GMR Genetics and Molecular Research
Online Journal
ISSN:1676-5680

Resveratrol could reverse the expression of SIRT1 and MMP-1 *in vitro*

J.W. Wu[1], J.J. Wang[2], J.B. Chen[1], Y.L. Huang[1], H. Wang[1], G.H. Liu[1], L.F. Li[3], M. Kang[1], X.G. Wang[1] and H.H. Cai[1]

[1]Department of Spine Surgery, HuiZhou Municipal Central Hospital, HuiZhou, Guangdong, China
[2]Department of Ophthalmology, HuiZhou Municipal Central Hospital, HuiZhou, Guangdong, China
[3]Department of Emergency, HuiZhou Municipal Central Hospital, HuiZhou, Guangdong, China

Corresponding author: H.H. Cai
E-mail: honhuacai@126.com

Genet. Mol. Res. 14 (4): 12386-12393 (2015)
Received April 26, 2015
Accepted August 15, 2015
Published October 16, 2015
DOI http://dx.doi.org/10.4238/2015.October.16.5

ABSTRACT. Intervertebral disc degeneration is the main cause of lumbago disease, in which the extracellular matrix structure and moisture in the nucleus pulposus is lost continuously. In this study, we aimed to detect differential expression of silence mating type information regulation 2 homolog 1 (SIRT1) and matrix metalloproteinase-1 (MMP-1) in human intervertebral disc nucleus pulposus cells and to explore the effects of SIRT1 and MMP-1 on the development of the intervertebral disc degeneration. Intervertebral disc nucleus pulposus specimens from 41 patients who underwent lumbar protrusion resection at HuiZhou Municipal Central Hospital, during the period from October 2011 to December 2013, were studied in comparison with 23 control cases from patients who underwent fractured lumbar resection. In degenerated human intervertebral disc nucleus pulposus cells, the expression of SIRT1 is decreased and MMP-1 is increased compared with that of the control cells.

Resveratrol could reverse these effects, thereby increasing the expression of *SIRT1* (0.87 ± 0.07 *vs* 0.54 ± 0.04), *Coll2α1* (0.90 ± 0.08 *vs* 0.38 ± 0.01), and *aggrecan* (0.69 ± 0.07 *vs* 0.42 ± 0.05) and decreasing the expression of *MMP-1* (0.61 ± 0.03 *vs* 0.93 ± 0.08). These results suggest that resveratrol could possibly reverse the process of intervertebral disc degeneration and thus could be applied as a potential drug for the disease.

Key words: Resveratrol; SIRT1; MMP-1; Immunohistochemistry; Intervertebral disc nucleus pulposus