

PANEL III: SOMATIC CELL GENETICS

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Introduction: (Dr. Krooth)

It is very difficult to define the boundaries of this field and so the topic is difficult to discuss. This results from the facts that the field is only 16 years old and so it is difficult to tell in what direction research is developing. Also, the field is subdivided into several branches, which at present appear to be unrelated. Consequently, the following papers may not seem entirely related.

Hybridization of Cells (Dr. Littlefield):

Fusion of cells in culture was first done in 1960. Two cell lines, with different chromosomal complements, were mixed and a new cell line with the resultant tetraploid complement was produced. The techniques of producing fusion are conceptually simple and these were discussed.

The uses of hybridization can be seen. Already some work has been done enabling the study and application of control of protein synthesis. For example, when one fuses a malignant cell with a nonmalignant one, the resultant cell is always malignant. There-

fore, one is forced to conclude that malignancy is not due to a loss of an enzyme as has been suggested by some authors. The technique has also been used to help localize specific genes on specific chromosomes, which could not previously be done in human cells.

Some Uses of Tissue Cell Culture (Dr. Sato):

It has been possible to grow cells with organ specific function. The possibilities of such endeavors are enormous. For example, if one could produce human hormones, especially those which are species specific obtaining hormones like growth hormone for therapeutic and research purposes would be simplified compared to methods currently available. One can also carry on certain physiological studies with this technique. It has been shown, for example, that ACTH acts on the adrenal by acting on the cell membrane and does not enter the cell.

Current theories of differentiation, elucidated using hybridization techniques, were also discussed.