Diabetic Mouse (db/db)
BKS.Cg-+ Lepr<sup>db</sup>/+ Lepr<sup>db</sup>/OlaHsd

Reaching your goals in diabetes and obesity studies can be a challenge or a success depending on the reliability of your research models. The Lepr<sup>db</sup> mutation was discovered in 1966 in the inbred BKS mouse strain. This model has since been well characterized as a model of Type 2 diabetes mellitus, exhibiting commonly published metabolic symptoms including hyperglycemia and hyperinsulinemia.

To ensure optimal research outcomes, continue to maintain this model on Teklad Global Diet 2018 (18% Protein Rodent Diet).

Molecular Characteristics
+ Lepr<sup>db</sup> is an autosomal recessive mutation on chromosome 4 (14, 24)
+ Leptin receptor deficient (2, 4, 23, 27, 32, 41)

Metabolic Characteristics
+ Exhibits obesity (16, 26, 35, 36) at 3-4 weeks of age (14, 24, 29)
+ Hyperinsulinemia as early as 10-14 days (14, 16, 24, 26, 29, 30, 35)
+ Depletion of islet insulin producing β-cells (14, 24)
+ Hyperglycemia (7, 16, 18, 26, 35, 40) at 4-8 weeks of age (14, 24, 29)
+ Hyperleptinemia (3, 16, 26)
+ Hyperphagia (14), polydipsia (14, 24)
+ Polyuria, proteinuria (14, 24)
+ Hyperlipidemia (17, 18, 40)
+ Hypertriglycerideremia (6)
+ Insulin resistance (9, 15, 16, 26)
+ Hyperglucagonemia (14, 35)
+ Decreased metabolic rate (3, 24, 36)

Immunological Characteristics
+ Impaired cellular immunity (2, 4, 23, 25, 27, 41)
+ Increased levels of inflammatory cytokines (3)
+ Diminished cytokine release (2)
+ Hyperglycemia targets glycocalyx permeability (40)
+ Nonautoimmune (12)

Neurological Characteristics
+ Peripheral neuropathy (14, 18, 24)
+ Degenerating cortical cells (37)
+ Defective hypothalamus (14)
+ Poor performance in spatial memory tasks (37)

Cardiovascular Characteristics
+ Reduced insulin stimulated glucose uptake in cardiomyocytes (7)
+ Cardiac contractile dysfunction (1, 7, 26)
+ Decreased cardiac glucose oxidation (1, 16, 26)
+ Increased cardiac fatty acid oxidation (1, 15, 16, 26)
+ Reduced cardiac efficiency (15, 17)
+ Increased susceptibility to ischemia (15, 18, 26)

Hepatic and Renal Characteristics
+ Reduced procollagen, keratin associated protein and keratin complexes gene expression (29)
+ Decreased expression of growth hormone (31)
+ Increased kidney weight due to hyperfiltration, albuminuria and glomerular hypertrophy (31)
+ Thickening of glomerular basement membrane (14)
+ Portal endotoxemia (3)
+ Hyperphagia (3, 24, 35, 36)
+ Disrupted intestinal barrier function (3)
+ Decreased levels of forkhead box O1 in kidneys (31)
+ Increased nephric and hepatic insulin-like growth factor binding protein 1 mRNA (31)
+ Nephropathy (18)
+ Enhanced intestinal monoacylglycerol acyltransferase 2 activity (6)
+ Pancreatitis (18)
+ Increased immunoglobulin and complement in mesangium (14, 24)
Additional Characteristics
- Infertility (14, 24)
- Diminished growth factor release (2, 29)
- Increased minor glycosylated hemoglobin (14)

Research Use
- Diabetes mellitus type II (2, 5, 9, 16, 18, 21, 29, 31, 34, 35, 40)
- Obesity (6, 19)
- Tissue repair (29)
- Steatosis (3)
- Leptin endocrinology (4, 6, 27, 28, 31, 36, 37)
- Leptin treatment (10, 11, 36)
- Therapeutics (1, 2, 5, 7, 9, 13, 19, 20, 21, 22, 30, 33, 34, 35, 38, 39)

References