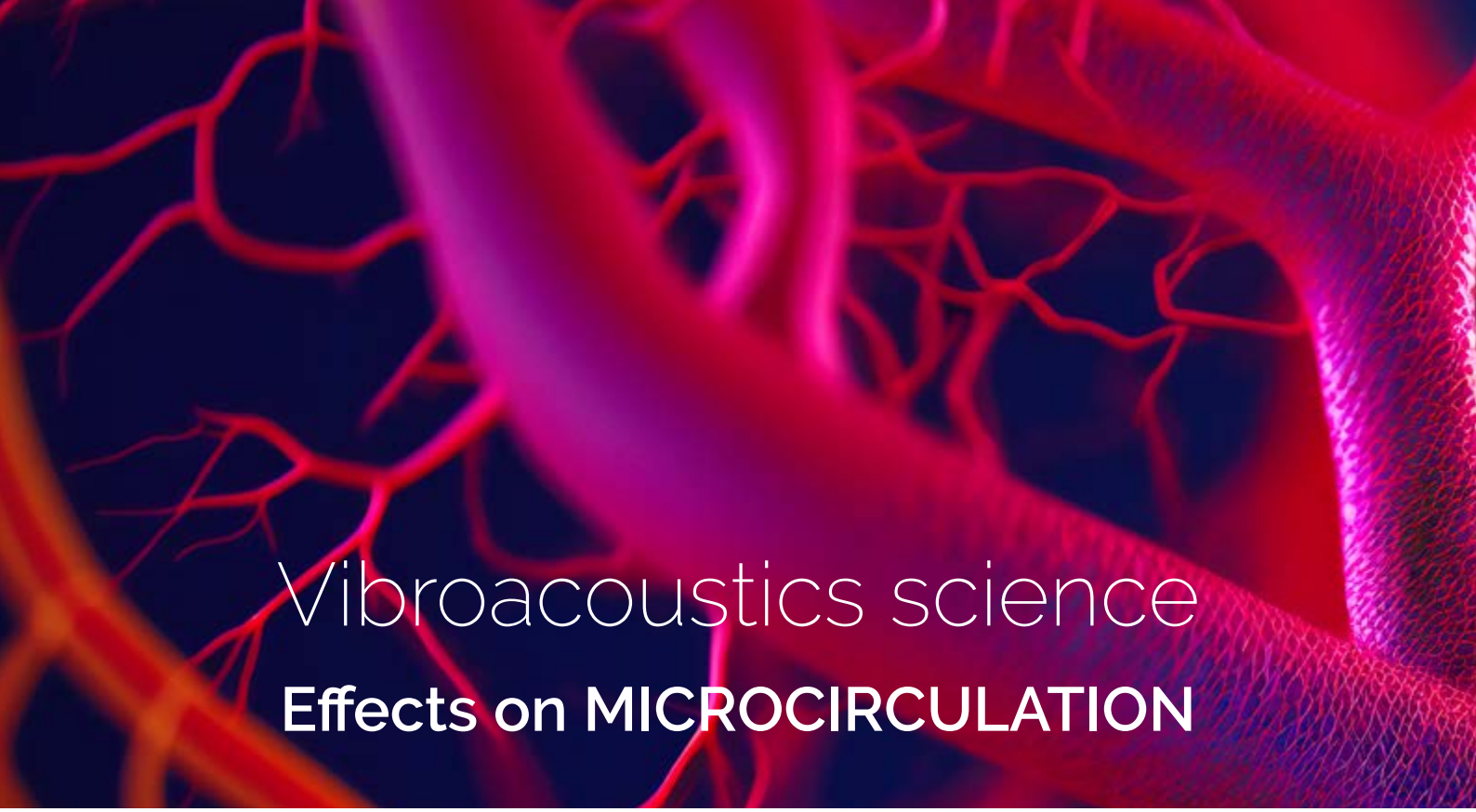
Reduction in blood pressure

Relaxation can also lower blood pressure. High blood pressure can cause blood vessels to constrict. By lowering blood pressure, relaxation can contribute to the process of vasodilation.

For all these reasons, the relaxing vibrations of the PSiO TRANS seat induce vasodilation of the blood vessels.

The relaxing vibration that penetrates deep into the body will therefore have beneficial effects on blood circulation, blood pressure, and cardiovascular health in general.





Vibroacoustics science

Effects on MICROCIRCULATION

Vibroacoustics not only has an effect on major blood vessels but also on microcirculation.

Microcirculation refers to the network of small blood vessels, such as arterioles, capillaries, and venules, found throughout the body to ensure blood perfusion to tissues and organs. These blood vessels are much smaller than the main arteries and veins and are responsible for supplying blood to cells and tissues.

Microcirculation plays an essential role in maintaining the health of tissues and organs, as it allows the delivery of oxygen and essential nutrients to cells, while removing metabolic waste and regulating body temperature.

Here are some important points about microcirculation :

Blood capillaries

Capillaries are the smallest blood vessels and are responsible for the exchange of gases, nutrients, and waste between the blood and cells. Their fine structure allows for efficient diffusion of molecules through their walls.

Blood flow regulation

Microcirculation is tightly regulated to adapt to the specific needs of tissues. For example, when an area of the body needs more blood, the arterioles dilate to increase blood flow.

Cellular nutrition

Microcirculation ensures the supply of oxygen, glucose, and other essential nutrients to cells, thereby supporting their metabolic functions and survival.

Waste elimination

Metabolic waste products, such as carbon dioxide, are transported by microcirculation to be eliminated from the body by the lungs and kidneys.

PSiO vibroacoustic chair

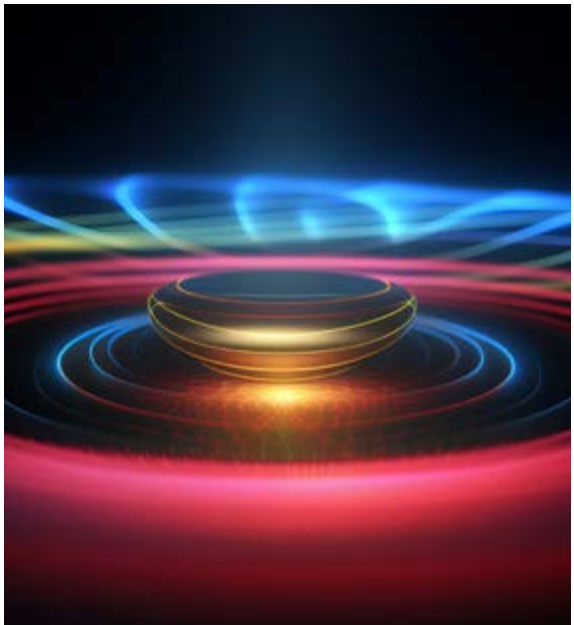
Blood pressure regulation

The blood vessels in the microcirculation can influence blood pressure by adjusting vascular resistance.

Microcirculation problems can lead to various medical issues, including reduced blood flow in tissues and sometimes a lack of oxygen and even a kind of tissue asphyxia, in some cases high blood pressure and other disorders related to poor blood perfusion. The health of microcirculation is therefore crucial to the overall well-being of the body and plays a key role in many diseases and conditions.

When the vibroacoustic session begins, the relaxing vibration penetrates all areas of the body and quickly induces deep relaxation not only of the voluntary and involuntary muscles, but also of the visceral muscles, which are on autopilot. The relaxing vibration and sensory pleasure provided by PSiO TRANS immediately stimulate the parasympathetic nervous system, which in turn opens up the microcirculation. This also applies to organs equipped with smooth muscles (which contract automatically without our involvement) such as the intestines and stomach, but also the fascia, ligaments, tendons, and other deep structures that may or may not be connected to the bones and the entire skeleton. The vibrating wave resonates in all tissues down to the cellular level and therefore spreads to all the organic structures that make up the human body. This explains the feeling of overall well-being, as well as the sensation of warmth in the back resting on the seat during the session.

Thermographic measurements confirm this vascular effect, including at the skin level.



PSiO® emits the good blue light

The light emitted by the PSiO® has been proven to be safe (see certification LNE - French National Measurement Laboratory) as well as effective in regulating sleep/wake cycles. While there have been articles citing risks in shining blue tones especially for people with macular degeneration, today this is no longer relevant for the PSiO®.

In fact, French researchers observed that the harmfulness of blue tones does not depend on the light intensity rather limited to specific the wavelengths of light between 415 and 455 nanometers, unlike the wavelength used for the diodes in the PSiO®: the PSiO® has 3 Diodes (RGB) one emitting blue light with a dominant frequency at 470 nm. This wavelength is responsible, more than any other type of light, for the regulation of melatonin, the hormone associated with sleep (*).

A manufacturer of optical lenses, Essilor group has also developed glasses to filter "bad blue" or blue-violet and UV frequencies and maximizing the transmission of "good blue" essential for our chronobiology while retaining the transparency of glass (Crizal Prevencia glasses).

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- Certification LNE - French National Measurement Laboratory
- Study on the toxicity of blue light: Phototoxic Action Spectrum Retinal Pigment Epithelium was Model of Age-Related Macular Degeneration
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- (*) Study on the effectiveness of PSiO® glasses on the inhibition of melatonin Stéphane Krsmanovic-Dumonceau & Nicolas d'Offay - August 2013 – Belgium

PSiO & Alzheimer

PSiO TECHNOLOGIES has over 35 years of experience in clinical settings, particularly in sleep laboratories. PSiO technology makes it possible to record data from patients with severe insomnia.

The purpose of this article is to propose a specific protocol for use by people with early-onset Alzheimer's disease.
PSiO technology consists of an optical device developed in collaboration with Prof. Habraken, a specialist in optical physics at the University of Liège, and is complemented by headphones or earphones and an MP3 player integrated into the glasses.
Two aspects are addressed here: the possibility of improving sleep and, on the other hand, the possibility improving cognitive functions. PSiO Technologies already has more than 35 years of clinical experience in the field of sleep and more than 20 years in the stimulation of cognitive functions.

Sleep

In fact, people who have significant sleep problems at home find it even more difficult to fall asleep in hospital when their sleep is being recorded. The headset with around twenty electrodes and the camera in the room do not make things any easier, especially as the surroundings are unfamiliar.
Shifting attention through pulsed stimulation on the one hand, and voice-guided recordings combined with deep relaxation techniques on the other, enable patients to fall asleep and be monitored during the night in hospital.

Cognitive functions

On the other hand, studies conducted over the past twenty years on the stimulation of cognitive functions by light have also proven their worth. All cognitive functions are boosted: concentration, memory, reaction time, data processing, and association of ideas.
Since deep sleep is crucial for the metabolization of the toxic proteins responsible for Alzheimer's, there are two types of treatment options for people with early-onset Alzheimer's :

The recommended protocol for therapists

Therapists can rent or sell the PSiO device to their patients. Patients can then use the device twice a day :

- During the day (morning or early afternoon), an initial session using blue light at 470 nm stimulates the melanopsin receptors located in the retina and connected by a non-visual nervous system to the pineal gland via the suprachiasmatic nuclei. This stimulates all daytime hormones and cognitive functions. If the pineal gland is sluggish or not sufficiently stimulated by the right amount of daylight, this daily session optimizes all cognitive functions (*)(**).
- Before nightfall, a second session, lying in bed, with red light pulsed at a certain frequency (7 hertz to 14 hertz), quickly stops rumination, in less than 20 minutes, while the audio master provides a relaxation session to induce a peaceful night's sleep that reduces the overall tension level of the vegetative nervous system..

This gradually eliminates nighttime awakenings and per-promotes peaceful nights and restorative sleep; experience shows an improvement in subjec-

tive and objective sleep, particularly in the amount of deep sleep and REM sleep. Studies have already proven in the past that these characteristics enable better metabolism of toxic proteins (Tau & amyloids).
PSiO technology therefore appears to be a very promising avenue for halting Alzheimer's disease. To be confirmed by further research !

MIT research

Another avenue has been explored by MIT in the United States (*). Several studies conducted over the past ten years have shown that stimulation with pulsed light (blue and green) can reverse the course of Alzheimer's disease at an early stage. Following the initial studies, a MIT spin-off company, COGNITO, produced a prototype (**) consisting of a pair of glasses and a helmet that stimulates the brain (see photo). It appears that one of the studies also used vibroacoustic stimulation. Cognito Therapeutics : www.cognitotx.com

Research on light therapy and cognitive functions

(*) Major historical research has demonstrated the existence of retinal melanopsin receptors (470 nm) with a non-visual nervous system connected to the circadian clock. (1) Phototransduction in ganglion-cell photoreceptors - Dr. David Berson at Brown University - European Journal of Physiology© Springer-Verlag 200710.1007/s00424-007-0242-2

(**) Other research has shown the influence of blue light at 470 nm on all cognitive functions. (2) Blue Light improves cognitive performance - Dr. Lehrl & colleagues - Journal of Neural Transmission. Department of Psychiatry and Psychotherapy, University of Erlangen-Nuremberg, Erlangen, Germany. Published online: January 25, 2007

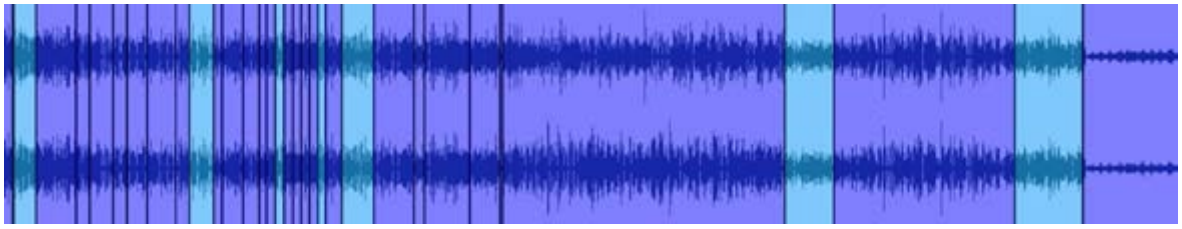
Pulsed blue light stimulation

PSiO technology allows us to select both the wavelengths and flashing frequencies used (40 hertz – 470 nm) by MIT, but the goal now is to use our own protocols for comparison purposes.

Thanks to further research and collaborations specializing in flashing frequencies and their influence on melanopsin receptors, PSiO TECH has been able to optimize its own stimulation sequences. A study conducted by S. Dumonceau proved the radical effectiveness of stimulation sessions using blue light emitted by PSiO glasses (***). S. Dumonceau also compared blue, green, and red light with a control group. However, this research, conducted in collaboration with a Brussels laboratory, must now be validated by an independent scientific body.

Study conducted by S. Dumonceau on the stimulation of the pineal gland by blue light: Summary of the study:
www.psio.com/en/research-melatonin.html
Full study : Study of the effectiveness of PSiO glasses on melatonin inhibition.

Stéphane Krsmanovic-Dumonceau, Nicolas d'Offay & Katrien Verschueren - August 2013 - Belgium



Stimulation by red light

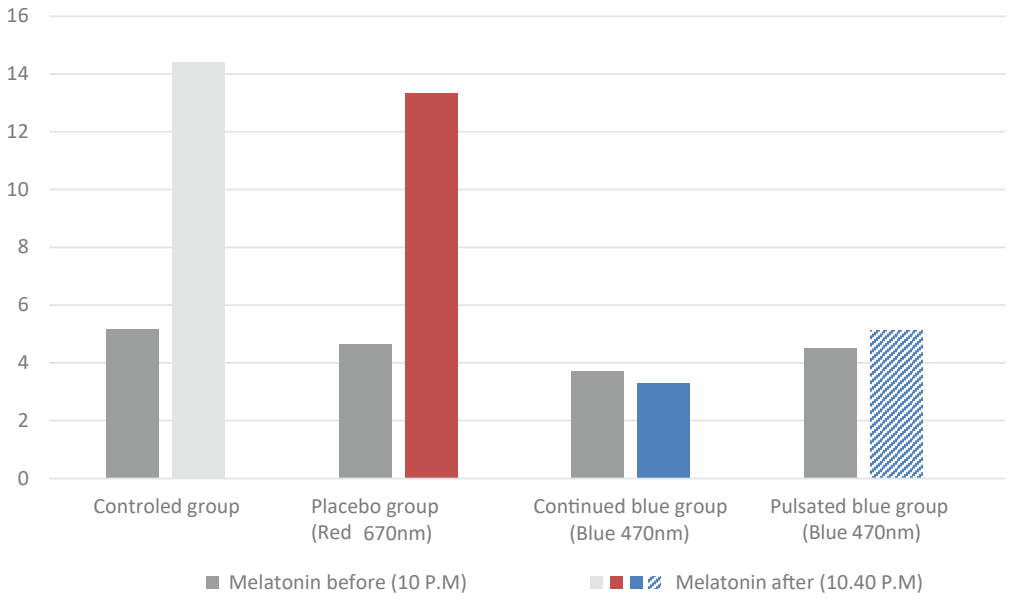
In addition, with 30 years of experience, S. Dumonceau has proven in a sleep laboratory that the stimulation frequencies generated are alpha and theta waves, a state of brain regeneration.

www.psio.com/en/research-brain-mapping.html

This research was conducted at Professor Sorel's neurology laboratory in Brussels. Study conducted by S. Dumonceau at the EEG laboratory of Professor Sorel's neurology department: :

www.psio.com/en/research-eeg.html

Red light or blue light on the biological clock (melatonin test) with PSiO



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