

# Researchers discover 'gateway' in nucleus has a second important job no one noticed before

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UAlberta medical researchers and their American colleagues have discovered that the "gateway" known to control the movement of molecules in and out of a cell's nucleus appears to play another critically important role – one no one had noticed until now.

These "gateways" have a second key job in a cell – the ability to control the structure of chromosomes and the [DNA](#) linked to those chromosomes. This impacts what [genes](#) produce or express. The discovery gives scientists a new way to investigate the triggers for various kinds of disease, says Richard Wozniak, the principal investigator with the Faculty of Medicine & Dentistry, who worked on the discovery with collaborators from the Institute for Systems Biology (Seattle).

"This discovery may explain links between disease and defects in these gateways," he says.

"Our studies provide new insights into how the [nucleus](#) is organized and how the genetic material it houses is used, including important information about the jobs genes do. When cells have to adapt to their environment, they need to change their gene expressions pattern. If this isn't done right, diseases such as cancer or heart disease occur. Our work also provides insight into why many viral infections target this gateway for their survival."

The research team's [discovery](#) was recently published in the peer-

reviewed journal, *Cell*.

Wozniak and his team are continuing their research in this area. They want to learn more about this new mechanism when it functions properly, and what causes it to malfunction. Uncovering the key players in this new mechanism are also key, he says.

"We want to understand how these gateways are functioning at a molecular level – what makes them capable of altering the structure of chromosomes and making other key changes? That is our next step," says Wozniak, who is a researcher with the Department of Cell Biology.

Provided by University of Alberta Faculty of Medicine & Dentistry

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