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Micrograph of *Leishmania major* promastigotes, a cause of leishmaniasis

LEASHING LEISHMANIASIS

KISHOR WASAN'S PROMISING ORAL FORMULATION OF AN INTRAVENOUS DRUG IS OFFERING THE PROSPECT OF EFFECTIVE TREATMENT FOR TWO UNRELATED INFECTIONS

Dr. Kishor M. Wasan's work as a pharmaceutical sciences researcher is part science, part humanitarianism. But even he could never have imagined that a challenge issued to him several years ago by a group of Vancouver doctors might impact millions of people in India and around the world. At the time, a rapid rise in the number of blood-borne fungal infections was sweeping the community of needle users in Vancouver's Downtown Eastside, and community doctors faced a critical hurdle.

"These fungal infections are highly treatable with a drug called Amphotericin B, but treatment is intravenous, which requires a hospital visit," says Wasan, a Professor and Distinguished University Scholar in UBC Vancouver's Faculty of Pharmaceutical Sciences. "The problem was, the doctors couldn't get people to come in off the streets to receive treatment. So they asked me to develop an oral formulation of Amphotericin B that they could take to the people."

Having worked with Amphotericin B (Amp B) for a number of years, Wasan and his wife and fellow formulation expert, Dr. Ellen Wasan, an Adjunct Professor in the Faculty of Pharmaceutical Sciences, devised a liquid formulation that showed promising lab results with minimal side effects. The significance of their break-through multiplied when the Wasans realized their treatment had more than one application.

"It turns out that Amp B is not only effective in treating blood-borne fungal infections, which are a problem in our part of the world, but also in treating visceral leishmaniasis, a big problem in the developing world," Wasan says. "It's quite rare in pharmaceuticals for a treatment to be effective against two separate conditions, but the mechanism of action is similar in each."

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A deadly parasitic infection transmitted by sandfly bites, visceral leishmaniasis claims over 60,000 lives annually, mainly in India, Nepal, Bangladesh, Sudan and Brazil. In the Indian subcontinent alone, more than 500,000 people host the parasite. Worldwide, visceral leishmaniasis affects more than 200 million people in 62 countries and, if left untreated, is fatal within two years. The key barrier to treatment – echoing Vancouver's outbreak of blood-borne fungal infections – is that most of the afflicted live far from hospitals where intravenous Amp B is readily available.

Global access principles

The discovery that Oral Amp B might be effective in the field against two distinct conditions was equivalent to striking pharmaceutical gold. A traditional next step might have been to form a lucrative spin-off company, but the unexpected intervention of former graduate student Rebecca Goulding helped to focus Wasan's vision for Oral Amp B. Goulding is an active voice in the UBC chapter of the Universities Allied for Essential Medicines (UAEM), a student-led group with more than 25 chapters across North America that advocates improving global access to public health goods developed on university campuses.

"She blew me away, made me feel guilty for even considering forming a spin-off company," Wasan says. "She said, 'you should think about doing this for the developing world.'"

In late 2007, UBC's University-Industry Liaison Office (UILO) – which oversees industry-sponsored research and the commercialization of UBC discoveries – launched the University's new Global Access Principles, developed in collaboration with the UBC-UAEM chapter. This strategy for enhancing the equitable licensing of UBC's intellectual property was a first among Canadian universities, and Wasan quickly engaged the UILO to negotiate the first licensing agreement under the new Global Access Principles with a local pharmaceutical company, iCo Therapeutics Inc.

In return for the exclusive worldwide right to develop and sell Oral Amp B as a treatment for blood-borne fungal infections in the developed world, iCo Therapeutics has agreed to ensure a suitable formulation is available and accessible to developing nations, at subsidized prices, to treat leishmaniasis. Wasan and iCo Therapeutics are currently pursuing funding from a number of philanthropic organizations including the Bill and Melinda Gates Foundation to proceed with clinical testing of Oral Amp B against both blood-borne fungal infections and visceral leishmaniasis.

"It's a long way from our laboratory 'home brew' to getting someone in India to actually administer it," Wasan says, "and the biggest challenge will be creating a formulation that is resistant to heat and long-term storage. But we're not starting with a brand new drug; other formulations of Amp B have been effective for years. I'm optimistic that our development timeline can be accelerated."

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