

Ajna Light Theory and Science - text from ajnalight.com

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The Ajna Light - What is it?

The Ajna Light was developed in 2014 to help people explore their intimate connection with the wisdom of the universe.

The pineal gland is a vestigial third eye which is located at the exact center of the brain. It has all the characteristics of the two optical eyes we use for everyday vision. The pineal gland has the remnants of the cornea and retina, and has the same light sensitive cells as the eyes. In the 1970s Fritz-Albert Popp at the University of Marburg in Germany showed that the spectral distribution of the emission was from 200 to 800nm, the visible and ultraviolet wavelengths. He showed that they were generated and detected by the vibration of DNA in the cell's nucleus, at 4GHz. It is thought that these biophotons form a light based communication between all the cells in the body, including bacteria in the gut (which make up 90% of the 100 trillion cells in the body).

The chakra system is the basis of the energetic model of yoga theory. The ancient yogis were aware of the flow of light energy in the body. They called the channels along which it flows Nadis, meaning energy nerves. There are 64,000 nadis in the energy body, with the main centers lying along a core running in front of the spine called the shushumna. The seven chakras are located along the shushumna, from the first chakra (called the root or muladhara) at the perineum to the seventh chakra (called the crown or sarishrara) at the top of the head. The pineal gland is located at the sixth chakra, the Ajna chakra. Therefore the energetic information from the entire body travels up to the pineal gland.

The pineal gland generates an endogenous psychotropic chemical called DMT (dimethyl tryptamine). Tryptophan is the amino acid which is the precursor to DMT, but the body has an inhibitor enzyme which normally prevents DMT being made from tryptophan. The shamans of South America intuitively selected two herbs, the leaves of the Ayahuasca shrub family called Psychotria which contain DMT added to the Caapi vine, a source of monoamine oxidase inhibitor (MAOI) which turns off the enzyme preventing DMT conversion.

DMT is naturally generated twice in the lifetime, at birth and again at death. It is responsible for allowing these potentially traumatic emotional life transition processes to happen gracefully. After a near death experience, one's full life flashes by, and a tunnel of light appears. Both of these effects are due to the psychedelic effects of DMT.

Shamans use Ayahuasca to connect deeply to nature, to give them the wisdom of our total interconnection with all of life. DMT brings teaching as part of a spiritual journey. However, as a psychotropic drug it is illegal in many countries, and also has potential dangers. It is important to use it for healing and spiritual growth, not for entertainment or escape from reality. Each person has a different sensitivity, so they may be overdosed or under-dosed. It can also take some hours for the effect to wear off, during which the user may be dizzy and need to vomit.

In the early 19th century, a Czech anatomist Jan Purkyně was the first to document a hypnogogic effect, during which various patterns appear at different rates of flicker. This hypnogogic effect occurs when we transition between being awake and asleep, and is a form of trance or hypnosis. In the trance state, our mental defenses are lowered, and we are open to a greater awareness than our typical controlling egoic state. More recently, in the 1910s, there was interest in this effect for generating a meditative effect, as each of the four brainwave patterns (alpha - alert, beta - relaxed, delta - meditative and theta - sleep) are stimulated by specific flicker frequencies. In the 1990s it was popular to use goggles with low power LEDs close to the eyes to produce this effect, but this is not a comfortable or powerful method of producing the hypnogogic effect.

The flicker effect has been studied since the 1960s using EEG. Similar to the use of binaural beats in music for hypnotherapy, the use of a constant flicker rate in lights will induce a trance state and entrainment of brainwaves. The Ajna Light uses this effect, but has other unique design characteristics which take the process much further than previous technology.

The Ajna Light uses the latest high power LEDs to allow the hypnogogic trance state to be induced easily and rapidly, and as soon as the Ajna Light stops playing the light pattern sequence, the receiver can quickly come back to the normal alpha or beta brainwave condition without the side-effects of Ayahuasca or LSD. The Ajna Light will take the user on a shamanic trance journey to connect to the root of their being, stimulating the pineal gland to open up psychic vision in a harmonious natural and powerful way, in balance with their own physiology.

Melanopsin

The Ajna Light invokes the physiological phenomenon of melanopsin, which has three aspects. The ganglial cells residing in the pigment of the retina are found in two classes. One is used to

visual purposes, and the other for detecting changes in season and other circadian rhythms. The visual aspect of melanopsin, in particular how it allows for high contrast sensitivity in low light conditions, was only discovered around 2010. The circadian rhythm aspect of melanopsin was discovered in the 1990s, although proposed earlier. Melanopsin stimulation also induces the tryptophan cascade, as a side effect of the circadian rhythm entrainment, a series of biochemical reactions which convert tryptophan to serotonin to DMT. Serotonin is present during the relaxation and sleep cycle. The molecule DMT is known as the God Molecule, as it is associated in high concentrations with spiritual consciousness. DMT is present in large concentrations during birth and at death. It helps the individual transition out of the uterus, and at death out of life, in a graceful manner. Near death experiences show a common pattern of transcendent experiences at these times, associated with the high levels of DMT. The Ajna Light, by stimulating melanopsin, causes a similar transcendent feeling, depending on how open the user is at the time of the session. Goggles and other Lights using halogen or warm light sources do not cause the melanopsin response present with the Ajna Light.

Visual Melanopsin

A special subclass of mammalian photoreceptor cells resides in the ganglion cell layer of the inner retina. These intrinsically photosensitive retinal ganglion cells (ipRGCs) express a photopigment called melanopsin. These special cells have the ability to respond to light in the absence of all rod and cone photoreceptor input. Although relatively few in number, ipRGCs extend their dendrites or nerve fibers across much of the retina. Therefore they can function as contrast detectors to assess changes in ambient light levels. Phototransduction in ipRGCs happens through transient receptor potential channels. These channels resemble the phototransduction cascade of invertebrate more than vertebrate photoreceptors. In addition, ipRGCs convey contrast (irradiance) information via the optic nerve to influence several functions. These nerve cell's dendrites are either shared or run alongside the optic nerve cell fibers.

It is now known that photoreception in the mammalian retina occurs outside of rod and cone cells. Research since the late 1990s showed that the melanopsin expressing retinal ganglion cells (mRGCs) provide this non-rod non-cone photoreception. The research also explains their extensive contribution to sub-conscious light responses. However, it was assumed that these mRGCs do not have a role in visual perception. However, it is now understood that there is an very extensive mRGC input to the primary visual pathway. Mice have this mechanism extensively, with 40% of neurones in the mouse visual thalamus having melanopsin signals, superimposed upon more conventional visual information.

The current research, highlighted below, shows that mRGCs connect directly into the visual system. The Ajna Light directly stimulates this pathway by using cool white LED modules, which

includes the 480nm melanopsin wavelength. Therefore activation of the waking visual system as well as the more indirect neural pathway from the retinal ganglial cells to the pineal gland described below (see pulsed melanopsin) occur together when using the Ajna Light. This combination may explain some of the subconscious and emotional clearing which has been observed using the Ajna Light over multiple sessions.

quoted directly from web articles about mRGB retinal ganglion cells:

ipRGCs are a novel mammalian photoreceptor whose morphological and physiological characteristics seem well suited for their primary role as light detectors for non-image forming visual reflexes. However, many mysteries remain, and an untold number of functions for this rare and special type of ganglion cell should not be overlooked. Their invertebrate-like phototransduction cascade makes them unique among all other known vertebrate photoreceptors, and provide a window into possible mechanisms of the evolution of the retina. In addition to their intrinsic melanopsin-driven photosensitivity, ipRGCs also receive rod and cone synaptic input and thus may provide the brain with different information in series, separated by complex spatial and temporal dynamics. Although they drive a number of tonic behaviors, requiring accurate representation of ambient light levels of long periods of time, ipRGCs have the ability to adapt to both light and darkness, and appear to have an ability to communicate back to the retina, possibly changing the functional properties of retinal circuitry. As the years catch up with this relatively young field of intrinsically photosensitive retinal ganglion cells, it is beginning to look like many ganglion cell types are melanopsin photoreceptive and have dual roles in both image processing, color processing and subconscious circadian photoentrainment.

It is now over 10 years since the remarkable discovery that photoreception in the mammalian retina occurs outside of rod and cone cells. In that time we have learnt a great deal about the melanopsin expressing retinal ganglion cells (mRGCs) that provide this non-rod non-cone photoreception, and about their extensive contribution to sub-conscious light responses. However, one idea that has persisted is that these mRGCs play little if any role in visual perception. Exciting new data challenge that view. Thus, we have recently described an extraordinarily extensive mRGC input to the primary visual pathway. This provides ~40% of neurones in the mouse visual thalamus with melanopsin signals, superimposed upon more conventional visual information.

mRGCs inform the brain about the irradiance (that is, brightness or intensity) and protracted presence of a light stimulus that is hitting the retina. This information isn't available from rods and cones because they either become saturated at low light levels (rods) or do not provoke much sustained activity in the brain (cones).

Rods and cones are the most well-known photoreceptors in the retina, activating in different light environments. Rods, of which there are about 120 million in the human eye, are highly

sensitive to light and turn on in dim or low-light environments. Meanwhile the 6 million to 7 million cones in the eye are less sensitive to light; they drive vision in brighter light conditions and are essential for color detection.

Rods and cones were thought to be the only light-sensing photoreceptors in the retina until about a decade ago when scientists discovered a third type of retinal photoreceptor – the ipRGC, or intrinsically photosensitive retinal ganglion cell – that contains melanopsin. Those cells were thought to be needed exclusively for detecting light for non-image-dependent functions, for example, to control synchronization of our internal biological clocks to daytime and the constriction of our pupils in response to light.

“Rods and cones were thought to mediate vision and ipRGCs were thought to mediate these simple light-detecting functions that happen outside of conscious perception,” Schmidt said. “But our experiments revealed that ipRGCs influence a greater diversity of behaviors than was previously known and actually contribute to an important aspect of image-forming vision, namely contrast detection.”

The Johns Hopkins team along with other scientists conducted several experiments with mice and found that when melanopsin was present in the retinal ganglion cells, the mice were better able to see contrast in a Y-shaped maze, known as the visual water task test. In the test, mice are trained to associate a pattern with a hidden platform that allows them to escape the water. Mice that had the melanopsin gene intact had higher contrast sensitivity than mice that lack the gene.

“Melanopsin signaling is essential for full contrast sensitivity in mouse visual functions,” said Hattar. “The ipRGCs and melanopsin determine the threshold for detecting edges in the visual scene, which means that visual functions that were thought to be solely mediated by rods and cones are now influenced by this system. The next step is to determine if melanopsin plays a similar role in the human retina for image-forming visual functions.”

Tryptophan to DMT - Melanopsin Induced Cascade

Melanopsin, the photopigment of retinal ganglion cells that interacts with retinal (vitamin A), has been shown to induce light sensitivity in non-sensitive cells. In retinal ganglion cells, stimulation of melanopsin with sky blue light around 480nm wavelength activates transient receptor potential channels (TRP channels) via a G-protein signaling cascade, resulting in calcium influx. The melanopsin opens calcium channels in the cell which activates the NFAT pathway.

Tryptophan is a component of protein-rich foods. It is one of the twenty essential amino acids from which all proteins are made. Serotonin is generated at the end of the tryptophan

processing reactions or cascade. Serotonin is seen as responsible for relaxation and sleep, although the full biochemistry is much more complex than that..

The three bioactive proteins or thermobiles are serum albumin, alpha lactalbumin and lactoferrin. Meditation research on spirit molecules has shown that alpha lactalbumin increases the following neurotransmitters in the chemical cascade starting from amino acid tryptophan -> serotonin -> melatonin -> pinoline -> 5-MeO-DMT (5-methoxy-dimethyltryptamine) -> DMT (dimethyltryptamine).

taken directly from web articles about tryptophan biochemistry:

Chemistry of Consciousness & Re-Awakening of Spirit Molecules

Complete darkness profoundly changes the sensory sensibilities of the brain. The body is deprived of all visual reference. Sounds begin to fall away as we lose contact with the external world and turn the senses inward. The effect of darkness is to shut down major cortical centers in the brain, depressing mental and cognitive functions in the higher brain centers. Emotional and feeling states are enhanced, especially the sense of smell and finer senses of psychic perception. Dreams become more lucid, and the dream state manifests in our conscious awareness. Eventually, we awaken within ourselves the awareness of the Source, the spirit, the soul. We descend into the void, into the darkness of deep, inner space. The light appears.

The dark room environment dramatically alters the chemistry of the brain, manifesting especially in neuro-endocrine systems which govern consciousness and regulate body functions. An important neurotransmitter involved in waking consciousness (serotonin) converts into a regulatory hormone (melatonin) that shuts down the organ systems, quieting the body in preparation for the finer and subtler realities of higher consciousness. The pineal gland initiates a cascade of inhibitory reactions, permitting visions and dream states to emerge in our conscious awareness. Eventually, the brain synthesizes the "spirit molecules" 5-methoxy-dimethyltryptamine (5-MeO-DMT) and dimethyltryptamine (DMT), facilitating the transcendental experiences of universal love and compassion.

Tryptophan

Serotonin

Melatonin

Pinoline

5-MeO-DMT

DMT

The spirit molecules are synthesized from the amino acid tryptophan in a series of biochemical steps shown above. The spirit molecules enable the nourishment and sustenance of the soul, sought daily in deep sleep and dream.

The direct experience of consciousness is often discordant with the necessities of physical existence on Earth. Thus, in the waking state, the body inhibits 5-MeO-DMT and DMT synthesis by producing the compound MAO to deactivate the serotonin -- DMT pathway. To maintain its connection to the soul, however, the body must periodically inhibit the action of monoamine oxidase (MAO), allowing for DMT synthesis and a return to the Source. This is accomplished by enzyme inhibitors, such as harmine and harmaline, which are secreted by the pineal gland in response to circadian rhythms and the darkness of night. The pineal gland also produces the hormone melatonin, which helps regulate circadian rhythms in the body.

Daylight is the cue that inhibits our essential connection to the Source, but facilitates physical survival on Earth. The Dark Room experience relaxes this constraint, by inhibiting the inhibitor, thereby activating the consciousness connection; for example, the pineal secretion of harmaline inhibits MAO, itself an inhibitor, allowing synthesis of 5-MeO-DMT and DMT. Thus, in the Dark Room, our biochemical connections to the Source are re-established. The Dark Room facilitates the synthesis and accumulation of the spirit molecules (5-MeO-DMT and DMT) in the brain, and hence the experience of our true nature, of love and compassion energy, and our reconnection with the Divine Tao (Wu Chi).

Tryptophan (Psychoneurobiology)

Increased brain serotonin levels improve the ability to cope with stress, while a decline in serotonin activity is associated with depression. Tryptophan is the amino acid that increases serotonin levels in the brain. Its transportation into the brain is dependent on other amino acids with a neutral charge. This influences tryptophan exchange via the ratio of tryptophan to the sum of other large neutral amino acids. A diet high in proteins that have high amounts of tryptophan may theoretically increase brain serotonin levels.

Twenty-nine (29) highly stress-vulnerable subjects and 29 other subjects participated in a double blind, placebo controlled study where all subjects were exposed to various experimental stresses after the intake of a whey protein (lactalbumin) or a casein supplement. Changes in mood, skin conductance, cortisol levels and plasma tryptophan/amino acid ratios were all assessed before and after the stress tests.

The researchers chose to assess lactalbumin protein fraction as it possesses one of the highest concentrations of tryptophan of any known protein. The scientists were interested to see if a protein supplement could induce favorable brain serotonin levels.

Results showed while the casein supplement produced little effect, the whey protein supplement increased the plasma tryptophan/amino acid ratio by 48%. In the stress vulnerable subjects the whey protein decreased cortisol levels and reduced depressive feelings and improved their ability to cope with the tasks presented. The scientists suggested the results obtained could only mean the whey protein supplement was able to increase brain serotonin levels.

The bovine protein alpha-lactalbumin increases the plasma ratio of tryptophan to the other large neutral amino acids, and in vulnerable subjects raises brain serotonin activity, reduces cortisol concentration, and improves mood under stress.

BACKGROUND: Increased brain serotonin may improve the ability to cope with stress, whereas a decline in serotonin activity is involved in depressive mood. The uptake of the serotonin precursor, tryptophan, into the brain is dependent on nutrients that influence the cerebral availability of tryptophan via a change in the ratio of plasma tryptophan to the sum of the other large neutral amino acids (Trp-LNAA ratio). Therefore, a diet-induced increase in tryptophan availability may increase brain serotonin synthesis and improve coping and mood, particularly in stress-vulnerable subjects.

OBJECTIVE: We tested whether alpha-lactalbumin, a protein with high tryptophan content, may increase the plasma Trp-LNAA ratio and reduce depressive mood and cortisol concentrations in stress-vulnerable subjects under acute stress.

DESIGN: Twenty-nine highly stress-vulnerable subjects and 29 relatively stress-invulnerable subjects participated in a double-blind, placebo-controlled study. Subjects were exposed to experimental stress after the intake of a diet enriched with either alpha-lactalbumin or sodium-caseinate. Diet-induced changes in the plasma Trp-LNAA ratio and prolactin were measured. Changes in mood, pulse rate, skin conductance, and cortisol concentrations were assessed before and after the stressor.

RESULTS: The plasma Trp-LNAA ratio was 48% higher after the alpha-lactalbumin diet than after the casein diet ($P = 0.0001$). In stress-vulnerable subjects this was accompanied by higher prolactin concentrations ($P = 0.001$), a decrease in cortisol ($P = 0.036$), and reduced depressive feelings ($P = 0.007$) under stress.

CONCLUSIONS: Consumption of a dietary protein enriched in tryptophan increased the plasma Trp-LNAA ratio and, in stress-vulnerable subjects, improved coping ability, probably through alterations in brain serotonin.

A massive amount of evidence suggests that low serotonin levels are a common consequence of modern living. High levels of cortisol, a hormone produced by the adrenal glands in response to stress, and loss of sensitivity to insulin, which can be caused by eating too many foods high in simple sugars, are two of the biggest culprits, because they impair conversion of tryptophan to

5-HTP. In short, the lifestyle and dietary practices of many people living in this stress-filled era result in lowered levels of serotonin within the brain. Consequently many people are overweight, crave sugar and other carbohydrates, experience bouts of depression, get frequent headaches, and have vague muscle aches and pain. All of these have been helped by raising serotonin levels with glutathione supplement.

Pulsed Melanopsin

The Ajna Light makes use of the physiological phenomenon of melanopsin, but combines it with pulsing. Biological systems are sensitive to pulsed signals, such as binaural and isochronic (constant drum beat rhythm) beats in music, and the flicker effect with light. This third vision system, is in addition to the widely understood systems of the cones (color vision, mainly in the fovea) and rods (monochrome, mainly peripheral vision). It was first discovered and described in 1998, as the result of investigation of light sensitivity in frog skin cells.

Melanopsin happens most strongly at 481nm light wavelength (sky blue color, the dominant color of light in evolution, and present in primitive physiology to measure the passing of the day and therefore calibrate the diurnal clock). We know little about it, as it is a recently discovered phenomenon. Purely on the physiological level, with constant illumination, the melanopsin effect is well understood. It brings the brain into synchrony with the circadian clock, timing all the cycles of hormones for alert sympathetic action during the day, and parasympathetic restorative and digestive processes at night.

taken directly from web articles:

Melanopsin originates in the connective tissue of the retina, between the cones and rods. The cells which have this function are named [intrinsically photosensitive Retinal Ganglion Cells](#) (ipRGCs), and have been shown to conduct light directly to the hypothalamus for entrainment to the circadian rhythm. More specifically, the retinohypothalamic tracts allow signaling from the ipRGCs to the suprachiasmatic nucleus, a small region of typically 20,000 cells located in the [hypothalamus](#), situated directly above the [optic chiasm](#). Some people have a larger SCN, others smaller. The peak wavelength of sensitivity in the melanopsin system is 488nm, the color of sky blue, which was the dominant visual stimulation during aeons of evolution. The Ajna Light uses a peak of 5000 lumen of cool white LED light which includes this frequency. It is thought that by the stimulation of the hypothalamus, the same mechanism which occurs daily in deep sleep are induced. Deep sleep (delta brainwave) turns off parts of the brain to allow for detoxification of

metabolic byproducts created during the activities of the day. This deactivation of the brain, possible while in the conscious state using the Ajna Light, allows the user to obtain an open connection to the quantum information field of consciousness. This phenomenon is observed in the feedback given by users of the Ajna Light.

It is not yet known what the effects of pulsed melanopsin stimulation are, but one study <http://www.jphysiolanthropol.com/content/31/1/23> indicates that the retinal ganglial cells respond by adjusting the size of the pupil just as well to 100us pulsed blue light as to full illumination, even though the subjects were not aware of the color blue used in the pulsed LED light.

Furthermore a meta study entitled <http://webvision.med.utah.edu/book/part-ii-anatomy-and-physiology-of-the-retina/elanopsin-ganglion-cells-a-bit-of-fly-in-the-mammalian-eye/> of pulsed melanopsin studies has the following conclusion:

"ipRGCs are a novel mammalian photoreceptor whose morphological and physiological characteristics seem well suited for their primary role as light detectors for non-image forming visual reflexes. However, many mysteries remain, and an untold number of functions for this rare and special type of ganglion cell should not be overlooked. Their invertebrate-like phototransduction cascade makes them unique among all other known vertebrate photoreceptors, and provide a window into possible mechanisms of the evolution of the retina. In addition to their intrinsic melanopsin-driven photosensitivity, ipRGCs also receive rod and cone synaptic input and thus may provide the brain with different information in series, separated by complex spatial and temporal dynamics. Although they drive a number of tonic behaviors, requiring accurate representation of ambient light levels of long periods of time, ipRGCs have the ability to adapt to both light and darkness, and appear to have an ability to communicate back to the retina, possibly changing the functional properties of retinal circuitry. The functional role these processes have on animal behavior remains to be understood. As the years catch up with this relatively young field of intrinsically photosensitive retinal ganglion cells, new and interesting cell types are being revealed and there is still much to learn in the future about them."

For users wishing to explore their own consciousness without the use of psycho-active drugs, flickering lights are highly effective and beneficial. However, prior to the Ajna Light, the state of the art was very limited in its effectiveness, due to the use of much lower power LEDs in goggles, different colored LEDs, or much higher heat output lights such as halogen lights.

The very intense psycho-spiritual journeys reported by Ajna Light users (see the video and text on the Experiences tab on <http://ajnalight.com>), such as seeing guides, and having extended out of body experiences, do not happen on previous technology using just the flicker effect. Research is underway to document and understand the phenomenon of melanopsin related to the Ajna Light.

Flicker Effect

Since ancient times, the flicker effect has been used to create altered states of consciousness. As described in the article

<http://web.stanford.edu/group/brainwaves/2006/theclinicalguidetosoundandlight.pdf> :

"Apuleius experimented in 125 A.D. with the flickering light produced by the rotation of a potter's wheel, finding that it could reveal a type of epilepsy. Ptolemy studied in 200 A.D. the phenomenon of the flickering generated by sunlight through the spokes of a spinning wheel. He noted that patterns and colors appeared in the eyes of the observer and that a feeling of euphoria could be experienced. French psychologist Pierre Janet, one of the first who reported a "rescripting" procedure (see section on Clinical Considerations), noticed that the patients at Salpetriere Hospital in Paris experienced reductions in hysteria and increased relaxation when exposed to flickering lights. "

In the same article , the author concludes:

" Richardson & McAndrew showed that a photic-stimulation frequency of 6 Hz produced more imagery than did stimulation frequencies of 10 or 18 Hz. In another study by researchers Lehmann, Koukou & Andreae (1979), during which subjects were encouraged to absorb themselves in fantasy, 9 percent of imagery reports were given during alpha EEG and 59 percent during theta. Richardson and McAndrew (1990) stated that, "Of all the many procedures to bring about an equivalent of the naturally occurring hypnagogic state (Schacter, 1979) and which, in turn, facilitate the emergence into awareness of visual imagination images, the easiest, safest and potentially most precise in its effects, is photic stimulation." In the reports of Glickson (1986), Kooi (1971), and Moses (1970), there is evidence that changes in flash frequency can produce corresponding changes in dominant EEG frequency. These conclusions, along with the data from the previously noted studies, would seem to indicate that the use of L/S may indeed facilitate the uncovering of suppressed or repressed memories in the form of visual flashbacks or at least symbolically coded visual information related to the actual events. "

Photonic Brainwave Entrainment

Light stimulation from the retina passes through the thalamus on the way to the occipital ridge at the back of the brain. The thalamocortical networks are made up of neurons in both the thalamus and cortex. The thalamus inhibits external stimuli from affecting the EEG when asleep - in the sleep state the EEG follows its internal 90 minute cycles of theta (REM) and delta (deep sleep) patterns, independent of outside light and sounds.

There are two main inputs to the thalamocortical region of the brain. Cortical neural mappings of external events enter into the ventrobasal thalamus. The neurons there project onto layer IV of the cortex as a result of specific external events. Similarly, nonspecific inputs give context from the internal state of the brain and enter into the centrolateral thalamus with axons in layers I and VI. Both types of thalamocortical neurons have synapses which connect to the pyramidal cortical cells which are thought to integrate them. In this way, external sensory information is introduced into the active context of cognition. The observed electrical effect of thalamocortical resonance from stimulation of the thalamocortical region produces coherent areas of similar EEG activity through vertical layers of the cortex.

It is therefore in the thalamus that external stimulation through pulsed light activates groups of neurons. The rhythmic EEG patterns seen, such as gamma frequencies in directed logical thinking, derive from cascading entrained firing of neurons in this region. By supplying a high level of external photonic stimulation, as the Ajna Light does, the entrainment of the brain affects the functioning of the thalamus, and therefore causes the hypnagogic effect of theta stimulation, and the deep meditative effect of delta stimulation.

Light stimulation is more effective in entraining the brain than sound stimulation, perhaps because of the greater number of neurons used for the visual system than the auditory system.

Using the Ajna Lamp

The Ajna Lamp is controlled using the lamp.com website served by the Ajna Lamp to play light files (.ajna) and music (.mp3). You can also upload more .ajna and your own .mp3 files to the Ajna Lamp. You can find new ajna files at AjnaLight.com. Light and sound play in sync, because they are started together when you touch the play button.

Sit in front of the Ajna Lamp, placing it at the level of your eyes, or lie down using a standard camera tripod to position the lamp above your forehead. Your eyes should be about 20cm to 30cm (8 to 12 inches) from the LED modules in the Ajna Lamp. Touch the play icon in the home page, and select the light sequence and music you wish to play, as well as the length of the light session. Then touch the play button and close your eyes. The light sequence will start to play a

few seconds later.

Light flicker frequencies entrain brainwaves, bringing you into a relaxed and meditative state. If you are stressed or have a busy mind, even with your thoughts active while the light sequence is playing, you will automatically be brought into a more relaxed state. There is no need to try to stop your thoughts, just observe your sensations during the light session. The Ajna Lamp assists you entering the meditative state without years of meditative practice.

The Ajna Light system uses very powerful LED lights (5000 lumens total, the same as a 250W halogen bulb) flickering at specific frequencies between 1Hz and 50Hz to entrain the user's brainwaves into a range of trance states, from a light relaxing state to the deepest meditative state. Deep meditative states activate the pineal gland, located in the center of the brain (the sixth chakra or third eye). When activated, the pineal gland produces DMT (dimethyl tryptamine) from the naturally occurring amino acid tryptophan. In a similar way to hallucinogenic drugs, the user can gain great spiritual insights during this process, but the great advantage of using the Ajna Light is that it does not change the brain chemistry, and therefore the effect stops as soon as the lights stop.

Extensive testing with people from different backgrounds and spiritual interests during the development of the Ajna Lamp showed that although each person's reaction and subjective experience is different, and each session is different even with the same music and light sequence, the result was relaxing and centering. The user, when open and receptive, was also able to go on a soul retrieval journey, and to connect with guides, elemental beings, and other consciousnesses outside or inside their own waking mind-state.

Controlling the Lamp Computer

The Ajna Light plays light files (.ajna) and music (.mp3) on the lamp computer in sync to bring you into a deep meditative state through light activation of the pineal gland and brainwave entrainment. The lamp is accessed through WiFi. The lamp computer is a WiFi access point (AP). The WiFi network AP name is AjnaLamp-xxxxxx, you select this network in your phone, tablet Settings app. Each Ajna Lamp has a unique code xxxxxx which allows you to distinguish between Ajna Lamps if you are in WiFi range of more than one lamp.

The Lamp computer uses four software technologies (Linux OS, Apache2 webserver, MPD mp3 player daemon, and Perl scripting language - LAMP) as well as jQuery and Ajax for running responsively on the client phone or tablet.

First connect to the WiFi Access Point in your phone or tablet Settings app. After you select the AjnaLamp-xxxxxx address, enter the password pineal777 the first time you access the lamp. Go

to your browser and enter lamp.com in the address bar to access the lamp website app.

Only one user can control the lamp at a time, so the Ajna Lamp WiFi AP does not connect to the internet. The lamp is therefore protected from outside internet clients. The lamp computer provides DNS service, which means that any internet URL requested (such as google.com) will access the lamp website. If you wish to access the internet while using the lamp, go to the Settings app and either turn off WiFi if you have a phone data service, or select another WiFi AP which connects to an internet router.

If there is more than one user connected to the lamp WiFi AP, only one is granted access to the lamp hardware at a time. At the top of the website page, the header displays the user name of the client's phone, tablet, or other computer in the top right corner, and a list of users currently on the lamp in the center of the screen, just below this. If you are not currently running the lamp, your user name is listed as waiting. You are only made the running user if the lamp is idle when you click the play button in the play page. If there is already another user shown as running, the lamp is working and therefore not available. Once the lamp has finished running, the running user is shown as waiting again. If you wish to abort a session started by another user (for example, if the running user is no longer present for some reason), you can do so by clicking the abort button. The abort button appears when the lamp is already running when you click the play button.

The Ajna Lamp website app controls the lamp to play light files (.ajna) and music files (.mp3) by touching the Play icon. Light and sound play in sync, because the light sequence and the music start playing together. The website app also allows you to upload and delete .ajna and .mp3 files by touching the Upload icon, to test the effect of any flicker frequency touching the Test icon, and to search the session log to find out when users had sessions by touching the Session Log icon. Details about these functions are provided by touching the Info icon.

Electrical Safety

The Ajna Lamp uses 12V DC power, the peak current requirement is 4A, and average current when the LEDs are running on full intensity is 2A. The Anja Light package includes a universal (120V or 240V AC input) power adapter, rated at 12V 6A output. This power adapter is fully certified for electrical safety by CE, RoHS, CCC, B, NOM etc.

The US government CE certification website states:

"All electrical equipment designed for use with a voltage rating between 50 and 1000 volts for alternating current (AC) or between 75 and 1500 volts for direct current (DC) are covered by the Low Voltage Directive. Voltage ratings refer to the voltage of the electrical input or output, not to voltages which may appear inside the equipment."

The Ajna Lamp inputs 12V DC, and therefore does not need CE or other certification for safety.

Solar power systems run at multiples of 12V DC, and therefore if you have a solar power controller which outputs at least 6A, you can run the Ajna Lamp directly without using an inverter to convert the solar power up to 120V or 240V AC.

If you are using a diesel power generator for your electrical supply, it is necessary to use a UPS to protect the Ajna Lamp, as stated above.

LST Theory

Theory of Light Self Therapy

LST means Light Self Therapy. It derives from Ericksonian psychology and various methods of working with the hypnogogic state (between awake and asleep) when the mind sees images, a kind of trance we go into each night just before sleeping. In the 1960s and 1970s, LSD was popular as a method of going through The Doors of Perception, opening the third eye or pineal gland to give psychic awareness. Strobe lights and goggles with low power LEDs have been used since then to help artists tap into inner creative states, as well as just for entertainment. icelens The Ajna Light advances the state of the art by using very high powered LED modules and computer sequencing of the light flicker frequencies. The results show that the Ajna Light is a very powerful aid to both relaxation and meditation, as well as accessing inner wisdom.

Written records from ancient Egypt, dating from 5000 years ago or more, show that the

Egyptian priests, in the healing temples such as the Temple of Imhotep in the city of Saqqar, understood that it is the unconscious mind which effects healing of emotional and spiritual issues. These issues show up in the body as symptoms, the sign of the body trying to heal itself and detoxify and clear energetic blockages. Engaging the patient through hypnotic suggestion and the medium of cultural symbols such as the gods and mental overload took the patient out of ordinary consciousness (alpha and beta brainwaves) and into a receptive trance state (theta, gamma, and delta brainwaves). Using trance induction through herbs and rhythmic prayer recitation for hours, the patient was then taken to a dark room to sleep and receive a vision of a cure. The patient themselves received the guidance directly from their unconscious mind, in the delta brainwave state of sleep. The trance state resulting from the herbs and rhythmic chanting took the patient beneath the usual alpha and beta brainwave states of waking, controlled consciousness.

When the Greeks, starting notably with Pythagoras around 500 BC, came to learn the ancient wisdom, they took the idea of temple sleep to Greece. The Greek god of healing, Aesculapius, had healing temples for sleep therapy. The sleep chamber in the Greek temples were filled with snakes, the symbol of Aesculapius. The patient was in a highly suggestive state of consciousness (theta brainwave), and therefore the usual inhibitions of the waking consciousness were avoided, so the wisdom of the unconscious mind could discover the patient's own form of healing. Temple sleep was an early form of hypnotherapy. Stretching back in time to the earliest trance induction techniques of shamanism, this wisdom of self healing has been reborn in our own time through trance dance, drumming, chanting and brainwave entrainment hypnosis using sound and light. The Ajna Light is part of this reconnection to ancient shamanic wisdom, trusting and helping the soul to heal itself and the body.

The Greeks also used divination through oracles. Before receiving the words from the oracle, the seeker was given herbs and taken into dark chambers filled with candles and brightly colored paintings. The hypnogogic images seen with the Ajna Light have the same quality of taking the user out of the ordinary state of consciousness and into trance, as well as out of body, when the user is open to that.

"The temple-sleep was one of the remedies employed by the priests of Egypt. Anyone who had suffered loss of health in any way in those days was not treated as a rule with external remedies; there were only a few of these, and they were seldom used. Sufferers were in most cases taken to the temple and there put into a kind of sleep. It was not an ordinary sleep, but a kind of somnambulistic sleep which was so intensified that the patient became capable of having not chaotic dreams merely but of seeing orderly visions. During this sleep the patient perceived etheric forms in the spiritual world, and the wise priests understood the art of influencing these etheric pictures which passed before the sleeper; they could control and guide them."

In modern times, psychologists and psychiatrists have taken over the role of the healing temple

priests. As a result of the controlling, reductionist scientific dogma established by Descartes 300 years ago, every deviation from average in society is treated as illness to be drugged and repressed chemically in the patient's body. As a fear based paradigm, western allopathic medicine dis-empowers the patient, and makes the patient controllable and exploitable for profit by the pharmaceutical corporations. The rising chronic sickness of developed countries is seen as inevitable, and a normal part of getting old. Turning children into future profit resources for the sickness industry is accepted and encouraged by governments, who respond to the 'greed for profit at any cost' model of social capitalism.

If we are to recover our power and health, we need methods and therapies which give this power back to the individual patient, as in the ancient world. Already it is evident that the level of conformity to the institutionalized corporate sickness policies is reducing. More people buy organic food, and soda consumption has fallen about 10% in the last few years.

Part of this impulse for self healing modalities is the Ajna Light. It uses the same concept as the ancient world, which is that in the absence of egoic, fear-based control structures of normal alpha and beta wave consciousness, the power of self healing is revealed in the trance states of gamma, theta and delta brainwave states.

The visionary psychiatrist, Milton Erickson, 1901-1980, understood the impossibility of using the egoic consciousness to manipulate and "fix" deviations in the unconscious mind. The more someone tries to force a certain mental state, the more the inner child resists and sabotages the effort. Typical talk therapy falls into this trap - because the more therapists seek to control the patient and implant new behaviors, the more the therapy will be resisted by the ego and unconscious mind, and fail to cause positive change. It is the same in meditation. The greater the effort to meditate, the greater the sabotage by the unconscious inner child. Erickson understood that there are many levels of trance, including light trances present in any focused activity such as reading, physical exercise, and even the state of confusion. By recognizing the positive traits in the unconscious mind, with its own desires and beliefs, Erickson could engage the unconscious mind to help in the healing process. Many of his techniques influenced the development of NLP theory and practice.

The Ajna Light directly mediates with the unconscious mind, and the neurophysiology of the body. The focused state, a light trance, is characterized by a 40Hz sweep of electrical waves from the thalamus to the back of the head. Using this frequency in the light patterns entrains the brain into this trance state. If you look at the faces of the Ajna Light Experiences videos, you can clearly see the trance states. Shamanic drumming is another ancient method of inducing trance, and I have found it to create much deeper trance when combined with the Ajna Light. The Ajna Light patterns utilize all the brainwave frequencies to produce a broad range of induced responses, from the lightest trance using low light intensity and alpha or beta flicker frequency to the deepest trance state using the maximum light intensity and delta flicker

frequency.

Effect of Light Flicker Frequencies

Certain flicker frequencies directly stimulate a relaxed, meditative state, corresponding to certain brain wave patterns, because the flickering lights entrain these wave patterns in the brain. This effect is called the hypnagogic effect, and occurs naturally as you are just between being awake and asleep. These frequencies are:

- Delta (deep meditative state): exact multiples of 4Hz, especially around 20Hz
- Theta (sleeping state): 4Hz – 8Hz and multiples
- Alpha (alert, relaxed state): 8Hz – 13Hz and multiples
- Beta (awake, thinking state): 13Hz – 30Hz and multiples
- Gamma (conscious awareness): 30Hz and above, particularly 40Hz
- Schumann Resonance (Earth electromagnetic peaks, corresponding to EEG alpha - theta): 8Hz, 14Hz, 20Hz, 26Hz, 33Hz, 39Hz, 45Hz and 51 Hz (vary over 24 hours, and during thunderstorms)

Alpha brainwaves happen in relaxation, often when the eyes are closed, during light meditation or a daydream. It is an easy alert state of focus and concentration. This state engages your imagination and powers of visualization. The pacemaker cells in the thalamus generate alpha waves when they are coherent (in phase). As the brainwaves slow down in alpha to 8Hz, intuition comes, as low alpha is on the edge of the unconscious mind range (delta and theta).

Beta brainwaves happen in normal alert waking consciousness, when the logical mind is reasoning, judging, analyzing and thinking. As the brainwave frequency increase in beta, there is disconnect from the intuitive low alpha state. The inner critic becomes stronger, leading to physiological, emotional and mental symptoms of stress. These symptoms include shallow breathing, worrying, obsessive thoughts, elevated heart rate and blood pressure, and high levels of adrenaline.

Gamma brainwaves are associated with insight and high-level information processing. perception occurs when the 40Hz gamma wave, originating in the thalamus, sweeps the brain from front to back bringing different neuron regions into synchrony. If the thalamus is even slightly damaged, this wave stops, conscious awareness does not form, and the person falls into profound coma. Gamma waves have been induced using light frequencies delivered through fiber optic cable in mice brains. Researchers performed this study in the frequency range of

8Hz–200Hz. The study produced empirical evidence of gamma wave induction in the approximate interval of 25–100 Hz. The gamma waves were most apparent at a frequency of 40Hz. Gamma waves have been observed in Tibetan Buddhist monks during a 2004 study with eight long-term Tibetan Buddhist monks. When the monks were asked to generate a feeling of compassion during meditation, their brain activity began to fire in a rhythmic, coherent manner, suggesting neuronal structures were firing in harmony. This was observed at a frequency of 25–40 Hz, in the range of gamma waves. These gamma oscillations in the monk’s brains were the largest seen in humans.

Delta brainwaves occur during deep non-dreaming sleep, and also during the deepest level of meditation. The delta state of meditation is experienced by those with many years of practice, when awareness is fully detached from the outside world. The delta state accesses the power and knowingness of your unconscious mind. Delta is the gateway to the universal mind and the collective unconscious, known in yoga as the akasha, where all the information in the universe is available which is otherwise inaccessible at the conscious level. In the delta state, cerebro-spinal fluid (CSF) washes out toxins resulting from waking metabolic processes out of the brain. The neurons shrink in size by 30% at this stage of sleep, so the CSF can flush through the brain. The body heals and regenerates.

Theta brainwaves happen during deep meditation and the REM periods of light sleep. It occurs every time you drift into sleep, and is called the hypnogogic state. Images are seen during this time as you are just entering sleep, although you are still just awake and aware. The subconscious mind is active in theta. It is the frequency in which people are easily influenced. Children, up to the age of five years, are in a constant theta state and are therefore easily conditioned by the family emotional environment. After the core unconscious belief system and the mask of the personality are formed during the first five years, the child changes brainwave frequency to dominant beta and alpha states, which persists throughout adulthood. The child no longer believes in magic, and loses the natural, open, loving and non-judgmental awareness of early childhood. Deep spiritual connection and unity with the universe occur in meditation at the theta state. The inner voice of theta is a profound aware silence and it allows you to experience clear, beautiful visualizations, great inspiration, creativity and insight.

Brainwaves and Production of Neurotransmitters

Alpha brain waves: Thinking and action come from the parietal lobe. It produces alpha waves and the neurotransmitter acetylcholine.

Beta brain waves: The frontal lobe, which controls movement and responds to messages that it receives from the sense organs via the hypothalamus, is associated with the neurotransmitter dopamine.

Theta brain waves: Memory and language are governed by the temporal lobe, that sits just

below the frontal and parietal lobes and balances their operation. The temporal lobe produces theta brain waves and the neurotransmitter GABA (gamma amino butyric acid).

Delta brain waves: The occipital lobe is at the back of our head. It controls our visual function, regulates our rest, and synchronizes all the cerebral lobes. It produces delta brain waves and the neurotransmitter serotonin.

The first five Schumann Resonance modes (0-35 Hz) correspond with the frequency range of the first four EEG bands. These EEG frequency bands are: Delta 0.5 to 4 Hz, Theta 4-8 Hz, Alpha 8-13 Hz and Beta 13-30 Hz.

The perception of color occurs mainly around 12Hz while subjective images are induced over the whole range of frequencies, from 1Hz to 40Hz.

When someone has attentive focus, either in the alert alpha state, during REM periods of sleep, or in a deep meditative state, there is a 40Hz unifying brainwave which sweeps from front to back of the brain, originating in the thalamus. It is thought that this 40Hz synchronization of neuronal discharges causes the integration of distributed neurons in the brain, bringing focus. This is the 40Hz gamma frequency.

During development of the Ajna Light, subjects were tested over the range of flicker frequencies. It was a blind test, the subjects did not know which frequencies were being used. Their responses agreed with the research papers on hypnogogic light effects:

- 4Hz: 1 light flickering effect is ok, 3 lights strong, 5 lights very strong
- 10Hz 5 lights: start hallucinations, more color, 3D effect; physical release felt
- 13Hz 5 lights: laughing, green color stronger, nice feeling
- 19Hz 5 lights: relaxing, 2D, more superficial
- 24Hz 5 lights: loved it; lines, more laughing, spreading out in 2D
- 31Hz 5 lights: physiological effects of breathing slowing very quickly, felt much more relaxed; running for 80 sec relaxing, non invasive; felt ilio-psoas release
- 33Hz 5 lights: too fast for brain to process, so felt as if different frequencies were happening; enjoyment, pleasure and ecstasy when the frequency was given for a long time; felt visceral release, the vagus nerve going parasympathetic; calm, gentle

For further information, see this article. <http://www.neuroacoustic.com/epsilon.html>

Setting Your Expectations

Before your first Ajna Light session spend a little time quietly observing what your expectations are. Each session will be different, and each person's reaction different, even with identical light patterns and music. Allow the mind to be where it is. Look at the ego's desire to have a spectacular experience.

Like meditation, it is the process of patiently meditating regularly which is important, due to the subjective feelings which may or may not come up from session to session. These feelings, insights, and subconscious intuitions are present during meditation to be observed and accepted, and therefore released from cellular memory in the body, and they come up at their own pace. Regular meditation allows time for the feelings to release their toxic hold on the body, and this release cannot be rushed or controlled.

If there is an issue which you wish to gain insight into, think about it in a detached way before the session. Use compassion and gratitude to neutralize hostile and fearful feelings, and allow yourself to be receptive to whatever comes.

Often people see kaleidoscopic visions with very vivid colors, but some people just see black and white. Both experiences are valid and just as meaningful. Many people report seeing pure white light at some point in the process. This is the light of unconditional love. It appears that pure white becomes dominant when the user is connecting to source consciousness, and black when the user is connecting to the empty space of the void, as in Zen meditation.

There is often a hole or circle in the center of the geometric patterns. Gently focus your attention on that if you can. It is the DMT tunnel of light which appears when one is dying. Through entering this tunnel, your guides may appear, or some other form of insight.

Choose a relaxing, gentle light pattern first, such as one of the three alpha .ajna file provided, for 5 or 10 minutes. It is better if you have never tried the Ajna Light to have someone else around the first time you try the light. Typically someone will be demonstrating the light to you. Occasionally buried trauma from childhood comes up as part of the self healing. Later you can safely increase the session length up to 50 minutes if you like, so you can go deeper in each session.

Safety

Medical Issues

The only type of person who should not use the Ajna Light is someone suffering from epilepsy, having a family history of epilepsy, or suffering from frequent headaches which can be a precursor to epilepsy. Epileptics know they cannot be around strobe lights, and so will avoid the

Ajna Light anyway. Epilepsy is a relatively uncommon condition, affecting about one person in 150 in the population.

If you have strained your eyes though overwork at the computer, it is a good idea to rest your eyes by changing your work schedule. If your eyes are strained, any bright light will feel uncomfortable. In this case, adjust the light intensity slider down. Even a 10% intensity can bring the user into trance.

WiFi EMFs

The light uses 10w led lights to entrain the brain into different states of consciousness. WiFi is only used for controlling the lamp computer. The WiFi is used just like a router, and is far enough away from your body to be negligible. It is a big problem if you use WiFi on a phone for a long time next to your body over a period of ten years, as tumors can form (such as gliomas). But the Ajna Light WiFi is about 100 times further away than a phone is, so the WiFi EMF is $1/(100*100)$ of the power, ie 10,000th of the phone EMF. So the effect of using WiFi to control the light is only 10,000th of the phone exposure, and typically people use their phone for many hours a day. Mostly people would use the Ajna Light for one session a day at maximum, a session being 10-60 minutes long.

Reference material

from Lucia Light website

The pineal gland of the brain serves, among others, to perceive brightness through closed eyelids. In death, it secretes Dimethyltryptamine (DMT). DMT is also the central active substance in a South American plant known as "liana of death". Indigenous healers claim that by consuming the plant they can reach a dimension of light where all healing starts. In the context of comprehensive research, Rick Strassmann (DMT – The Spirit Molecule, 2001) was able to prove that a massive release of DMT from the pineal gland is to be regarded as the neurological cause of near-death experiences. DMT is secreted directly into the liquor (brain fluid) and can thus reach the receptors in contact with brain fluid even after a cardiac arrest.

After application of the corresponding DMT dosis, Strassmann's test persons repeatedly referred to impressive experiences in a supernatural light which they attributed healing and insight-inducing properties.

The brain is in a position to activate powers that can heal the body at any stage of illness. This phenomenon is known as spontaneous remission (sudden healing) and the subject of interdisciplinary research projects. Although it is unclear to date how the brain accomplishes this task, the persons concerned often describe sensations of light and warmth which they associate with this.

For a long time, light has played a central role in the treatment of various illnesses. Whether in the treatment of depression, tumours or compulsive disorders, the range of possible applications seems unlimited.

At the climax of spiritual experience we again encounter light phenomena.

Light and consciousness reflect the dual nature of one and the same phenomenon. Light manifests as matter and energy, consciousness as body and mind. And just like light, consciousness stultifies any attempt to lift its secret. Nobody knows the true nature of light or consciousness.

DMT theory

<http://disinfo.com/2013/05/breakthrough-dmt-found-in-the-pineal-gland-of-live-rats/>

BREAKTHROUGH: DMT Found in the Pineal Gland of Live Rats

by MIQEL on May 28, 2013 in News

siamese_seahorse_fractal In a major breakthrough in consciousness and psychedelic studies, Cottonwood Research Foundation has published a paper (soon to appear in the Journal Biomedical Chromatography) documenting the presence of DMT in the brains of living rats.

For decades researchers have hypothesized that DMT may be one of the neurochemicals responsible for consciousness, dreams and visionary experiences. It's certainly responsible for these and ever weirder experiences for those who have smoked it or taken Ayahuasca. DMT has been documented as naturally occurring in human blood, but this was not conclusive evidence that it is produced in the brain. DMT is structurally related to Serotonin, Melatonin and Pinoline, so the small traces in human blood could be an enzymatic breakdown product of these precursor molecules.

Now we have clear proof of DMT being manufactured in the living Pineal Glands of rats, and

that the genes responsible for this exist in the Pineal Gland and Retina! The first implication is that Yes, it truly is a natural neurochemical responsible for modulating consciousness. It is not a foreign substance to the body & mind of mammals. Also, if found in rats in this context then it is almost certain to function similarly in humans.

From the press release:

We're excited to announce the acceptance for publication of a paper documenting the presence of DMT in the pineal glands of live rodents. The paper will appear in the journal Biomedical Chromatography and describes experiments that took place in Dr. Jimo Borjigin's laboratory at the University of Michigan, where samples were collected. These samples were analyzed in Dr. Steven Barker's laboratory at Louisiana State University, using methods that funding from the Cottonwood Research Foundation helped develop.

The pineal gland has been an object of great interest regarding consciousness for thousands of years, and a pineal source of DMT would help support a role for this enigmatic gland in unusual states of consciousness. Research at the University of Wisconsin has recently demonstrated the presence of the DMT-synthesizing enzyme as well as activity of the gene responsible for the enzyme in pineal (and retina). Our new data now establish that the enzyme actively produces DMT in the pineal.

The next step is to determine the presence of DMT in cerebrospinal fluid (CSF), the fluid that bathes the brain and pineal. CSF is a possible route for pineal-synthesized DMT to effect changes in brain function. Successfully establishing DMT's presence in this gland adds another link in the chain between the pineal and consciousness and opens new avenues for research.