
Foreword

I am writing this foreword from the perspective of a clinician who has always aspired to be a scientist. Although development of the clinician-scientist seems to be a universal ideal in medical education, only a handful of individuals have been able to demonstrate excellence in both areas. Most of us have our primary strength either as a clinician or as a scientist. Whereas accepting this perspective may constitute defeat for some, it can serve to empower others. A clinician who wishes to aid in the advancement of science must first seek the help of adept scientists, and must then be able to communicate with them. Herein lies the beauty of the present manual, as it is an excellent resource by which to educate clinicians who are either engaged in laboratory research for a portion of their career, or who serve as clinician-scientists seeking to answer fundamental questions relevant to clinical medicine. In fact, I cannot recall another text that presents concepts related to cell culture with the clarity or simplicity of the present manual.

The manual is clearly organized and can therefore serve as a reference for specific techniques related to cell culture, or as a comprehensive overview of the subject, addressing the language, tools, and applications of human cell culture. The manual begins with an introduction to basic principles of biosafety that would apply not only to a cell culture laboratory, but to any laboratory performing bench research on human tissues. Following this is a discussion of the basic equipment needed to run a tissue culture laboratory. A very germane presentation of techniques specific to

each of the major cell types cultured from human tissues is then provided. Techniques for harvesting the tissues (e.g., bone marrow aspirate) and subsequent culture of these tissues are provided for each cell type, making this a useful reference for both clinicians and scientists. Human stem cells, both embryonic and adult, are discussed separately, providing a very pertinent discussion in the present medical environment. Following a discussion of the reagents used for cell culture, the manual focuses on techniques for manipulating cell culture. Transfection techniques, both viral and non-viral, are defined and elucidated, followed by means of evaluating cellular response to manipulation, including cell proliferation assays, transcript assessment of gene expression, and protein assessment of gene expression.

In summary, this manual can help to empower the aspiring clinician-scientist at any stage of his or her career, whether performing laboratory research or interacting with basic scientists who practice these techniques day in and day out. I have encountered manuals directed to fundamentals of clinical principles for medical students and residents, and I am so glad to see a manual that serves as a counterpart for clinicians who wish to never lose sight of the basic science which sets the stage for advances that may one day ensue in the clinical arena.

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The culture of human cells from tissues is an essential tool in biology and biomedical research. The development of basic, effective and reproducible protocols for exhorting the cells dissociated from human tissues to survive and avoid apoptosis, and then to proliferate in tissue culture, has allowed us to identify and characterise essential molecules and signal transduction pathways by which cells relate to their immediate environment, in health and in disease. Tissue culture is also now a critical technology for early stage testing of hypotheses and principles of novel approaches to therapy for diseases.

Being able to study human tissues to increase our knowledge and understanding is a privilege. As we seek to comprehend human diseases and try to discover more effective approaches to therapy, there is an ethical obligation to use any available human tissue effectively and professionally to increase our knowledge base. Surplus human tissue material should never be discarded whilst we remain challenged with inadequate treatments for human disease. Equally, there is an onus on researchers to develop their skills in handling cells from human tissues in such a way that opportunities for research are not missed.

To this end, this manual aims to share the best practices and protocols with others wishing to develop primary culture

of human cells. In doing so, this will help the biomedical research and development community to get the most out of every precious sample that finds its way to the tissue culture lab.

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