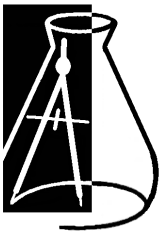

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Innovative Engineering for Science

BRAIN SLICE TRANSPORTER

BST

BRAIN SLICE TRANSPORTER

CAUTION !

YOUR BRAIN SLICE TRANSPORTER SYSTEM IS A PRECISION ENGINEERED TOOL FOR SCIENTIFIC INVESTIGATIONS. PLEASE TAKE A FEW MINUTES TO FAMILIARISE YOURSELF WITH THE SYSTEM AND READ THROUGH THIS SHORT MANUAL BEFORE ATTEMPTING TO USE IT.

DO NOT USE ALCOHOL OR SIMILAR SOLVENTS IN ANY CONCENTRATION ON ANY PART OF THE TRANSPORTER SINCE AS WITH MOST ACRYLICS, IT MAY FRAGMENT OR DEVELOP HAIR-LINE CRACKS.

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TRANSPORTER DESCRIPTION

The BST Brain Slice Transporter is designed to maintain isolated, living slices *in vitro* and allow them to be transported from surgical preparation areas to other laboratory locations whilst maintaining oxygenation, circulation of aCSF and humidification. Since the distance between locations can often involve transport by walking or on a vehicle on the road, the design allows brain slices to be kept in interface mode without disturbing the slices from external motion whilst maintaining the slices viable.

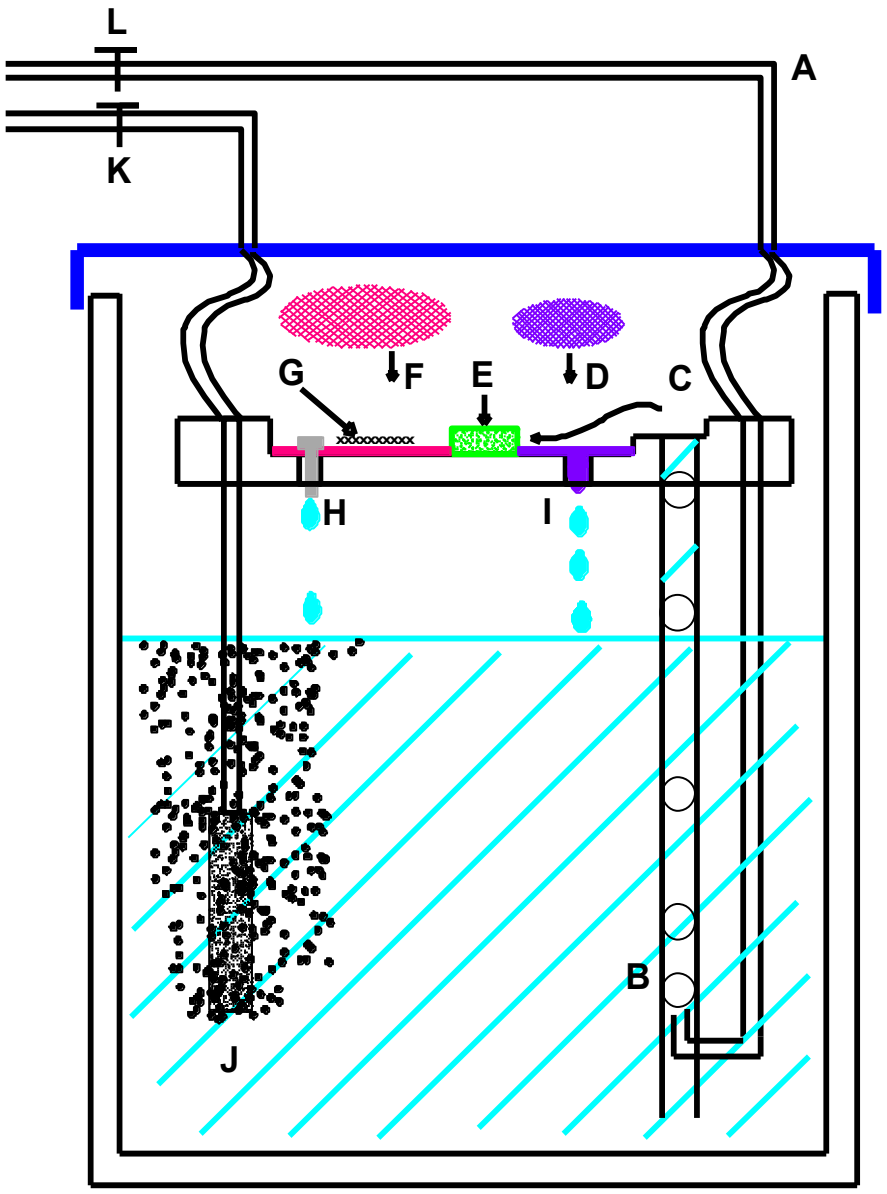
CONSTRUCTION

The transporter manifold is constructed in acrylic plastic, with an upper section containing an interface chamber, a solution feed reservoir and a liquid pump operated entirely by carbogen gas. The chamber is mounted above a reservoir containing oxygen saturated aCSF and contained in a transport jug with a handle for easy handling. A tight seal lid on top of the jug allows for the maintenance of a high oxygen and humidification level above the slices during transport. The diameter of the jug is 85mm, height is 160mm. The transporter module is carried entirely within the jug. The lower section of the jug maintains saturated aCSF with a volume of 500ml and provides humidification with an air stone incorporated into it. The aCSF is pumped up to the interface chamber above by means of a second carbogen line that feeds into a tube to allow bubbles to carry solution to the top, this is the fluid pump. This is fed to a reservoir from which aCSF is wicked into an interface chamber with a base lined with polypropylene mesh. Excess fluid returns from one end to the reservoir to the bottom, likewise extra solution from the reservoir returns to the bottom for re-circulation. Two separate carbogen feed tubes enter the jug from the lid and are connected to the upper chamber. An external source of portable carbogen is required for the operation of the Brain Slice Transporter system.

INSTALLATION AND OPERATION

Your parcel should contain the Brain Slice Transporter installed within the jar with packing material to stop movement during shipping. Once all packing material has been removed, PLEASE take some time to examine the construction of the chamber. Remove and identify: removable chamber well manifold with lid attached by two gas lines, a pack of spares including nylon mesh, buffer material and plastic inserts for drip control.

The carbogen feed line requires connection to the output of a regulated pressure carbogen cylinder. This line in divided into two with two independent needle valve controllers to regulate the flow to the aCSF pump and air stone within the jar.
Do not attempt to dismantle the transporter system at this stage, it should rarely be necessary to do so.



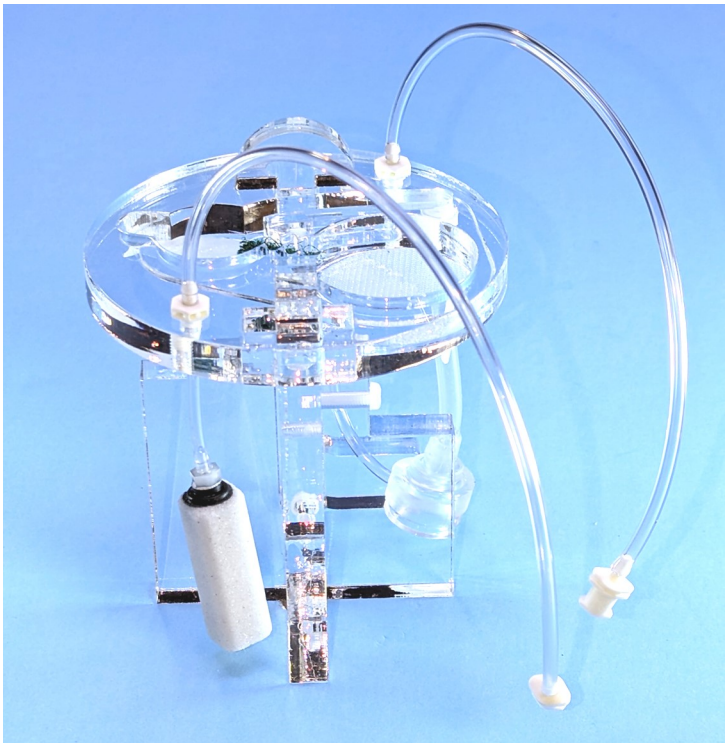
Carbogen enters the jar through the top of the lid at [A]
where it is connected to the bottom of a larger bore tube. Bubbles at [B]
rise up the tube taking aCSF to the top chamber part at [C].
A small polypropylene mesh disc [D]
with a drip control wick [I]
receives aCSF and is led to a buffer material [E].
A continuous feed of aCSF passes into another larger polypropylene mesh disc [F]
upon which the brain slice is laid over a piece of lens tissue [G].
Since the polypropylene mesh is wetted at it's surface, lens tissue on which brain slices rest are maintained at an interface with high oxygen concentration with the lid in place
Excess aCSF falls through a drip point [H]
A second carbogen feed goes directly to an air stone bubbler [J]
to maintain a high concentration of oxygen.
Carbogen to both points is regulated with fine control needle valves [K] and [L]

III

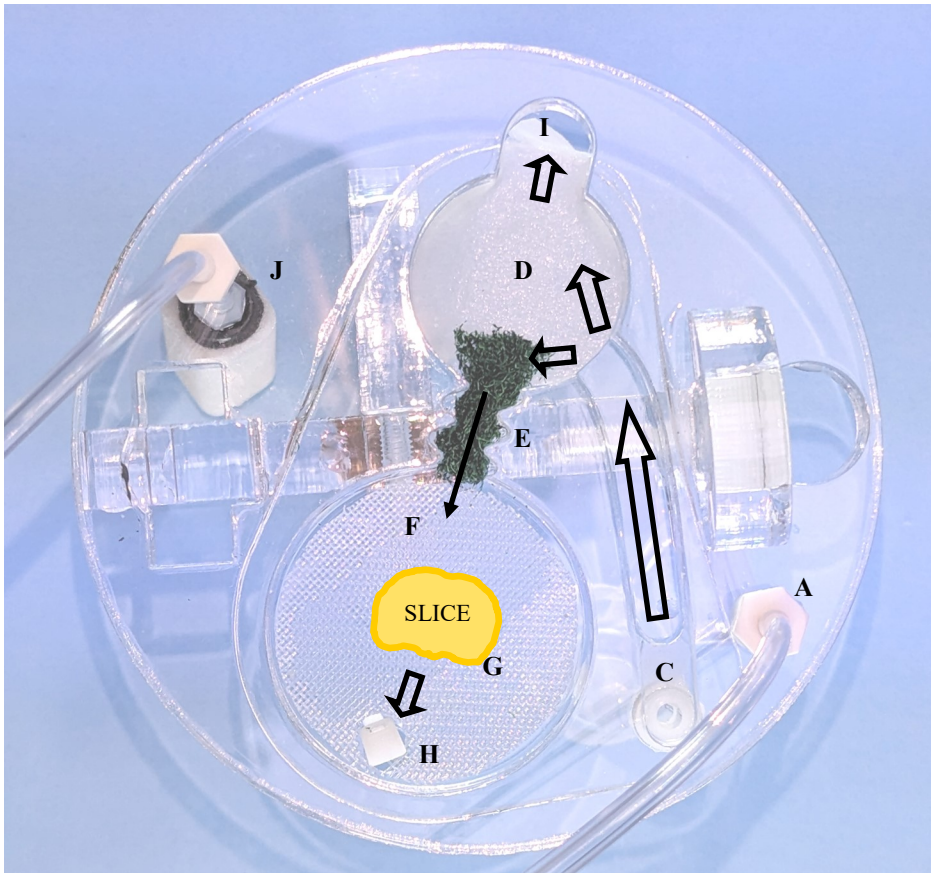
CONNECTION TO GAS MIXTURE SOURCE

The gas mixture source should in addition to its reduction valve have a secondary flow regulator for fine adjustments. Once connected to needle valve regulators [K] and [L] adjust the fluid pump component so that one or two bubbles per second are seen in the tube at [B]. Adjust the air stone feed at [J] for good continuous saturation of the aCSF. In addition to providing moistened gas to the upper chamber, this gassing is necessary to keep the lower section stirred for efficient oxygen feed of aCSF via the fluid pump at [B]

SIDE VIEW OF CHAMBER MANIFOLD



TOP VIEW OF CHAMBER MANIFOLD



Carbogen enters the jar through the top of the lid at [A]
where it is connected to the bottom of a larger bore tube. Bubbles rise up the tube taking aCSF to the top chamber part at [C].
A small polypropylene mesh disc [D]
with a drip control wick where the mesh in bent down [I]
receives aCSF and is led to a buffer material [E].
A continuous feed of aCSF passes into another larger polypropylene mesh disc [F]
upon which the brain slice is laid over a piece of lens tissue [G].
Since the polypropylene mesh is wetted at its surface, the lens tissue on which brain slices rest are maintained at an interface with high oxygen concentration with the lid in place.
Excess aCSF falls through a drip point [H]
A second carbogen feed goes directly to an air stone bubbler [J]
to maintain a high concentration of oxygen.
Carbogen to both points is regulated with fine control needle valves (not visible in this photo.

VI

MAINTENANCE

Alcohol should never be used on the slice chamber for cleaning purposes even at low concentrations because it de-hydrates and produces hair-line cracks in acrylic. A laboratory detergent which completely rinses out should be used. Heavy deposits of salts should be washed out with distilled water overnight and carbonate salts treated with mild acids such as citric acid. The most common contaminant is fungal growth in the upper section tubes and cavities. This can be avoided by agitated washing i.e. suck out plenty of distilled water intermittently with air bubbles through the tubes and holes of the chamber by use of a powerful vacuum line at the end of each experiment. Continue to dry out by using the vacuum line around all the tubes and also below the removable insert. Leaving the chamber dry will prevent the growth of foreign matter. Cover the chamber with a sheet of clean medical wipes to prevent dust settling on the surfaces. Before the start of each experiment rinse with perfusion fluid.