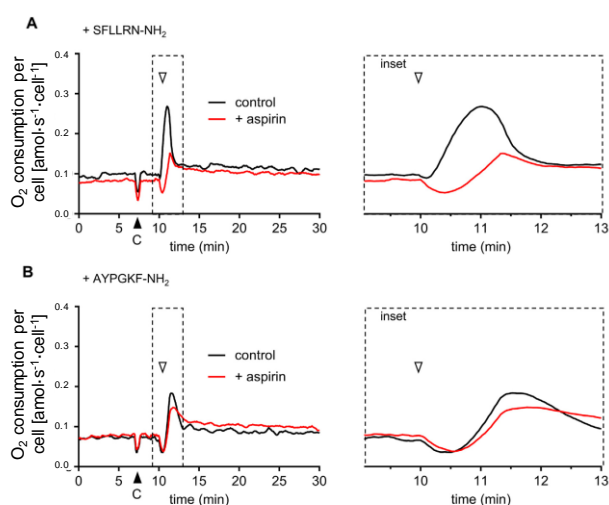# Platelets

Rapid kinetics of changes in oxygen consumption rate in thrombin-stimulated platelets measured by high-resolution respirometry

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High-resolution respirometry of platelets

Figure 1. Protease-activated receptor agonist peptides trigger a rapid increase in I_{O2}. The traces represent the mean signal ($n = 5$) for platelets treated with aspirin or vehicle control. The black and white arrowheads indicate respectively addition of $CaCl_2$ and the agonist peptide (SFLLRN-NH2, a PAR1 agonist in A or AYPGKF-NH2, a PAR4 agonist in B). The dashed area is shown expanded as an inset panel to the right.

High-resolution respirometry can be used to investigate the kinetics of changes in O_2 consumption rate in stimulated platelets, across a timescale that is relevant to the rapid activation of platelets

High-resolution respirometry and transient increase of respiration in platelets
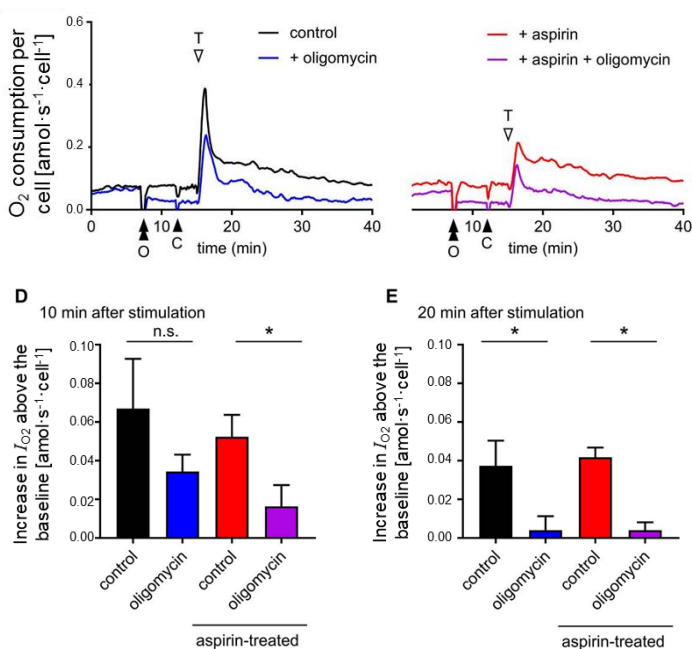
Fig. 2. Oligomycin inhibits O_2 flow (I_{O2}) in unstimulated and stimulated platelets. The traces show mean signal ($n = 5$) from control platelets (DMSO 0.1%) or aspirin-treated (300 mM). The platelets were treated with oligomycin (2.5 mM) or its vehicle (ethanol, 0.05%) as control (double black arrowhead, 'O'). $CaCl_2$ was then added (black arrowhead, 'C') followed by thrombin (white arrowhead, 'T'). The increases in I_{O2} 10 or 20 min after thrombin addition are shown in D or E, respectively.

Following stimulation of platelets, O_2 is rapidly consumed in a COX-dependent manner, as previously reported. However, the high-resolution of this approach shows that other pathways of O_2 consumption are also rapidly activated

Reference: Sowton AP, Millington-Burgess SL, Murray AJ, Harper MT (2018) Rapid kinetics of changes in oxygen consumption rate in thrombin-stimulated platelets measured by high-resolution respirometry. Biochem Biophys Res Commun 503:2721-27.