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Immobilization of L-Cysteine onto Polyethylene Glycol Polymerized by Surface-wave Plasma ZHENYI SHAO, AKIHISA OGINO, MASAAKI NAGATSU, Shizuoka University — Immobilization of anticoagulant bioactive compounds is an effective way to improve anticoagulant properties of blood-contacting materials. Free L-cysteine has attracted researcher's much attention as it can catalyze protein S-nitrosoalbumin (AlbSNO) to release NO messenger molecule, which is a potent inhibitor of platelet activation and aggregation and leading to the potential of long-time anticoagulant property. Polyethylene glycol (PEG) with terminal of hydroxy functional groups is proposed to play the role of both hydrophilic layer to alleviate aging effect and subsequent covalent immobilization of L-cysteine. Surface-wave plasma treatment is presented to polymerize or crosslink polyethylene glycol (PEG) onto polyurethane (PU) surface for immobilization of L-cysteine. The correlativity between introduced functional groups and immobilized L-cysteine was discussed. The results suggest that a bio-functionalized surface with high density of immobilized L-cysteine could be achieved on surface with high density of effective hydroxy functional groups. Furthermore, both plasma pre- and post-treatment parameters are investigated to achieve a surface with high density of OH functional groups. The influence of pre-treatment conditions on immobilization of L-cysteine is not very distinctive and post-treatment conditions are optimized to reserve more effective OH functional groups for subsequent L-cysteine immobilization.

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