Nanoemulsions as delivery systems for poly-chemotherapy aiming at melanoma treatment

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Advanced melanoma is characterized by a poor outcome. Despite several innovations over the last decade, current pharmacological strategies are only partially effective. Therefore, the improvement of the current systemic therapy is worthy of investigation. Injectable nanoemulsions have been used clinically as i.v. nutritional supplements for over 40 years. Their biocompatibility, and concomitant FDA approval, paved the way to their employment for drug delivery. Indeed, such nanoemulsions are currently marketed for repurposing different compounds related to pain management. Based upon various mechanisms, they can be purposed also for anti-tumour drug delivery, aiming to melanoma treatment. Indeed, they can be loaded with combinations of drugs, with different physico-chemical properties and acting through various mechanisms, including kinase inhibitors, monoclonal antibodies and immunotherapies. Furthermore, they can be targeted by surface functionalization, either chemical or biological (cell ghosts wrapping). Encouraging preclinical results obtained on melanoma cell and animal models could drive towards clinical translation.