U Mass - Acute lipid infusion

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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.

EXTERNAL LINK

https://mmpc.org/shared/document.aspx?id=153&docType=Protocol

MATERIALS

NAME	CATALOG #	VENDOR	CAS NUMBER	RRID
INTRALIPID® 20%	NDA18-449/S-039, NDA17-643/S-072	Baxter Healthcare		
Heparin	NDC0409-2723-01	Hospira(Pfizer)		
Glycerol	G5516	Sigma Aldrich		

MATERIALS TEXT

Note:

Baxter RRID:SCR_003974
Sigma-Aldrich RRID:SCR_008988
Hospira RRID:SCR_003985

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 µl) 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 µl 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)