

Abstract

The present disclosure provides a metal-chelated phospholipid complex, a metal-chelated phospholipid complex nanoparticle and a drug-lipid particle, and preparation methods and uses thereof, which relates to the field of biotechnology. The metal-chelated phospholipid complex is formed by reaction of a phospholipid molecular moiety, a linker molecular moiety, and a metal ion moiety. The metal-chelated phospholipid complex nanoparticle comprises a metal-chelated phospholipid complex, a particle aggregation-inhibiting conjugated lipid, and a non-cationic lipid or a non-ionizable lipid. The drug-lipid particle comprises a drug and the metal-chelated phospholipid complex nanoparticle. The metal-chelated phospholipid complex has a function in adsorbing drugs with negative charges and self-assembling with other lipids into metal-chelated phospholipid complex nanoparticles (MPP), so as to avoid the use of cationic lipid or ionizable lipid under the condition of ensuring the effectiveness which is not less than that of LNP, so that the toxicity of the drug-lipid particle is greatly reduced compared with LNP, the biological safety is remarkably improved, and the delivery of drugs with negative charges in organisms is facilitated.

Fig. 2-10