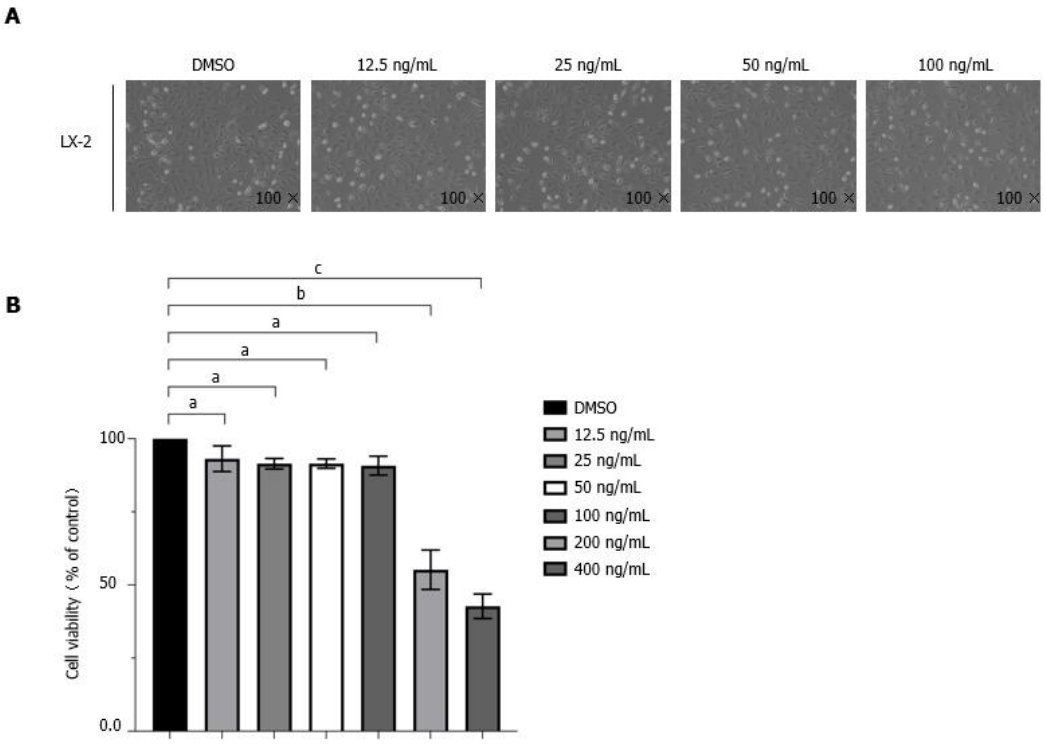
Supplementary material

CCK-8

LX-2 cells were seeded in 96-well plates (3×10^3 cells/well) and cultured overnight. After treatment with different concentrations of rh-FBP1 for 48 h, 10 μL CCK-8 reagent was added to each well and incubated for 2 h at 37°C. Absorbance was measured at 450 nm using a microplate reader, with cell viability calculated relative to untreated controls.



Supplementary Figure 1 The effect of different concentrations of recombinant human FBP1 protein on LX-2 cells. A: Representative pictures of LX-2 cells of each group; B: Cell viability in LX-2 cells. All data are from three independent samples. Data are represented as the mean ± SD. [a]Not significant; [b]$P < 0.001$; [c]$P < 0.0001$.

Supplementary Table 1 List of key differential genes in glucose metabolism

Gene symbol	Annotation
Acss2	Acyl-CoA Synthetase Short-Chain Family Member 2
Adh4	Alcohol Dehydrogenase 4
Adh5	Alcohol Dehydrogenase 5
Aldh2	Aldehyde Dehydrogenase 2
Aldh3a2	Aldehyde Dehydrogenase 3 Family Member A2
Aldh3b1	Aldehyde Dehydrogenase 3 Family Member B1
Aldh7a1	Aldehyde Dehydrogenase 7 Family Member A1
Aldh9a1	Aldehyde Dehydrogenase 9 Family Member A1
Aldoa	Aldolase A
Aldoc	Aldolase C
Dlat	Dihydrolipoamide S-Acetyltransferase
Dld	Dihydrolipoamide Dehydrogenase
Eno1	Enolase 1
Eno3	Enolase 3
Fbp1	Fructose-1,6-Bisphosphatase 1
Galm	Galactose Mutarotase
Gck	Glucokinase
Gpi	Glucose-6-Phosphate Isomerase
Hk3	Hexokinase 3
Ldha	Lactate Dehydrogenase A
Pck1	Phosphoenolpyruvate Carboxykinase 1
Pck2	Phosphoenolpyruvate Carboxykinase 2
Pdha1	Pyruvate Dehydrogenase E1 Subunit Alpha 1
Pdhb	Pyruvate Dehydrogenase E1 Subunit Beta
Pfkl	Phosphofructokinase Liver
Pfkm	Phosphofructokinase Muscle
Pfkp	Phosphofructokinase Platelet

Pgam1	Phosphoglycerate Mutase 1
Pgk1	Phosphoglycerate Kinase 1
Pgk2	Phosphoglycerate Kinase 2
Pgm1	Phosphoglucomutase 1
Pgm2	Phosphoglucomutase 2
Pklr	Pyruvate Kinase L/R
Pkm	Pyruvate Kinase M1/2
Tpi1	Triosephosphate Isomerase 1

Supplementary Table 2 Basic information of clinical patients

Variables		**Liver fibrosis (*n* = 12)**	**Normal (*n* = 5)**	**Total (*n* = 17)**	***P* value**
Gender, *n* (%)					> 0.05
	Female	6 (35.3)	2 (11.8)	8 (47.1)	
	Male	6 (35.3)	3 (17.7)	9 (53.0)	
Age (year)		52.5 (42.0, 66.0)	51 (49.0, 67.0)	52 (42.0, 67.0)	> 0.05
Staging of liver fibrosis (Metavir), *n* (%)					< 0.05
	F0	0 (0)	5 (100)	5 (29.4)	
	F3	6 (50)	0 (0)	6 (35.3)	
	F4	6 (50)	0 (0)	6 (35.3)	
Bile acid (μmol/L)		13.9 (4.0, 538.7)	5.7 (1.7, 6.9)	6.2 (3.2, 36.1)	> 0.05
ALT (U/L)		30 (23.8, 45.7)	14.5 (11.2, 29.6)	27.4 (17.9, 45.2)	> 0.05
AST (U/L)		34.8 (26.8, 51.2)	23.8 (20.2, 24.2)	28.8 (23.8, 48.3)	< 0.05
Total bilirubin (μmol/L)		14.6 (7.1, 20.5)	7.7 (6.9, 9.0)	9.2 (6.9, 18.9)	> 0.05
Direct bilirubin (μmol/L)		5.3 (2.9, 13.6)	2.7 (2.6, 3.0)	4.4 (2.7, 9.0)	> 0.05
Indirect bilirubin (μmol/L)		6.1 (4.9, 712.6)	5 (4.2, 6.4)	5.9 (4.2, 11.7)	> 0.05

GGT (U/L)	64.7 (28.6, 200.0)	40 (13.8, 83.5)	24.7 (24.7, 131.7)	> 0.05
ALP (U/L)	124 (76.5, 165.0)	101 (92.0, 109.0)	109.0 (80.0, 149.0)	> 0.05

F0: No fibrosis; F1: Mild fibrosis; F2: Moderate fibrosis; F3: Severe fibrosis; F4: Cirrhosis; M: Median, Q_1: 1st quartile, Q_3: 3st quartile;ALT: Alanine aminotransferase; AST: Aspartate aminotransferase; GGT: Gamma-glutamyl transferase; ALP: Alkaline phosphatase.