Gwasanaeth Gwaed Cymru
Welsh Blood Service

Research Development & Innovation Report

September 2023

Foreword

We are marking the Welsh Blood Service's first grants awards from external funding bodies. These accolades are a significant achievement, reflecting that our research is at the cutting edge. Our researchers are thrilled to have this opportunity to address questions and problems that affect the world.

Our first competitive grant enables us to explore innovative manufacturing methods from blood donation platelets. The article here describes how this project will be performed across the various departments within the Welsh Blood Service.

Also in this issue, we present the link between the blood service's research and our defence services. Working together, our two services are developing new techniques and technologies for all patients that need transfusion care. Here we describe the collaboration between our blood service and the UK's Defence services and how we are both improving the service for people's health and well-being. We believe these advancements will positively affect the lives of us all, and we are eager to share our progress with you all.

Our grant success is the result of hard work and persistence, so we extend our gratitude to all those who supported our ambitions along the way. Thank you for your continued support, and we look forward to keeping you updated on our ongoing efforts.

Siân James
RD&I Facilitation Lead
Welsh Blood Service

About this document

This document has an up-to-date summary of all planned, ongoing, or completed research, development and innovation activity within the Welsh Blood Service.

This version of the document has been specially adapted so the donors, patients and the public can see the Research, Development and Innovation activity they support through the gift of blood, stem cell and organ donation**.**

Our Connection to the UK's Defence Services

Our Component Development & Research Laboratory partnered with the Ministry of Defence to investigate a cutting-edge new development in blood components for military use.

The Defence Medicine Department is focused on improving the shelf life and functionality of blood so it can be provided to patients closer to the casualty during battle.

Platelets are a blood component that control clotting and help prevent bleeding. They gather at the site of the injury and create a plug that seals the damaged blood vessels. Platelets help to prevent blood loss from the body and are often needed during emergencies, particularly in major trauma patients.

The current guidelines for storing platelets in the United Kingdom are at room temperature under continuous agitation. This method only allows for a relatively short shelf life of seven days.

The equipment needed to keep room temperature stored platelets under continuous agitation means they are difficult to access in pre-hospital settings, such as field hospitals.

An alternative method to platelet storage is in cold temperatures. Cold-stored platelets have a longer shelf life and do not need continuous agitation.

A Consultant Haematologist at Derriford Hospital in Plymouth and Royal Navy Haematologist has partnered with the Component Development & Research Laboratory to investigate cold-stored platelets.

Storing platelets in cold temperatures would provide many benefits, including a longer shelf life and reduced infection risk for patients receiving a platelet transfusion. Cold stored platelets also have the potential to improve effectiveness at stopping bleeding.

This ongoing research is a promising step towards a more efficient supply chain, particularly for the military. Storing platelets in cold temperatures would allow them to be easily transported to field hospitals without the need for large equipment to agitate them.

The Component Development & Research Laboratory has ambitions to conduct a clinical trial future. This exciting development could significantly improve the functionality, shelf life and accessibility of platelets in an emergency setting.

The Impact of European Blood Alliance Funding

In November 2022 our Component, Development & Research Laboratory was awarded funding by the European Blood Alliance to investigate a new method to manufacture platelet concentrates for transfusion.

The European Blood Alliance is an organisation that aims to be a voice for non-profit blood establishments across Europe. Collaborating with the European Blood Alliance enables our researchers to exchange knowledge from centres Europe-wide to improve the availability, quality and safety of blood products.

The Project Team

Our team are working with specialist biomedical scientists in Processing, Verification, and Issues, allowing specialist biomedical scientists from different departments to collaborate. Support from Business Intelligence has also been crucial to facilitate the research.

Laura Paletto
Specialist Biomedical Scientist

Platelet Manufacturing

Platelets are an essential blood component that are frequently needed for transfusion. To be transfused, platelets must be separated from whole blood and manufactured into platelet concentrates.

A common method to manufacture platelet concentrates is by using buffy coats, a portion of the blood that is high in white blood cells. Currently, four buffy coats are used to manufacture platelet concentrates. The grant was awarded to support an investigation into the feasibility of manufacturing platelet concentrates from just three buffy coats.

Why is this research important?

The demand for platelet concentrates is on the rise. Platelet concentrates have a relatively short shelf life of seven days so maintaining adequate platelet stocks can be challenging. This is a difficulty faced by transfusion centres across Europe.

Successfully manufacturing platelet concentrates from three buffy coats would boost stocks and optimise the supply chain. The European Blood Alliance has recognised the potential impact this project could have on donors, patients and transfusion centres Europe-wide.

RD&I Project Portfolio

We have 11 open projects

Projects by Theme

Transplantation	Products	Donor	Cellular Therapies
Includes solid organ and stem cell transplantation, histocompatibility, immunogenetics and donor registries	Includes blood components, immunohematology, testing, component and product manufacturing, quality management, and the evaluation of equipment and materials	Includes donor recruitment and retention, eligibility and care and public health surveillance	Includes topics surrounding cellular and other blood therapies
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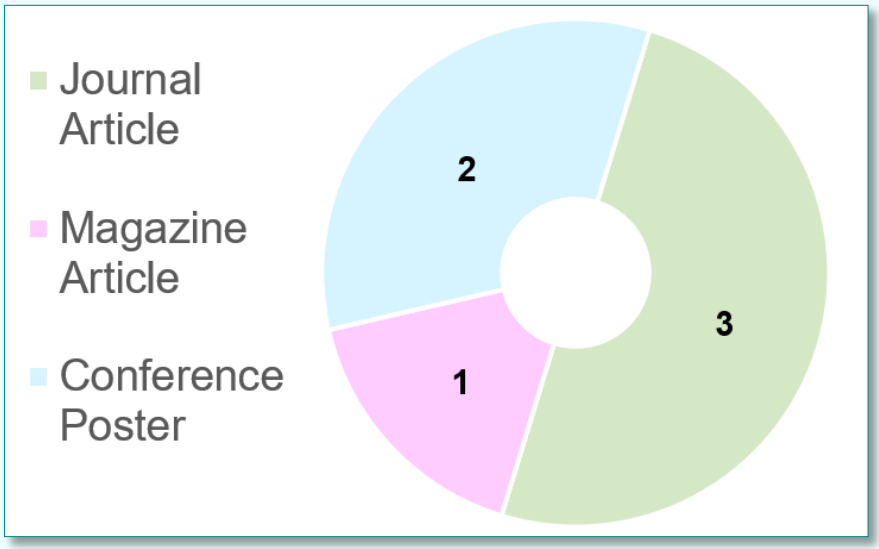
Publications

In the last four months



Journals

Eurosurveillance

Immunohematology
JOURNAL OF BLOOD GROUP SEROLOGY AND EDUCATION

TRANSFUSION MEDICINE

Publications

Impactful publications from the Welsh Blood Service colleagues and our collaborators in the previous four months.

Journal Articles

Serosurveillance of SARS-CoV-2 in Welsh Blood Donors: Establishment of the surveillance system and results up to November 2022

Sian James *in the journal* **Eurosurveillance**

Citation: Harker S, James SE, Murphy J, Davies B, Moore C, Tennant BP, Geen J, Thomas D. Serosurveillance of SARS-CoV-2 in Welsh Blood Donors: Establishment of the surveillance system and results up to November 2022. Euro Surveill. 2023

Transfusion of incompatible blood to a patient with alloanti-Sc1

Chloë George, Heather Davies Edwin Massey & Kalinga Perera *in the journal* **Immunohematology**

Citation: George, C.E., Grimsley, S., Cumber, R., Thornton, N., Davies, H., Harris, C., Massey, E. and Perera, K.. "Transfusion of incompatible blood to a patient with alloanti-Sc1" Immunohematology, vol.39, no.2, 3923, pp.70-71

Quantitative Increases of Extracellular Vesicles in Prolonged Cold Storage of Platelets Increases the Potential to Enhance Fibrin Clot Formation

Jamie Nash, Christine Saunders & Chloe George *in the journal* **Transfusion Medicine**

Citation: Nash J, Davies A, Saunders CV, George CE, Williams JO, James PE. Quantitative increases of extracellular vesicles in prolonged cold storage of platelets increases the potential to enhance fibrin clot formation. Transfus Med. 2023 Aug 8.

Magazine Articles

Next Gen Scientists: Navigating the Different Routes to Registration

Victoria Binding, Celyn Hughes, Lowri Kadelka & Jemima Hughes *in the*

British Blood Transfusion Society Bloodlines Magazine

Conference Proceedings

Evaluation of a novel monoclonal anti-Vel phenotyping reagent

Sian James, Gareth Nottage, Chloe George & Heather Davies

Poster Presentation at the
The International Society of Blood Transfusion 2023

Consent for Blood Transfusion: UK development of resources to support SaBTO recommendations.

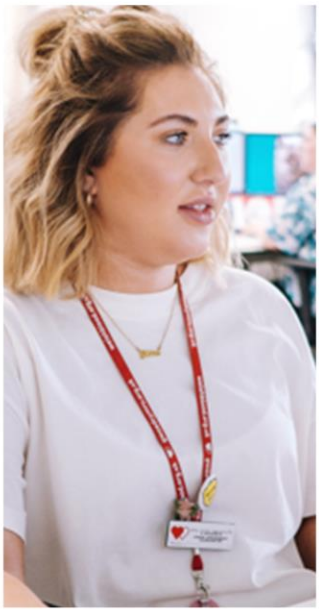
Alister Jones

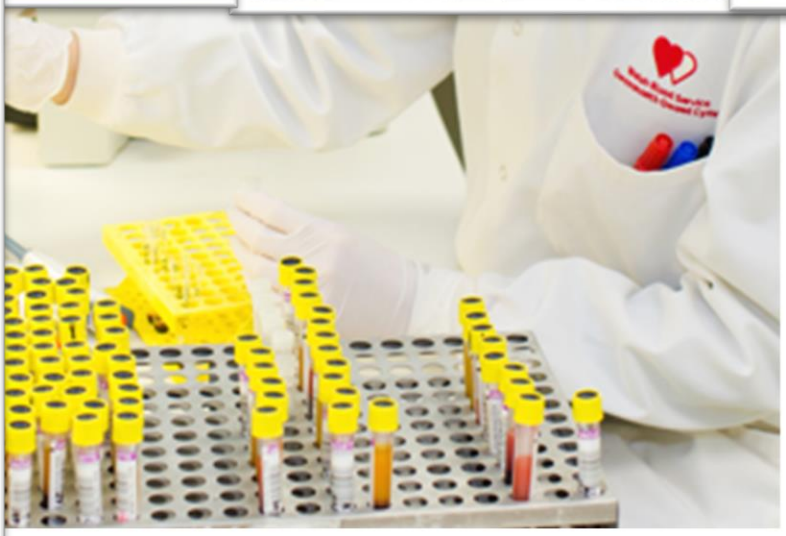
Poster Presentation at the
Serious Hazards of Transfusion Symposium 2023

This report is prepared by

Natasha McLaughlin & Sian James

Valid until January 2024





We thank the blood, platelet and transplant donors who make our research possible.