# EVALUATION OF A NEW MONITOR FOR MEASUREMENT OF PROPOFOL CONCENTRATIONS IN SPIKED BLOOD SAMPLES

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**Introduction:** We describe the performance of a propofol analyzer in spiked blood which is more than adequate to support development into a point-of-care, in vitro diagnostic device.

Current methods for the measurement of whole blood propofol concentrations require complex extraction and analysis techniques unsuitable for use at the point of care. We present the results from a monitoring system which combines sample preparation, extraction and detection into one instrument. 0.5ml of whole heparinised blood is mixed with 1ml of distilled water and injected into the instrument. Propofol is removed from the lysed blood using a solid phase extraction medium. The extract is then mixed with Gibbs reagent to produce a colour change indicative of the propofol concentration. The colour change is measured using ultra violet absorption spectroscopy. Automation of the fluidics control and data acquisition in this research instrument is achieved using a programmable logic controller and LabVIEW software (National Instruments). Results are displayed on a laptop PC screen. The instrument is calibrated using three solutions of known propofol concentration in a water:methanol mix. A reference method for whole blood analysis was also developed using acetonitrile extraction and High Performance Liquid Chromatography (HPLC).

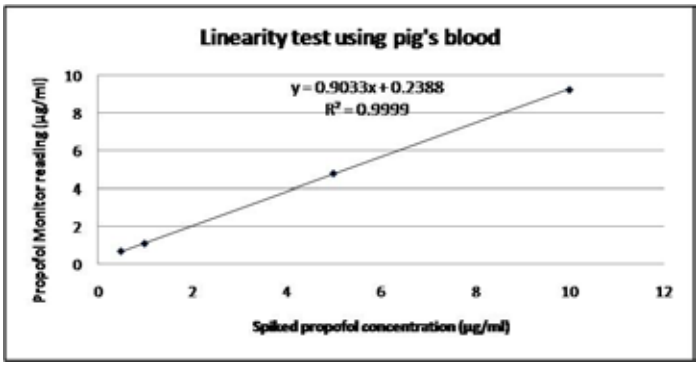


*Figure 1*

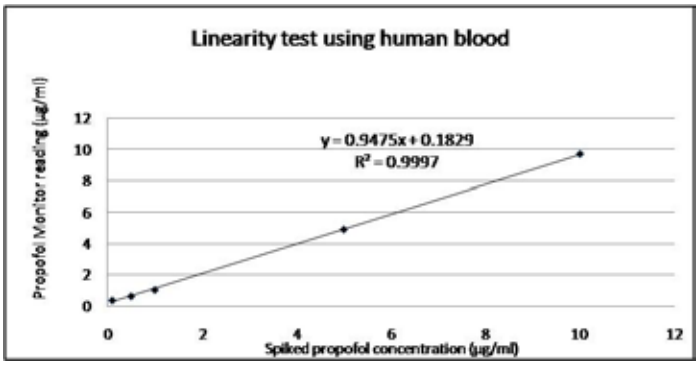


*Figure 2*

**Method:** In the first experiment heparinised pig's blood was spiked with propofol to achieve a calculated concentration of 10 g/ml. Serial dilutions were then performed to produce calculated concentrations of 5, 1 and 0.5 g/ml. In the second experiment freshly donated and heparinised blood from a human volunteer was split into two aliquots, the first aliquot was spiked with propofol to a predicted concentration of 10 g/ml and then diluted with blood from the second aliquot to predicted concentrations of 5, 1 and 0.5 g/ml. Paired samples were analysed by the research instrument and by HPLC.

**Results:** Figure 1 shows the results from the spiked pig's blood, each point represents the mean of 3 measurements, the spread is too small to indicate on these figures.

Figure 2 shows the results from the spiked human blood each point represents the mean of 3 measurements, the spread is too small to indicate on these figures.

**Discussion:** The system described is able to measure whole blood propofol concentrations over the clinically relevant range. From 0.5 g/ml to 10 g/ml the instrument shows exceptional linearity, minimal between sample variability and a more than acceptable bias and precision of measurement. Further development of the instrument is planned and will result in a point-of-care in vitro diagnostic device allowing clinical staff to rapidly and accurately measure whole blood propofol concentrations during surgery and in critical care.

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