Glucose Tolerance Test with insulin secretion

Version: 1
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(note that the following list should be linked to the appropriate location.)

Summary: *(This area will include a brief description of what the protocol is used for and why someone would need to use it.)*

Glucose tolerance test with insulin secretion measures systemic clearance of glucose and systemic appearance of insulin following an intraperitoneal bolus injection of 20% dextrose. This experiment measures insulin sensitivity and insulin secretion (pancreatic β-cell function) in awake mice assuming that there are no alterations in systemic insulin clearance. Insulin sensitivity and pancreatic β-cell function are altered in obese mice.

Reagents and Materials: *(This should be a comprehensive list of stock solutions and material. The reagent list for the stock solutions is included in the reagent preparation area that is included at the end of this SOP.)*

Reagent/Material	Vendor	Stock Number
20% Dextrose, injection, USP	Hospira	NDC0409-7935-19
Insulin Ultrasensitive ELIZA	Alpco	80-INSMSU-E01

Protocol:

1. Mice may be fasted overnight (~15 hours) or for 5 hours prior to the start of experiment.
2. Collect plasma sample (20 μl) before the start of experiment (basal-0 min) to measure basal glucose and insulin levels.
3. Administer intraperitoneal injection of 20% dextrose (1 or 2 g/kg body weight) using an insulin syringe.
4. Collect plasma samples (20 μl) at 10, 20, 30, 60, 90, and 120 min following injection to measure circulating glucose and insulin concentrations.
5. For data analysis, plasma glucose levels vs. time after injection are plotted, and area-under-curve may be calculated to estimate insulin sensitivity. Also, plasma insulin levels

vs. time after injection are plotted, and area-under-curve may be calculated to estimate insulin secretion (pancreatic β-cell function).