PROJECT FACT SHEET

A Better Understanding of How Cells Share Information

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Cells must join together in order to do a number of things including allowing humans to reproduce – and viruses to spread. In this process, it is initially the outer membranes of the cells that connect and allow for information to be transferred. Eventually, these membranes join and form a single shell around the content of both cells. Researchers study this process, called cellular membrane fusion, to understand what initiates and facilitates the sharing of information between cells that occurs during numerous biological activities such as muscle development, placenta and bone formation, fertilization, and wound repair.

Roy Duncan, a member of the Department of Microbiology and Immunology at Dalhousie University, is looking at the smallest known proteins that play a role in cellular membrane fusion: "FAST" proteins. These are the proteins responsible for transmitting some viruses between cells.

After studying these proteins, Dr. Duncan was able to develop an innovative model of cellular membrane fusion, based on several discoveries involving the parts of these proteins and their functions. "In the end," he says, "this study offers a more complete and comprehensive picture of how these proteins help cells share information."

The information provided by this study will help Canadian health researchers more fully understand cellular membrane fusion. This information could lead to better drug-delivery processes and more effective gene therapy techniques. Furthermore, understanding how cellular membrane fusion is initiated may lead to tools that practitioners can use to halt the spread of diseases in the body.

"This project reinforces the importance of basic medical science research. It drives innovation, improves health care, informs clinical practice and allows for researchers to recruit, train and retain highly qualified personnel," says Dr. Duncan.

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