



# N-ethylmaleimide-sensitive factor siRNA improves cardiac function following myocardial infarction in rats

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Genet. Mol. Res. 14 (3): 9478-9485 (2015)

Received November 12, 2014

Accepted April 6, 2015

Published August 14, 2015

DOI <http://dx.doi.org/10.4238/2015.August.14.11>

**ABSTRACT.** This study examined the effects of N-ethylmaleimide-sensitive factor (NSF) small interfering RNA (siRNA) on cardiac function following myocardial infarction (MI) in rats. Thirty-six adult Sprague Dawley rats were randomly divided into three equivalent groups. An acute MI model was established by ligating the anterior descending branch of the left coronary artery and confirmed by electrocardiogram. Recombinant NSF-siRNA adenovirus (experimental), negative adenovirus (control), and normal saline were injected near the infarcted area of the left ventricle in each respective group. The left ventricular ejection fraction (LVEF) was measured with a noninvasive ultrasonic cardiogram. Left ventricular end-diastolic pressure (LVEDP) and the maximum rate of rise in left ventricular pressure (+dp/dt max) were measured using the BL-420 Biological Functional Experimental System. Hearts were sectioned and stained with 2,3,5-triphenyl tetrazolium chloride (TTC) to observe the MI area. Two weeks after

surgery, LVEF in the experimental group ( $46.0 \pm 7.5\%$ ) was higher than control ( $34.0 \pm 6.0\%$ ) and saline ( $37.5 \pm 4.5\%$ ) group LVEFs ( $P < 0.05$ ), whereas LVEDP was the lowest in the experimental group ( $18.51 \pm 6.87$  vs  $29.47 \pm 9.94$  and  $26.58 \pm 8.97$  mmHg, respectively) ( $P < 0.05$ ). The  $+dp/dt$  max was also higher in the experimental group ( $9.74 \pm 1.16$  vs  $4.33 \pm 1.19$  and  $5.24 \pm 1.53$  mmHg/s  $\times 10^3$ , respectively) ( $P < 0.05$ ); however, the MI area did not differ significantly between groups. Local injection of an adenovirus-mediated NSF-siRNA expression vector near infarcted areas improved cardiac function two weeks after MI, but had no impact on the MI area.

**Key words:** N-ethylmaleimide-sensitive factor; RNA interference; Cardiac function; Myocardial infarction