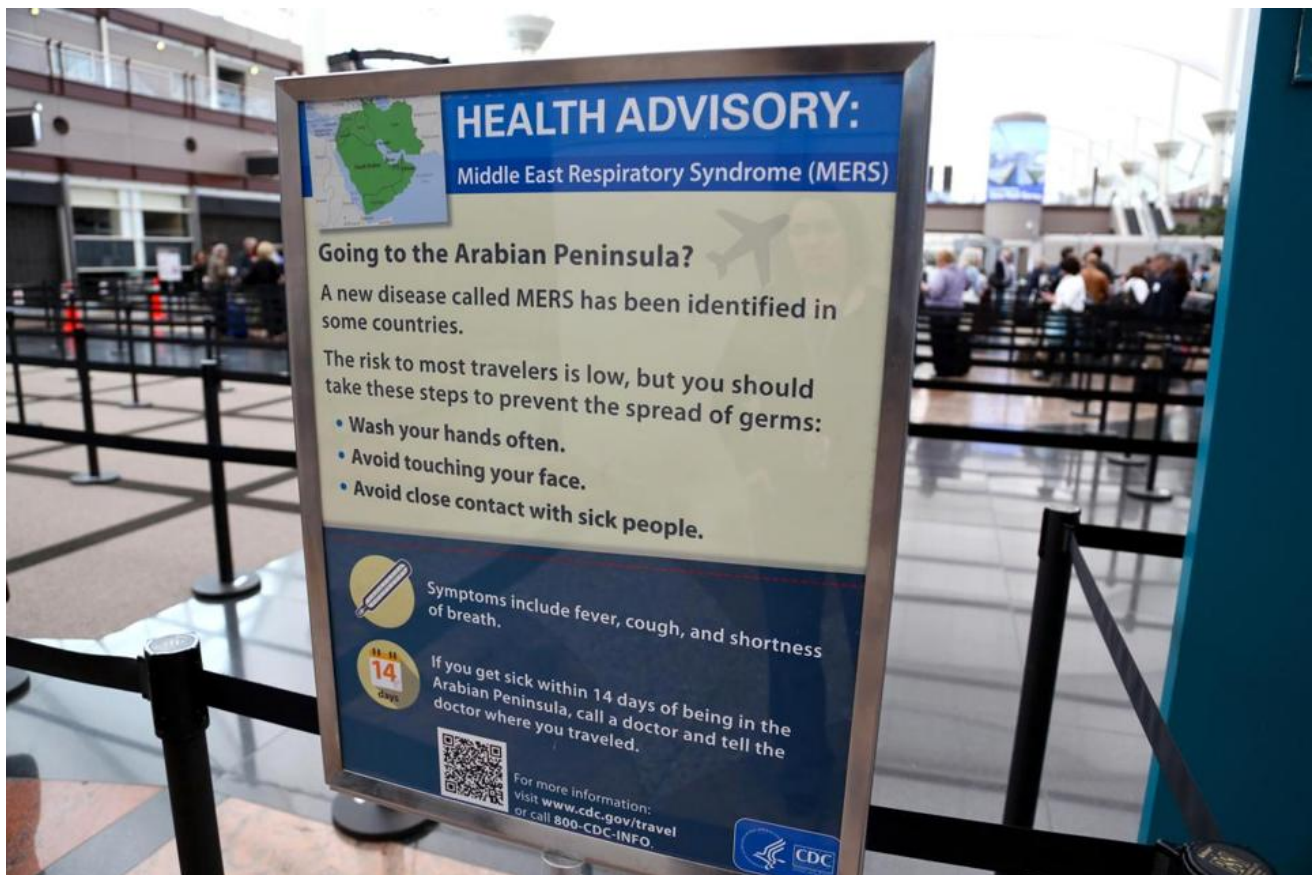


The Boston Globe

Science

Dana-Farber researcher blocks MERS virus in experiment

By Carolyn Y. Johnson | GLOBE STAFF MAY 20, 2014



AP PHOTO/DENVER INTERNATIONAL AIRPORT

Newly erected signs warning travelers about the danger of the MERS virus, at Denver International Airport.

The severe respiratory virus called MERS only recently arrived on American shores, carried here by two travelers from the Middle East. But for two years, researchers at Dana-Farber Cancer Institute have been studying the virus, and they recently

discovered a way to combat the deadly pathogen by blocking its ability to enter and infect cells.

Dr. Wayne Marasco, a professor of medicine at Harvard Medical School and Dana-Farber who led the research, will travel to Qatar this weekend to present to an array of government and public health officials his new leads — including the identification of a molecule that can neutralize a key fragment of the virus. So far, his work has only been done in laboratory dishes, but he plans to begin testing in animals.

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“We are imminently going to start those studies now,” Marasco said. It is possible that the approach could potentially lead to a preventive vaccine or as an emergency therapy for MERS, which kills 40 percent of the people infected. Marasco said that under the sped-up timelines and urgency that often accompany drug development for emerging infectious diseases, it is possible for a therapy to move into human trials within 15 months.

Marasco’s ability to quickly identify ways to combat deadly infectious diseases stems from work that he began 15 years ago, when he collected blood samples from 57 healthy people and isolated naturally-occurring antibodies in their blood. Antibodies are part of the body’s immune system defenses against infections; they latch on to viruses and bacteria. After he had collected details of the genetic makeup of those antibodies, Marasco essentially put that information into a blender to create a wider array of options. By swapping parts of one antibody for another, he cobbled together an exhaustive library: 27 billion antibodies in total.

In 2003, Marasco screened the SARS virus against all the antibodies in his laboratory and found one that appeared to block it. That work moved ahead rapidly and even got federal approval to move into a clinical trial, but in the intervening time the outbreak was quelled.

Those materials, he said, are being safely stored at the National Institutes of Health, however, in case SARS should re-emerge.

Now, Marasco has identified seven antibodies that block and neutralize a certain protein that is normally found on the surface of the MERS virus, and which helps it attach to cells and infect them. He reported those results last month in the journal [Proceedings of the National Academy of Sciences](#).

Marasco said that the work he has done on MERS has so far suggested that the virus may be well-suited for an antibody-based treatment. That's because the mechanism that the virus uses to evade the attack also happens to weaken it -- making it harder for the virus to multiply.

This all puts Marasco in the unusual position of fielding calls from various government agencies. He said there is interest in his work, which was funded by the National Institutes of Health, both from foreign governments and companies and at home.

Marasco said that he believes MERS, which is thought to be transmitted by camels, may be here to stay. But when asked how worried people should be, he said that while caution and awareness are justified, this isn't a time for panic. Fortunately, the virus appears to spread mostly in close encounters between patients and their family members and health care workers.

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