

BLOOD and PLASMA  
MOTHER'S MILK  
STEM CELLS  
HUMAN TISSUES



# 2025 Scientific Activities Report

**Gaston**  
RESEARCH DONOR SINCE 2002



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**Nathalie Fagnan**



**Dr. Marc Germain**

## Introductory remarks

We are pleased to introduce the 2025 edition of Héma-Québec's scientific activities report. This document outlines the achievements of the Vice-présidence aux affaires médicales et à l'innovation and selected projects of the Vice-présidence à la médecine transfusionnelle.

Faithful to our mission, our teams of seasoned scientists combined rigor and creativity. Their innovations optimized our operations, strengthened the quality and safety of our biological products and, ultimately, contributed to the health of donors and recipients of products of human origin.

As an example, our scientists showed that the purity, recovery, and functionality of stem cells from cord blood depend on how the units are thawed. This project laid out a methodological framework for preparing cord blood units and then using them as starting material for



cell therapy—and it also highlighted the potential for using cord blood in a therapeutic setting.

Another example is a study that shed light on the effect of hematocrit on neutrophil preservation. These findings pave the way for the optimization of protocols to prepare granulocyte concentrate and enhance transfusion efficacy.

These achievements reflect the scientific progress made during the year. We invite you to explore the sections of the report and learn about both the scope of our work and its outcomes.

Finally, we would like to warmly thank all donors who contributed to our projects. Without their commitment, many of these advances would have never happened.

Enjoy your reading!



**Nathalie Fagnan, MSM, FCPA, IAS.A**  
President and Chief Executive Officer



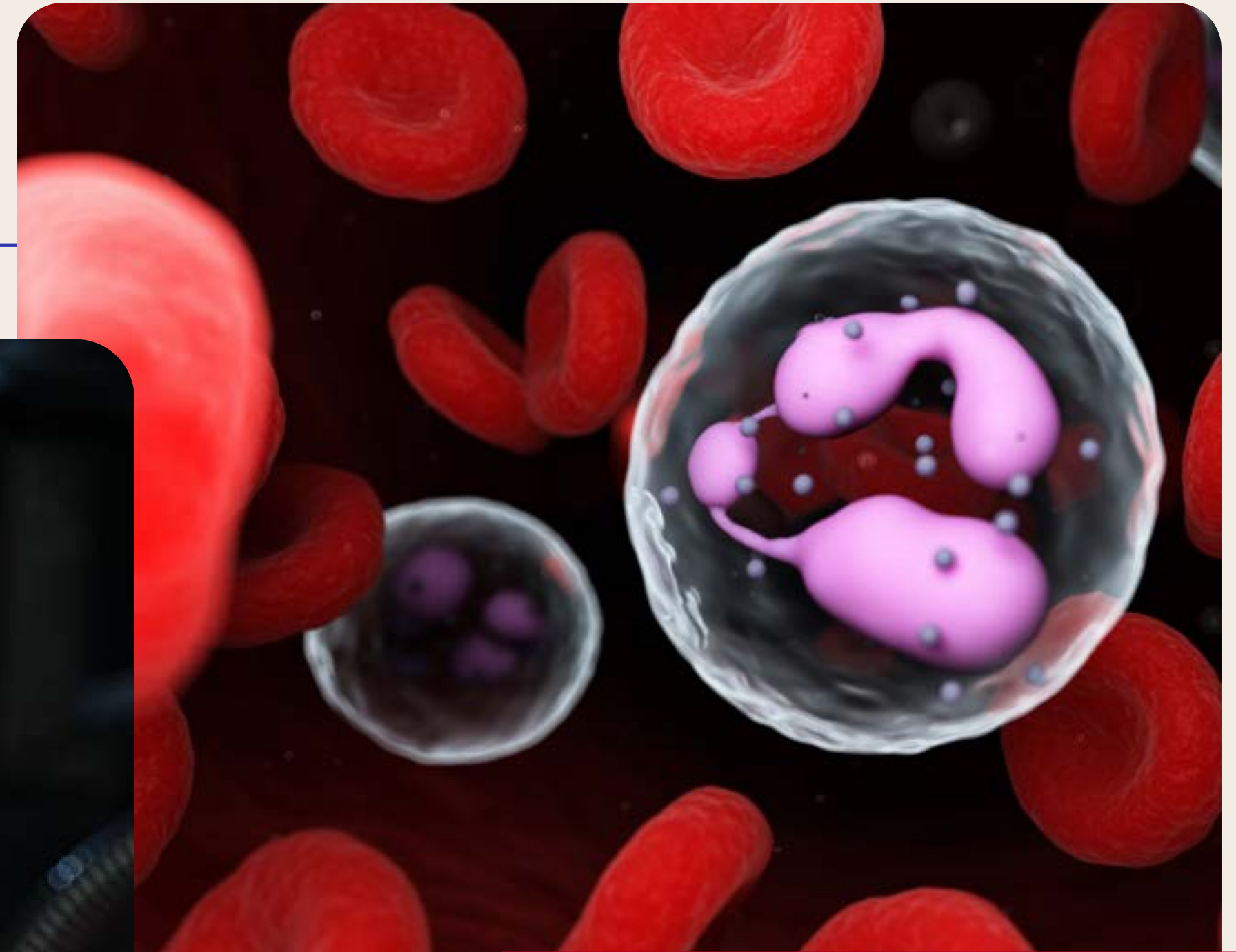
**Marc Germain, MD, PhD, FRCPC**  
Vice-President, Medical  
Affairs and Innovation



# Highlights



**Our teams demonstrated that the purity, recovery, and functionality of stem cells from cord blood depend on how the units are thawed—a breakthrough discovery that could simplify their use in therapeutic products.**



**A project by Héma-Québec highlighted the role of hematocrit in preserving neutrophils.**



# Overview of our teams

Several teams are leveraging their knowledge to advance scientific activities at Héma-Québec.

## **Vice-présidence aux affaires médicales et à l'innovation** **Marc Germain, MD, PhD, FRCPC**

Direction scientifique  
Renée Bazin, PhD

Direction de la recherche  
Mélanie Dieudé, PhD

Direction épidémiologie, vigie et risques biologiques  
Antoine Lewin, PhD, MPH

Direction médicale, microbiologie et épidémiologie  
Christian Renaud, MD, MSc, FRCPC

Direction médicale, donneurs et receveurs  
Sylvie Lachance, MD, FRCPC, DRCPC

Direction des services infirmiers  
Isabelle Rabusseau, inf.

Direction de l'exploitation des tissus humains  
Étienne Fissette, BSc, MBA

## **Vice-présidence à la médecine transfusionnelle** **Nancy Robitaille, MD, FRCPC**

Direction médicale, hématologie  
et cellules souches  
Catherine Latour, MD, FRCPC

Direction des cellules souches  
Diane Fournier, PhD

Direction des Laboratoires de référence  
Sandrina Da Fonseca, PhD

Direction du partenariat clinique avec  
les centres hospitaliers  
Marie-Hélène Robert, TM, RT

**To find out more and to contact the members  
of our teams, see [Our teams' scientific  
roles and responsibilities](#) section.**



A new researcher joins Héma-Québec!

# Philippe Leprohon

## Researcher

Holding a PhD in microbiology and immunology, Philippe Leprohon joined Héma-Québec's research department in August 2025. Previously, he spent 15 years as a project manager at the Centre de recherche du Centre hospitalier universitaire de Québec (CHU) in Québec City, where he led research programs in microbial genomics and metagenomics. Coauthor of more than 60 scientific articles, he contributed to the development of new approaches to studying antimicrobial resistance and the role of microbiota in human health.

In his current role, he develops innovative approaches involving next-generation DNA sequencing and genome editing to characterize red blood cell and platelet antigens and study the origin of blood diseases.





“Héma-Québec’s scientific activities constitute a strategic development engine for the organization because they transform biological data into concrete solutions—in addition to training the next generation of scientists.”



**Philippe Leprohon**  
Researcher



# **Innovation**

**Héma-Québec saw no shortage of innovations in 2025. This section highlights the innovative solutions our research teams have developed.**

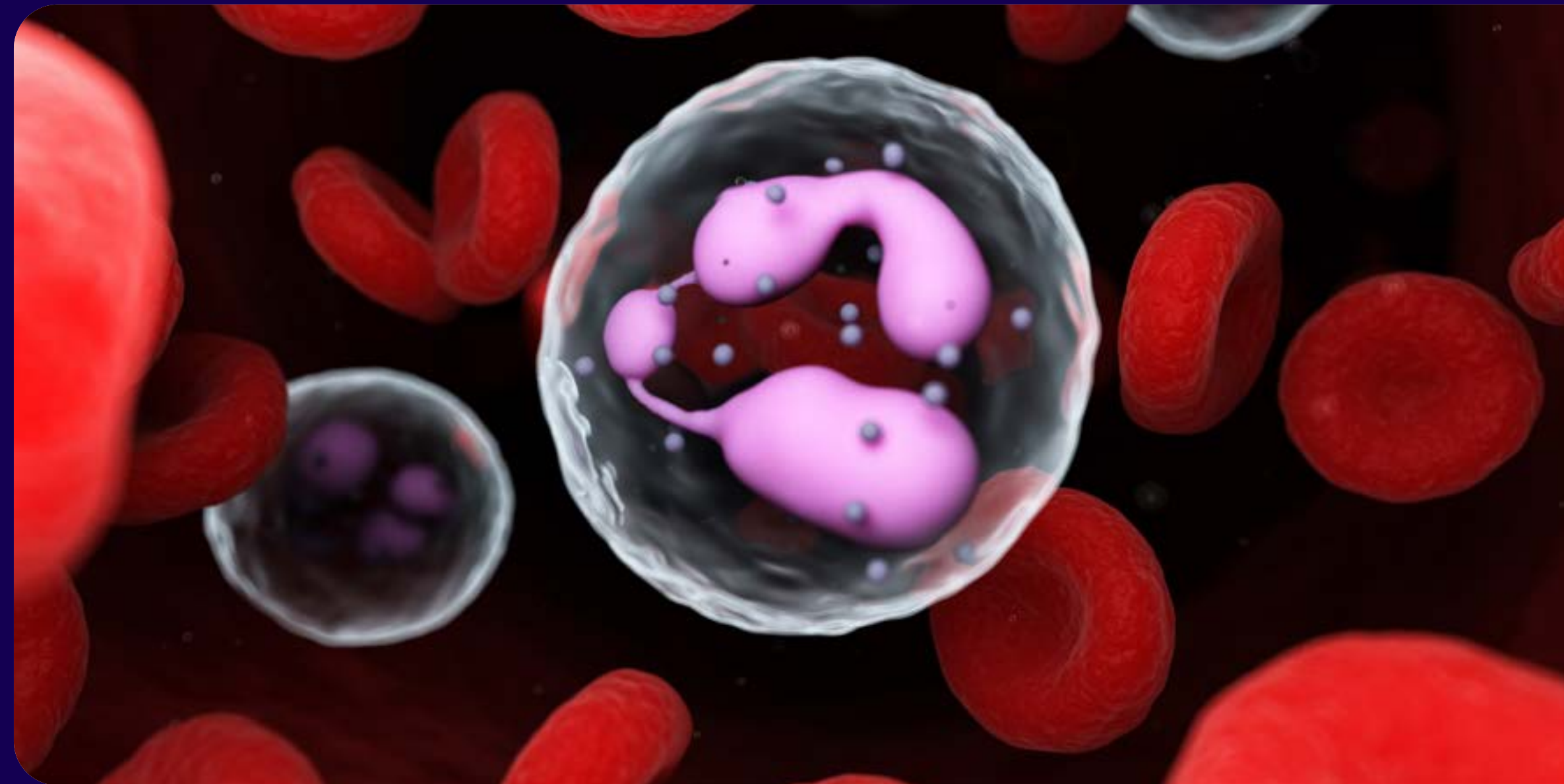


## BLOOD PRODUCTS

### When hematocrit matters: Better preservation of neutrophils intended for transfusion

Granulocyte concentrates (GC) provide a source of neutrophils for transfusion. The hematocrit of GC can range from 0.09 L/L for those collected by apheresis to 0.24 L/L for those obtained from whole blood. This difference could influence the activation, survival, and functional capacity of neutrophils.

In cooperation with the University of Pittsburgh and Vitalant, Héma-Québec has therefore examined the effect of hematocrit on the viability and functions of neutrophils transfused to neutropenic patients. For this purpose, two ABO-compatible whole blood donations were combined, separated, and processed using the Reveos automated system to generate four units of residual leukocytes with various hematocrit levels (0.5 L/L, 0.24 L/L, 0.09 L/L, and 0 L/L). Neutrophils derived from GC with low hematocrit (0.09 L/L) exhibited increased activation, reduced viability and functional capacity, and elevated levels of pro-inflammatory cytokines. In contrast, a hematocrit of 0.24 L/L maintained the integrity



and functions of neutrophils, including chemotaxis, phagocytosis, and production of reactive oxygen species (ROS) over time, whereas red blood cell enrichment (0.5 L/L) provided no additional benefit.

These results suggest that a hematocrit of about 0.24 L/L better preserves neutrophils. They pave the way for optimizing GC preparation protocols to enhance their transfusion efficiency. Nevertheless, GCs should be produced in an operational setting (by apheresis or from whole blood) to validate these observations.



## BLOOD PRODUCTS

### **Smoked cannabis and blood platelets: An emerging transfusion risk?**

Cannabis use has risen in Canada during the last few years, and cannabis may have an effect on platelet quality. However, these potential effects remain poorly understood.

Héma-Québec thus investigated the impact of cannabis joint extracts on platelet activation and function, with the aim of better understanding potential transfusion risks. Human platelets were exposed to various concentrations of two cannabis joint extracts with distinct cannabinoid profiles. The results indicate that the extracts activated the platelets in a dose-dependent manner. The extracts also led to increased metabolic stress and energy loss, and diminished their ability to aggregate normally—but without affecting the activation of cellular pathways, such as p38, ERK, and NF- $\kappa$ B. The analyses also uncovered increased levels of several inflammatory factors and an enhanced ability of platelets to activate endothelial cells.

To conclude, cannabis changes the activation and function of platelets in laboratory conditions, suggesting that consuming cannabis might influence the effectiveness of transfused platelets. Human studies are ongoing to confirm these findings and to determine if cannabis use carries a risk for blood product safety.



## MOTHER'S MILK

### **Human mother's milk selectively eliminates some senescent fetal intestinal cells**

Senescence is a cellular process defined by irreversible halting of proliferation and an inflammatory phenotype. An accumulation of senescent cells may have deleterious effects on the fetal intestine. Human mother's milk (HMM) could modulate the abundance and function of senescent cells in the fetal intestine, but that hypothesis was never explored.

Therefore, Héma-Québec tested whether HMM could eliminate senescent intestinal cells of fetal origin. To do so, senescent and non-senescent cells were exposed to HMM, its distinct fractions (i.e., rich or poor in free fatty acids), and an infant formula product. Findings show that mother's milk decreases the survival of senescent cells without affecting healthy cells. This reduction occurs through decreased  $\beta$ -galactosidase activity, decreased expression of phosphorylated p38 and  $\gamma$ H2AX, mitochondrial depolarization, and decreased caspase activation. Interestingly, incubation at 37 °C increased the concentration of free fatty acids in HMM as well as its senolytic activity.

This study suggests that HMM induces the death of senescent fetal intestinal cells, and that this senolytic effect is mediated by free fatty acids in HMM. These observations, published in the journal *Biology*, point to a novel role for HMM in maintaining intestinal homeostasis.



## STEM CELLS

### **Thawing cord blood units: when indications dictate the process**

Cryopreserved cord blood units (CBUs) can be used as starting material in cell therapy. Nevertheless, thawing them can reduce the number of viable cells and their functionality. Our teams thus compared methods for preparing CBUs before freezing and after thawing them, in order to optimize cell number, cell purity and cellular fitness in a therapeutic context.

This study was carried out by Héma-Québec in cooperation with the Centre de recherche du Centre hospitalier de l'Université Laval in Québec City. Findings show that after thawing, the methods

tested involve an unavoidable trade-off between the number of viable cells, their functional state, and the preservation of all cell populations. As such, it is necessary to select the thawing process according to the specific requirements of the cell therapy to be produced. Interesting fact: one of the thawing approaches led to a marked decline in the number of CD14+ cells, a population potentially important for certain immune activation applications.

In summary, this study provides a methodological framework for preparing CBUs for use as source material in cell therapy. It also emphasizes the significant potential for using CBUs in therapeutic contexts. The study was published in the journal *Cytotherapy*.



## BLOOD PRODUCTS

### Increased production of anti-Spike IgG4 after multiple vaccinations against SARS-CoV-2 and consequences on antiviral functions

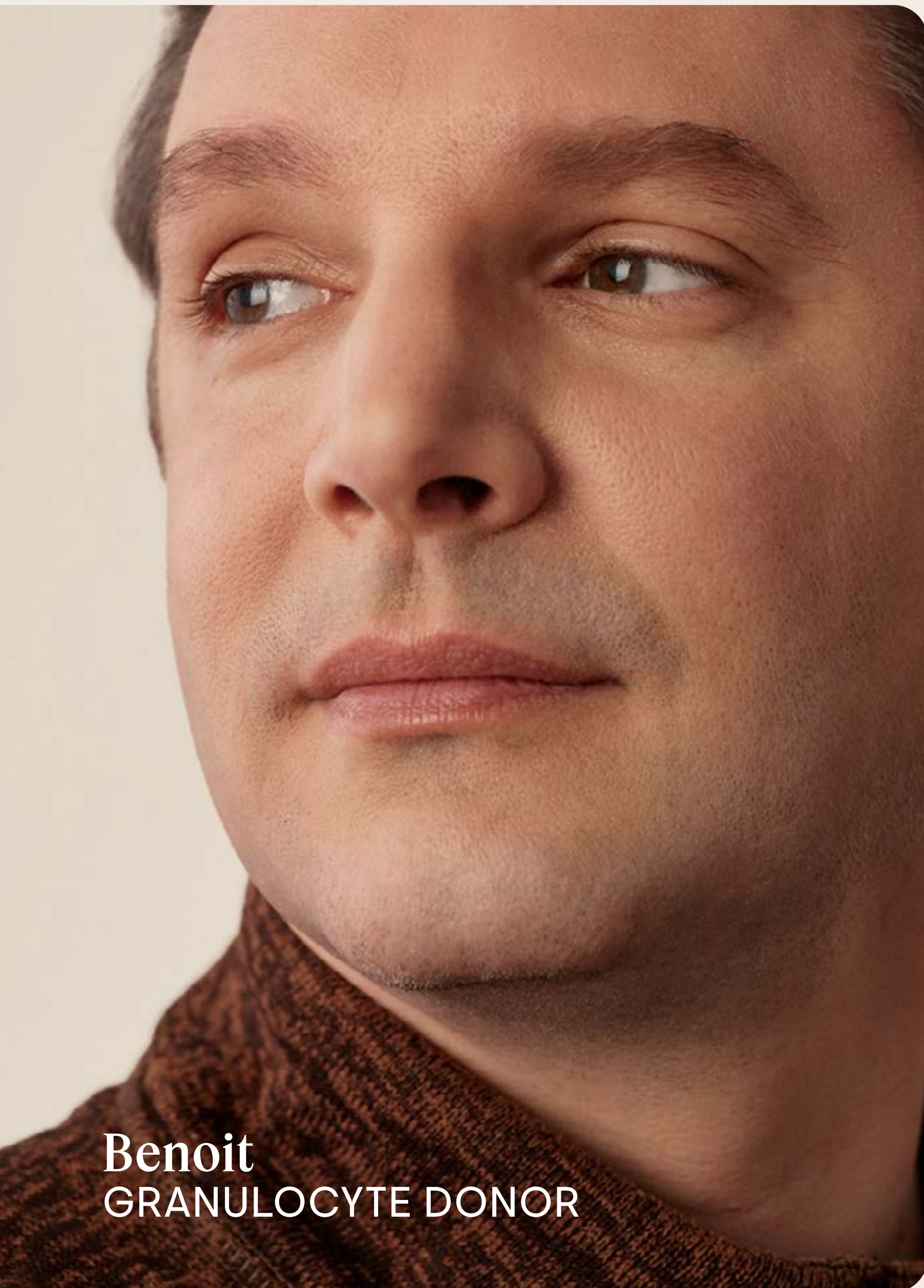
Messenger RNA (mRNA) vaccines against SARS-CoV-2 induce the production of neutralizing antibodies—mainly immunoglobulin G (IgG)—with Fc-effector functions. Nevertheless, the administration of several successive doses of these vaccines stimulates the production of an IgG subclass named IgG4 to the detriment of other subclasses, such as IgG1.

The consequences of this redistribution were examined in a study jointly undertaken by the Centre de recherche du Centre hospitalier de l'Université de Montréal (CRCHUM) and the Uniformed Services University. The study analyzed samples from healthcare workers as well as elderly individuals who were given up to six doses of mRNA vaccine. Many of these samples came from Héma-Québec's PlasCoV biobank. Anti-Spike IgG4 appeared mainly after the third dose of the vaccine, and its levels increased with subsequent doses. However, this subclass was less effective than IgG1 at activating Fc-effector functions, such as antibody-dependent



cellular cytotoxicity and antibody-dependent cellular phagocytosis. Findings also show that SARS-CoV-2 infection raises IgG1 levels without boosting IgG4 levels, thus enhancing overall antiviral activity.

Conclusively, IgG4 plays a role in viral neutralization, but its relative rise is linked to a reduction in antiviral Fc-effector functions. Tracking the IgG subclasses produced in response to vaccination could help optimize future vaccine strategies. These study results were published in the journal *Viruses*.



**Benoit**  
GRANULOCYTE DONOR

## BLOOD PRODUCTS

### **More time, more options: how to lengthen the viability and functionality of neutrophils**

Granulocyte concentrates (GC) can hardly be stored beyond 24 hours, which makes their preparation and availability difficult.

This research—carried out in cooperation with the Centre de recherche du Centre hospitalier universitaire de l'Université Laval in Québec City—evaluated how to lengthen the viability and antimicrobial activity of neutrophils in GC that are transfused to neutropenic patients. Neutrophils isolated from healthy donors were resuspended in autologous plasma, followed by various combinations of clinically approved additives (i.e., Plasma Lyte, SAGM, AS-3, and Alburex) tested with and without buffers to study cell viability and function for up to 72 hours of room temperature storage. In the end, the most effective combination turned out to be preserving the GC in Plasma Lyte solution with buffers and AS-3 solution, which maintained viability for up to 48 hours of storage and certain functions (e.g., phagocytosis) for up to 72 hours. On the other hand, chemotaxis was impaired after only 24 hours of storage.

These results show the functionality of freshly isolated neutrophils can be extended by adapting current additives. Nevertheless, some optimizations are still required before their clinical use.



## Portrait

# Jean-François Leblanc

## Scientific information advisor

Holding a master's degree in microbiology and immunology, Jean-François Leblanc began working at Héma-Québec in 2000 as a research assistant. In 2001, he took on the role of scientific information advisor, a position he has held since then!

His responsibilities are far-reaching: he monitors scientific and technological developments in areas relevant to Héma-Québec's product lines, conducts literature reviews for internal clients, and manages Héma-Québec's patent portfolio. Jean-François' scientific mind and rigorous nature proved to be valuable assets to Héma-Québec throughout his career with our organization.





**Jean-François Leblanc**  
Scientific information advisor

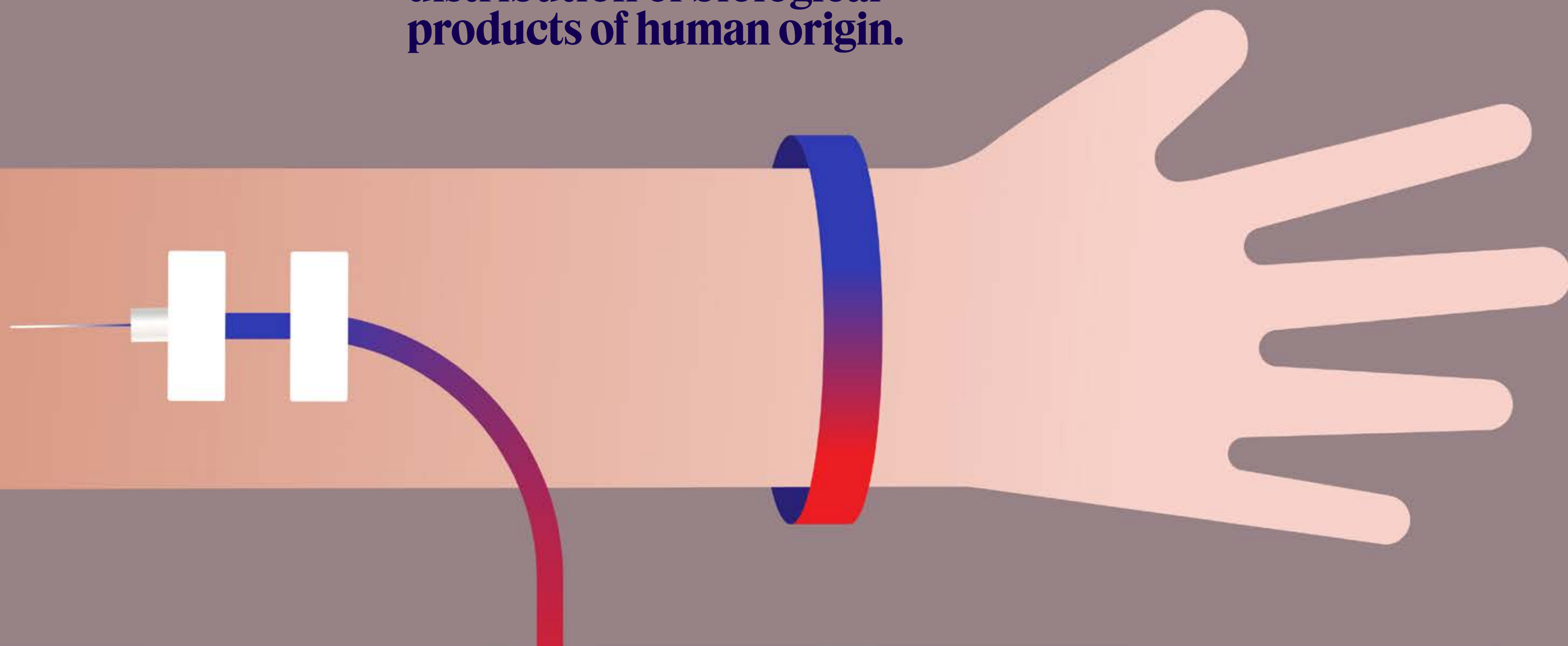
In the spring of 2026, he will begin a new and well-deserved chapter in his life: retirement. Héma-Québec warmly thanks Jean-François for his years of exemplary service and wishes him all the best.

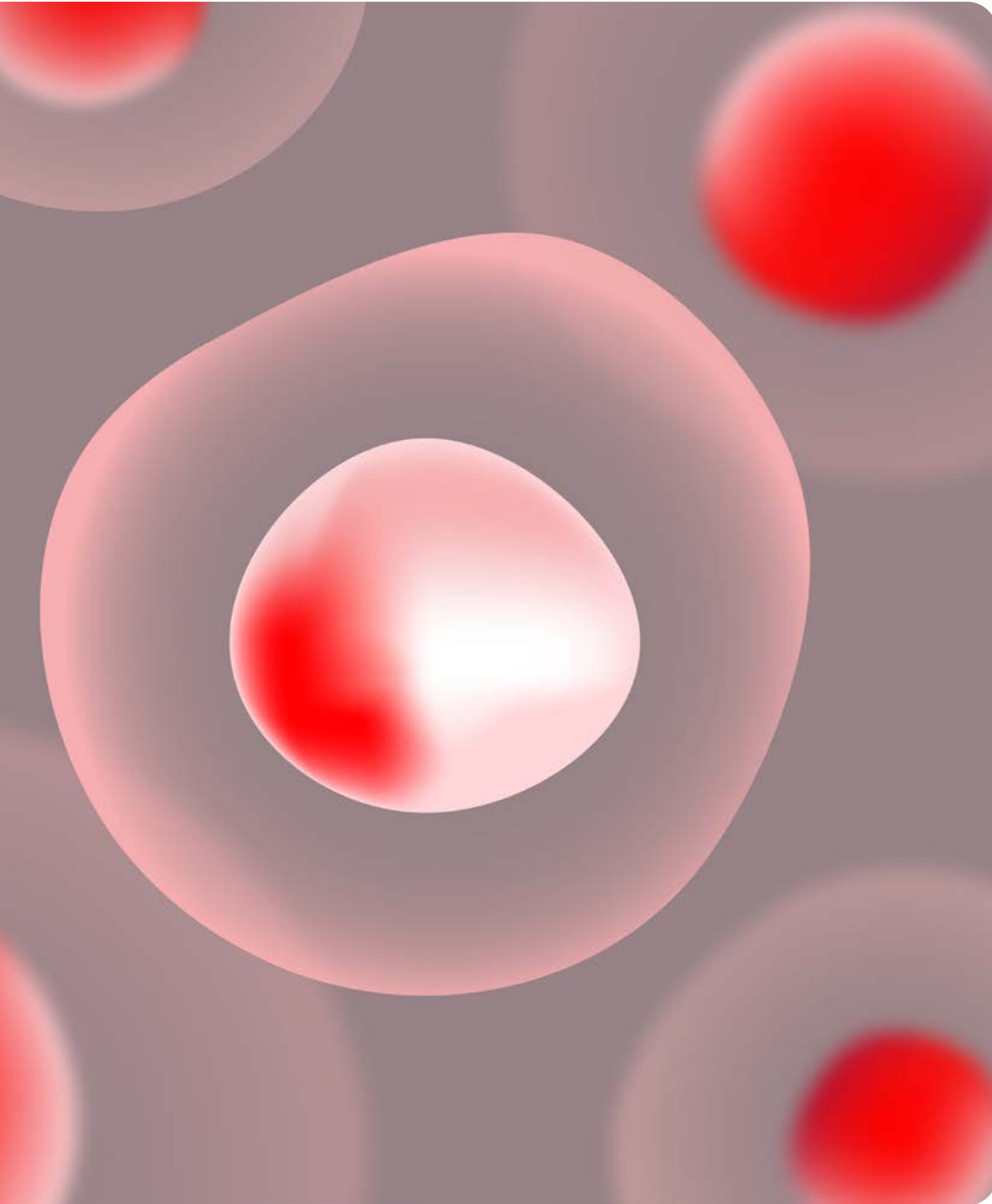
“Research and development are essential to Héma-Québec’s mission because new technologies are constantly emerging and have the potential to optimize the services offered to the Québec population.”

An illustration of a hand with a blood collection device. A red tube is connected to a white rectangular component, which is further connected to a needle. The background is a gradient of grey and orange.

# Operations support

**Héma-Québec's scientific activities influence the day-to-day collection and distribution of biological products of human origin.**





## STEM CELLS

### **Peripheral stem cells: effective even after decades**

Some peripheral stem cell (PSC) units remain unused after years—or even decades—of storage. Long-term storage could, in fact, diminish the quality of PSC. In such cases, Héma-Québec may dispose of these units on a priority basis, given that space constraints limit the number of PSC units it can store continuously in nitrogen gas.

Our organization therefore examined the quality of PSC stored in nitrogen vapor for 15 to 30 years in cooperation with the Centre hospitalier de l'Université de Montréal (CHUM), the Hôpital du Sacré-Cœur, the Centre hospitalier universitaire de Sherbrooke, and the Jewish General Hospital.

The viability of CD34+ cells stayed high (>95%) after thawing, regardless of storage time for the samples studied. Furthermore, all samples showed positive clonogenic growth. Overall, the response to the IL-3-pSTAT5 test—which measures the functional potential of CD34+ cells—remained stable over time.

**This study shows that PSC units generally remain in good condition even after 15 to 30 years of storage. The storage duration of units should therefore not be considered when prioritizing which PSC units should remain in storage.**





## BLOOD PRODUCTS

### **A test developed by Héma-Québec identifies an uncommon phenotype in a patient with hemophilia**

A 46<sup>th</sup> blood group system has recently been discovered. It hinges on a single high-frequency antigen, known as LIL, present on the membrane protein ATP11C of red blood cells. Some individuals carry a complete deletion of the *ATP11C* gene, resulting in the lack of the LIL antigen and a risk of alloimmunization against this antigen.

In 2025, one such patient benefited from Héma-Québec's research expertise. He had hemophilia and presented with signs that suggested the presence of anti-LIL antibodies. Yet Héma-Québec had no genotyping test to characterize the *ATP11C* gene in this patient.

This project sought to develop a molecular biology test (PCR) targeting three distinct regions of the *ATP11C* gene for the purpose of screening for deletions associated with the LIL negative phenotype. The test, designed to target the proximal, central, and terminal segments of the *ATP11C* gene, showed complete deletion of the patient's gene. This result confirmed that the patient indeed exhibited the LIL negative phenotype.

This new test will allow Héma-Québec to more effectively identify LIL negative individuals, an extremely rare phenotype described in only seven other patients in the literature. It paves the way for a better serological and transfusion management of patients.



## BLOOD PRODUCTS

### **Héma-Québec develops a dependable method for characterizing platelet antigens**

Exposure to incompatible platelet antigens, notably during transfusions or pregnancy, might cause the development of antibodies directed against platelets (“alloimmunization”). Sometimes, identifying the exact specificity of these antibodies is challenging, requiring a more granular characterization of the platelet antigens of alloimmunized individuals. This characterization hinges on the amplification and sequencing of the genes that code for platelet antigens. Currently, Héma-Québec outsources these analyses to external suppliers but would rather perform them in-house for greater efficiency and time savings.

Our organization has thus developed a platelet genotyping approach using targeted amplification and sequencing of four genes linked to blood platelet antigen expression. The optimized approach then underwent testing by genotyping platelet antigens from different donors. The test targets 70 gene segments whose amplification specificity was confirmed by DNA sequencing. It meets the required performance criteria and ensures consistent identification of platelet antigens.

Héma-Québec now has a proven tool for characterizing platelet antigens. This approach paves the way for in-house management of complex cases of platelet alloimmunization.



## Other operational support

Although the Sorvall BP8 centrifuge handles relatively large weight differences between blood samples (i.e., up to 85 g), tests found that smaller differences cause significant vibration, mostly when concentrated on one side of the machine. The mechanical safety and efficiency of the centrifuge may be preserved by avoiding centrifuging bags with weights differing by more than 10 g.

Héma-Québec has designed a molecular biology test (PCR) capable of detecting an internal deletion in the *MAL* gene that causes the lack of the high-frequency AnWj erythrocyte antigen. This test will serve as an effective means of screening donors for this phenotype, thereby enhancing Héma-Québec's rare blood program.

The Reveos LR collection device was replaced by the Reveos LR-EXT. An assessment was conducted to analyze how this device change affected the Reveos processing and the quality of the plasma generated.

The Reveos LR-EXT device enables the collection of blood volumes ranging from 405 mL to 495 mL. Héma-Québec assessed the feasibility of increasing the target collection volume of Reveos from 460 mL to 480 mL by analyzing how this change impacted the physical properties and quality markers of generated blood products.



## Portrait

# Marie-Joëlle de Grandmont

## Chief, operational research

A trained microbiologist, Marie-Joëlle de Grandmont held several key jobs at Héma-Québec. After completing her master's degree at our Québec City site, she landed a position as a research assistant. Her responsibilities then grew in importance: she became project coordinator in 2014, senior operational research specialist in 2021, and chief operational researcher in 2024, a position she has held since.

In her current functions, she collaborates with project teams to ensure that research project designs align with operational needs. When necessary, she also assists with quality and regulatory processes.





**Marie-Joëlle de Grandmont**  
Chief, operational research

Furthermore, she plans and coordinates several activities, notably logistical support for research, technology transfers, and controlled activities, as well as the production of plasminogen concentrates.

Her career path illustrates the real opportunities for advancement within our organization. We wish to highlight her inspiring journey and her commitment to excellence in research at Héma-Québec.

**“I find it particularly rewarding to see the impact of research projects on our operations.”**

The background features a vibrant red color with several large, overlapping, curved shapes in a lighter shade of red. A prominent white, ribbon-like shape curves across the middle of the frame. In the bottom-left corner, there are blue geometric shapes, including a dark blue triangle and a lighter blue trapezoid, which appear to be part of a larger graphic element.

# **Product safety and efficacy, and donor health**

**Our organization's mission is focused on the quality of the products we distribute. Héma-Québec therefore carries out numerous scientific activities to guarantee the safety and effectiveness of its products and procedures.**



## BLOOD PRODUCTS

# Transfusion reactions reported to the Québec hemovigilance system: Comparing rates in children and adults

Few studies have compared the prevalence of transfusion reactions in children and adults. Furthermore, none of these studies were conducted in Canada.

To address this knowledge gap, Héma-Québec and the Institut national de santé publique du Québec used Québec's hemovigilance system data to analyze the impact of transfusion reactions in children and adults from 2005 to 2022. In total, data on more than 5 million transfusions and nearly 24,000 reactions were analyzed. The analysis found that children experienced more

than twice the rate of reactions compared to adults throughout the years covered by the study. This difference in reaction rates was particularly prominent among children and adolescents aged  $\geq 12$  months to 18 years, as well as among recipients of platelets or red blood cells. A noteworthy exception was children aged  $< 1$  month, who exhibited lower reaction rates than adults.

This study, published in the *British Journal of Haematology*, shows that children had higher rates of reported transfusion reactions than adults. More research is needed to establish whether this difference stems from a reporting bias, different transfusion practices in pediatric and adult recipients, or a genuine biological susceptibility in children.



## BLOOD PRODUCTS

# Surveillance of babesiosis in blood donors in southern Québec

The risk of emergence of babesiosis—an infectious disease transmitted by ticks—is rising in southern Québec. As of now, blood donations collected by Héma-Québec are not tested to screen for donations infected with this parasite. Any decision to implement this test requires a solid scientific basis, such as the collection of prevalence data in blood donors.

In partnership with Grifols, the American Red Cross, and the Institut national de santé publique du Québec, Héma-Québec evaluated the prevalence of blood samples with positive test results for *Babesia* nucleic acids collected from blood donors in five regions of southern Québec: Estrie, Montérégie, Montréal, Mauricie, and Centre-du-Québec. Ultimately, 28,000 donations were collected and tested. None tested positive for *Babesia* nucleic acids.

This study, published in the journal *Transfusion*, suggests that the risk of contracting babesiosis through a blood transfusion remains low in southern Québec. Héma-Québec continually evaluates the epidemiological situation of babesiosis to safeguard the safety of its blood products.





## BLOOD PRODUCTS

### **Characteristics of blood donors before and during the COVID-19 pandemic: An international study by the BEST Collaborative**

Blood product suppliers faced considerable challenges during the COVID-19 pandemic: blood product demand was unpredictable, and SARS-CoV-2 sparked legitimate concerns about the safety of donors, recipients, and collection staff. To overcome these issues, several measures were introduced that may have affected the composition of the donor base and product safety. Yet no international study had assessed the pandemic's impact on these aspects.

Héma-Québec carried out an international study in cooperation with the Biomedical Excellence for Safer Transfusion (BEST) Collaborative to review donor characteristics, including donations with positive test results for transfusion-transmissible diseases, before and after the COVID-19 pandemic. Eleven blood product suppliers in nine countries took part in the study. On average, whole blood donations dropped by 4.0% during the pandemic. The decline was particularly steep among first-time donors, men, and donors aged 16 to 25. The rate of positive infectious disease markers declined by 11.4%.

This study, published in the journal [\*Vox Sanguinis\*](#), confirms that most blood products suppliers had to deal with fewer donors during the pandemic.

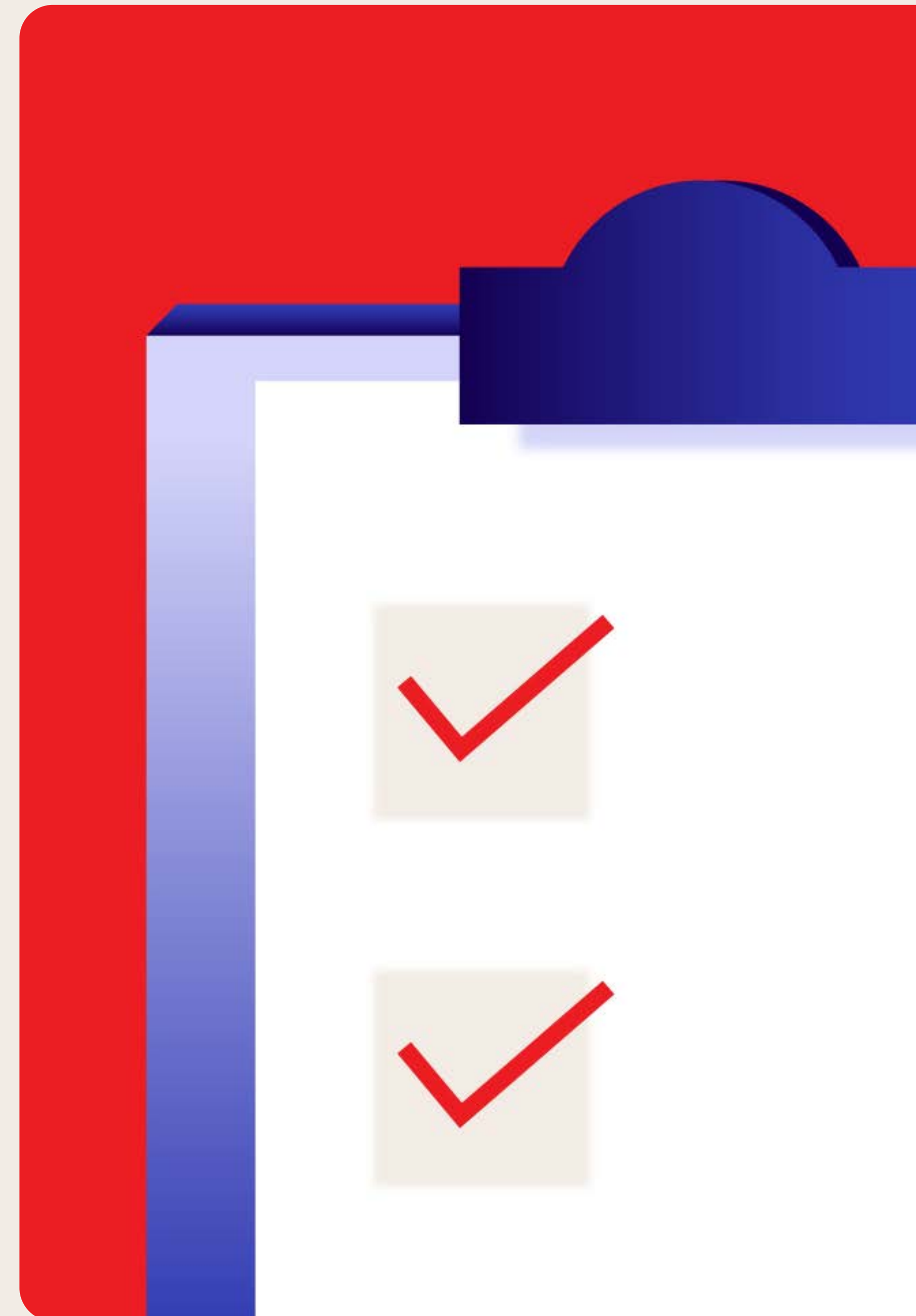
## BLOOD PRODUCTS

## HBV: A 3-month deferral period validated using statistical modelling

Until recently, individuals with risk factors for hepatitis B virus (HBV) infection could be deferred from donating blood for 3, 6, or 12 months, based on the specific risk factors that they reported. Not only was this approach complex, but it also potentially hampered access to blood products, as data suggest that a uniform deferral period of 3 or 4 months could be more than adequate.

In partnership with Sanquin and NHS Blood and Transplant, Héma-Québec modelled to what extent a 3-month deferral period would increase the risk of collecting HBV-infected blood compared to a 4-month deferral period. In total, the modelling included 10,000 HBV-infected donors (all simulated). Of these 10,000 infected donors, only 32 would test positive for HBV between the 3<sup>rd</sup> and 4<sup>th</sup> month after exposure to the virus. That equates to only one additional contamination per 7.8 million donations collected.

This study, published in the journal *Transfusion*, suggests that the adoption of a 3-month deferral period entails a negligible risk compared to a 4-month deferral.





## BLOOD PRODUCTS

### **Safety and contemporary use of autologous blood donations prior to obstetric delivery**

Autologous blood donation (ABD) can be indicated for pregnant women with rare blood types. Unlike hospitals, several blood services are, however, reluctant to collect ABD from this at-risk population.

Héma-Québec conducted a study assessing the safety and efficacy of prepartum ABD carried out at its facilities. A total of 24 pregnant women with rare blood types underwent 52 ABD between 2010 and 2021. Only 3 (7.9%) on-site vasovagal reactions were reported, which is less than expected considering the donors' risk factors (i.e., all women who were first-time donors). None of the 41 units of autologous blood distributed were transfused to the mother, but three were transfused to the newborn. Over half of the ABD were conducted less than three weeks before the expected delivery date, while guidelines recommend a minimum of three weeks.

These results, published in the journal *Transfusion*, suggest that pregnant women may safely donate autologous blood through a blood service. Thus, that is an option to consider for pregnant women with rare blood types who lack access to compatible allogeneic products.



## BLOOD PRODUCTS

### **Vein-to-vein databases: Uses and considerations in transfusion medicine**

The name says it all: vein-to-vein databases collect information on blood donors, collected products, and recipients to improve our understanding of transfusion safety and effectiveness. Such databases are generating considerable interest within the scientific community, primarily because linking large amounts of data between donors and recipients promises to open unprecedented opportunities in transfusion research.

In a recently published article in the journal *Transfusion Medicine Reviews*, Héma-Québec joins other blood services in the United States and in Europe in drawing attention to the many advantages of implementing such databases. The article also outlines the numerous technical, legal, and statistical challenges associated with these databases.

This deliverable is part of Héma-Québec's goal to help set up such a database in Québec—and possibly across Canada.



Portraits

**Lucie Richard and Élise Trudel both work at Héma-Québec's Reference Laboratories. They have been a highly effective duo for many years now.**



From 2001 to 2007, Lucie Richard served as administrative and scientific director of the Reference Laboratories. As such, she oversaw the erythrocyte serology and genotyping programs, the rare blood bank, the cord blood bank, and all areas related to human leukocyte antigen (HLA) and platelet immunology. In 2008, she shifted her focus from administration to scientific management to obtain the American Society for Histocompatibility and Immunogenetics (ASHI) accreditation required for the HLA histocompatibility laboratory. Her numerous research initiatives and partnerships have propelled Héma-Québec's HLA and platelet immunology laboratories to international prominence.



“From a scientific perspective, patients are the most interesting part of our work. This is what motivates us and what we’re passionate about.”

**Lucie Richard**, Scientific director,  
platelet immunology laboratory



Élise Trudel joined Héma-Québec as a specialist in the HLA and platelet immunology laboratories. Prior to becoming part of our team, she accumulated no less than 14 years of experience in comparable fields at the Red Cross and Canadian Blood Services. This background constitutes a tremendous asset for our organization and serves to support the Reference Laboratories team in meeting hospital requests for specialized analyses required to treat their patients.

“What brings us together is teamwork, collaboration, and mutual support—always with the goal of treating patients.”

**Élise Trudel**, Senior specialist,  
platelet immunology

# **External training and knowledge dissemination**

**Héma-Québec fosters emerging talent  
in fundamental and applied research  
in sectors relevant to its activities. It  
frequently welcomes physicians seeking  
specialization in transfusion medicine.**





## Contribution of Héma-Québec scientific staff to training activities and continuing education workshops

3

### training sessions

offered to professionals from the healthcare network:

- Immunohematology training program
- Regulatory training program for cord blood collection
- World Cord Blood Day Webinars

4

### university courses

offered by researchers and physicians.

1

### workshop

offered by Héma-Québec researchers and physicians.

4

### educational presentations

performed during events.



11

**students in training**  
(including 2 PhD students and 9 master's students).

2

**postdoctoral  
researchers**  
in training.

2

**master's theses**  
were submitted  
in 2025.



## Hats off!

**A master's student  
earned a place on  
the Honour Roll of  
Université Laval's  
Faculté des études  
supérieures et  
postdoctorales for her  
outstanding thesis.**

# Contributions to scientific groups

**Beyond conducting its own research projects, Héma-Québec actively supports initiatives run by external partners. In 2025, 26 studies were published as a result of these collaborations.**

**Héma-Québec also provides research teams with unused biological material from blood product donations (e.g., leukocytes in leukocyte reduction cones, cord blood samples). In 2025, 16 research teams throughout Québec took advantage of these products, which allowed for better use of our donors' blood products.**



**Héma-Québec's scientific staff is also involved in several scientific groups, a number of which are international in scope, including:**

- Agence de la biomédecine (France)
- American Society of Transplantation
- Association for the Advancement of Blood & Biotherapies
- Biomedical Excellence for Safer Transfusion Collaborative
- Canadian Institutes of Health Research
- Canadian Society for Transfusion Medicine
- Canadian Society of Transplantation
- Canadian Standards Association Group
- Cell Therapy and Transplant Canada
- Data Standards Hackathon
- European Milk Bank Association
- Fonds de recherche du Québec – Santé
- Foundation for the Accreditation of Cellular Therapy
- Institut national de la santé et de la recherche médicale (France)
- International Society of Blood Transfusion
- Invitational Conference of Investigational immunohematologist
- International Society for Research in Human Milk and Lactation
- National HLA Advisory Committee
- Natural Sciences and Engineering Research Council of Canada
- Société Francophone de Transfusion Sanguine
- World Marrow Donor Association



# Outreach

## Appointments and awards

Our teams worked tirelessly to participate in the organization of a joint conference between Cell Therapy Transplant Canada (CTTC) and the International Donor Registry Conference (IDRC), which was awarded two prizes: “Best congress” and “First prize among events held in 2025 of the Cercle des ambassadeurs de la Ville de Québec”.

Dr. Nancy Robitaille was awarded one of the 2025 Awards of Merit from the Canadian Standards Association (CSA) Group. This recognition honours CSA Group members for their outstanding individual contributions and leadership in the development and advancement of standards at the national level.

In addition to be granted an emeritus membership in the Association des médecins hématologues et oncologues du Québec, Dr. Sylvie Lachance has been selected to serve as chair-elect of the World Marrow Donor Association’s Medical Committee. This appointment is the result of a rigorous process aimed at ensuring a balance between expertise, regional representation, and the committee’s current strategic requirements.

### **Professor Clermont Dionne: An exemplary commitment**

After serving on Héma-Québec’s Research Ethics Committee for more than two decades, Professor Clermont Dionne is retiring. An experienced epidemiologist, full professor, he is also director of Université Laval’s Department of Social and Preventive Medicine. Héma-Québec commends his commitment, whose rigor and humanity have shaped its ethical practices in research. Many thanks!



## Héma-Québec's scientific outreach in figures

**47**  
publications

**13**  
invited lectures

**15**  
oral presentations  
at conferences

**27**  
conference poster  
presentations



## Publications in peer-reviewed journals

1. Amar, Sam, Gilles Paradis, Aimina Ayoub, et al. 2025. “Preeclampsia and Onset of Renal Disorders in the Long-Term Period Following Pregnancy.” *American Journal of Nephrology*, July 21, 1–9. <https://doi.org/10.1159/000547538>.
2. Amar, Sam, Brian J. Potter, Gilles Paradis, et al. 2025. “Outcomes of Postpartum Preeclampsia: A Retrospective Cohort Study of 1.3 Million Pregnancies.” *BJOG: An International Journal of Obstetrics and Gynaecology* 132 (6): 752–59. <https://doi.org/10.1111/1471-0528.18030>.
3. Andronache, Ruxandra, Jessica Healy-Profitós, Fiona Young, Antoine Lewin, and Nathalie Auger. 2025. “Limited Impact of COVID-19 on Pre-Existing Trends in Postpartum Infection.” *Journal of Obstetrics and Gynaecology Canada* 47 (8): 102 961. <https://doi.org/10.1016/j.jogc.2025.102961>.
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  10. Bienz, Marc, Jessica Constanzo-Yanez, Nadia Baillargeon, et al. 2025. “Planning Antepartum Directed Donations in Preparation for Neonatal Cardiac Surgery in the Absence of Compatible Donors.” *Transfusion* 65 (1): 234–39. <https://doi.org/10.1111/trf.18087>.
  11. Boccacci, Yelena, Nellie Dumont, Yannick Doyon, and Josée Laganière. 2025. “CRISPR-Cas9-Driven Antigen Conversion of Clinically Relevant Blood Group Systems.” *Human Molecular Genetics* 34 (12): 1001–8. <https://doi.org/10.1093/hmg/ddaf040>.
  12. Boucoiran, Isabelle, Hinatea Dieumegard, Emmanuel Bujold, et al. 2025. “CMV Primary and Non-Primary Infections among Daycare Workers, and Development of Strategies to Prevent Infection (EDUQ-CMV): A Mixed-Method Study Protocol.” *BMC Infectious Diseases* 25 (1): 1658. <https://doi.org/10.1186/s12879-025-11984-2>.
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# Our teams' scientific roles and responsibilities

## Vice-présidence aux affaires médicales et à l'innovation

**Marc Germain, MD, PhD, FRCPC**

Provides medical, scientific and nursing expertise, in addition to monitoring activities, which enable the offering of services and safe biological products of human origin that integrate the most recent technological advances while ensuring the development and production of human tissues.

### Direction scientifique

Renée Bazin, PhD

[renee.bazin@hema-quebec.qc.ca](mailto:renee.bazin@hema-quebec.qc.ca)

- Supervises and supports all scientific activities within the Vice-présidence aux affaires médicales et à l'innovation as well as those of the rest of the organization.
- Oversees the training program for the next generation of scientists.
- Is in charge of the activities of the Comité de gouvernance des projets scientifiques (GoPAMI).



### **Direction de la recherche**

Mélanie Dieudé, PhD

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- Contributes to improving knowledge through innovation projects in all activity sectors of the organization.
- Develops and contributes to projects in collaboration with university and industry sectors locally, nationally and internationally.
- Carries out projects aimed at developing new products, tests and processes.
- Develops and carries out projects in response to the technical or operational needs of the entire organization.
- Provides scientific expertise to all sectors of the organization.

### **Direction épidémiologie, vigilance et risques biologiques**

Antoine Lewin, PhD, MPH

[antoine.lewin@hema-quebec.qc.ca](mailto:antoine.lewin@hema-quebec.qc.ca)

- Leads epidemiological research projects.
- Is responsible for strategic monitoring in Héma-Québec's areas of activity.
- Provides expertise in risk management of biological products prepared by Héma-Québec.
- Provides scientific, biostatistical and methodological support to the design, management, execution, analysis and publication of scientific studies and research protocols.
- Trains students in epidemiology and statistics.



### **Direction médicale, microbiologie et épidémiologie**

Christian Renaud, MD, MSc, FRCPC  
[christian.renaud@hema-quebec.qc.ca](mailto:christian.renaud@hema-quebec.qc.ca)

- Follows up suspected transfusion-transmitted infections.
- Contributes to knowledge improvement through innovative projects in microbiology and epidemiology.
- Provides expertise in risk management of biological products prepared by Héma-Québec.
- Provides medical expertise in microbiology and infectious diseases.
- Participates in the evaluation of reported transfusion reactions and donor selection criteria.

### **Direction médicale, donneurs et receveurs**

Sylvie Lachance, MD, FRCPC, DRCPC  
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- Provides a medical expertise in hematology, cell transplantation and cell therapy.
- Participates in the determination and the revision of donor eligibility criteria for the different product lines.
- Contributes to donor and recipient safety by reviewing and analyzing adverse events associated with the donation, collection or administration of blood products, cells, or tissues.
- Contributes to knowledge improvement through innovative projects related to the donation, donor selection and safety of donors and recipients.



### **Direction des services infirmiers**

Isabelle Rabusseau, inf.

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- Ensures that best practices are maintained and recommends the actions aimed at improving practices to preserve the safety of donors and recipients of blood products.
- Participates in the knowledge development of collection staff and in the implementation of changes related to blood drives, and analyzes the effects of these changes in collaboration with other sectors of the organization.
- Evaluates and determines the eligibility of blood product, mothers' milk and stem cell donors who have a special condition.
- Supports the management and monitoring of donation-related risks and assesses transfusion-related adverse event files.

### **Direction de l'exploitation des tissus humains**

Étienne Fissette, BSc, MBA

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- Is responsible for collecting, processing, qualifying, storing and distributing human tissues.
- Collaborates with the Direction de la recherche to develop new products and processing procedures for human tissues.
- Develops the mandate of acting as the exclusive distributor of human tissues, which implies supplying hospitals that transplant human tissues, such as corneas, tendons or skin.
- Strengthens relationships with transplant surgeons in collaboration with the Vice-President, Medical Affairs and Innovation.
- Monitors tissue transformation processes to enhance Québec's self-sufficiency in human tissues.



## Vice-présidence à la médecine transfusionnelle

**Nancy Robitaille, MD, FRCPC**

Provides testing, services and specialized products in transfusion medicine and stem cell transplantation that help hospitals and our international partners provide their patients with the care they need on a timely basis, in addition to participating in the production of educational material related to transfusion medicine.

### **Direction médicale, hématologie et cellules souches**

Catherine Latour, MD, FRCPC

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- Supervises transfusion medicine fellows and is responsible for training days intended for resident physicians in hematology and oncology.
- Provides medical expertise in hematology and cell therapy.
- Participates in the assessment of declared transfusion reactions and donor selection criteria.
- Helps manage rare blood cases by providing expertise in erythrocyte and platelet immunology.



### **Direction des cellules souches**

Diane Fournier, PhD

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- Manages the activities of the Stem Cell Donor Registry, including the enrollment, qualification, research, selection and support of donors.
- Ensures all the operations of the Public Cord Blood Bank, from donor enrollment to product distribution.
- Provides an autologous peripheral stem cell cryopreservation service for four hospitals.
- Manages the registration and qualification of mother's milk donors.



### **Direction des Laboratoires de référence**

Sandrina Da Fonseca, PhD

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- Conducts specialized erythrocyte, platelet and leukocyte immunology (HLA) tests for hospitals' blood banks.
- Maintains an inventory of phenotyped and frozen pellets.
- Conducts HLA tests for the Stem Cell Donor Registry, the Public Cord Blood Bank and the Platelet Registry with compatible HLA profiles.
- Selects specialized blood products that are compatible with patients.
- Is responsible for the rare blood program.

### **Direction du partenariat clinique avec les centres hospitaliers**

Marie-Hélène Robert, TM, RT

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- Reinforces Héma-Québec's partnership role.
- Develops a personalized client-centered approach based on the client's needs.
- Promotes and communicates the hospital's perspective on each project.



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