

# FULLY AUTOMATED CELL ISOLATION

With RoboSep™

## TABLE OF CONTENTS

3	<b>Fully Automated Immunomagnetic Cell Separation</b>
4	<b>How RoboSep™ Works</b>
6	<b>The RoboSep™ Advantage</b>
8	<b>Case Study: Fully Automated Sequential Cell Isolation of Four Different Cell Types from a Single Sample with RoboSep™-S</b>
9	<b>Research and Applications</b>
10	<b>Equipment and Specifications</b>

## Scientists Helping Scientists™

STEMCELL Technologies is a leader in the development of specialty cell culture media, cell separation products, and accessory reagents for life science research. Driven by science, we deliver over 2500 products to more than 120 countries worldwide. To learn more about how STEMCELL Technologies helps to make research work, visit [www.stemcell.com](http://www.stemcell.com).

# Fully Automated Immunomagnetic Cell Separation

RoboSep™ instruments combine the speed and simplicity of a column-free immunomagnetic cell isolation system with the automation and throughput of a liquid handling platform.

- Isolate highly purified cells without the use of columns to minimize cell activation and yield functional, viable cells that are immediately ready for downstream applications
- Automate all sample labeling and magnetic separation steps to reduce “hands-on” time and eliminate the risk of sample cross-contamination
- Perform simultaneous or sequential cell isolations to increase laboratory throughput and efficiency



## RoboSep™-S

The compact design of RoboSep™-S brings the convenience of automated cell isolation to any busy laboratory.



## RoboSep™-16

The enhanced liquid-handling capabilities of RoboSep™-16 allow high-volume users to efficiently isolate desired cells with speed and confidence.

“We like the reliability of the RoboSep™, the minimization/elimination of specimen handling by the tech during subset separation, and the low maintenance of the instrument. These factors are important to us with such a high throughput of samples processed.”

Wendy Leong, Senior Clinical Laboratory Scientist  
PATHOLOGY/STANFORD BLOOD CENTER LABORATORY

# How RoboSep™ Works

## Fast, Easy, and Column-Free Cell Separation

The isolation of viable, functional cells is often a critical first step in successful basic and translational research in many areas, including immunology, stem cell biology, drug discovery and development, and vaccine development.

RoboSep™ instruments bring together the reliability, convenience, and throughput of a liquid-handler with the flexibility, speed, and fidelity of an immunomagnetic cell isolation system. RoboSep™-S and RoboSep™-16 perform all sample labeling and magnetic separation steps, thereby increasing laboratory output and efficiency while minimizing sample handling and technician time.

By using an automated, column-free cell isolation system, cell activation is minimized while the time required to isolate highly pure cells is significantly reduced compared to column-based systems. In addition, there is no risk of clogged columns, which could delay or compromise your research. The use of individual sample magnets and disposable pipette tips eliminates both sample cross-contamination and the need for frequent wash cycles or daily cleaning procedures.

## EasySep™ Technology

STEMCELL Technologies' EasySep™ cell isolation platform serves as the foundation for both RoboSep™-S and RoboSep™-16. EasySep™ combines the specificity of monoclonal antibodies with the ease of a column-free magnetic system for the isolation of highly purified cells that are immediately ready for downstream assays. Either cells of interest (positive selection) or unwanted cells (negative selection) are crossed-linked to EasySep™ magnetic particles using antibody complexes and, following placement in an EasySep™ magnet, unlabeled cells are simply poured or pipetted off.

EasySep™ and RoboSep™ reagents are compatible with a wide range of sample sizes and sources, including:

- Whole blood
- Leukapheresis samples
- Peripheral blood mononuclear cells (PBMCs)
- Bone marrow
- Splenocytes
- Other tissues



### VIDEO

Discover How EasySep™ Works  
[www.stemcell.com/EasySepVideo](http://www.stemcell.com/EasySepVideo)



### INTERACTIVE PRODUCT TOUR

See RoboSep™-S in Action  
[www.stemcell.com/RoboSep-S](http://www.stemcell.com/RoboSep-S)

# Performing a Cell Separation With RoboSep™

Start your cell isolation protocol with as little as 5 minutes of “hands-on” time with RoboSep™-S and RoboSep™-16. Both pre-programmed routine protocols and customizable protocols are available to meet your unique cell isolation needs.

### RoboSep™-S



↓



↓



**1**  
Select protocol. Load samples, EasySep™ reagents, buffer, and tips.

**2**  
Press “Run.”

**3**  
Return in 25 to 60 minutes to collect your separated cells.

### RoboSep™-16



↓



↓



Figure 1. RoboSep™-S and RoboSep™-16 Protocols

# The RoboSep™ Advantage

RoboSep™-S and RoboSep™-16 fit easily into the workflow of any lab that needs the multi-sample processing capacity, speed, reliability, and convenience of automated cell isolation.

In addition, STEMCELL's Quality Management System is certified to ISO 13485 Medical Devices Standards. Our Quality Assurance, Quality Control, and Regulatory Affairs departments are happy to work with you to meet your project's specific requirements.

## Compact Design with Removable Lid

Multiple units fit easily in a biological safety cabinet.

## Simple Reagent and Experiment Tracking

Integrated barcode reader and End-of-Run reports track user, reagent, and protocol details.

## Simultaneous or Sequential Cell Isolation

Perform simultaneous cell isolations for up to 4 samples or sequential isolation of up to 4 cell types from the same sample.



RoboSep™-S

## Custom Isolation Protocols

Easily develop custom protocols to meet your unique needs.

## No Daily Maintenance

No daily washing or decontamination is required.

## Minimal Sample Handling with No Cross-Contamination

Automated sample handling with disposable pipette tips reduces the risk of exposure to dangerous pathogens and eliminates the risk of sample cross-contamination.

## Quick Start Options

Pre-program routine protocols and start a separation in just 5 minutes with minimal "hands-on" time.

## Simultaneous or Sequential Cell Isolation

Perform simultaneous cell isolations for up to 16 samples or sequential isolation of 4 cell types from 4 different samples.

## Reagent Detection

Conductive pipette tips automatically detect EasySep™ reagent levels and utilize spare reagents when required.



RoboSep™-16

# Case Study

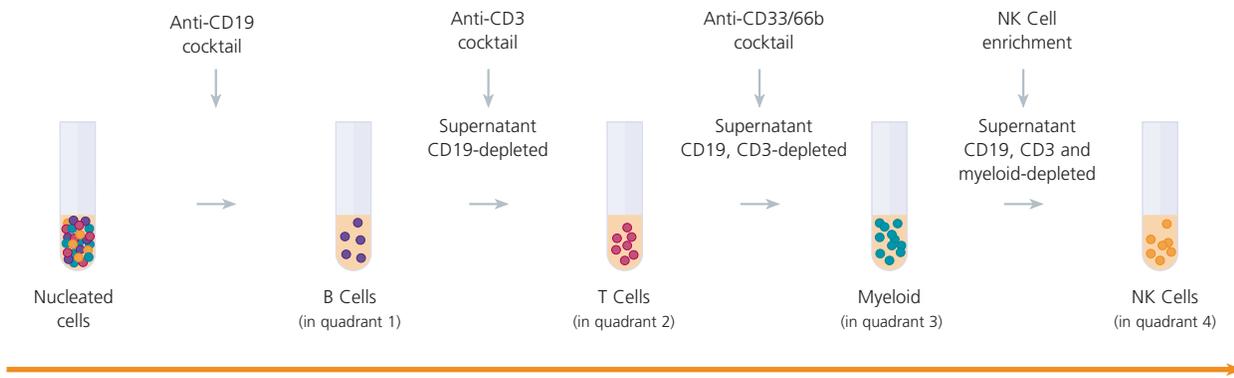
## Fully Automated Sequential Cell Isolation of Four Different Cell Types from a Single Sample with RoboSep™-S

Florida Hospital Tissue Typing Laboratory, Orlando, Florida

### Background

Many analyses, such as chimerism testing, are often performed on small blood samples (e.g. pediatric samples). As a result, analysis of purified cell subsets requires techniques that can isolate more than one cell type from an undivided starting sample. Here we describe a method used by the Florida Tissue Typing Laboratory to sequentially isolate B cells, T cells, myeloid cells, and NK cells for their chimerism analysis, starting from a single sample of HetaSep™-treated blood.

### Methods



Fully Automated Sequential Separation with RoboSep™ Instruments

Figure 2. Automated Sequential Separation of B Cells, T Cells, Myeloid Cells, and NK Cells from a Single Sample of HetaSep™-Treated Blood

### Results

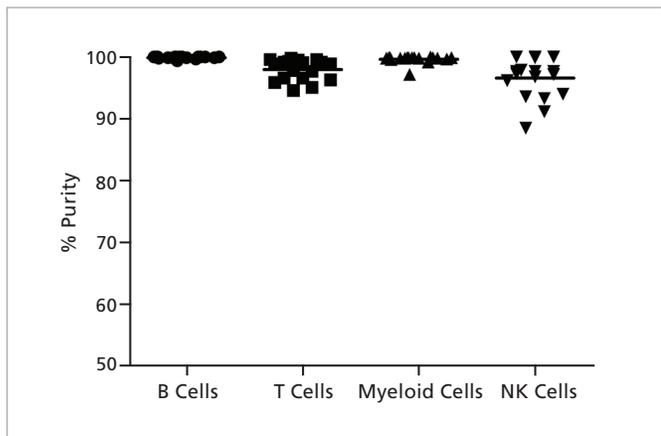


Figure 3. Purity of Four Different Cell Types Isolated from 18 Different Samples Using RoboSep™-S Sequential Separation  
Data kindly provided by Max Marschner, Supervisor, Florida Hospital Tissue Typing Lab.

### Why Use RoboSep™ for Sequential Isolation of Immune Cells?

**FLEXIBLE.** Perform sequential cell isolations of 4 cells types from a single sample using RoboSep™-S or from four samples using RoboSep™-16.

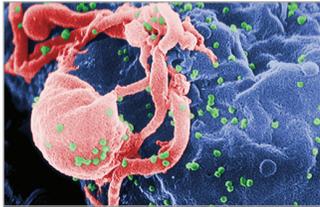
**FULLY AUTOMATED.** Perform all isolations during a single machine cycle with minimal “hands-on” time.

**EFFICIENT.** Isolate cells from small volumes (0.5 - 4.5 mL) of blood to run DNA analysis or other down stream applications.

**VERSATILE.** Customize protocols for any cell type and sample source.

**INCREASED THROUGHPUT.** Streamline cell isolations and increase laboratory throughput.

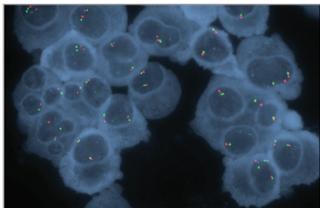
# Research and Applications



## Immunology and Infectious Disease Research

RoboSep™ minimizes the risk associated with handling hazardous biological specimens and has been used to study:

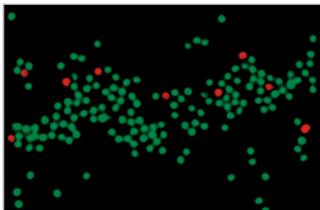
- Pathogens, including HIV, other viruses, and bacteria<sup>1-3</sup>
- Autoimmune diseases, including diabetes and rheumatoid arthritis<sup>4,5</sup>
- Transplantation immunology<sup>6,7</sup>
- Cancer<sup>8,9</sup>



## Hematological Malignancies

RoboSep™ effectively enriches rare cell types to enhance assay sensitivity for research on:

- Multiple myeloma<sup>10,11</sup>
- Chronic lymphocytic leukemia<sup>12,13</sup>
- Acute myeloid leukemia<sup>7,14,15</sup>



## Chimerism and HLA Testing

RoboSep™ facilitates simultaneous or sequential cell isolation with reliable and reproducible results for:

- Chimerism analysis<sup>9, 15-17</sup>
- Flow cytometric crossmatch (FCXM)<sup>18</sup> assay
- Serology-based assays



## Assay Development and Immunotherapy Research

RoboSep™ has been used to isolate highly purified, functional cells for:

- Drug discovery and development<sup>19-21</sup>
- Immune cell-based assay development
- Vaccine development<sup>22,23</sup>
- Basic cellular therapy research<sup>24,25</sup>

## Selected RoboSep™ References

1. Sáez-Cirión A et al. (2010) *Nat Protoc* 5(6): 1033–41.
2. Miles B et al. (2013) *J Leukoc Biol* 94(2): 281–9.
3. Karpinski J et al. (2016) *Nat Biotechnol* 34(4): 401–9.
4. Montandon R et al. (2013) *Proc Natl Acad Sci U S A* 110(24): E2199–208.
5. Morawski PA et al. (2017) *Sci Rep* 7: 40838.
6. Haniffa M et al. (2009) *J Exp Med* 206(2): 371–85.
7. Jonas BA et al. (2016) *PLoS One* 11(7): e0159189.
8. Olkhanud PB et al. (2011) *Cancer Res* 71(10): 3505–15.
9. Eggimann L et al. (2015) *Bone Marrow Transplant* 50(5): 743–5.
10. Shetty S et al. (2012) *Int J Hematol* 95(3): 274–81.
11. Toydemir RM et al. (2018) *J Hematop* 11(3): 75–80.
12. Bodogai M et al. (2013) *Cancer Res* 73(7): 2127–38.
13. He R et al. (2018) *Am J Surg Pathol* 42(7): 843–854.
14. Treppendahl MB et al. (2012) *Blood* 119(1): 206–216.
15. van Besien K et al. (2017) *Leuk Lymphoma* 58(2): 288–297.
16. Decot V et al. (2008) *Biomed Mater Eng* 18(1 Suppl): S19–26.
17. Lee HC et al. (2015) *Biol Blood Marrow Transplant* 21(11): 1948–54.
18. Fernandez-Bango C et al. (2017) *Hum Immunol* 78: 224.
19. Misund K et al. (2013) *J Biomol Screen* 18(6): 637–46.
20. Vitale LA et al. (2012) *Clin Cancer Res* 18(14): 3812–21.
21. Zhou Q et al. (2013) *Clin Exp Immunol* 173(1): 131–9.
22. Bae J et al. (2012) *Clin Cancer Res* 18(17): 4850–60.
23. Bae J et al. (2015) *Leukemia* 29(1): 218–29.
24. Pahwa R et al. (2010) *J Immunol Methods* 363(1): 67–79.
25. Korniotis S et al. (2016) *Nat Commun* 7: 12134.

# Equipment and Specifications

## RoboSep™-S

### System Includes:

- 4 “The Big Easy” EasySep™ Magnets
- RoboSep™ Service Rack
- RoboSep™ Tube Kit
- USB Flash Drive
- User Reference Manual
- Quick Start Guide
- 1-Year Warranty

### Technical Specifications:

#### DIMENSIONS

- Height with removable lid: 52.2 cm (20.5")
- Width: 42 cm (16.5")
- Depth: 42 cm (16.5")
- Weight: 22 kg (48.5 lb)

#### POWER REQUIREMENTS

- 100 - 240 V~, 65W, 50/60 Hz, 1.6 A
- 2 x Fuses: 250 V~, 1.6 A Fast Blow

#### CONNECTIONS

- 3 USB ports available
- RJ-45 10/100 Ethernet port

#### CONDITIONS FOR OPERATION

- Temperature: 10 - 30°C (50 - 86°F). RoboSep™-S is not specified for use in a cold room (4°C, 39°F)
- Humidity 20 - 85% (non-condensing)

### Capacity:

Up to 4 samples. Sample volume ranges from 250 µL to 8.5 mL per sample. *Negative and positive selections can be executed simultaneously.*

### RoboSep™-S & Accessories

Product	Catalog #
RoboSep™-S	21000
RoboSep™-S Double Package	21002
RoboSep™-S Triple Package	21003
RoboSep™ Service Rack	20101
RoboSep™ Buffer <sup>1</sup> (250 mL)	20104
RoboSep™ Buffer 5X Concentrate (250 mL)	20124
RoboSep™ Filter Tip Racks* (1 box of 8 racks)	20125
RoboSep™ Tip Head Polishing Compound (7 mL)	20119

\* RoboSep™ Buffer and 1 - 2 boxes of RoboSep™ Filter Tip Racks are included with every purchase of a RoboSep™ Reagent Kit.

### Service Options

Product	Catalog #
1-Year Warranty	21200
Preventative Maintenance Visit (for an instrument without a warranty)	21203
1-Year Warranty with 1 Preventative Maintenance Visit	21202
Additional Preventative Maintenance Visit (for an instrument on an active warranty)	21209

# RoboSep™-16

## System Includes:

- 16 EasySep™ Magnets
- Laptop Computer with RoboSep™-16 Application
- Technical Manual
- 1-Year Warranty

## Technical Specifications:

### DIMENSIONS

- Height with door open: 87.9 cm (34.6")
- Height with door closed: 123 cm (48.4")
- Width: 102.9 cm (40.5")
- Depth: 70.6 cm (27.8")
- Weight: 122 kg (270 lb)

### POWER REQUIREMENTS

- 100 - 240 V~, 50/60 Hz, 5 A
- 2 x Fuses: T5 AL 250 V~

### CONNECTIONS

- 2 USB ports available (laptop)
- RJ-45 10/100 Ethernet port

### CONDITIONS FOR OPERATION

- Temperature: 15 - 30°C (59 - 86°F). RoboSep™-16 is not specified for use in a cold room (4°C, 39°F)
- Humidity 30 - 85% (non-condensing)

## Capacity:

Up to 16 samples. Sample volume ranges from 200 µL to 2 mL per sample. *Negative and positive selections can be executed simultaneously.*

## RoboSep™-16 & Accessories

Product	Catalog #
RoboSep™-16	23000
RoboSep™ Buffer (250 mL)	20104
RoboSep™ Buffer 5X Concentrate (250 mL)	20124
Sterile Filtered Conductive Tips	23101
Non-Sterile Filtered Conductive Tips	23102
Waste Bags	23103

## Service Options

Product	Catalog #
1-Year Warranty	23200
Preventative Maintenance Visit (for an instrument without a warranty)	23203
1-Year Warranty with 1 Preventative Maintenance Visit	23202
Additional Preventative Maintenance Visit (for an instrument on an active warranty)	23209

Our commitment to your research does not end when you purchase our products. STEMCELL Technologies' technical support experts and comprehensive RoboSep™ service packages offer top quality support and maintenance, freeing you to focus on your science.

Please visit [www.stemcell.com/RoboSep](http://www.stemcell.com/RoboSep) to learn more.

Copyright © 2019 by STEMCELL Technologies Inc. All rights reserved including graphics and images. STEMCELL Technologies & Design, STEMCELL Shield Design, Scientists Helping Scientists, EasySep, RoboSep, RosetteSep, SepMate, EasyStand, EasyEights, EasyPlate, RapidSpheres, HetaSep, and SpinSep are trademarks of STEMCELL Technologies Canada Inc. Lymphoprep™ is a trademark of Axis-Shield. Ficoll-Paque® is a registered trademark of GE HealthCare Ltd. Lympholyte® is a registered trademark of Cedarlane Laboratories Ltd. All other trademarks are the property of their respective holders. While STEMCELL has made all reasonable efforts to ensure that the information provided by STEMCELL and its suppliers is correct, it makes no warranties or representations as to the accuracy or completeness of such information.

STEMCELL TECHNOLOGIES INC.'S QUALITY MANAGEMENT SYSTEM IS CERTIFIED TO ISO 13485. PRODUCTS ARE FOR RESEARCH USE ONLY AND NOT INTENDED FOR HUMAN OR ANIMAL DIAGNOSTIC OR THERAPEUTIC USES UNLESS OTHERWISE STATED.

# FULLY AUTOMATED CELL ISOLATION

With RoboSep™



TOLL FREE PHONE 1 800 667 0322

PHONE +1 604 877 0713

INFO@STEMCELL.COM

TECHSUPPORT@STEMCELL.COM

FOR GLOBAL CONTACT DETAILS VISIT [WWW.STEMCELL.COM](http://WWW.STEMCELL.COM)

DOCUMENT #28060 VERSION 2.2.0 APRIL 2019