

Why measles spreads so quickly

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Mayo Clinic researchers have discovered why measles, perhaps the most contagious viral disease in the world, spreads so quickly. The virus emerges in the trachea of its host, provoking a cough that fills the air with particles ready to infect the next host. The findings may also help in the fight against ovarian, breast and lung cancers.

The findings, published online Nov. 2 in the journal [Nature](#), give researchers insight into why some respiratory viruses spread more quickly and easily than others: They found the measles virus uses a protein (called nectin-4) in the host to infect and then leave from the strategic location of the throat.

Despite the development of a [measles vaccine](#), the virus continues to affect more than 10 million children each year and kills about 120,000 worldwide. In recent years, the spread of the virus has increased due to lack of people being vaccinated, and measles is still a significant public health problem in the United States.

But why is the measles virus so much more contagious than other [respiratory viruses](#)?

"The measles virus has developed a strategy of diabolic elegance," says Roberto Cattaneo, Ph.D., principal investigator of the study and Mayo Clinic [molecular biologist](#). "It first hijacks [immune cells](#) patrolling the lungs to get into the host. It then travels within other immune cells everywhere in the body.

"However, the infected immune cells deliver their cargo specifically to those cells that express the protein nectin-4, the new receptor. Remarkably, those cells are located in the trachea. Thus, the virus emerges from the host exactly where needed to facilitate contagion."

The researchers were also excited about another aspect of these findings.

Nectin-4 is a [biomarker](#) of several [types of cancer](#) such as ovarian, breast and lung. Clinical trials are under way that use measles and other viruses to attack cancer — including current ovarian, glioma and myeloma clinical trials at Mayo Clinic.

Because measles actively targets nectin-4, measles-based cancer therapy may be more successful in patients whose cancer express nectin-4. Many researchers believe that modified viruses could be a less toxic alternative to chemotherapy and radiation.

Provided by Mayo Clinic

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