FACULTY OF ENGINEERING AND TECHNOLOGY

History of Animal Cell Culture

animal cell culture was first successfully undertaken by Ross Harrison in 1907, it was not until the late 1940's to early 1950's that several developments occurred that made cell culture widely available as a tool for scientists.

First, there was the development of antibiotics that made it easier to avoid many of the contamination problems that plagued earlier cell culture attempts.

Second was the development of the techniques, such as the use of trypsin to remove cells from culture vessels, necessary to obtain continuously growing cell lines (such as HeLa cells).

Third, using these cell lines, scientists were able to develop standardized, chemically defined culture media that made it far easier to grow cells.

Historical Events in the Development of Cell Culture

1878: Claude Bernard proposed that physiological systems of an organism can be maintained in a living system after the death of an organism.
1885: Roux maintained embryonic chick cells in a saline culture.

1897: Loeb demonstrated the survival of cells isolated from blood and connective tissue in serum and plasma.
1903: Jolly observed cell division of salamander leucocytes in vitro.
1907: Harrison cultivated frog nerve cells in a lymph clot held by the 'hanging drop' method and observed the growth of nerve fibres in vitro for several weeks. He was considered by some as the father of cell culture.
1910: Burrows succeeded in long-term cultivation of chicken embryo cell in plasma clots. He made detailed observation of mitosis.
1911: Lewis and Lewis made the first liquid media consisted of sea water, serum, embryo extract, salts and peptones. They observed limited monolayer growth.

1913: Carrel introduced strict aseptic techniques so that cells could be cultured for long periods.
1916: Rous and Jones introduced proteolytic enzyme trypsin for the subculture of adherent cells.
1923: Carrel and Baker developed 'Carrel' or T-flask as the first specifically designed cell culture vessel. They employed microscopic evaluation of cells in culture.
1927: Carrel and Rivera produced the first viral vaccine – Vaccinia.
1933: Gey developed the roller tube technique.

1940s: The use of the antibiotics penicillin and streptomycin in culture medium decreased the problem of contamination in cell culture.
1948: Earle isolated mouse L fibroblasts which formed clones from single cells. Fischer developed a chemically defined medium, CMRL 1066.
1949: Enders reported that polio virus could be grown on human embryonic cells in culture.

1952: Gey established a continuous cell line from a human cervical carcinoma known as HeLa (Helen Lane) cells. Dulbecco developed plaque assay for animal viruses using confluent monolayers of cultured cells.
1954: Abercrombie observed contract inhibition: motility of diploid cells in monolayer culture ceases when contact is made with adjacent cells.
1955: Eagle studied the nutrient requirements of selected cells in culture and established the first widely used chemically defined medium.
1961: Hay flick and Moorhead isolated human fibroblasts (WI-38) and showed that they have a finite life-span in culture.

1964: Littlefield introduced the HAT medium for cell selection.
1965: Ham introduced the first serum-free medium which was able to support the growth of some cells.
1965: Harris and Watkins were able to fuse human and mouse cells by the use of a virus.
1975: Kohler and Milstein produced the first hybridoma capable of secreting a monoclonal antibody.
1978: Sato established the basis for the development of serum-free media from cocktails of hormones and growth factors.

1982: Human insulin became the first recombinant protein to be licensed as a therapeutic agent.
1985: Human growth hormones produced from recombinant bacteria was accepted for therapeutic use.
1986: Lymphoblastoidy γIFN licensed.

1987: Tissue-type plasminogen activator (tPA) from recombinant animal cells became commercially available.