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Letters to the Editor

Editor:

During a recent literature review, I came across and read with interest the abstract to the article titled Contraindications in non-invasive laser therapy: truth and fiction,[1] which classifies cancer as a correct contraindication of such lasers.

Two months prior to the appearance of your manuscript, our group published a 10-year toxicity result from a Phase I trial of a novel noninvasive NIR laser denominated infrared pulsed laser device (IPLD)[2] in patients with advanced neoplasias.[3] The results of that study demonstrated that the IPLD is safe for clinical use and may have potential beneficial effects on Karnofsky performance status (KPS) and Spitzer quality of life index (QLI). Antitumor activity was found in approximately 88% of patients. In January 2002, we published cytomorphologic results documenting increased apoptosis in neoplastic cells after IPLD treatment and no apparent changes in non-neoplastic cells.[4] These results are in agreement with the previously published immune monitoring of the trial[5] as well as with theoretical[6,7] and experimental data[8,9] concerning the biological effects of the IPLD.

For years the clinical use of low-energy lasers has been marred by ill-founded claims and commercialism. During the last two decades, many researchers, societies, and journals have begun to establish firm ground upon which to base sound clinical applications for different types of low-energy lasers. Given the meritorious aim of your article and the significance for the field of *Photomedicine and Laser Surgery*, I thought it appropriate to inform you of our work for future reference. I would also like to invite you to continue to enrich with your talents what we believe will be a blossoming area of multidisciplinary research.[10]

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REFERENCES

1. Navratil, L., Kymplova, J. (2002). Contraindications in noninvasive laser therapy: truth and fiction. J. Clin. Laser Med. Surg. 20, 341–343.
2. Santana-Blank. United States Patent- No. 5,231,984 and other existing and pending patents.
3. Santana-Blank, L.A., Rodriguez-Santana, E., Vargas, F., et al. (2002). Phase I trial of an infrared pulsed laser device in patients with advanced neoplasias. Clin. Cancer Res. 8, 3082–3091.
4. Santana-Blank, L.A., Rodriguez-Santana, E., Vargas, F., Santana-Rodriguez, K.E. (2002). Photo-induced cytomorphologic changes in an advanced cancer phase I clinical trial. Lasers Surg. Med. 30, 18–25.
5. Santana-Blank, L.A., Castes, M., Rojas, M.E., Vargas, F., Scott-Algara, D. (1992). Evaluation of serum levels of tumour necrosis factor-α (TNF-α) and soluble IL-2 receptor (sIL-2R) and CD4, CD8 and natural killer (NK) populations during infrared pulsed laser device (IPLD) treatment. Clin. Exp. Immunol. 90, 43–48.
6. González, J.A., Martin Landrove, M., Carbó, J.R., Chacón, M. (1994). Bifurcations and chaos of DNA solitonic dynamics. International Centre For Theortical Physics, ed. International Atomic Energy Agency, Trieste, Italy, pp. 1–29.
7. González, J.A., Martin Landrove, M. (1994). Solitons in a nonlinear DNA model. Phys. Lett. A 191, 409–415.
8. Rodriguez-Santana, E., Santana-Blank, L.A., Reyes, H., et al. (2003). H-NMR spin-lattice and correlation times of burned soft-tissue after treatment with an infrared pulsed laser device. Lasers Surg. Med. 33, 190–198.
9. Santana-Blank, L.A., Rodriguez-Santana, E., Scott-Algara, D., et al. (2000). Short-term bioeffects of an infrared pulsed laser device on burned rat skin monitored by transverse relaxation times (NMR). Lasers Surg. Med. 27, 411–419.
10. Santana-Blank, L. (2003). Modulated low-energy near-infrared (NIR) lasers and cancer: An invitation to discuss a new treatment approach. Lasers Surg. Med. 32, 1–2.

Editor:

I HAVE READ with interest the letter from Luis Santana-Blank concerning the apoptosis effects of therapeutic laser on malignant tissue.

In Europe malignant disease is still considered as an indisputable contraindication to LLLT, and a similar view was also expressed by my Brazilian colleagues at a recent laser symposium in Florence. The co-operation between our University and your Institute could be interesting. I personally believe that the study of radioprotective effects of therapeutical laser for clinical use is very promising.

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Editor:

Our group is always pleased to exchange ideas about research that is both methodologically sound and scientifically rele-

vant. From the pioneer work of E. Mester on to more contemporary studies, such as those of T. Karu, controlled experiments have documented that LLLT can induce multiple stimulatory as well as inhibitory effects on cells depending on a number of variables, such as laser beam specifications, radiant exposure, and characteristics of the target tissue. It is precisely this versatility of biological effects which accounts for the immense potential for therapeutic applications of low-energy lasers and for the growing interest in the field by scientific publications, including the *Photomedicine*.

In addition to our group's studies, which to our knowledge are unique, investigations by other researchers with different approaches further indicate that the presence of malignant disease may be a valid contraindication only depending on the laser apparatus and treatment technique employed. Indeed, laser therapy has been found to significantly reduce the incidence and the severity of mucositis in chemotherapy patients [*Cancer J.* 8(3):247–254, 2002]. Increased natural antitumor resistance level, reduction of intoxication severity, and augmented organism tolerance to irradiation and polychemotherapy have also been reported with adjuvant low-energy laser therapy [*Klin. Khir. (Kiev)*, 3:40–41, 1998]. Moreover, low-energy laser irradiation has been shown to be able to induce an apparent adaptive response in Indian muntajac fibroblast in the form of a reduction in the frequency of chromosome aberrations induced by radiation but not in cell survival [*Mutat. Res.*, 435:35–42, 1999]. In this vein, it has been argued that "investigations into the ability of crisis to endow cancer cells with new growth properties and the identification of relevant accompanying genetic changes will hopefully allow [us] to design smarter therapies to treat this disease" [*Science.* 2002 Jul 26;297(5581):565–9].

As stated, our published investigations concern the biological effects of a patented apparatus [Santana-Blank, United States Patent 5,231,984 and other existing and pending patents] that is significantly different from other LLLT devices and is applied with an original method. Future lines of research will center on the effects of new laser technology considerably more advanced and with potential applications in the treatment of neoplasias and other diseases. The American Association for Cancer Research (AACR) (publisher of *Clinical Cancer Research*) has made freely available reprints of our phase I trial (http://clincancerres.aacrjournals.org/cgi/content/full/8/10/3082#B19). The rest of the publications listed in my previous correspondence should be easily reached since they were published by leading American and European peer-reviewed journals. Among the manuscripts published by our group in Europe, I would like to highlight the immune study of the phase I trial conducted by Fundalas jointly with the Pasteur Institut (Paris) and Instituto de Biomedicina at Universidad Central de Venezuela (Caracas) as early as 1992 [*Clin. Exp. Immunol.* 90(1):43–48, 1992], and theoretical papers resulting from cooperation agreements with other foreign and domestic research centers [*Physics Letters A,* 191:409–415, 1994; International Centre for Theoretical Physics 1–29, International Atomic Energy Agency and United Nations Educational Scientific and Cultural Organization Trieste, Italy 1994].

We are most appreciative of your valuable comments and look forward to continue building bridges of fruitful communication.

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