SUPPLEMENTARY DATA

Supplementary Table 1. Characteristics of Male C57BL/6J Mice Fed a High Fat Diet. Mice were fed either a low fat (control diet) or a high (60%kcal) fat diet for 12 weeks starting at 6 weeks of age. Following an overnight fast, mice were weighed and blood samples taken to assess glucose and insulin levels, and calculate the homeostatic model assessment of insulin resistance (HOMA-IR). Mice were randomly assigned to one of three experimental groups as follows: 1) Ex vivo muscle glucose uptake; 2) In vivo muscle glucose uptake; or 3) Skeletal muscle intracellular signaling. Statistical significance was defined as $P<0.05$ and denoted by '*' vs Control Diet within an experimental group.

Experimental Group:	***Ex Vivo* Muscle Glucose Uptake**		***In Vivo* Muscle Glucose Uptake**		**Skeletal Muscle Intracellular Signaling**	
Diet (Number of Mice)	**Control Diet (N=20)**	**High Fat Diet (N=21)**	**Control Diet (N=8)**	**High Fat Diet (N=8)**	**Control Diet (N=10)**	**High Fat Diet (N=9)**
Age (weeks)	18 ± 0	18 ± 0	18 ± 0	18 ± 0	18 ± 0	18 ± 0
Body Weight (g)	26.1 ± 0.3	34.1 ± 0.6*	25.6 ± 0.4	36.5 ± 1.9*	27.0 ± 0.6	35.0 ± 1.9*
Fasted Blood Glucose (mM)	6.7 ± 0.4	9.4 ± 0.6*	5.6 ± 0.3	9.4 ± 1.0*	7.7 ± 0.5	10.3 ± 0.6*
Fasted Serum Insulin (pM)	61.1 ± 3.8	116.7 ± 13.0*	56.5 ± 6.9	106.3 ± 28.2	35.2 ± 5.0	148.0 ± 52.7*
HOMA-IR (mM x mU/L)	2.5 ± 0.1	6.6 ± 0.7*	2.0 ± 0.2	6.5 ± 1.9*	1.7 ± 0.2	9.8 ± 3.6*

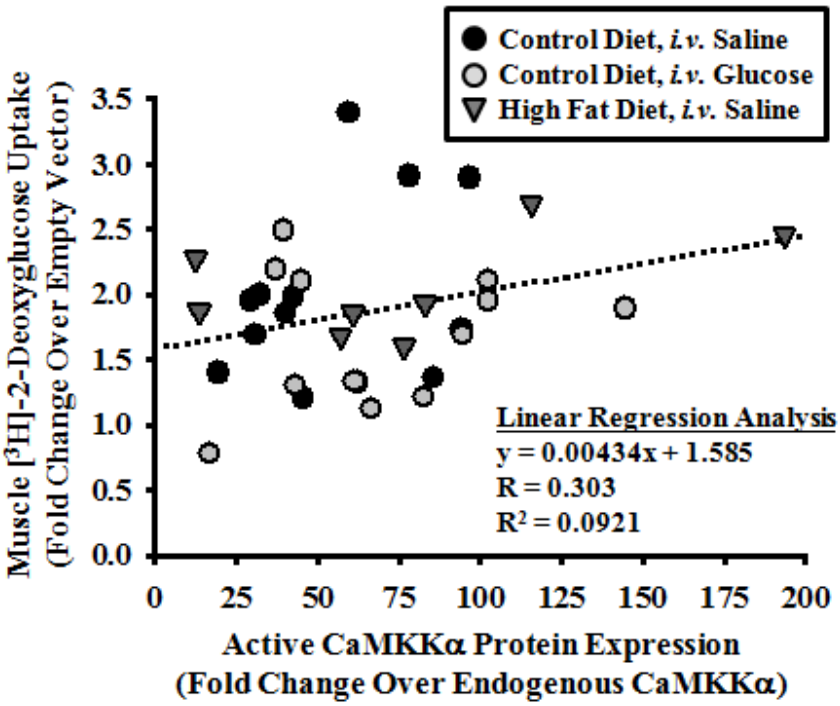
SUPPLEMENTARY DATA

Supplementary Table 2. Characteristics of Mice Pre- and 2 Weeks Post-Muscle Transfection. Mice were fed either a low fat (14%kcal, control diet) or a high (60%kcal) fat diet for 12 weeks starting at 6 weeks of age. Following an overnight fast, mice were weighed and blood samples taken to assess glucose and insulin levels, and calculate the homeostatic model assessment of insulin resistance (HOMA-IR). Mice were anesthetized and the tibialis anterior muscle of one leg was transfected with plasmid DNA containing the sequence for constitutively active CaMKKα while the contralateral muscle was transfected with empty vector DNA. Two weeks post-transfection, mice were fasted overnight, weighed and blood samples taken to assess glucose and insulin levels, and HOMA-IR. Statistical significance was defined as $P<0.05$ and denoted by '*' vs Control Diet, and '#' vs Pre-Transfection.

	Pre-Transfection		**2 Weeks Post-Transfection**	
Treatment Group (Number of Mice)	**Control Diet (N=18)**	**High Fat Diet (N=17)**	**Control Diet (N=18)**	**High Fat Diet (N=17)**
Age (weeks)	18 ± 0	18 ± 0	20 ± 0	20 ± 0
Body Weight (g)	26.3 ± 0.4	35.7 ± 1.3 *	27.0 ± 0.4	40.4 ± 1.5 *#
Fasted Blood Glucose (mM)	6.8 ± 0.4	9.9 ± 0.5*	7.9 ± 0.4 #	9.8 ± 0.3 *
Fasted Serum Insulin (pM)	43.1 ± 5.1	128.4 ± 30.4 *	91.6 ± 8.0	336.8 ± 50.6 *#
HOMA-IR (mM x mU/L)	1.7 ± 0.2	8.3 ± 2.1 *	4.7 ± 0.4	22.1 ± 3.7 *#

SUPPLEMENTARY DATA

Supplementary Figure 1. Relationship Between Expression of Constitutively Active CaMKKα and Muscle Glucose Uptake. Linear correlation analysis between muscles expressing active CaMKKα and muscle glucose uptake. Data taken from new Figures 1 and 3.



SUPPLEMENTARY DATA

Supplementary Figure 2. Representative Immunoblots for CaMKKα. *(Top)*: Immunoblot with endogenous and constitutively active CaMKKα proteins shown at different exposure times. *(Bottom)*: Immunoblot with endogenous and constitutively active CaMKKα proteins shown at the same exposure time. *(*Image taken from new Figures 2D.)