Applied Cells

Redefining **CD138+ Plasma Cell Isolation** for **Multiple Myeloma** Clinical Research

Empowering Multiple Myeloma researchers and clinicians

The expression of CD138, a marker expressed on the surface of plasma cells, plays a critical role in the identification of plasma cell tumors and multiple myeloma cells.[1] While the characteristics of plasma cells can vary depending on the disease stage and biological traits of the patient, studies have proven the prognostic value of specific antigen expression patterns in neoplastic plasma cells.[2]

Traditionally, the assessment of plasma cells in bone marrow involves a time-consuming and labor-intensive method involving ficoll density gradient separation, which results in the loss of antigens, including CD138, from the plasma cell surface, necessitating immediate staining and analysis.[2]

MARS® platform incorporates their proprietary in-flow immuno-magnetic separation technology to efficiently isolate CD138+ plasma cells directly from unprocessed bone marrow samples. This innovative approach simplifies the isolation process, enabling fast and dependable analysis of CD138 expression in plasma cells

AUTOMATED PRECISION

MARS® brings the next level of automation. **Automatic 2x or 3x separation** promises unrivaled consistency and a seamless user experience, setting us apart from the laborious manual methods.

UNRIVALED RECOVERY AND PURITY

Break away from traditional limitations. Our technology guarantees **high cell purity** that far outstrip conventional methods. When it comes to **recovery**, we persistently outperform - even after intensive serial runs.

EFFICIENT, ECONOMICAL AND REUSABLE

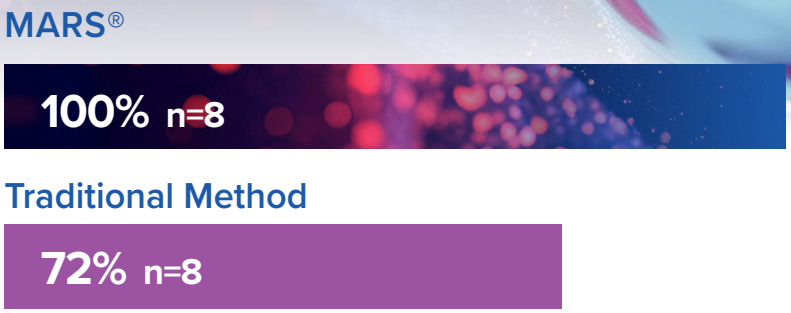
With **reusable and cleanable fluidics**, MARS® dramatically reduces the per sample running cost. Preset cleaning protocols offer unprecedented efficiency, enabling multiple sample runs without the need for fluidics replacement.

1. Chilosi M, Adami F, Lestani M, et al. CD138/syndecan-1: a useful immunohistochemical marker of normal and neoplastic plasma cells on routine trephine bone marrow biopsies. Mod Pathol. 1999;12(12): 1101-1106.
2. Kumar S, Kimlinger T, Morice W. Immunophenotyping in multiple myeloma and related plasma cell disorders. Best Pract Res Clin Haematol. 2010 Sep;23(3):433-51.

Enhanced Enrichment of Plasma Cells Can Lead to More Accurate Test Results

FISH Testing

100% of samples that exceeded minimum 50% enrichment criteria



MARS® purification enhances FISH success rates for patient samples with initial counts as low as 1% or below. Unlike traditional enrichment methods, MARS® ensures reliable FISH readouts, facilitating earlier disease detection using a widely recognized FISH platform.*

*The information provided by our user is intended for general guidance only. We do not guarantee its accuracy, completeness, or suitability for any particular purpose. We disclaim any responsibility or liability for any decisions made or actions taken based on this information.

Genomic studies

Multiple Myeloma is a diverse disease with significant genetic variations. The expression levels of specific genes are just as crucial as the DNA changes in understanding the disease, assessing its risk, and devising targeted treatments. Advances in gene study techniques have provided deeper insights into Multiple Myeloma's mechanisms. Tools like gene expression profiling (GEP) and whole-exome sequencing (WES) have been instrumental in classifying patients based on their genetic profiles and the progression of their disease.[1]

We're immensely proud to be mentioned in the groundbreaking research recently published in Nature medicine. Dive deep into the paper, highlighting the need to consider the tumor antigen landscape for optimal treatment selection.

Mechanisms of antigen escape from BCMA- or GPRC5D-targeted immunotherapies in multiple myeloma, Lee H et al, Nature Medicine volume 29, pages2295–2306 (2023)

1. Ovejero S, Moreaux J. Multi-omics tumor profiling technologies to develop precision medicine in multiple myeloma. Explor Target Antitumor Ther. 2021;2:65-106.

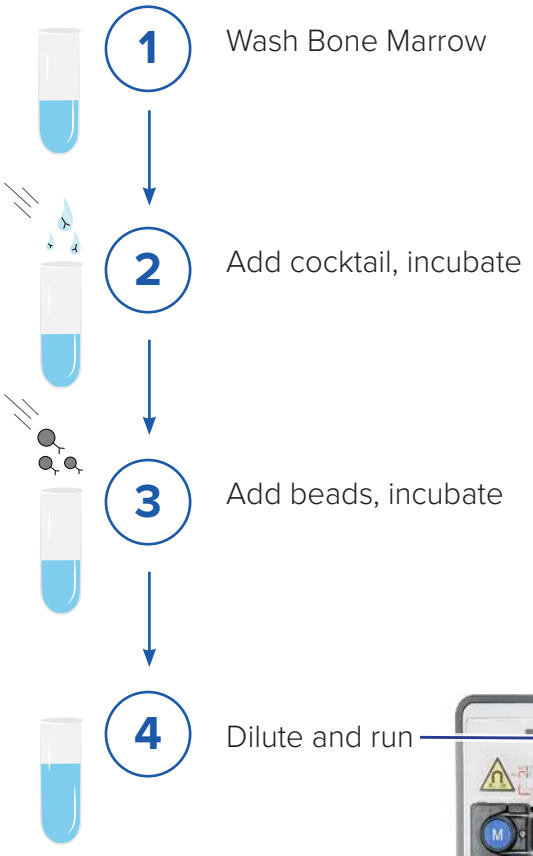
Read the publication here

Easy, sequential purification process

The MARS® platform simplifies the cell isolation process through its fast and easy workflow, which improves purity while maintaining high recovery of cells.

Our instrument uses an automated one- to three-pass cell enrichment process and involves minimal hands-on time.

Other unique features include matrix-free cell isolation, economical consumables, and sterilizable and reusable fluidics. The obtained samples can also be rapidly re-run through the magnetic channel to maximize efficiency.



2022 WINNER
TheScientist TOP10 INNOVATIONS

Simple CD34+ hematopoietic stem cell enrichment from Human Cord Blood Mononuclear Cells process using MARS® Bar.

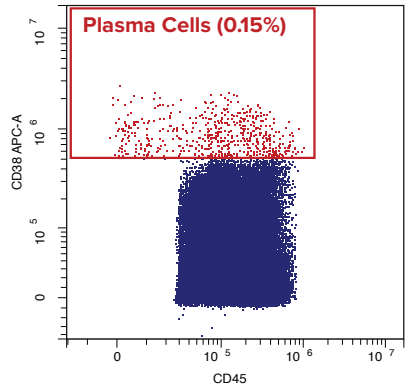
CD138+ Cell Isolation Directly from Bone Marrow

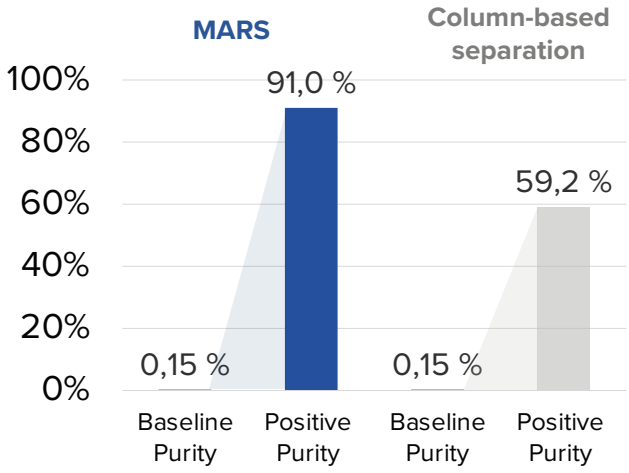
MARS® platform is a powerful solution for plasma cell isolation with:

☑ Very high cell **purity and recovery**

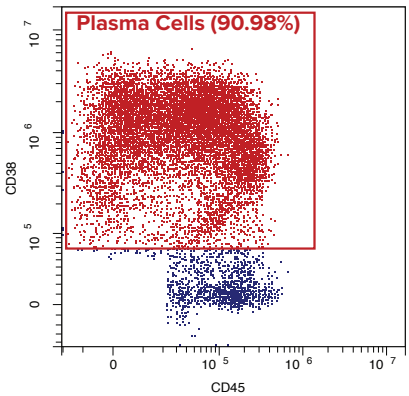
☑ Very high cell **viability**

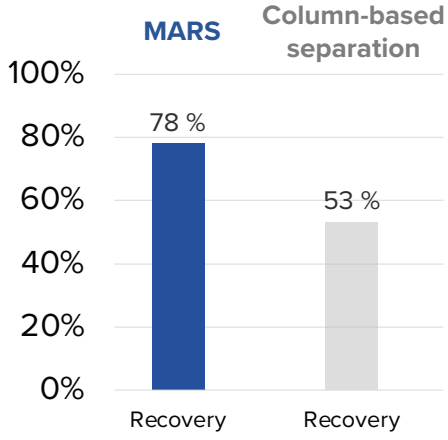
BASELINE





MARS POSITIVE





Faster, Simpler, Better

Experience an unparalleled ease in cell separation with the MARS® platform. Cut down both overall and hands-on time by nearly an hour, and follow a seamless workflow: from labeling protocol straight to two (or optionally three) MARS® Immunomagnetic isolation runs. Dive into efficiency today!

MARS® workflow reduced the number of steps from 8 to 5

Column-based workflow

- BONE MARROW
- FILTER
- CENTRIFUGE WASH
- INCUBATE WITH BEADS
- CENTRIFUGE WASH
- PRIME THE COLUMN
- SEPARATE MAGNETICALLY
- RINSE THE COLUMN
- ELUTE
- ISOLATED CD138+ CELLS

MARS® workflow

- BONE MARROW
- CENTRIFUGE WASH
- ADD MARS CD138+ COCKTAIL
- ADD MARS CD138+ BEADS
- DILUTE
- RUN MARS SERIAL PROGRAM
- ISOLATED CD138+ CELLS

A VARIETY OF INPUT SAMPLES

PERIPHERAL BLOOD

BONE MARROW

APHERESIS AND LEUKOPAKS

MNCS AND PBMCS

MARS® Bar Specifications

	MARS® BAR Flex	MARS® BAR BIBO
SAMPLE		
Magnetic Cell labeling	✓	✓
Containment	5 mL, 15 mL, 50 mL tubes	Bags
Sample processing	1 sample each module I Max 3 samples in parallel	1 sample by 3 parallel channels
Sample types		
• Whole blood	✓	✓
• Apheresis	✓	✓
• Leukopaks	✓	✓
• Frozen PBMC's	✓	✓
• Bone marrow	✓	✓
• Dissociated Tissue	✓	
REAGENTS & CONSUMABLES		
Isolation buffer	MARS® MAG buffer	
Isolation reagents		
• MARS® MAG lines (RUO)	✓	
• MARS® Ingenuity Line (RUO, GMP)	✓	✓
Fluidics	Open-end tubing sets Cleaning and sterilization protocols	Closed tubing set (Gamma radiated)
CELL ISOLATION		
Positive isolation	✓	✓
• Direct from Whole Blood & Leukopak	✓	✓
Depletion	✓	✓
Positive & negative tubing sets	Same (program enabled change)	
OPERATIONS		
Speed	Protocol dependent; 0.5-6 mL/min	
Column-free **MARS® MAG in-flow technology**	✓	✓
Separation channels	Flex-BIBO scalable	
Redundancy	3x Modules	
Time to assemble tubing set	<5 min*	<15 min*
Time to initiate isolation	<2 min	< 8 min
Typical time to process 1e9 cells	<20 min (3 modules, single batch)	<30 min (25e6/mL)
Capacity	0.5 - 45 mL per module	20 mL - 1L I Expandable >1L
Max total cells processable	No practical limit	
Batched isolation	✓	✓
Operation in bio-safety hood	✓	N/A
Additional configuration	Serial program**	N/A
SOFTWARE		
Pre-programmed protocols	✓	✓
Adjustable & lockable parameters	✓	✓
Tiered user rights	✓	✓
Logged UI events	✓	✓
Encrypted logs	✓	✓
INSTRUMENT		
Dimensions	20.5'' W x 16.5'' D x 19.75'' H 52cm W x 41 cm D x 50 cm H	20.5'' W x 16.5'' D x 28'' H 52cm W x 42cm D x 74cm H
Weight	62 lb / 28 kg	59 lb / 27 kg

For research use only. Not for use in therapeutic or diagnostic procedures. The MARS® Bar instrument and tubing set are designed, manufactured and tested under quality system certified to ISO 13485. Not a medical device.

* With standard training ** Customizable on demand

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