

## Measuring Tissue Blood Flow Using Ultrasound Modulated Diffused Light

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Monitoring Tissue Blood Flow is vital during states of decreased or increased flow. However, there are currently no non-invasive devices that measure microcirculatory blood flow in tissue continuously. The CerOx monitor (Ornim Medical Ltd.) is a novel device that uses Ultrasound Modulation of Diffused Light to perform non-invasive monitoring of blood flow in the microvascular level underneath its sensor.

We demonstrate the ability of the CerOx to monitor tissue blood flow on anesthetized swine model during different manipulations. Increased Blood flow manipulations were performed by systemic Epinephrine injection. Decreased flow manipulations were performed by arterial occlusion. Measurements were done on the calf muscle of the animal and compared with Laser Doppler (LD) (Moor Instruments. UK).

Results from 6 animals demonstrate a good response of the CerOx readings to all of the flow manipulations. Receiver Operator Curves (ROC) analysis was performed as a test for the discriminative power of the measurements to accurately identify these manipulations. For detecting decrease in flow during arterial occlusion, or increase in flow following Epinephrine injection, CerOx flow readings provide a ROC curve with an area under the curve (AUC) of 0.95. The results demonstrate a high sensitivity for measuring the relative increase or decrease of blood flow during the manipulations. In addition, results show a significant correlation with Laser Doppler reading from a proximal location, with correlation of  $r = 0.81$ ,  $p < 0.001$ .