

Simulation and Mathematical Modelling of ECMO (Extracorporeal Membrane Oxygenation)

Paper:

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Awarded *Best Paper of the Year* by the Austrian Academy of Sciences.

Overview

Extracorporeal Membrane Oxygenation (ECMO) is an ICU procedure that oxygenates blood externally when pulmonary function is severely impaired. Clinicians had observed a persistent drop in oxygen transfer efficiency during ECMO and suspected **recirculation**—the unintended return of oxygenated blood to the venous system—as the root cause.

I developed a computational model of the ECMO process to test this hypothesis and quantify the contribution of recirculation under realistic physiological and clinical