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Scientists in Singapore develop innovative and flexible method to study immune cell capabilities

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This simple and efficient method can directly identify and sort immune cells involved in cell-mediated cytotoxicity



Assistant Professor Cheow Lih Feng from the National University of Singapore's (NUS) Institute for Health Innovation & Technology, together with his team members Dr Luah Yen Hoon and Dr Wu Tongjin, have devised a simple and innovative way to directly identify and sort the immune cells involved in cell-mediated cytotoxicity.

During cell-mediated cytotoxicity, some immune cells can destroy foreign cells through cell lysis by releasing proteins that trigger a cascade of cellular processes that destroy foreign cells. These immune cells that have exhibited cell-killing behaviour are referred to as killer cells. Once these foreign cells are killed or lysed, they will spill their intracellular contents to the surrounding area.

Building upon this concept, the NUS team have proposed a way to 'paint' the surface of the killer cells responsible for destroying these foreign cells. The researchers named this new method PAINTKiller (for 'proximity affinity intracellular transfer identification of killer cells').

The NUS researchers used an intracellular staining dye known as carboxyfluorescein succinimidyl ester (CFSE) to stain the foreign cells. This non-toxic dye can enter and be retained within cells. The team then modified the surface of immune cells so that they would have this receptor to capture the CFSE dye when it is released by the foreign cells during cell lysis, allowing them to identify the killer cells that are responsible.

The NUS team is working to expand the versatility of the PAINTkiller method by testing it on different killer and foreign cell combinations to reveal the biology behind the complexities of immune responses, and to develop it as an integral tool for research and clinical applications.