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„ГОЦЕ ДЕЛЧЕВ“  
ШТИП

# ANTITUMOR ACTIVITY OF RESVERATROL LOADED SOLID LIPID NANOPARTICLES

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## INTRODUCTION

Resveratrol is identified as (3,5,4'-trihydroxy-trans-stilbene), classified as natural polyphenol consisting of two phenolic rings attached by methylene bridge. This active compound exhibited potent pleiotropic, antineoplastic activity without documented toxicity to normal cells. In addition, numerous studies reported that resveratrol, as most researched stilbene, possess numerous health-benefit properties, such as cardioprotective, antidiabetic, neuroprotective and chemopreventive. Regrettably, clinical realization of resveratrol is restricted due to its poor aqueous solubility (0.05 mg/ml), degradation at physiological pH associated with extremely low systemic bioavailability. An intriguing strategy to overcome these limitations is formulation of resveratrol-loaded nanoparticles such as solid-lipid nanoparticles as platforms for delivery to target tissues..

## METHODOLOGY

For the purpose, we did a detailed overview of data from clinical studies of various formulations of resveratrol loaded solid lipid nanoparticles, process of preparation and characterization of their structure, influence of various parameters on stability are processed and the patented formulations placed on the market are listed. We obtained the data by searching a relevant scientific-professional literature, we pointed out the advantages and disadvantages of the nanoparticles and discussed the results of clinical studies of resveratrol loaded solid lipid nanoparticles.

## RESULTS AND DISCUSSION

Obtained results showed significantly improved bioavailability and stability of resveratrol incorporated into solid lipid nanoparticles. For example, intravenous application of resveratrol loaded SLN in rats showed cytotoxicity on C6 glioma cells and significantly improved cell internalization. Brain distribution was also tested and results showed substantially higher concentration, even nine folds, of resveratrol loaded SLN compared with free solution of the hydrophobic drug.

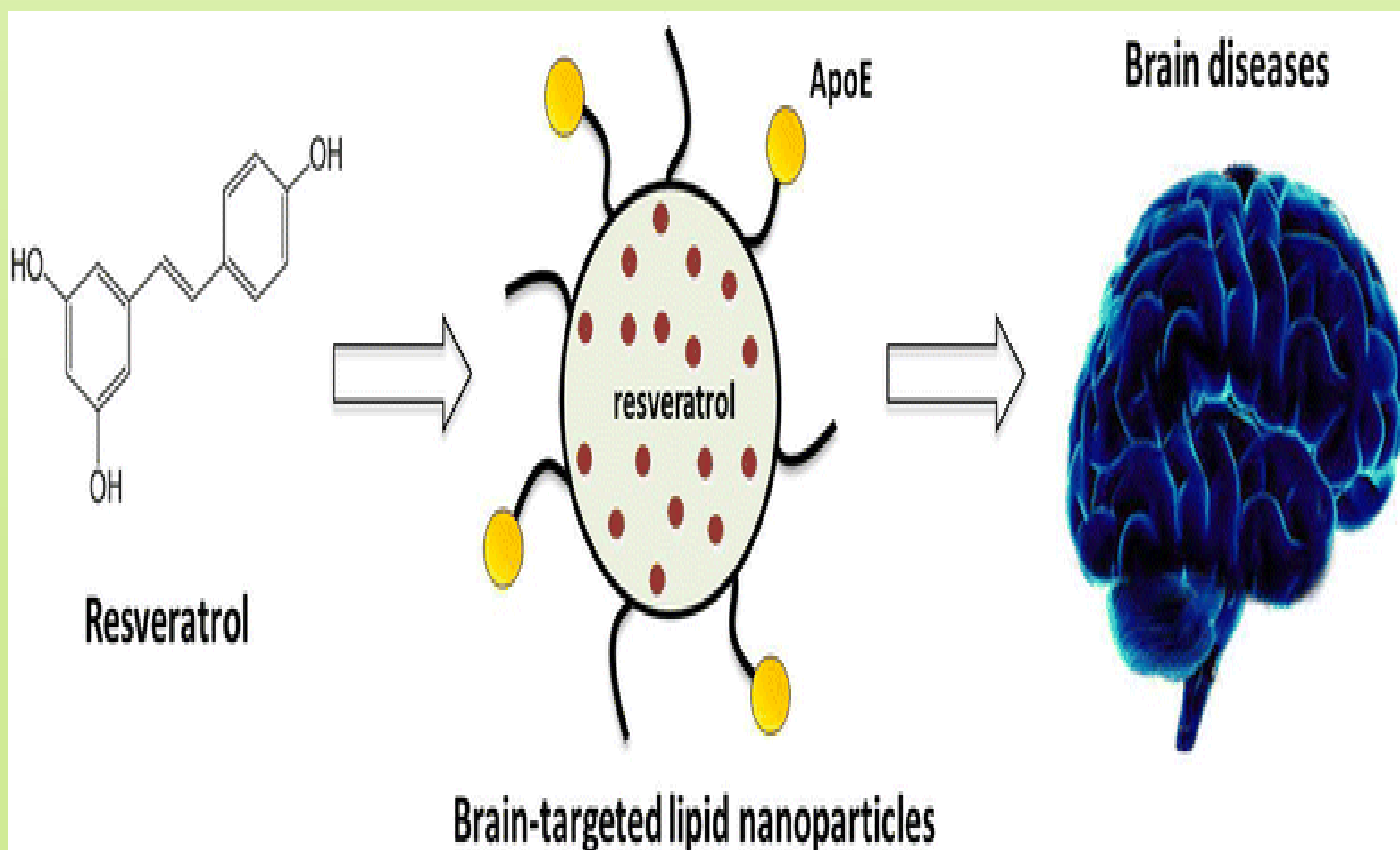


Figure 1. Brain delivery of resveratrol using SLN

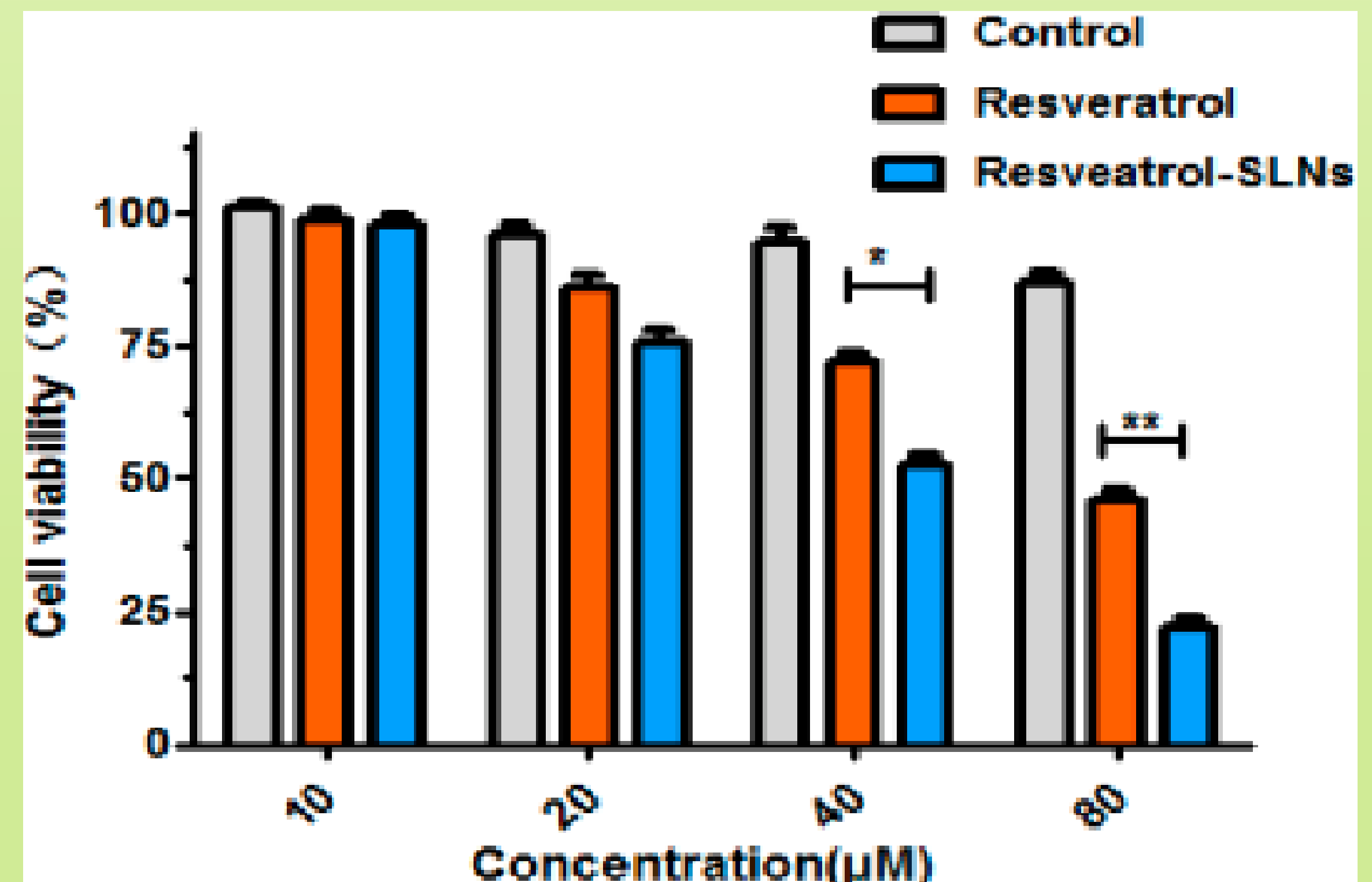


Figure 2. Antitumor activity of resveratrol loaded SLN

## CONCLUSION

Resveratrol loaded nanoparticles showed remarkable advantages over non-encapsulated agent. Low-solubility problems, low systemic circulation and stability were significantly improved with encapsulation of this efficacious agent into nanoparticles.