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City could be center of HIV fight

By Keith Lawrence, Messenger-Inquirer

Published: Tuesday, March 31, 2009 12:17 AM CDT

Within a decade, Owensboro could be the production center for a drug that could effectively eliminate the spread of HIV and AIDS worldwide -- if clinical trials are successful.

Kenneth Palmer, a researcher at the Owensboro Cancer Research Program, is the senior author of a study published Monday by the National Academy of Sciences about how the HIV inhibitor can be produced cheaply in plants.

Plans call for the drug -- if it eventually wins approval from the Food and Drug Administration -- to be grown in a form of tobacco plants patented by Kentucky BioProcessing in Owensboro and produced by KBP.

Palmer said Monday that the product, which uses the protein griffithsin, is believed to prevent the spread of HIV during sex.

The idea is to create a safe, cheap method of using the protein. Palmer said it could be in gel form, in strips that dissolve on contact (like some breath or cold products) or in a vaginal ring.

The drug could be effective in stopping the spread of HIV and AIDS during both heterosexual and homosexual sex, he said.

Palmer said the idea is to keep the price of each dose of the product at roughly the same price as a condom. He predicted that sales could eventually equal those of condoms.

Worldwide condom sales are estimated at between 6 billion and 9 billion a year.

To produce that much griffithsin in tobacco-type plants, Palmer said, would require "hundreds of acres of plants."

It takes 9,300 plants to produce 100,000 doses. So it would take 465 million plants to produce 5 billion doses.

But Palmer said the Nicotiana benthamiana plants, which look like tobacco, don't have the same growing cycle as tobacco.

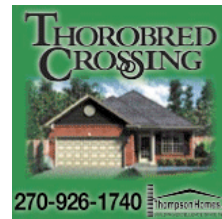
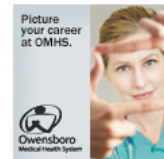
The plants are grown for 22 days, then the gene used to create the drug is inserted into the plant, which is allowed to grow another 12 days before being harvested.

That means the same fields could produce many crops in one growing season, Palmer said.

News about the potential HIV preventive product was released last week and embargoed until Monday.

Palmer said he has already heard from the Discovery Channel and news outlets in Brazil seeking information about the

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product.

Producing the protein in plants is the only way it can be made cheaply enough to be effective for people in developing countries, he said.

In Africa, more women are infected with HIV than men, Palmer said.

"We need a female-controlled inhibitor," he said. "This puts the power to prevent infection in the hands of women."

In 2006, the U.S. reported 56,300 new cases of HIV -- 53 percent of them among men.

But Palmer said griffithsin could be used to prevent infections among men as well.

"This is a very big advance and can help stem the epidemic in developing countries," he said.

Preclinical tests have shown that the product is safe and noninflammatory, Palmer said.

It was tested against strains of HIV found in the United States, East Africa, West Africa, South Africa and India and prevented the spread of all five strains, he said.

Palmer said the cancer research program at Owensboro Medical Health System has been working on the product since 2006 because contracting HIV increases the risk for cancer.

He said he read a report by the scientists who discovered griffithsin, led by Dr. Barry O'Keefe at the National Cancer Institute. They discovered it in an algae that grows off the coast of New Zealand.

Palmer said he began trying to see if the protein could also grow inside Nicotiana.

Before the product can move into clinical trials, he said, the cancer program will have to determine how it will be applied.

It's currently in gel form, "but women prefer not to use gel-based products because they are messy," Palmer said.

A vaginal ring would be the preferable method for women, he said.

"I think it's very feasible and not too far away," Palmer said of the product. "We are very hopeful."

Hugh Haydon, chairman of Kentucky BioProcessing, said the company will have to go through the regulatory process to gain approval to grow the plants with the drug in fields rather than greenhouses.

Palmer said more funding will be needed before the clinical trials can begin.

If all goes well, he said, all three phases of clinical trials could be completed in five to six years.

The local cancer research program is also working on a vaccine to prevent HIV. But Palmer said: "People have been working on an HIV vaccine for 30 years and we're farther behind now than we were five years ago. This seems to offer the most hope now."

The study published Monday was a close collaboration between Palmer, KBP, Owensboro-based Intrucept Biomedicine LLC and scientists at Duke University and the University of London, England.

Barry Bratcher and Steven Hume of KBP were also authors of the study.

Haydon said if the drug is successful, KBP may someday need facilities in other countries, particularly Africa.

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