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Anticancer efficacy of self-nanoemulsifying drug delivery system of sunitinib malate

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Sunitinib malate (SM) is reported as a weakly soluble drug in water due to its poor dissolution rate and oral bioavailability. Hence, in the current study, various "self-nanoemulsifying drug delivery systems (SNEDDS)" of SM were prepared, characterized and evaluated for the enhancement of its *in vitro* dissolution rate and anticancer efficacy. On the basis of solubilization potential of SM in various excipients, "Lauroglycol-90 (oil), Triton-X100 (surfactant) and Transcutol-P (cosurfactant)" were selected for the preparation of SM SNEDDS. SM-loaded SNEDDS were developed by spontaneous emulsification method, characterized and evaluated for "thermodynamic stability, self-nanoemulsification efficiency, droplet size, polydispersity index (PDI), zeta potential (ZP), surface morphology, refractive index (RI), the percent of transmittance (% T) and drug release profile." *In vitro* dissolution rate of SM was significantly enhanced from an optimized SNEDDS in comparison with SM suspension. The optimized SNEDDS of SM with droplet size of 42.3 nm, PDI value of 0.174, ZP value of −36.4 mV, RI value of 1.339% T value of 97.3%, and drug release profile of 95.4% (after 24 h via dialysis membrane) was selected for *in vitro* anticancer efficacy in human colon cancer cells (HT-29) by MTT assay. MTT assay indicated significant anticancer efficacy of optimized SM SNEDDS against HT-29 cells in comparison with free SM. The results of this study showed the great potential of SNEDDS in the enhancement of *in vitro* dissolution rate and anticancer efficacy of poorly soluble drug such as SM.

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