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## News Release

### Mayo Clinic First to Show Virotherapy is Promising Against Multiple Myeloma

ROCHESTER, Minn. — April 14, 2014 — In a proof of principle clinical trial, Mayo Clinic researchers have demonstrated that virotherapy — destroying cancer with a virus that infects and kills cancer cells but spares normal tissues — can be effective against the deadly cancer multiple myeloma. The findings appear in the journal [Mayo Clinic Proceedings](#).

Two patients in the study received a single intravenous dose of an engineered measles virus (MV-NIS) that is selectively toxic to myeloma plasma cells. Both patients responded, showing reduction of both bone marrow cancer and myeloma protein. One patient, a 49-year-old woman, experienced complete remission of myeloma and has been clear of the disease for over six months.

“This is the first study to establish the feasibility of systemic oncolytic virotherapy for disseminated cancer,” says [Stephen Russell, M.D., Ph.D.](#), Mayo Clinic hematologist, first author of the paper and co-developer of the therapy. “These patients were not responsive to other therapies and had experienced several recurrences of their disease.”

Multiple myeloma is a cancer of plasma cells in the bone marrow, which also causes skeletal or soft tissue tumors. This cancer usually responds to immune system-stimulating drugs, but eventually overcomes them and is rarely cured.

In their article, the researchers explain they were reporting on these two patients because they were the first two studied at the highest possible dose, had limited previous exposure to measles, and therefore fewer antibodies to the virus, and essentially had no remaining treatment options.

Oncolytic virotherapy – using re-engineered viruses to fight cancer – has a history dating back to the 1950s. Thousands of cancer patients have been treated with oncolytic viruses from many different virus families (herpesviruses, poxviruses, common cold viruses, etc.). However, this study provides the first well-documented case of a patient with disseminated cancer having a complete remission at all disease sites after virus administration.

The second patient in the paper, whose cancer did not respond as well to the virus treatment, was equally remarkable because her imaging studies provided a clear proof that the intravenously administered virus specifically targeted the sites of tumor growth. This was done using high-tech imaging studies, which were possible only because the virus had been engineered with a 'snitch gene' — an easily identifiable marker — so researchers could accurately determine its location in the body.

More of the MV-NIS therapy is being manufactured for a larger, phase 2 clinical trial. The researchers also want to test the effectiveness of the virotherapy in combination with radioactive therapy (iodine-131) in a future study.

Other authors include Mark Federspiel, Ph.D., Kah-Whye Peng, Ph.D., M.Med., Caili Tong, David Dingli, M.D., Ph.D., William Morice, M.D., Ph.D., Val Lowe, M.D., Michael O'Connor, Ph.D., Robert Kyle, M.D., Nelson Leung, M.D., Francis Buadi, M.D., S. Vincent Rajkumar, M.D., Morie Gertz, M.D., Martha Lacy, M.D., and senior and corresponding author Angela Dispenzieri, M.D., all of Mayo Clinic.

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Drs. Russell, Federspiel and Peng and Mayo Clinic have a financial interest in the technology used in the study.

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