

Determining the best approach to treat children with relapsed anaplastic large cell lymphoma

Project title: Determining the underlying biology that leads to relapse of ALCL while being treated with ALK inhibitors, or rapidly after treatment cessation

Lead researcher: Professor Suzanne Turner, University of Cambridge

Project Stage: Starting soon (September 2024)

Funded by: Funded by CCLG and CCLG Special Named Funds including Elliott's Army, #TeamJayden, Lila's Pink Bunny Fund, Little Miss Niamhie B and Annika's Challenge.



ABOUT THE PROJECT

Most children with ALCL have too much of a protein called anaplastic lymphoma kinase (ALK) in their cancer cells. This protein helps cancer grow and spread. A new class of drugs, called tyrosine kinase inhibitors (TKIs), have been developed that can work against ALK. TKIs are gradually being introduced through clinical trials and on compassionate grounds. However, these drugs don't always work, and we don't know why or how to prevent resistance to them.

In this project, Professor Suzanne Turner at the University of Cambridge, clinician scientist Dr Lucy Hare, and collaborator Professor Amos Burke want to understand how to use these drugs to achieve long-term cures. Professor Turner's team has developed models of ALCL in the lab, including ones that can show how the relapsed ALCL behaves in a whole-body environment. The cancer cells come from real patients, and each is labelled before being added to the model. This allows the researchers to track every cell in the growing tumours and see how each reacts to treatment.

Any cancer cells that survive ALK TKI treatment will be extracted and analysed. Professor Turner and Dr Hare plan to look at how the cancer cells' genetic code changes after TKI treatment. They think that these changes could then affect the behaviour of the remaining cancer cells. This research will help show whether some cancer cells are naturally resistant to ALK TKIs or if they develop resistance after being exposed to the drug.

At the same time, the research team will analyse the 'tumour microenvironment' – the mix of healthy cells (like immune cells) and cancer cells found inside the ALCL tumour. They want to see whether the immune system responds to ALCL differently after TKIs, to see whether immunotherapy could work for these patients.

Together, this will help Professor Turner and Dr Hare understand why ALK TKIs sometimes don't work and help them identify weaknesses of resistant ALCL cells to target with new treatment approaches.

**Elliott's
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