

Safeguarding The Cell Nucleus — ScienceDaily

By Admin On Feb 1, 2022

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The nucleus is guarded by a highly secure door, the so-called nuclear pore, that controls the transport of substances from the cytoplasm to the cell nucleus and back.

The nuclear pore is responsible for regulating the transport of proteins from the cytoplasm into the cell nucleus and for ushering RNA out of it.

Professor Roderick Lim from the Biozentrum of the University of Basel aims to resolve this enigmatic selective transport system.

The number of shuttle proteins that occupy the pore depends on their concentrations within the cell. However, when one shuttle protein is reduced, another shuttle protein can take its place to reinforce the pore.

Interchangeable shuttle proteins safeguard the nuclear pore

"It turns out that the shuttle proteins, although they are from the same receptor family, differ in function in terms of the cargo they carry, localization and concentration," says Dr. Joanna Kalita, first author of the study.

When the researchers changed the concentration of one of the shuttle proteins, the number of the other two proteins that occupied the nuclear pore also changed.

Diseases caused by defective nuclear pores

Damage to this biological security system is detrimental to cells, and has been associated with cancer and neurodegenerative diseases.

Conversely, substances important for the cell nucleus are no longer imported. Clearly, deeper insights into nuclear pore function will be important for understanding the causes and consequences of defective nuclear transport with respect to disease," explains Lim.

Story Source:

Materials provided by University of Basel. Note: Content may be edited for style and length.

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