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Applications and Management of Tissue culture in animals

Dominique Langin and Mohammad Dominique *

Department of Animal Science, Sichuan Agricultural University, Sichuan, China.

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DESCRIPTION

Cells can be grown in culture media of biological origin such as serum or tissue extracts, chemically defined synthetic media, or a mixture of the two. The medium should contain the nutrients required by the cells under study in the correct proportions and should be appropriately acidic or alkaline. Cultures are typically grown as monolayers of cells on glass or plastic surfaces or as suspensions in liquid or semisolid media.

Cell culture is the process of growing human, animal, or insect cells in a favorable artificial environment. Cells can be derived from multicellular eukaryotes, pre-established cell lines or established cell lines. Animal cell culture became a popular experimental technique in the mid-20th century, but the concept of keeping a living cell line separate from its original tissue source was discovered in his 19th century. Animal cell culture is currently one of the most important tools used in the life sciences, a research area with commercial value and potential for 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 advancing our understanding of cell proliferation and differentiation, identifying growth factors, and understanding the mechanisms underlying the normal function of various cell types. New techniques are also being applied to study bioreactors with high cell densities and culture conditions.

Tissue culture is an important tool for studying the cell biology of multicellular organisms. It provides an *in vitro* model of tissue in a well-defined environment that is easy to manipulate and analyze. In animal tissue culture, cells can be grown as two-dimensional monolayers in modern usage, "tissue culture" generally refers to the *in vitro* growth of cells from tissue of multicellular organisms. These cells can be cells isolated from a donor organism (primary cells) or an immortalized cell line. Cells are bathed in a medium containing essential nutrients and energy sources required for cell survival. Therefore, the broad term "tissue culture" is often used interchangeably with "cell culture." On the other hand, the strict meaning of "tissue culture" refers to the culture of a piece of tissue, explant culture. Cell culture is a fundamental component of tissue culture and tissue engineering, as it establishes the basics of growing and maintaining cells *in vitro*. The major application of human cell culture is in stem cell industry, where mesenchymal stem cells can be cultured and cryopreserved for future use. Tissue engineering potentially offers dramatic improvements in low cost medical care for hundreds of thousands of patients annually. A cell strain is derived either from a primary culture or a cell line by the selection or cloning of cells having specific properties or characteristics which must be defined. Cell strains are cells that have been adapted to culture but, unlike cell lines, have a finite division potential. Non-immortalized cells stop dividing after
40 to 60 population doublings and, after this, they lose their ability to proliferate (a genetically determined event known as senescence).

CONCLUSION

There are two main types of cultures: Primary (mortal) cultures and cultures of established (immortal) cell lines. Primary cultures consist of normal cells, tissues, or organs that are excised directly from tissue collected by biopsy from a living organism. Primary cultures are advantageous in that they essentially model the natural function of the cell, tissue, or organ under study. However, the longer the samples are maintained in culture, the more mutations they accumulate, which can lead to changes in chromosome structure and cell function live Cultures may be examined and explained the cells microscope, or they may be observed by means of photographs and motion pictures taken through the microscope. Cells, tissues, and organs may also be killed, fixed (preserved), and stained for further examination. Following fixation, samples can also be embedded (e.g., in a resin) and cut into thin sections to disclose additional details under a light or electron microscope.