

Cancer's rapacious need for iron

Source: <http://sci.tech-archive.net/Archive/sci.med/2004-11/0288.html>

From: doe (*ironjustice_at_aol.com*doe)

Date: 11/03/04

Date: 03 Nov 2004 15:00:41 GMT

Oct. 14, 2004 | Science and Tech

UW licenses potential cancer treatment derived from ancient Chinese folk remedy

FROM: Rob Harrill rharrill@u.washington.edu 206-543-2580

A group of promising cancer-fighting compounds derived from a substance used in ancient Chinese medicine will be developed for potential use in humans, the University of Washington announced today.

The UW TechTransfer Office has signed a licensing agreement with Chongqing Holley Holdings, a Chinese company, and Holley Pharmaceuticals, its U.S. subsidiary.

The compounds, all developed through the research of UW scientists Henry Lai and Narendra Singh of the Department of Bioengineering and Tomikazu Sasaki of the Department of Chemistry, make use of a substance known as artemisinin, found in the wormwood plant and used throughout Asia since ancient times to treat malaria.

Although the compounds are promising, potential medical applications are still years away, officials say.

"We are very excited about the UW's discovery and an opportunity to develop an artemisinin-based cancer drug," Kevin Mak, chief scientist at Holley, said.

"The technology is very promising, but it's in its early stages. Further research and clinical trials are needed."

The company, located in Chongqing, China, has been in the artemisinin business for more than 30 years, and is a world leader in farming, extracting and manufacturing artemisinin, its derivatives and artemisinin-based anti-malaria drugs, officials say.

Lai said he became interested in artemisinin about 10 years ago. The chemical helps control malaria because it reacts with the high iron concentrations found in the single-cell malaria parasite. When artemisinin comes into contact with iron, a chemical reaction ensues, spawning charged atoms that chemists call "free radicals." The free radicals attack the cell membrane and other molecules, breaking it apart and killing the parasite.

sci.med: Cancer's rapacious need for iron

Lai said he began to wonder if the process might work with cancer, too.

"Cancer cells need a lot of iron to replicate DNA when they divide," Lai explained. "As a result, cancer cells have much higher iron concentrations than normal cells. When we began to understand how artemisinin worked, I started wondering if we could use that knowledge to target cancer cells."

Perhaps the most promising of the methods licensed involves the use of transferrin, to which the researchers bind artemisinin at the molecular level. Transferrin is an iron-carrying protein found in blood, and is transported into cells via transferrin receptors on a cell's surface.

Iron-hungry cancer cells typically have significantly more transferrin receptors on their surface than normal cells, which allows them to take in more of the iron-carrying protein. That, according to Lai, is what seems to make the compound so effective.

"We call it a Trojan horse because a cancer cell recognizes transferrin as a natural, harmless protein and picks up the tagged compound without knowing that a bomb -- artemisinin -- is hidden inside."

Once inside the cancer cell, the iron is released and reacts with the artemisinin. That makes the compound both highly toxic and, because of cancer's rapacious need for iron, highly selective. Surrounding, healthy cells are essentially undamaged.

"Our research in the lab indicated that the artemisinin-tagged transferrin was 34,000 times more effective in selecting and killing the cancer cells than normal cells," Lai said. "Artemisinin alone is 100 times more effective, so we've greatly enhanced the selectivity."

###

For more information, contact Lai at (206) 543-1071 or hlai@u.washington.edu.
The Holley contact is Michael Liu, (714) 606-8415 or michael@holleypharma.com.

Who loves ya.

Tom

Jesus Was A Vegetarian! <http://jesuswasavegetarian.7h.com>

Man Is A Herbivore! <http://pages.ivillage.com/ironjustice/manisaherbivore>

DEAD PEOPLE WALKING <http://pages.ivillage.com/ironjustice/deadpeoplewalking>