Patient and Public Newsletter

Funded by: CANCER RESEARCH UK for Children & Young People; Blood cancer UK

VIVO BIOBANK NEWSLETTER - SPRING UPDATE 2026

Welcome to our **Spring edition** of the VIVO Biobank newsletter.

As we move through 2026, we're pleased to share updates from the biobank, including our latest banking figures, research highlights, introductions to new team members, and our new certificates of acknowledgments for children and young people who donate their samples for biobanking. We'll also outline developments to our website and biobanking information video as we continue strengthening how we engage with patients and the public.

We remain incredibly grateful to the patients, families, clinical teams and researchers who make this work possible. Your ongoing collaboration enables us to grow a resource that supports meaningful progress for children and young people affected by cancer.

Inside this issue :

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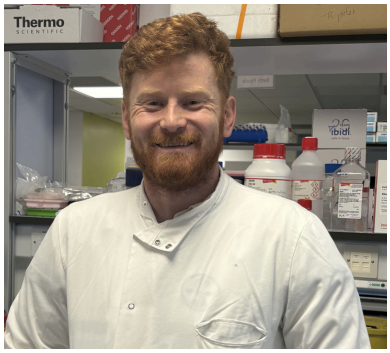
Meet Our New Research Technicians

We're pleased to welcome two new Research Technicians to the VIVO Biobank team. Based in the Newcastle central biobank, they work hands-on with samples every day, carefully processing and storing them so they are preserved to the highest standards. Their work helps ensure researchers receive the best possible material to support vital childhood cancer research.

Kai Oxley

Kai holds a Master's degree in Stem Cell Technology and Regenerative Medicine. In his previous role, he researched personalised regenerative therapies using blood derivatives and mesenchymal stem cells to accelerate bone regeneration.



John McAlery

John completed a Master's in Research (MRes) in Molecular and Cell Biology at the University of Cape Town and moved to the UK in 2021. He previously worked at Leica Biosystems and at Newcastle University's Fibrosis Research Group.

Research Impact: Advances in Childhood Leukaemia Research

Understanding and Overcoming Hidden Treatment Resistance in T-cell Acute Lymphoblastic Leukaemia - **Dr David O'Connor**

Research supported by VIVO Biobank was recently published in Nature Communications: [A non-canonical lymphoblast in refractory childhood T-cell leukaemia | Nature Communications]

Q: What question was this research trying to answer?

Some children with **T-cell acute lymphoblastic leukaemia** (**T-ALL**) do not respond to their first course of chemotherapy, but the reasons for this are not fully understood. Instead of studying all leukaemia cells together (as most previous research has done), the researchers focused on a small, unusual group of leukaemia cells that may be responsible for treatment resistance. They wanted to understand how these cells behave in children whose treatment does not work well, and how these cells switch different biological programmes on and off.

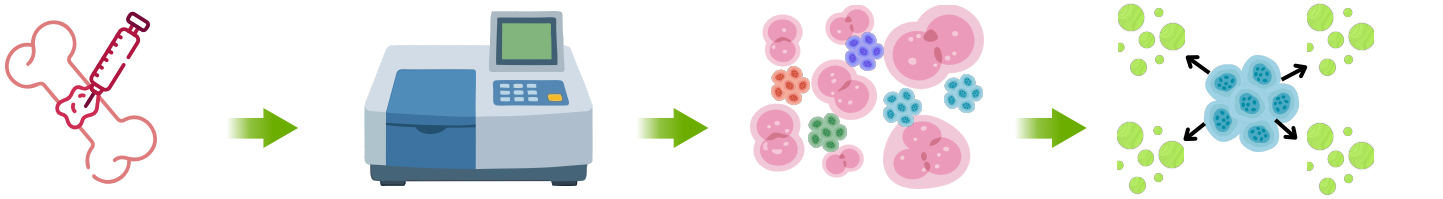
Q: Why is this important?

The team used an advanced technique called **single-cell messenger RNA (mRNA) sequencing**, which allows scientists to examine thousands of individual cancer cells one by one. Messenger RNA shows what each cell is actively doing, not just which genes it carries. Using 84 samples from 54 children provided by VIVO Biobank, the researchers compared samples taken at **diagnosis** and again **after the first month of treatment**. This allowed them to track how treatment-resistant cells appeared and changed over time. Rather than looking at an average signal across all cells in a sample, this approach pinpointed exactly which specific cells survived chemotherapy.

Q: What did they discover?

The researchers found a distinct group of leukaemia cells producing high levels of ***ZBTB16*** mRNA. ZBTB16 is a transcription factor, a type of molecular "**switch**" that controls which other genes are turned on or off. These high-ZBTB16 cells were strongly linked to resistance to treatment. They were already present at diagnosis in children who later did not respond well to their initial therapy. When the researchers looked at a larger patient dataset, this same cell type was also linked to poorer overall outcomes. This suggests that a small, hidden population of cells, not detected by standard testing, may play a key role in relapse risk.

Uncovering Treatment-Resistant Cells



Isolating Leukaemia cells from bone marrow collected at diagnosis and after 1 month of chemotherapy

Analysing thousands of individual cells using Single-cell RNA sequencing.

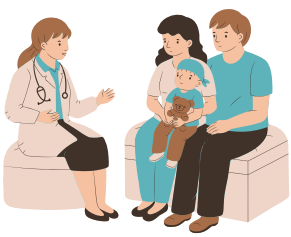
Pinpointing which cells survived chemotherapy and tracking their change over time.

Resistant cells express high levels of ZBTB16 - linked to poor treatment response and clinical outcomes.

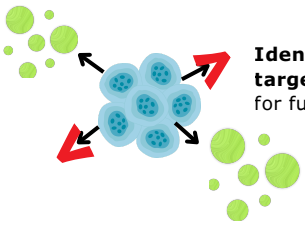
Q: Why it is important for patients?

Identifying and understanding these resistant cells could help doctors predict earlier which children are at higher risk of poor response to treatment. If high-risk patients can be identified sooner, treatment could potentially be adjusted earlier instead of waiting for standard therapy to fail. The study also identified new features of these resistant cells that could be targeted by future drugs. In the long term, this research brings us closer to more personalised treatments tailored to the biology of each child's leukaemia.

Helping Patients with New Insights



Predicting relapse risk early, so treatment can be adjusted sooner



Identifying new, specific **targets** on resistant cells for future drugs

Research Impact: Advances in Childhood Solid Tumour Research

Circulating Tumour DNA as a Biomarker in Neuroblastoma - **Prof. Deb Tweddle**

VIVO Biobank-supported research has demonstrated a new, non-invasive way to monitor neuroblastoma in children: Detection of Targetable Genetic Abnormalities in Neuroblastoma Circulating Tumour DNA

Q: What did this study discover?

This study showed that a simple blood test can detect important genetic changes in **neuroblastoma**, a childhood cancer of the sympathetic nervous system that mainly affects children under five. Instead of using a traditional tumour biopsy, the researchers analysed **circulating tumour DNA** (**ctDNA),** which is made up of tiny fragments of cancer DNA found in the bloodstream. They tested 32 plasma samples provided by VIVO Biobank. The blood test identified cancer-driving genetic changes in several children, including the main mutations usually found in tumour biopsies. Importantly, some mutations were found only in the blood and were not seen in the original tumour sample.

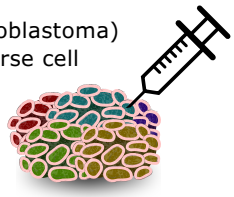
Q: Why is this important?

Children with neuroblastoma often need invasive biopsies to diagnose their cancer and guide treatment. These procedures can be stressful, physically demanding, and carry medical risks. A blood test could provide the same essential genetic information in a safer and less distressing way. Biopsies also only sample one part of a tumour. This means important mutations, especially small or newly emerging ones linked to more aggressive disease, can be missed.

Tumour Heterogeneity: Biopsy vs Blood Testing

A biopsy samples a single part of the tumour

Tumours (such as neuroblastoma) contain genetically diverse cell populations

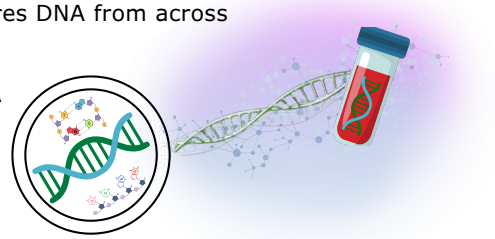


Biopsy findings may miss mutations present elsewhere in the tumour

Tumour releases DNA into the bloodstream

A blood test captures DNA from across the whole tumour

Blood contains DNA from multiple tumour regions, revealing hidden mutations

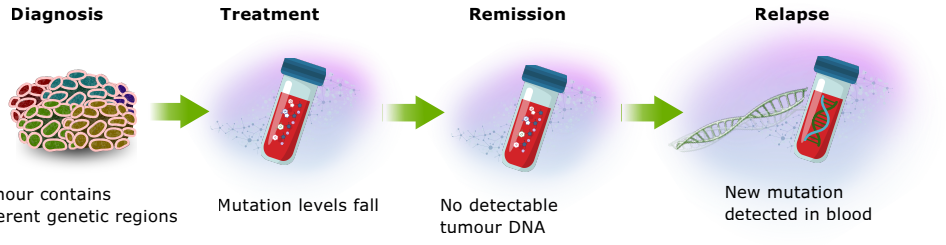


Q: What makes this blood test different?

Circulating tumour DNA comes from multiple tumour sites in the body, including areas where the cancer has spread. It also changes quickly over time.

In this study, the blood test detected new mutations in key neuroblastoma driver genes that were not present in the original biopsy samples but later appeared when the cancer relapsed. This shows the test can capture both differences between tumour sites and changes that happen over time.

Blood tests can detect changes as the cancer evolves



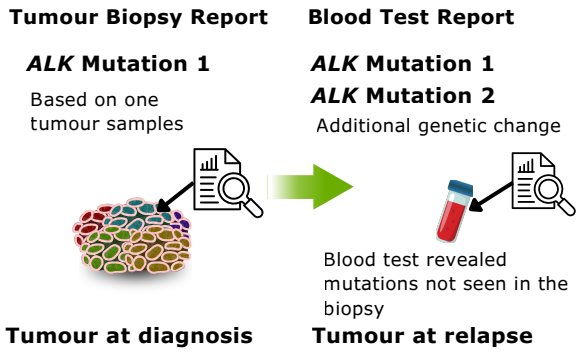
Q: How could this help children in the future?

This approach could allow doctors to:

- Monitor tumours over time without repeated surgeries
- Detect relapse earlier
- Track how well treatment is working
- Identify new genetic targets for therapy

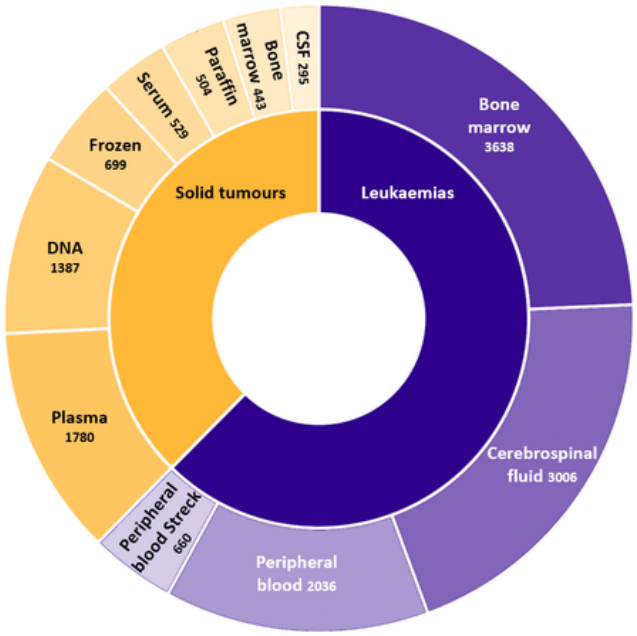
In the future, ctDNA testing could reduce the need for repeated invasive biopsies, particularly in very young children. By providing real-time genetic information from a simple blood test, doctors may be able to adjust treatment earlier and more precisely. Overall, this could lead to faster, safer and more personalised care, improving outcomes while avoiding unnecessary procedures.

Blood testing can reveal mutations missed in the original tumour sample



Our Latest banking Figures

Since July 2022, VIVO Biobank has continued to grow as a national resource for childhood cancer research, with thousands of samples collected and stored to support ongoing and future studies.



Samples collected by VIVO Biobank from July 2022 to December 2025

The chart shows the range of samples donated during this period, with both solid tumours and leukaemia, and the different types of material collected, including frozen tissue, blood and cerebrospinal fluid, each playing an important role in advancing research.

Every sample reflects a family's willingness to contribute to impactful research, and we are grateful for the trust placed in the biobank.

Upcoming PPIE Plans

Our **Patient and Public Involvement and Engagement** (**PPIE**) group of 15 active members is helping shape the future of the VIVO Biobank through two exciting projects.

Improving the VIVO website — working with our York database team to make it more engaging and user-friendly.

Creating a biobanking information video — explaining biobanking, supporting families during consent, and sharing personal experiences

Our PPIE members bring their experiences and insights to help shape the work of the VIVO Biobank. Through meetings and committees, they help ensure our research is communicated clearly and that the biobank reflects the needs of the community. We're grateful to our PPIE members for helping ensure the biobank continues to grow with patients and families at its centre.

If you would like to find out more or are interested in joining our PPIE committee, please visit the PPI page on our website: **https://vivobiobank.org/ppi** for more information and contact details.

Everyone is welcome to apply**.**

Certificates of Acknowledgement

The VIVO Biobank is providing certificates to **recognise children and young people who generously donate samples**.
Donating a sample is a meaningful way for young participants to contribute to research that aims to improve understanding and treatment of childhood cancers.
These certificates are a **small token of appreciation** to acknowledge their generosity and the important role they play in helping research move forward.
Certificates will be provided by the clinical team following donation.