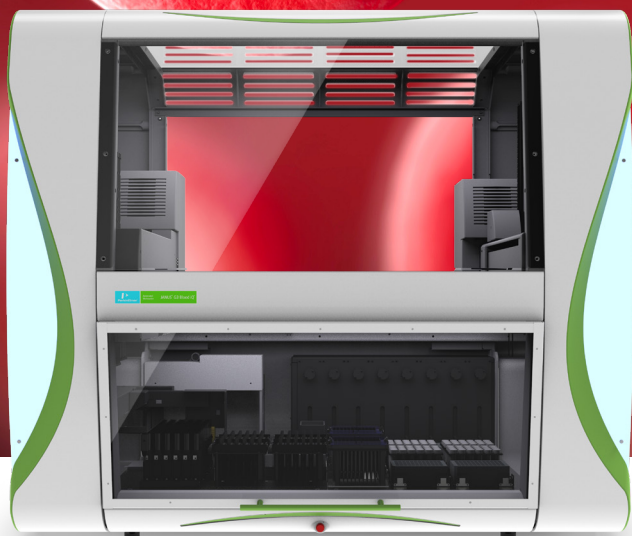


TRACEABLE, EFFICIENT, & REPRODUCIBLE BLOOD FRACTIONATION



For research use only. Not for use in diagnostic procedures.

JANUS® G3 Blood iQ™ Workstation

PerkinElmer understands centralized biobanking facilities face demanding challenges to setup an efficient and scalable workflow for storage and processing of biological specimens. These challenges include: sample traceability, blood fractionation, quality control, and sample preparation for genetic analysis. The new JANUS® G3 Blood iQ™ workstation is the first step in a seamless, efficient, and traceable workflow for the genetic analysis of cfDNA, cfRNA, and genomic DNA from fractionated blood.

The JANUS® G3 Blood iQ™ workstation is the premium biobanking solution for unattended automation of any blood fractionation workflow. The JANUS® G3 Blood iQ™ workstation combines:

- Deep-learning based image analysis
- Highly reproducible liquid transfer technology
- Downstream gripper
- Deck capacity
- Out-of-the-box protocols

The JANUS® G3 Blood iQ™ workstation guarantees traceable, efficient, and reproducible blood fractionation necessary for the isolation of gDNA, cfDNA, and cfRNA from buffy coat and plasma layers of fractionated blood.

Volume Verification or Volume-driven Pipetting: Two Ways to Automate cfDNA and cfRNA Workflows

Volume verification allows the user to set a desired level of plasma required to provide an adequate yield for downstream analysis. The JANUS® G3 Blood iQ™ workstation verifies the volume in each tube and will only process those with adequate available plasma.

In volume-driven pipetting the JANUS® G3 Blood iQ™ workstation transfers all available plasma volume based on the calculated plasma height. This is particularly useful in some cfDNA workflows where obtaining the highest volume of plasma is necessary to increase the likelihood of uncovering a rare variant or mutation.

Either method creates an efficient and reliable first step in the genetic analysis of fractionated blood. This powerful tool combined with other PerkinElmer products, such as the chemagic™ 360 nucleic acid extractor, LabChip® GX-Touch™ nucleic acid analyzer, and the Sciclone® G3 NGSx iQ™ workstation, enables a fully automated genetic analysis workflow from blood, a common sample matrix for complex workflows.

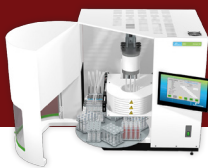
AUTOMATED cfDNA & cfRNA WORKFLOW

**PRECISE REFORMATTING
OF PLASMA LAYER
FROM CENTRIFUGED
WHOLE BLOOD**



Blood Fractionation:
JANUS® G3 Blood iQ™ Workstation

**HIGH YIELD & PURITY OF
EXTRACTED DNA OR RNA
FROM PLASMA**



Cell-Free Nucleic Acid Extraction:
chemagic™ 360 Nucleic Acid Extractor

Cell-Free DNA Extraction:
NextPrep-Mag™ Automated cfDNA Isolation Kit

Cell-Free RNA Extraction:
NextPrep™ Magnazol™ cfRNA Isolation Kit

**PRECISE FRAGMENT
SIZE DISTRIBUTION
& QUANTITATION OF
PURIFIED DNA OR RNA**



Cell-free DNA & RNA Quality Control:
LabChip® GX-Touch™ Microfluidic Technology

**AUTOMATION FOR
REPRODUCIBLE, LIBRARY
CONSTRUCTION FROM
cfDNA OR cfRNA**



NGS Library Preparation:
Sciclone® G3 NGSx iQ™ Workstation

cfDNA Library Preparation:
NEXTFLEX® Rapid DNA-Seq Kit 2.0

Small RNA Library Preparation:
NEXTFLEX® Small RNA-seq Kit v3

**PRECISE FRAGMENT
SIZE DISTRIBUTION
& QUANTITATION OF
LIBRARIES**

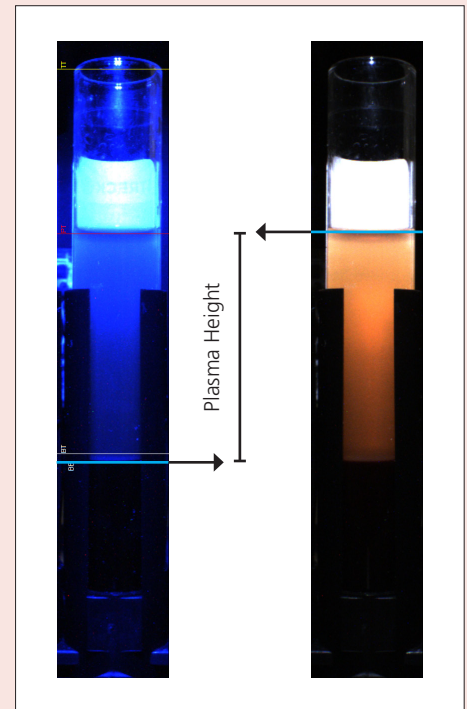


Library Quality Control:
LabChip® GX-Touch™ Microfluidic Technology

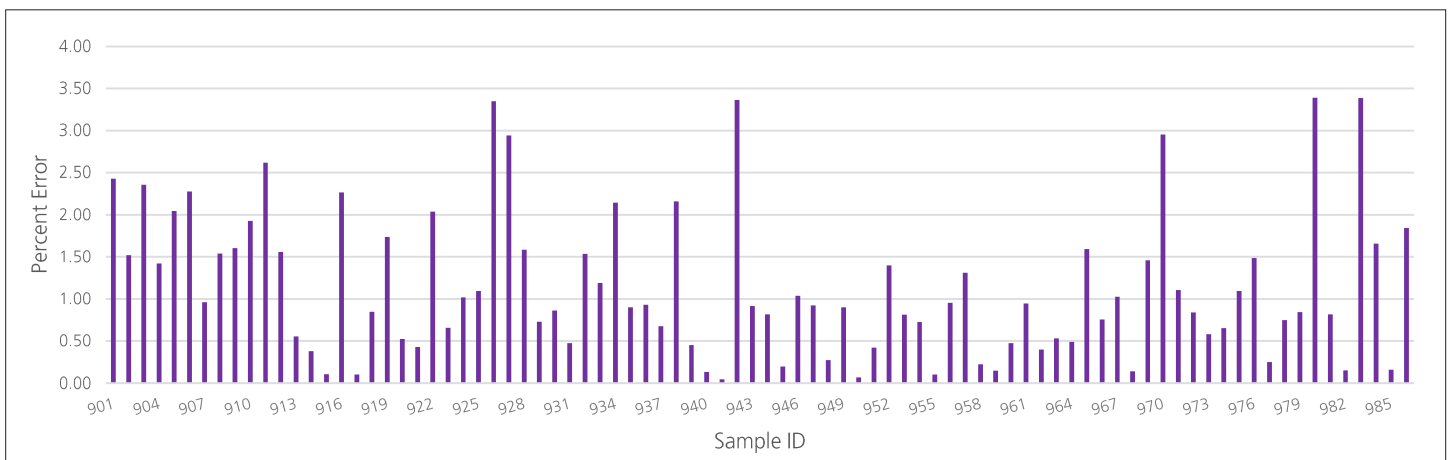


Blood Layer Detection

Proprietary imaging technology allows the JANUS® G3 Blood iQ™ workstation to precisely identify plasma and buffy coat layers in centrifuged blood tubes. A blue image is taken and identifies the buffy layer height based on a bounded square around the pixels identified to contain white blood cells. A white image is taken and identifies the plasma layer height through points on the plasma layer meniscus and their relative position to the buffy layer. This imaging technology is driven by a deep-learning based image analysis model which precisely identifies the distinct blood layers. Subsequently, the JANUS® G3 WinPrep™ software calculates volumes based on the layer height and tube geometries. Height calculations are unique to each tube. This important technology outputs the following parameters:



This vital information is stored in a CSV file which can be seamlessly integrated with laboratory information management systems. The JANUS® G3 Blood iQ™ workstation provides users with a notification to recover their samples if these variables do not meet the user-assigned target volume.



The above graph shows the difference between manually measured plasma heights and measurements from the JANUS® G3 Blood iQ™ imaging system. The overall percent accuracy shows the JANUS® G3 Blood iQ™ workstation accurately measures the plasma height of fractionated blood.

JANUS® G3 VARISPAN™ TECHNOLOGY: PRECISION PIPETTING FOR cfDNA, cfRNA & gDNA ANALYSIS

The JANUS® G3 Blood iQ™ workstation comes with an 8-channel VariSpan™ pipetting module which enables industry leading accuracy and precision variable pipetting. The four main pipetting tips used in this workstation, shown below, allow for complex plasma and buffy coat extraction in fractionated blood.

Matrix	Volume	Accuracy (Standard Error)	Precision (Random Error)
Plasma	5.0 mL	+/-5%	5.0% CV
Plasma	500 µL	+/-10%	5.0% CV
Buffy Coat	900 µL	+/-5%	5.0% CV
Buffy Coat	100 µL	+/-10%	5.0% CV



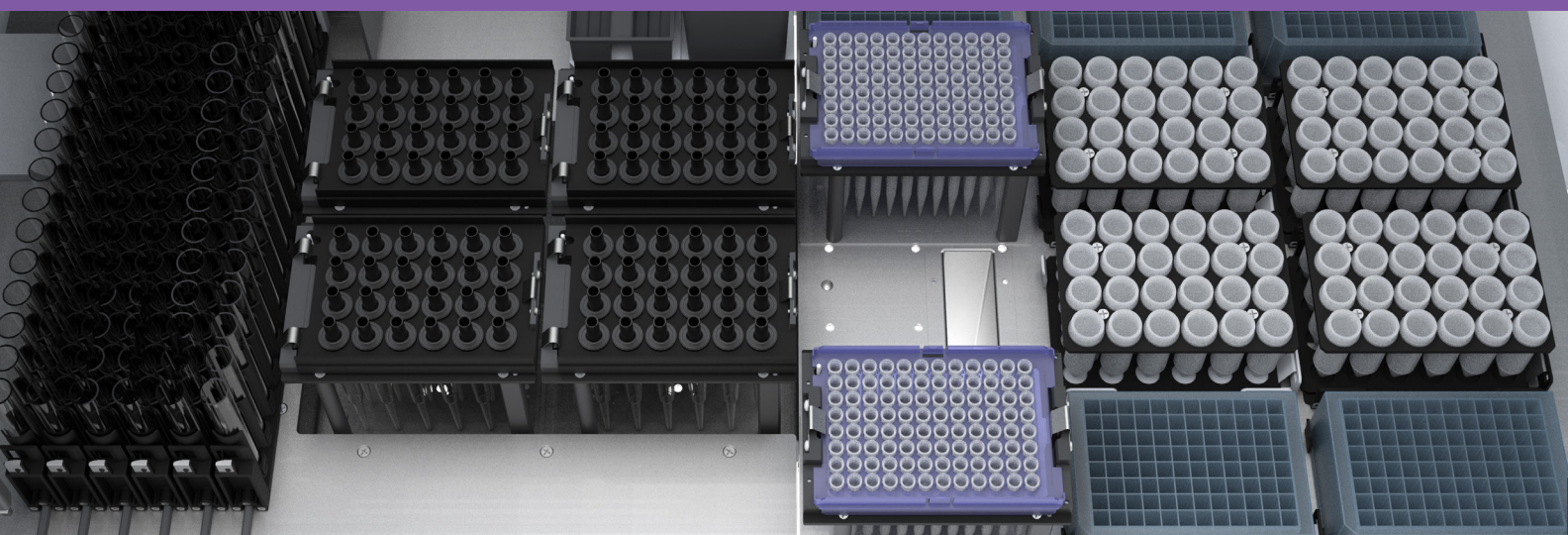
PLASMA TIP
5 mL Conductive
Filter Tip



BUFFY COAT TIP
900 µL Wide Bore
Conductive Filter Tip

Downstream Extraction: Integrated Gripper and Deck Capacity

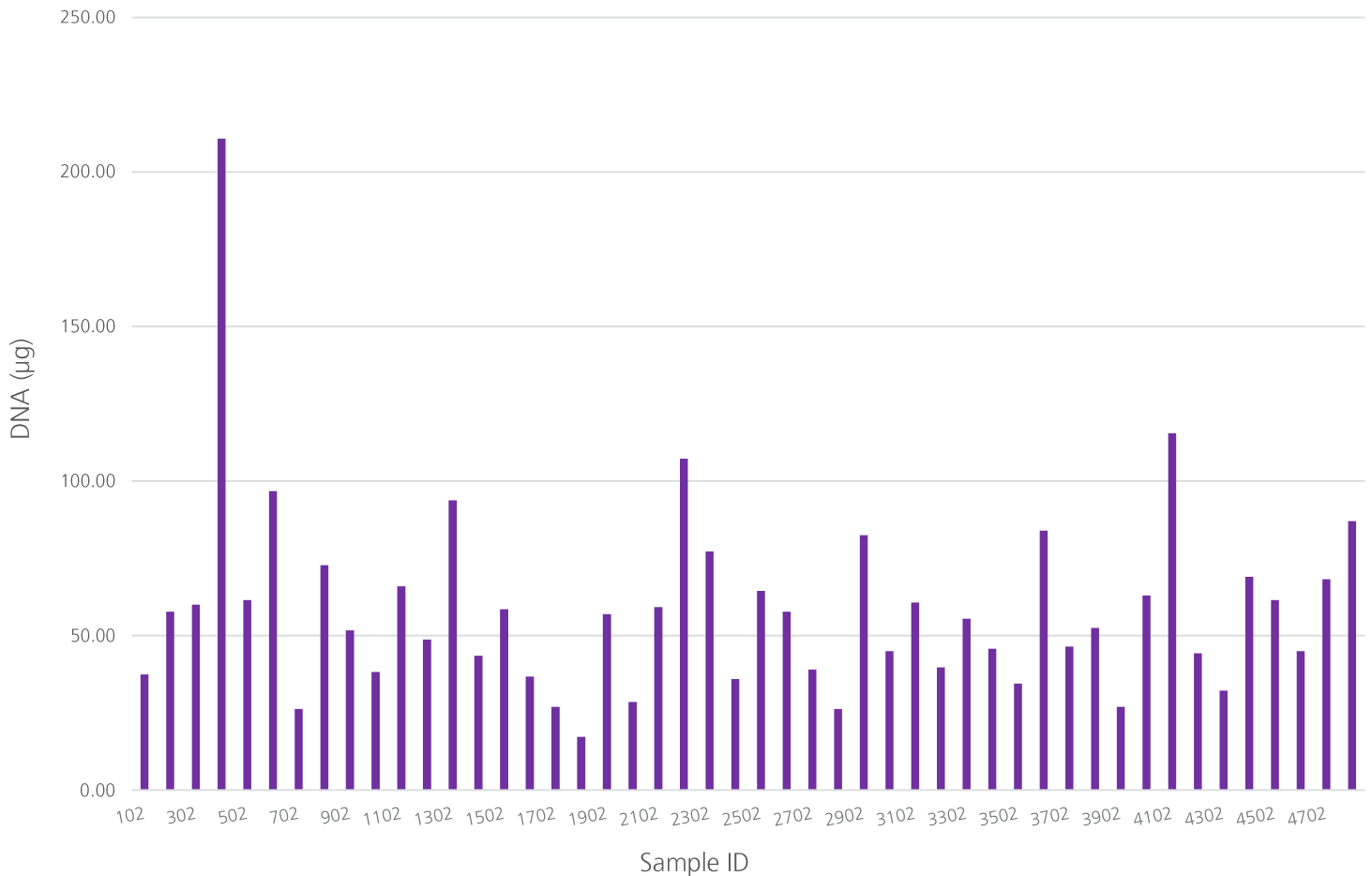
The JANUS® G3 Blood iQ™ workstation is equipped with generous deck capacity and an integrated gripper to fully automate downstream workflows such as magnetic-bead based nucleic acid extraction. This instrument can further prepare wash and elution plates for nucleic acid extraction platforms such as the chemagic™ 360 instrument.





Buffy Coat DNA Yield

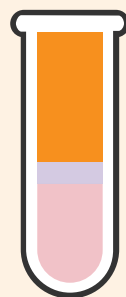
Samples were processed in an automated workflow using the JANUS® G3 Blood iQ™ workstation. On average, the JANUS® G3 Blood iQ™ workstation extracted 58.7 µg of total genomic DNA from the available buffy coat layer.



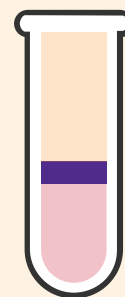
Out of the Box Protocols

PerkinElmer specializes in push-button protocols for automation of blood fractionation. At launch, the JANUS® G3 Blood iQ™ workstation will be equipped with:

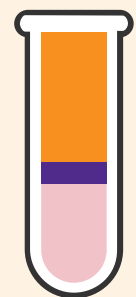
All you need to do is input your desired transfer volumes (or automated image-determined volumes) and click Go!



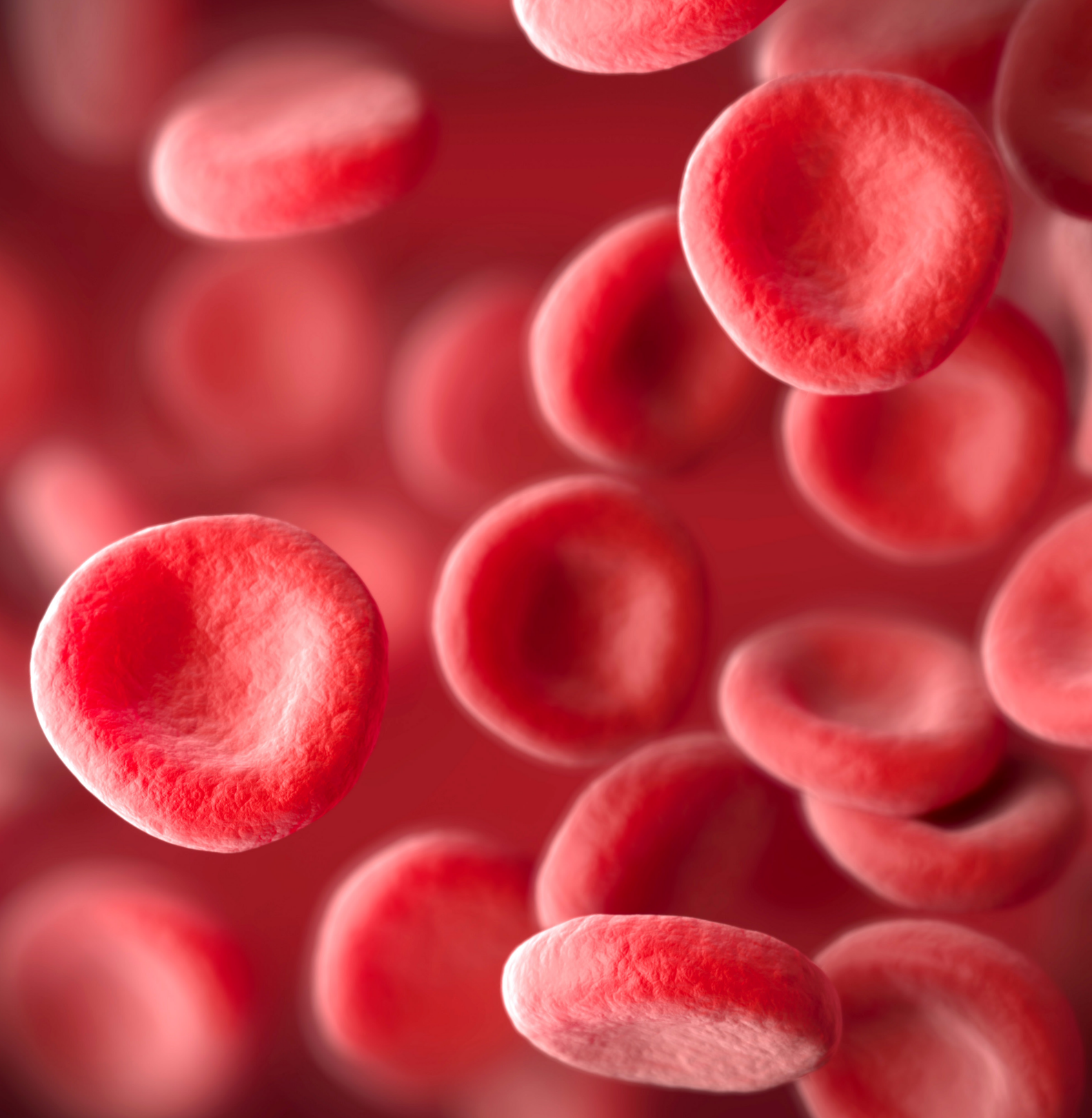
PLASMA LAYER
REFORMATTING



BUFFY COAT LAYER
REFORMATTING



PLASMA & BUFFY
COAT LAYER
REFORMATTING



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