# P3-372 A COMPARISON OF METABOLIC CHARACTERISTICS AMONG C57BL/6NTAC, C57BL/6J AND C57BL/6JBOM DIO ET

INDUCED OBESE MICE WITH ENVIRONMENTAL CONDITIONING

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The C57BL/6NTac mice are extensively used in research and evaluation of obesity and climate for several reasons, including the high incidence of spontaneous insulin resistance when fed a high fat diet (HFD), the ‘better-natured’ behavior of MSO, an easy-to-use genetic model, and relatively simple processing protocols. The C57BL/6NTac model is a unique tool for the study of obesity, metabolic syndrome and related diseases. The main objective of this study was to determine the effect of the environment on metabolic parameters in different substrains of C57BL/6 mice. The study included a comparison between the Tac and Jax substrains of C57BL/6 mice conditioned at two different locations. The Tac substrains were housed in Bound Brook, NJ and the Jax substrains were housed in Templeton, CA. The mice were fed a high fat diet (HFD) for 14 weeks, followed by a recovery period of 4 weeks on regular diet. The parameters measured included body weight, food consumption, glucose tolerance test, insulin sensitivity, and hematological and plasma chemistry profiles.

**Key Findings**

1. **Body Weights**: The Tac DIO mice weighed more than Jax DIO mice, regardless of the DIO conditioning site. All DIO mice were heavier and gained weight more quickly than the other two substrains, even when conditioned with a HFD at two different locations. An increase in adiposity was verified by DEXA scan and weights of individual adipose depots suggest an increased fat content in Tac DIO compared to Jax DIO mice.

2. **Glucose Tolerance Test**: Oral glucose tolerance test results showed a significant difference between the Tac and Jax substrains. Tac DIO mice had a higher fasting glucose level compared to Jax DIO mice. The Tac DIO mice also showed a slower decline in blood glucose levels after glucose administration, indicating a lower insulin sensitivity.

3. **Insulin Levels**: Insulin levels during the glucose tolerance test were highest in the B6NTac substrain, from both groups than the regular diet fed B6NTac while only the TC conditioned Jax DIO mice had higher insulin levels than the corresponding regular diet fed group for both male and female mice. The increase in insulin levels was higher in the Tac DIO from Tac than the regular diet fed B6NTac mice.

4. **Triglycerides and Free Fatty Acids**: Triglycerides and free fatty acids levels were significantly higher in the Tac DIO than the Jax DIO mice conditioned at TC. The difference was only significant between the Cranbury conditioned Tac and Jax mice. Both Tac DIO groups and the Jax DIO group were higher than the corresponding regular diet fed group for both male and female mice. The increase in free fatty acids levels was significantly higher in the Tac DIO than the Jax DIO mice conditioned at TC.

**Summary**

Clear differences were observed in the rate of weight gain among the substrains of C57BL/6NTac mice. The B6NTac substrains gained weight faster and at a greater extent than the Jax substrains, and even when fed with a HFD at two different locations. An increase in adiposity was verified by DEXA scan and weights of individual adipose depots suggested an increase in fat content. The Tac DIO mice had a higher fasting glucose level compared to Jax DIO mice. The Tac DIO mice also showed a slower decline in blood glucose levels after glucose administration, indicating a lower insulin sensitivity. Triglycerides and free fatty acids levels were significantly higher in the Tac DIO than the Jax DIO mice conditioned at TC. The difference was only significant between the Cranbury conditioned Tac and Jax mice. Both Tac DIO groups and the Jax DIO group were higher than the corresponding regular diet fed group for both male and female mice. The increase in free fatty acids levels was significantly higher in the Tac DIO than the Jax DIO mice conditioned at TC. The increase in insulin levels was higher in the Tac DIO from Tac than the regular diet fed B6NTac mice. The increase in insulin levels was higher in the Tac DIO from Tac than the regular diet fed B6NTac mice. The increase in insulin levels was higher in the Tac DIO from Tac than the regular diet fed B6NTac mice.