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Animal Tissue Culture

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Commentary

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DESCRIPTION

Animal cell culture has become an integral part of today's life sciences as it provides the basis for studying regulation, proliferation, and differentiation and for performing genetic manipulations. Certain technical skills are required to run successfully.

Cell culture is the process by which human, animal, or insect cells grow in a preferred artificial environment. Cells can be derived from multicellular eukaryotes, already established cell lines, or established cell strains. Animal cell culture is currently one of the most important tools in life sciences in the field of study with economic value and commercialization. The development of basic media has enabled scientists to work with a wide variety of cells under controlled conditions. It has played an important role in gaining a better understanding of cell growth and differentiation, identifying growth factors, and understanding the underlying mechanisms of normal functioning of various cell types. The new technology is also being applied to study high cell density bioreactors and culture conditions.

Many biotechnology products (such as viral vaccines) basically rely on mass culture of animal cell lines. Many simpler proteins are made using rDNA in bacterial cultures, while glycosylated (carbohydrate-modified) more complex proteins now need to be made in animal cells. Currently, cell culture studies aim to study the effects of culture conditions on the viability, productivity, and homeostasis of post-translational modifications such as glycosylation, which are important for the biological activity of recombinant proteins. Biologics produced by recombinant DNA (rDNA) technology in animal cell culture include anticancer agents, enzymes and hormones.

Tissue culture is the *in vitro* maintenance and proliferation of isolated cell

tissues or organs in a suitable artificial environment. Many animal cells can grow outside their original organs and tissues under defined conditions by supplementing with a medium containing nutrients and growth factors. For *in vitro* proliferation of cells, culture conditions for temperature, pH, CO_2, O_2, osmolality, and nutrition should not mimic *in vivo* conditions. In addition, cultured cells require sterile conditions, along with a stable supply of nutrients for growth and sophisticated incubation conditions. Animal cells are currently cultured in natural or artificial media, depending on the requirements of the experiment. This depends on the type of cells that need to be cultured for cell proliferation differentiation or the production of designed medicines. Cells from a wide variety of tissues and organisms are growing in the laboratory. Previously, the main purpose of cell culture was to study growth, growth requirements, cell cycle, and the cells themselves. Homogeneous cultures, now obtained from primary cell cultures, are a useful tool for studying cell origin and biology. Organ-type and tissue-type cultures that mimic each organ/tissue have been proven for the production of artificial tissue.

Partial adult organs from the embryo are used to initiate organ culture *in vitro*. These cells in organ culture also retain their differentiated characteristics, their functional activity, and their *in vivo* structure. They do not grow rapidly and cell proliferation is restricted to the periphery of the explants. Since these cultures cannot grow over long periods of time, new explanations are needed for all experiments that lead to variability between experiments in terms of reproducibility and homogeneity.