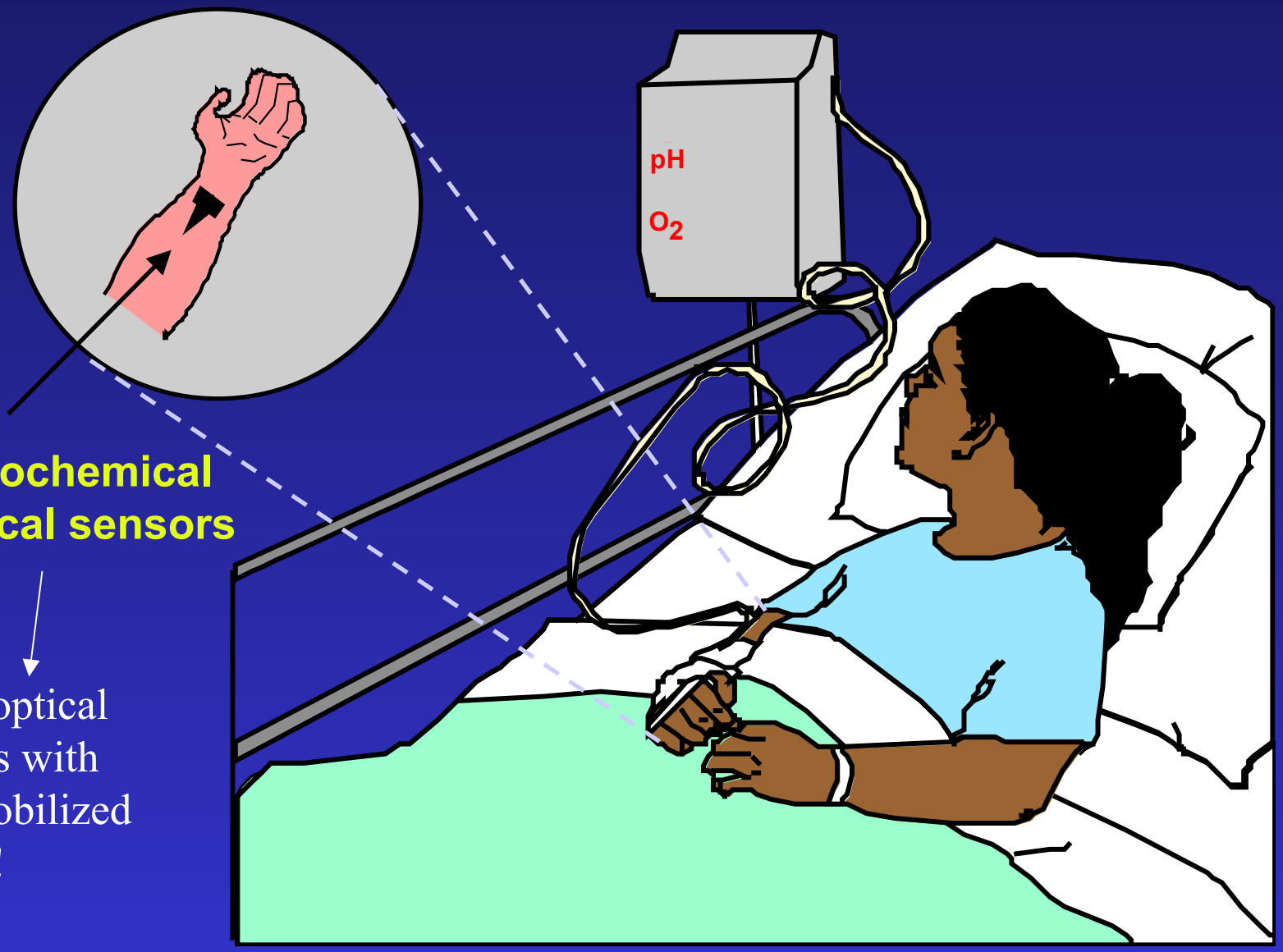
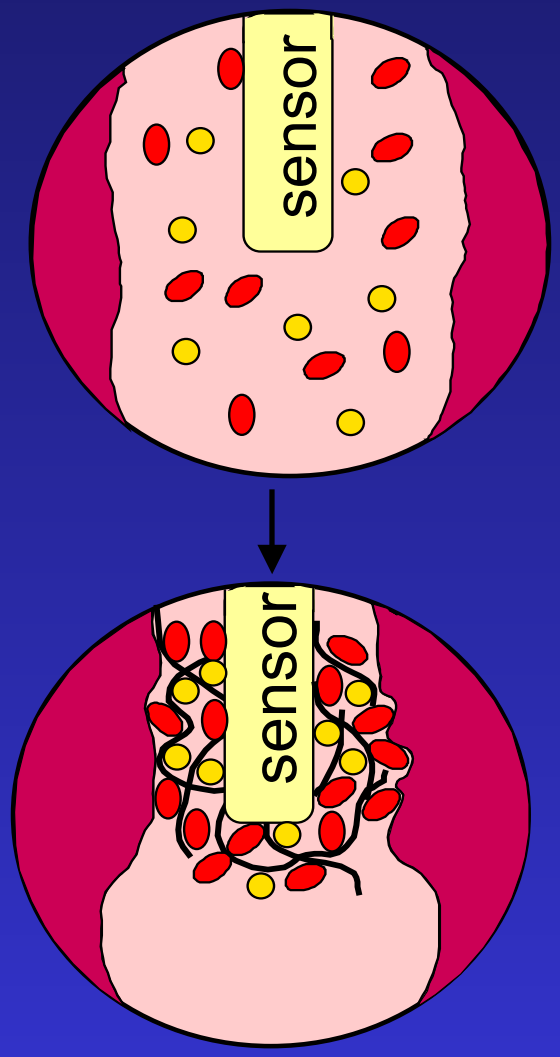
Patient Monitoring with Intra-Arterial Sensors

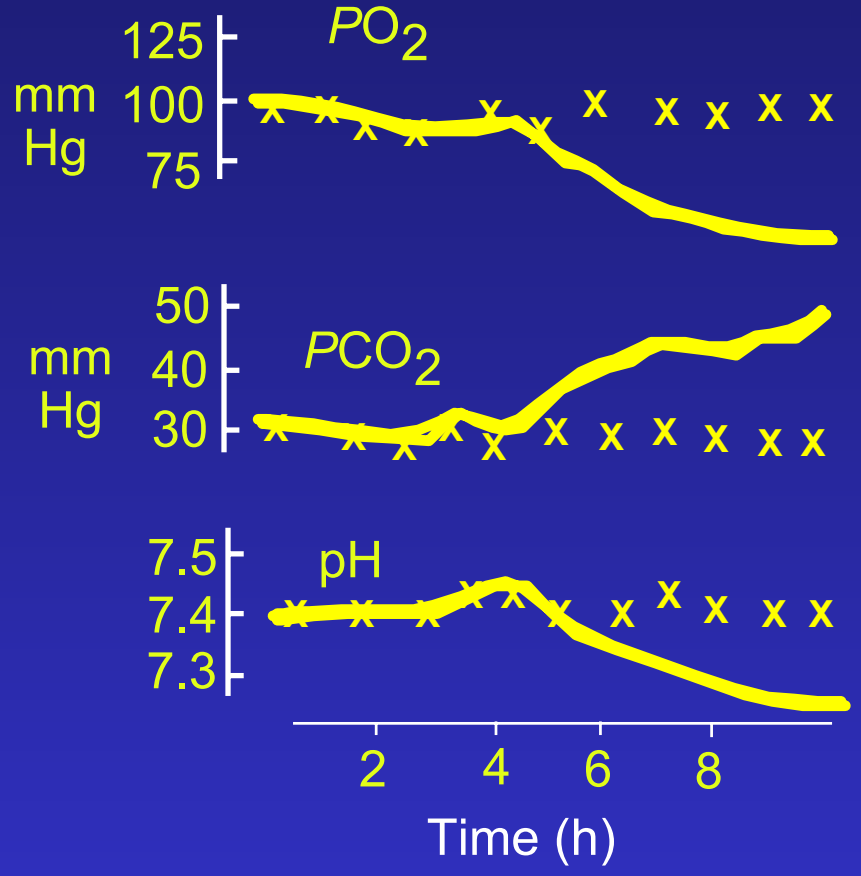


electrochemical or optical sensors

thin optical fibers with immobilized dyes!

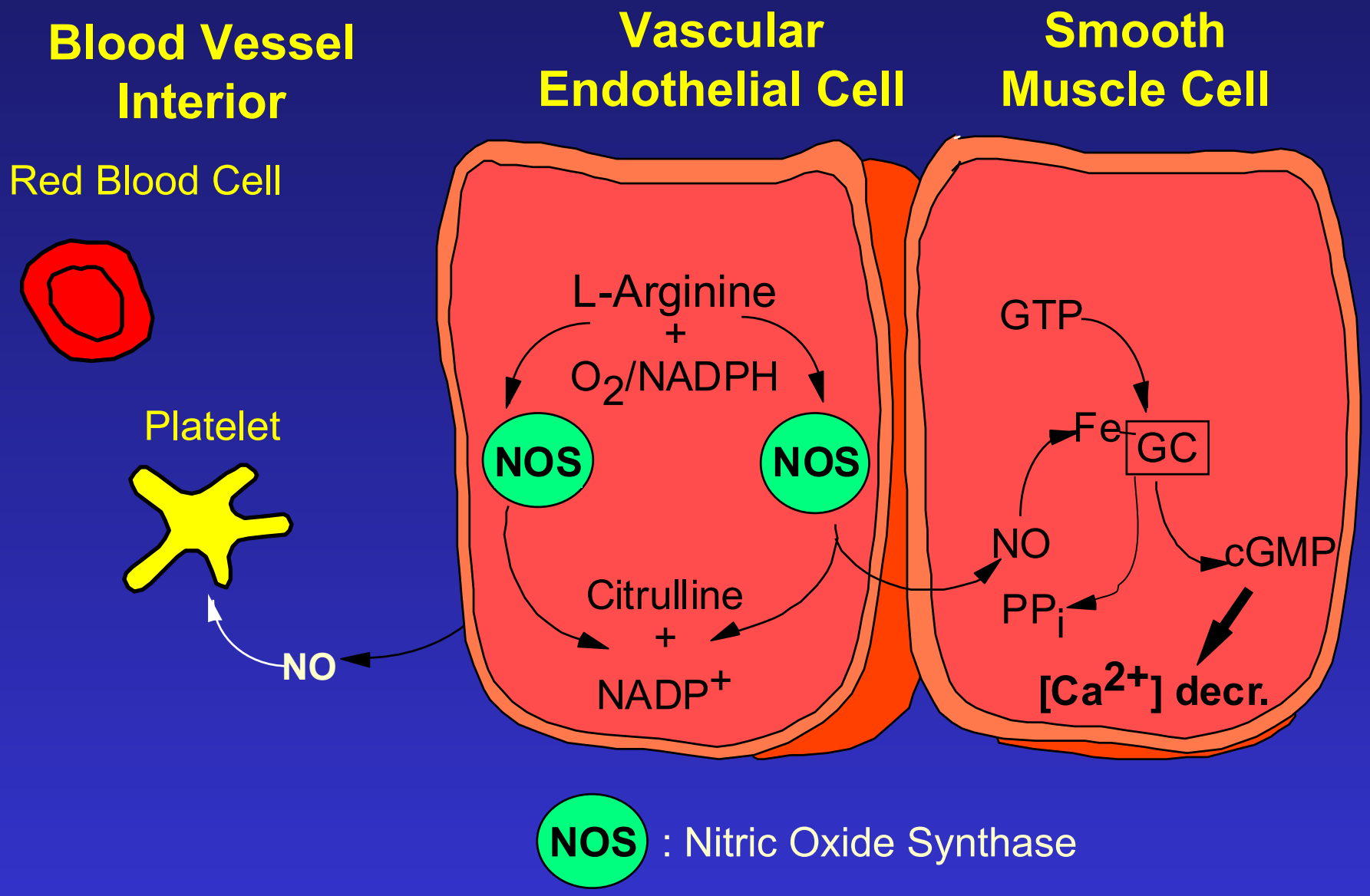
Typical Accuracy Pattern Observed for Intra-Arterial Measurements



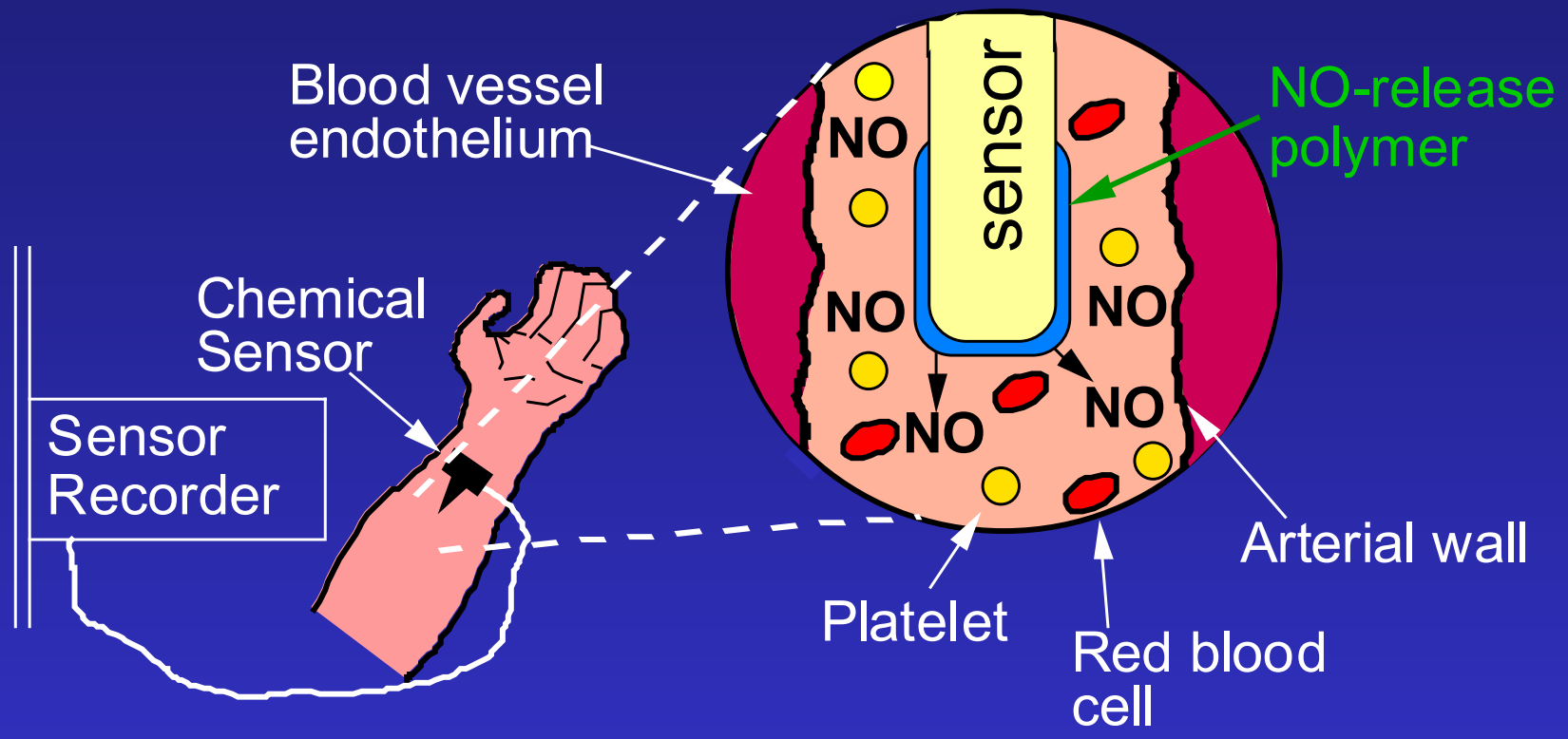


X = in vitro blood gas measurement

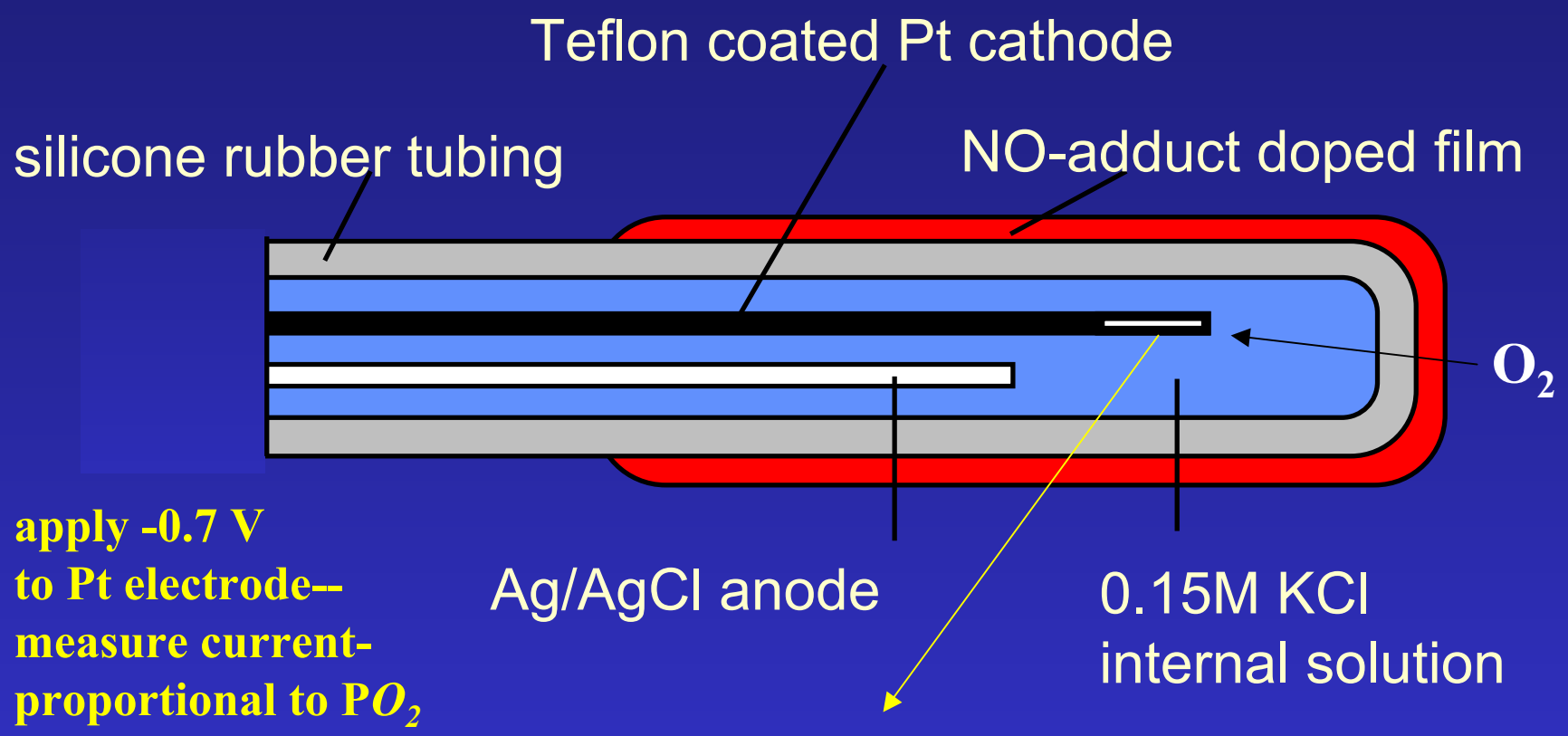
NO Production: Endothelial Cells



Concept of NO Release Polymeric Films for Improved Biocompatibility of Chemical Sensors

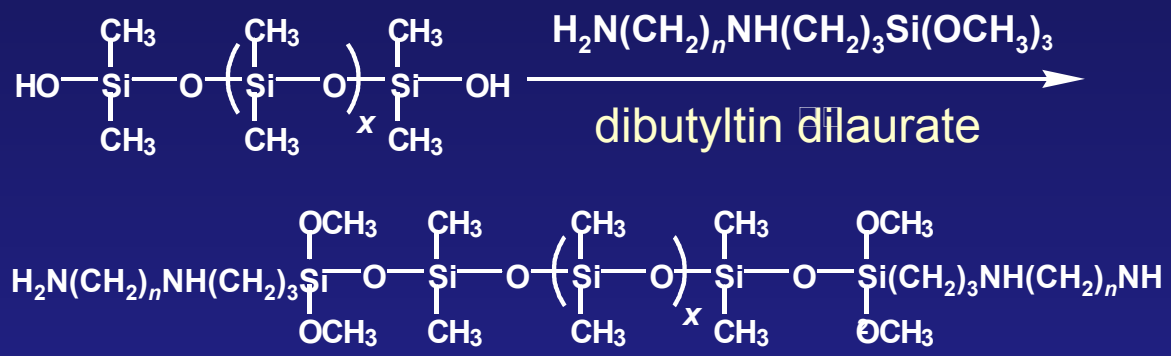


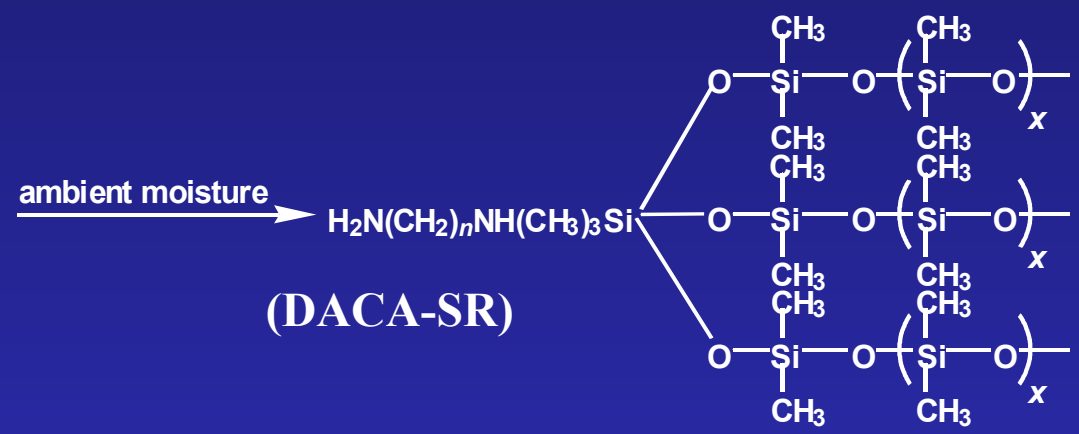
Tubular Amperometric Oxygen Sensor (1 mm o.d.) for Arterial Implantation

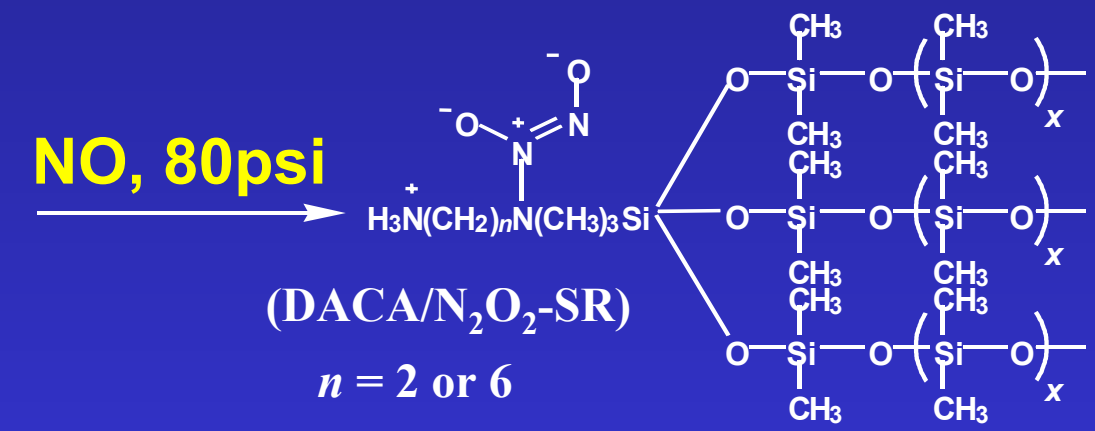


apply -0.7 V to Pt electrode-- measure current- proportional to PO_2

cathode reaction: $O_2 + 2H^+ + 4e^- \longrightarrow 2OH^-$



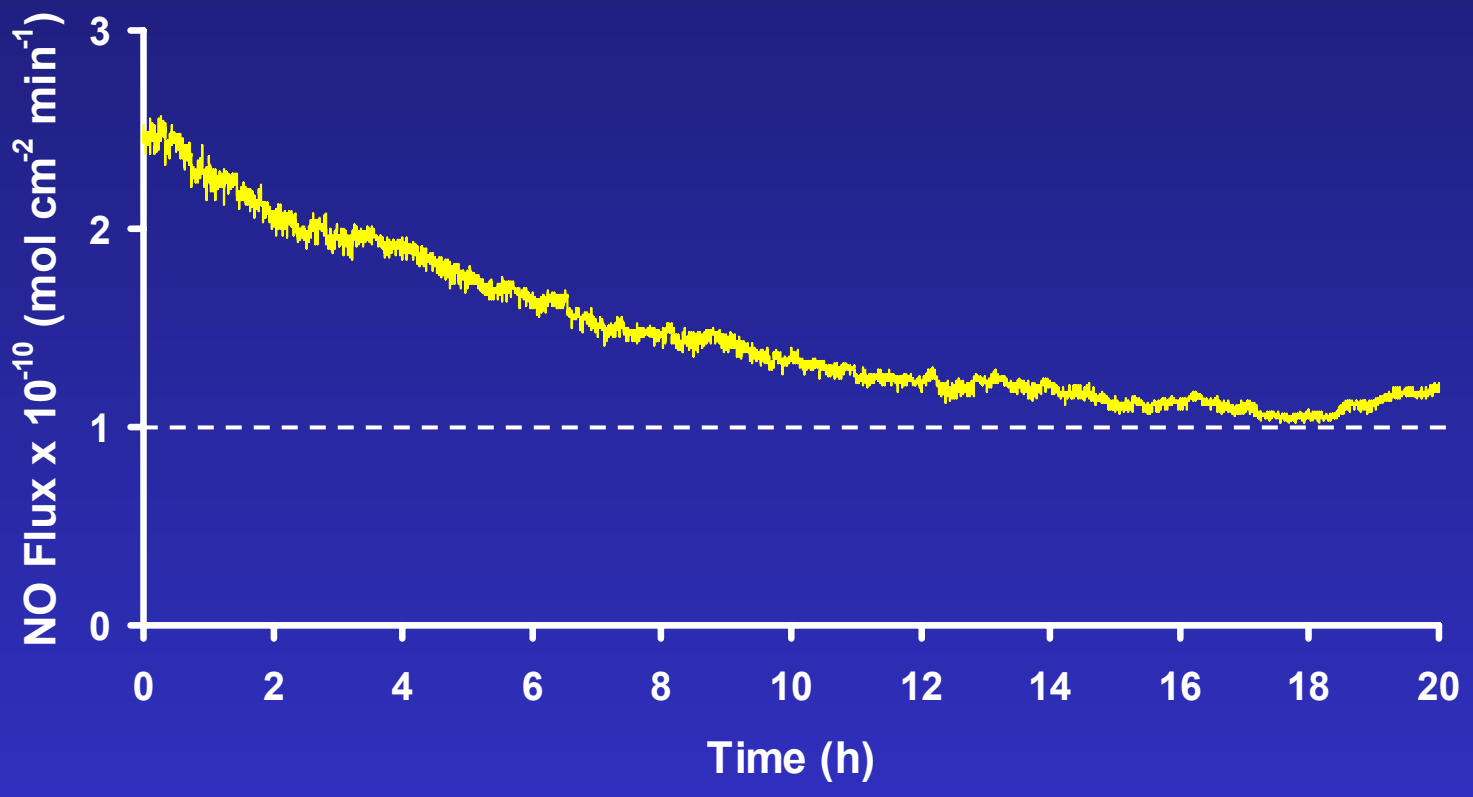




Rxn Scheme to Prepare NO Release Silicone Rubber--

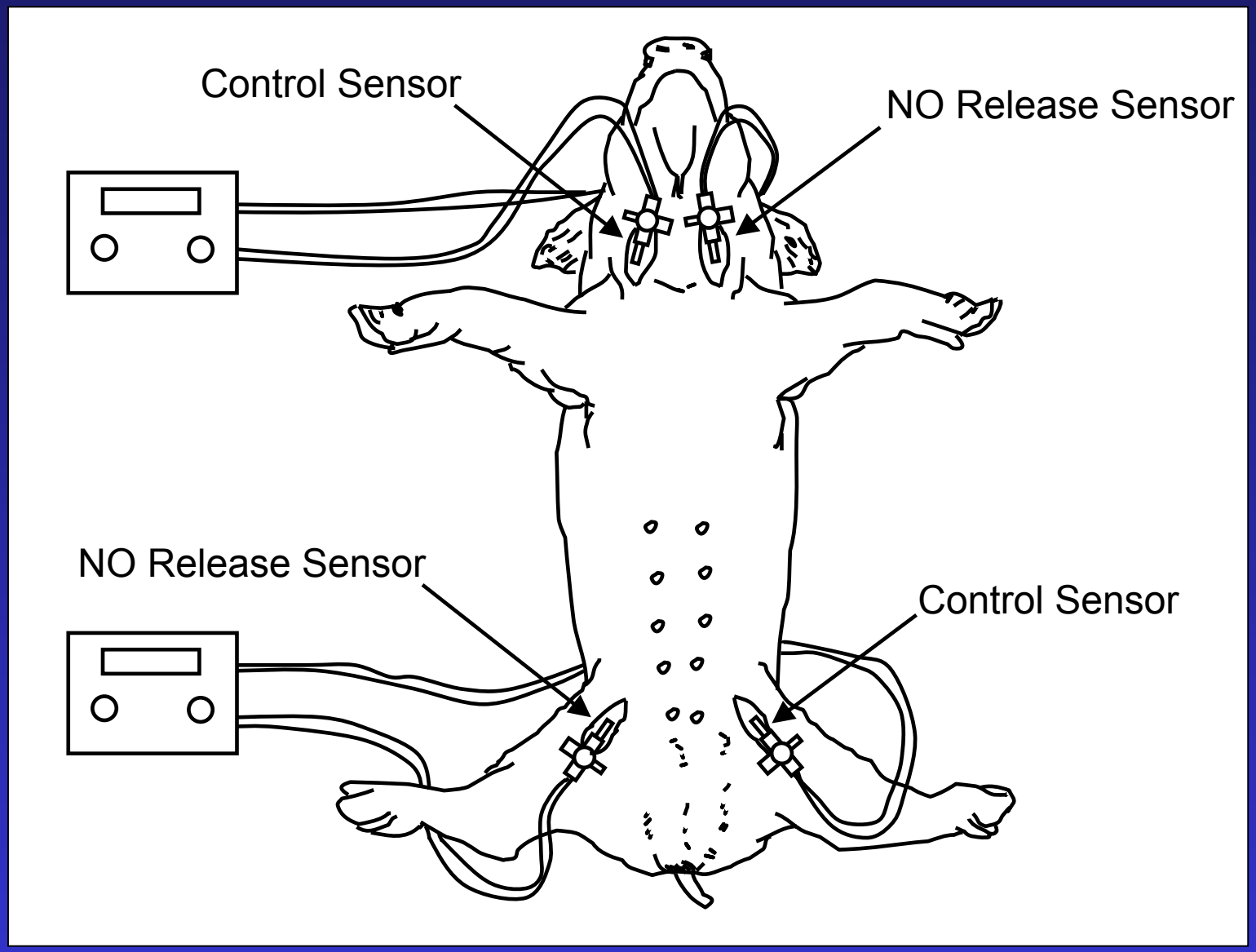
this NO release polymer is coated on oxygen sensing catheter!

Chemiluminescence Determination of NO-Release from DACA-6/N_2O_2 Coated Oxygen Sensor



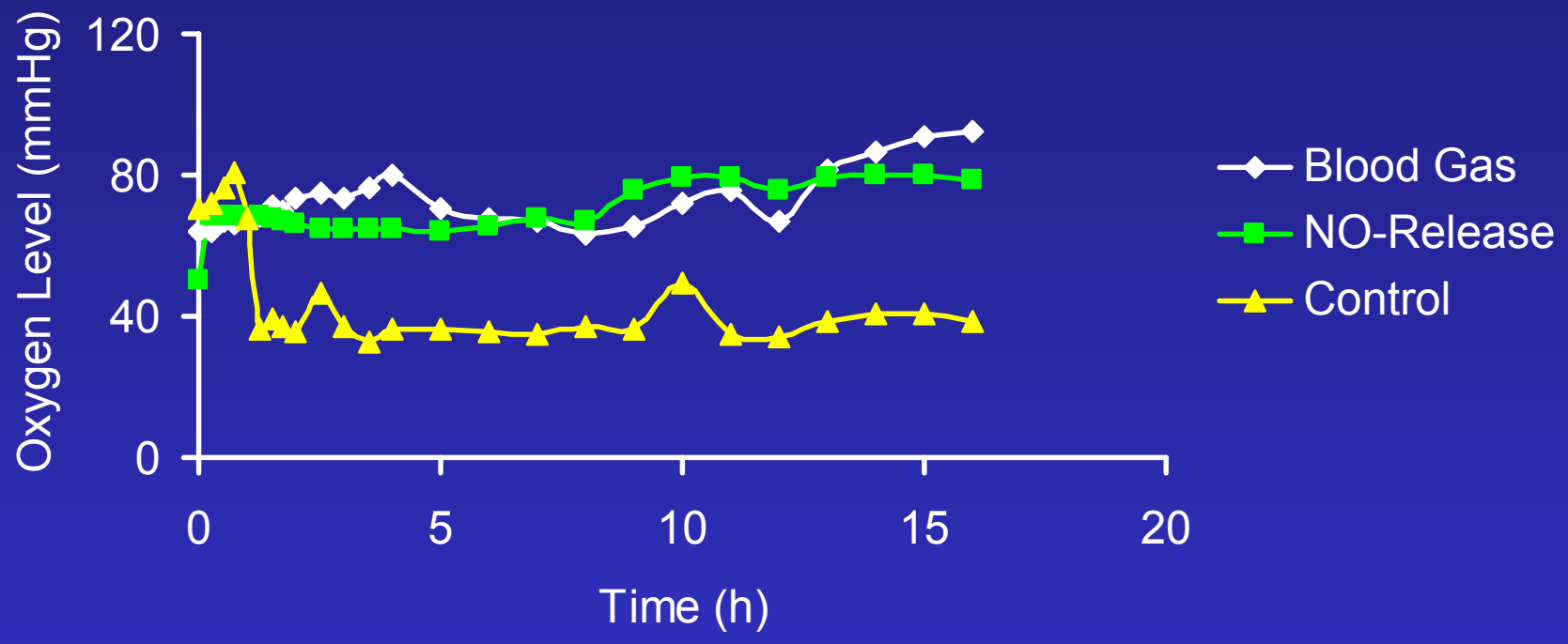
coating thickness=100 μm

Schematic of *In Vivo* Oxygen Sensor Experiment

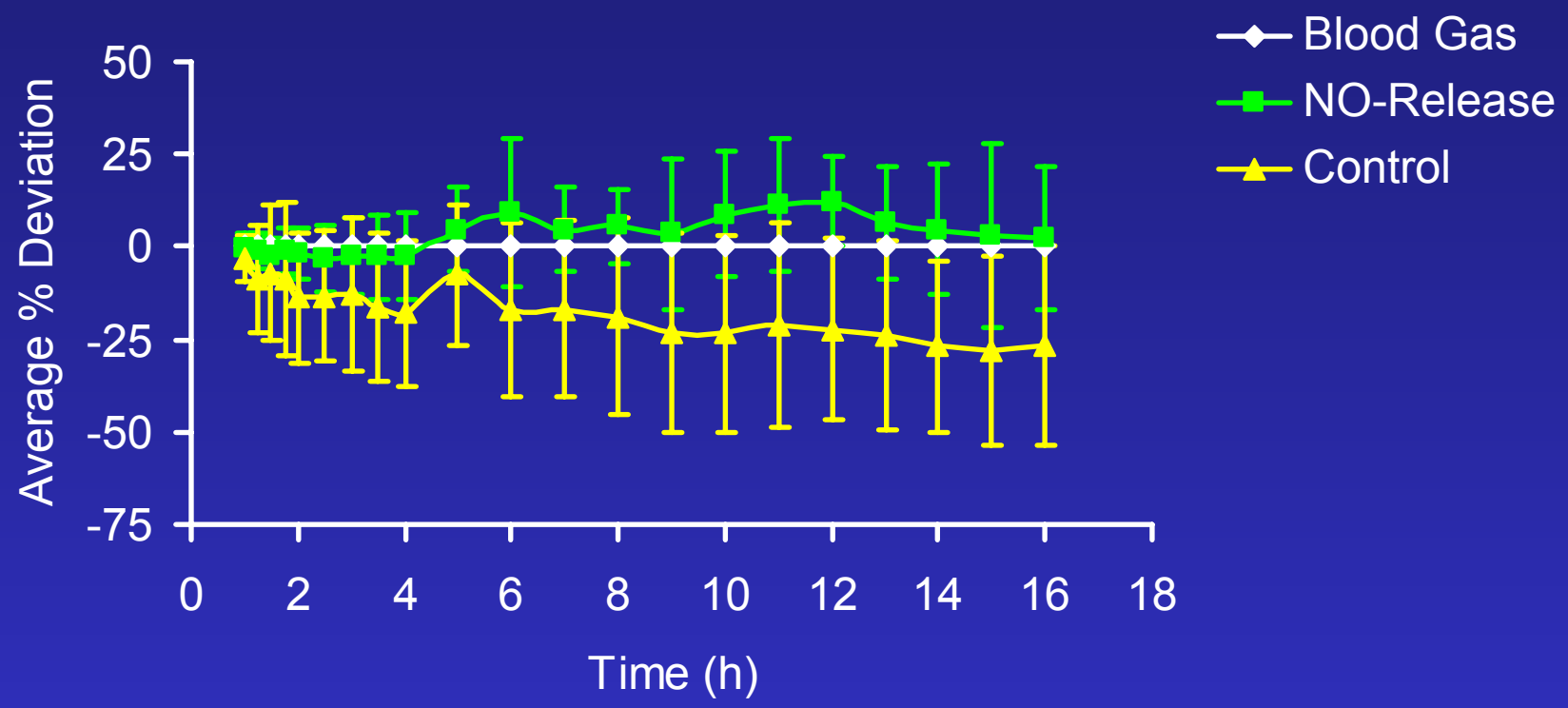


Oxygen Sensors Coated with DACA-6 SR After 16h Implantation in Porcine Carotid Arteries

Oxygen Levels Determined by Intravascular Sensors Coated with DACA-6 SR Compared to Control



Percent Deviation (± s.d) in Oxygen Levels Determined by Intravascular Sensors Compared to Standard In Vitro Blood Gas Measurement



N= 10 controls and 10 NO Release Sensors--in 5 Pigs