

### Antiparasitic Activity of Photodynamic Therapy in *Leishmania Amazonensis* Promastigotes

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Tegumentary leishmaniasis (TL) is an important form of Leishmaniasis in South America, which can cause ulcers throughout the body, including serious damage in the facial mucosal. Therapeutic approaches consist mainly in chemotherapy, which is not satisfactory due to the toxicity for the patient. Furthermore, conventional treatments can lead to the development of parasite resistance forms. Photodynamic Therapy (PDT) is a new therapeutic approach to treat TL that combines light, photosensitizer and oxygen. It has been used successfully against virus, bacteria, fungi and parasites [1], but literature about PDT on TL is still scarce. Our study investigated the PDT effects on *Leishmania amazonensis* promastigotes viability, using different laser irradiation parameters and methylene blue (MB) as the photosensitizer. Infective-stage of *L. amazonensis* metacyclic promastigotes were isolated from stationary cultures in 96 well plates, and 10<sup>7</sup> parasites were incubated with different MB concentrations (50µM, 100µM, 250µM, 500µM) during 10 minutes. Thereafter, the samples were irradiated during 1 and 5 minutes, using a LED (P= 100 mW or 260 mW) with λ=630 nm. The MTT colorimetric assay ((3-(4, 5-Dimethylthiazol-2-yl)-2, 5-diphenyltetrazolium bromide) was performed to evaluate cell viability. Data were statistically analyzed by Anova One Way test (p <0.05). Our results show that PDT using MB at 50 µM and 100 µM concentrations with LED power set on 260 mW for both times presented a higher leishmanicidal activity. We conclude that this therapy can be effective depending on light and photosensitizer parameters, and further studies using this approach would be valuable to advance its use in clinical practice.

[1] T.G.St.Denis, *et al.* All you need is light: Antimicrobial photoinactivation as an evolving and emerging discovery strategy against infectious disease.2011, *Virulence*,2:6,509-520.