

## **PARP1 Promotes Heart Regeneration and Cardiomyocyte Proliferation**

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Supplementary Figures

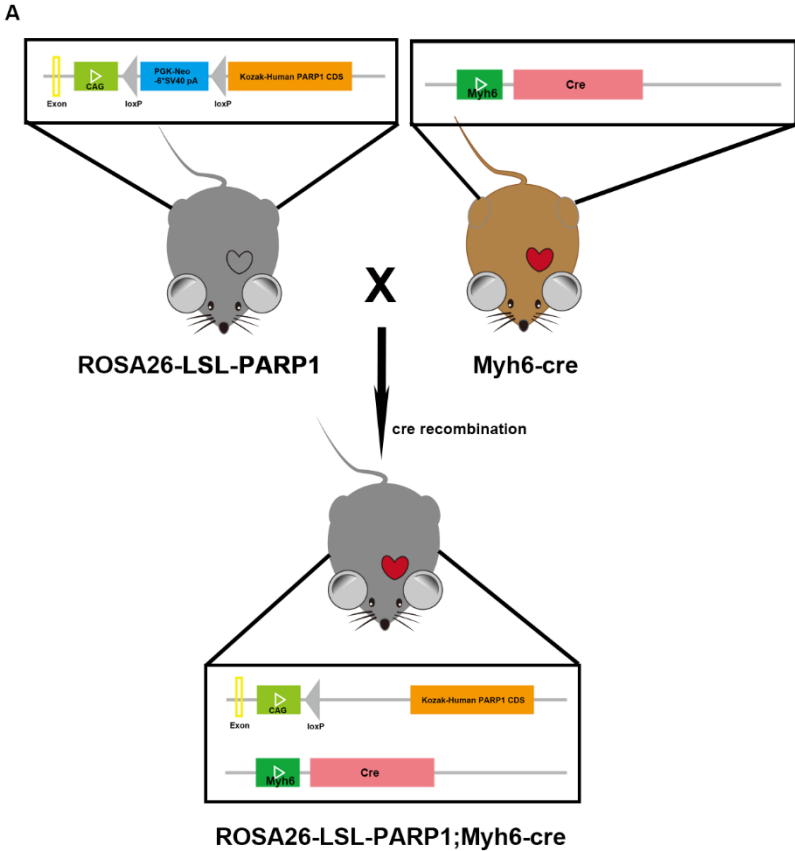
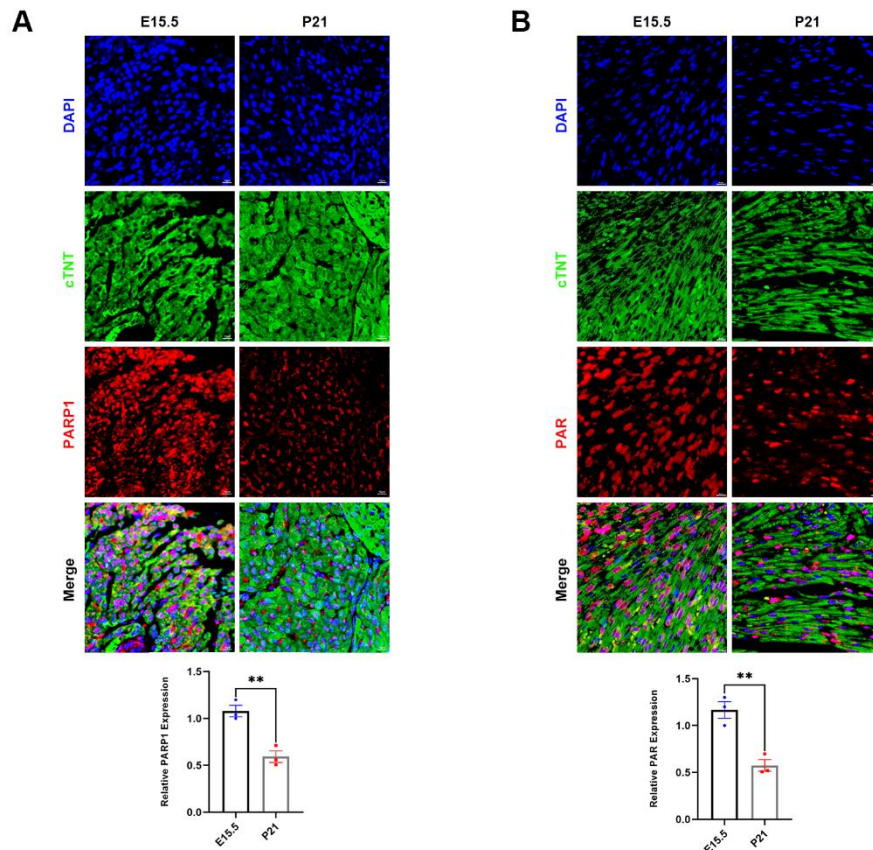
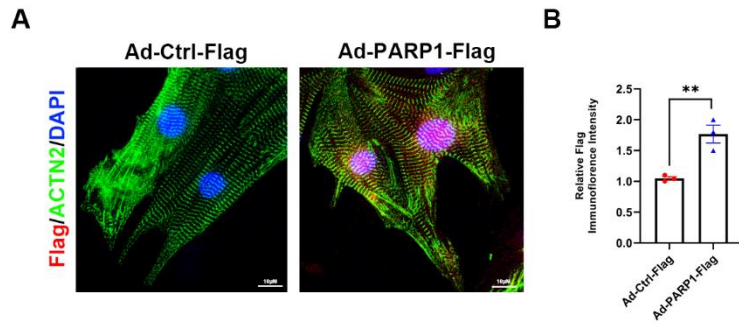


Figure S1 Schematic representation of the conditional knockin of PARP1.  
(A) Schematic representation of the conditional knockin of PARP1.



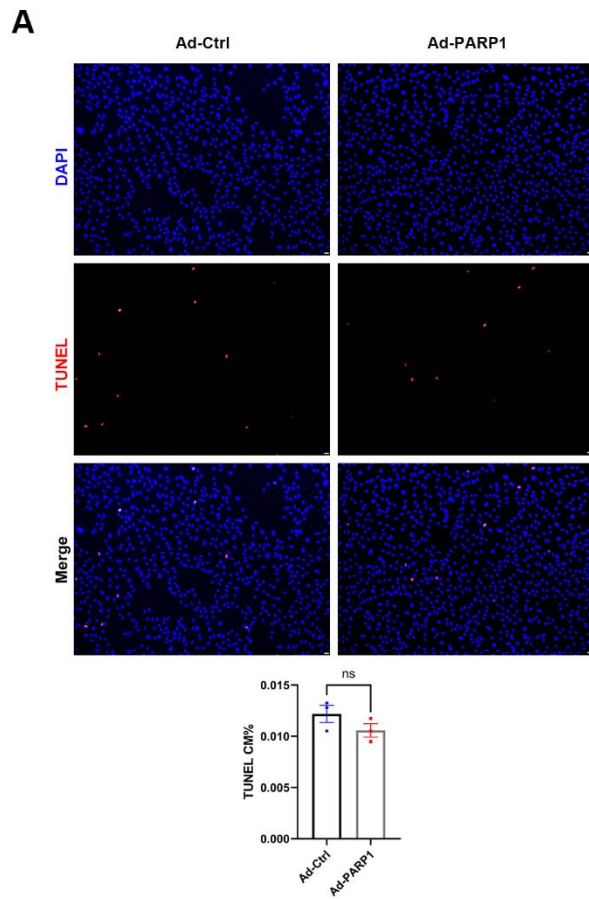
**Figure S2 PARP1 and PAR expression decreases in mice heart with age.**

(A) Representative immunostaining image and statistical analysis of PARP1 expression level (red) in cardiomyocytes at P21 relative to E15.5 (n=3 per group). Scale bars, 10 $\mu$ m. \*\*P < 0.01 by unpaired Student's test. (B) Representative immunostaining image and statistical analysis of PAR expression level (red) in cardiomyocytes at P21 relative to E15.5 (n=3 per group). Scale bars, 10 $\mu$ m. \*\*P < 0.01 by unpaired Student's test.



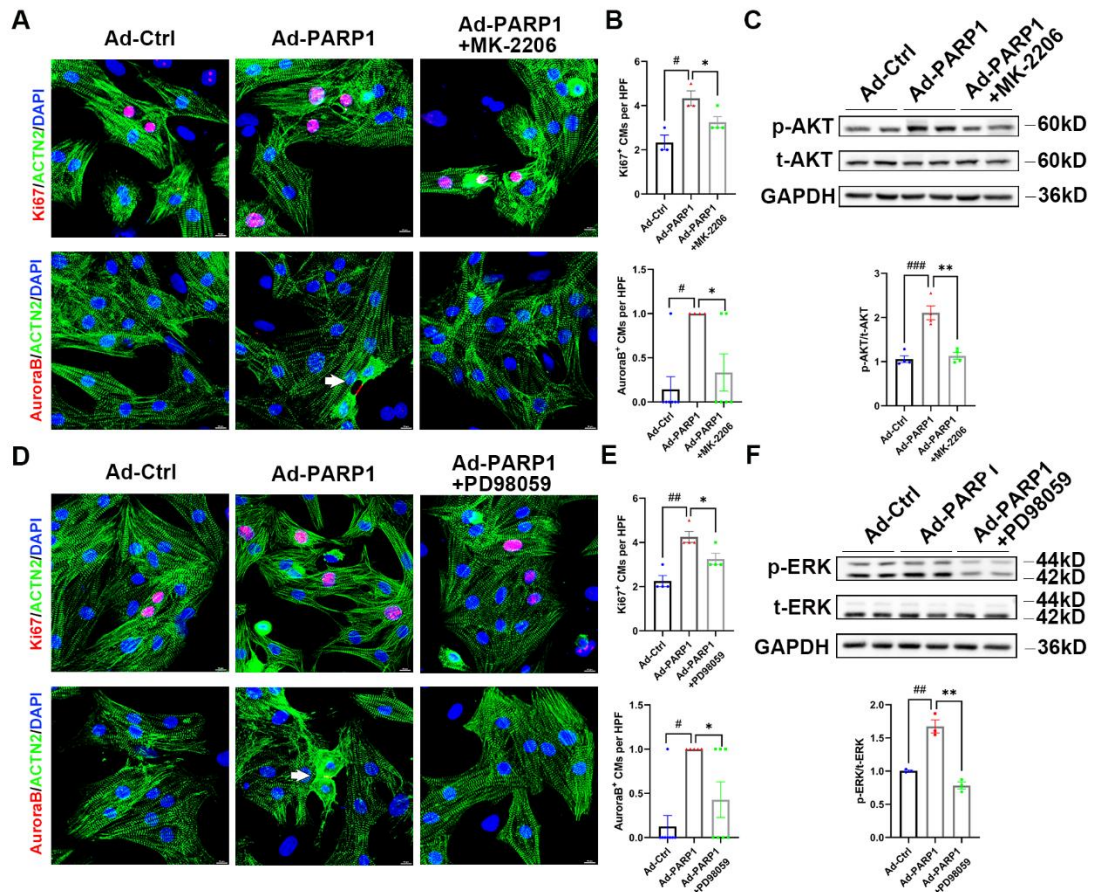
**Figure S3 Transduce efficiency of Ad-PARP1-Flag in NRCMs.**

(A) Representative images and statistical analysis of transduce efficiency of Ad-ctrl-Flag and Ad-PARP1-Flag infected NRCMs (n=3). \*\*P < 0.01 by unpaired Student's test.



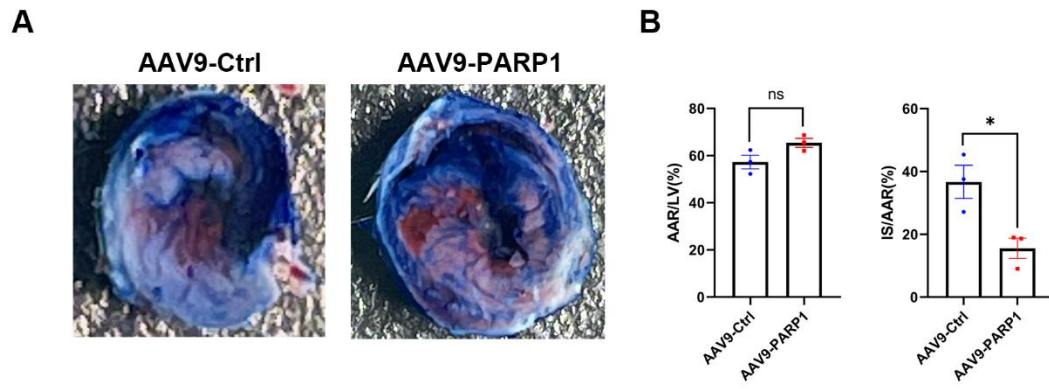
**Figure S4 PARP1 overexpression does not affect cardiomyocyte apoptosis.**

(A) TUNEL staining and statistical analysis of cell apoptosis between Ad-Ctrl and Ad-PARP1 infected NRCMs (n=3).



**Figure S5 ERK or AKT inhibitor partially hinders the effect of PARP1 on cardiomyocyte proliferation.**

(**A and B**) Representative images and statistical analysis of Ki67<sup>+</sup>, Aurora B<sup>+</sup> cardiomyocytes (red) in Ad-Ctrl, Ad-PARP1, and Ad-PARP1+MK2206 NRCMs (n=3-6). #P < 0.01 by unpaired Student's test, \*P < 0.01 by unpaired Student's test. (**C**) Representative western blot images and statistical analysis of p-AKT, t-AKT, and GAPDH protein expression (n=4). ###P < 0.001 by unpaired Student's test, \*\*P < 0.01 by unpaired Student's test. (**D and E**) Representative images and statistical analysis of Ki67<sup>+</sup>, Aurora B<sup>+</sup> cardiomyocytes (red) in Ad-Ctrl, Ad-PARP1, and Ad-PARP1+PD98059 NRCMs (n=3-7). #P < 0.01 by unpaired Student's test, \*P < 0.01 by unpaired Student's test. (**F**) Representative western blot images and statistical analysis of p-ERK, t-ERK, and GAPDH protein expression (n=3). ##P < 0.01 by unpaired Student's test, \*\*P < 0.01 by unpaired Student's test.



**Figure S6 PARP1 improves cardiac repair in adult mice after MI.**

**(A and B)** Representative images of Evans blue-TTC staining of MI and statistical analysis of area at risk (AAR) and infarct size (IS) in AAV9-Ctrl and AAV9-PARP1 group (n=3). \*P < 0.05 by unpaired Student's test.