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Ethnopharmacology and Physiotherapy Congress 2019: New curcumin formulation for the treatment of cutaneous t-cell lymphoma - Antonios Trochopoulos - German Cancer Research Centre

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Cutaneous T-cell lymphomas (CTCL) are a group of heterogeneous life-threatening extranodal T-cell lymphoproliferative neoplasms, of which Mycosis Fungoides (MF) and Sézary syndrome (SéS) are the most prominent subtypes. Taking into account the acquired resistance of malignancies in general, curcumin, a natural pigment with proven antineoplastic effect and insignificant toxicity, could serve as a therapeutic agent in combination regimes.

Moreover, with inflammation playing a major role in the pathogenesis of CTCL, it is clear that compounds with antineoplastic/anti-inflammatory activity like curcumin, are favorable. In this study, we tested the antitumor efficacy of curcumin in ethanol solution, as well as incorporated into nanoparticles (mixed micelles based on Pluronic®123 and Pluronic® 127).

Both forms of curcumin were tested on 3 CTCL cell lines, namely HuT-78, HH and MJ. MTT-dye reduction assay showed cytotoxic effects in all 3 CTCL cell lines for both curcumin formulations with the IC50 values varying from 29.01 μM to 31.17 μM (ethanol solution) and 4.134 μM to 29.76 μM (nano-curcumin). The nano-formulation exerted faster cytotoxic effects (MTT-dye assay), which can be explained by its faster internalization into the cells as measured by fluorescent microscopy and HPLC analysis of the curcumin content in cell culture medium.

Western blot analysis showed down regulation of important protein molecules regarding proliferation and survival such as: WT-1, ALK, p-JAK2, p-JAK3 for both formulations. In conclusion, in this study we compared two different curcumin formulations and, as the active ingredient is the same, we saw similar down-regulating effects on signal transduction proteins responsible for proliferation and apoptosis escape.

It can be assumed that the inclusion of curcumin into polymeric nanoparticles will ameliorate its low bioavailability and support its faster internalization into the tumor cells.

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