

Interview with Dr. Ernesto Leal Jr. was recorded 10.9.24 with J. Mark Strong

Hello Dr. Ernesto thank you for being here.

You've dedicated over 10 years of your life to studying laser therapy and its mechanisms of action.

How did you get started with this amazing technology?

Your studies are on Google Scholar Citations. Hundreds of researchers cite your studies for the quality of the data.

Your research includes pre-event athletic conditioning and post event athletic recovery, including extensive work with the U.S. Navy Seals. The issues are similar at the elite level of equine competition.

You've studied the cytoprotective protective qualities and faster recovery from pain at Nove de Julho University.

In equine distal limb injuries, increasing blood flow, increasing oxygen and nutrients is essential for faster more complete healing.

Please explain the mechanisms of action that are so important to the healing process.

It's said that your research findings are translational because mitochondria is so similar between human and animals. How are photons absorbed by different chromophores resulting in photobiomodulation, increasing photochemical results like ATP and photophysical actions creating more nitric oxide. This is the energy power plant in our cells?

Can the density of photons produced by these high peak power lasers produce better results versus the heat produced from continuous wave lasers?

How is delivering more photons through the skin possible without having a thermal impact?

Why is the true super pulsing laser so important when combined with certain wavelengths?

It's possible to deliver more photons through skin without potentially hazardous heat?

When we're talking to equine vets, human clinicians,
they want to know, are you able to reach these
deeper target tissues: the ligaments tendons
muscles, bone fractures?

Equine studies were discussed with Stelio Pacca Luna, Brazil's well known equine vet and Allen Schoen, named one of 15 most influential vets. You agreed removal of skin for penetration tests changes everything from blood flow to resonance. Instead, a pinch of cervical skin with special sensors to measure energy transiting this double thickness and included 12 different shades of skin pigmentation from white through grey to black. The study was published* and widely accepted as in vivo, noninvasive, and showing 10x more light transited through with super pulsed vs class IV.

*Equine Journal of Vet Science Nov. 2019

You validated that super pulsing delivers more light the skin more efficiently, but how does that affect dosimetry? We hear about 1,000, 3,000, and 10,000 joules. How do you know? Validation of dosimetry was a major focus of your research?

The Arndt Shultz curve and bi-phasic dose response are so interesting. You demonstrated when beneficial stimulatory effects begin, when they reach their peak and when you should you stop the dose if there's a thermal effect involved. Concluding, all lasers start out stimulatory, but become inhibitory based on the size of the dose and the rate at which it's delivered?

So, when the dose becomes inhibitory,
what actually is happening physiologically?

It's so important to know what the temperature is right below the skin, but if dose is based on joules, 1watt/cm², that's only on the surface.

You were using biomarkers: cytochrome c oxidase, for much more accurate analysis of inflammatory responses and for controlling inflammation.

This is what clinicians and veterinarians especially appreciate, identifying all the different variables involved in order to have enough data points to draw any sort of conclusions.

If you want to inhibit chronic back pain from arthritis, then a large dose delivered quickly is most effective.

Laser is generally accepted as a standard of care, but FEI sets the rules for safety at elite equine events. Having FEI approval of Multi Radiance including the MR5 ACTIVet Pro and Pro LaserShower for same day use at events was a breakthrough.

FEI vet, João Paulo Marques, returning from the Olympics and Para Olympics said, “These are the lasers I used at the Olympics daily because they’re effective and approved. They can be in my pocket and are always safe.”

One of the most common injuries involves tendons and ligaments, especially the proximal suspensory ligament on a distal limb in horses where there's poor blood flow.

What is photohemotherapy and can this be used to bring more blood, more oxygen down to these lesions to promote faster healing.

For anyone who may be wondering, where is mitochondria
in our bodies?

Where is there most and where is there least?

Sports injuries happen most frequently to muscles and the tendons connected to them.

Since there's an abundance of mitochondria in these tissues, it makes sense that delivering super pulsed photonic energy to those target tissues, consistently, will help accelerate a more complete healing.

A lot of people are going to wonder if there's any harm possible by accelerating healing.

Is it safe to say there are no side effects from use of these lasers?

Something also important for humans and animals is that collagen fibers are regrown with the right alignment to preserve their tensile strength.

Has this also been validated by your research?

Another of the important mechanisms of action is photodissociation of nitric oxide, producing vasodilation in these capillaries to allow the congested blood cells that are part of inflammation to move through?

Let's talk about addition of the bactericidal blue wavelength.

It's not a magic bullet against every bacteria. There are so many types. But for wounds, to help prevent or to fight infection, you can use this effective powerful blue light.

They will try to reproduce, so use the blue light even by itself to make sure you're applying enough to kill them?

You can use blue at full power by itself and it's also synergistic with the other wavelengths.

Would you also comment on the roll of static magnetics for sustaining the photosensitizing effects that make Multi Radiance unique?

This is one of the elements that drives our newcomer would be competition crazy. They don't understand the role of static magnetics and certainly don't understand the role of very complex algorithms.

It's taken over a decade with your team, plus the dedication of Sr. VP of Science (Doug Johnson) Director of Education (Robin Schumacher), and many others, before Multi Radiance became acknowledged as the 'Experts in Light' in the research community.

A lot of veterinarians, clinicians and athletes have discovered that the full benefits of these lasers results from making them part of general healthcare, daily training and conditioning programs.

Don't wait for an injury or degenerative conditions. Instead, use laser's prophylactic benefits at the onset of inflammatory conditions like arthritis. Utilize the cytoprotective properties by adding laser before events.

What's next?

Thank you to Dr. Ernesto Leal Jr.,
Doug Johnson, Robin Schumacher and everyone
who has contributed to making Multi Radiance lasers the
favorite of clinicians and athletes worldwide.



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