

TECHNICAL NOTE

APPARATUS FOR MEASURING CELL AGGREGATION IN VITRO

Z. T. SABIKOWSKI and R. T. HUTCHINGS

Department of Pharmacology, Royal College of Surgeons of England, Lincoln's Inn Fields, London, WC2A
3PN, England

(Received 15 June 1977)

This low cost apparatus has been developed for measuring the aggregation of platelets[1], macrophages and bacteria such as *Staphylococcus aureus* for use in laboratories engaged in studying the effect of agents on blood cells[3] and in routine test screening of patients in hospital with haemostatic disorders such as thrombasthenia and von Willebrand's disease[2]. This is achieved by photoelectric detection in transmitted light changes of cell suspension.

The apparatus consists of a brass sample-holder fitted with a cadmium sulphide photocell (Mullard RPY33), a 1200 RPM a.c. stirring motor with a magnet, tungsten lamp and an electronic unit with power supplies and a Wheatstone bridge circuit (Fig. 1).

The sample-holder (Fig. 2) has one vertical hole and a horizontal hole with a machined slot at the end. The photocell is fitted in the horizontal hole. The slot allows the light beam from the tungsten lamp to pass through the sample containing 1 ml of plasma. Constant temperature of the sample is maintained by circulating water from an external thermostatically controlled source. Alternatively, the temperature of the sample can be maintained by fixing an electrical heating element to the sample-holder, with a thermistor coupled to a proportional temperature controller.

The plasma is stirred by the motor with a magnet arranged to rotate below the sample-holder which is magnetically linked with a small magnet inside the sample tube.

The light beam from the 6V 15W tungsten lamp passes through the plasma onto the cadmium sulphide photocell which is connected to a Wheatstone bridge circuit with a multi-turn potentiometer and indicator for zero balance adjustment.

Adding agents to the stirred plasma suspension produces a variation of light intensity, resulting in conductive change in the photocell which unbalances the bridge circuit to produce a voltage. The output of the photocell can exceed 100mV on a potentiometric pen recorder. Adjustment of the output voltage level is provided by a multi-turn sensitivity control fitted with a lockable duo-dial so that the apparatus can be used with a wider choice of pen recorder

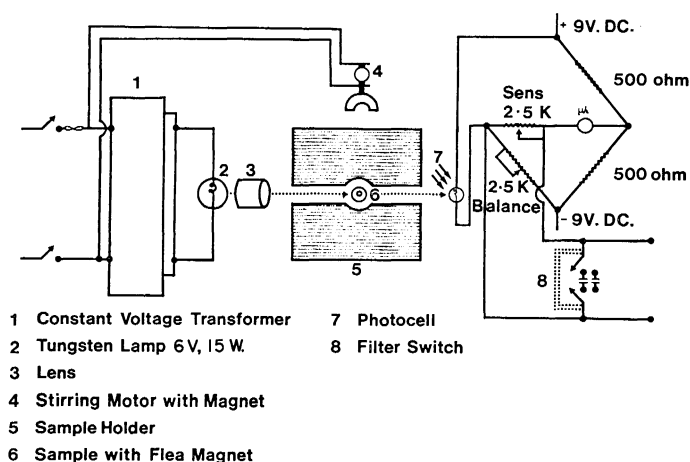


Fig. 1.

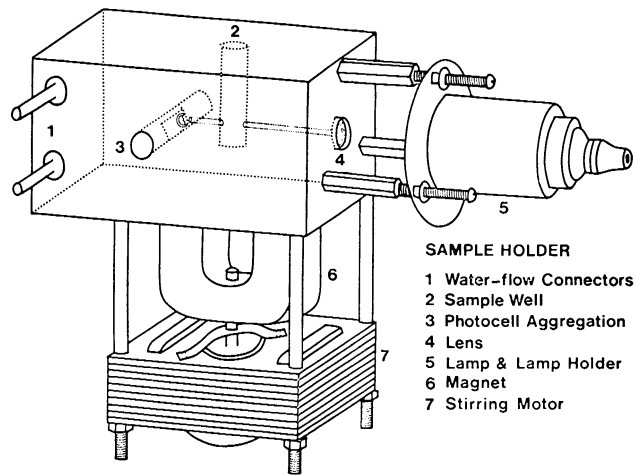


Fig. 2.

inputs. The filtering is provided with an RC filter circuit to minimize excessive signal fluctuation during the experiment.

The apparatus is now being used in this department and other laboratories.

REFERENCES

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3. Moncada, S., Gryglewski, R., Bunting, S. and Vane, J. R. *Nature (Lond.)* **263**, 663, 1976.