

Discovering water's role within a protein

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A team of researchers from Case Western Reserve University has identified a way to probe water molecules deep inside proteins, exposing a communication network mobilized when proteins are turned "on."

The investigators, whose findings were published in [Proceedings of the National Academy of Sciences](#), explored the protein rhodopsin, which is found in the eye's [retina](#) and allows a person to see in dim light. Using a combination of X-ray radiolysis and mass spectrometry, the researchers looked at water molecules inside the proteins, which are suspected to play a key role in the protein's shape and function.

"Our technique revealed that water molecules are dynamic players in transporting information from deep inside a protein to its surface," explains the study's co-author Sayan Gupta, PhD, of the university's Center for [Proteomics](#) and bioinformatics. He explains that the water

molecules inside rhodopsin rearranged as scientists switched the protein on and off.

This finding is especially important, Gupta says, because [genetic mutations](#) in parts of a protein associated with water can cause diseases.

"The more we can learn about proteins and the biochemical events occurring within them, the closer we will be to influencing biological response and, ultimately, managing medical conditions," he says.

Provided by Case Western Reserve University

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