Supplementary material

Materials and methods

1. Serum collection and tissue sample collection

Blood samples were clot for 2 hours at room temperature, then centrifuged at 800 ×g for 15 min to obtain blood serum, which was stored at −80°C until further analysis. The epididymal fat tissue was weighed and divided into two parts, one of which was stored in formalin for histological examination and the other was frozen in liquid nitrogen and stored at −80°C until use.

2. Histomorphological analysis

The epididymal fat tissue was fixed with 4% paraformaldehyde solution, embedded in paraffin and then stained with haematoxylin–eosin (H&E). Representative micrographs of the epididymal fat was taken under a 20× objective.

3. Analysis of serum leptin and epididymal fat adiponectin

The level of serum leptin was analyzed with corresponding commercial kit (Nanjing Senbeijia Biological Technology, Nanjing, China). Epididymal fat samples were thawed and homogenized in cold physiological saline (w:v=1:9). After centrifugation at 3000g for 10 min, the supernatant was collected and the level of adiponectin was analyzed with corresponding commercial kit (Nanjing Senbeijia Biological Technology, Nanjing, China).

Supplementary results

1. Lactic acid bacteria intervention showed no effects on epididymal fat weight of mice

As shown in Fig. S1, although the body weight of mice in the Model group was lower than that in the Control group, the epididymal fat weight in the Model group was significantly higher than that in the Control group. However, no significant differences between the epididymal fat weight of mice in lactic acid bacteria intervention groups and the mice in Model group were found.

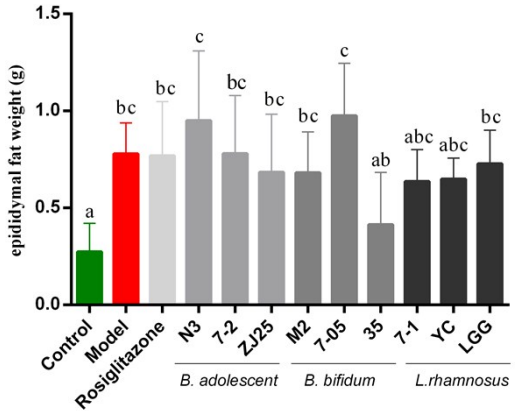

Figure S1. Effects of different lactic acid bacteria on the epididymal fat weight of T2D mice. Different superscript letter of column indicates statistical difference between every two groups ($P < 0.05$).

2. Lactic acid bacteria intervention showed different effects on epididymal fat lesions

As shown in Fig. S2, compared with the Control group, the volume of adipocytes of Model group increased, and this change was alleviated to varying degrees after the intervention of some lactic acid bacteria. Among these strains treated groups, the effects by the *B. adolescentis* 7-2, *B. adolescentis* ZJ25 and *B. bifidum* M2 were most significant.

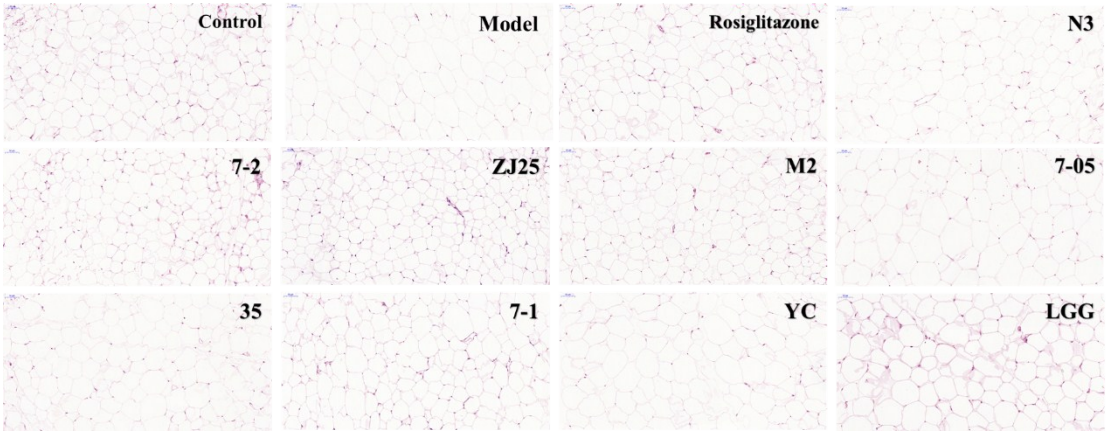

Figure S2. Effects of different lactic acid bacteria on the epididymal fat of T2D mice. H&E staining of the pancreas (final magnification, 200×)

3. Lactic acid bacteria intervention showed limited effects on serum leptin and fat adiponectin level

The serum leptin level and fat adiponectin level were supplemented as Fig. S3. The leptin level in the Model group was significantly higher than that in the Control group, and the adiponectin level was lower than that in the Control group. Compared with the Model group, except for Rosiglitazone and group 35, the leptin levels of T2D mice were not significantly altered by other strains interventions. All lactic acid bacteria strains interventions did not change the decrease in adiponectin content significantly caused by high-fat diet and STZ.

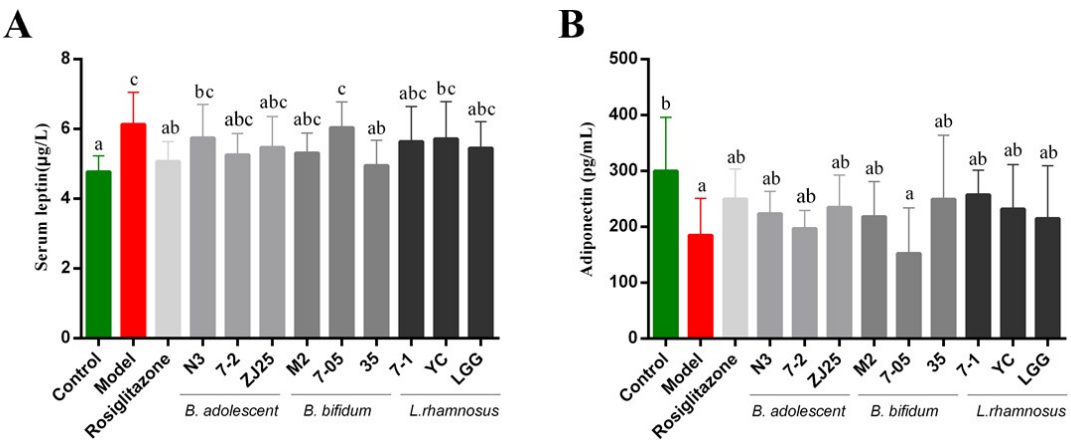

Figure S3. Effects of different lactic acid bacteria on (A) the serum leptin and (B) adiponectin of T2D mice. Different superscript letter of column indicates statistical difference between every two groups ($P < 0.05$).