Summary

The focus of my PhD project was to identify early predictors of liver graft outcome in the context of Donation after Circulatory Death (DCD). Organ donation in the DCD context, due to Italian regulation, is possible using abdominal Normothermic Regional Perfusion (a-NRP), an in-situ perfusion that facilitates the recovery of abdominal organ metabolism and is particularly important to maintain liver graft function.

Interestingly, in a preliminary analysis, it appeared that ischemia time was not different between transplanted and discarded grafts, hence suggesting more than one underlying mechanism of liver tissue damage in this context.

When the study population was increased from 27 to 60 donors a difference in ischemia time emerged between the two outcome groups, discarded grafts had longer functional warm ischemia time and agonic time ($p = 0,002$ and $p = 0,001$ respectively). Moreover, as previously observed, liver grafts that were eventually transplanted showed lower lactate and transaminase levels throughout the a-NRP procedure and the reduction from baseline in lactate was different over time and between the two groups ($p < 0,001$ for both).

Notably, lactate levels at the beginning of the reperfusion were significantly related to function warm ischemia time ($rs = 0.5$, $p < 0,001$) whereas no correlation was found for AST ($p = 0,22$) and ALT ($p = 0,06$). However, the reduction in lactate from baseline to the first hour was significantly correlated to oxygen consumption ($rs = - 0.48$, $p < 0,001$). This might indicate that despite the statistical difference found between the two groups in terms of ischemia time, a linear correlation exists only with lactate levels, a byproduct of anaerobic metabolism that results from ischemia, but not with liver tissue necrosis markers such as AST and ALT. Thus, suggesting individual differences in susceptibility to ischemic damage during cardiac arrest.