

MAY 2023  
Vol. 25 No. 5

# AABB News

- 6 Emerging Technologies Shaping Donor Recruitment
- 12 Lab-Grown Red Blood Cells
- 16 Integrated Programs for Trauma and Disaster Response



## Advances in Technology



Association for the Advancement  
of Blood & Biotherapies

# *Transfusion's* Monthly Podcast

Tune into *Transfusion's* free monthly podcast, which examines questions big and small about transfusion medicine and its role in supporting patients and society. This podcast highlights new manuscripts published in *Transfusion*, along with broader topics that relate to transfusion and biotherapies.

*Transfusion's* monthly podcast host Yara Park, MD, chats with authors on the stories behind their research.

## A sampling of podcast topics include:

- Race in scientific papers
- Predicting vasovagal reactions
- Following up with low-iron donors
- Prehospital blood transfusion
- Components for patients with sickle cell disease
- And many more

**Tune in or learn more:**  
[transfusion.org](https://www.transfusion.org)





6

## The Evolution of Technology

Novel innovations are shaping donor recruitment efforts and addressing donation challenges.



12

## New Discovery: Lab-Grown Red Blood Cells

The RESTORE trial tests new technology in healthy donors.

16

High Priority

## Integrated Programs for Trauma and Disaster Response

Regional blood centers, in collaboration with others in the field, can play a vital role in disaster relief and trauma response efforts.

### COLUMNS & INTERVIEWS

President's Message

**2 Technological Advancements Shaping Our Field**

AABB Foundation

**4 Technology Research Spotlight**

Be Well

**20 Transforming Your Well-Being**

White Coats

**24 Scott Koepsell, MD, PhD: Cutting Edge of Technology**

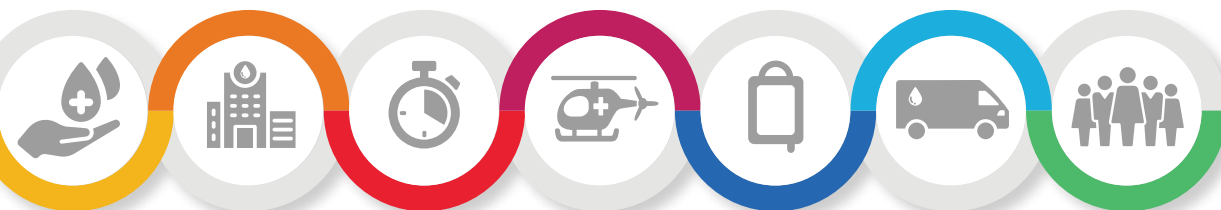
### DEPARTMENTS

**22 Significant Findings**

**27 Membership Focus**

**28 Of Note**

**29 Calendar**



# Technological Advancements Shaping Our Field

**T**imes were quite different in blood banking before the invention of the Internet, computers, social media, smartphones and other modern technologies we rely on today. These technological advancements have revolutionized many facets of our personal and professional lives, from the way we communicate and network with our colleagues to how we diagnose and treat patients and recruit blood donors.

It's exciting to witness how far the field has come in the digital age. Researchers throughout the world can use technology to collaborate in real-time to solve complex scientific issues. Blood donor professionals can recruit potential donors and raise awareness via social media platforms or virtual reality campaigns. Pathogen-reduction technologies are being used as additional protection against the risk for infectious diseases, offering an innovative approach to further advance blood safety. Looking ahead, research predicts artificial intelligence and robotics will play a major role in transfusion medicine to predict transfusion needs and improve the quality of patient outcomes.

## Novel Innovations

As a community and Association, we have embraced emerging technologies and novel innovations advancing our work and research. AABB is committed to keeping safety at the forefront in a rapidly changing technology world.

This issue of *AABB News* focuses on advances in technology. Our first feature article examines the evolution of technology and its impact on blood donations. AABB institutional



Brian Gannon, BA,  
MBA

members share novel innovations driving their recruitment efforts while addressing blood donor challenges. The second highlights the first-in-human trial of laboratory grown RBCs manufactured from stem cells from donors—the Recovery and Survival of Stem Cell Originated Red Cells (RESTORE) trial. In addition, this issue also features an article that explores integrated programs for trauma and disaster response from a regional blood center perspective.

## Mark Your Calendars

Lastly, AABB staff and committee members are gearing up for the 2023 AABB Annual Meeting, to take place in-person October 14-17 in Nashville, TN. Member registration opens May 31, and general registration opens June 7. We have many great things in store for attendees and we are eager to finally gather in-person as a community once again. I look forward to seeing you there. ■

Brian Gannon, BA, MBA  
AABB President

## President

Brian Gannon, BA, MBA

## Chief Executive Officer

Debra BenAvram, FASAE, CAE

## Chief Communications and Engagement Officer

Julia Zimmerman

## Director of Marketing and Communications

Jay Lewis, MPH

## Managing Editor

Kendra Y. Applewhite, MFA

## Senior Communications Manager

Drew Case

## Design and Production

V Studio

## Advertising

Contact Michael Lamattina

+1.781.388.8548

mlamattina@wiley.com

## Change of Address:

Make changes online at [www.aabb.org](http://www.aabb.org) > Membership > My Account

## Notice to Copiers:

Reproduction in whole or part is strictly prohibited unless written permission has been granted by the publisher. AABB members need not obtain prior permission if proper credit is given.

## Postmaster:

Send address changes to AABB News; c/o Member Services; 4550 Montgomery Avenue; Suite 700 North Tower; Bethesda, MD 20814.

## AABB News

(ISSN 1523939X) is published monthly, except for the combined November/December issue for the members of AABB; 4550 Montgomery Avenue; Suite 700 North Tower; Bethesda, MD 20814.

AABB is an international, not-for-profit association representing individuals and institutions involved in transfusion medicine, cellular therapies and patient blood management. The association is committed to improving health by developing and delivering standards, accreditation and educational programs that focus on optimizing patient and donor care and safety.

+1.301.907.6977

Email: [news@aabb.org](mailto:news@aabb.org)

Website: [www.aabb.org](http://www.aabb.org)

Copyright 2023 by AABB.

Periodicals postage paid at Bethesda, MD, and at additional mailing offices.

Views and opinions expressed in *AABB News* are not necessarily endorsed by AABB unless expressly stated.

Publications Mail Agreement No. 41248513.

Return undeliverable Canadian addresses to PO Box 503; RPO West Beaver Creek; Richmond Hill, ON L4B 4R6.



# Foundation

## Fueling Innovative Research

The AABB Foundation supports innovation through its early-career scientific research grants, which helps to advance AABB's mission of improving lives by making transfusion medicine and biotherapies safe, available and effective worldwide. Since 1983, the Foundation's Scientific Research Grants Program has funded more than 200 investigators – many of whom are now leaders in the field.

**Donate to the AABB Foundation today and join us in supporting the future of patient and donor care.**

**[aabb.org/Foundation](https://aabb.org/Foundation)**



# Technology Research Spotlight: Building a Platform for in Silico Trials

By Kendra Y. Applewhite, MFA  
Managing Editor

**J**ansen N. Seheult, MBCh, BAO, MSc, MS, MD, discovered the field of transfusion medicine during his residency training. He completed his residency in clinical pathology and fellowship training in blood banking/transfusion medicine at the University of Pittsburgh Medical Center (UPMC), as well as fellowship training in special coagulation at the Mayo Clinic in Rochester, Minn. Seheult said he enjoyed conducting scientific research and credited his mentor for shaping his interest and research in transfusion medicine early on in his career.



Jansen Seheult, MBCh, BAO,  
MSc, MS, MD

“I would not be where I am today without Dr. Mark Yazer’s support and mentorship,” said Seheult, a senior associate consultant and assistant professor in the divisions of hematopathology and computational pathology and AI, department of laboratory medicine and pathology, at Mayo Clinic in Rochester, Minn. “I came

across transfusion medicine by a circuitous route. The most interesting aspect was that there were many clinical questions in transfusion that could benefit from applications of computational/in silico methods.”

Seheult has extensive experience in data analytics, simulation techniques and machine learning. His doctoral research at the Royal College of Surgeons in Ireland focused on development of a novel technology for acoustic signal processing of time-stamped inhaler events for the prediction of drug delivery from a dry powder inhaler. Seheult’s current research interests include in silico simulation of hemostatic resuscitation, applied computer vision for diagnostic hematopathology and automated flow cytometry analysis and gating. He spends most of his time at Mayo Clinic developing computational methods, including machine learning/AI models, for analyzing structured and unstructured laboratory data to build predictive and diagnostic models to improve efficiency in health

care delivery and diagnosis in the laboratory.

“I enjoy the technical aspects of my research, especially programming, statistics and applied computation pathology,” he told *AABB News*. “You can read a publication from 60 years ago, and you must think about how you can refactor what was done 60 years ago in the structure of what you’re working with now. That is a very exciting challenge, and I enjoy those aspects of my work.”

## Innovative Approach

In 2021, Seheult was awarded an early-career scientific research grant from the AABB Foundation for his research project titled “A Stochastic, Multicompartment, Dynamic Model of Hemostasis and Oxygenation During Trauma Resuscitation: Building a Platform for in Silico Trials of Transfusion Strategies.” Seheult stated the AABB Foundation grant helped him advance his research by providing the means to hire a contract data scientist and programmer to assist with the model development and allowing him protected time to devote to his research project.

“The AABB Foundation grant has been invaluable and allowed me to free up some of my time to focus more on the technical aspects of the work without needing to do all of the programmatic implementation myself. This award also gives me more recognition within my current institution and former institution,” he stated. The grant, Seheult added, is a launching pad for a career that combines academic research with clinical practice. “Receiving an AABB Foundation grant gives you some leverage to orient yourself toward a research track career. It also can get you more buy-in from leadership if you want to apply for additional grants or funding mechanisms.”

Seheult is working alongside Casey Vieni, an MD/PhD student at NYU Grossman School of Medicine, to build a platform that would allow clinicians and surgeons to perform in silico clinical trials and simulate virtual patient cohorts to compare the effectiveness



of different trauma resuscitation strategies, primarily around transfusion resuscitation. Their work expands upon previous deterministic models to create a stochastic computational model of hemostatic resuscitation that accounts for variations in blood component composition and temporal features of transfusion therapy.

“A lot of what I am doing is not actually building the in silico models, but more akin to a plumbing project—taking models that have been developed since 1919 and merging those earlier models with more recent models,” Seheult explained, noting the first model they are working with was developed by August Krogh, the Danish scientist who received the 1920 Nobel Prize in Physiology or Medicine. “It is quite a lot of hands-on work that’s required to combine these models because they are not necessarily written in the same programming language, and they don’t follow the same form or structure. We have built a lot of the pipeline, and we are finalizing the incorporation of a tissue oxygenation module into our in silico model.”

Although there are no full end-to-end examples of an in silico clinical trial in transfusion medicine, there are compelling opportunities for the use of computational models in areas such as trauma resuscitation and personalized transfusion therapeutics, Seheult noted.

“There are successful use cases of in silico clinical trials in other clinical domains that can act as a blueprint for using this design in transfusion medicine,” he said. “We have the basic science models available, and we should be leveraging them to build these in silico clinical trial platforms because they can provide significant value for identifying patient subgroups that might benefit from a particular therapy or transfusion strategy.”

Seheult’s research is revealing that in silico models of resuscitation can offer an innovative approach to evaluate the comparative effectiveness and safety of transfusion strategies and resuscitation protocols, in-

cluding effects on body fluid compartment volumes, tissue oxygenation and hemostatic factors. They can also supplement real-world clinical trial data on efficacy and safety. He pointed out that regulatory agencies, such as the U.S. Food and Drug Administration (FDA), have recognized the value of modeling and simulation with an emphasis on the benefits of developing and implementing in silico methods as a complementary approach for achieving complex health aims in medicine.

### Providing Support

The AABB Foundation’s Scientific Research Grants Program has funded more than 200 investigators and fueled early-career research in the fields of transfusion medicine and biotherapies for 40 years. These Foundation-funded research projects have helped to advance the field and support AABB’s mission to improve lives by making transfusion medicine and biotherapies safe, available and effective worldwide.

“As trainees or junior faculty, we have quite limited opportunities for pursuing our own independent research and protecting our time, especially if you work at an academic institution where extra funding is required to have protected time to conduct research,” Seheult stated. “These AABB Foundation research grants are the first step, and the Foundation is providing a valuable opportunity. We need more of these grants because there are so many people who have innovative and novel ideas and are working on interesting projects, and all they need is a little bit of support to bring those ideas to fruition.” ■

To learn more about the AABB Foundation and support its mission, visit <https://www.aabb.org/foundation>.