How a Flickering Light Holds Promise in Alzheimer’s Treatment and Prevention Transcript

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Introduction to 40 Hz Brain Stimulation

From our studies we have shown that we can stimulate the brain with our non-invasive light and at the same time we've seen positive indications of a slowing or stopping of cognitive decline.

Again, we still need to run further clinical trials as we're only in our phase two clinical trial right now. But these are positive indication that can look forward to in understanding how we delay or even improve the quality of life and brain health for individuals.

you What if stimulating your brain at a specific frequency using, for example, light could create an environment that's conducive for brain healing? That's the subject of our podcast today.

We're going to be interviewing Dr. Mai Huynh, who has developed technology out in California that does exactly that. She is the CEO and founder of a company called Optosudix.

Let me tell you a little bit more about Dr Huynnh. Dr. Wen is a trailblazer in neurotechnology, pioneering advancements in what we call non-invasive brain stimulation, this type of technology for the prevention and treatment of Alzheimer's and dementia.

And as mentioned, she is the CEO and co-founder of a company called Optosudix. We're gonna explore that today. She received her bachelor's degree in microbiology at the University of California, Berkeley, and her PhD in integrative biology with emphasis in neuroendocrinology, also at Berkeley, University of California.

Optosudix is a company involved in the exploration and creation of a device called the EVY device that we're going to look at today. that allows each of us to stimulate our brains at 40 Hertz to improve what's called gamma oscillation.

This has been shown to reduce inflammation in the brain, actually reduce the accumulation of toxic beta amyloid, and has associated with some pretty amazing clinical improvements in individuals with existing cognitive decline.

So I'm very excited to get to our interview. Let's do it right now. Dr. Wen, hello. Welcome to the program. Hi, David. It's a pleasure to have you.

Dr. Huynh's Personal Motivation

Thank you for having me to your program. And, you know, as I've been, investigating your work, very taken by your works, and we're going to unpack this whole exciting new science of how 40 Hertz stimulation affects the brain, how it regulates gamma frequency, etc.

But I wanted to start by being a little bit more personal and ask you, How do you get involved in something like this? What was the motivation? Yeah, I think for me, it started back in 2018 when I was still in graduate school and one of the motivation is actually my father who passed away from complications in 2020. He's always been my sort of inspiration, him and my mom.

And so now, especially with just having my Mom here with me and it's more of an urgency for figure out how to also bring better quality of life, but at the same time, improve her cognition, especially during this time while she's in a later stage in her life.

So you had a very personal motivation then to explore what was out there and how do you end up looking at

flashing light of all things, thinking that that might improve the brain somehow?

Yeah, you know, again, it was during my graduate school and there was a few publications we've known for, decades, the impact of various brainwave frequencies in the brain and particularly 40 Hertz has been looked at in literature, but it wasn't until probably November 2016. When a publication was released that indicated 40 Hertz light flashing light can actually reduce amyloid, recruit microglia, and potentially improve cognition in mouse models.

During that time, I realized if you haven't seen 40 hertz light before, it's very stroboscopic, very uncomfortable. I mean, again, knowing that my mom and dad has always been my inspiration, I felt that there was no way for them to be able to sit in front of something or have that flashing light that long period of time.

How EVY Uses Light to Entrain Gamma Oscillations

So I came up with a patent technology that basically masks the light so that it's nearly imperceptible while retaining the simulation of the 40 hertz in the brain.

Well, that's really quite interesting. I think our viewers are aware of the work of Dr. Tsai. We've talked about her work, pioneering work as well. And, you know, technology, I ultimately to work through Medicare and insurance, go through FDA approval.

But you are kind enough to send me a bunch of studies that really validate that this is a powerful technology already and that you've made it available to the general public.

So let's just slow down a little bit and look at this frequency of light that's flashing. And it's targeting the brain in such a way that your enhancing what's called gamma oscillation.

Maybe we could talk about what is that and why is it that we want to enhance that? Yeah, gamma oscillations, typically you can see in individuals, you know, 15 to 20 years before symptoms arises, that signaling or that pathway is declining.

And, 40 Hz isn't just for those with diagnosis because we do understand that these decline happen years beyond the symptomatic being able to re-entrain and stimulate for those frequency can allow for better focus, clarity, you know, emotional regulation in healthy brains as well.

And that's what it is what appeals to me as being proactive, for maintain their memory as well as keep their mental edge. Why do we wait until we have the sort of decline symptomatically?

And by then, you know, most of the neurons are already dead and it's hard to do anything about it. So rather than treating, we want to look at prevention at this point.

So this is a way of targeting the brain, applying a therapy to the. And you mentioned that actually targets beta amyloid targets, the microglia targets neuro inflammation.

and you know, we've seen an array of pharmaceutical interventions developed and actually approved. For example, to target beta Amyloids, The results of which have been less than satisfactory.

I'll leave it at that with really some. potential for significant side effects like hemorrhage into the brain in as many as 20 to 30 percent of individuals.

So here you are with a technique that at least has not demonstrated any significant site effect, and you're able at the least demonstrated it in laboratory animals to target beta amyloid.

And in your human trials, You've actually shown a very significant slowing of the rate of brain atrophy or brain wasting in individuals who've received this type of therapy.

Tell us about that research. I think it's interesting how we as a society has been so trained or ingrained to utilize drugs and various other avenues from ecological treatments that often come with quite large side effects.

And for something that we understand today, especially with non-invasive stimulation such as light and sound, that can potentially signal deep brain stimulation that will allow proper functioning of the brain region.

For me, it was quite important. that during our clinical trials, as well as others, right?

Clinical Results and Early Benefits

Others from Li-Hui Tsai's lab, who you mentioned, you said an amazing work on not only animal models, but they collaborate with other institutions and have found that 40 Hertz light and sound combination can not only help entrain brain wave frequency, reduce white matter in the brain, and this is from her study.

From our studies, we have shown that we can stimulate the brains with our non-invasive light, And at the same time, We've seen positive indications of a slowing or stopping cognitive decline, Again, we still need to run further clinical trials as we're only in our phase two clinical trial right now.

But these are positive indications that we can look forward to in understanding how we delay or even improve the quality of life and brain health for individuals.

So you call your technology EVY technology. What does that mean? Is that an acronym or is it a name? Yeah, I endearingly, you know, when we were coming up for the name of our device, uh, And so for me, it was important to bring life back.

To bring the joy of life. What can we do in order to change the way that we live today? So that's a little bit of the background as to why it's called EV.

Mm-hmm. So this is then a delivering light at a specific frequency and you have manipulated this to really make it less obnoxious that you're looking at flash light and your not looking a flashing light.

The way that your modified the technology is such that whether you don't really perceive that it's a flash in light, do you look right into the lighter?

Can this be something that's active while you are doing something else, working on your computer, watching television, reading a book? Surprisingly, you don't have to look at the light because EV actually integrates this research into a very comfortable, easy-to-use, daily device, which was the whole purpose of why I wanted to do it because my mom moves around a lot.

She is a creature of habit. Although EV is not a medical device, it's grounded in the latest research in neural stimulation that allow real-world impact, where you can integrate it into while you're reading, while eating breakfast, or you watching TV with your significant other.

And some of the real world impact that it can have is, not only is it for the individual themselves, but for their caretaker, which offers a simple way to help your loved ones sort of stay present, sleep better, and engage in more you know, consistent conversations and things like that.

And so I think as long as we can, for individuals who are also going through these cognitive decline, sort of the consistency is very important for them.

So having somebody lay down and immobilize for an hour for treatment is often impossible. So by bringing and developing a device that can be integrated into what an individual is already doing, what we're doing is we are making it as simple but as important as it is to have a better quality of life for everyone around.

So what are some of your early clinical results revealing? It's revealing that EV light or our clinical device can

actually improve mood, better sleep.

Early indications, like I told you earlier, that it's showing a stopping or slowing of cognitive decline in mild to moderate Alzheimer's patients. They're not significant yet because we have to finish with the rest of our cohort.

that's still very encouraging to learn the impacts of not only on the neurological side, but also on behavioral side for individuals, right? So I'm really hopeful that our viewers right now are going to take in what we're talking about here.

I mean, here we are faced with a kind of a paradigm that says pretty much live your life come what may.

Safety, Risks, and Broader Applications

And then now that you've been diagnosed with mild cognitive impairment or early Alzheimer's disease, you are given an opportunity if you qualify to receive a beta amyloid targeted type of monoclonal antibody given intravenously that has been demonstrated to have very, very minimal effect in terms of slowing your cognitive decline.

and is associated, as we read about the studies in the New England Journal of Medicine, with a pretty significant risk of side effects. So here you are offering what sounds to be almost non-invasive and getting great results.

But when we talk about side-effects, let's talk for just a moment, what potentially should we be thinking about in terms of, or maybe what have you identified as any potential risk, of individuals being exposed to this type of therapy?

Yeah, I mean, there's always risk with therapy, but with our therapy we've shown in terms of clinical trials adverse events that, you know, of course, if you come with sort of pre-diagnosed sort mental health or like glaucoma, You can potentially have headaches and nausea.

There's symptomatics with those of bipolar that can react differently to any kind of light. But other than that, we have not seen any severe side effects other then eye strain, headache to what those who have light sensitivity, which is very still, again, very encouraging to understand that it does not cause any hemorrhaging or brain bleeding and things like that.

Well, above all, do no harm. It seems to me that in that this type of therapy is able to target things like improvement of the way neurons can communicate with each other, reduction in neuroinflammation, et cetera, that its application is much more, we should consider much, more widely applicable to things, like yes, Alzheimer's, but also Parkinson's and possibly even depression.

et cetera, maybe even autism. So it seems like, as opposed to being a targeted therapy for a specific disease entity, that this, because it gets at a more global reasoning in terms of what makes a good brain go bad, there could be very wide application of this technology.

Yeah, I agree. There definitely potentially can be very wide application of this technology. We've seen in our own mouse model study that 40 Hertz light can actually improve depression symptoms and anxiety symptoms in mouse models.

Stress has a lot to do with cognitive decline. And so by understanding that, we understand that why don't we use something that can improve and train our brain much earlier in life rather than waiting.

Why then, this is fascinating technology that you are working on, that people at MIT are work on. why is mainstream so reluctant to embrace this type of intervention?

Is it because it's not a drug, it is not given in a laboratory setting? What's the pushback? I think when you really think about it, it is also society and we're creatures of habit, right?

We're taught from a young age what we know. When you're feeling sick, you take a drug when something happens. But it's also light isn't sexy, if I can say it correctly myself is that most people would look at it and say, okay, why don't I just go outside?

Or why can't i have the same stimulation just sitting under a room light? It's because those room lights are not optimized for brain entrainment at 40 hertz, a frequency that's often seen as plays a major role in cognition and alertness in the human brain.

And so I think that reluctancy is also the education, right? Some mainstream society don't really understand how brainwave frequency works. A lot of people We are getting there, right?

Science is getting that. I can tell you honestly, you know, seven years ago when I first started, most people just thought like, what the heck is this?

But seven, years now on, we've had over 40 publications from various institutions, not only our own from MIT, Georgia, from other countries such as Italy.

People are starting to notice and understand the impact of not only in training the brain in the proper way, but in combination I do believe with early diagnostic tools such as blood biomarkers, correct?

Because 20 years ago, when you got diagnosed with Alzheimer's, it was way too late. There was no cure. And so oftentimes people think about it as a death sentence.

Okay, I got diagnose with Alzheimers. I really can't do anything about But today, we have diagnostic tools such as blood biomarkers, PTAL-217, that can then understand and diagnose 15 to 20 years before a symptom arises.

And now, in combination with exercise and diet and also devices such ourselves, We can potentially slow down the degradation of our own brain much earlier on before symptoms arise.

I think it's a hugely important point. Again, I Most of our society leads in America really waits for the other shoe to fall until they begin to realize now it's time to do something and.

Why the Technology Faces Mainstream Skepticism

Your point is very well taken that if we look at metabolic scans of the brain using glucose tracers in the brand, we can identify the metabolic changes in brain that presage the clinical manifestations, the cognitive decline memory issues of Alzheimer's by two to three decades.

And clearly what you're saying is that's when we need to be intervening not just with the technology that you are pioneering, but also with respect to re-establishing healthy brain metabolism, which is within our grasp via lifestyle modification.

Because we know that with changes in the body's metabolism come changes to the brain's immune metabolism through what now recognizes this whole new science of immunometabolism, leading to increased inflammation that's damaging to neurons, that ultimately then after a period of decades manifests as cognitive decline.

So what you're saying is that we need to target this early on. One wonders why technology like you are working on couldn't be in schools. couldn't be in public places.

To me, it seems that you've developed a technique to make that very unobtrusive, to almost not noticeable. One of the things about looking at a 40-hertz flashing light is there's, for example, a low chance, but it's not zero, of inducing photoconvulsive activity or light flashing-inducing epilepsy, though it is a faster frequency.

And as you mentioned earlier, you know, some people are just bothered by it. It seems to be obnoxious, but you created a way that we can all benefit from this 40 Hertz stimulation without experiencing this kind of negative

feeling of a light flashing in our eyes.

So, one wonders if we could play it out on a wish list. Why couldn't we have these lights in schools, for example? Yeah, I think structurally, a lot of times we do have the understanding that my vision is that one day we can integrate all of this, our technology into ceiling lights, into tablets, right?

And I, and I that's the thing that in order to change all that, you need the resources and the infrastructure in or to create that change, but also you'd need people.

to understand why it's important that we need to fund these changes, that learn and think and be exposed to light or sound in a positive way. And then I think that's something that will come with more research and understanding.

We just gotta continue our work and continue to educate the public on what are some of the beneficial effects of it. Now you have actually, in addition to the light stimulation, coupled your therapy with auditory stimulation.

Can we talk about that for a moment? Multicentury simulation has been shown to even further amplify the signaling in the brain and help further. And so we've decided with a lot of, because we are on the market as a general wellness product, we do have real world testimonials and individuals who've asked us, who have given us feedback and they say, hey, look, I've heard about this research.

which has been shown in music therapy and sound. And so we've decided that we were going to combine that with our app that were developing because we are doing impact assessment.

So we're not only delivering the device to the individuals, but we want to be able to give them some impact and value back through our software, which then will allow them to learn about how they're improving week to week, month to month.

But at the same time, be able to say, yeah, I want to use this in combination with a sound therapy, whether through headphones or even just do their stereo.

Combining Light and Sound Therapy

And we've actually worked with the various sound and music professors in Uhus, maximize the comfort of also the 40 Hertz sound as well. So moving forward, what does the next five years look like in terms of this area of research in general and perhaps your more specific areas of interest?

I think in the next five years, we're going to really change the way that we think about prevention and treatment and devices that can utilize in order to train the brain.

There is already a lot more research going into not only Alzheimer's, but looking at MS, looking Parkinson's as well as other pathologies that you can examine in future.

For us, we would like to be the leaders in not only the scientific research and backing, but also in breaking ground for individuals to understand how to continue to train their brain.

probably extend our arms reach other than just a device, but hopefully speak with more leaders to change the way that we actually utilize our light systems.

We do hope that people will be more open to such a technology, especially early on in their life cycle. I think life is hard right now for people, Is there a sense that there may be benefit to coupling this type of therapy along with some sort of pharmacotherapy?

You know, I am a firm believer that if you can utilize this technology in order to amplify signaling in the brain and have it optimized that maybe we will be able to reduce the amount of drug that is needed to take to then reduce a side effects, right?

Because a lot of times these drugs are helping symptomatically and they can potentially help, but because the side-effects are so hard that adherence is a problem.

And so can we do something in inorder to them sort of personalize individual care, individual sort of instead of chronotherapy or phototherapy, you want to combine that and understand, okay, we gave you this dosage, but then have you have this stimulation in the brain to amplify the signaling of the dosages?

Can we reduce the amount of side effects? That could be potential. That also means that we need collaborators in that the pharmacological field to run the study for them.

Yeah. Where can people go to learn more about your work and for those who are interested, actually get hold of the device for themselves? They can reach out to me or go to our website at www.optosutics.com.

We have a lot of blogs to have people to understand not only how 40 Hertz and gamma simulation can help improve their quality of life, but we also just have general knowledge for individuals, caretakers, as well as you can also purchase our device now on our web site.

Future Research, Prevention, and Access

Wonderful. I will tell our audience that I am going to be receiving my device very, very soon, as in a matter of days. Believe me, I'm very excited about that.

Who wouldn't want to maintain their cognitive function? I have been very public about the fact that i have a family history of Alzheimer's. My father died of that disease, though I don't carry…

I think our viewers are quite familiar with the APOE4 allele, so my risk is perhaps less, and I'm not diabetic and haven't had head trauma. But that said, as we age, our risk continues to increase.

So I can't imagine why we wouldn't want to avail ourselves of therapy like this, along with physical exercise and getting adequate amounts of sleep, keeping our blood sugars optimized.

This seems like the perfect complement to all the lifestyle things we've been talking about for years. Yeah, I agree. And I think what people don't understand typically is that when we exercise our body, we forget to exercise, our brain.

So why don' we do both? Why don''t we improve? And also, most of the time we only worry when get a cut. but what do you do to prevent that cut is also just as important.

But yeah, I feel you and I think for me, it's been a journey to have this opportunity to create impact, but also to show individuals that we can do something about it and we should.

Well, great. Well let me thank you for taking time out for all of us today. This is incredibly exciting research and we'll definitely be following this with you over the next few years to see where it leads.

And I'm hoping you'll continue to send me the research articles as they're published. what an exciting time it is. And I'm very much looking forward to including this information in my upcoming book, Brain Defenders.

This is a brain defender that really it's so important that people know about. So thank you for joining us today. Yeah, thank you for having me and thank for your work.

And I do think that, you know, it's good to get to people to understand all of these information and you do a fantastic job at it. So thank so much, David.

Thank you so, much. We'll talk soon. Bye for now. Well, thanks again to Dr. Wen and Optosudix for sharing time with us today. What incredible technology.

to know that here is an intervention that doesn't require an intravenous medication or a pill that has now developed some really fascinating clinical application, really not just for people with existing disease, existing cognitive decline, mild cognitive impairment, or even early stage Alzheimer's, but really as a way of keeping the brain healthy and sharp.

Really fascinating information. I'm glad you all joined us today.