New treatments for relapsed rhabdomyosarcoma

Project title: Novel Models and New Treatments for Relapsed Rhabdomyosarcoma Patients

Lead researcher: Professor Janet Shipley, The Institute of Cancer Research

Project Stage: Ongoing (started June 2022, planned end May 2025)

Funded by: CCLG and Angus' Door, The Jenni Clarke Fund, Ollie's Star, Team Jake, Pass the Smile for Ben, Jacob's Join, Hattie's Rainbow of Hope Appeal and Be More Ruby

ABOUT THE PROJECT

Of all the children diagnosed with rhabdomyosarcoma, a third will have their cancer spread or return after their initial treatment (otherwise known as a relapse). Unfortunately, these patients often have a low chance of survival and need more effective treatments for their relapsed rhabdomyosarcoma.

Scientists use disease models to assess whether new treatments work or to develop new treatments. For rhabdomyosarcoma, these models might be the same as the tumour genetically, physically or experimentally. This project aims to develop and test new models of rhabdomyosarcoma in order to find better treatments for relapsed patients. The research team at The Institute of Cancer Research, led by Professor Janet Shipley, will use tumour samples taken from relapsed patients in European countries enrolled onto the existing FaR-RMS international clinical trial for rhabdomyosarcoma. Cancer cells will then be grown flat in petri dishes, as well as in 3D and in zebrafish, as models of relapsed rhabdomyosarcoma.

These models will be used to screen and test available drugs, such as regorafenib, which is being introduced for relapsed patients into the FaR-RMS trial. The new drug will be used alongside traditional chemotherapy in the new models at the same time as they are being used to treat patients. This means that the models' reaction can be compared to patients' tumours' reactions so that the researchers can see which models are most like real tumours.

This study will try to identify potential treatments for further investigation in the models. Together with molecular characterisation of these models in a parallel project, this will provide better understanding of the biology of relapsed rhabdomyosarcoma that respond to particular drugs. From the models, tumour biomarkers can be found that show how a tumour is responding to treatment. Professor Janet Shipley hopes treatments can be identified for children with relapsed rhabdomyosarcoma that could also be introduced into the FaR-RMS trial.

CCLG RESEARCH PROJECT UPDATE

PROGRESS

The researchers have established several models that show how relapsed rhabdomyosarcoma behaves. These have been created using an innovative new method that will be shared with other scientists to help advance their research. The cancer cells were slower to grow and collect than expected however, leading to a 12 month extension of the project.

The team are now gathering data about their models, like the genetic mutations in the cancer cells, to compare to patient samples and ensure the models are representative of real cancer. They are also testing different drugs on the models to see how good they are at fighting rhabdomyosarcoma. This could identify new treatment options for these young patients and help us understand which tumours are more likely to respond to each treatment.

WHAT'S NEXT?

The new relapsed rhabdomyosarcoma models and the genetic and molecular testing results will provide vital new tools for future research. The team hope that this, combined with the results from the treatments tested on the new models, will give a better understanding of rhabdomyosarcoma. If any treatments are promising, they plan to gather evidence in order to introduce them into the FaR-RMS clinical trial. This has the potential to change the standard of care treatment at relapse for rhabdomyosarcoma patients.

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