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SPARC enhance acute corneal repair after chemical injury in a rat dry eye modelYun-Ching Cheng¹, Wen-Yang Lai¹, Wan-Yu Hsieh² and Shu-Ching Hsu³¹Chang Bing Show Chwan Memorial Hospital, Taiwan²National Cheng Kung University, Taiwan³National Institute of Infectious Diseases and Vaccinology, Taiwan

Objective: The objective of this study was to report the evaluation of efficacy of mesenchymal stem cells (MSC) conditional medium for the treatment of severe keratitis in dry eye disease in early-access program. Unique abilities of MSC could be used to develop new treatment approaches for dry eye disease.

Materials & Methodology: An SD rat dry eye model was used in which chemical damage corneal break decreased the Schirmer test score by at least 40%. The eye symptom score, breakup time of tear film (BUT) and Schirmer test score were compared before and after treatment in the two groups (MSC conditional medium in normoxia and hypoxia). The repair ability of conditional medium of MSC by wound weal assay using HUVEC and cancer cell line. We identified the specific component of hypoxia conditional medium of WJ-MSC (Wharton's jelly) by mass spectrometry (MS-MS). Classification of specific high expression protein was determined by western blot analysis.

Results & Discussions: Hypoxia conditional medium of WJ-MSC showed significant high repair ability than normoxia conditional medium of WJ-MSC in SD rat dry eye model. SPARC was identified as major protein in hypoxia conditional medium. According to the different days of conditional medium by western blot analysis, SPACR (secreted protein, acidic and rich in cysteine) was increased as time-dependent manner. Cell mobile ability was being increase by SPACR in serum-free culture condition of HUVEC. In SD rat dry eye model, rat continuing treatment with PBS, Artificial tears and SPACR for 2 weeks and determine the recovery by BUT and Schirmer test score. SPACR show the best recovery ability than others.

Conclusions: In a rat dry eye model, SPARC, the special expression in hypoxia conditional medium, show great recovery ability. Cell based assay, SPARC enhance the cell wound weal. According these results, we consider that SPARC is a potential therapeutic agent for use in the treatment of dry eye syndrome.

Biography

Yun-Ching Cheng has completed her PhD from National Sun Yat-sen University and Post-doctoral studies from Cancer Research of NHRI in Taiwan. Her studies focus on the role of hypoxia condition-expression of proteins/genes in cancer metastasis and the repair ability of hypoxia-induced proteins in MSC. She has published more than five papers in reputed journals.

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