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**Ben-Gurion University of the Negev and University of Illinois at Urbana-Champaign Researchers Develop New Membranes that Remove Viruses from Drinking Water**

**SEDE BOQER, Israel…April 19, 2017** – Researchers from Ben-Gurion University of the Negev (BGU) and the University of Illinois at Urbana-Champaign (UIUC) have developed novel ultrafiltration membranes that significantly improve the virus-removal process from treated municipal wastewater used for drinking in water-scarce cities.

Current membrane filtration methods require intensive energy to adequately remove pathogenic viruses without using chemicals like chlorine, which can contaminate the water with disinfection byproducts. Researchers at UIUC and BGU collaborated on the new approach for virus pathogen removal, which was published in the current issue of [*Water Research*](http://www.sciencedirect.com/science/article/pii/S0043135417301963).

“This is an urgent matter of public safety,” the researchers say. “Insufficient removal of human Adenovirus in municipal wastewater, for example, has been detected as a contaminant in U.S. drinking water sources, including the Great Lakes and worldwide.”

The norovirus, which can cause nausea, vomiting and diarrhea, is the most common cause of viral gastroenteritis in humans, and is estimated to be the second leading cause of gastroenteritis-associated mortality. Human adenoviruses can cause a wide range of illnesses that include the common cold, sore throat (pharyngitis), bronchitis, pneumonia, diarrhea, pink eye (conjunctivitis), fever, bladder inflammation or infection (cystitis), inflammation of the stomach and intestines (gastroenteritis), and neurological disease.

In the study, Prof. Moshe Herzberg of the [Department of Desalination and Water Treatment](http://in.bgu.ac.il/en/bidr/ziwr/dwt/Pages/default.aspx) in the [Zuckerberg Institute for Water Research](http://in.bgu.ac.il/en/bidr/ziwr/Pages/default.aspx) at BGU and his group grafted a special hydrogel coating onto a commercial ultrafiltration membrane. The "zwitterionic polymer hydrogel" repels the viruses from approaching and passing through the membrane. It contains both positive and negative charges and improves efficiency by weakening virus accumulation on the modified filter surface. The result was a significantly higher rate of removal of waterborne viruses, including human norovirus and adenovirus.

“Utilizing a simple graft-polymerization of commercialized membranes to make virus removal more comprehensive is a promising development for controlling filtration of pathogens in potable water reuse," says Prof. Nguyen, Department of Chemical Engineering, UIUC.

Prof. Herzberg and his student, Maria Piatkovsky, worked on this groundbreaking research with Prof. Thanh H. Nguyen and her student, Ruiqing Lu, Department of Chemical Engineering, UIUC as well as Professor Dr. Mathias Ulbricht, chair of Technical Chemistry II, University Duisburg-Essen, Germany.

The project was supported by the U.S. Environmental Protection Agency (EPA grant RD83582201-0) and the German-Israeli Water Technology Cooperation Program, which is funded by the Ministry of Science & Technology of Israel and the Federal Ministry of Education and Research of Germany (BMBF-MOST, BMBF grant # 02WA1261B, MOST grant # GR-2394).

*Improvement of virus removal using ultrafiltration membranes modified with grafted zwitterionic polymer hydrogels, Lu, R., Zhang, C., Piatkovsky, M., Ulbricht, M., Herzberg, M., Nguyen, T.H.,*

Water Research *(2017), doi: 10.1016/j.watres.2017.03.023.*

**About BGU’s Zuckerberg Institute for Water Research**

The [Zuckerberg Institute for Water Research](http://in.bgu.ac.il/en/bidr/ziwr/Pages/default.aspx), Israel’s largest and leading water institute, conducts interdisciplinary, cutting-edge research and graduate education in water sciences, aimed at improving human well-being through technologies and policies for sustainable use of water resources. World-renowned Zuckerberg researchers are focused on desalination technologies and groundwater production, water quality and microbiology, as well as water resource economics and management. Zuckerberg graduate programs attract students from all corners of the world who are involved in research projects and collaborations in both developed and underdeveloped countries. Named for New York philanthropist Roy J. Zuckerberg, the Institute was founded in 2002 within the [Jacob Blaustein Institutes for Desert Research](http://in.bgu.ac.il/en/bidr/Pages/default.aspx) at the Sede Boqer Campus of Ben-Gurion University of the Negev. For more information, visit [www.aabgu.org/water](http://www.aabgu.org/water).

**About American Associates, Ben-Gurion University of the Negev**

[American Associates, Ben-Gurion University of the Negev (AABGU)](https://www.aabgu.org) plays a vital role in sustaining David Ben-Gurion's vision: creating a world-class institution of education and research in the Israeli desert, nurturing the Negev community and sharing the University's expertise locally and around the globe. As Ben-Gurion University of the Negev (BGU) looks ahead to turning 50 in 2020, AABGU *imagines* a future that goes beyond the walls of academia. It is a future where BGU *invents* a new world and *inspires* a vision for a stronger Israel and its next generation of leaders. Together with supporters, AABGU will help the University foster excellence in teaching, research and outreach to the communities of the Negev for the next 50 years and beyond. Visit [vision.aabgu.org](http://vision.aabgu.org/) to learn more.

AABGU, which is headquartered in Manhattan, has nine regional offices throughout the United States. For more information, visit [www.aabgu.org](http://www.aabgu.org).

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