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U Mass - Acute lipid infusion

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Protocol status: Working

We use this protocol and it's working

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Abstract

Summary:

Triglyceride emulsion and heparin will be intravenously infused for 5 hours to acutely raise circulating fatty acids levels in awake mice. Acute lipid infusion is shown to cause insulin resistance in peripheral organs.

Materials

MATERIALS

⊗ INTRALIPID® 20% **Baxter Catalog #NDA18-449/S-039, NDA17-643/S-072**

⊗ Heparin **Pfizer (Hospira) Catalog #NDC0409-2723-01**

⊗ Glycerol **Merck MilliporeSigma (Sigma-Aldrich) Catalog #G5516**

Note:

Baxter [RRID:SCR_003974](#)

Sigma-Aldrich [RRID:SCR_008988](#)

Hospira [RRID:SCR_003985](#)

Troubleshooting

- 1 Survival surgery is performed to establish a chronic indwelling catheter at 5~6 days prior to experiment for intravenous infusion. (refer to M1023: Surgery-jugular vein cannulation)
- 2 Mice are fasted overnight (~15 hours) or for 5 hours prior to the start of experiment.
- 3 Place a mouse in a rat-size restrainer with its tail tape-tethered at one end.
- 4 Expose and flush the intravenous catheter using saline solution. Then, connect the catheter to the CMA Microdialysis infusion pump.
- 5 Collect plasma sample (10 μ l) before the start of infusion (basal-0 min) to measure basal fatty acids levels.
- 6 Start the experiment by turning on the pump and intravenously infusing 20% Intralipid (triglyceride emulsion) at 2.5 ml/kg/hr and heparin at 6 U/hr in awake mice.
- 7 For control experiment, 20% glycerol is infused at 2.5 ml/kg/hr in awake mice.
- 8 Collect plasma samples (10 μ l each) at 120, 240, and 300 min to measure serum FFA levels.
- 9 At the end of experiment, tissues may be collected for biochemical and molecular analyses.
- 10 Alternatively, a 2-hr hyperinsulinemic-euglycemic clamp may follow this 5-hr acute lipid infusion experiment to measure the effects of elevated fatty acids on insulin sensitivity. (refer to M1001: Hyperinsulinemic-euglycemic clamp)