

# Hypothermic ex-situ perfusion and inflammatory mediators characterization: A preliminary experience of Pancreas.

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## Introduction

Several experimental settings have explored the role of ex-situ machine perfusion (MP) in pancreas preservation, focusing also on the effects on parenchymal oedema or tissue damage. One of the main goals of MP is to protect the graft from the ischemia-reperfusion injury (IRI), negatively affecting the transplant outcomes. The mechanisms underlying MP protective effects are still to be fully characterized. In this report, we describe a preliminary feasibility study on the application of inflammatory mediators (IM) adsorption to strengthening the IRI mitigation in pancreas MP.

## Methods

The pancreas from a 23-years-old donor after cardiac death, after 20-minutes no-touch period was procured and placed in SCS for 8h. After SCS, the graft was perfused in hypothermic oxygenated (HOPE) modality with PerLife system, adapting the pressure-controlled PerKidney operational mode with target temperature at 5 °C, target pressure at 30 mmHg. A standard acellulare abdominal organs' hypothermic perfusate was used. The perfusion was combined with the application of the PerSorb device within the circuit in order to adsorb IM from the perfusate (flow rate: 300 ml/min) and lower the inflammation burden. To characterize the effects, perfusate sampling was performed before and after PerSorb and within the duodenal secretion bag to dose IL-6, IL-10 and TNF-alfa levels. In order to modulate duodenal resistance, mannitol and albumin were added to the perfusate as impermeants for a proper osmotic pressure. Due to duodenal secretion at 2h 20 minutes 1 L of fresh perfusate was added to reestablish the volume levels.

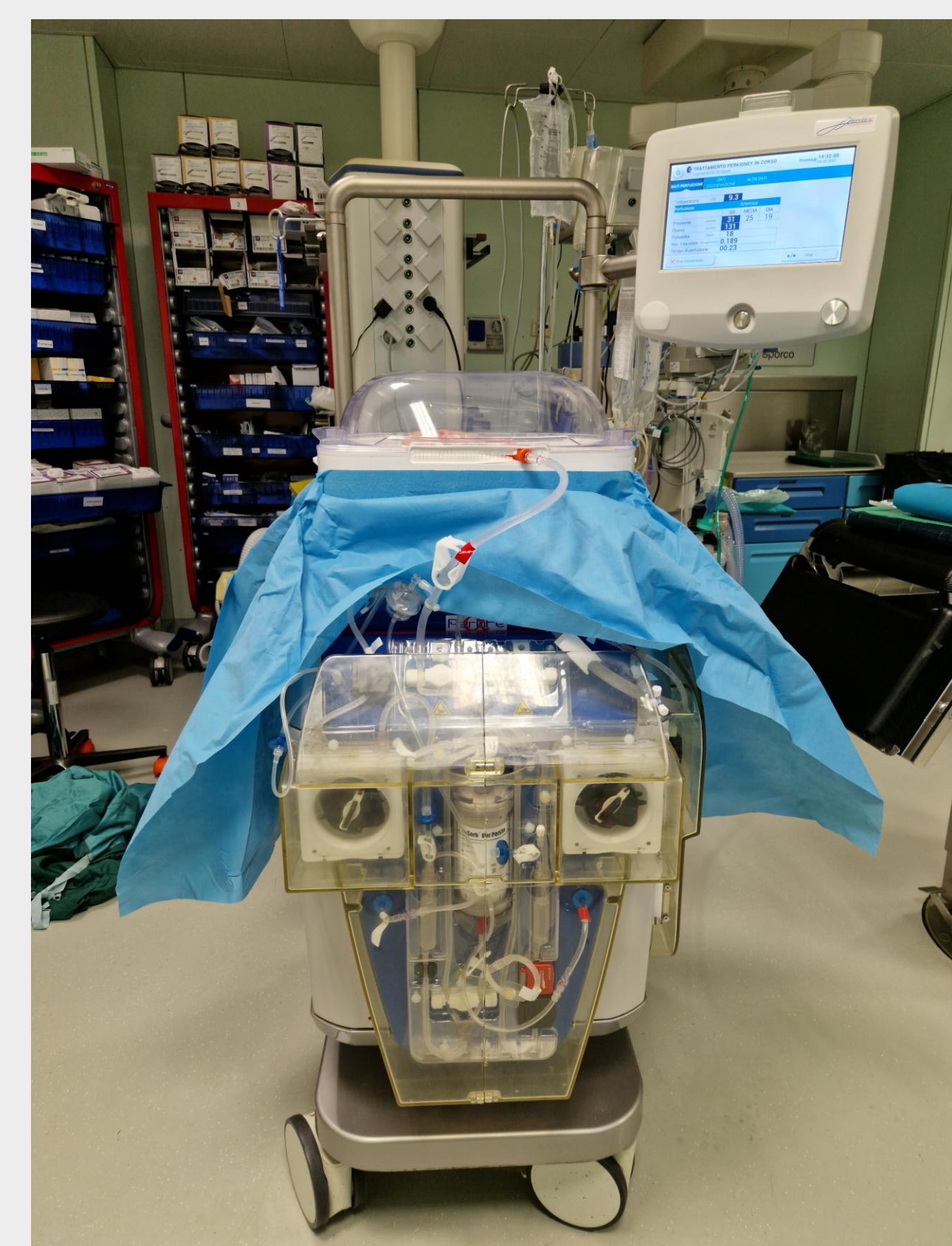
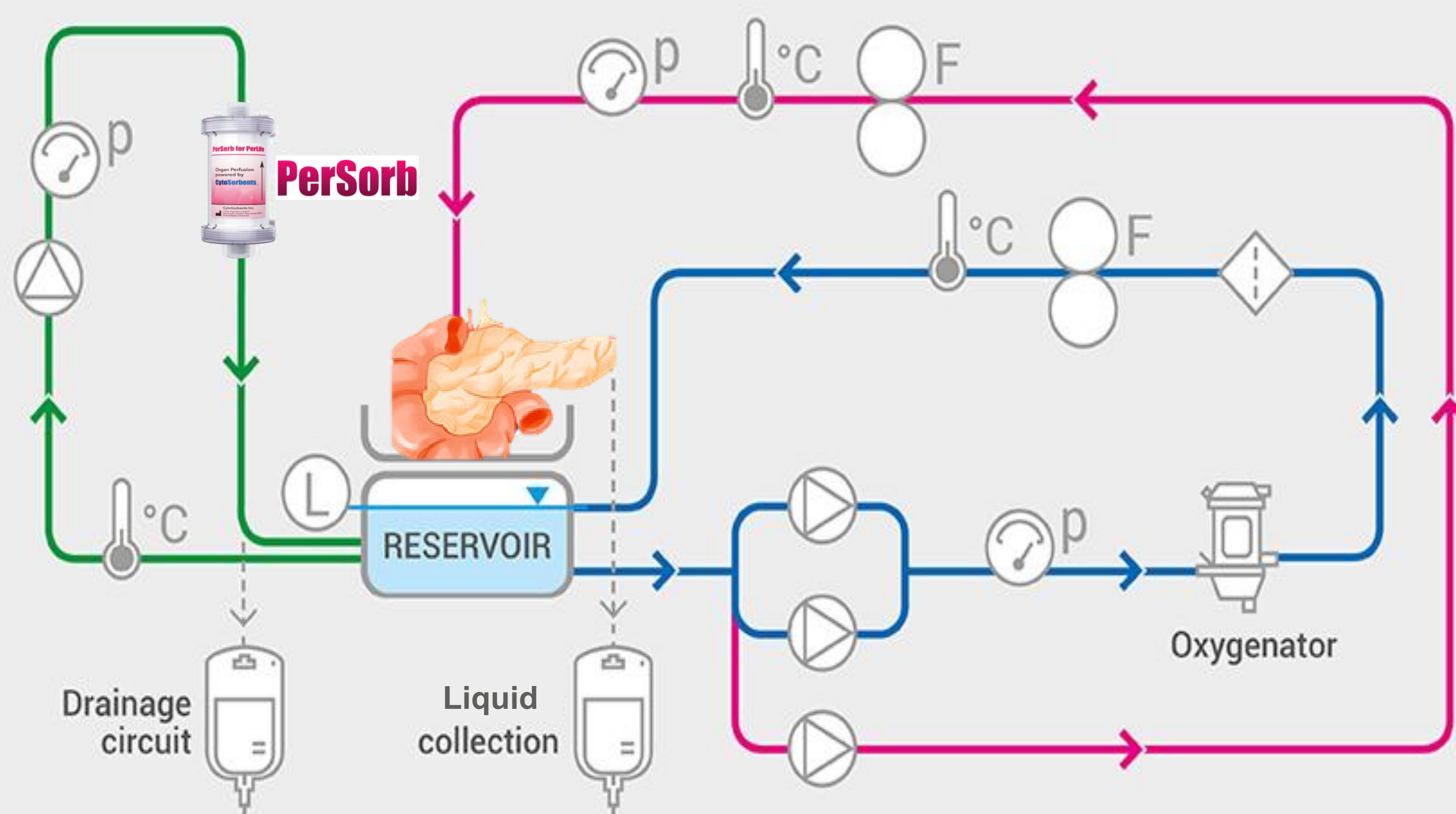


Figure: Implementation of adsorption during ex-situ pancreas machine perfusion

## Results

In 187 minutes of treatment, the total levels of cytokines within the perfusate were below detectable values, while in the duodenal secretion the target cytokines rose. IL6 peaked 1h: 997 pg/ml; IL-10, TNF-alfa peaked at 2h: 174 pg/ml; 239 pg/ml, respectively. The addition of fresh perfusate, mannitol, albumine, determined the lowering of the cytokines levels at 160 minutes. At 180 minutes, the duodenal cytokines levels were peaking again: 746 pg/ml (IL-6), 59 pg/ml (IL-10), 92 pg/ml (TNF-alfa).

## Conclusions

Purification during pancreas HOPE is safe and feasible. Further studies are needed to deeply explore the inflammatory response of the graft and the potential role of IM adsorption for IRI mitigation in this setting.