Welsh scientists 'clone' human virus

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A team of Welsh scientists have successfully cloned a human virus offering new hope for the treatment of potentially life-threatening diseases.

Human cytomegalovirus (HCMV) is a major infectious cause of congenital malformations worldwide. The virus is also known to cause life-threatening disease in transplant patients and people with HIV/AIDS.

The development of new treatments has been hampered as scientists have been unable to stably replicate HCMV outside the human body.

Dr Richard Stanton from Cardiff University's School of Medicine who led the joint research, said: "HCMV has by far the largest genome of all viruses affecting humans - consequently it was technically difficult to clone in an intact form in the laboratory.

"Cloning a copy of the virus from a strain isolated by Cardiff Public Health Laboratories has enabled us to identify the genes causing the instability of the virus outside the body.

"Following the identification of these genes, we have successfully developed cells in which we can grow virus that corresponds to that which exists in the human body."

Cloning the virus for the first time will help virologists develop antivirals and vaccines against the virus that causes clinical disease.

Following the study, the clone has already been distributed to research laboratories worldwide, and is being tested by the World Health Organisation (WHO) as part of a study to develop an international diagnostic standard with which to compare clinical isolates.

The genome sequence of the Cardiff virus has also been designated the international reference for HCMV in the National Centre for Biotechnology Information (NCBI) - an international database that provides reference standards for biomedical and genomic information.

Dr Stanton added: "HCMV has been designated as a highest priority vaccine target by the US Institute of Medicine. When developing vaccines, anti-viral agents and improving understanding of disease, it is crucial to work with a virus that accurately represents the virus present in patients.

"For the first time our work has enabled us to create an exact copy of the virus outside of the body offering a vital step forward in the development of new treatments."

The study, published in the The *Journal of Clinical Investigation*and funded by the Wellcome Trust and the Medical Research Council, was a joint collaboration between Cardiff University's Infection, Immunity and Inflammation Interdisciplinary Research Group and Drs Davison and Dargan at the Centre for Virus Research at the University of Glasgow.

The virus, named Merlin, was isolated from a clinical sample identified by the Diagnostic Unit, Public Health Wales.

More information: Reconstruction of the complete human cytomegalovirus genome in a BAC reveals RL13 to be a potent inhibitor of replication - is available in the on-line edition of *The Journal of Clinical Investigation*: www.jci.org/articles/view/42955

Provided by Cardiff University