**Supplementary data**

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| **Primer** | **Sequence** |
| β-actin forward | 5’-GTCCCTCACCCTCCCAAAAG-3’ |
| β-actin reverse | 5’-GCTGCCTCAACACCTCAACCC-3’ |
| Mfn2 forward | 5’-CTTGAAGACACCCACAGGAACA-3’ |
| Mfn2 reverse | 5’-GGCCAGCACTTCGCTGATAC-3’ |
| Mfn2 promoter forward | 5’-TGATCCGGAAAGGAAAACAG-3’ |
| Mfn2 promoter reverse | 5’-CACCGAAAGGCCACAGTAAT-3’ |

**Table S1** Primers used for PCR analysis.



**Figure S1** Decreased NAD+ content and excessive mitochondrial fission were observed in diabetic hearts of db/db mice. (A) Representative echocardiography images. (B) Left ventricular ejection fraction (LVEF). (C) Left ventricular fractional shortening (LVFS). (D) NAD+ content in heart tissue. (E) Representative blot images and quantitative analysis of Mfn2. (F) Real-time PCR analysis of Mfn2 mRNA expression. (G) Representative transmission electron microscopic images of the myocardium, Scale bar= 1μm. (H) Mean size of mitochondria. (I) The number of mitochondria per μm2. \*\*P<0.01. n=4 in each group.

**Figure S2** Body weight, food intake, blood glucose and serum lipid in db/db and db/+ mice. (A) &(B) Body weight and food intake of db/db and db/+ mice were determined every 2 weeks. (C) Blood glucose of db/db and db/+ mice were determined every 2 weeks. (D)&(E) Serum lipids of db/db and db/+ mice were determined every 4 weeks. TG, triglyceride; TC, total cholesterol. n=4-6 in each group.



**Figure S3** NR dose-dependently promoted Mfn2 expression in HG/HF cultured cardiomyocytes. Representative blot images (Above) and quantitative analysis of Mfn2 (below). HG/HF, High-glucose and high-fat. \*P<0.05, \*\*P<0.01. n=4 in each group.