অসম এছ'চিয়েচন অফ নর্থ আমেৰিকা

Assam Association of North America (AANA)

AANA REGIONAL SPOTLIGHT - March 2026

Assamese Researchers at North Dakota State University (NDSU) Find 'Egg-Cellent' Solution to Global Forever Chemical Crisis

Two brilliant Assamese research scholars at North Dakota State University (NDSU, Fargo) are making headlines for their work in nanotechnology, tackling an environmental crisis that spans from the United States to India. Shirsa Mazumdar, a Tezpur University alum from Dibrugarh, and Jimli Goswami, who studied at B. Borooah College in Guwahati, are pursuing their PhDs under the mentorship of fellow Assamese professor Dr. Achintya Bezbaruah. Their groundbreaking study, recently published in the prestigious journal *Cell Reports Physical Science*, reveals a surprisingly simple solution to a complex problem: using chicken egg whites to clean our water.

The focus of their research is a class of man-made compounds known as PFAS (per- and polyfluoroalkyl substances). These "forever chemicals" are found in everyday items ranging from non-stick cookware, shampoo, lipsticks, nail polish to firefighting foams. They are notorious for their carbon-fluorine bonds (among the strongest in organic chemistry) which prevent them from breaking down in nature. Instead, they accumulate in soil, water, and even the human bloodstream, posing serious long-term health risks.

While the United States is currently implementing regulations to clean up its drinking water, the crisis has taken on a troubling global dimension. As Western nations tighten regulations, many PFAS-producing industries are shifting their manufacturing bases to India to take advantage of different regulatory frameworks. This has led to detectable levels of these chemicals in the Ganges River and groundwater near major Indian industrial hubs. Because these chemicals are highly mobile, outsourced factories in India eventually can create major water, soil, and air pollution issues in India too.

Recognizing that the world cannot simply move its pollution from one backyard to another, the research group at NDSU has pioneered a 'benign-by-design' solution in collaboration with Iowa State University, the University of Central Florida, and the United States Environmental Protection Agency. Their research discovered that ovalbumin, the primary protein found in common chicken egg whites, can act as a natural, biodegradable magnet to capture PFAS. By understanding how the molecular structure of this protein binds to toxic chemicals, they have provided a blueprint for low-cost, eco-friendly water filters that do not rely on expensive or toxic synthetic materials.

The success of these student scholars is a testament to the academic foundations they built in Assam. Shirsa Mazumdar, who is nearing the completion of his PhD, is also applying his expertise as a synthetic chemist to develop new, low-impact fertilizers to help farmers grow food more sustainably. Jimli Goswami, who has a couple of years left in her doctoral program, is dedicating her research to creating fire-retardant materials that protect lives without the use of harmful chemicals.

For the Assamese community in the USA and back home, the work of Shirsa and Jimli is a profound source of pride. They represent a bridge between the academic excellence of institutions like Tezpur University and B. Borooah College and the cutting edge of global innovation.