

# Virus shows promise as prostate cancer treatment

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A recombinant Newcastle disease virus kills all kinds of prostate cancer cells, including hormone resistant cells, but leaves normal cells unscathed, according to a paper published online ahead of print in the *Journal of Virology*. A treatment for prostate cancer based on this virus would avoid the adverse side effects typically associated with hormonal treatment for prostate cancer, as well as those associated with cancer chemotherapies generally, says corresponding author Subbiah Elankumaran of Virginia Polytechnic Institute, Blacksburg. The modified virus is now ready to be tested in preclinical animal models, and possibly in phase I human clinical trials.

Newcastle disease virus kills chickens, but does not harm humans. It is an oncolytic virus that hones in on tumors, and has shown promising results in a number of human clinical trials for various forms of cancer. However, successful treatments have required multiple injections of large quantities of virus, because in such trials the virus probably failed to reach solid tumors in sufficient quantities, and spread poorly within the tumors.

The researchers addressed this problem by modifying the virus's fusion protein. Fusion protein fuses the virus envelope to the cell membrane, enabling the virus to enter the host cell. These proteins are activated by being cleaved by any of a number of different cellular proteases. They modified the fusion protein in their construct such that it can be cleaved only by [prostate specific antigen](#) (which is a protease). That minimizes off-target losses, because these "retargeted" viruses interact only with

[prostate cancer cells](#), thus reducing the amount of virus needed for treatment.

Retargeted Newcastle disease virus has major potential advantages over other cancer therapies, says Elankumaran. First, its specificity for prostate cancer cells means it would not attack normal cells, thereby avoiding the various unpleasant side effects of conventional chemotherapies. In previous clinical trials, even with extremely large doses of naturally occurring strains, "only mild flu-like symptoms were seen in cancer patients," says Elankumaran. Second, it would provide a new treatment for hormone-refractory patients, without the side effects of testosterone suppression that result from hormonal treatments.

About one man in six will be diagnosed with prostate cancer, and one in 36 will die of this disease. Men whose prostate cancer becomes refractory to hormone treatment have a median survival of about 40 months if they have bone metastases, and 68 months if they do not have bone metastases.

**More information:** A copy of the manuscript can be found online at [bit.ly/asmtip0213b](http://bit.ly/asmtip0213b). Formal publication of the article is scheduled for the first April 2013 issue of *Journal of Virology*.

R. Shobana, S.K. Samal, and S. Elankumaran, 2013. Prostate-specific antigen-retargeted recombinant Newcastle disease virus for prostate cancer virotherapy. *J. Virol.* online ahead of print, 23 January 2013, [doi:10.1128/JVI.02394-12](https://doi.org/10.1128/JVI.02394-12)

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