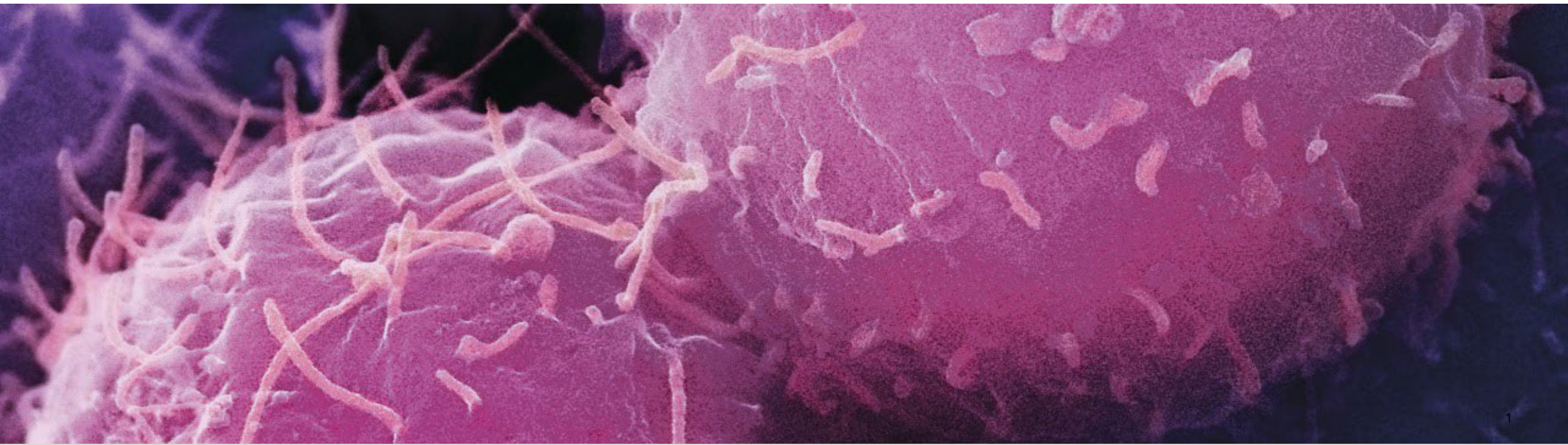


# Primary Blood and Immune Cells for Research

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# Agenda



Introduction and hematopoiesis



Tissue sources - overview



Donor variety



Products by tissue type



Applications



Support and resources



# Not Every Cell Will Work in Your Assay...

Discover our expanded portfolio of blood and immune cells



01

Highest quality blood tissue and cells



02

Unmatched donor and cell variety



03

X-VIVO® Serum-free Hematopoietic Cell Culture Media – with cell guarantee\*



04

World-class scientific support team



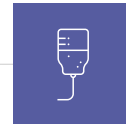
05

*More than cells* – support for wide ranging workflows including transfection using Lonza's Nucleofector® Technology



06

Global supply reach



07

Full donor consent and IRB-approved collection facilities



08

Certificate of Analysis, SDS in multiple languages

\* Lonza guarantees the performance of its primary cells only if appropriate Lonza recommended media and reagents are used exclusively and the recommended storage and use protocols are followed. Any modifications made to the recommended cell systems including the use of alternative media, reagents or protocols, will void cell and media performance guarantees. If you need assistance in selecting the appropriate media, reagents, or protocol, please contact Lonza Scientific Support.



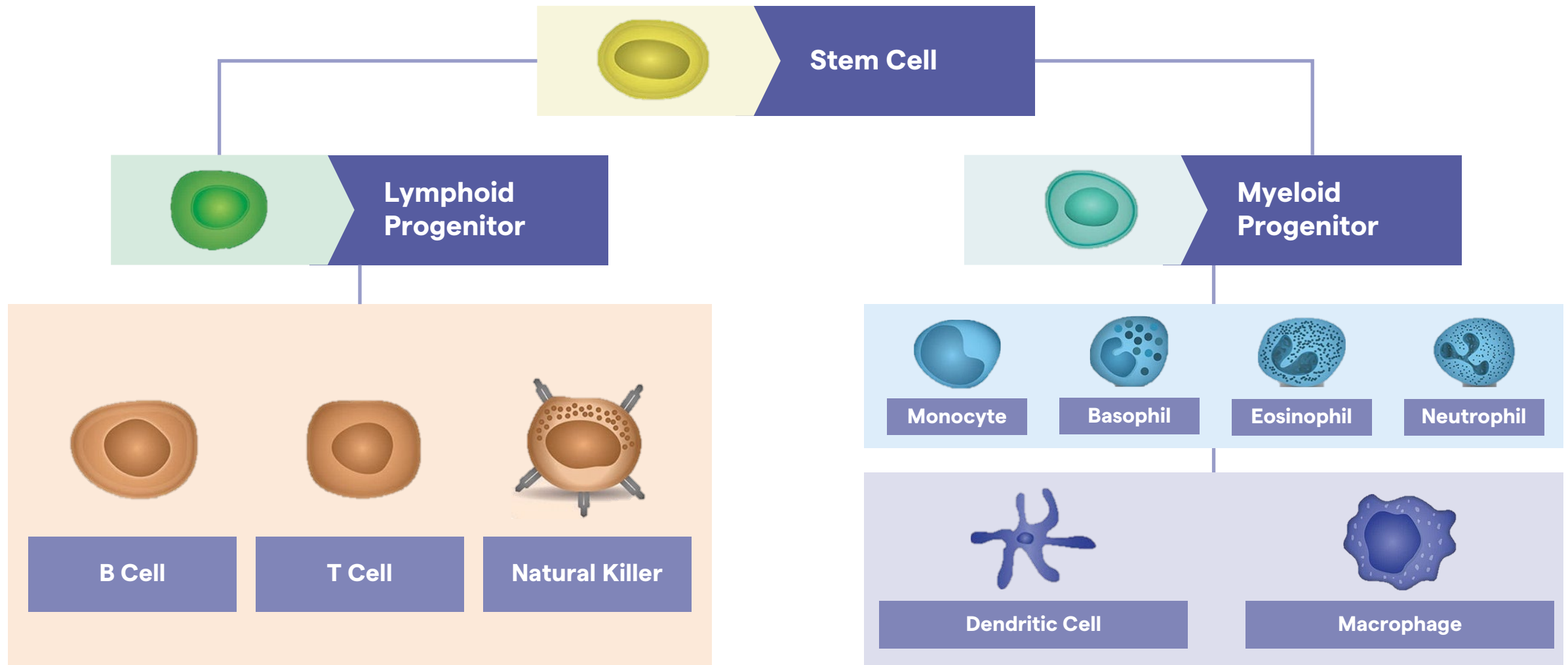



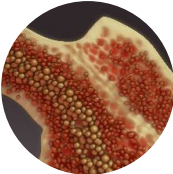



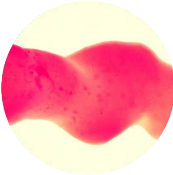
# The Hematopoietic System

From stem cells to T Cells

# Lonza

Cell & Gene



			Availability 
	<b>Bone Marrow</b>	<ul style="list-style-type: none"> <li>The source of hematopoiesis (the process by which blood cells are formed)</li> <li>Up to 100mL per donor can be obtained</li> </ul>	<ul style="list-style-type: none"> <li>Fresh whole bone marrow</li> <li>Source for characterized cells including mesenchymal stem cells, CD34+ stem/progenitor cells, and mononuclear cells</li> </ul>
	<b>Peripheral Blood (Leukopak)</b>	<ul style="list-style-type: none"> <li>The result of leukapheresis: a specific type of apheresis in which white blood cells are separated from the rest of the blood components</li> </ul>	<ul style="list-style-type: none"> <li>Fresh leukopaks in multiple sizes (volume or total cell count)</li> <li>Source for characterized immune cells</li> </ul>
	<b>Mobilized Peripheral Blood (Leukopak)</b>	<ul style="list-style-type: none"> <li>Donor is treated with drug which “mobilizes” cells from the bone marrow to the peripheral blood for easier collection, and in greater quantities</li> <li>Multiple treatment regimens available</li> </ul>	<ul style="list-style-type: none"> <li>Fresh mobilized leukopaks</li> <li>source for large quantities of CD34+ stem/progenitor cells</li> </ul>
	<b>Whole Blood</b>	<ul style="list-style-type: none"> <li>Collected by standard venipuncture</li> <li>Various volumes, containers, anticoagulants available</li> </ul>	<ul style="list-style-type: none"> <li>Whole blood</li> <li>Serum, plasma</li> <li>Erythrocytes</li> </ul>
	<b>Cord Blood</b>	<ul style="list-style-type: none"> <li>Obtained from the umbilical cord during birth</li> <li>Valuable for obtaining cells in a more naïve state</li> </ul>	<ul style="list-style-type: none"> <li>Source for isolated cryopreserved CD34+ Stem/Progenitor cells</li> </ul>

# Donor Variety

Robust programs to find exactly the cells you need



## FEATURES

- > All donations from healthy, consenting donors following IRB-approved protocols
- > Donors from multiple geographic regions in the US with different ethnicities (west coast, northeast, mid-atlantic)
- > Dedicated teams to manage, recruit, recall, and support donors
- > “Made to order” requests are available (select your specific donor attributes)
- > Large donor variety of select cryopreserved cells in stock and ready to ship



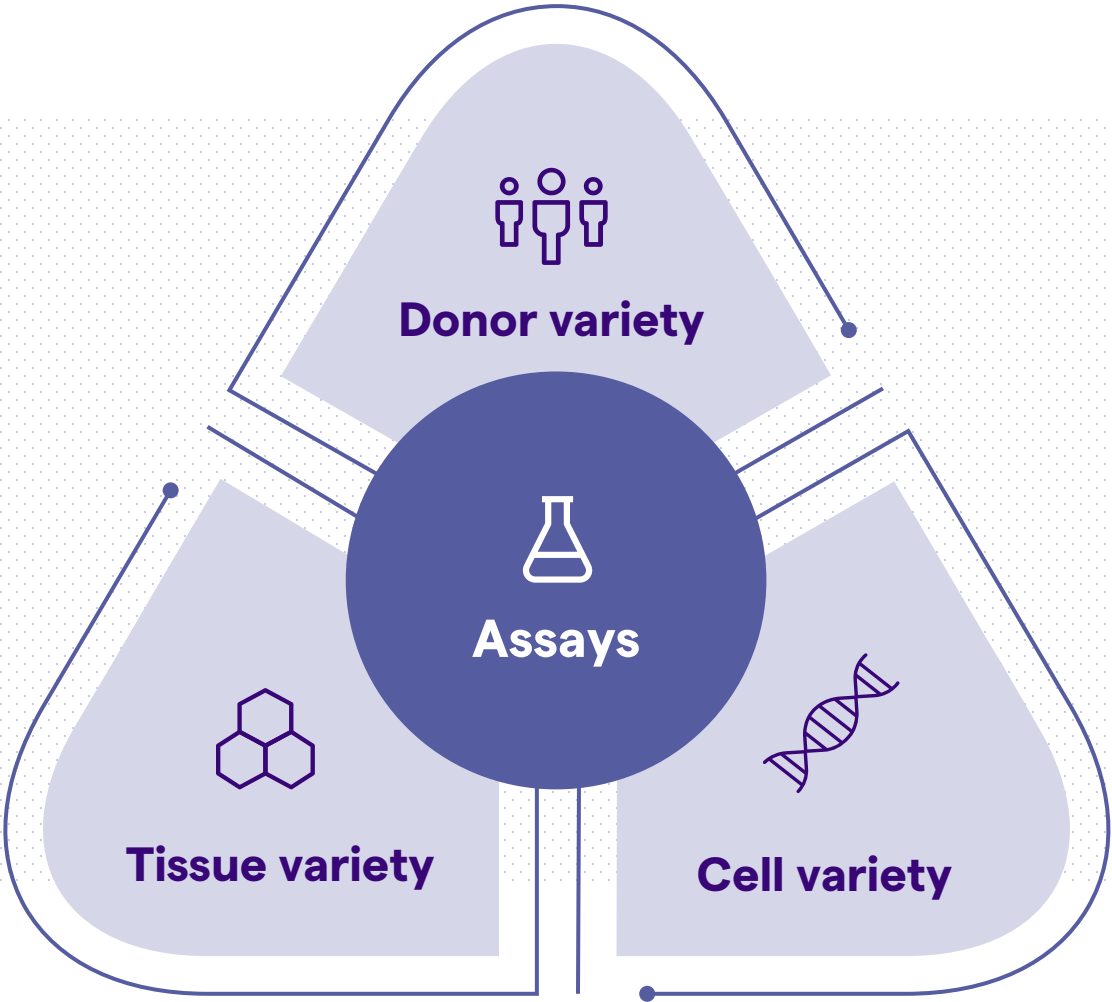
## BENEFITS

- > Access the specific donor attributes you require for your experiments
- > Choose multiple donors to account for population diversity
- > Obtain cells from a specific donor over time\*
- > Compliance with ethical and regulatory guidelines
- > Start your experiments immediately with in-stock cryopreserved cells

\* Every effort within ethical and IRB approved limits will be made to schedule specific donors for recall, but no guarantee can be made regarding availability

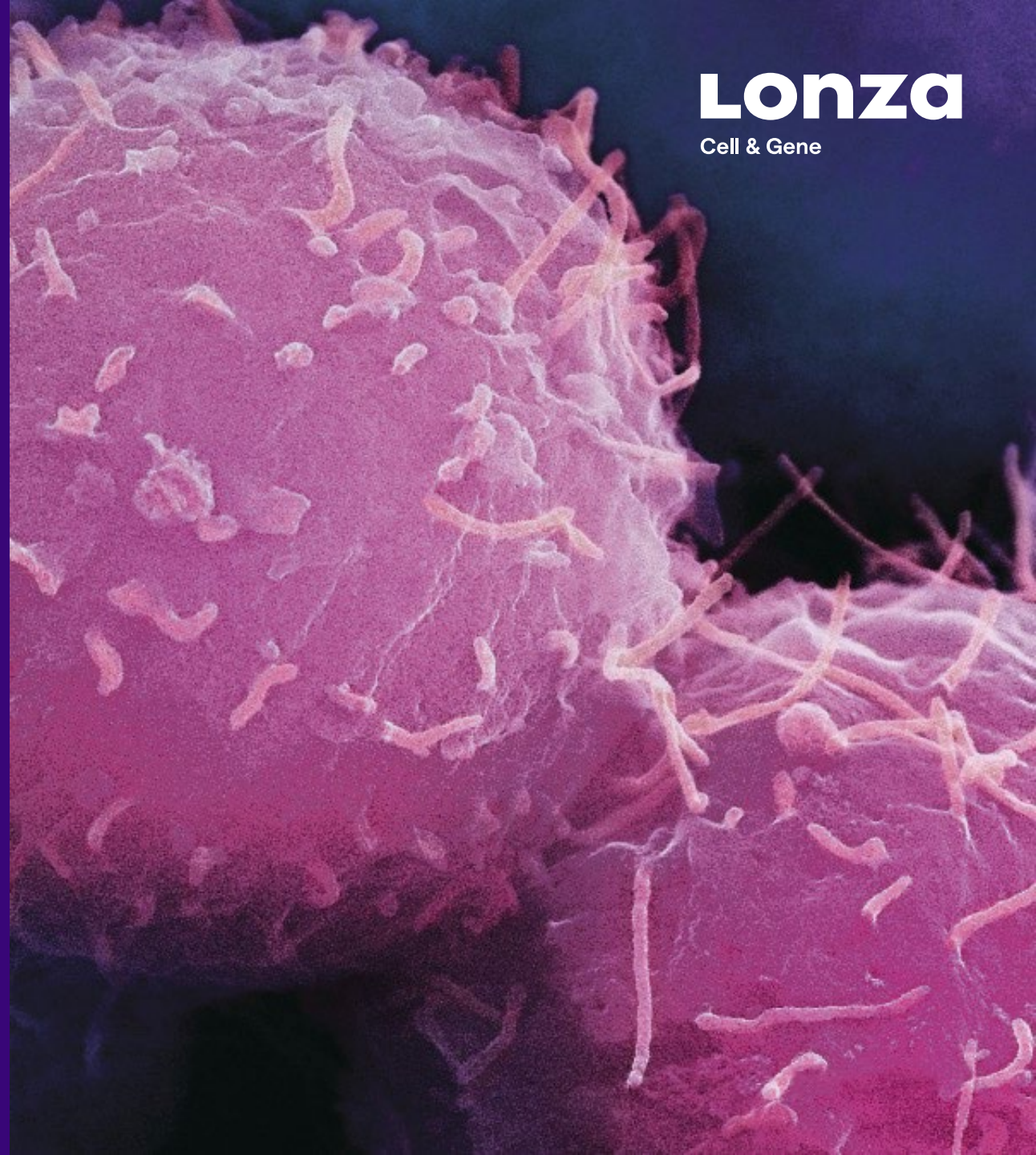


# Flexible and Robust Sourcing



# Products by Tissue Type

**Lonza**  
Cell & Gene





# Peripheral Blood Leukopak

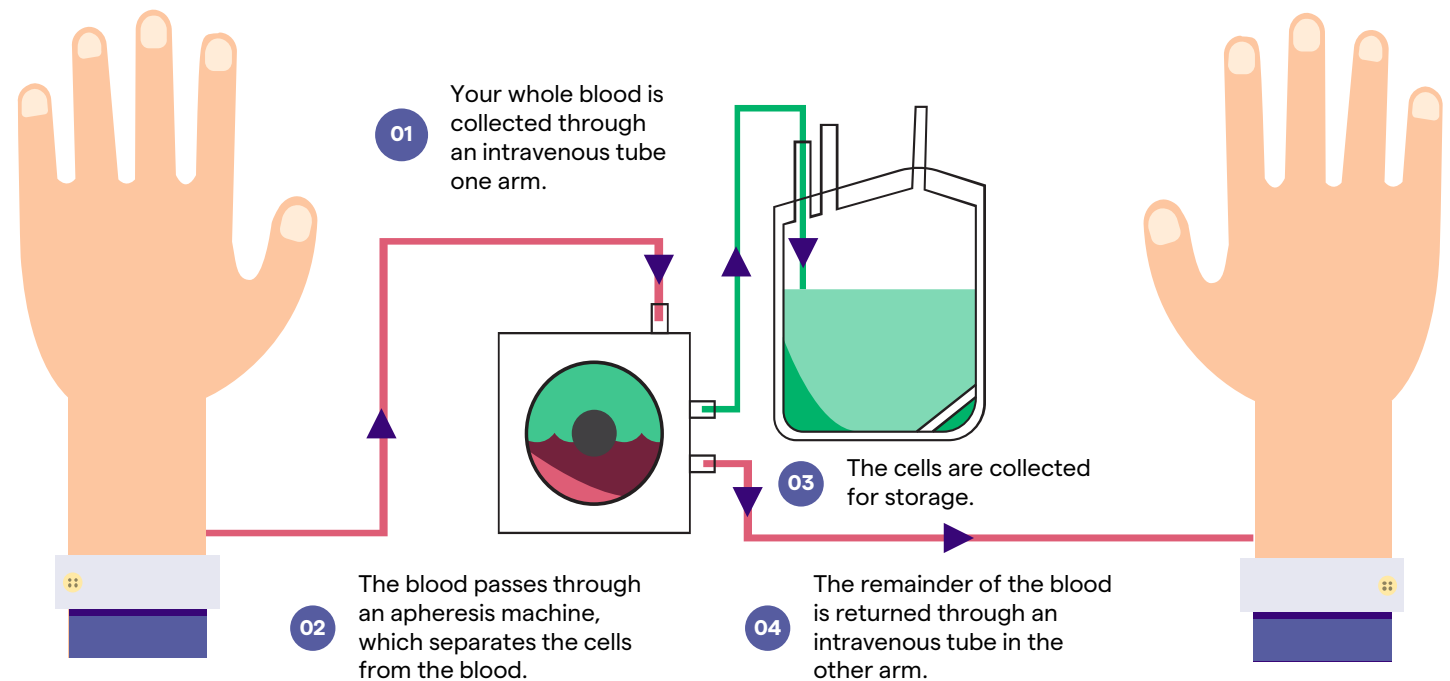
## Blood enriched for leukocytes

### Process



- > **Leukopaks** are the end product from leukapheresis, a process by which donors supply blood enriched for leukocytes (white blood cells).
- > Collections are performed using the Spectra Optia® Apheresis System, from healthy, consenting adults, and following IRB-approved protocols.
- > Mononucleated cell-rich blood is continuously collected into a sterile bag using ACD-A as an anticoagulant
  - Roughly 12 donor blood volumes are processed for a full procedure
  - Volume-based leukopaks : full / half / quarter
  - Minimum Cell Count-based leukopaks: 10B/5B/2.5B
- > Donor attributes may be selected to suit experimental design
- > Donors are compensated for time and effort per NIH guidelines

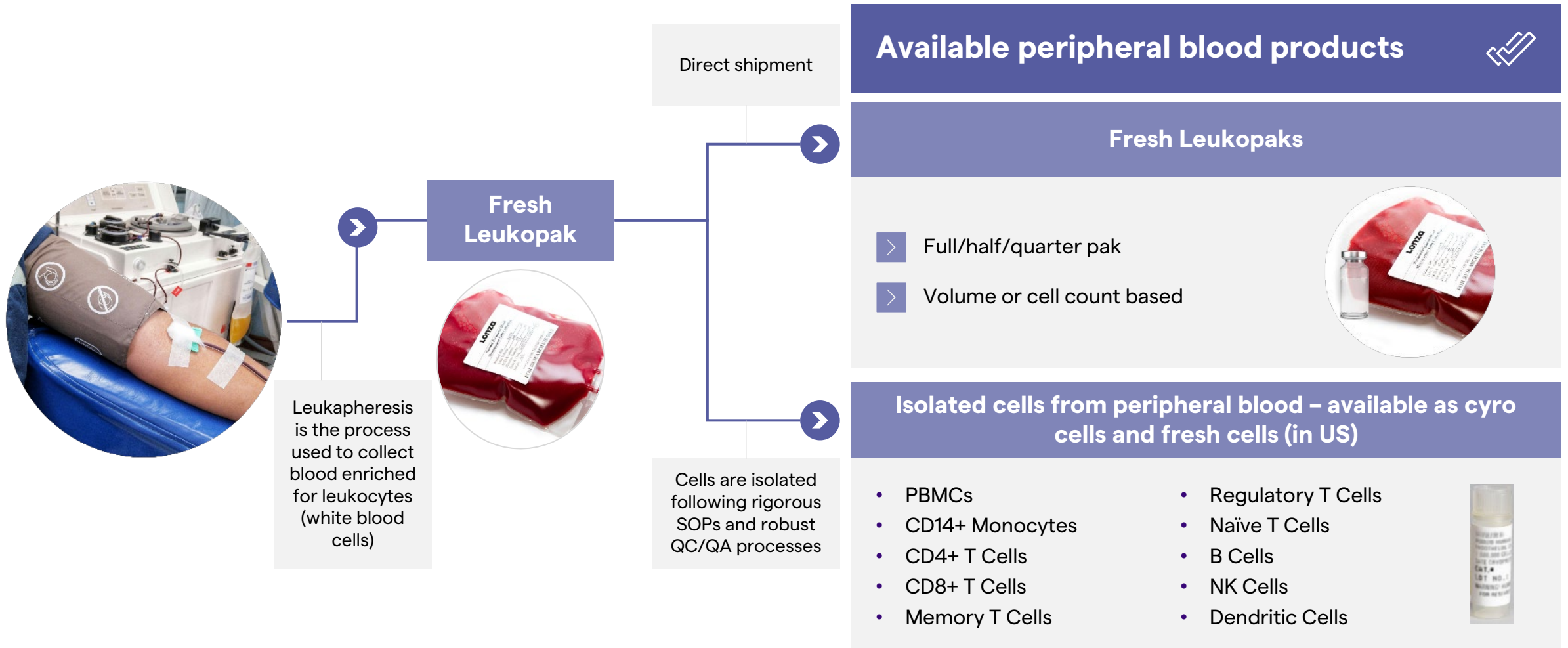
### APHERESIS PROCESS



	CD34+	CD3+ Pan T	CD4+ T Cells	CD8+ T Cells	CD14+ Mono	CD19+ B Cells	NK Cells	Granulo-cytes
Typical %	< 0.01%	60%	32%	23%	11%	7%	5%	10%

# Peripheral Blood Products

## Leukopaks



# Mobilized Leukopak

Obtain large quantities of CD34+ hematopoietic stem cells



Mobilized leukopaks are the end product from the leukapheresis from donors pre-treated with a mobilization drug (Neupogen® or Mozobil®)

- Mobilization drug causes cells in the bone marrow to be “mobilized” into the circulating peripheral blood. Easier to obtain blood via venipuncture compared to bone marrow aspiration. Additionally, up to 10x more CD34+ cells can be obtained from a mobilized leukopak vs bone marrow aspiration



Donors are healthy, consenting adults, and all protocols are IRB approved.



Multiple treatment regimens available (see table to right)



**Large quantities of CD34+ HSCs and CD14+ Monocytes can be obtained from mobilized leukopaks**

## Regimen description

RegF	Neupogen® dosed at 10µg/kg/day for 5 days leading up to collection on day 5.	2 collection days available (day 5 and day 6)
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RegH	Neupogen® dosed at 10µg/kg/day for 5 days leading up to collection. Mozobil® dosed at 240 µg/kg/day on days 4 and 5	2 collection days available (day 5 and day 6)
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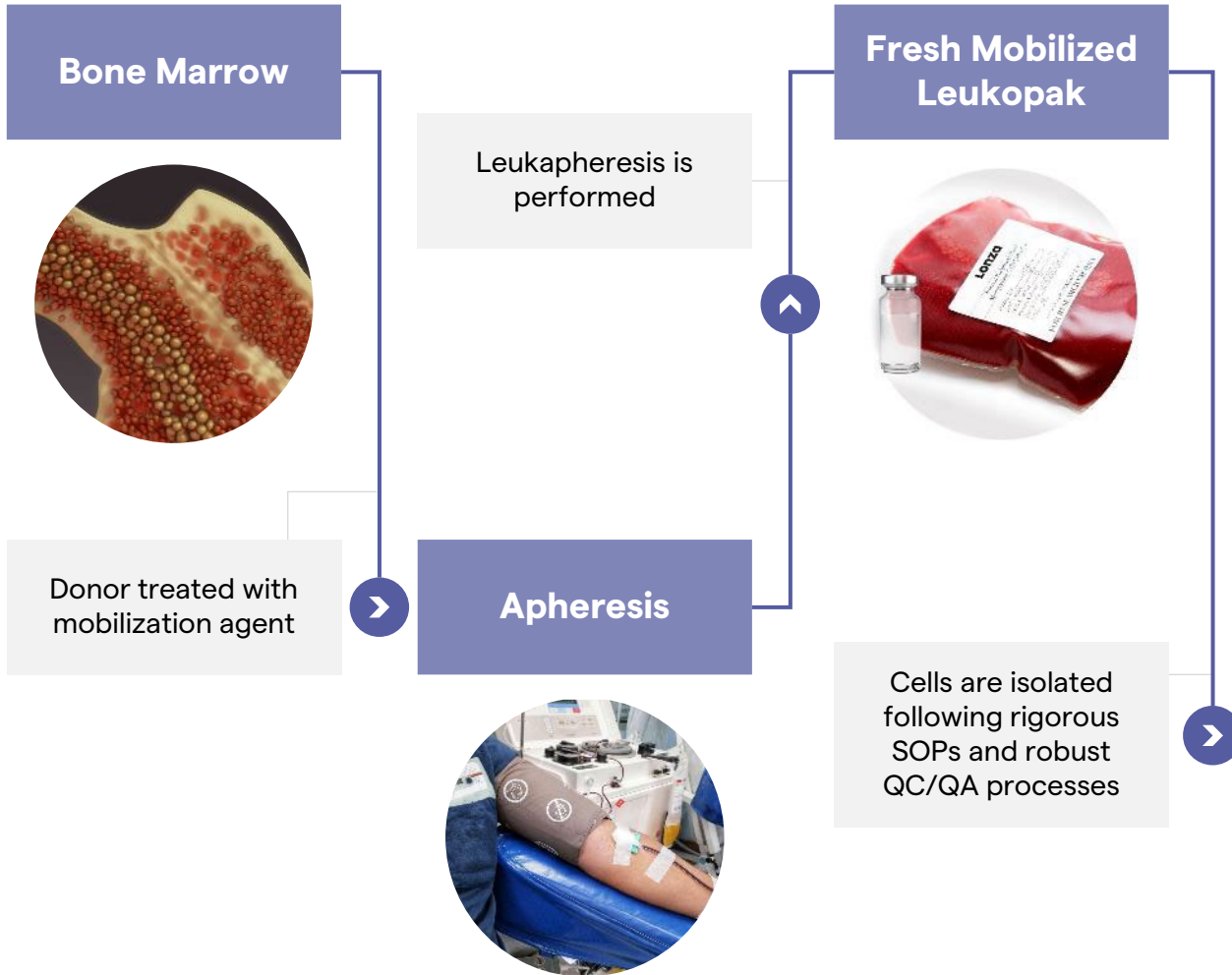
MozA	Mozobil® dosed at 20mg/mL, 1.2 mL single dose	Single collection on day 5
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	CD34+ HSCs	CD3+ Pan T	CD4+ T Cells	CD8+ T Cells	CD14+ Mono	CD19+ B Cells	NK Cells	Granulo- cytes
Typical %	1%	15%	10%	8%	25%	5%	5%	40%

- Neupogen is a registered trademark of Amgen Inc. Mozobil is a registered trademark of Genzyme Corporation

# Mobilized Blood Products

## Mobilized leukopaks



## Available Mobilized Blood Products



## Fresh Mobilized Leukopaks

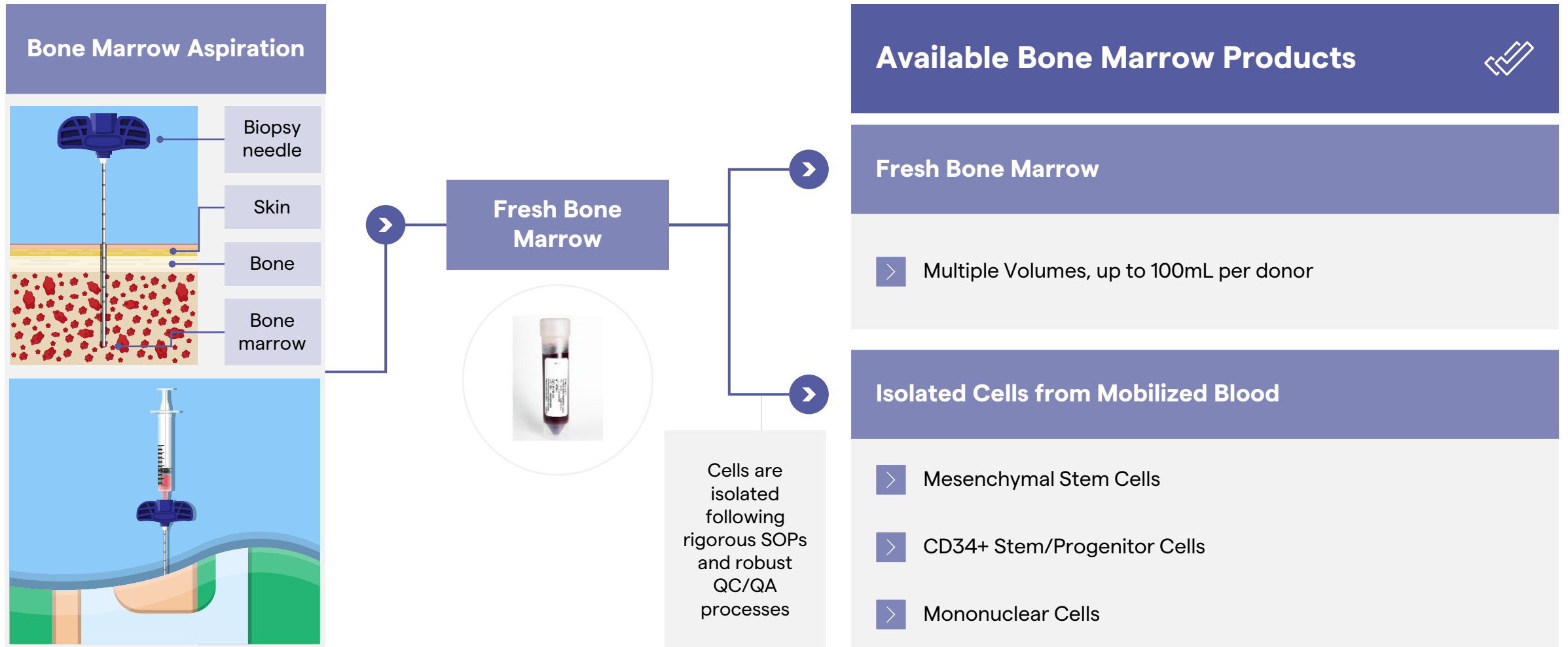
- > Available as full leukopaks
- > Multiple treatment options
  - RegF
  - RegH
  - MozA

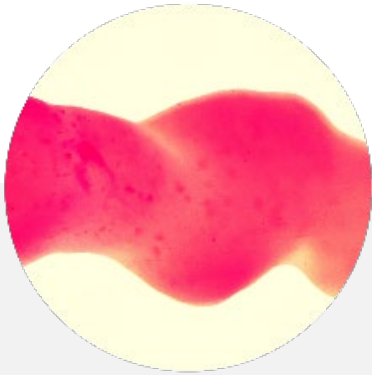


## Isolated Cells from Mobilized Blood

- > CD34+ Stem/Progenitor Cells
- > CD14+ Monocytes







**01** Baby is born with umbilical cord and placenta attached.

**02** After the cord is tied and cut, some blood is left in the blood vessels of the placenta and cord

**03** This cord bleed is extracted from the umbilical cord using a special collection bag.

Cells are isolated following rigorous SOPs and robust QC/QA processes

## Available Cord Blood Products



### Isolated Cells from Cord Blood

- > CD34+ Stem/Progenitor Cells
- > Mononuclear Cells
- > CD14+ Monocytes
- > CD3+ T Cells
- > CD4+ T Cells
- > CD8+ T Cells
- > Naïve T Cells
- > NK Cells

## Fresh Whole Blood



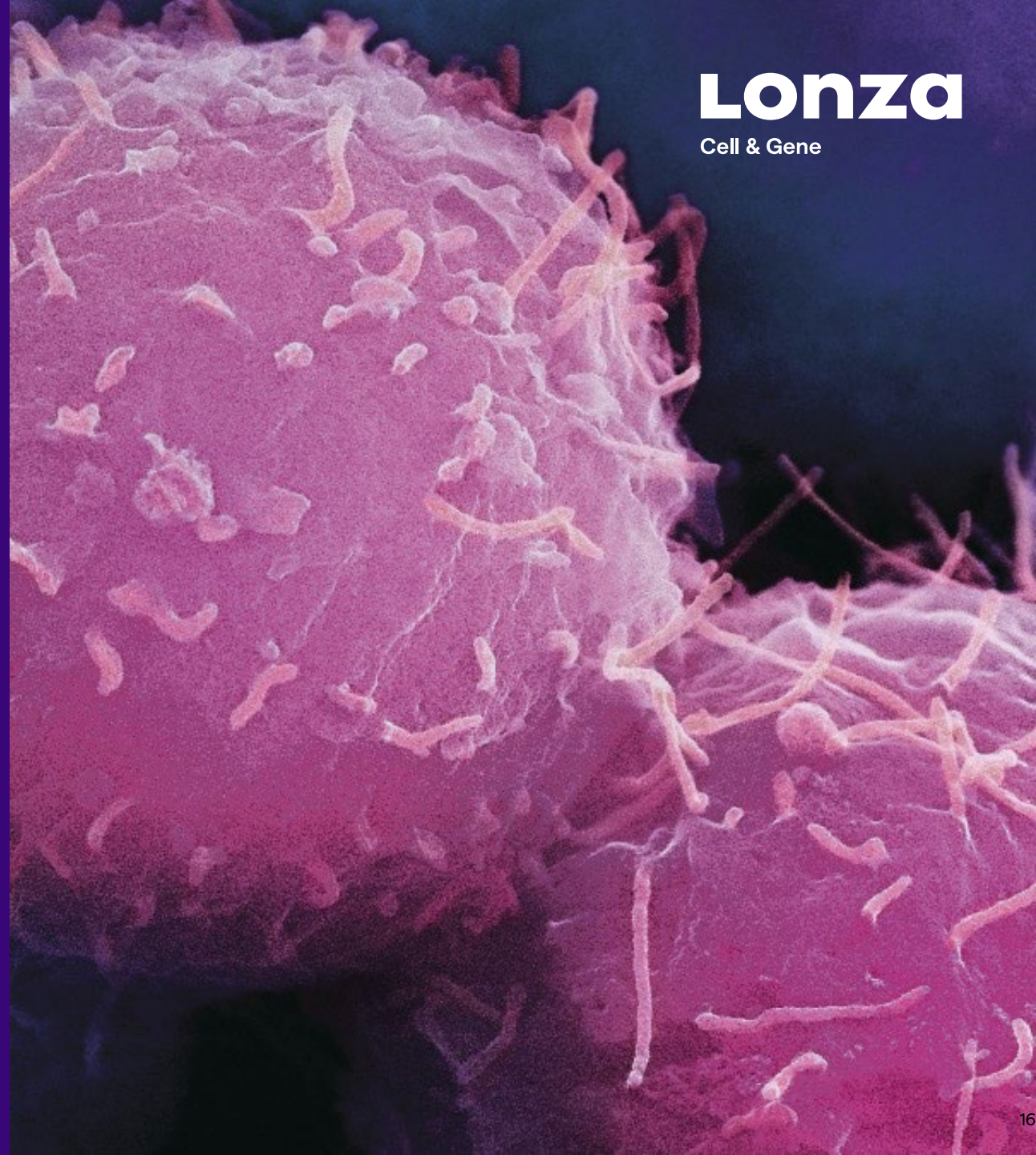
## Available Whole Blood Products



- > Whole blood in
  - *Multiple container types*
  - *Multiple anticoagulants*
  - *Multiple volumes*
- > Plasma
- > Serum
- > Platelets
- > Erythrocytes

# Applications

**Lonza**  
Cell & Gene





# Key Applications / Research Areas

> **Regenerative medicine**  
(MSCs, CD34+ stem cells)

> **Immunogenicity screening**  
(PBMCs, Monocytes, Fresh Blood)

> **Immuno-oncology**  
(T Cells, B Cells)

> **CRISPR**  
(T Cells, NK Cells)

> **STING**  
(T Cells)



> **Cell & Gene Therapy**  
(T Cells, Dendritic Cells, NK Cells)

> **Humanized mice**  
(CD34+ Stem Cells / PBMCs)

> **Drug Clearance**  
(PBMCs)

> **Large-quantity cell isolation**  
(Leukopaks)



## For additional product information and pricing visit:

- <https://bioscience.lonza.com/hematopoietic-products>



## Find citations and methods from peer-reviewed publications in our knowledge centers:

- <https://knowledge.lonza.com>
- <https://bioscience.lonza.com/immuno-and-hematopoietic-knowledge-center>



## For questions and support, contact our Scientific Support Team:

- <https://bioscience.lonza.com/contact/lonza>

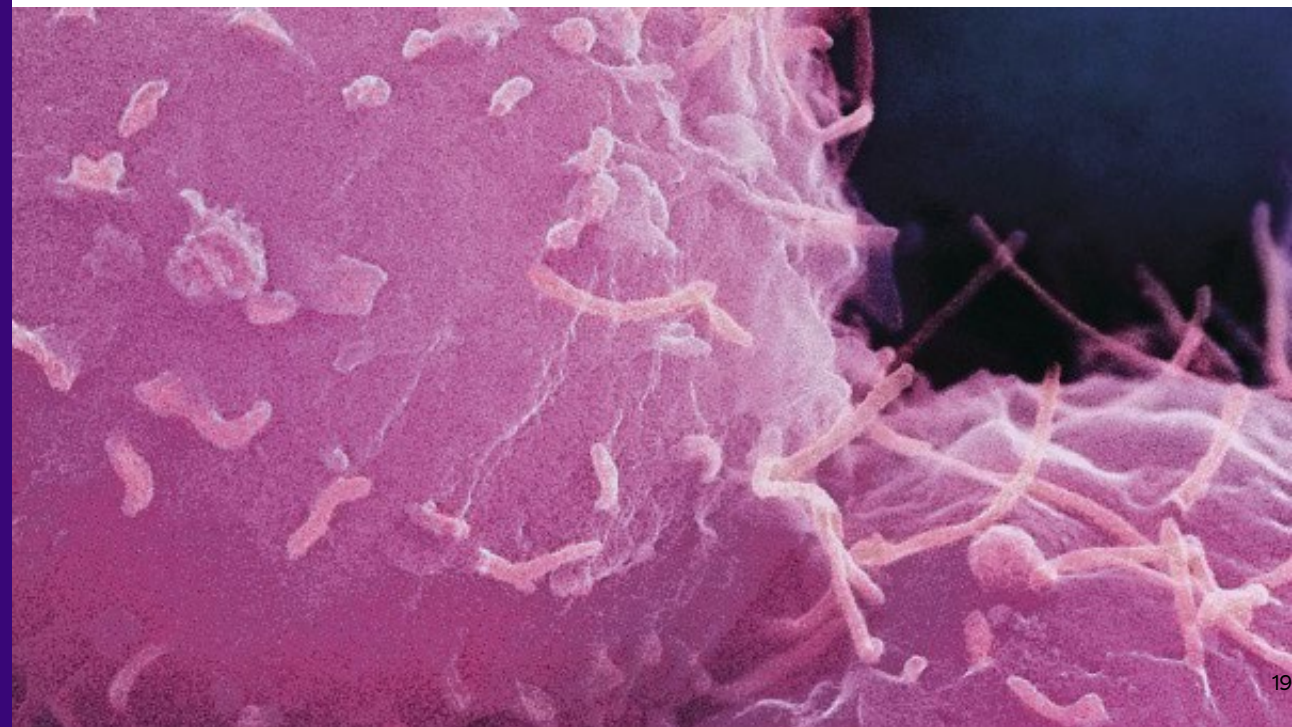
# Thank You

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# Agenda



Introduction and  
hematopoiesis



Tissue sources - overview



Donor variety



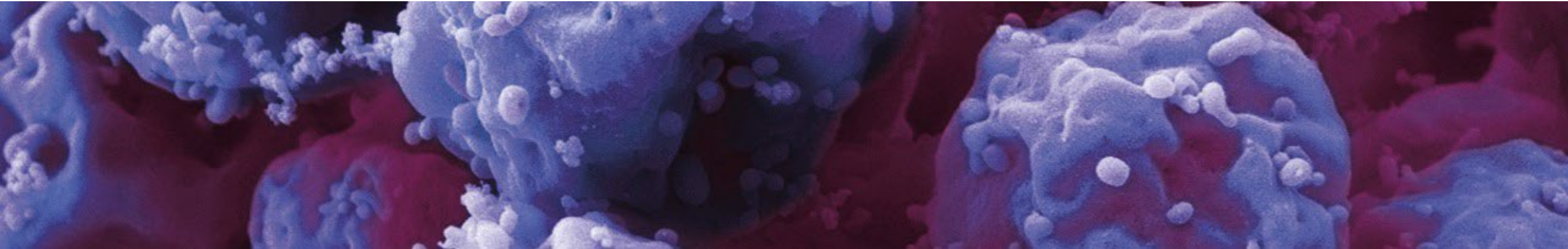
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Applications



Support and resources





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Highest quality blood tissue and cells

02

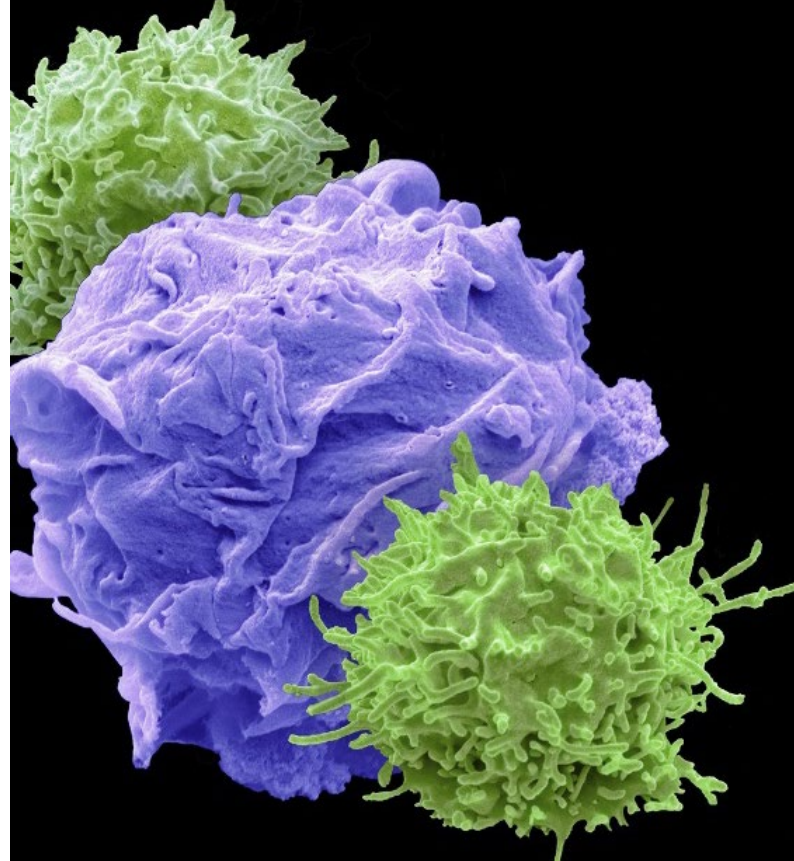
Unmatched donor and cell variety

03

X-VIVO® Serum-free Hematopoietic Cell Culture Media – with cell guarantee\*

04

World-class scientific support team



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*More than cells* – support for wide ranging workflows including transfection using Lonza's Nucleofector® Technology

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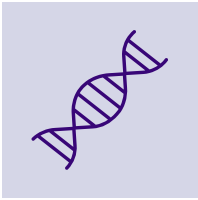
**Assays**



**Donor variety**



**Tissue variety**



**Cell variety**

# Resources

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Cell & Gene



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