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Surface Modification with ECM-Inspired SDF-1 α /Laminin-Loaded Nanocoating for Vascular Wound Healing

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Surface biomimetic modification with extra-cellular matrix (ECM)-derived biomolecules is an emerging potential method of accelerating the healing of vascular stent lesions. However, insufficient capacity of the constructed biofunctional layer in maintaining its long-term efficiency and preventing thrombus and neointimal hyperplasia continue to be major limitations in clinical application. On the basis of the structure and function of ECM, in this study, we constructed a novel stromal cell-derived factor-1 α (SDF-1 α)/lamininloaded nanocoating on the 316L stainless steel (SS) surface to provide improved function in modulation of vascular remodeling. The modified surface was found to control delivery of biomolecules and exhibit promising potential to provide stage-adjusted treatment after injury. An *in vitro* biocompatibility study suggested that the constructed layer may effectively prevent thrombosis formation by inhibiting platelet adhesion and activation, while accelerating endothelium regeneration by inducing endothelial cell (EC) migration and endothelial progenitor cell (EPC) aggregation. An *in vivo* animal test further demonstrated that the nanocoating may prevent thrombus and neointimal hyperplasia after implantation for 3 months. Therefore, the ECM-inspired nanocoating described in this study is a promising novel approach for vascular stent surface modification.

Biography:

Dr. Xia Li achieved his Medicine Bachelor Degree at Medical University of China Qinghai, China in 1982, his Internal Medicine Specialist title at People's Hospital, Medical University of China Qinghai in 1983, his lecturer and chief resident of cardiology and geriatrics in 1988, his assistant professor and attending physician of cardiology and geriatrics in 1994, his Master of Medicine Medical University of China Lanzhou in 1988, his Doctor of Medicine Degree at Medical University of China Qinghai in 1992, his associate professor and associate chief physician of cardiology and geriatrics in 1997 and his professor and chief physician of cardiology and geriatrics in 2002. He was visiting research scholar in College of Health Sciences, University of Wyoming, U.S.A. Research project Molecular Pulmonology, visiting professor and postdoc in College of Health Sciences, University of Wyoming, U.S.A. Research Project Molecular Cardiology Aging and Myocardial Hypertrophy, Postdoc TX Medical Center U.S.A. Research Project Molecular Cardiology. He has been the associate chairman of Geriatric Association North China, Director of China Nanjing Huaian Geriatric Institute, Director of Department of Geriatric Huaian Hospital Xuzhou Medical University of China. 16 SCI papers were published in 2016-2017.