

Promising new antibiotic targets potentially deadly gut infections

April 12 2013

(Medical Xpress)—Researchers at the University of Virginia School of Medicine have developed a promising new antibiotic to treat potentially deadly gastrointestinal infections without harming the beneficial probiotic bacteria that help prevent relapse.

The investigational drug, Amixicile, can take down even hyper-[virulent strains](#) of drug-resistant *Clostridium difficile* – commonly called "C. diff" – which kills 14,000 Americans each year. It also shows efficacy against *Cryptosporidium* (protozoans that cause diarrhea) and [Helicobacter pylori](#) in mouse models of infection and potentially against many other human pathogens, including *Campylobacter jejuni*.

"You have an enzyme found in all these bad-guy bacteria, and our drug gets all of them," U.Va. researcher Paul Hoffman said. "It's remarkable to have one drug that has this kind of spectrum."

Because of Amixicile's expansive reach, Hoffman called it a "superdrug." It is so widely effective, he explained, because it targets enzymes shared by the [harmful bacteria](#).

"Most of the bad pathogens have this enzyme, and the good guys don't," Hoffman said. "The [catalytic mechanism](#) is absolutely the same in every one of these [harmful] organisms, so the way the drug works is the same for all these organisms, even though their enzymes are slightly different."

Recently completed preclinical studies show Amixicile has excellent safety and bioavailability indicators and is a good candidate for clinical trials, Hoffman said.

Amixicile could prove to be an important weapon against *Clostridium difficile*, an infection that often follows [antibiotic usage](#) and strikes more than 400,000 people in the United States each year.

Amixicile offers significant advantage over existing treatments in its ability to spare the [beneficial bacteria](#) that help prevent a recurrence of the infection. In addition, high doses of Amixicile caused no adverse effects in mice, the U.Va. researchers reported.

"It's a very, very low toxicity drug," Hoffman said. "Best of all, we have not seen any indication of drug resistance, perhaps due to its novel mechanism of action.

"It has about every metric you could want in an antibiotic."

Hoffman and his fellow U.Va. researchers – including the School of Medicine's Dr. Richard L. Guerrant, Dr. Cirle Warren and Timothy L. Macdonald, who also holds a post in the College of Arts & Sciences' chemistry department – continue to work with the National Institutes of Health, the sponsor of the preclinical studies. The next step is to test the safety and effectiveness of Amixicile in humans, to see if it is as effective and well-tolerated as it has been in mice.

Hoffman and his colleagues are working closely with the U.Va. Licensing & Ventures Group to identify industry partners to assist in bringing the drug to market, so it may ultimately benefit patients.

Provided by University of Virginia

Citation: Promising new antibiotic targets potentially deadly gut infections (2013, April 12)
retrieved 23 April 2024 from
<https://medicalxpress.com/news/2013-04-antibiotic-potentially-deadly-gut-infections.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.