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<http://www.mnn.com/health/fitness-well-being/stories/miracle-drug-discovered-that-cures-any-viral-infection>

Miracle drug discovered that cures any viral infection

The drug — a single, broad-spectrum cure for virtually any viral infection — could be the greatest medical discovery since antibiotics.

By [Bryan Nelson](#) Thu, Aug 11 2011 at 1:22 AM EST

Imagine a world without viral infections of any kind. The common cold, influenza, dengue fever, even ebola — all of them, wiped out forever. Even more unfathomable, imagine that the cures for each of them was a single drug.

In what might be the greatest medical discovery since antibiotics, scientists working at MIT's Lincoln Laboratory have designed exactly that: a broad-spectrum miracle drug that could one day make viral infections a thing of the past, [reports MedicalXPress.com](#) about a paper published in PLoSOne.

Most of the world's infectious diseases are caused by either bacteria or viruses. The discovery and initial development of antibiotics in the early part of the 20th century offered a solution to most bacterial infections, but diseases caused by viruses have largely continued to threaten lives and human health around the world. While there are a handful of vaccines and antiviral drugs that combat specific viruses, a broad-spectrum drug that is capable of curing a wide variety of viruses has, until now, remained elusive.

"If you detect a pathogenic bacterium in the environment, there is probably an antibiotic that could be used to treat someone exposed to that, but I realized there are very few treatments out there for viruses," said Todd Rider, one of the scientists credited with discovering the new drug.

The MIT team's drug, called DRACO (Double-stranded RNA Activated Caspase Oligomerizers) for short, is most notable for its ability to cure just about any type of virus. So far researchers have tested DRACO against 15 viruses — including rhinoviruses at the root of the common cold, H1N1, a stomach virus, a polio virus, and dengue fever — and found it was equally effective against all of them.

"In theory, it should work against all viruses," said Rider.

The drug works by utilizing a protein that targets a type of double-stranded RNA produced only in cells that have been infected by viruses. This protein is then combined with another protein that induces cells to undergo apoptosis (or programmed cell suicide). Because the RNA signatures of cells infected with viruses are so unique, DRACO kills only infected cells, leaving healthy cells unharmed.

The way that DRACO works is also remarkable in its ability to ward off drug resistance.

"Viruses are pretty good at developing resistance to things we try against them, but in this case, it's hard to think of a simple pathway to drug resistance," said Karla Kirkegaard, professor of microbiology and immunology at Stanford University.

In other words, DRACO avoids one of the pitfalls of most antibiotics, which can become less effective over time due to the evolution of drug-resistant superbacteria.

So far the only live animals to be tested with DRACO have been mice, but the results of those trials were extremely encouraging. Mice infected with the H1N1 influenza virus were cured by the drug without any toxic side effects. Rider says he hopes to license the technology for trials in larger animals soon, with the end goal being human clinical trials.