Argan Oil-Enriched Nanomedicines to Enhance Both the Efficacy and Safety of Cancer Therapy - Pr Tamer EL BAYOUMI

The unique quality of poly-unsaturated fatty acids contained in argan oil (Argania spinosa), in addition to the abundance of active compounds (e.g., sterols, carotenoids, xanthophyls, and potent antioxidants) in the un-saponifiable fraction indicate marked potential nutritional benefits for the prevention of cardiovascular diseases and cancer. As poly-unsaturated fatty acids (PUFA) have demonstrated synergism with both radio- and chemo-therapy, in solid and haematological tumors, tocopherols and saponins derived from A. spinosa exerted evident anti-proliferative effect, both in vitro and in vivo. Within past few years, the succinate ester form of α-tocopherol, d-α-tocopheryl polyethylene glycol 1000 succinate (TPGS), a common surfactant in various nanocarriers, has received notable attention for its pro-apoptotic activity against cancer, not normal, cells.

Our recent preclinical cancer data indicate that active argan oil composition displayed cytotoxic activity, when optimally formulated in a pharmaceutical nanoemulsion (NE) platform. Enhanced inhibitory effect on the proliferation of model cancer cell lines was achieved via the incorporation of active TPGS in the emulsification of argan oil NE, suggesting a cooperative role of tocopherols along with other core active oil compounds, contributing to augmented inhibition of cancer growth.

Additionally, utilizing antioxidant argan oil NE formulations—further enriched with oxygen—radical scavengers/anti-inflammatory molecules—demonstrated superior in vitro cardio-protective activities, as well as marked reduction of H_2O_2—and adriamycin-induced apoptotic effects. Hence, our enriched argan NEs effectively diminished oxidative and non-oxidative damage of cardiomyocytes and aortic medial cell cultures. Collectively, optimized nano-formulations of the unique components of argan oil (PUFAs, sterols, polyphenols, tocopherols and saponins) offers not only superior pharmaceutical properties but can also enhance its pharmacological activity profiles in both cancer and cardio-protective therapies.

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