

MRC scientists advance understanding of cell death

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Medical Research Council (MRC) scientists have made an important advance in understanding the biological processes involved when cells are prompted to die. The work may help scientists to eventually develop new treatments for the many common diseases and conditions which occur when cell death goes wrong.

The research, published in leading journal *Molecular Cell* today was carried out by a team of scientists, at the MRC Toxicology Unit at the University of Leicester and a subsequent patent application has been filed by MRC Technology, the commercial arm of the MRC.

Cells in the human body are continually dying and most of these cells kill themselves by a form of [cell death](#), commonly referred to as apoptosis. In a healthy body, the number of cells stays constant. Millions of new cells are produced every second, and millions of others are lost or kill themselves. Failure of the normal apoptosis process plays a role in different diseases including cancer, certain neurodegenerative disorders such as Parkinson's and immune diseases, such as autoimmune lymphoproliferative syndrome (ALPS).

One of the study's authors, Dr Marion MacFarlane, MRC Toxicology Unit, explained: "This new research takes us a step closer to understanding how the DISC triggers cells to die. The challenge now is to try and use this fundamental knowledge to help work towards finding better treatments for conditions which occur when DISC-mediated cell death goes wrong."

Previous research has shown that a complex called the 'DISC', which is made up of different proteins and is formed following activation of molecules called 'Death Receptors', can trigger apoptosis by 'switching on' key players in the cell death process. However, previous research has found that the DISC can also activate cell survival, thus raising the question as to how paradoxically the 'DISC' can trigger these opposing cellular outcomes?

Now, scientists at the MRC Toxicology Unit have found that the DISC can trigger cell death or cell survival by switching the activity of key death-promoting molecules. Stopping the 'DISC' from functioning properly prevents the cell death programme from being carried out efficiently and instead results in cell survival. Thus, in diseases such as ALPS, where a crucial death-promoting protein is often not active the DISC fails to function properly.

More information: "Reconstitution of the Death-Inducing Signalling Complex reveals a novel Substrate Switch that determines CD95-mediated Death or Survival" *Molecular Cell*.

Source: University of Leicester ([news](#) : [web](#))

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