

Investigating Cardiac Metabolism in the Isolated Perfused Mouse Heart with Hyperpolarized [1-¹³C]Pyruvate and ¹³C/³¹P NMR Spectroscopy

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Materials

Name	Company	Catalog Number	Comments
Equipment			
HyperSense DNP Polariser	Oxford Instruments	52-ZNP91000	HyperSense, 3.35 T, preclinical dissolution-DNP hyperpolarizer
NMR spectrometer	RS2D		NMR Cube, 5.8 T, equipped with a 10 mm broad-band probe
Peristaltic pump	Cole-Parmer	07554-95	
Temperature probe	Osensa	FTX-100-LUX+	NMR compatible temprature probe
Somnosuite low-flow anesthesia system	Kent Scientific		
Lines, tubings, suture			
Platinum cured silicone tubes	Cole-Parmer	HV-96119-16	L/S 16 I.D. 3.1 mm
Thin polyether ether ketone (PEEK) lines	Upchurch Scientific		id. 0.040"
Intravenous catheter	BD Medical	381323	22 G
Silk suture	Ethicon	W577H	Wire diameter of 3-0
Chemicals and pharmaceuticals			
[1- ¹³ C]pyruvic acid	Cambridge Isotope Laboratories	CLM-8077-1	
Calcium chloride	Sigma-Aldrich	21074	CAS: 10043-52-4
D-(+)-Glucose	Sigma-Aldrich	G7528	CAS: 50-99-77
Heparin sodium	Rotexmedica	HEP5A0130C0160	
Hydrochloric acid 37%	Sigma-Aldrich	258148	CAS: 7647-01-0
Insulin aspart (NovoLog)	Novo Nordisk		
Isoflurane	Terrel		
Magnesium Sulfate	Sigma-Aldrich	793612	CAS: 7487-88-9
Potassium chloride	Sigma-Aldrich	P4504	CAS: 7447-40-7

Potassium phosphate monobasic	Sigma-Aldrich	P9791	CAS: 7778-77-0
Sodium bicarbonate	Gadot Group		CAS: 144-55-8
Sodium chloride	Sigma-Aldrich	S9625	CAS: 7647-14-5
Sodium hydroxide	Sigma-Aldrich	655104	CAS: 1310-73-2
Sodium phosphate dibasic	Sigma-Aldrich	S7907	CAS: 7558-79-4
Sodium phosphate monobasic dihydrate	Merck	6345	CAS: 13472-35-0
TRIS (biotechnology grade)	Amresco	0826	CAS: 77-86-1
Trityl radical OX063	GE Healthcare AS	NC100136	OX063
NMR standards			
¹³ C standard sample	Cambridge Isotope Laboratories	DLM-72A	40% p-dioxane in benzene-D6
³¹ P standard sample	Made in house		105 mM ATP and 120 mM phenylphosphonic acid in D ₂ O
Software			
Excel 2016	Microsoft		
MNova	Mestrelab Research		