

CCLG: The Children & Young People's Cancer Association research: Studying immune cells to help develop new treatments for babies with leukaemia

Project title: Exploiting macrophage functions to find novel therapies for KMT2a:MLLT3 infant leukaemia

Project stage: Just started

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Led by: Dr Samanta Mariani, University of Edinburgh



About the project

Leukaemia in babies under a year old is rare but extremely aggressive. Sadly, only half of the babies who develop leukaemia before their first birthday can be successfully treated, as many treatments either aren't suitable or effective. Recent research studying leukaemia in adults has shown that a type of white blood cell called a macrophage, normally part of the body's immune defence system, can be 'reprogrammed' by the cancer cells. These 'reprogrammed' macrophages are called leukaemia-associated macrophages (LAMs). LAMs help the cancer cells to survive and resist treatment. The role of LAMs hasn't yet been studied in babies with leukaemia. Researchers believe that understanding the role of these LAMs in babies could be crucial in helping us develop new treatments that make chemotherapy more effective.

In this project, Dr Mariani and her team want to study LAMs in babies to understand how they interact with the leukaemia cells. They will look at different types of macrophages to identify which ones are helping the cancer cells to grow and survive. They will test whether changing how the LAMs behave can slow down or stop the growth of the cancer cells. To take this a step further, the team will build tiny 3D models of bone marrow (the environment where leukaemia begins) to see how changes in the behaviour of the LAMs affect how well cancer cells respond to chemotherapy. Their goal is to find new drugs that can target the LAMs or the signals they send, stopping them from helping cancer cells grow and survive.

If this research is successful, it could lead to new ways to treat leukaemia in babies. These new therapies won't replace existing treatments but could be used alongside them, helping to make treatments safer and more effective. This is especially important for babies where their cancer has not responded to treatment or their cancer has come back. If successful, this work could open the door to treating many types of leukaemia in babies and children.



The Children &
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