# Muscle mTORC1 Activation Causes Reduced Fat Mass

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# Abstract

# Introduction

# Methods and Materials

## Animal Husbandry

## Body Composition Analysis

## Histology of Adipose Tissue

## Adipocyte Size Determination

## CLAMS

## Western Blotting

# Results

## High Protein Diet Feeding Results in Lean Mice With Increased Energy Expenditure

To test the effects of a high protein diet, we fed 10 week old C57B/6J mice a diet containing either 10% protein or 40% protein (Table 1). We observed a slight decrease in body weight in these animals (Figure 1A). This was not due to a decrease in lean mass (Figure 1B) but rather was due to reduced accumulation of fat mass (Figure 1C).

To determine whether this was due to reduction of specific fat pads, we dissected subcutaneous and epididymal fat pads from these animals and determined their weights. As shown in Figure 1D both subcutaneous and epididymal fat pads were smaller from these animals. We next evaluated adipose tissue sections, and observed smaller adipocytes from both depots when animals were fed a high protein diet (Figure 1E). Together these data suggest that feeding animals a diet that is higher in protein causes less adiposity than feeding animals a diet higher in carbohydrates.

In order to identify changes in energy balance in these animals, we monitored food intake of HPD and CD-fed animals throughout the study. As shown in Figure 1F XXXX. We also evaluated energy expenditure and substrate preference in these animals. As shown in Figure 1G XXXX

## High Protein Diet Feeding Results in mTORC1 Activation

Since mTORC1 is a major regulator of metabolism and is activated by elevated amino acids, we next evaluated whether mTORC1 activity is increased in animals fed a high protein diet. To avoid the confounding effects of acute protein feeding, animals were starved for 16h prior to sacrifice. We blotted lysates from quadriceps for the mTORC1 target S6K and found increased phosphorylation of S6K, indicating increased mTORC1 activity in muscle tissue.

## Deletion of *Tsc1* in Muscle Results in Reduced Fat Mass

## Muscle Tsc1 Deletion Promotes Fasting Glycogen and Lipid Levels

## Activation of mTORC1 in Muscle Does Not Result in Insulin Resistance

## Ablation of Muscle Tsc1 Results in Increased Expression of Fatty Acid Uptake Genes

# Discussion

# References

# Tables

Table 1: Composition of Control and High Protein Diets.

# Figure Legends