[18] Electrophoretic Separation of Lymphoid Cells

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Introduction

The dissection of a complex system into its components, their separate analysis, and the controlled reconstitution is a scientific principle that has been used quite successfully in biochemistry. Its application in immunology calls for techniques for large-scale separation of highly pure and functionally intact lymphocyte subpopulations. Since most lymphocyte functions are mediated through their cell surface, a separation based on differences in cell membrane properties, such as surface charge, seems to be especially promising.

Preparative electrophoresis of cells became possible with the development of free-flow electrophoresis by K. Hanning.[1-3] The application of this method to the separation of lymphocytes is closely connected with the name of our collegue, the late K. Zeiller. He and a number of workers in other laboratories have demonstrated the potential of free-flow electrophoresis to efficiently separate murine T and B cells, as well as lymphocyte subpopulations at different stages of activation or differentiation (reviewed in refs. 4–9). Although most investigations have dealt with lymphocytes from mice and rats, lymphoid cells from humans, [5,10-12] non-

[1] K. Hannig, *Z. Anal. Chem* **181,** 244 (1961).
[2] K. Hannig, *in* "Methods in Microbiology" (J. R. Norris and D. W. Ribbons, eds.), Vol. 5, Chapter 8, p. 513. Academic Press, New York, 1971.
[3] K. Hannig, *Tech. Biochem. Biophys. Morphol.* **1,** 191 (1972).
[4] K. Zeiller, *Behring Inst. Mitt.* **52,** 11 (1972).
[5] P. Häyry, L. C. Anderson, C. Gahmberg, P. Roberts, A. Ranki, and S. Nordling, *Isr. J. Med. Sci.* **11,** 1299 (1975).
[6] G. V. Sherbet, ed., "The Biophysical Characterization of the Cell Surface," Chapter 4, p. 36. Academic Press, New York, 1978.
[7] T. G. Pretlow and T. P. Pretlow, *Int. Rev. Cyto.* **61,** 85 (1979).
[8] K. Shortman, H. v. Boehmer, J. Lipp, and K. Hopper, *Transplant Rev.* **25,** 163 (1975).
[9] K. Shortman, J. M. Fiedler, R. A. Schlegel, D. J. V. Nossal, M. Howard, J. Lipp, and H. v. Boehmer, *Contemp. Top. Immunobiol.* **5,** 1 (1976).
[10] G. Stein, H. D. Flad, R. Pabst, and F. Trepel, *Biomedicine* **19,** 388 (1973).
[11] G. Stein, *Biomedicine* **23,** 5 (1975).
[12] P. H. Chollet, P. Hervé, J. Chassagne, M. Masse, R. Plagne, and A. Peters, *Biomedicine* **28,** 119 (1978).

ISBN 0-12-182008-4