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Short Communication

Methodology and Historical Development of Cell Culture

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ABOUT THE STUDY

The process through which cells are cultivated under controlled circumstances, typically outside of their natural environment, is referred to as cell culture or tissue culture. American doctor Montrose Thomas Burrows is credited with coining the phrase "tissue culture." Another name for this method is micropropagation [1]. The cells of interest can thus be maintained under carefully monitored conditions without the need to be kept at body temperature in an incubator once they have been removed from living tissue. These circumstances differ depending on the type of cell, but they often involve an appropriate vessel with a substrate or rich medium that provides the necessary nutrients, growth factors, hormones, and gases and controls the physical and chemical environment. While some cells can be cultivated as suspension cultures that float freely in a solution, the majority of cells need a surface or artificial substrate to produce an adherent culture. To facilitate this, a liquid, semi-solid, or solid growth medium, like broth or agar, is typically utilized. Animal cells and tissues are typically cultured using the term "tissue culture," while plants are cultured using the more precise term "plant tissue culture [2]. The majority of cells have a genetically defined lifespan, but under the right circumstances, some cell culture cells have been "converted" into immortal cells that can continue to divide eternally. In contrast to other methods of culture that also produce cells, such as plant tissue culture, fungal culture, and microbiological culture, the phrase now, the term "cell culture" refers to the growing of multicellular eukaryotic cells, notably animal cells [3].

The methodology and historical development of cell culture are very similar to those of tissue and organ culture. Cells serve as the hosts for viruses in viral culture. In the middle of the 20th century, the laboratory procedure for keeping live cell lines separate from their original tissue source became increasingly reliable. In order to keeps an animal's heart pumping outside of the body, English scientist Sydney Ringer created salt solutions including sodium, potassium, calcium, and magnesium chlorides [4]. Wilhelm Roux developed the fundamental idea behind tissue culture in 1885 when he cut a piece of an embryonic chicken's medullary plate out and kept it in a warm saline solution for many days. In 1907, Ross Granville Harrison, a naturalist, documented the development of frog embryonic cells that would later give rise to nerve cells in a medium of clotted lymph. Vaccine virus was developed in 1913 by E. Steinhardt, C. Israeli, and R. A. Lambert in guinea pig ocular tissue pieces. Regenerative tissue was first utilized to replace a tiny segment of the urethra in 1996, which led to the realization that the process of taking tissue samples, growing them outside the body without a scaffold, and then reapplying them can only be employed for short distances of less than 1 cm [5]. The results of studies conducted by Ross Granville Harrison between 1907 and 1910, while he was a student at Yale University and a faculty member at Johns Hopkins Medical School, were published, laying the foundation for tissue culture. The first person to highlight the advantages of plant tissue culture was Gottlieb Haberlandt.

CONCLUSION

He proposed that this method might be used to determine the potential of individual cells through tissue culture as well as the reciprocal effects of tissues on one another. Since Haberlandt made his first claims, techniques for tissue and cell culture have been developed, resulting in important biological and medical advancements. He first proposed the concept of totipotency in 1902, which states that "theoretically, all plant cells are capable of giving rise to a full plant." The 1940s and 1950s saw a substantial advancement in cell culture methods to aid virology research. Viral growth in cell cultures allows for the creation of pure viruses for vaccine production. One of the first items produced in large quantities utilizing cell culture techniques was the injectable polio vaccine created by Jonas Salk. The cell culture work of John Franklin Enders, Thomas Huckle Weller, and Frederick Chapman Robbins, recipients of the Nobel Prize for their invention of a technique for producing the virus in monkey kidney cell cultures, made it possible to develop this vaccine. Vaccines for various diseases have been developed in part thanks to cell culture.

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