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Preparation of the SAHA-Pluronic F127 nanoparticles and anticancer activity *in vitro*

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Purpose: Vorinostat (SAHA) is the most representative histone deacetylase inhibitor and a widely used anticancer drug, SAHA is applied in the treatment of hematological malignancies and most solid tumors. SAHA is challenging due to poor water solubility, low bioavailability and rapid elimination of drugs *in vivo*. In this study, we will prepare SAHA-Pluronic F127 Nanoparticles and investigated whether this could improve drug solubility, the effect of sustained release and inhibitory effect on cancer cells.

Methods: SAHA-Pluronic F127 nanoparticles were prepared by thin-film method. The drug loading, entrapment efficiency and *in vitro* drug release test were determined by High Performance Liquid Chromatography (HPLC). The proliferation on HeLa cell was examined by MTT. The mRNA expression of p53 and p21 were determined by real-time PCR.

Results: The particle size of the nanoparticles was 23.86±0.30 nm, the encapsulation efficiency was 94.36±0.76% and the drug loading was 1.31±0.062. The results showed that SAHA NPS can achieve about 17% sustained release effect and the inhibitory effect on cell growth of SAHA NPS was better than SAHA. Both the SAHA and SAHA NPS up-regulated p21 and down-regulated p53 in mRNA level after 24 h and 48 h treatment and SAHA nanoparticles had better effects compared to SAHA at 48 h.

Conclusion: This study confirmed encapsulation of SAHA into Pluronic F127 nanoparticles can improve drug aqueous solubility and sustained release in vitro and the inhibition of cell growth of SAHA NPS was more potent than SAHA.

Biography

Xiong Wang has completed his Bachelor's degree in Pharmacy from Wenzhou Medical University. Presently, he is pursuing his Master's degree from the Xi'an Jiaotong University, China.

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