FOLLOWING AN OLD LEAD: WOUND TREATMENT BY GELS CONTAINING *„NATRIUM CHLOROSUM"*

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Leishmaniasis is a tropical disease caused by parasites estimated to affect ~12 million people worldwide with ~1.5 million new infections occurring annually. In one of its forms, the *cutaneous leishmaniasis*, patients suffer from large, open skin wounds, often resulting in disfiguring scars on face or hands. Currently available treatment methods either involve expensive antibiotics or the application of antimony(V) salts causing severe side-effects. As an alternative way to treat *leishmaniasis* wounds, the non-profit organization *Waisenmedizin e.V.* based in Freiburg has been following initial work published nearly 40 years ago and developed *LeiProtect*®, a cellulose-based gel dressing containing chlorite (ClO_2^-).[1] *LeiProtect*® has shown very promising first results and is currently under further development to become a licenced product.[2]

Figure: *left*: Children suffering from cutaneous leishmaniasis (Getty Images); *right:* a syringe containing the cellulose-based *LeiProtect*® gel developed by *Waisenmedizin e.V.*.

The chlorite-containing component of *LeiProtect*® is a so-called *Natrium Chlorosum* solution, traditionally prepared by reducing chlorine dioxide (ClO_2) to ClO_2^- in an alkaline, aqueous medium. As details concerning the actual chemical composition, reactivity or release kinetics of *Natrium Chlorosum* are still very much unclear, we carried out a thorough investigation of the synthesis and chemical properties of this oxochloride solution as well as the gel properties of the *LeiProtect*® product. Additionally, we put a special focus on possible reactions of ClO_2^- in a "wound environment", meaning physiological pH and the presence of heme iron. The presentation will summarize our current understanding of the complex, very interesting bioinorganic chemistry possibly taking place when chlorite enters a wound and will offer first attempts to explain the mode of action of the *LeiProtect*® gel.

[1] J. Hinz, H. Hautzinger, K.-W. Stahl, *Lancet* **327**, 825 (1986)

[2] D. Debus, S. Genç, P. Kurz, M. Holzer, K. Bauer, R. Heimke-Brinck, M. Baier, A. Debus, C. Bogdan, K.-W. Stahl, *Am. J. Trop. Med. Hyg.* **106**, 857 (2022)