Supplemental Information

Subcellular Localization of Survivin Determines Its Function in Cardiomyocytes

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1 supplemental table and 11 supplemental figures
Supplemental Table 1

<table>
<thead>
<tr>
<th>Echocardiography</th>
<th>Treatment</th>
<th>Sham</th>
<th>adGFP</th>
<th>adSVV</th>
<th>adT34A</th>
<th>adNLS-SVV</th>
<th>adNLS-SVV + AZD1152</th>
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<tr>
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<td>D1</td>
<td>D21</td>
<td>D1</td>
<td>D21</td>
<td>D1</td>
<td>D21</td>
<td>D1</td>
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<tr>
<td>EDV (mL)</td>
<td>0.087 ± 0.013</td>
<td>0.097 ± 0.008</td>
<td>0.163 ± 0.018</td>
<td>0.493 ± 0.1</td>
<td>0.158 ± 0.015</td>
<td>0.221 ± 0.024</td>
<td>0.164 ± 0.01</td>
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<tr>
<td>ESV (mL)</td>
<td>0.028 ± 0.006</td>
<td>0.03 ± 0.004</td>
<td>0.1 ± 0.012</td>
<td>0.328 ± 0.056</td>
<td>0.1 ± 0.009</td>
<td>0.171 ± 0.022</td>
<td>0.105 ± 0.013</td>
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<td>FS (%)</td>
<td>31.2 ± 1.828</td>
<td>32.81 ± 0.969</td>
<td>14.29 ± 0.483</td>
<td>12.45 ± 0.686</td>
<td>15.26 ± 0.480</td>
<td>16.72 ± 1.827</td>
<td>15.68 ± 1.749</td>
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<td>EF (%)</td>
<td>67.2 ± 1.985</td>
<td>65.63 ± 2.779</td>
<td>36.53 ± 0.596</td>
<td>28.18 ± 1.698</td>
<td>36.35 ± 0.934</td>
<td>36.18 ± 0.613</td>
<td>35.33 ± 1.707</td>
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</tbody>
</table>

Supplemental Table 1. Cardiac functions of mice received intramyocardial virus injection and MI surgery. EDV, end diastolic volume; ESV, end systolic volume; FS, fraction shortening; EF, ejection fraction.
**Supplemental Figure S1. Expression of three SVV isoforms in developing mouse heart and post-MI adult heart.**

A, SVV-140 and SVV-121 are detected in the developing mouse heart. B, SVV-140 and SVV-121 are detected in adult mouse heart post-MI.
Supplemental Figure S2. Statistical analysis of SVV expression level in mouse heart after MI.
Supplemental Figure S3. Western blot of cardiomyocyte subcellular fractions after MI.
Supplemental Figure S4. SVV is not detectable in cardiomyocyte in KO mouse heart after MI. Scale bar, 20 µm.
Supplemental Figure S5. Proliferating cardiomyocyte in MCM and KO mice after MI. A, Immunostaining of ki67 and cTnl in MCM and KO mice. White bar, 50 µm; yellow bar, 10 µm. B, Statistical analysis of proliferating cardiomyocytes in MCM and KO mice.
Supplemental Figure S6. Examination of cardiomyocyte size in MCM and KO mice after MI. A, WGA staining of heart in sham and MCM or KO mice after MI. Yellow bar, 200 µm. B, Quantification and statistical analysis of cardiomyocyte size.
Supplemental Figure S7

Supplemental Figure S7. Expression level of endogenous SVV and exogenous SVV, fused with GFP, in cardiomyocytes infected with virus.
Supplemental Figure S8.

Supplemental Figure S8. Overexpression of SVV attenuates cardiomyocyte apoptosis. A, Overexpressing SVV in CMs reduces doxorubicin-induced apoptosis. Dox, doxorubicin. B, Quantification of TUNEL positive CMs. ***, P<0.005.
Supplemental Figure S9. Delivery efficiency and localization of treatment using intramyocardial injection of virus. **A**, Exogenous SVV, fused with GFP, could be detected around the infarction border zone 2 days after MI. Scale bar, 400 µm. **B**, Exogenous SVV is detected in the cytoplasm of cardiomyocytes in adSVV administration, but in both the nucleus and cytoplasm of cardiomyocytes in the adNLS-SVV group. White bar, 20 µm; yellow bar, 5 µm.
Supplemental Figure S10. EdU-pulse labeling assay in mouse received adGFP or adSVV administration. A, C57BL/6J Narl mice received virus injection and MI surgery, and were administrated with 50 mg/kg EdU daily. White bar, 50 µm; yellow bar, 20 µm. B, Statistical analysis of EdU-positive cardiomyocytes in adGFP and adSVV group.
Supplemental Figure S11. Expression level of CREB-binding protein (CBP) mRNA in mouse heart development.