Tissue Culturing


This book is a collection of 27 papers presented at a "Practical Tissue Culture Applications" conference held in Nairobi, Kenya, in August 1979. It consists of four sections.

Section I, "Introduction to in vitro Techniques," is opened by Hanks, the doyen of tissue culturists, who provides practical information on preparation of media. The following two sections are extensive reviews of the methods most commonly practiced in vertebrate cell and organ culture (Murrell) and in plant tissue culture (Murashige). Otsawa discusses "problems in tissue culture work in developing countries." The difficulties resulting from mismanagement, inefficient technical procedures, and ill-equipped laboratories are not, however, confined to developing countries.

The wide range of topics covered by the second section, "Application of in vitro Techniques," includes electron microscopy of cultured cells (Porter and Wolosewick); isolation and identification of human viruses (Lenette and Lenette) and arboviruses (Porterfield); vaccine production (Jensen and Bachrach); cultivation of lymphocytes for immunologic assay of malnutrition (Carney et al.) and assessment of immune function (Allison); tissue culture application in detecting antiviral and antimotor substances (Grunberg) and plant quarantine (Kahn); and animal and plant tissue culture decontamination (Schaffner). The chapters vary in scope and significance. Carney et al. describe an immunologic assay for malnutrition, a serious problem in Africa, but their contribution appears to be a short course in immunology with emphasis on cell-mediated immunity. The paper by Schaffner, one of the most valuable in the book, contains information on the use of chemical disinfectants, antibiotics, and fungicides in tissue culture.

The third section comprises 12 chapters on the cultivation of parasites. Hanks writes a brief account of electrolytes and nutritional components for growing intracellular agents in cell cultures. The present status of cultivation technology, as it is applied to the propagation of Plasmodium falciparum, Plasmodium vivax, and Plasmodium malariae are contributed by Siddiqui. Methods in the cultivation of schistosomes are described by Butterworth and Vadis in their paper, "Immunologic Studies on Schistosomes Cultured in vitro."

Two papers are concerned with the cultivation of salivarian trypanosomes. Hirumi recapitulates and expands his important method for the cultivation of bloodstream Trypanosoma brucei on monolayers of mammalian cell lines. Information pertaining to the development of the life cycle in vitro, previously published only in abstracts, is presented in more detail. In an excellent chapter on tsetse fly tissue culture and its application to the propagation of African trypanosomes, Schneider describes the development of a tsetse fly cell line and the numerous attempts to cultivate the vector stages of this parasite. The usefulness of the method of cultivating metacyclic trypanosomes in tsetse fly salivary gland organs might be limited by the severe restrictions on studies with tsetse flies in certain countries. The development of Trypanosoma congolense to the epimastigote stage in Schneider's Glossina cell line gives further encouragement for use of tsetse fly cell lines.

Papers on methods in mosquito cell culture (Varna et al.) and on trends in tick cell culture (Kurtul and Buscher) will prove valuable for anyone interested in these culture systems. Maramorosch states in his paper, "Biological Control by Insect Pests and Viruses," that the number of viruses available for use as insect pest control is very limited, and yields in vitro are lower than those obtainable from insects. A brief chapter dealing with in vitro feeding techniques and tissue culture for study of arthropod-borne disease agents is presented by Galan.

The last section contains one chapter by Lenette and Schmidt, "Future Prospects of Tissue Culture in Microbiology." Although interesting and informative, this presentation is not an entirely satisfactory substitute for one that would summarize the significant advances reported in the previous chapters.

The book is a comprehensive view of current methodology employed in in vitro cultivation of animal and plant cells, and its application to studies of diseases of man and domestic animals. The chapters are somewhat uneven in quality; nevertheless it merits a place on the tissue culturists' bookshelf.

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