

Bacterial protein 'mops up' viruses found in contaminated water supplies

December 16 2011

Access to clean water is a necessity often taken for granted. However UNICEF estimates that 900 million people across the world do not have access to safe drinking water. New research published in BioMed Central's open access journal *BMC Biotechnology* shows that an enteric virus-binding protein (EVBP), isolated from bacteria found in activated sludge, is able to capture viruses often present in contaminated water.

One of the difficulties in measuring viral contamination in water is that viruses may be present at a very low concentration yet still make people ill. Even a single enteric virus can infect a human and cause gastroenteritis, and these viruses can survive for a long time in water.

Researchers from Tohoku University and Hokkaido University used activated sludge, produced during [sewage treatment](#) by aerating the sewage and allowing bacteria to breakdown organic material, as starting material in their search for a protein able to bind to enteric viruses. Using PCR the researchers isolated the [gene coding](#) for one of the subunits of GroEL from sludge DNA. GroEL is a 14 subunit 'chaperone' protein which ensures that proteins are folded correctly during their manufacture.

Using biochemical and enzymatic assays the subunit was found to be able to capture enteric viruses. GroEL is able to bind to hydrophobic amino acids on the surface of proteins and it is thought that the newly isolated EVBP similarly binds to hydrophobic areas on the surfaces of viruses and viral fragments.

Dr Daisuke Sano from Hokkaido University explained, "Unlike virus-specific and expensive antibodies, EVBP bound all the enteric viruses we tested (norovirus, [rotavirus](#) and poliovirus). Once developed this easy-to-use method could be used to detect low concentrations of viruses in the clinic or environment."

More information: Adsorption characteristics of an enteric virus-binding protein to norovirus, rotavirus and poliovirus, Takahiro Imai, Daisuke Sano, Takayuki Miura, Satoshi Okabe, Keishi Wada, Yoshifumi Masago and Tatsuo Omura, *BMC Biotechnology* (in press)

Provided by BioMed Central

Citation: Bacterial protein 'mops up' viruses found in contaminated water supplies (2011, December 16) retrieved 18 April 2024 from <https://phys.org/news/2011-12-bacterial-protein-mops-viruses-contaminated.html>

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