Estimating the damage due to reperfusion caused by Ischaemia via a mathematical model

Ischaemia-reperfusion injury (IRI) or reperfusion injury or reoxygenation injury, is the tissue damage caused when blood supply returns to tissue after a period of ischaemia or lack of oxygen (anoxia or hypoxia). The absence of oxygen and nutrients from blood during the ischaemic period creates a condition in which the restoration of circulation results in inflammation which leads to the death of the cells and oxidative damage through the induction of oxidative stress rather than restoration of normal function. There is a sizable amount of cell death that happens when the liver is reperfused with oxygenated blood. Current sources disagree on how much of the damage a liver with IH sustains is from reperfusion and how much is from necrosis.

Research goals

Detailed literature study of reperfusion due to ischaemia or other associated causes

Data search of biomarkers values from patients associated with reperfusion injury

We aim to model damage due to reperfusion injury due to Ischaemia or other associated causes

Estimate the rate of reperfusion damage to prevent irreversible damage due to ischaemia.

Parameter estimation of the model

Note: Student driven research projects are also highly encouraged in my team.