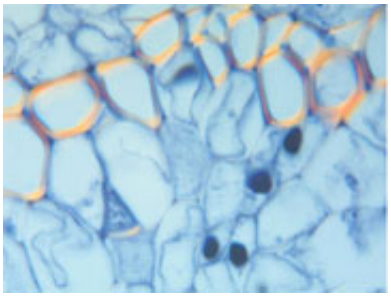
Breaking new boundaries

June 12 2008



A team led by scientists at the Universities of Bristol and Cambridge has developed an exciting new technique which may lead to a greater understanding of how drugs get in and out of the cells in our bodies. The method identifies the structures that guard the entrance and exits to cells.

Cells are surrounded by a membrane wall, which provides the ultimate in cellular security. Nothing can get into a cell without the approval of membrane proteins. These are complex molecular structures that form tightly regulated gates in the wall and as such are the targets for many drugs.

In most cases, we do not know what these membrane structures look like, nor which particular molecules make them up. One of the major difficulties is that the structures fall apart during attempts to study them.

Professor Paula Booth from the University of Bristol and Professor

Carol Robinson from Cambridge University, have cracked this problem and showed they can maintain the intact structure for a particularly powerful analytical method. This means they can pinpoint exactly which molecules are present, thus enabling the identification of the molecules that work together to control cells.

“This is a major advance that helps us understand how Nature constructs cellular life. The membrane wall of cells is a precision-made, complex and highly regulated structure. We are now much better equipped to understand this incredible feat of self-assembly.” says Paula Booth.

For Carol Robinson, Royal Society Research Professor and lead author, this is a major breakthrough; she pioneered the analytical method and successfully applied it to many cellular structures; but membrane protein complexes had proved tantalisingly difficult.

She added: “I look forward to exploiting this discovery to the full; not only in characterising the many membrane complexes for which controversy exists but also in discovering new assemblies and in investigating the potential of this approach in drug discovery.”

The research was published in *Science* journal.

Source: University of Bristol