Preparation of blood compatible alpha-lipoic acid coating stent by low temperature plasma polymerization

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Most conventional drug eluting stents were coated to form polymer thin film onto the metal stent surface by dip or spray coating containing drug. These polymer thin films in this method usually possess poor adhesion to the stent surface. Therefore, we have made efforts to improve attachment between stent surface and drug compounds. We could prepare more stable polymer thin film on the stent surface by using low temperature plasma polymerization, and then α-lipoic acid covalently grafted onto the polymer thin films. First metal stent surface was modified with DACH to have amine functional by low temperature plasma polymerization process. Then, the amine group on the surface of stents could be chemically grafted with carboxyl group of α-lipoic acid to form the amide bond in the presence of carbidiimides. We investigated some factors influencing the amide formation in grafting reactions, such as pH, molar ratio of ALA to carbodiimieds. The in vitro blood compatibility of ALA grafted stents was investigated.