



# ***Rehmannia glutinosa* oligosaccharide induces differentiation of bone marrow mesenchymal stem cells into cardiomyocyte-like cells**

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**ABSTRACT.** The aim of this study was to observe the effect of *Rehmannia glutinosa* oligosaccharide (RGO) on differentiation of bone marrow mesenchymal stem cells (MSCs) into cardiomyocyte-like cells. Rat MSCs were isolated, treated, and grouped as follows: RGO treatment group, 5-azacytidine (5-aza) treatment group, RGO + 5-aza treatment group, and control group. Following a four-week induction period, cardiac troponin I (cTnI) levels in MSCs were quantified by chemiluminescence, and the levels of myocardial enzymes creatine kinase (CK) and creatine kinase isoenzyme-MB (CK-MB) were measured using a dry chemistry analyzer. The cTnI- and connexin 43 (Cx43)-positive MSC population was identified by

immunofluorescence, and expression levels of cTnI and Cx43 were analyzed by western blots. Following induction, cTnI, CK, and CK-MB levels were significantly higher in the RGO + 5-aza group as compared with the RGO and 5-aza groups ( $P < 0.05$ ). In addition, fluorescence intensity of cTnI and Cx43 was higher in the RGO + 5-aza group as compared with the RGO and 5-aza groups. No cTnI- or Cx43-positive cells were detected in the control group. Western blot analysis further confirmed that cTnI and Cx43 were not expressed in the control group, while cTnI and Cx43 was higher in the RGO + 5-aza group than in the RGO and 5-aza groups. These results suggest that MSCs can be induced by RGO to differentiate into cardiomyocyte-like cells *in vitro*, and that RGO in combination with 5-aza enhance differentiation of MSCs.

**Key words:** *Rehmannia glutinosa* oligosaccharide; Mesenchymal stem cells; Cardiomyocyte-like cells; Cell differentiation