

Streptozotocin/High Fat Diet-induced Type 2 Diabetes

Background: Unlike type 1 diabetes, type 2 diabetes (T2D) is associated with resistance to insulin action. To develop the corresponding animal pathology model, High Fat Diet (HFD) is often used. HFD leads to the development of obesity, metabolic syndrome and decrease in insulin sensitivity in mice, in contrast to low fat diet (LFD). Combination of HFD and single Streptozotocin (STZ) injection leads to metabolic changes that are characteristic of Type 2 Diabetes, including peripheral insulin resistance and pancreas β -cell impairment. HFD/STZ-induced model of experimental T2D can be used for efficacy testing of anti-diabetic and anti-obesity drugs. The induction of disease can be carried out in rats or mice. This model is suitable not only for the study of the effectiveness of the drugs stimulating the production/release of insulin from β -cells, but also drugs that reduce the production of glucose in the liver, improve the sensitivity of tissues to insulin, regulate the production of incretins, etc.

Service Details: To induce T2D in C57BL mice, the standard HFD (Research Diets, Inc.) in combination with a single high dose (95 mg/kg) of STZ is used. Development of the diabetic state is monitored by routine tests – food and water intake, body weight gain, glucose levels, glycosylated hemoglobin in the blood, glucose tolerance test (GTT), and insulin tolerance test (ITT). Various markers of diabetes' side effects can be monitored upon request. To develop the HFD/STZ model of Type 2 diabetes for testing a drug candidate, we suggest using 8-10 animals per each planned experimental group, 12 weeks of HFD for obesity induction and post-HFD/STZ treatment monitoring to confirm that the mice are diabetic. If the study goal is to test an accompanying pathology, the time allowed for disease development may be increased to 6-8 months.

Deliverable: Report including description of the study design, methodology, raw experimental data, graphs and interpretation.

Sample Submission: Dry compound or compound in pre-made dosing formulation (amount required depends on the dosing levels and schedules). For example, to treat a group of 8 mice at 10 mg/kg, twice daily (b.i.d.) for 1 week, about 16 mg of the test compound is needed.