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Fermentation first at PRL Teamwork on the Prairies

For years, biologists have been examining the poppy plant and attempting to remove cells from the plant and culture them in fermenters for the production of opiates. The mix of substances that make up opium is, after all, of great medical and pharmaceutical importance. Morphine, one of opium's active ingredients, is medicine's drug of choice for killing pain, while codeine, another component of the opiate mix, is widely used as an analgesic (pain-killer) and antitussive agent (cough suppressant). Recently, workers at the National Research Council's Prairie Regional Laboratory in Saskatoon succeeded in obtaining cultures of poppy cells that yield one of these valuable compounds.

"The most important compound of the opiates, specifically the morphinane alkaloids, is codeine," says PRL's Dr. Wolf Kurz. "It has a much wider commercial application than the other, stronger analgesics in the alkaloid family."

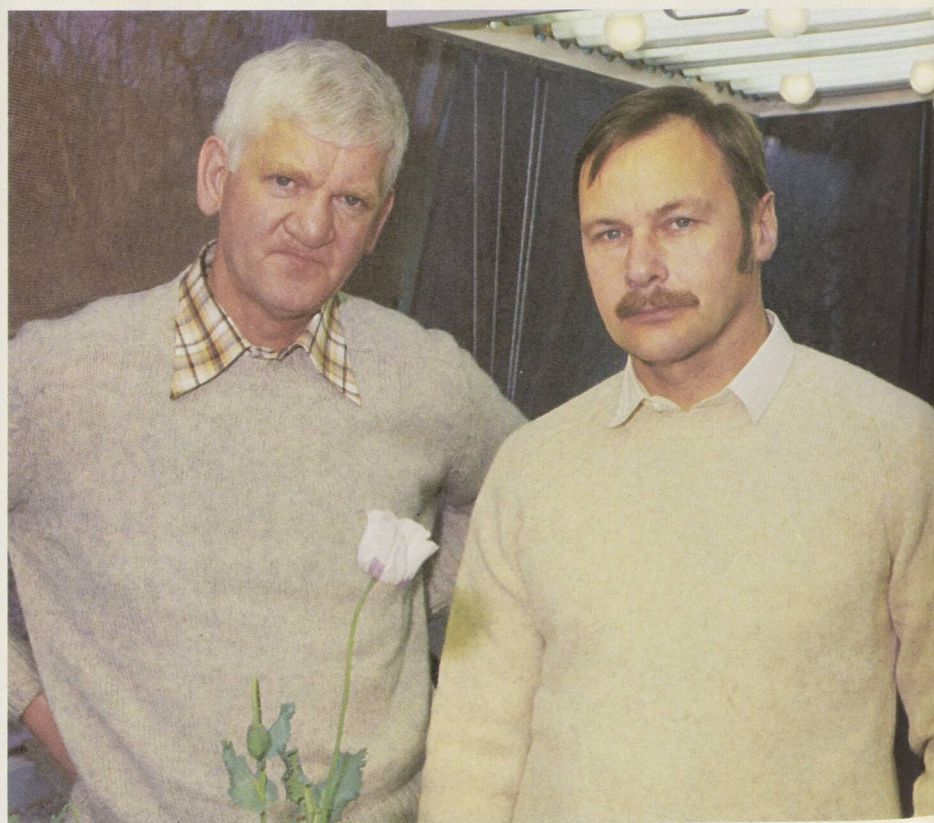
Kurz, who is adept at growing cells with his own specially-designed fermentation equipment, works with another PRL scientist, Dr. Fred Constabel, whose expertise lies in isolating the cell lines that act as Kurz's raw material. In fact, the codeine work is only one of several cell culture projects that bring the two scientists together.

Cell biologists, particularly those in Ger-

many, the U.S.A. and Japan, have tried for years to grow poppy cells containing commercial amounts of these analgesic alkaloids without avail. The advantages of such a breakthrough: it may remove Western medicine's reliance on imported plant materials and could tighten up the security system surrounding the transport and processing of these important pain-killing drugs. Kurz and Constabel, fortunate in selecting the right poppy variety, have come up with laboratory conditions that favor the growth of the so-called "giant" cells which resemble the latex vessels of the poppy that contain the milk from which opium is derived.

While other scientists have been aware of these giant cells, coaxing the plant to grow and produce opiate alkaloids in culture has been the big problem. Says Kurz: "It not only depends upon the plant cultivar (or variety) you use, but on the growth medium as well, in other words what nutrients and hormones you provide the cell with to grow." The PRL scientists recently published their findings in the scientific journal *Phytochemistry*, and patents on the process are now pending in a number of countries, Canada, the United States, Germany and Japan, to name a few. □

Wayne Campbell



Drs. Fred Constabel and Wolf Kurz. Teamwork is the key. (Photo: Prairie Regional Laboratory)

Les Drs Fred Constabel et Wolf Kurz. La collaboration est la clef de la réussite. (Photo: Laboratoire régional des Prairies)