https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7691729/

Preparation of magnetic nanoparticle integrated nanostructured lipid carriers for controlled delivery of ascorbyl palmitate 2020

Magnetic hyperthermia (MH) is based on induction heating of MNps under application of an alternating magnetic field and the temperature increase in body tissues leading to cellular structure change. In high temperature, such as 40–43 °C, cancerous cells would be damaged but healthy cells survive. Basically, MH is focused on the destruction of tumors by heat, which is obtained from magnetic nanoparticles under the application of an alternating magnetic field (AMF) [17], [18], [19]. In addition to the use of MNPs individually, their integration into a drug-loaded nanocarrier and the application of local HP allows a combined therapy with a dual effect, while causing damage to the tumor cells locally and promoting the diffusion of the drug through the carrier. In this context, the modification of AA, as an antitumor agent, with PA and the administration of AP with MH by loading into MNp integrated NLCs (MNLCs), both providing locally high dosage AA application and local damaging of tumor cells can be considered as a promising and advantageous method that can be used in combined therapy.

When we look at the drug release% values in Fig. 13.A, it is seen that there is not much difference between free AA and AA-NLC in terms of percentage release. Looking at the released value after 1 h, it is seen that free AA is only 11% more than AA-NLC. This is the main reason why AA is chemically modified with palmitic PA and converted to AP. When looking at AP release from AP-NLC, it is observed that the release is slowed down considerably and converted into a controlled manner. While AA-NLC release% value was 83% after 1 h, this value was calculated as 23% for AP-NLC.