Partnership Opportunity

BIOMARKERS OF RED BLOOD CELL STORAGE & TOXICITY

To learn more

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BACKGROUND: Blood transfusion, the single most common in-hospital medical procedure in the US, represents a complex therapeutic space in terms of personalized/precision medicine. Not only is there genetic and environmental variation in the recipient, but there is similar variation in the drug (e.g. the blood product). It is well known that there is tremendous donor-to-donor variability in how well red blood cells (RBCs) store; however, the factors that regulate whether the blood from a given donor stores well or poorly are not understood. For this reason, there is currently no means to determine how any particular unit of RBCs will perform post-transfusion.

PROBLEM: The inability to get the "correct unit to the correct patient" is a large impediment in patient care. RBCs that survive poorly post-transfusion result in a less-efficacious product from the standpoint of RBC replacement, and can have medically significant impacts on transfusion recipients. For example, patients who require chronic transfusion (but who are not bleeding – e.g. beta thalassemia and sickle cell disease) suffer toxicological effects of transfusion-related iron overload. Despite chelation therapy, iron toxicity leads to morbidity and mortality in these patients. If one could give the "best" units to these patients, the frequency of transfusion could be reduced, significantly decreasing the iron burden on these patients.

SOLUTION: Bloodworks has developed a panel of biochemical markers that predict, *a priori*, **how well a unit of RBCs will survive post-transfusion, as well as the toxicity of said units. While developed using animal models, the lead markers in this technology have been validated in humans. By measuring the level of these biomarkers, using both genetic and proteomic approaches, we can determine the suitability of a RBC unit for transfusion, as well as the suitability of a human subject to be a blood donor.**

OPPORTUNITY AREAS:

Transfusion product improvements: These methods can be useful in the advancement of personalized transfusion medicine, allowing for units of blood to be characterized and matched to the particular needs of recipients, ultimately improving patient outcomes.

Blood supply management: These methods can be useful for identifying "better" donors, or directing certain units to particular uses or altered storage periods. In addition, this technology also has the capacity for interventions (e.g. modification of blood storage conditions and/or modification of donor RBCs).

Ultimately, this technology can facilitate the development of a less-toxic, more efficacious, and de-commoditized RBC component.

PARTNERSHIP OPPORTUNITIES:

- Collaborative research and development opportunities
- Licensing agreement