

# Fat serves as cells' built-in pH sensor: research

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A specific type of fat present in cell membranes also serves as a cellular pH sensor, a team of University of British Columbia researchers has discovered.

pH is a measure of acidity or basicity. Cells need to maintain pH in order to perform their normal [cellular functions](#). However, the mechanisms by which cells monitor pH were unknown.

"Scientists have known that specific proteins can detect changes in pH under certain circumstances," says Chris Loewen, an assistant professor in the Department of Cellular and Physiological Sciences in the UBC Faculty of Medicine and a member of the UBC Life Sciences Institute. "But we found that a specific phospholipid, or fat, called phosphatidic acid, which is present in all cells, is actually responsible for detecting pH."

The findings are published today in the journal *Science*.

"Using brewer's yeast as a model, we found that, when deprived of nutrients, the resulting decrease in cellular pH affected the chemical state of phosphatidic acid. This in turn altered [gene expression](#) and [cellular metabolism](#)," says Dr. Loewen, who is also a member of the Brain Research Centre at UBC and Vancouver Coastal Health Research Institute.

The new findings have important implications for understanding human

metabolism and disease because lipid structure and function are very similar amongst all organisms. Further work is needed to explore the implications of this discovery for other areas, such as tumour progression - because both phosphatidic acid and pH play important roles in this process - and brain research - because [brain cells](#) dynamically change their cellular pH, implying they, too, use a pH sensor.

Provided by University of British Columbia

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