



Insulin

IR

PTPs
(PTP1B, LAR, SHP-1)

Tyr-P

IRS-1

Ser-P

PI3K

PIP3

Akt

TSC1-2

Rheb

S6KI

Nutrients

- Amino Acids
- FFA
- Glucose

AMPK

mTOR

IFN γ

TNF α

IL-1

IL-6

IKK/JNK

INOS

ONOO-NO

GLUT4

GLUT1

Glucose

Exercise
Metformin
TZD

AMPK