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Medicine Nobel Recognizes Fights against Malaria and River Blindness

A Chinese herbal remedy and a drug made from soil bacteria lead three researchers to a share in the 2015 Nobel Prize in Physiology or Medicine.

By Christine Gorman | October 5, 2015 | Véalo en español |

The ancient roots of Chinese medicine briefly took center stage when half a share in the 2015 Nobel Prize for Physiology or Medicine was given to Youyou Tu, who consulted traditional texts on herbs to help isolate and purify the malaria drug artemisinin. The medication saves some 100,000 lives each year in Africa as well as restoring the health of countless others around the world. The other half of the Nobel prize was awarded to William C. Campbell and Satoshi Omura for their discovery of Avermectin, whose many derivatives were first used as veterinary treatments before being developed into a drug that has stopped the spread of river blindness in many parts of western Africa.

While a female Anopheles mosquito takes in her blood meal, malaria parasites from her saliva can infect a person.

Credit: CDC/James Gathany

Working in the 1960s at what was then known as the China Academy of Traditional Chinese Medicine, Tu consulted many traditional doctors from southern China and read through 2000 recipes of herbal remedies for fever before narrowing her search to 380 extracts from 200 herbs. Only one of these worked against the malaria parasite—an extract derived from a plant known as Qinghao in Chinese, *Artemisia annua* in Latin or sweet wormwood in colloquial English.

"Using the Qinghao to treat malaria was in fact recorded in the *Manual of Clinical Practice and Emegency Remedies* by Ge Hong of the East Jin Dynasty in 340 C.E.," Tu said in a video interview in 2011 after she won the Lasker-DeBakey Clinical Medical Research Award (often called the American Nobels). But Tu's research proved that the active ingredient she had isolated would work against malarial parasites that had become resistant to chloroquine, which was then the first-line treatment against the disease.

Satoshi Omura is a Japanese microbiologist and "expert in isolating natural products," according to the Nobel committee. He isolated 50 new strains of the *Streptomyces* microbe found in the soil (the same bug that gave us the streptomycin antibiotic) that showed potential for creating new drugs.

The next chapter of the story takes place in the U.S. Working at Merck, William C. Campbell acquired Omura's strains and isolated avermectin, which worked especially well against a group of parasitic worms, known as helminths, in animals. The company then developed one of avermectin's chemical derivatives into a veterinary drug called ivermectin for deworming dogs, cattle and other

animals. In 1978, Campbell suggested using ivermectin to try to control river blindness in western Africa. The cause was taken up by both the company and former President Jimmy Carter and their efforts have since greatly reduced the spread of this scourge. The once common site of seeing a young child leading a group of four or five blind older relatives single file through eastern Nigeria and neighboring regions has now almost disappeared. Ivermectin kills the larvae of the worm that causes river blindness. The parasite is spread through the bite of flies that live close to fast-flowing water, hence the name river blindness.

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