

# *Journal of Optometric Phototherapy*

*April 2020*

**Exploring CBD with Syntonics as  
an Effective Treatment in  
TBI Populations**

**Tribute to Robert Kaplan**

**Syntonics in Korea**

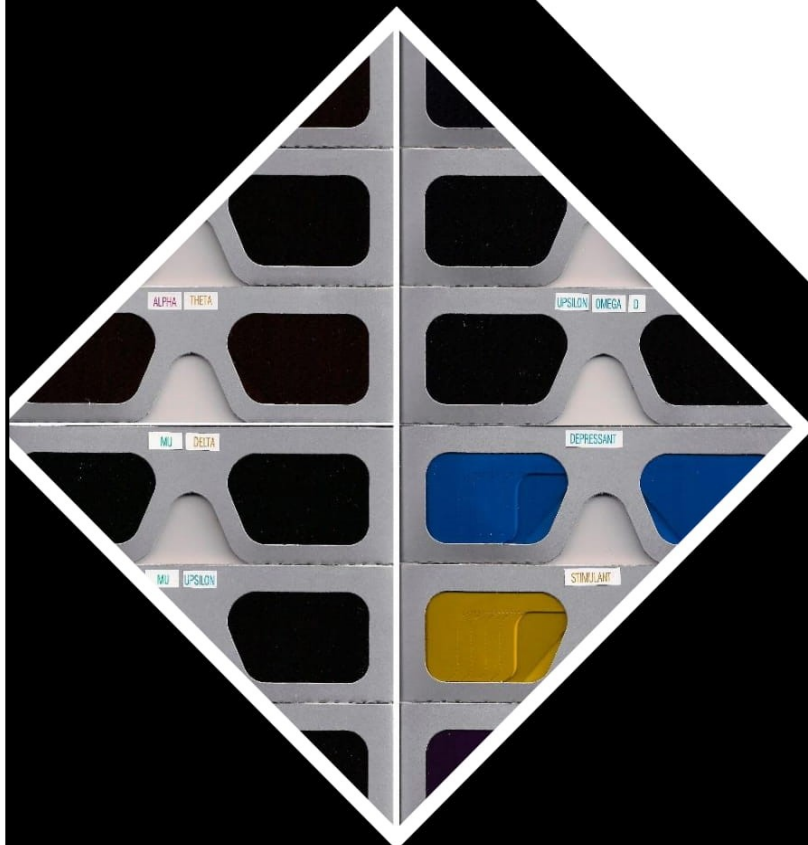
**Mysteries of Gamma Brainwaves**

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# The President's Message

No matter where you go, there you are!  
-Buckaroo Banzai

Welcome to this year's edition of the Journal of Optometric Phototherapy! My original draft of this column was written to highlight our annual meeting, which was to be in Nashville in June. Well, the coronavirus has thrown a huge wrench in everyone's meeting plans. Even though the meeting in Nashville of the College of Syntonic Optometry is being postponed for one year, the need for education in this area continues to be relevant.

Rarely a day goes by where I do not hear someone mention the need to learn or perform Syntonics or Optometric Phototherapy. It may be in online courses, Facebook, on the Developmental Optometry Community List serve (DOC List), or in an email or text from an optometric colleague. Here at the College of Syntonic Optometry we are working hard to develop and deliver the highest quality webinar-based education and coursework to satisfy our profession's thirst for knowledge on this subject.

Whether you are a novice, an experienced syntonic practitioner, or just curious to learn why there is such a buzz about us, please join us for live, web-based Basic and Advanced courses.

The spreading of the word about Syntonics has truly been a global phenomenon. Thanks to the dedicated work of our CSO staff, members and faculty, over the past few years, Basic Courses have been taught in Canada, Mexico, South America, Europe, and the Philippines. Last spring, I even had the honor to bring Syntonics to South Korea thanks to COVID-Korea.

Finally, please take the time to enjoy this Journal. It is chock full of clinically relevant articles. In addition to these papers, new research on the use of light to treat conditions from pain to concussions is now being published on a regular basis.

I hope to see you in Nashville in 2021!

-Rob Fox, OD, FCOVD, FCSO

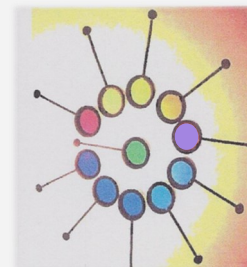


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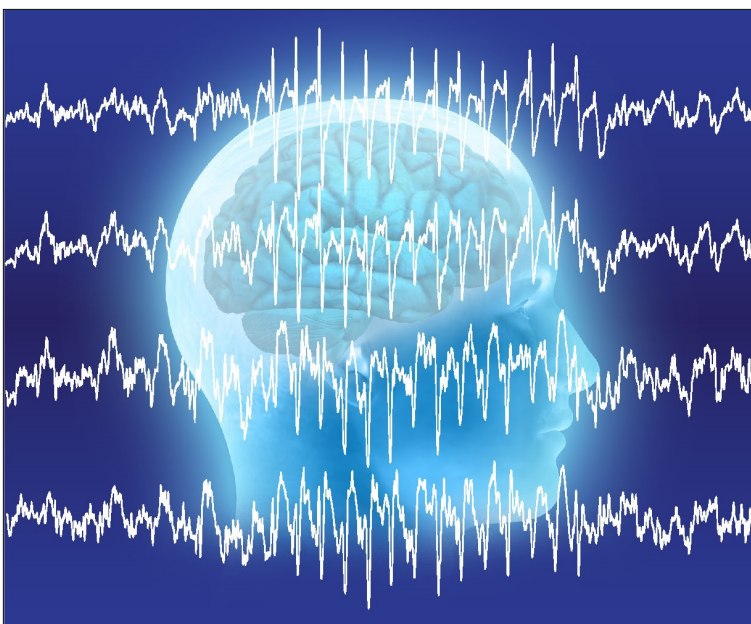
# Mysteries of Gamma Brainwaves

Anadi Martel

*The following article is adapted from the original published in The Book of Light by the International Light Association (September 2019)*

It has been known since 1924 that our brain emits electromagnetic waves, when neurologist Hans Berger was first to detect their tiny electric field of around 10 microvolts. It did not take long for medicine to explore the properties of these, known as *electroencephalographic* (EEG) waves, and to realize that their frequency is related to our mental state. By now all of us have heard about the main brainwaves bands, such as alpha, theta and beta, ranging from 1Hz (or cycle per second) to about 20Hz; a short description of each band is given in Table 1.

As early as 1934 electrophysiologists Adrian and Matthews had found that brainwaves can be influenced by sensorial input. When we are exposed to an external stimulus vibrating at a rhythm that is within the range of brainwaves frequencies, our brain has a tendency to fall in sync with this stimulus and starts to generate brainwaves at a similar rhythm. This phenomenon called *brainwave entrainment* works with many of our senses, whether through sound, light or touch. Since each brainwave frequency band corresponds to a specific mental landscape, this provides us with a remarkable way to influence our inner state through these natural sensory gateways.



**Figure 1 – Our brain emits EEG waves**

## A brief history of audio visual entrainment

*Photic brainwave entrainment* (the kind operating through light pulses) was intuitively recognized long ago. As early as 300AD Ptolemy, a disciple of Aristotle, described the sensation of contentment induced by the observation of the sun rays flashing through a rotating wheel. And at the very beginning of the 20<sup>th</sup> century Dr. Pierre Janet, a colleague of Sigmund Freud working at the Salpêtrière Hospital in Paris, reproduced the same sort of effect. By focusing on pulsating light from a kerosene lamp placed behind a wheel, his patients found relief from their states of depression, tension and agitation. Closer to us, a classic example of photic entrainment is the *Dream Machine* created by British artist Brion Gysin. It consisted of a simple cylinder with a central light placed on a revolving turntable. The cylinder was pierced in such a way as to generate stroboscopic pulsations in the alpha EEG wave band. Starting in the 1960s, Gysin and American poet William Burroughs together explored and popularized altered states of consciousness induced through contemplating this device.

*Audio brainwave entrainment* can be realized through sound pulsating at the sought after frequency, such as with *binaural beats* where each ear is presented with a tone of slightly different frequencies (for example using 300 Hz and 310 Hz to generate a 10 Hz beat frequency in the alpha range). Their exploration started in the 1960s, notably by Robert Monroe and his institute.

One of the most interesting variations is obtained by the stimulation of both auditory and vision senses, in *audio visual entrainment*, or AVE. Several generations of AVE devices have come on the market since the 1970s. For the most part these consist of goggles equipped with pulsating light sources and a set of earphones. Some of the best modern AVE devices have been presented at conferences of the International Light Association (ILA) in recent years: the DAVID, created by Canadian Dave Seiver (who was the recipient of the ILA's first *Frances McManemin Award* in 2011), the PSiO from Belgian designer Stéphane Krsmanovic, and the Lucia No3 from Austrians Drs. Englebert Winkler and Dirk Proeckl.

I have myself long explored visual stimulation as I developed a technique called *light modulation* in which light is pulsed in subtler ways than the stroboscopic flashes commonly used in AVE. This enables more sophisticated applications involving properties of peripheral vision and





Figure 2 – DAVID, PSiO and Lucia No3 AVE devices

all result from resonant energy exchanges).

Closer to us, brainwaves in themselves are one of most exquisite examples of resonance. They are produced when millions of individual neurons, each emitting a tiny electric pulse every time they fire, start to operate in synchrony. Instead of cancelling each other in chaotic noise,

their fields fall in sync and neatly add up until their sum becomes large enough to be detected through the cranium as the EEG wave.

brain laterality, as realized in the Sensora multisensorial system and more recently in the portable SensoSphere light device.

Clinical studies have validated therapeutic applications of AVE in areas as varied as PTSD, affective disorders (seasonal and others), concussions, hypertension, chronic pain and fibromyalgia, attention and learning issues, among many others (see e.g. Seiver).

Is it then surprising that these vast assemblies of synchronized neurons would in turn be susceptible to interaction with the rhythmic neural energy pulses generated by the sensorial stimulation of AVE, and adapt their firing frequency to that stimulus? This sensory resonance typically originates from the thalamus region of the brain, and from there gradually expands to other brain areas within minutes.

### Sync and Resonance

What could be the operating principle behind brainwave entrainment? It is none other than the universal phenomenon of *resonance*. Resonance is the natural tendency of any system susceptible to oscillation (and this is the case for most systems in our world) to react to an external field vibrating at a frequency similar to its own. When frequencies match and synchronize, energy can be transferred and amplified with near perfect efficiency. This operates at all levels of the universe, from the microscopic quantum scale (as with the electron orbitals in the atom which resonate at highly specific frequencies) all the way to the cosmic scale (the Moon's tidal locking, the perfect ordering of Saturn's rings, or the shape of spiral galaxies

### Enter gamma brainwaves

For most of the past century it was considered that all significant brainwaves were contained in the four classical bands of delta (deep sleep), theta (hypnagogic states), alpha (resting state) and beta (mental activity) spanning the range of 1 to 20Hz. Only recently have we taken notice of the band above this range, known as the *gamma band*. This is because its levels are usually very low and its function remains elusive. It is still so little understood that even its frequency range is not well delineated: depending on references, it is stated as starting anywhere from 20Hz to 30Hz and extending up to about 100Hz.

EEG Band	Frequency Range	Associated Properties
Gamma	30 to 100 Hz	Gamma waves are related to higher cognitive activity, appearing in states of meditation or in moments of conscious focus. Like the conductor of the brain, they keep the rest of the brain in sync
Beta	14 to 30 Hz	Brain waves in this range indicate the normal waking state. This is a state of mental activity and attention turned out towards the world. Most of us spend the majority of our waking hours in this state.
Alpha	8 to 13 Hz	Alpha waves are the natural resting rhythm of the brain and accompany relaxation. This state indicates attention turned inward, as in deep unwinding and let-go.
Theta	4 to 7 Hz	The hypnagogic state just before falling asleep. This state plays an important role in visualization, creativity and learning.
Delta	1 to 4 Hz	Delta waves appear during the deepest portions of sleep. They are also associated with states such as trance mediumship.

There are clear indications linking gamma brainwaves to cognitive functions. An early study in 1993 looked at 40Hz gamma brainwaves during sleep and found them active during rapid-eye-movement (REM) sleep where dreams take place (Llinas 1993). The authors concluded: “we propose 40Hz oscillation

Table 1 – EEG Brainwaves Bands

to be a correlate of cognition”. Further studies reinforced this assertion. One found a relation between gamma-band EEG and associative learning (Miltner 1999); another looked at the role of gamma brainwaves in establishing long-distance synchronization of brain activity (Rodriguez 1999). A third one linked an increased synchronization of gamma brainwaves with conscious perception (Srinivasan 1999).

Other studies have confirmed the prevalence of gamma brainwaves in people who have practised long-term meditation, compared with the human average. High-amplitude gamma and phase synchronisation are apparent not only during meditation activity, but also in the resting brainwave baseline of experienced meditators (Lutz 2004, Braboszcz 2017).

While these findings were intriguing, no clear clinical role could still be found for gamma brainwaves.

### Gamma and Alzheimer’s

This is where things stood when in 2016 an original article sent shockwaves through the medical community. Dr. Li-Huei Tsai (affiliated to the Broad Institute of Harvard and MIT) and her team found that light flashes in the gamma brainwave range could reverse the neurological degeneration brought about by Alzheimer’s disease (AD). This was done on mice genetically engineered to develop AD. Dr. Tsai knew that gamma brainwaves are among the first to disappear as AD develops, and she reasoned that perhaps stimulation at that frequency through photic entrainment would have some influence. But even she never expected such a drastic outcome: daily one-hour courses of gamma light pulses (administered through flashing white LEDs in the animals’ cage) actually reduced the amyloid plaque load in the mice’s brains by 40-50% within a week (Iaccarino 2016). Amyloid plaques are sticky protein deposits that invade and even-

tually kill neurons in AD. In a healthy brain they are normally kept in check by the action of *microglia*, a type of glial cell which accounts for 10-15% of all cells found within the brain. Microglia are resident macrophage cells, and they constitute the first and main form of immune defence in the central nervous system. As AD progresses, microglia gradually stop their work. Somehow, gamma stimulation restores their vitality and allows them to clear the plaque build-up.

This amyloid clearing happened mostly in the visual cortex and only when the light flashing frequency was 40Hz; other frequencies or random pulses had no significant effect. It was accompanied by a halting of the cognitive decline experienced by the AD mice. Conversely, the amyloid plaques rebounded within 12 hours after the light treatment was interrupted.

A further study published recently by Tsai’s team (Adaikkan 2019) sought to better understand the mechanisms involved in this neuroprotective approach, now designated as *Gamma entrainment using sensory stimulus* (GENUS). Here, the 40Hz gamma light prevented neurodegeneration in mice that were given highly neurotoxic proteins usually resulting in rapid brain damage. Gene data suggests that chronic GENUS shifts neurons to a less degenerative state, improving synaptic function, enhancing neuroprotective factors, and reducing DNA damage in neurons while also reducing inflammatory response in microglia. Dr. Tsai herself noted in an interview: “I haven’t seen anything like that. It’s very shocking (...) After all, oscillations are initiated by neurons, and I still like to think that they are the master regulators. I think the oscillation itself must trigger some intracellular events, right inside neurons, and somehow they are protected.”

While the brain pathology of mice may be quite different from ours, as the researchers are the first to point out, these results still hold the potential promise of alleviating

symptoms of AD in humans in the completely non-invasive way that is a hallmark of most light therapies. Dr. Tsai has established a private corporation (Cognito Therapeutics) to test this, though ongoing human studies are expected to take at least 5 years and as of today no conclusive outcome is yet available. Unofficial results in 2017 seemed positive, as participants in a first pilot study with five AD sub-



Figure 2 – Amyloid plaque build-up in neurons

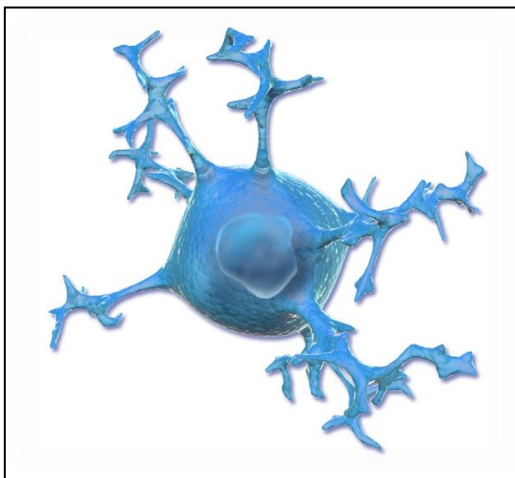


Figure 3 – Microglia cell



jects saw memory and cognitive improvements – although their state reverted after treatment was discontinued at the end of the trial. A study from another group published in 2018 found no significant amyloid removal for subjects with early AD exposed to 10 days of 40Hz light, which indicates that longer treatment periods may be required for humans than for mice (Ismail 2018).

### Multisensory gamma modalities

In parallel with these visual entrainment trials, other modalities of gamma brainwave stimulation have recently been explored. For example, positive amyloid-reducing effects have been reported in mice AD models using stimulation with sound modulated at 40Hz (Lee 2018).

Although 40Hz is a frequency too low to be properly heard by our auditory system, it is ideal as a source of kinesthetic stimulation when converted through acoustic transducers. Dr. Lee Bartel from the University of Toronto has been studying this type of stimulation using vibroacoustic reclining chairs and already in 2015 he had found that 40Hz *gamma low-frequency sound stimulation* (LFSS) reduced symptoms in patients with fibromyalgia (Naghdi 2015). He wrote: “The present study premises that thalamocortical dysrhythmia is implicated in fibromyalgia and that LFSS can play a regulatory function by driving neural rhythmic oscillatory activity.” In a follow-up study he found that the same LFSS has positive effects on patients with AD, especially for those with mild and moderate symptoms (Clements-Cortes 2016).

Furthermore, by combining both sound and light stimuli Dr. Tsai’s team have obtained better results on AD mice than when using either method separately (Martorell 2019). Interestingly, while sound stimulation affects primarily the auditory cortex and light stimulation the visual cortex, effects of their combination appear to spread across multiple brain areas: such multisensory stimuli produced widespread reduction of amyloid plaque throughout the neocortex within a few days.

### A new frontier in audio visual stimulation

I have been well aware of the advantages of multisensory stimulation, as we integrated it into our Sensora system

early in our research from the 1990s. For this purpose I developed a method called *dynamic sound transduction* where low-frequency vibroacoustic signals are distributed over an array of 8 transducers in a reclining chair or table, resulting in kinesthetic sensation perceived as patterns or waves gently moving across the surface of the whole body. We’ve always considered that this physical sensation acts as an anchor allowing a deeper integration of the transformative effects of complementary audio and visual stimulation in our system.

Thus it was with great interest that I surveyed these new findings regarding 40Hz gamma brainwaves. Since my instruments had been designed to operate across the classic 1-20Hz brainwaves frequency range, I undertook in 2018 to modify both my light projectors and kinesthetic transducers to enable their operation at 40Hz in the gamma band. We’ve developed AVE programs implementing gamma frequencies and have now started to explore their use.

Gamma stimulation holds the tantalizing possibility of contributing to both preventing and alleviating dementia symptoms in humans through non-invasive means using our natural sensory channels. But one may wonder how it would eventually be best administered. Current studies indicate that its beneficial effects are temporary and thus that daily stimulation is needed to ensure sustained results. It is hard to imagine elders suffering from AD wearing pulsing-light goggles for an hour every day, as is the case in current clinical trials. Hence new methods to apply gamma stimulation in more practical ways need to be developed.

I am pursuing one approach with the SensoSphere, which I’ve adapted to emit 40Hz gamma light pulsations. This globe-shaped lamp is designed to be used in the everyday environment, where it unobtrusively emits beautiful coloured light patterns. We now have to find out if such low-level but continuous gamma stimulation can act as a gentle cognitive prophylactic. We have been surprised to

see many of our users report that the new gamma program quickly became their favourite, so clearly gamma stimulation can be enjoyed by all and is not exclusively reserved to AD patients.

The exploration of gamma brainwaves is still in its early days. But whatever form it eventually takes, gamma



**Figure 4 – The SensoSphere as a source of gamma brainwaves modulation**

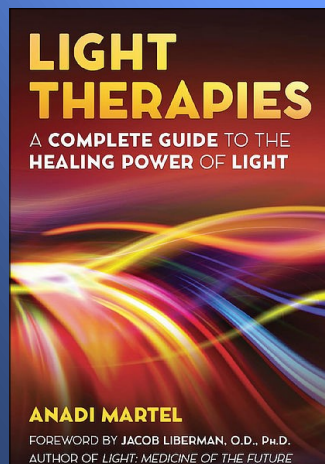
stimulation has already achieved a significant result: it has taken the hitherto relatively alternative technique of AVE into the mainstream medical world, and brought it recognition and renewed interest. It will undoubtedly be a significant part of the medicine of the future.

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### About the Author:

Anadi Martel is a physicist working in novel ways with sound, light, and brainwaves. His Spatial Sound Processors have been used worldwide by professionals in psychoacoustics, multimedia and cinema. His work has led to patents in the field of light modulation and in LED-based design. He served as president of the International Light Association from 2011 to 2018. He recently published the book *Light Therapies – A Complete Guide to the Healing Power of Light* (Healing Arts Press, 2018).



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# Exploring CBD with Syntonics as an Effective Treatment in TBI Populations

Alia Santoyo, O.D., FCSO

It seems that CBD is the “latest fad”. You can now find it at gas stations, grocery stores and stand-alone shops. It seems to be touted as the latest and greatest miracle to cure our many ailments. As more states make cannabis legal, and more medical professionals are recognizing the benefits of cannabis, I wondered...what is CBD and what is it good for? Most importantly, can we use CBD to help our patients? As I work towards my Masters in Cannabis Science, and practice as a Syntonic/Neuro Optometric Rehabilitative Optometrist, I questioned if CBD would be a beneficial adjunct in helping my TBI population. I questioned if CBD could speed up recovery and aide in abating post-concussion symptoms. The more I researched, the more I learned about the healing powers of Cannabis; this made me even more curious on incorporating CBD in to my Neuro-Optometric Rehabilitation practice. Before we start our discussion of CBD, Syntonics and TBI treatment of my patients, let us first discuss concussion (mTBI), cannabidiol, and the Endocannabinoid system.

According to the CDC, “Traumatic brain injury (TBI) is a major cause of death and disability in the United States”. It is reported that the number of TBI related ER visits and deaths have increased by 53% in less than 10 years. TBI can have many debilitating effects such as memory and cognition impairments, vestibular, emotional issues, personality changes, depression, anxiety, Autonomic Dysregulation, sleep disturbance, and visual disturbances. Recent research shows that approximately 90 percent of TBI patients endure visual disturbances such as: blurred vision, photophobia, difficulty with reading, headaches with visual tasks, reduced visual field, reduced functional field, visual midline shifts, difficulty with near tasks, difficulty with eye tracking and eye movements--just to name a few. My office has a high volume of TBI patients who suffer from most of the previously mentioned symptoms. As a Syntonic practitioner, a majority of my patients find great relief through optometric phototherapy alone. I find that within a few days of treatment on the college unit syntonizer, my patients’ symptoms tend to decrease. Based on this, I wanted to see if I could incorporate other healing modalities into my office practice. This is where my interest in combining CBD and Syntonics arose.

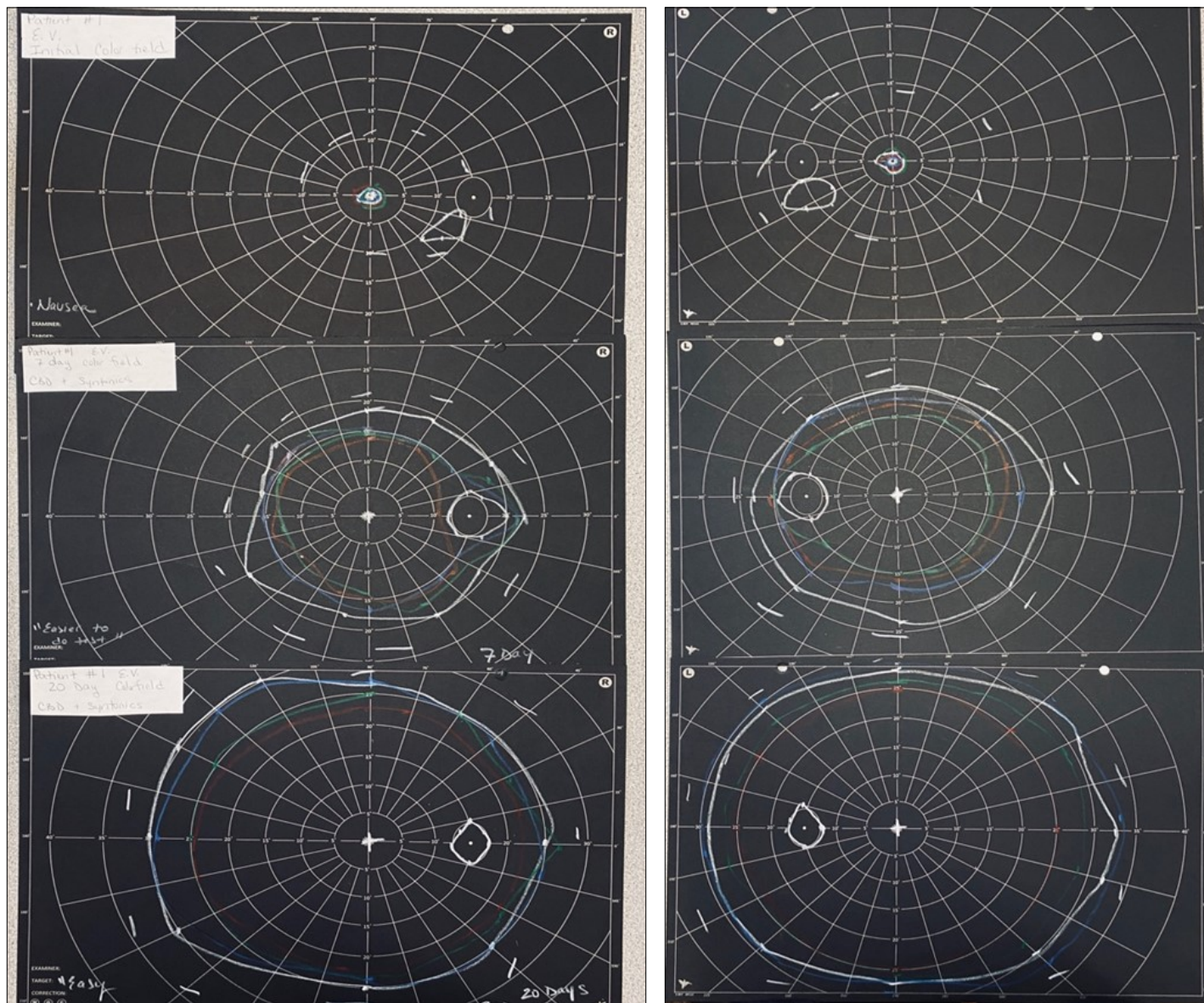
Research dating as far back as 2700 B.C demonstrates the use of Cannabis for medicinal purposes for a vast number of disorders. Yet, cannabis tends to be a “taboo” subject. Many of my patients were unaware Cannabis is

a plant and did not know they have an Endocannabinoid system. Let us explore Endocannabinoids and our Endocannabinoid System, and how it can work in conjunction with Syntonic Optometry.

Endocannabinoids are endogenous cannabinoids, which means our own bodies make them. CBD and the other compounds found in Cannabis, are cannabinoids. Interestingly enough, cannabinoids mechanically act the same in our bodies as endocannabinoids. One of the most studied components of Cannabis are phytocannabinoids. Phytocannabinoids are defined as “plant substances known to stimulate cannabinoid receptors”. Three of the most well studied phytocannabinoids are delta-9-tetrahydrocannabinol (THC), cannabiol (CBN), and cannabidiol (CBD). THC is the major psychoactive constituent, while CBD is a major non-psychoactive. Research is showing all 3 to have therapeutic benefits. These extracts come from the cannabis sativa subspecies hemp and marijuana. For the purpose of this paper, we will focus on industrial hemp CBD. Current neurological research shows that CBD may have significant medicinal properties and benefits for MS, Alzheimer’s disease, migraines, neuropathic pain, cancer, Autism, Parkinson’s disease, Seizure disorders, anxiety, depression, PTSD, and Post-Concussion Syndrome. Newer CBD research from Spain also suggests the stimulation of neurogenesis, which is the production and integration of new neurons in the brain.

The Endocannabinoid System, (ECS), is a very important physiologic system in our body. It is involved in establishing and maintaining human health and regulation. Studies have shown that cannabinoids can play a role in the stress response by effecting the hypothalamus, pituitary and adrenal glands. They can also regulate reproductive health, sexual behavior, and the release of gonadotropin. The goal of the ECS is to maintain homeostasis, which is a stable internal environment. Endocannabinoids and their receptors can be found throughout the body. The most current research suggests there are 2 main cannabinoid receptors, CB1 and CB2. It is hypothesized that they can bind the psychotropic component of the plant cannabis sativa. There is some speculation within Cannabis research that there may be a third cannabinoid receptor, (CB3), to be discovered. Type 1 cannabinoid receptors (CB1) are found in fatty tissue, the CNS, hippocampus, connective tissues, gonads, amygdala, and intestines. Newer research has shown that the CB1 receptor is expressed in the pituitary gland and hypothala-





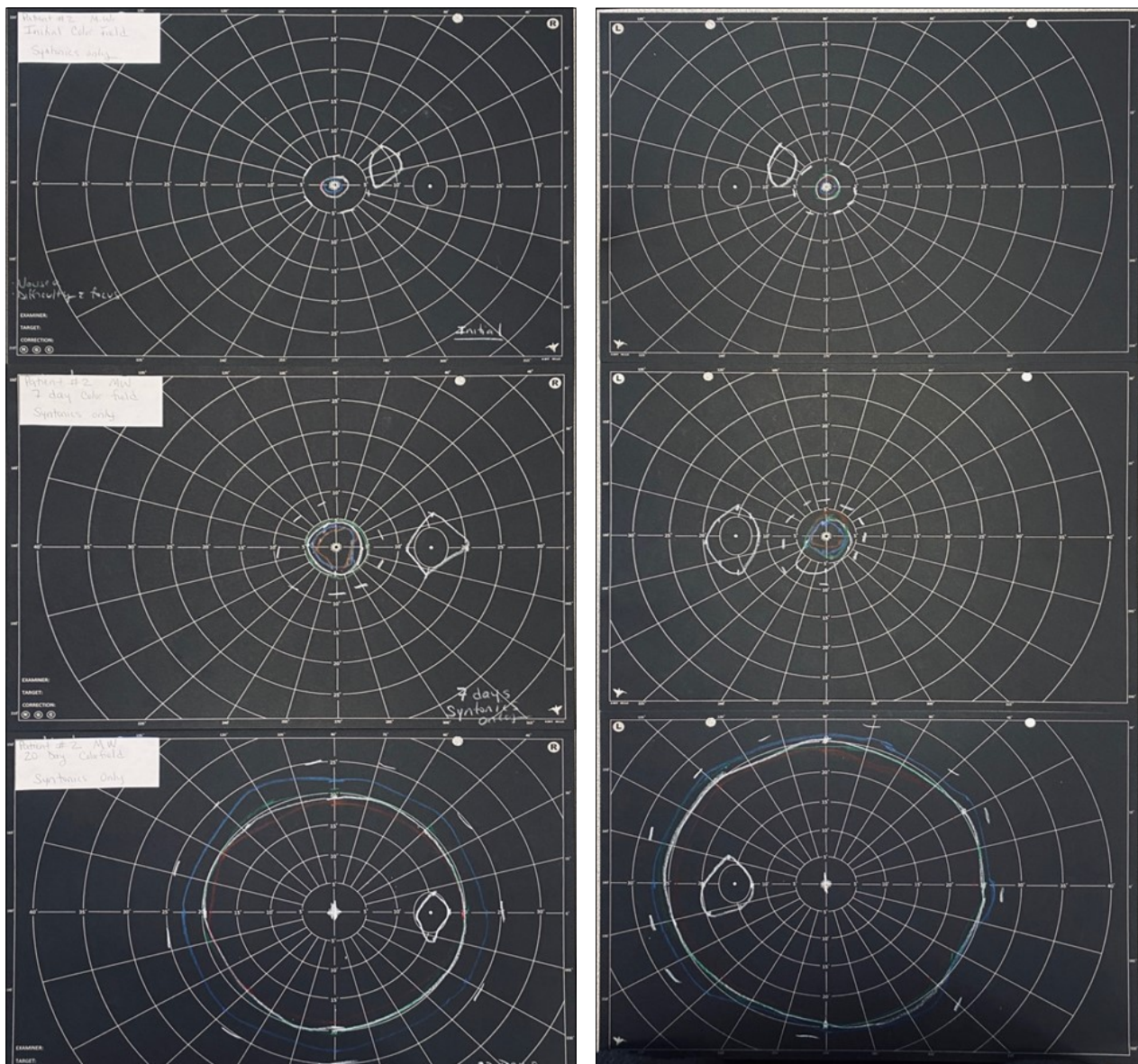
**Patient 1 fields: Before treatment, at 7 days, and then 20 days into treatment with CBD and Syntonics.**

mus. It is also shown that when activated it is known to modulate all the endocrine hypothalamic-peripheral endocrine axes. Type 2 (CB2) are found in the PNS, some immune system cells, (e.g., such as mast cells, monocytes, macrophages, B and T cells, and microglia), spleen, tonsils, thymus, and a small number exist in the brain.

How does CBD work in the body? There is not a lot of human research done, however, recent research done by Dr. Russo suggests, “CBD modulates non cannabinoid receptors as well”. It directly activates the 5hT (serotonin receptor and acts as an atypical antipsychotic), binds directly to TRPV1 (Pain, inflammation, hypothalamus control), and blocks GPR55 (a 3rd cannabinoid type receptor) which through a series of events, decreases the breakdown of bone, acts as an antiseptic, prevents cancer cells from growing and many other things. CBD also changes the shape of the CB1, preventing THC from di-

rectly binding to it. All cannabinoids, including CBD, produce effects in the body by attaching to certain receptors. Every receptor responds to different cannabinoids; some cannabinoids can interact with both. Full Spectrum CBD Hemp Extract Oil mixture ensures that CB1 and CB2 receptors are activated. Cannabinoids can act as ligands and are known to bind to these receptors and regulate food intake and homeostasis. In turn, this affects the activity of various glands such as the pituitary, pancreas and adrenal glands. Also, cannabinoids work as chemical messengers for the ECS in our body. While various cannabinoids exist, all of them comprise 2 categories: endogenous or exogenous. Our bodies naturally produce its own cannabinoids to help support our ECS, but similar to other nutrients, there can be a deficiency. CBD works by blocking our body’s breakdown of our own endocannabinoids, thus allowing our bodies to use more of what it is naturally producing.





**Patient 2 fields: Before treatment, at 7 days, and then 20 days into treatment with Syntonics only.**

Learning and discovering the interrelations between the Endocannabinoid system and the activity of the endocrine system was fascinating for me, knowing what we learned from Dr. Spitler’s book, *The Syntonic Principle*. Dr. Spitler describes the pituitary gland as the “master gland”, as it is responsible for secreting hormones along with other endocrine glands in response to specific light frequencies to help maintain bodily health and balance (Syntony). Having two treatment modalities that work on the endocrine system was intriguing to me and this is what inspired me to explore this treatment combination and document my findings.

For the purpose of this mini experiment, I used a small sample of patients, (n=40). I compared patients treated with industrial hemp CBD + Syntonics to patients who were treated with only Syntonics. All 40 patients had a diagnosis of concussion (mTBI). Twenty patients received CBD and Syntonics, while twenty received only

Syntonics. Each patient was asked to fill out a quality of life questionnaire prior to our initial visit, at 4 days, at 7 days, and at 20 days into the study. The patients’ chief complaints were: anxiety, poor sleep, photophobia, ‘mild’ depression, and pain. The patients were asked to rate the pain, using a 0-10 scale, 10 being unbearable pain. The main goal was “pain relief”. All patients were kinesiometry tested for Upsilon Omega (pain relief) followed by Mu Upsilon (Acute Syndrome). All patients used a college unit syntonizer, uncorrected for 10 minutes of each frequency, respectively (in office). I also followed up at 1 month, 3 months and 6 months post initial visit. Each patient had a full work up by a well-known neurologist, a full neuro-optometric vision exam, functional fields, and quality of life survey. The patients’ ages ranged from 18-35 and had a diagnosis of concussion from either a fall or motor vehicle accident. Each patient used the same brand of industrial hemp CBD oil, Nature’s Rooted Wisdom, and was carefully titrated and

monitored during treatment. The CBD used for this study was full spectrum industrial hemp CBD oil containing the legal limit of 0.3% THC. The CBD oil was Level 1, micro-dosed at 40mg per 1 fluid oz. We micro-dosed 5 drops sublingually and increased 5 drops every 5 days until 30 drops was reached. It was noted that 70% of my patients on CBD + Syntonics reported improvement in mood, sleep, anxiety and pain by day 4. I also noted an increase in form and blue fields. It is also worth mentioning that my patients on CBD + Syntonics felt more comfortable sitting for the light treatment. By day 7, 90% of the CBD and Syntonic patients reported pain levels of 4 or less, and by day 20, 100% reported vast improvement with all symptoms, (0/10 pain scale). It was found that my Syntonic only patients reported mild improvement in pain, but no improvement of sleep by day 4, and 30% improvement in pain by day 7. By day 20, about 80% reported a 0/10 pain scale, with 90% in sleep. They also had complaints of photosensitivity with the light therapy treatments within the first 4 days, but tolerated for the sake of healing. By the 1-month mark, the CBD +Syntonic patients had more stable blind spots and consistency with color field testing. They also reported continued improvement in sleep, pain, and mood. The 3 months follow up demonstrated consistent improvements and stability in color field testing. The 6 month mark it was found that my CBD + Syntonics patients reported more stability in remission of symptoms, that is to say, the relief of pain was gone a majority of the days (reported as 6 days or fewer per week of pain); whereas my Syntonics only patients reported 4-5 days or fewer of pain per week. Both groups of patients reported feeling much better and were able to return to work soon-

er than the neurologist anticipated. For the sake of this paper, I will show only 1 case from each of the 2 groups.

Both patients were treated by the neurologist as Post Concussive Syndrome, both patients were in overall good health and no other medications. Both patients reported the primary goal as “pain relief” with headache initially rated at 10/10.

Patient 1 (CBD +Syntonics): 35-year-old Caucasian female police officer struck in the line of duty; she hit her head on the ground as she was pushed by the assailant. Her BCVA was 20/20. She had a reduction in her accommodative system, convergence insufficiency, and post trauma vision syndrome. Patient 1’s fields, shown on page 10, are before treatment, at 7 days, and then 20 days into treatment with CBD and Syntonics.

Patient 2 (Syntonics only): 30-year-old Caucasian female painter. She fell off a ladder and struck her head on an end table. Her BCVA was 20/20. She also had a reduction in her accommodative system, convergence insufficiency, and post trauma vision syndrome. Patient 2’s fields, shown on page 11, are before treatment, at 7 days, and then 20 days into treatment with Syntonics.

In summary, my “mini experiment” demonstrates that CBD can be a consideration in conjunction with Syntonics for our TBI population. Currently, I am working on a “true” research project for my Masters. I hope to share my findings in next year’s journal. This research will compare TBI patients on only CBD, CBD + Syntonics, Syntonics only, no treatment, and placebo. Although my “mini experiment” was not fully scientific, and could be

### About the Author:

Dr. Alia Santoyo is a 2006 graduate of the Illinois College of Optometry and is a Fellow of the College of Syntonic Optometry. She is a member of the Neuro-Optometric Rehabilitation Association, College of Syntonic Optometry, Ocular Wellness and Nutrition Society, and OEP.

She enjoys working with all patients; however, her main focus is Neuro-Optometric Rehabilitation. Dr. Santoyo is also a health and wellness educator. She not only educates her patients, but lectures on the importance of nutrition and healthy lifestyle habits. She is a certified yoga and meditation instructor, which she also incorporates into her treatment programs.

Dr. Santoyo is excited as she is pursuing an Apprenticeship in Shamanism, Certification for Sound Healing, and a Masters in Cannabis Science.





regarded as fortuitous, I do hope that it can start a discussion on CBD and Syntonics wonderful role as a healing modality for our patients. Both modalities are safe with few to no side effects. However, it is important to find a pure, potent CBD that is safe, organic, non-GMO, pesticide free and from unaltered Cannabis plants. If possible, get to know your farmer or cultivator and learn how the CBD is processed. The beauty of CBD and Syntonics is that it shows that we are all energetic beings that need to remain in homeostasis or Syntony; CBD and Syntonics are the key players to help the body achieve this goal. In Love and light... Namaste...

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# Tribute to Robert Kaplan

PASHYA ROOHANI ROBERTO-MICHAEL KAPLAN

We are sad to report the passing of Pashya Roohani Roberto-Michael Kaplan (2019), after a lifetime of energetic self-study, self-experimentation, self-direction, insight, and development.

Also known as Rocky Kaplan and Robert-Michael Kaplan, he was an optometrist, author, artist (photography), and teacher. Dr. Kaplan was active in CSO in the late 1970's and 1980's and was one of the several young O.D.'s who joined CSO and helped to resuscitate Syntonics.

Rocky Kaplan (as he was known at that time) was born and educated in South Africa. He moved to the United States where he earned his Doctorate of Optometry and taught at the University of Houston College of Optome-

try and then joined the academic faculty of the Pacific University School of Optometry. Several years later he moved to British Columbia, then Austria and finally to Germany where he lived with his wife, Vistara Haiduk.

Rocky wrote academic articles and self-healing books concerned with improving the energetic and emotional basis of seeing beyond focused, aligned, and diseased eyes. He was truly an original thinker and healer who presented workshops and individual sessions related to a wide range of natural vision improvement.

He wrote one of just three clinical research articles about Syntonic phototherapy. The article is summarized on the following page.



*Christian and Leona Vermeire, Roberto Kaplan, Ray Gottlieb*

CHANGES IN FORM VISUAL FIELDS IN READING  
DISABLED CHILDREN PRODUCED BY SYNTONIC  
(COLORED LIGHT) STIMULATION.

Rocky Kaplan, O.D., M.Ed.

The International Journal of Biosocial Research 1983: 5  
(1):20-33.

Twenty-two children (age range 6-16 years) had form and color kinetic visual field evaluations before and after receiving treatments as follows: The students were divided into three groups. The "Experimental Group" (n=9) were two or more grades below their chronological reading age received syntonac phototherapy only; "Control Group 1" (n=4) were classified as significantly below average in reading and had binocular dysfunction, poor eye movement and accommodation skills. This group received white light only treatments; and "Control Group 2" who were poor readers with binocular and accommodation problems but were only slightly behind their peers in reading. These students received general binocular and visual motor training and no light.

Results: The Experimental Group mean initial form field measured only 18.4 (R) and 18.8 degrees (L). After 16

colored syntonac treatments, their form fields had increased significantly to 39.2 and 43.9 degrees. They also reported significant academic and social behavior improvements. The Control Group 1 form fields measured at least 30 degrees (normal fields) initially but their fields had constricted significantly, and these students exhibited emotional, attention, sleep problems following 16 white light treatments. The Control Group 2, VT and no light had initial form fields that averaged 24.73 (R) and 20.63 (L) degrees at the beginning of the study. Their fields did change significantly following their VT but no light treatments. This research reinforced the syntonac claim that form field size is reduced in poor readers and that syntonac phototherapy can rectify the problem.

--Ray Gottlieb

"He was a special - spiritual person, his insight of what the underlying causes of eye-sight problems were certainly a great help for many! He was most active the last 20 years in Europe. His books are of tremendous help for us and many who attended his workshops, seminar. **Thank you, Roberto, for sharing your insights, your wisdom, and your smile!** Love and LIGHT to you, wherever you are!"

--Leona Vermeire

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# The Use of Multi-Radiance Therapies in Treating Ocular Conditions

Review by Larry Wallace, O.D., Ph.D., FCSO

Studies compiled by Dr. Arzhan Surazakov, Ph.D. January 22, 2020.

Dr. Surazakov is the medical director of Multi-Radiance Life Technologies who invented the Delta Laser, a multi radiance laser that employs low level laser, ultrasound, color, and magnetic pulsed fields to treat eyes and general health conditions. These studies confirm the efficacy of this approach in treating the below ocular conditions.

The following studies utilize the following therapies: low level laser, magnetic fields, color therapy, ultrasound, and micro-current. These therapies were most effective in combining at least two radiances.

In my practice we have often used multi-radiance therapies for glaucoma, AMD, dry eyes and for neuro-rehabilitation in brain injuries to balance the autonomic nervous system. It has been my experience that in employing multiple energetic therapies, that there is a synergistic effect where combining therapies results in greater successful treatments than when only one therapy is used.

The multi-radiance therapies we use are: The Delta Laser, focal treatment on the eye with a Photon Stimulator (from Light Forms), Syntonic phototherapy, Micro-current therapy (Inspirstar or Scyfix units) and neuro-entrainment (Mind Alive).

Clinical Trials include:

- Russian research on combining non invasive treatment using low level laser, ultrasound, color, magnetic field and micro-current therapy for treatment.
- Beneficial effects include conditions such as optic nerve disease, Graves' ocular pathology, glaucoma, macular degeneration, keratitis, uveitis, and myopia.
- Combining at least two radiances have synergistic effects to show significant improvements in vision, normalizing arterial blood pressure, reduction of headaches, dizziness and chronic brain ischemia and reduced myopia.

- Magnetic Fields + Micro-current in treating primary open angle glaucoma
- Low Level Laser + Magnetic Field + Micro-current in treating open angle glaucoma with chronic cerebral ischemia.
- Low Level Laser + Magnetic Field + Micro-current for rehabilitation of patients with myopia
- Effects of Laser + Transcranial Magnetic therapy on retinal ganglion cell activity versus using medication
- Low Level Laser + Magnetic Field+ Micro-current effects on retinal and optic nerve disorders
- Low Level Laser + Magnetic Field on accommodation and its reaction to myopia
- Transcranial magnetic therapy effects on disorders of accommodation with children and myopia.
- Magnetic Field + Photo therapy for rehabilitation - premature infants with affected central nervous system disorders.

Reference's Conclusions: Restorations of conductivity in optic nerve fibers, microcirculation, hemodynamic correction, regulation of sympathetic nervous system, synergistic physiotherapy in neuro-protective actions. Optometry is well placed to employ these energetic therapies within the scope of our licenses. These therapies allow alternatives to traditional medication and surgical approaches.

The author has no commercial interest in any of these devices or therapies. References are available on request.

Larry B. Wallace, O.D., Ph.D., FCSO

lbwallace@twcny.rr.com

### “Purpose Clause” of the College

The purpose of this Corporation shall be to unite for mutual welfare and benefit legally qualified optometrists throughout the world who use selected light frequencies for the aid of vision, its associated and supportive functions; to develop and teach this technique, known as Syntonics, and to elevate its standards; to protect its members, fellows, students and graduates in the use of Syntonics as an integral part of optometry, to provide instruction in syntonics and to acquire, rent, or lease real property, buildings, equipment, instruments, devices, appliances, biological and dissection material for such purpose, and to employ competent teachers therefore; to use its equipment and facilities to provide under-graduate instruction in optometry; to organize, maintain, conduct or have conducted researches in biology and physiology, in the theory, application, extent of and practice of syntonic technique as an integral part of optometry; to organize, maintain, conduct or have conducted a department for advanced graduate instruction in syntonics; to engage in the teaching of and study of human anatomy, by human cadaver dissection in the advancement of the instruction and training of under-graduates in optometry or optometrists studying the syntonic technique; to award suitable certificates or professional degree-conferring diplomas to those who complete the prescribed professional courses of instruction; to adopt an emblem to protect its student, members and fellows in the exclusive right to use the same and the name “syntonics” or derivative thereof; to publish study lessons and any of the research department’s scientific findings or discoveries; to aim to restrict the use of syntonics and the practice thereof to ethical, professional and qualified optometrists; to establish, charter, supervise and control geographical groups within the college to be known as “academics”; and to do and perform all things and acts for the furtherance of these purposes, and the development, elevation, advancement and welfare of the professions of optometry and Syntonic Optometry.”

The CSO Executive Board

## Optometric Syntonic Phototherapy Virtual 101

*May 15-16, 2020  
9:00 am - 4:00 pm EDT*

For the first time ever the Phototherapy 101 course will be given as a virtual course with 8 COPE hours.

Subjects to be covered are: The Theory and History of Syntonic Phototherapy; Emerging concepts in Neuro Photo-biomodulation; Alpha Omega Pupil; Introduction to Syntonic Syndromes; Holistic Optometric Approach to Neuro-Rehab; Functional Visual Fields and Syntonic Practice Management.

These classes are taught by our outstanding faculty: Robert Fox, Larry Wallace, Ray Gottlieb, John Pulaski, Phil Bugaiski and Mary Van Hoy.

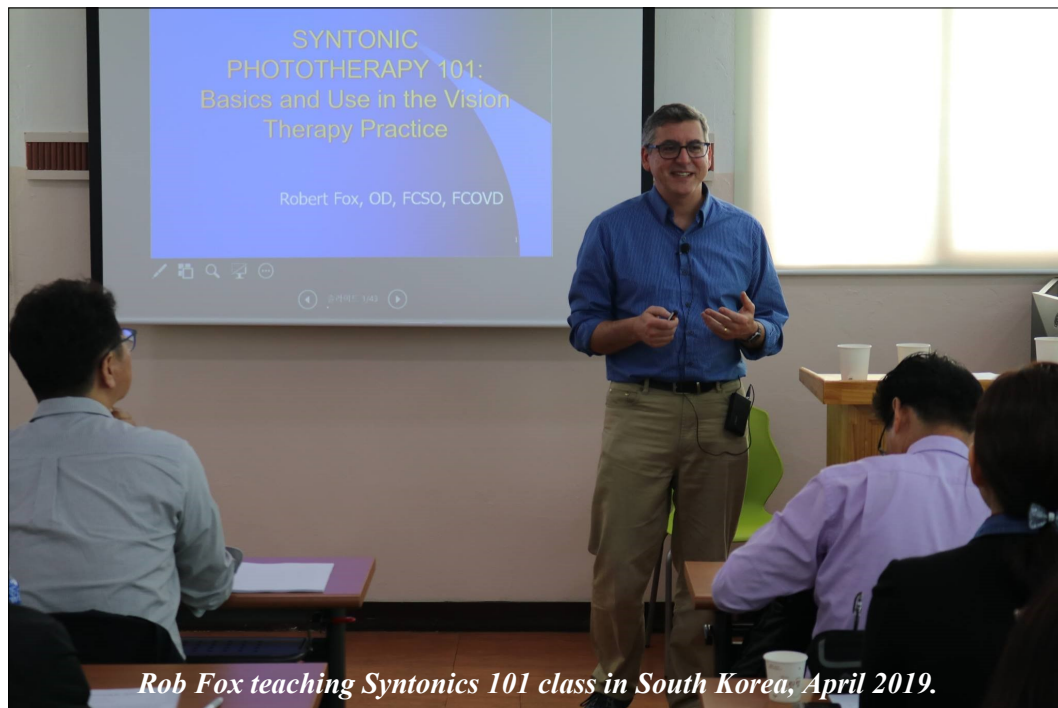


# Syntonics in Korea

This past April, our own Rob Fox has the honor of teaching our Syntonics Basic course in Busan, South Korea.

Thirty Korean optometrists attended this extensive two-day course. Vision therapy is growing rapidly in South Korea. Along with this has been a strong desire to add syntonics to their VT practices.

In addition to the syntonics class, Dr. Fox presented a two hour lecture on Vision Therapy in Daegu as part of a large regional optometric meeting.



*Rob Fox teaching Syntonics 101 class in South Korea, April 2019.*



*Korean Syntonics 101 Attendees, 2019.*

# Awards and Accomplishments



**Congratulations to  
Alia Santoyo-Johnson,  
O.D., FCSO  
for receiving her  
CSO Fellowship!**

Alia Santoyo-Johnson,  
Larry Wallace  
2019 St. Pete Beach, FL



**Congratulations to  
Chula Lerdvoratavee,  
O.D., FCOVD, FSCO  
for receiving her  
CSO Fellowship!**

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# Historical Perspective

## *SYNTONICS BEFORE EACH REFRACTION*

*By B. H. Kaplan, O.D., M. A. O.  
January 14, 1933*

The paper which I am going to read is entitled "Syntonics Before Each Refraction."

The analytical knowledge that we Syntonists have received as to classifying types of patients has meant much to me in my optometrical practice.

I analyze each patient as to whether the patient is an Asthenic or Pyknic. I do all this in my consulting room when I record the history of the case.

I have learned not to be afraid to ask the patients questions. They like it because they feel you are trying to do something for them. I ask them everything necessary. You know what Alpha Omega will do for some women, especially those with cold hands. You cannot go wrong in using Alpha Omega before each eye examination.

In case of an Asthenic, I first want to know whether this patient is an over-stimulative type or an exhaustive type. I first note the size of the pupils and also the curvature of the iris. If the patient has a "dish-pan iris", his pupil will be too large, which would indicate quick exhaustion.

My subjective examination is to take the habitual phorias test with the glasses the patient is wearing, or if not wearing glasses, I take phoria without glasses. If exophoria is manifested in the asthenic, and he also shows under 6 degrees of Exo at about 13 inches, I know this patient is an over-stimulative type. To him I apply N/L nascentizing, Delta Omega, Mu, or Mu Upsilon. If the patient has a headache, I use Upsilon Omega depending upon where it is as to nascentizing.

If this asthenic should show the opposite, as Exophoria, which would mean to me an exhaustive type, I would use Alpha Upsilon, Mu Upsilon or any technic that is stimulative, lately I have been using the new filter as an Alpha Lambda combination which would decrease the Exophoria. In nascentizing I mostly use N/L.

On the subject of nascentizing, N/L, I find better results in putting the red over the non-dominant eye.

After each eye examination I use for about five minutes Mu Upsilon, nascentizing L, sometimes I do not nascentize at all. I do this to eliminate eye discomfort

after an eye examination, and in the meantime, I make up my complete refraction analysis.

In my Syntonic experience, I have found it very important to find out which is the dominant eye. This will stand further research. If the patient's left eye is dominant and he is right-handed this patient generally has a low duction or reserve and generally phlegmatic in action. Alpha Omega or Alpha Upsilon or Alpha Lambda, N/L works nicely before an eye examination. It warms up the patient, blood circulation is improved so that after the eye examination the patient really feels much better than before he came into the office.

## CASE REPORTS

I will relate at this time a few cases. A minister came to my office recently his complaint was about his eyes and mainly had a feeling that his head is stuffed, and told me that if he did not receive relief soon, he would have to give up the pulpit. This patient was an asthenic as all ministers should not be. I immediately applied Mu for four minutes and Mu Upsilon for seven minutes, N/L nascentizing. He noticed relief in his head at once and was surprised at the results. I also gave him Keystone Stereoscopic exercises. I have given five Syntonic treatments using same filters. The unique part of this case is that when he read, he used three pairs of glasses he had around the house, one on top of the other. And now he used one pair of glasses, Azurlite tint with 1-degree prism on each eye, base in. Patient was in last Wednesday for a treatment feeling fine with no feeling of head being stuffed.

A school teacher in the forties made the remark that she would have to quit teaching school if she did not receive some relief. The left eye was dominant and she was right-handed. I knew immediately it was a case of low reserve. Syntonic analysis indicated inactive low vital reserves. On taking the habitual phoria test she showed an exophoria of 9 degrees, but at will can make herself orthophoric. I used Alpha Lambda mostly with N/L nascentizing. Prescribed FulVue bifocals with 1-degree prism base out on each eye. The patient feels fine.

A young girl of 15 years of age sent to me by the county trustees for a pair of glasses proved to be a case. This girl acted rather melancholy with absolutely no pep. She had a fairly good-looking face, if she would brace up and smile. I tried to examine her eyes, the Skiascope showed that she needed glasses. The astigmatic wheel

was playing a game of “ring-around-the-rosy”. I could not get anywhere with the subjective test but still this girl was intelligent. I asked the girl’s mother, who was present, if the girl had ever menstruated. To my surprise the mother said, “Not yet”. Alpha Upsilon nascentized N/L was my Rx for three consecutive days and then I followed up with Alpha Omega. I have since examined her eyes with more definite results. The girl has straightened up... and began to smile...

I could relate many more cases which I have here with me on my record cards, but I will not take up any more time.

In closing I will say without any exaggeration that Syntonics has really kept me in practice during the present depression.

\* Paper presented on Jan. 14, 1933, Dayton, Ohio

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In addition to ongoing software enhancements, the new viewing hardware for the FCFTester received significant upgrades in 2020. Now constructed of high-impact ABS, the new hardware provides a durable, professional appearance. Also, the viewer now features a trial lens well.

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Alona M. King, O.D.



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**Light Therapy: The Total Experience It's much more than meets the eye!** by Joe Shapiro, O.D.\*

**The Science and Application of Intention: Practical Applications for Optometry** by Hans Lessmann, O.D., FCOVD, FCSO\*

**Applications and the Power of Green Light to Improve Vision** by Sarah Cobb\*

**Interpreting Laboratory Findings: General Health, Functional Endocrinology and Relevance to Syntonic Phototherapy** by Terry Trinkka, O.D.\*

**Integrated Treatment of Vision Conditions; using nutrition, pharmacotherapy and micronutrient therapy for best outcomes** by Rian Shah, M.D.\*

**Light and The Quantum Information Field, Part I & II** by James Oschman, Ph.D.\*

**Beyond 2020: Seeing Physical, Mental and Emotional patterns in the Iris** by Randy Schulman, O.D., FCOVD\*

**Advances in Photo-Medicine** by Larry Wallace, O.D., Ph.D., FCSO, and Ray Gottlieb, O.D., Ph.D., FCSO\*

\*Speaker availability may change due to pandemic