

# Opium and marijuana research go underground

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The world's leading expert on the opium poppy has joined forces with researchers working on another infamous drug-producing plant – cannabis – in hopes of finding new uses for the much-maligned sources of heroin and marijuana.

Peter Facchini, professor of Biological Sciences and Canada Research Chair in Plant Biotechnology, has received a \$650,000 NSERC Strategic Project Grant to create new varieties of opium poppy and cannabis that can be used for medicinal and industrial purposes, but will have no value as illicit drugs. And his work is taking him where few Canadians have gone before: Deep underground into the country's ultra high-security medicinal marijuana growth facility.

“It's certainly unusual for a plant biochemist to work in a copper mine hundreds of metres underground,” Facchini said. “This is a really great project that involves two of the world's most important medicinal plants and is clearly unique in the plant biology field.”

Facchini and a new team of U of C postdoctoral researchers have teamed up with Saskatoon-based Prairie Plant Systems Inc., the National Research Council – Plant Biotechnology Institute, the Alberta Research Council and the University of Saskatchewan to create and study mutant varieties of opium poppy and cannabis in an unused portion of a copper and zinc mine near Flin Flon, Manitoba. Prairie Plant Systems produces medicinal marijuana under contract with Health Canada in this state-of-the-art facility.

Despite awareness of the importance of crop diversification for the long-term success of agriculture in Canada, few plants are cultivated for the production of high-value bioproducts. Opium poppy accumulates the alkaloids morphine, codeine and thebaine, and cannabis produces psychoactive cannabinoids and is used as a source of high-quality fiber and oil. The domestic market for codeine, morphine and oxycodone, which is derived from thebaine, is in excess of \$1.6 billion annually, all of which is currently imported. “Canada is well-positioned to support the development of new crops cultivated for the production of valuable bioproducts, such as pharmaceuticals and fibers,” says Facchini. The research will identify novel genes for use in the metabolic engineering of opium poppy to accumulate high-value pharmaceutical alkaloids and to block cannabinoid production in cannabis. The latter will allow for a safe, legal, made-in-Canada cannabis crop that will have virtually none of the mind-altering chemical of marijuana but can be grown for hemp fibre, oil and food.

“The overall theme of this work is to modify plants to make them more useful as crops and chemical factories,” Facchini said. “Alberta is quickly becoming a leader in this area, especially in the area of biofuels. The immense potential of plants as sources of high-value bioproducts for the agricultural and pharmaceutical sectors also needs attention.”

The Biosecure Underground Growth Chamber is in a mine owned by Hudson Bay Smelting & Mining Co. Ltd. Facchini says it is a superb venue for his research. “It’s not what you would picture an old mine shaft to be. It’s clean and well-lit, it’s kept at a constant temperature and it’s one of the most secure places in the country,” he says. “It gives a whole new meaning to ‘mining our data.’”

Source: University of Calgary

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