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## Biological effects of modified curcumin on cancer cells and Leishmania Parasites

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Curcumin is the active ingredient in the turmeric rhizomes. The diarylheptanoid structure of curcumin has been found in recent studies to possess potential biological activities against a wide range of numerous human diseases. Despite this potential, curcumin has two main disadvantages associated with its structure: poor stability and low bioavailability. Also, Nitric Oxide (NO) holds a great potential for NO-based treatments for a wide variety of diseases. To check the combined effect of Curcumin and NO, we synthesized a Nitro-Curcumin hybrid through nitrate esterification reaction at the keto-enol position of curcumin and simultaneous aromatic nitration. In the current study, the anti-Cancer as well as anti-Leishmanial activities of modified curcumin (NO-curcumin) were observed and compared to those of unmodified curcumin. Under *in vitro* conditions, the modified NO-curcumin was found to possess stronger activity than the original structure. Exhibiting reducing cell proliferation, increasing cell death and lowering IC50. Moreover, we found that NO-curcumin has no cytotoxic effects on normal cells. Therefore, the modified natural compound (NO-curcumin) may serve as a promising alternative to the currently used drugs and continues to be researched in further related studies.

### **Recent Publications:**

- 1. Jantarat C (2013). Bioavailability enhancement techniques of herbal medicine: a case example of curcumin. Int J Pharmacy Pharm Sci 5: 493– 500.
- Kim, K.C., Lee, C (2010) Curcumin Induces Downregulation of E2F4 Expression and Apoptotic Cell Death in HCT116 Human Colon Cancer Cells; Involvement of Reactive Oxygen Species. Korean J Physiol Pharmacol 14: 391-397.
- 3. 3. Keeble, J.E., Moore, P.K. (**2002**) Pharmacology and potential therapeutic applications of nitric oxide-releasing nonsteroidal anti-inflammatory and related nitric oxidedonating drugs. Br J Pharmacol 137: 295-310.
- 4. 4. Moghadamtousi, S. Z., Abdul Kadir, H.; Hassandarvish, P., Hassan, T., Abubakar, S., Zandi, K (2014) A Review on Antibacterial, Antiviral, and Antifungal Activity of Curcumin. BioMed Research International. http://dx.doi. org/10.1155/2014/186864.
- 5. 5. Changtam, C., de Koning, H.P., Ibrahim, H., Sajid, M. S., Gould, M. K., Suksamrarn, A (**2010**) Curcuminoid analogs with potent activity against Trypanosoma and Leishmania species. Eur. J. Med. Chem 45, 941-956.

### Biography

Adel Al Hidmi obtained his PhD from The Hebrew University of Jerusalem, department of medicinal chemistry & natural products. He is currently working as a research and lecturer at Birzeit University.

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