

# Triple-whammy drug kills parasites that make 20 million sick

Taking out several parasites at once may be key to treating diseases

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By Emily Benson

There's a new hope for treating three parasitic diseases that together affect 20 million people and cause more than 50,000 deaths worldwide a year.

Chagas disease, leishmaniasis and sleeping sickness are all caused by parasites spread by insect bites, mostly in Asia, Africa and Latin America. "There are treatments for these diseases," says Frantisek Supek at the Genomics Institute of the Novartis Research Foundation in San Diego, California. "But all of them have limitations."

Some of these drugs are too expensive, some can only be given to people if they are in hospital, and some have side-effects so toxic that up to a fifth of people stop taking them before therapy is complete.

Now Supek and his team have discovered a new drug that could solve these problems. Analysing 3 million different compounds, they identified a chemical that targets all three of the parasites that separately cause these diseases. They then tweaked it to make it even more powerful, and at the same time less toxic to human cells.

## Higher doses

The new compound blocks an essential enzyme in the parasites, causing unneeded proteins to build up inside them until they die.

Although people also have a form of this enzyme, our version is structurally different, meaning that the drug affects only the type in parasites. “The key for this compound is it’s highly selective, just for parasites,” says Supek.

The drug proved at least as effective as existing medication in tests on mice, but its promise lies in the fact that it may be less toxic than other drugs. This means it could be possible to administer higher doses and people might be less likely to stop taking it.

“I think it’s a great advance,” says Abhay Satoskar at the Ohio State University in Columbus. “It looks very promising.”

Because people often have more than one infection, a drug that combats multiple parasites would be very useful, says Satoskar. There are, however, still a few hurdles to cross before the compound can be put to use – such as evaluating its ability to clear parasites from multiple internal organs, and moving from tests in mice to tests in humans.

“We hope this is going to work to the same degree, but you never know,” says Satoskar.

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