

perience it is easy to reach a purity degree of at least 90%, in most cases 98%. Until now, a comparable purity and recovery was only obtained from blood of patients having an eosinophilia of 40–85%. In these cases the method of Day<sup>11</sup> gives good results, but it can not be used for the isolation of the eosinophils from normal human blood.

Other special and more complicated methods published recently (Spray<sup>12</sup>, Shar<sup>13</sup> and Parrillo<sup>14</sup>) use the differences in IgG binding capacity, the different iron phagocytosis or differences in the adherence on a nylon wool surface of the neutrophilic and eosinophilic granulocytes, for isolation of the eosinophils from normal blood.

- 1 The authors are indebted to the 'Schweizerischer Nationalfonds zur Förderung der wissenschaftlichen Forschung' for financial support.
- 2 C.J.F. Spry, Schweiz. med. Wschr. 108, 1572 (1978).
- 3 C.J.F. Spry and P.C. Tai, Clin. exp. Immunol. 24, 423 (1976).
- 4 J.T. Connell, J. Allergy 41, 1 (1968).
- 5 A. Jörg, P. Portmann, G. Fellay, J.L. Dreyer and J. Meyer, Experientia 34, 1654 (1978).
- 6 H. Rosen and S.J. Klebanoff, J. clin. Invest. 58, 50 (1976).
- 7 M. Markert and J. Frei, Experientia 34, 914 (1978).
- 8 B.M. Babior, R.S. Kipnes and J.T. Curnutte, J. clin. Invest. 52, 741 (1973).
- 9 L. Ignarro, J. exp. Med. 139, 1935 (1974).
- 10 W.H. Grover, H.H. Winkler and D.E. Normansell, J. Immunol. 121, 718 (1978).
- 11 R.P. Day, Immunology 18, 955 (1970).
- 12 P.C. Tai and C.J.F. Spry, Clin. exp. Immunol. 28, 256 (1977).
- 13 R. Sher and A. Grover, Immunology 31, 337 (1976).
- 14 J.E. Parrillo and A.S. Fauci, Blood 51, 457 (1978).

### A simple and versatile apparatus for the continuous superfusion of nervous tissue preparations

R.C. Cantrill and M.J.W. Brennan<sup>1</sup>

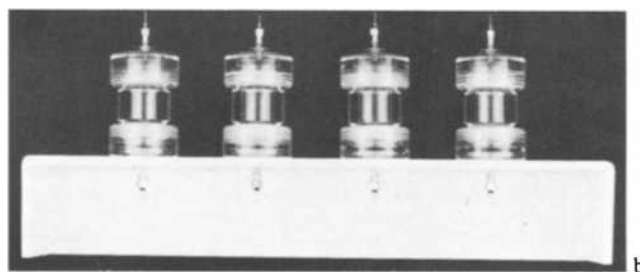
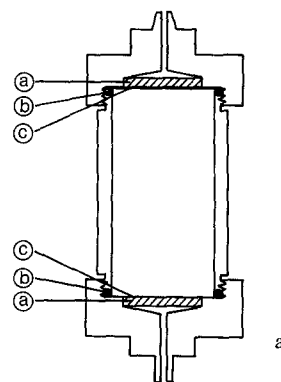
Department of Medical Biochemistry, University of the Witwatersrand Medical School, Johannesburg 2001 (South Africa), 2 April 1979

**Summary.** A bimodal apparatus for the continuous superfusion of both subcellular particles and whole tissue slices is described.

The measurement of the rate of release of neurotransmitter substances from slices or subcellular fractions of nervous tissue has been confounded by the presence of very active transport systems. These uptake processes, which exist for many transmitters in nerve endings, synapse-associated glial cells and post-synaptic perikarya, are responsible for the removal of the released substance from the surrounding medium before an accurate measurement of release can be made. Recently, this problem has been overcome by the development of a superfusion apparatus shown to minimise reuptake of released transmitter by continuous removal of the medium and released transmitter substance<sup>2,3</sup>. In this communication, we describe a simple apparatus which can be used for the continuous superfusion, at constant volume, of subcellular particles or whole brain slices.

The chamber depicted in the figure consists of a central barrel of machined perspex which is screwed into 2 identical perspex endpieces. Each endpiece is fitted with a Millipore 25 mm filter support frit and a rubber 'O' ring (Millipore) to seal the connection. The outlet of the endpiece is machined to give minimum dead volume. The apparatus can be used in the conventional manner to superfuse a bed of subcellular particles resting on the lower Millipore filter. In this mode, an appropriate volume of medium can be introduced into the chamber and the volume thereafter kept constant since the apparatus is airtight. It is also possible to superfuse subcellular organelles or whole tissue slices against gravity by pumping the medium into the chamber from the bottom of the apparatus and drawing it out of the top. Such upward displacement of the medium keeps the tissue preparation in suspension and prevents blockage of the lower filter, a problem often encountered in superfusion of tissue slices by conventional techniques. Since it is necessary to fill the chamber completely with medium when operating in this mode, the volume of the chamber can be varied by altering the length of the barrel.

An apparatus consisting of 4 chambers of the type described above arranged in parallel has been used extensively in the investigation of the efflux of the amino acid neurotransmitters gamma-aminobutyric acid and L-gluta-



Superfusion apparatus. *a* Diagram of the construction of the perspex apparatus in cross section. All dimensions are based on the 25 mm Millipore filter shown at (c). Rubber 'O' rings are shown (b) together with the Millipore support frits (a). *b* The complete apparatus mounted in a bank of 4 chambers as used in experiments to determine neurotransmitter release.

mate from nervous tissue preparations under a variety of conditions<sup>3-5</sup>. In addition, we have used the apparatus to monitor the release of endogenous somatostatin from tissue slices and synaptosomes (unpublished results). Since the chambers can be used in 2 different modes and the superfusion volume and flow-rate maintained constant, we believe that this apparatus has wide application in the perfusion of preparations from a variety of tissues. Certainly in the study of neurotransmitter release mechanisms, where uptake has been shown to interfere with measurement of the true rate of efflux, this design has proved both versatile and invaluable.

- 1 The authors wish to thank Mr W. Maddison and the Physiology Department workshop for manufacture of this apparatus. Research was supported by the South African Medical Research Council and the Atomic Energy Board of South Africa.
- 2 M. Raiteri, F. Angelini and G. Levi, *Eur. J. Pharmac.* 25, 411 (1974).
- 3 M.J.W. Brennan and R.C. Cantrill, *J. Neurochem.* 31, 1339 (1978).
- 4 M.J.W. Brennan and R.C. Cantrill, *J. Neurochem.* in press (1979).
- 5 M.J.W. Brennan and R.C. Cantrill, *J. Neurochem.* in press (1979).

## CONGRESSUS

### Switzerland

#### International symposium on inborn errors of metabolism in humans

*Interlaken, near Berne, 2-5 September 1980*

Note: change of dates. For information write to: Mrs Sonja R. Wyss, Medizinisch-chemisches Institut der Universität, Bülhlstrasse 28, CH-3000 Bern 9, Switzerland.

### Czechoslovakia

#### International congress of polarography, in memoriam Jaroslav Heyrovsky

*Prague, 25-29 August 1980*

Information by Dr J. Kůta, secretary of the congress, Vláška 9, 118 40 Praha 1, Malá Strana, Czechoslovakia.

### Instructions to authors

**Experientia** is published on the 15th of every month and can be obtained in any country through booksellers or from the publishers. All communications to the editors should be addressed to the publishers. All manuscripts for publication in a given number must be in the hands of the editors 3 months before publication.

**Articles** of general scientific interest, of interdisciplinary character: briefly stated and hitherto unpublished original reports of sufficient novelty value.

**Experiments** Papers in which animal experiments have been conducted without using the appropriate anaesthesia will not be accepted.

**Text** should not exceed 2-3 typewritten pages (50-60 lines). 1-2 relevant figures or tables. English summary of maximum 4 lines. Abbreviations should be properly explained. References should be numbered consecutively and be presented on a separate page. Name and address have to be placed directly under the title. Linguistically inadequate manuscripts will be returned. Manuscripts in languages other than English should be supplemented by an English translation of the title. Footnotes should be avoided.

**Figures** Illustrations should be separate from the text, with the author's name on the back in soft pencil. The desired labelling should be shown on a second set of figures, which will be used as a model for inscriptions. Drawings for reproductions should be on good paper in Indian ink, photographs should be supplied as glossy positive prints. The illustrations should be at least one and a half times, as

large as the definitive size desired. Over-large figures can be easily damaged in the mail. Captions should be selfexplanatory, without reference to the text.

**Tables** should be provided with a title and with selfexplanatory captions.

**Headings** In submitting their manuscript to *Experientia*, authors are requested to indicate one of the headings mentioned below, under which they would wish to place their short communication:

1 Mathematics and Physics; 2. Cosmology, Astronautics, Cosmonautics; 3. Mineralogy, Geophysics, Oceanography; 4. Inorganic and Physical Chemistry; 5. Organic Chemistry; 6. Biophysics; 7. Molecular Biology, Cellular Biology; 8. Genetics; 9. Botany; 10. Zoology; 11. Ecology; 12. Biochemistry (analytic and synthetic); 13. Biochemistry (Enzymes, Metabolism); 14. Physiology; 15. Neurology; 16. Pharmacology, Toxicology, Pathology; 17. Experimental Gerontology; 18. Anatomy, Histology, Cytology, Histochemistry; 19. Embryology; 20. Endocrinology; 21. Circulation, Cardiology, Angiology; 22. Nutrition, Gastroenterology; 23. Hematology, Serology; 24. Immunology, Allergy; 25. Microbiology, Parasitology, Chemical Therapeutics; 26. Oncology, Carcinology, Cytostatics; 27. Radiology.

**Reprints** The authors receive 50 reprints, without cover, free of charge. Price-list for further reprints is available.