Supplementary Information

Promotion of Pathological Cardiac Remodeling by Excessive Mitochondrial Fission in Sedentary Lifestyle-Associated Myocardial Infarction

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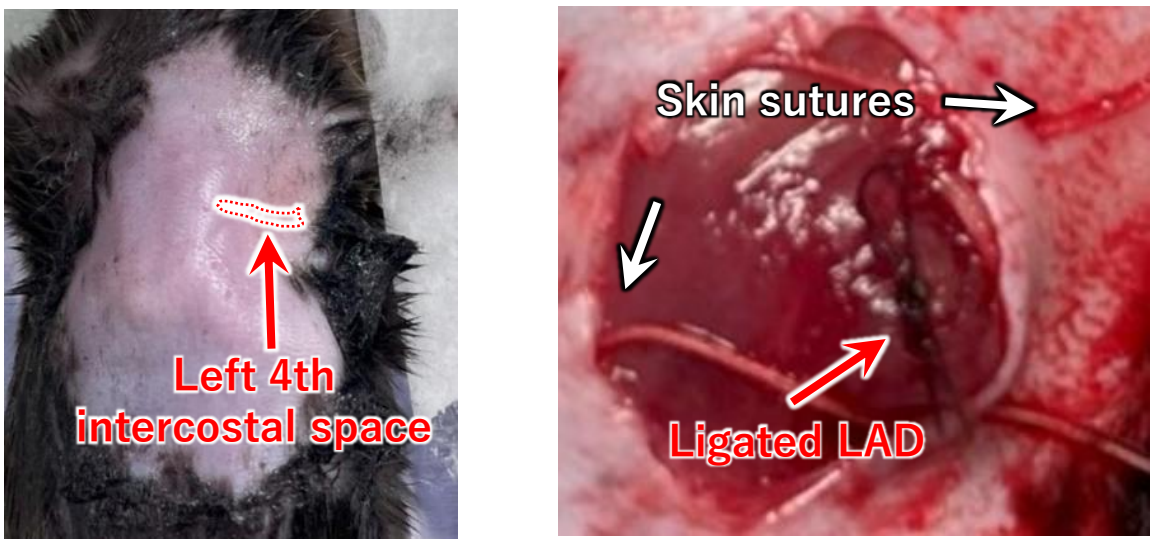
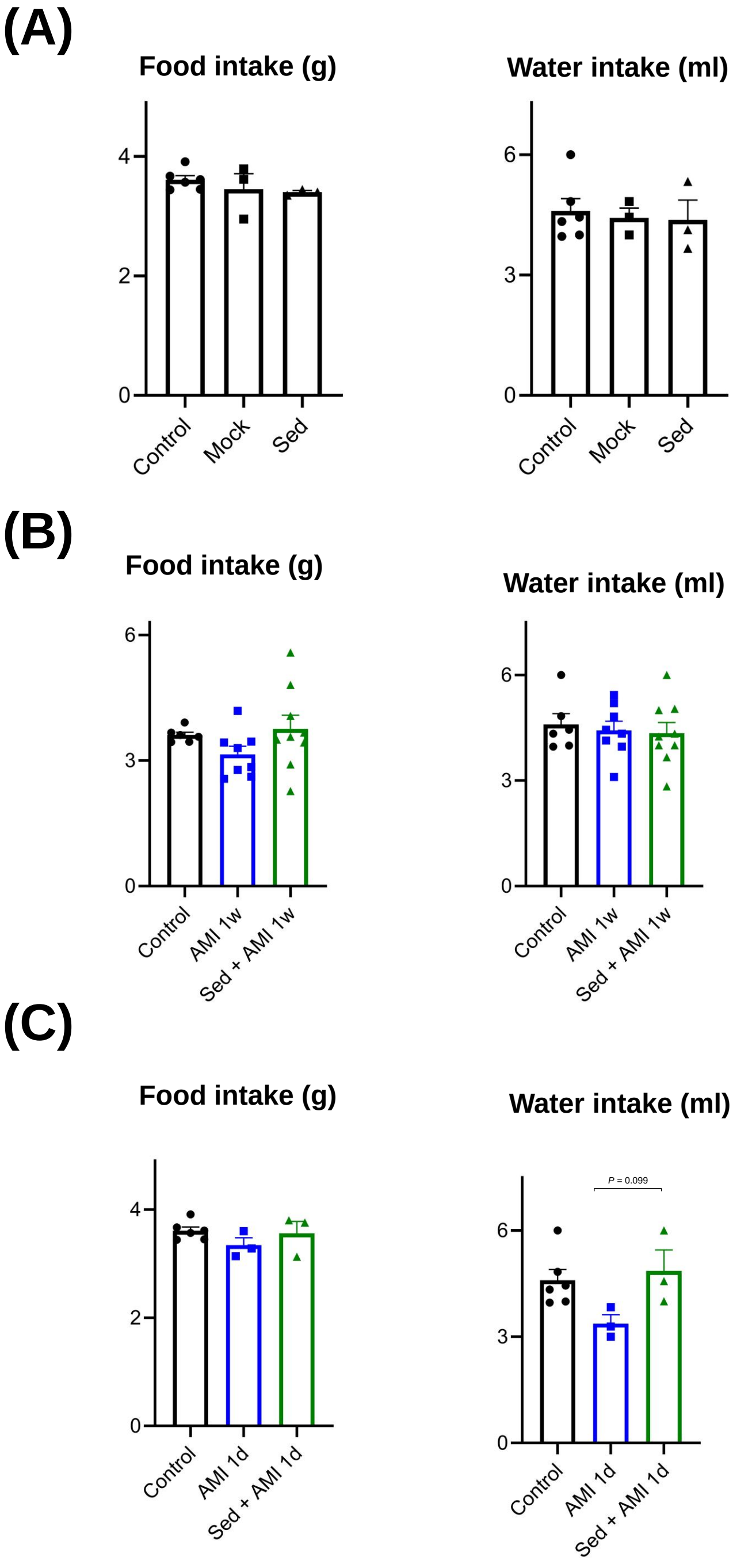
Supplementary Table 1. RT-qPCR primers for analysis

Gene	Direction	Sequence
GAPDH	Forward	AGGTCGGTGTGAACGGATTTG
GAPDH	Reverse	TGTAGACCATGTAGTTGAGGTCA
Beta actin	Forward	CCACTGCCGCATCCTCTT
Beta actin	Reverse	TGGATGCCACAGGATTCCAT
Anf	Forward	GTGTACAGTGCGGTGTCCAA
Anf	Reverse	ACCTCATCTTCTACCGGATC
Bnp	Forward	GCTGCTTTGGGCACAAGATAG
Bnp	Reverse	GGAGCTCTTCCTACAACAACTT
bMhc	Forward	AGGGCGACCTCAACGAGAT
bMhc	Reverse	CAGCAGACTCTGGAGGCTCTT
Col1a1	Forward	CACGGCTGTGTGCGATGA
Col1a1	Reverse	TCGCCCTCCCGTCTTTG
Col3α1	Forward	TCCCCTGGAATCTGTGAATC
Col3α1	Reverse	TGAGTCGAATTGGGGAGAAT
aSMA	Forward	CCAGAGCAAGAGAGGGATCCT
aSMA	Reverse	TGTCGTCCCAGTTGGTGATG
TNFa	Forward	CCCTCACACTCAGATCATCTTCT
TNFa	Reverse	GCTACGACGTGGGCTACAG
IL-6	Forward	TAGTCCTTCCTACCCCAATTTCC
IL-6	Reverse	TTGGTCCTTAGCCACTCCTTC
F4/80	Forward	CTCTGTGGTCCCACCTTCAT
F4/80	Reverse	GATGGCCAAGGATCTGAAAA
Col3α1	Forward	TCCCCTGGAATCTGTGAATC
Col3α1	Reverse	TGAGTCGAATTGGGGAGAAT
F4/80	Forward	CTCTGTGGTCCCACCTTCAT
F4/80	Reverse	GATGGCCAAGGATCTGAAAA
Vegfr2	Forward	CCTGGTAGAAGATTCAGGCATTG
Vegfr2	Reverse	CCTCACCCTGCGGATAGTCA
Pgc-1a	Forward	GACATGTGCAGCCAAGACTC
Pgc-1a	Reverse	CTCAAATGGGGAACCCTTGG
Drp1	Forward	ATGCCAGCAAGTCCACAGAA
Drp1	Reverse	TGTTCTCGGGCAGACAGTTT
Mfn1	Forward	GCAGACAGCACATGGAGAGA
Mfn1	Reverse	GATCCGATTCCGAGCTTCCG
Mfn2	Forward	TGCACCGCCATATAGAGGAAG
Mfn2	Reverse	TCTGCAGTGAACTGGCAATG
Opa1	Forward	GATGACACGCTCTCCAGTGAAG
Opa1	Reverse	CTCGGGGCTAACAGTACAACC
XBP1	Forward	CCTGAGCCCGGAGGAGAA
XBP1	Reverse	CTCGAGCAGTCTGCGCTG
CHOP	Forward	CCACCACACCTGAAAGCAGAA
CHOP	Reverse	AGGTGAAAGGCAGGGACTCA

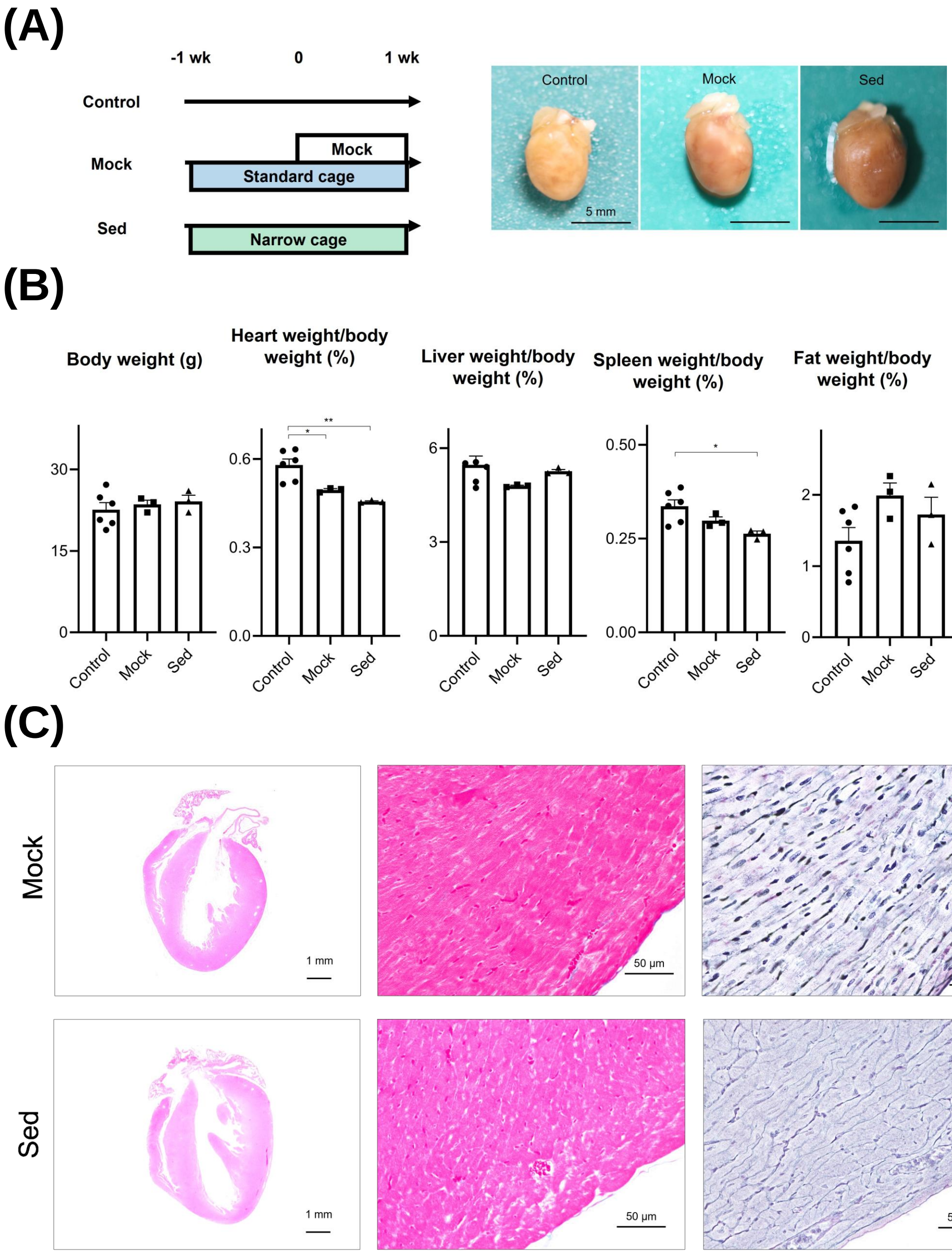
Permanent coronary artery ligation



Supplementary Figure 1. Procedure of permanent coronary artery ligation
1) Opened thoracic cavity, 2) Exposed heart, 3) Sutured left anterior descending artery, 4) Placed back heart, 5) Evacuated air, 6) Closed thoracic cavity, 7) Sutured skin

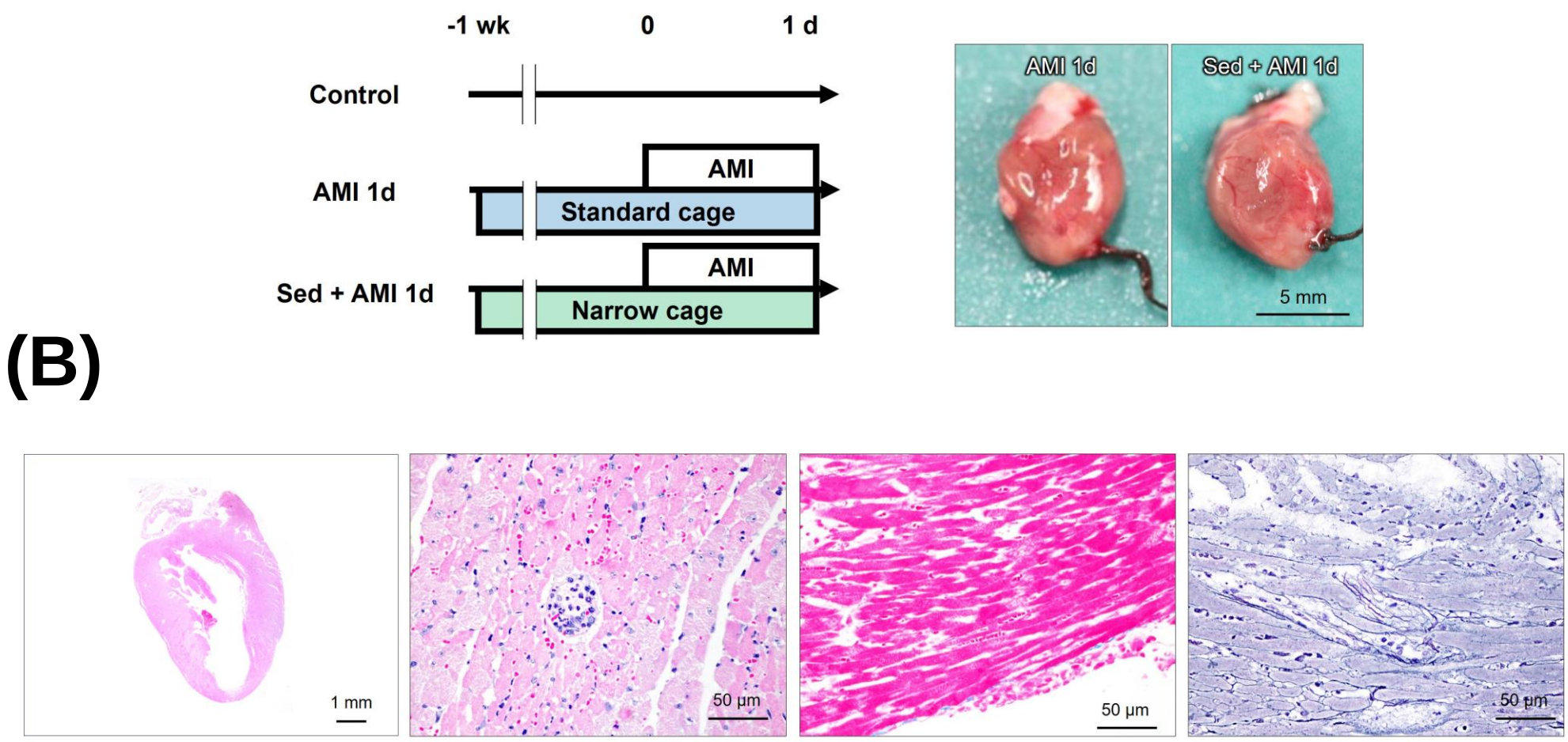


Supplementary Figure 2. Food and water intakes are similar to each model.
Food and water intakes in each mouse. Data represent the mean ± SEM. Statistical analyses were performed by one-way ANOVA with Tukey's post-hoc test. n≥3 for all groups.



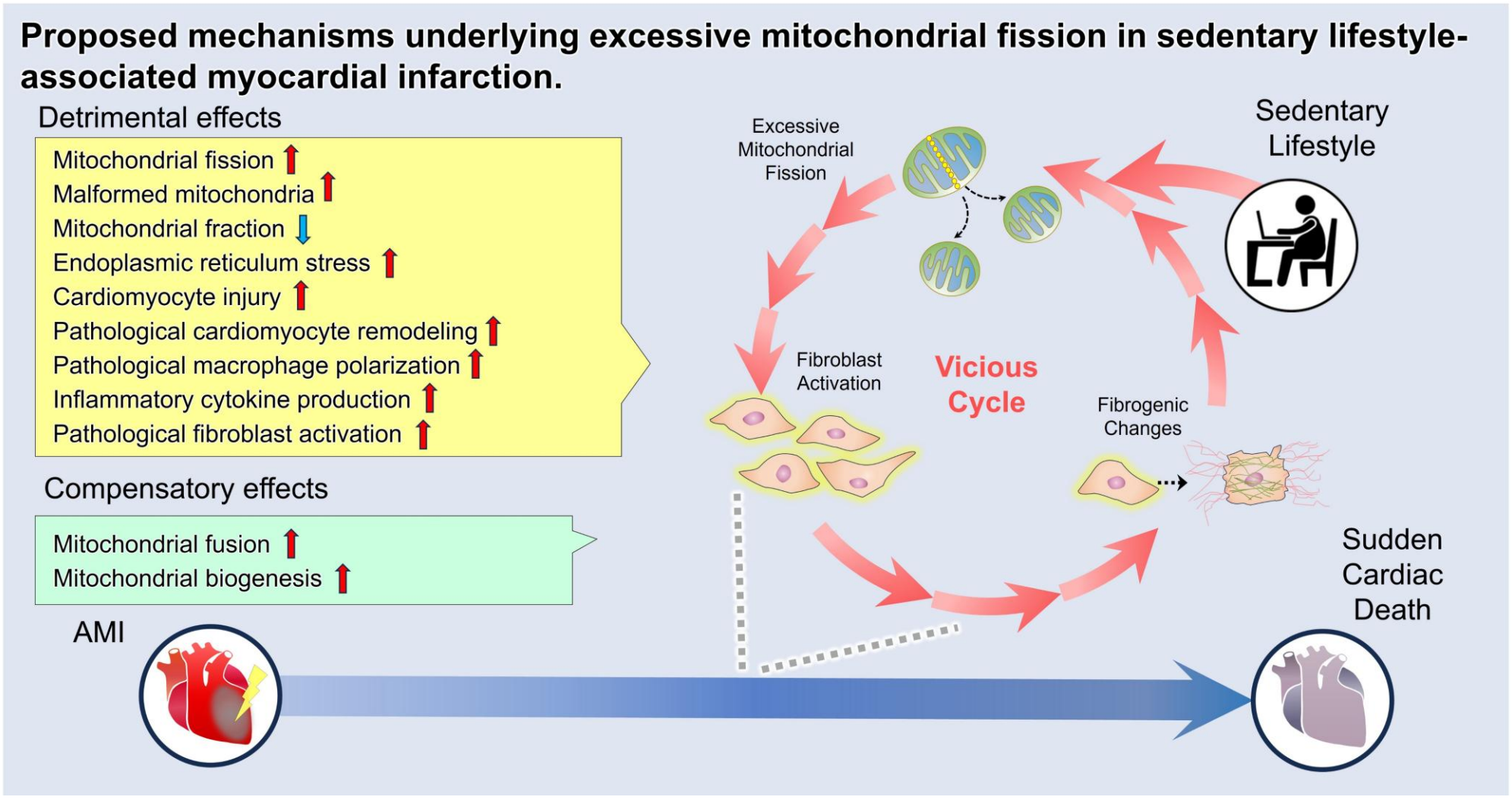
Supplementary Figure 3. Mock operation and physical inactivity do not show any pathological changes by themselves

(A) Study protocol and macroscopic appearance in each mice. Scale bar = 5 mm. (B) Bodyweight, heart/body weight-, liver/body weight-, spleen/body weight-, and fat/body weight-ratios in each mouse. (C) Histological images of each mouse. Scale bar = 1 mm in H&E-, 50 μm in Azan- and reticulin-stained sections. Data represent the mean ± SEM. Statistical analyses were performed by one-way ANOVA with Tukey's post-hoc test. **P*<.05, ***P*<.01. n≥3 for all groups.



Supplementary Figure 4. Physical inactivity aggravates coronary ligation-induced aberrant gene expression changes in cardiomyocytes

(A) Study protocol and macroscopic appearance in each mice. Scale bar = 5 mm. (B) Histological images of hearts from mice at one day after coronary artery ligation. Scale bars = 1 mm in H&E-, 50 μm in Azan- and reticulin-stained sections. (C) Bodyweight, heart/body weight-, liver/body weight-, spleen/body weight-, and fat/body weight-ratios in each mouse. Data represent the mean ± SEM. Statistical analyses were performed by unpaired two-tailed Student's t-test or one-way ANOVA with Tukey's post-hoc test where appropriate. **P*<.05, ***P*<.01, ****P*<.001, $^{\#}P$<.05. $^{\#\#}P$<.01. n≥3 for all groups.



Supplementary Figure 5. Proposed mechanisms underlying excessive mitochondrial fission in sedentary lifestyle-associated myocardial infarction

Excessive mitochondrial fission in cardiomyocytes enhances fibroblast activation and subsequent extensive fibrogenic changes in coronary artery disease, and eventually leads to sudden cardiac death. Sedentary lifestyle further aggravates the excessive mitochondrial fission-mediated myocardial infarction. Mitochondrial fission could have a pivotal role for progression of sedentary lifestyle-associated myocardial infarction.