



Brain Slice Chamber System

BSC1

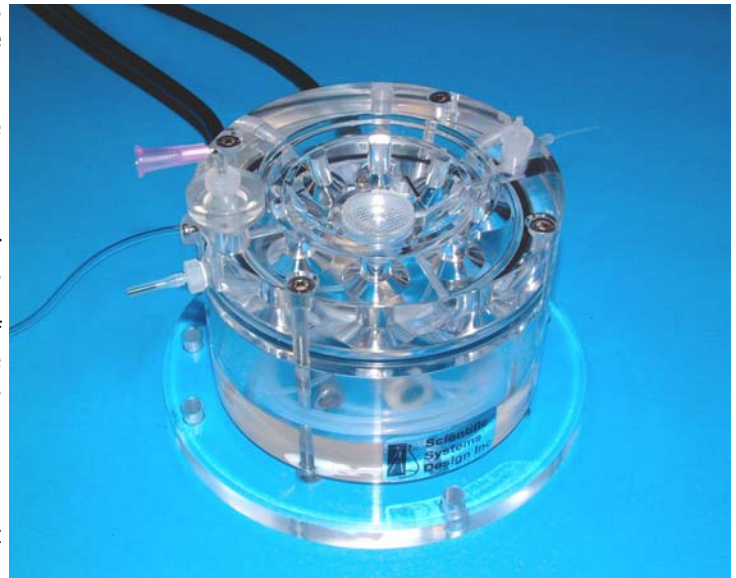
Submerged and Interface Preparations

The BSC1 chamber design is similar to the original "Oslo chamber" (Langmoen & Andersen 1981) with later modifications (Dhanjal & Sears 1980, Alger *et al* 1984) to allow both interface and submerged methods of slice maintenance (Williams *et al*, 1993, Murphy *et al*, 1997, Bliss *et al* 2003). The temperature is controlled by a proportional control heating unit, the PTC03.

FEATURES

- * "Submerged" and "interface" methods of slice maintenance with same chamber
- * Slices supported on removable insert, adaptable to your requirements
- * Proportional temperature controller (PTC03) with low noise
- * Optional temperature control via circulating water heater

The chamber is constructed from clear acrylic having a diameter of 100mm, height is 75mm and the base plate is 130mm in diameter. The slices rest on a nylon net fixed on to a removable insert, located in the centre of the chamber. Pre-oxygenated medium enters the main body of the chamber through a fine bore tube which spirals in the heated distilled water in the lower part of the chamber and enters the upper part of the chamber via a bubble trap. Depending on whether submerged or interface type preparations are required, the height of the perfusion fluid is adjusted at the exit well by means of a screw mechanism. In the case of interface preparations, the high oxygen tension is maintained by bubbling a 95% oxygen, 5% carbon dioxide gas mixture through a ceramic bubbler located in the lower heated part of the chamber. This moistened and warmed gas mixture enters the upper part of the chamber via "port holes" and is then deflected by a profiled lid across and downwards towards the centrally located slice preparation.



The temperature in the upper chamber is maintained by ensuring that the medium and moistened gas mixture enter at the required temperature. This is dependent on the temperature of the lower chamber body which is warmed by a heating element controlled by the Proportional Temperature Controller PTC03.

References:

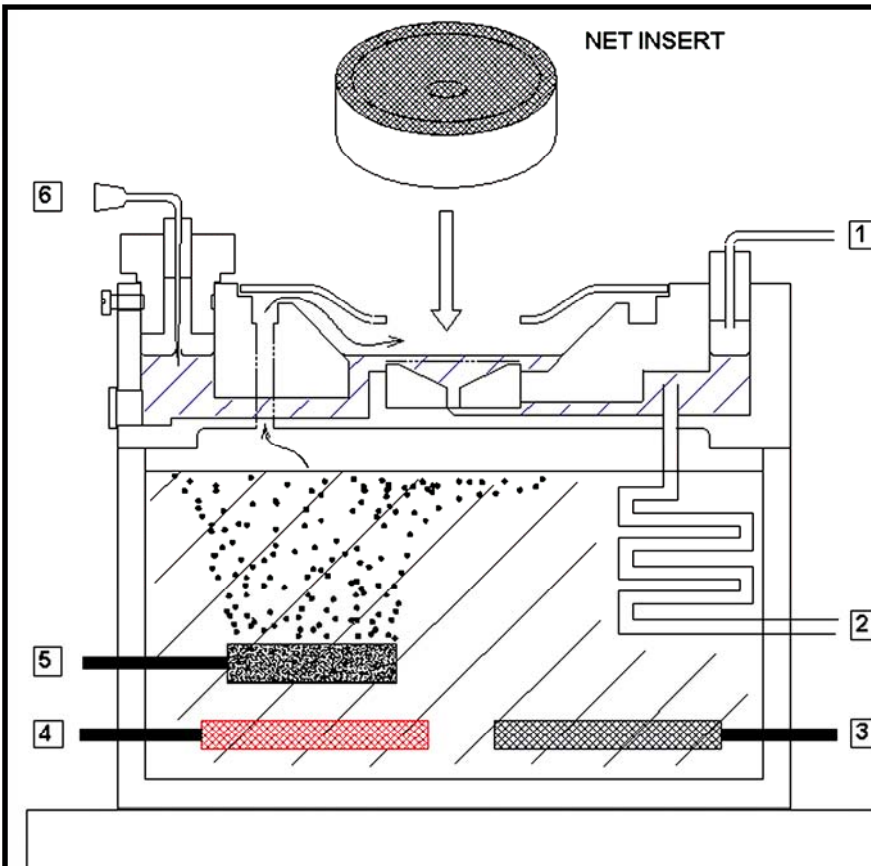
- Alger, B. E., Dhanjal, S. S., Dingleline, R., Garthwaite, J., King, G., Lipton, P., North, A., Schwartzkroin, P. A., Sears, T. A., Segal, M., Whittingham, T. S., and Williams, J. (1984). Brain Slice Methods. In: Brain Slices, ed. R. Dingleline, pg 381, Plenum Press, NY.
- Bliss, T.V.P., Errington, M.L., Voss, K., Peters, M., Cammarota, M., Bradshaw, K., Brent, V., Murphy, K.P.S.J., Giese, K.P., Rostas, J.A.P. and Lengyel, I. (2003) New observations on the role of α CaMKII in LTP *J Physiol* **551P**
- Dhanjal, S. S. and Sears, T. A., (1980) An *in vitro* preparation of the adult mammalian spinal cord *J. Physiol.* **312** 12-13P
- Langmoen, T.A., and Andersen, P. (1981). The hippocampal slice *in vitro*. In: Electrophysiology of Isolated Mammalian CNS preparations (Eds.) Kerkut, G.A & Wheal, H.V. pp.51. Academic Press, London
- Murphy, K.P.S.J., Reid, J., Trentham, D., Bliss, T.V.P. (1997) Activation of NMDA receptors is necessary for the induction of associative LTP in area CA1 of the rat hippocampal slice. *J. Physiol.* **504:379-385**
- Williams, J., Li, K., Nayak, A., Errington, M., Murphy, K. and Bliss, T.V.P. (1993) The suppression of LTP in rat hippocampus by inhibitors of nitric oxide synthase is temperature and age dependent. *Neuron* **11**: 877-884



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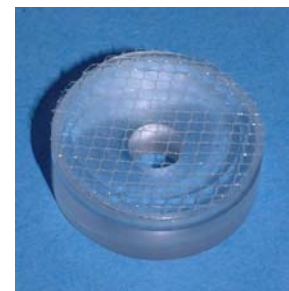
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Schematic diagrams



The design of the chamber is modular to allow easy cleaning and replacement of parts. The heater and control sensor elements are screwed into the base of the chamber. The three main components: base, trough and upper chamber are screwed together. The trough which forms the heated water bath is over 10mm thick for durability, heat insulation and stability. Solution lines are HPLC type PTFE tubing which resists formation and adhesion of fungal growths.

NET INSERT



PARTS DESCRIPTION

- [1] BUBBLE TRAP - helps to eliminate bubbles entering under the net insert
- [2] HEAT EXCHANGER TO WARM INCOMING SOLUTION - solution enters area of slice at the set temperature
- [3] TEMPERATURE CONTROL SENSOR - screwed into side for easy replacement
- [4] HEATING ELEMENT - screwed into side for easy replacement
- [5] OXYGEN/CARBON DIOXIDE GAS BUBBLER - long lasting ceramic air stone easy to clean and maintain
- [6] EXIT FOR PERFUSION FLUID VIA SUCTION LINE - replaceable hypodermic needle sets fluid height