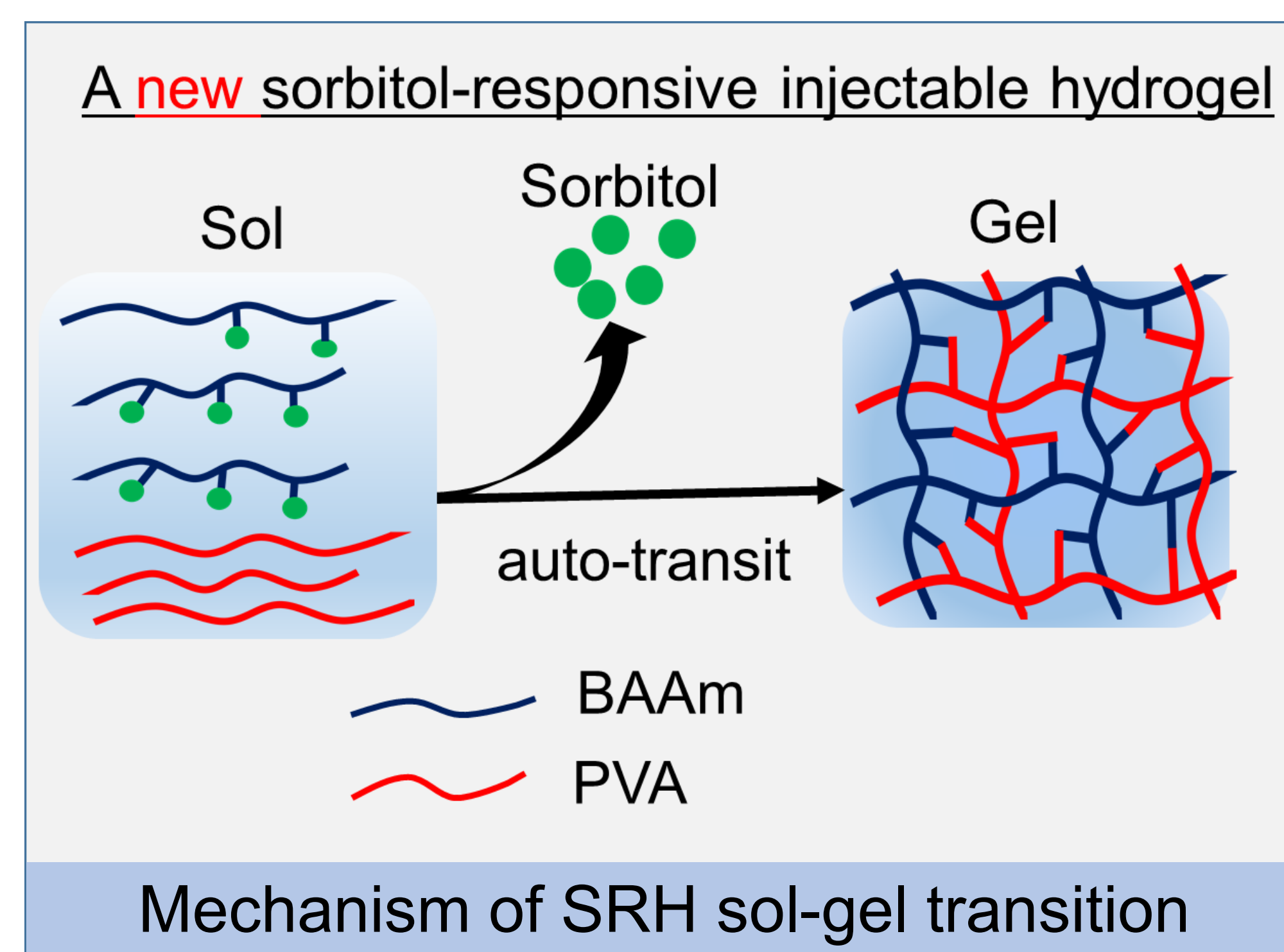


Introduction

Delivery of injectable hydrogel to the heart tissue has been still a challenge for the cardiac therapy because its gelation behavior has been difficultly controlled. We here developed a new system composed of poly (3-acrylamidophenylboronic acid-co-acrylamide) (BAAm) and polyvinyl alcohol (PVA), whose gelation depends on sorbitol concentration (so called sorbitol-responsive hydrogel, SRH). Our research aims to achieve its sol-gel transition in myocardial infarction (MI), and to investigate the effect of gelation behavior on cardiac function recovery.

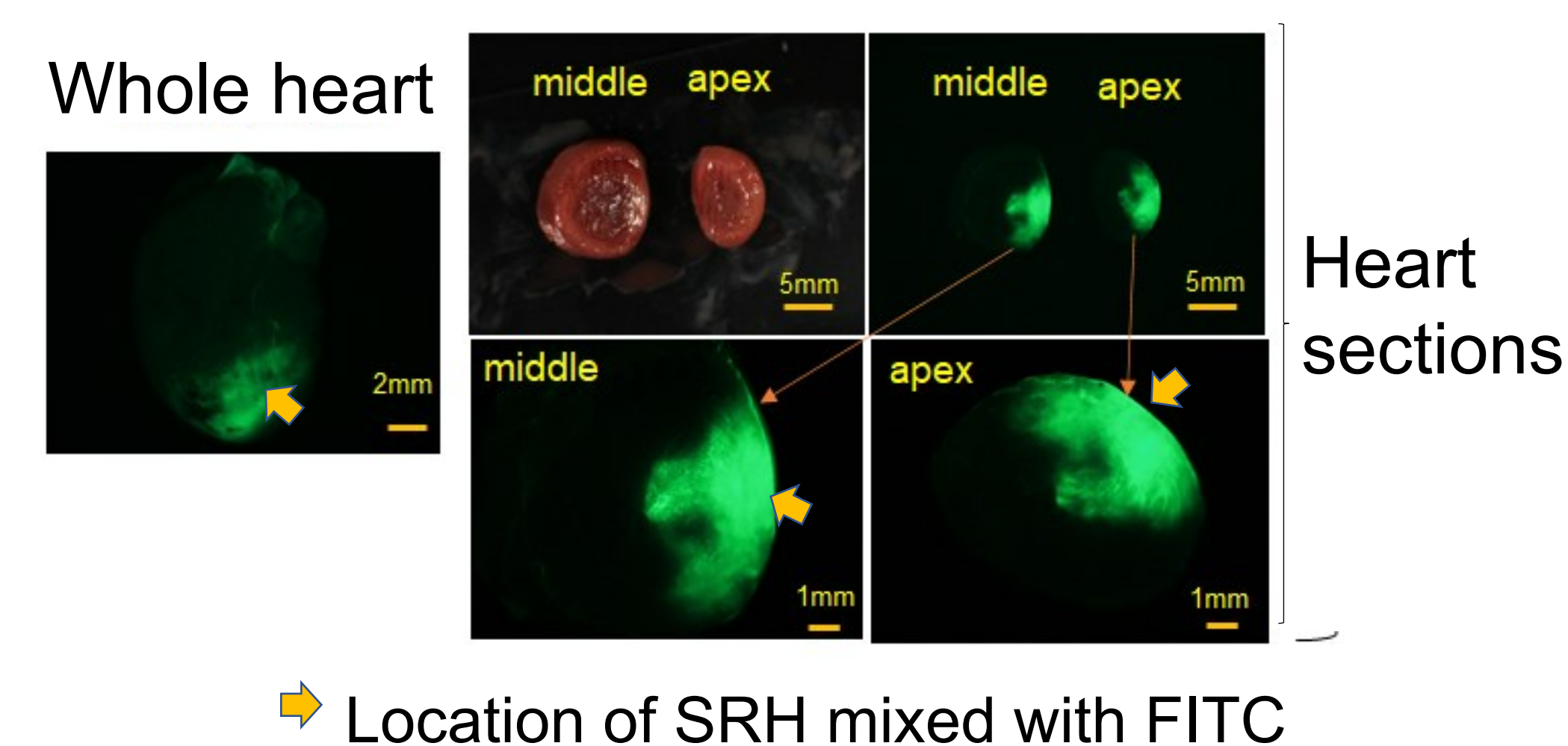


Result 2: Sol-Gel transition of SRH with different sorbitol concentration

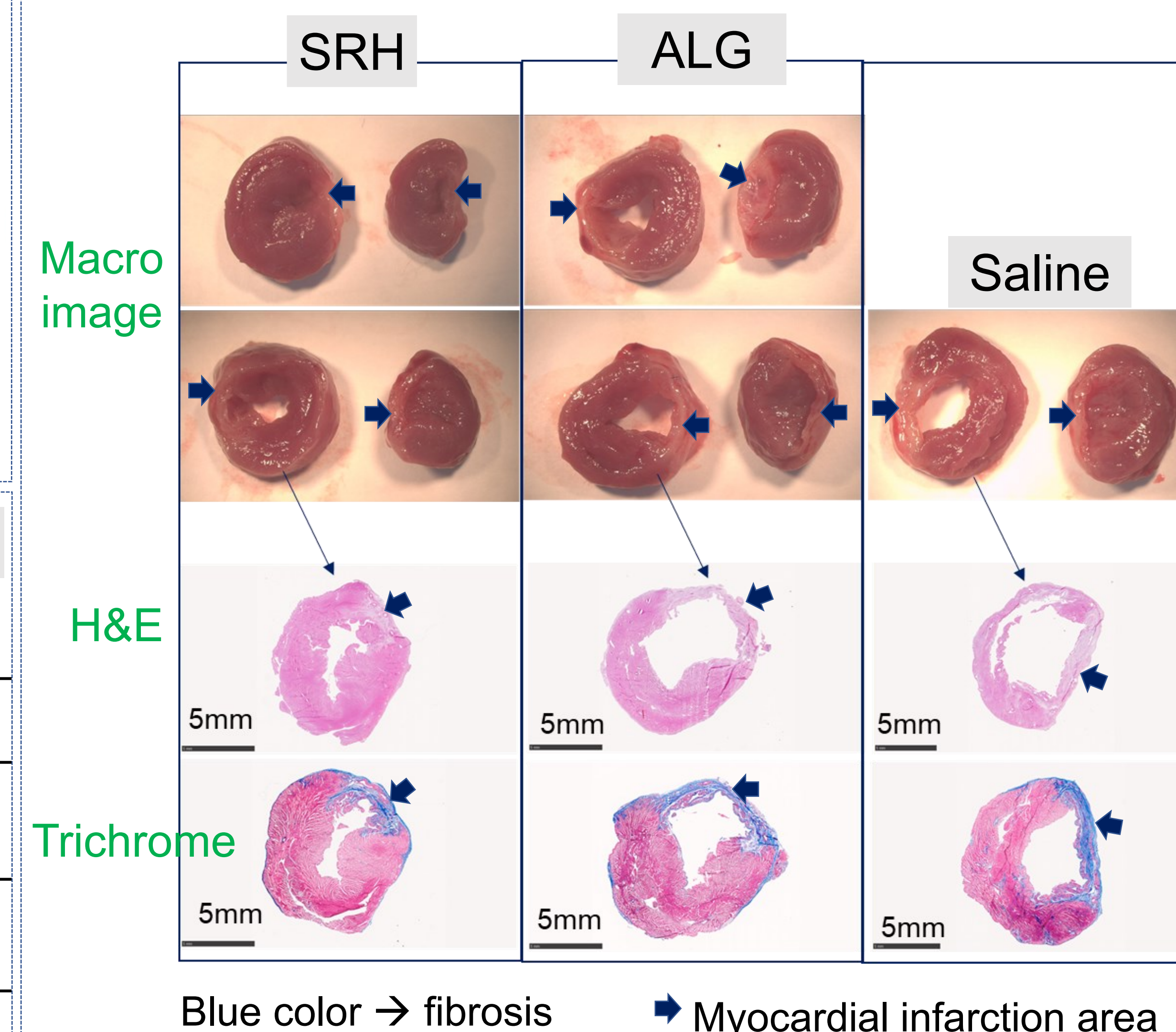


Result 3: The effect of SRH on cardiac function and morphology of MI rats

Distribution of SRH in heart tissue



The effect of SRH on cardiac morphology



Fraction shortening post SRH treatment

	pre treat	1 week	2 week	3 week
SRH	34.6 ± 14.5 (n=4)	36.09 ± 15.9 (n=4)	41.6 ± 11.2 (n=2)	40.1 ± 11.2 (n=2)
ALG	37.2 ± 16.5 (n=4)	39.8 ± 17.9 (n=4)	37.95 ± 15.5 (n=2)	35.5 ± 10.7 (n=2)
Control	20.4 (n=1)	16.9 (n=1)	17.1 (n=1)	14.8 (n=1)
Ref. (1)	43.6 (n=10)	27.6 (n=10)	23.4 (n=10)	22.4 (n=10)

(The data was presented as mean value ± standard deviation)

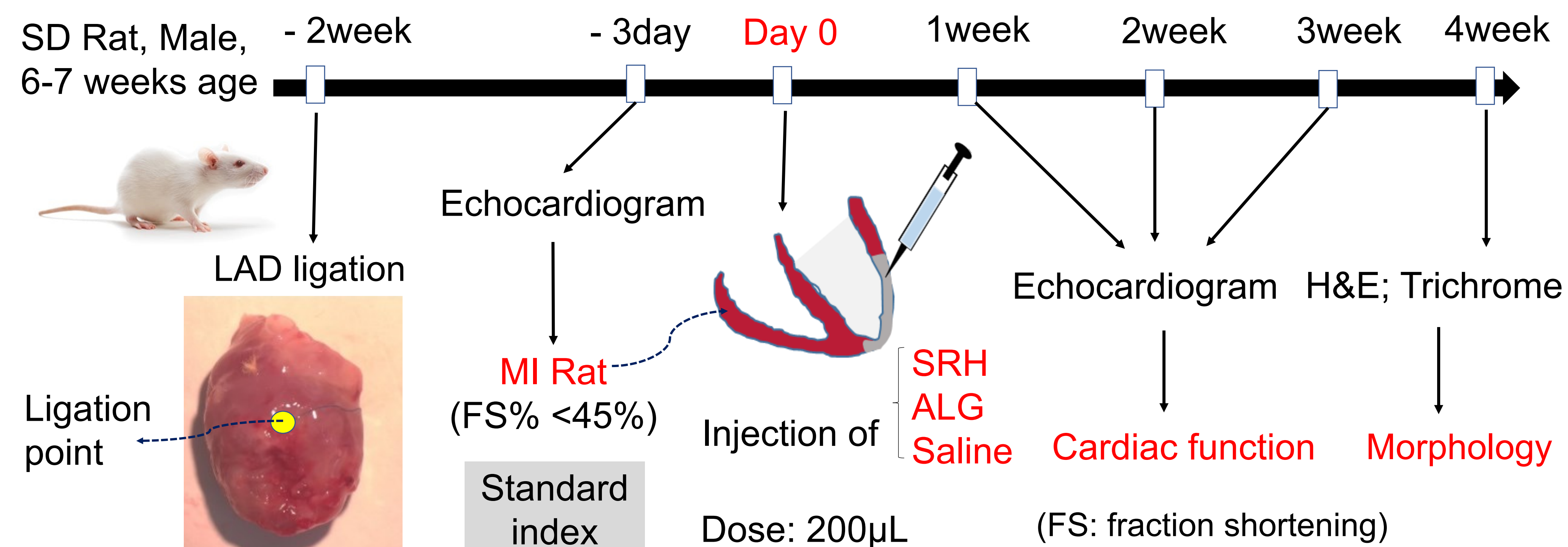
SRH improved cardiac function of MI rat more than ALG

Summary

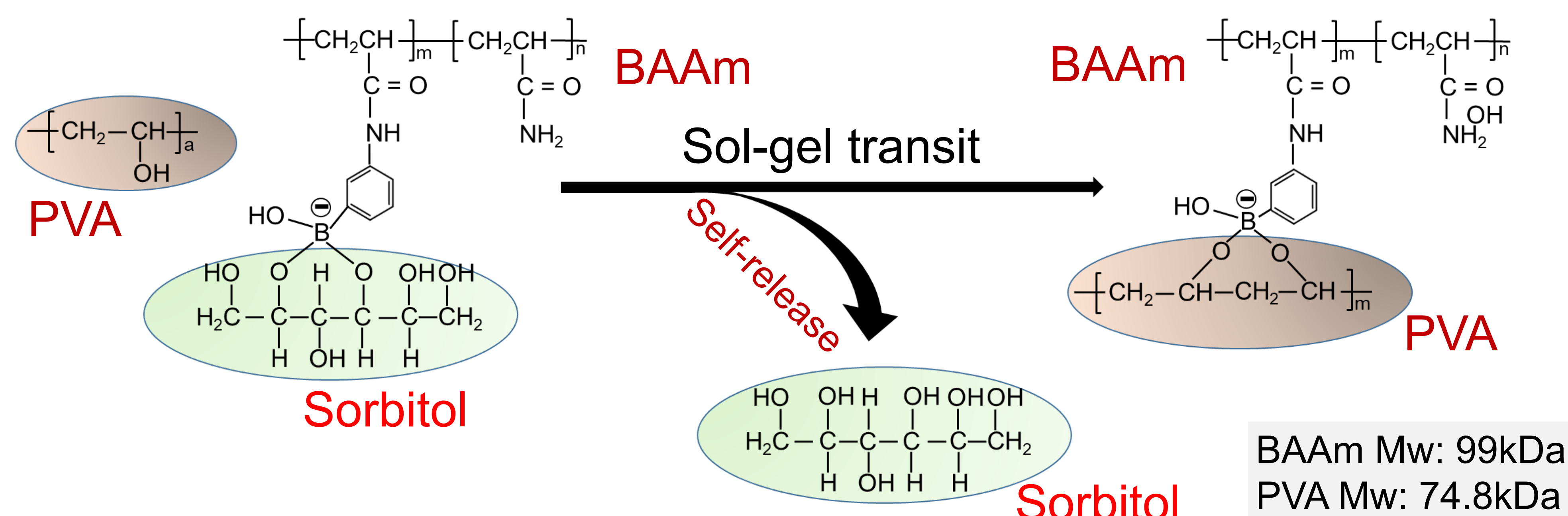
Our current data demonstrated that sol - gel transition of SRH solution was induced by decreased sorbitol concentration. It was spontaneously occurred without any exogenous stimuli. Interestingly, SRH may have more effective treatment for MI than ALG.

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Method: SRH treatment of rat MI



Result 1: Chemical concept of sol to gel transition of SRH



References : (1) Abdalla, Sherif et al. *Interactive cardiovascular and thoracic surgery* (2013), 17(5): 767-72