Partnership Opportunity

IMPROVED DETECTION OF RBC ALLOANTIBODIES

To learn more

AARON POSEY, *Chief Ventures Officer*
Bloodworks Northwest
921 Terry Ave, Seattle, WA, 98102
aposey@bloodworksnw.org
O (206) 568-2234 **C** (206) 719-3235

JAMES ZIMRING, MD PHD
Adjunct Member, Bloodworks Research Institute

BACKGROUND: Approximately 1 in 70 Americans are transfused each year. Exposure to foreign red blood cell (RBC) antigens, due to prior transfusion or pregnancy, can result in the development of RBC alloantibodies. In many cases, when alloantibodies are formed, RBCs expressing the antigen in question can no longer be safely transfused at the risk of medically significant and in extreme cases fatal events, including hemolytic transfusion reactions, bystander hemolysis, renal failure, or death. In patient populations who receive chronic transfusions *(e.g. sickle cell disease and Thalassemia major)*, rates of alloimmunization are near 50%. In order to select a safe, appropriate RBC unit for a transfusion recipient, RBC alloantibody detection and identification is performed as a part of pretransfusion work-up. Alloantibody detection is currently performed using human RBC reagents from living donors.

PROBLEM: Alloantibody detection methods that use human RBC reagents face the following challenges:

- Lot-to-lot variability in test results
- Reliance on pattern recognition and human interpretation
- Clinically significant alloantibodies can be masked by the presence of autoantibodies
    - Encountered in 7% of pretransfusion work-ups
    - Requires costly and time-consuming autoabsorption testing
- Detection can be confounded by monoclonal antibody therapeutics that also bind RBCs *(e.g. anti-CD38, daratumumab)*

SOLUTION: Bloodworks has invented a novel transgenic RBC technology to detect RBC alloantibodies in potential transfusion recipients' blood that can enable selection of appropriate units for transfusion.

The platform utilizes non-human erythrocytes from genetically modified non-human mammals that functionally express single or multiple RBC antigens. These transgenic RBCs could be used in place of, or in addition to, the human RBCs currently utilized for the detection and identification of RBC alloantibodies in transfusion recipients. This technology would be suitable for use in all platforms (current or future, manual or automated) that utilize human RBCs.

ADVANTAGES:

- Expression of a single RBC antigen - Eliminates complex sequential combinatorial analysis and reduces subjectivity/interpretation of results
- Consistent antigen expression - reproducible and controlled
- Does not bind RBC autoantibodies - Eliminates autoabsorption testing
- Does not bind human therapeutic monoclonal antibody therapeutics

PARTNERSHIP OPPORTUNITIES:

- Collaborative research and development opportunities
- Licensing agreement