

Cancer Riddle Unlocked

► THE LACK of communication between cancer cells has been found to be the cause of their uncontrollable growth. Normal cells exchange information freely with the neighboring ones they touch, but there is apparently no such exchange between cancer cells when they touch.

To biologists, this discovery made by two Columbia University scientists provides a way of finding out how cells organize themselves and how their growth is directed. To pathologists, it means a new diagnostic method for detecting cancer at much earlier stages than now possible. It is also a way of determining why cells become cancerous at all.

How communication between cells is involved in tissue growth was reported in *Nature*, 209:1248, 1966, by Drs. W. R. Loewenstein and Y. Kanno of Columbia University's College of Physicians and Surgeons.

The Columbia scientists found that cancer cells induce changes in the ability to communicate among nearby normal cells. Although these fringe cells appear normal, their ability to engage in cross-talk is "significantly less" than normal, a clue to precancerous conditions.

Although the scientists used rat liver cells for convenience in their experiments, the results apply to human cancer cells and their neighbors.

An important clue to understanding their results came from the recent finding that communication between normal cells can be interrupted by the removal of calcium ions and by other procedures.

Dr. Loewenstein and his co-workers had previously found that normal cells communicate quite freely with each other, including the exchange of ions and molecules. Such materials move unhindered from one cell to another at the place where the cell walls join.

This communication, or lack of it was measured electrically by tiny microprobes.

"Communication between cells is at the very root of the organization and development of normal organs from cells," Dr. Loewenstein told *SCIENCE SERVICE*. "The lack of communication between cells probably forms part of the chain of events leading to cancerous cells."

Dr. Loewenstein and his co-workers checked on intercellular communication by passing a current of ions from inside a cell, then determining what fraction of the current leaks to an adjacent cell.

Normal cells on a glass surface can be seen to stop moving and growing when they touch each other, and they stop only then. This implies that some kind of a signal is transmitted between the cells.

Cancer cells, unlike normal ones, stop neither moving nor dividing on cellular contact, as can be seen very clearly when they are grown on glass surfaces.

Dr. Loewenstein and his group found that the resistance to passage of an electric current in cancer cells was 20 to 100 times greater than in normal cells.

• *Science News*, 89:229 April 2, 1966

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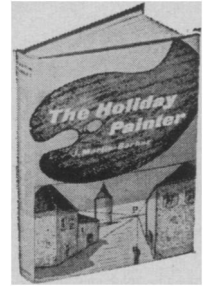
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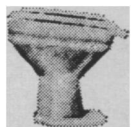
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