

MiCareo

RARE CELL DIAGNOSTICS



Unlocking the Secrets
of Rare Cells

Automated Single-Cell Liquid Biopsy

Precision medicine promises a future of the right treatment for the right patient at the right time.

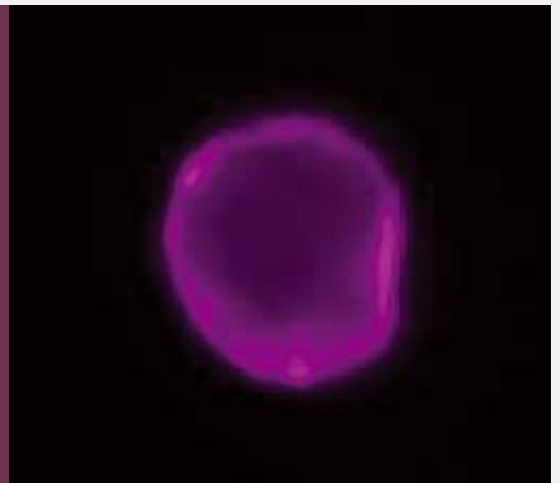
To get us to that future, drug developers and researchers need crucial information that is often hidden away deep inside rare cells that circulate in our body. These cells provide a plethora of genomic and cellular information, from gene mutations to protein expression profiles.

Liquid biopsy has shown the ability to detect and identify important information in blood. MiCareo goes one step beyond the competition.

**We capture, stain, and acquire
fluorescent multiplexed high-
dimensional images of rare cells**

Starting from whole blood

Down to a single live cell



The use of whole blood, in combination with MiSelect's fully automated process from cell selection, to antibody labeling, to fluorescence imaging, ensures that sample loss is minimized and results are reproducible. Our gentle process and integrated instrument provide consistent access to isolated live rare cells such as CTCs, and immune cells. The flexibility and downstream compatibility of our output improves the way pharmaceutical companies screen for drug effectiveness, and allows researchers to find new correlations in biomarker expression.

Our unique imaging software transforms immune-cell studies from the analysis of individual data points to a fully quantitative visual subtyping of each cell.

MiSelect R

An easy-to-use tool to solve complex problems

We have spent over a decade innovating tools that can consistently capture, image, and provide live rare cells for downstream analysis.

The best of microfluidic design, laser sorting, and fluorescence imaging technology is integrated into our fully automated rare cell system. To minimize cell loss the MiSelect R analyzes whole blood.

4 Simple Steps



1. Label whole blood

Choose our validated sorting reagents or your own cocktail



2. Pick marker panel

Select and load the imaging biomarkers



3. Let it run

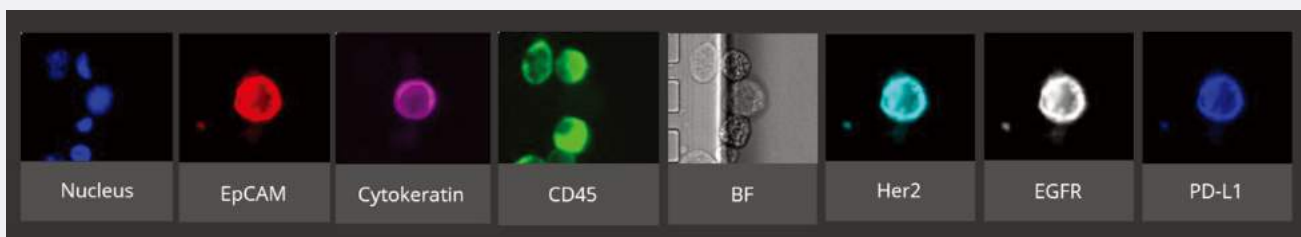
From enrichment to imaging in a single afternoon



4. View the results

Watch your screen light up with a panel of target cells

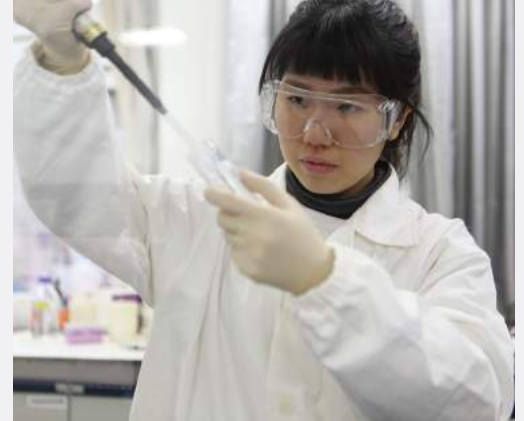
**Characterize the target cells with 7 markers
or run an expanded Boost panel for up to 13 markers.**



How it all works

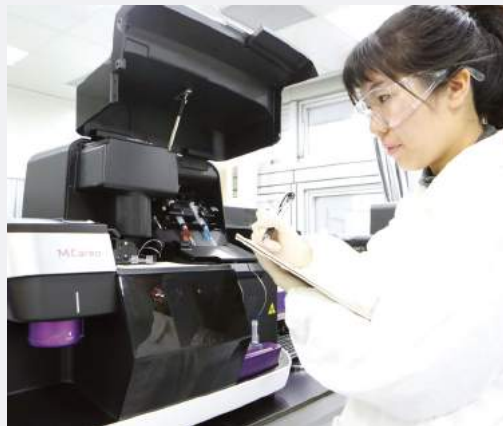
Label whole blood

- » Use any cell surface fluorescent antibody
- » Minimize sample loss
- » 10 minutes of hands on prep
- » No lysis, density centrifugation, or magnetic beads



Microfluidic Sort

- » Rapid aliquot sorting of whole blood
- » Up to 16 mL
- » 90% recovery of target cells
- » Single cell sensitivity



Stain and Image

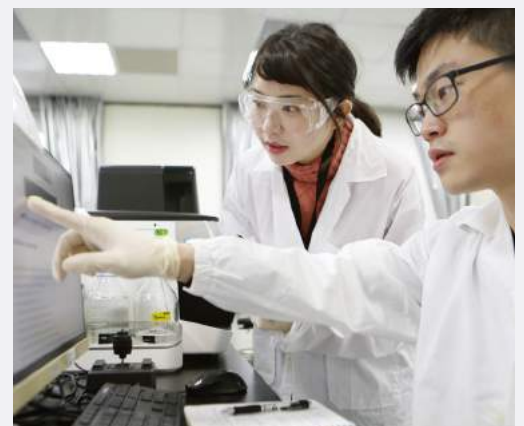
- » Automated workflow
- » 7 markers on a single cell
- » Up to 13 markers with an expanded boost panel
- » High-dimensional imaging

Rare cell retrieval

- » Collect cells with the SelectChip Retrieval
- » Up to 75% cell purity

Downstream analysis

- » High purity for NGS
- » RNA transcription profiles
- » Phenotypic studies



One tool for all your needs

Attain automated and reproducible results

Confidently get the same results independent of operator. The MiSelect R System consistently achieves over 90% recovery efficiency with less than 10% variation.

Capture key biomarker info quickly

Process two samples of whole blood with only 10 minutes of hands on prep, and complete the automated imaging of the rare target cells within a few hours. Up to 7, or even 13 biomarkers, can be characterized on the same cell allowing for finer cellular classification and faster biomarker discovery.

Obtain more than genomic information

Our technology preserves the integrity of isolated cells, affording access to the complete range of genomic as well as cellular information.

Go beyond CTCs

Rare Immune Cells

The MiSelect R isolates rare immune cells more successfully than FACS, and the multiplexed high-dimensional images provide quantitative subtyping using markers such as PD1, CTLA-4, TGFb, LAG-3, TIM-3, CD4, and CD8.

Other Rare Cells

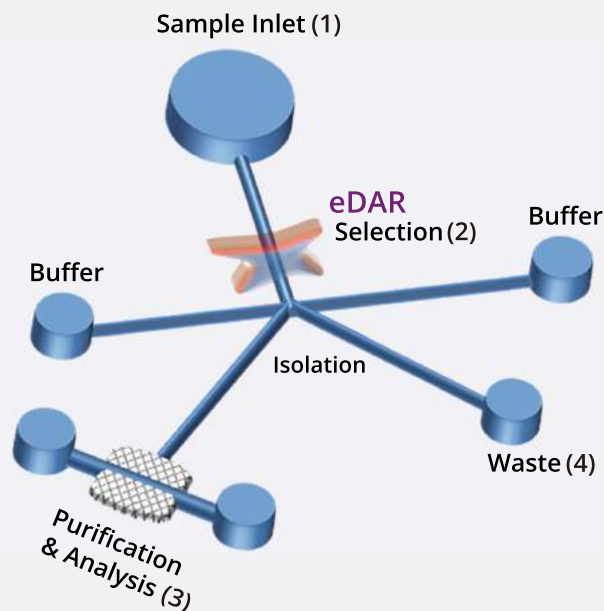
Research auto-reactive T cells, lymphoblastic cells, fetal cells, cancer stem cells or other rare cells with your own selective cell surface markers.



Enrich and identify

Our technology is able to process large samples rapidly and yet preserve cell integrity thanks to a technique we developed called ensemble-decision aliquot ranking (eDAR). Instead of treating the whole blood sample as equal, eDAR breaks it down into nanoliter aliquots; only those aliquots containing the target cells receive closer investigation.

Begin by labeling the whole blood sample with surface antibodies (or a cocktail of antibodies).



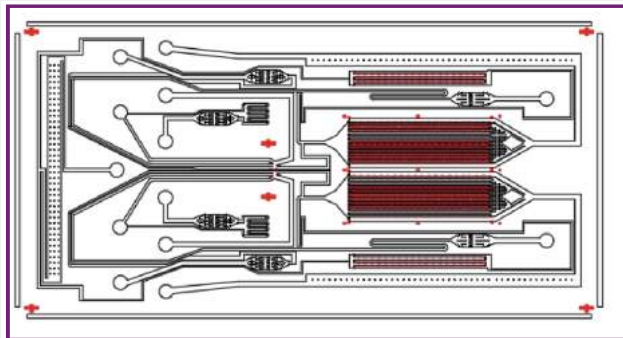
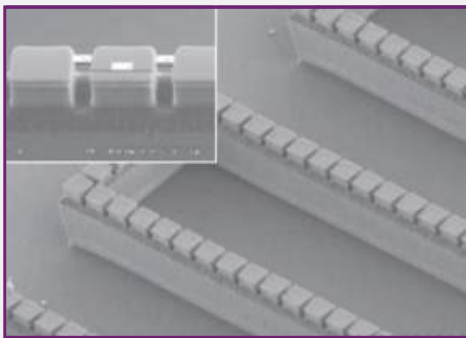
Fluorescently labeled blood enters through the inlet (1) and flows continuously through the laser light. When eDAR detects the presence of target cells (2), it triggers the sorting of the aliquot into a separate chamber for further purification and analysis (3). The rest of the sample flows into the waste chamber (4).

On-chip filtration and imaging

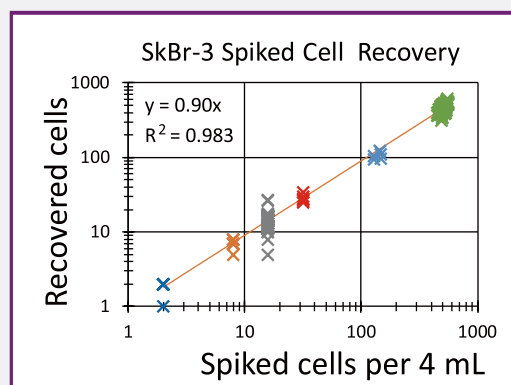
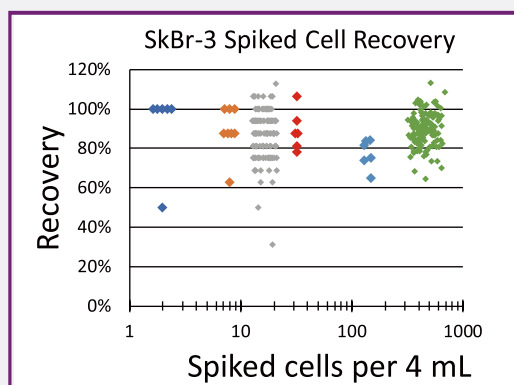
Once the aliquots containing the target cells are collected, on-chip filtration removes blood cells, especially RBCs, and a purification chamber further enriches the rare cells leaving a nearly pure collection.

The enriched target cells are ready for the automated and integrated reagent staining and imaging, or cell removal for downstream analysis.

- » Size based removal of the few remaining non-target blood cells
- » Our technology has solved clogging, cell shear stress, and capacitance issues normally associated with size based separation techniques
- » 5 micron filter gap captures even the smallest CTCs

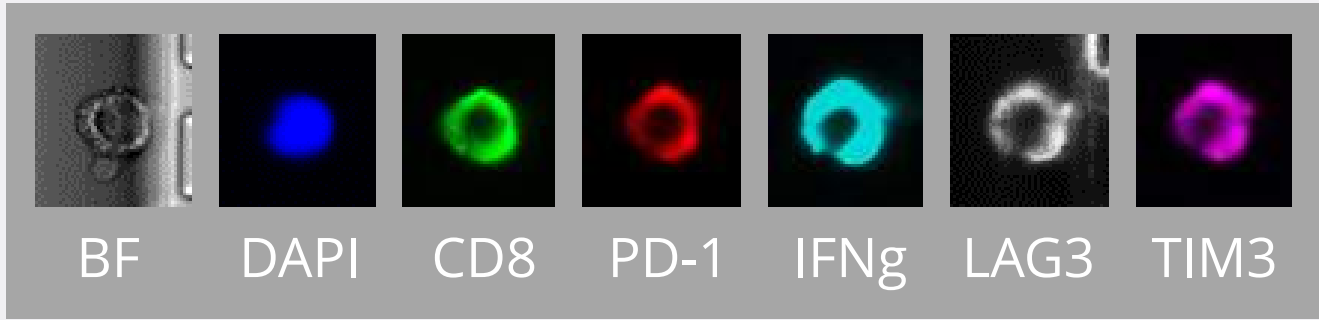
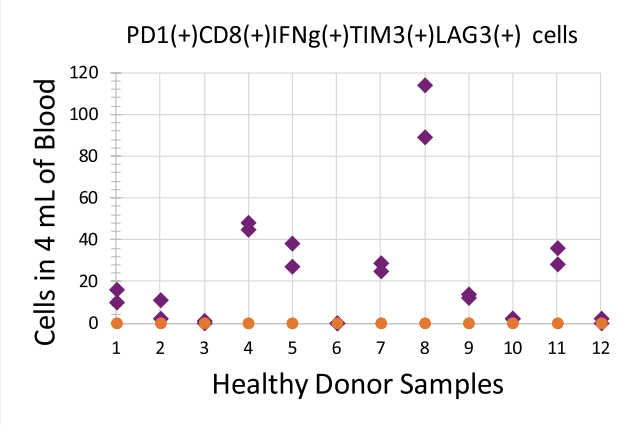
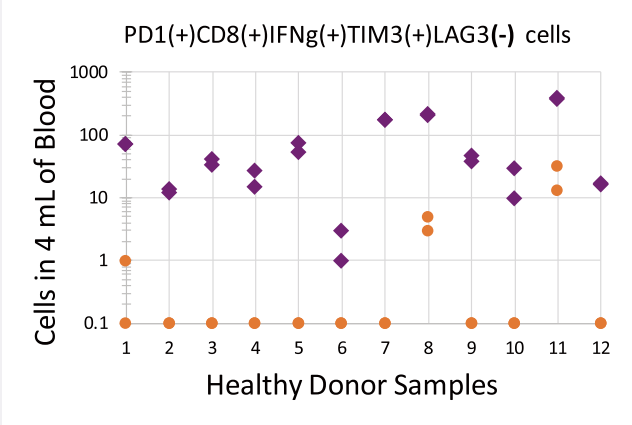
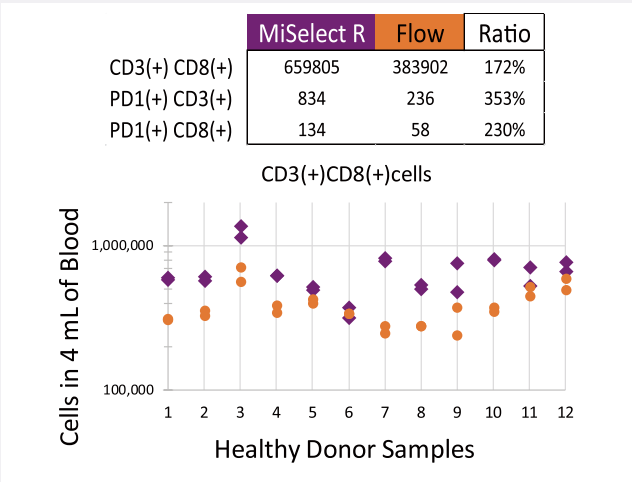
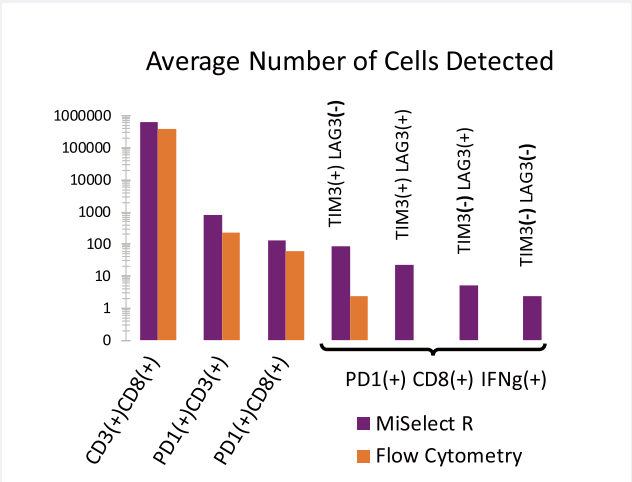


MiSelect R analytical performance



Sensitive Immune Cell Collection and Analysis

>2x higher cell detection than Flow Cytometry





Specifications

Size and weight

70cm W x 60cm H x 50cm D
80kg

Power specifications

Rated voltage: 90 ~ 246 VAC
Rated frequency: 47 ~ 63 Hz

Environmental specifications

Indoor use only
Operation temperature: 20 ~ 30°C
Humidity: 5% ~ 80% R.H.

Optical specifications

Objective lens: CFI Plan Apo Lambda 20X 0.75NA

Camera: Scientific CMOS, 5.5 megapixel

Laser: 488nm, 50mW

LED excitation at 4 wavelengths: 385nm, 475nm, 530nm, 625nm

Fluorescence filters:

8 positions filter wheel

Laser filter: 580/30m

UV filter: 460/50m

UV/Red filter: 625/30m (optional)

UV/IR filter: 800/40m (optional)

Blue filter: 530/30m

Blue/Red filter: 690/50m (optional)

Green filter: 580/30m

Red filter: 690/50m



SelectChip Dual

SelectChip Dual is a single use microfluidic cartridge designed to process milliliters of whole blood quickly and isolate target rare cells. Each chip has two independent channels to allow for two separate patient samples or one larger volume sample. SelectChip does not cause cell shear stress or capacitance issues normally associated with size based separation techniques.

- » 16 mL of blood can be processed with a single chip (two 8 mL samples in parallel)
- » Dual channels for processing up to two samples at once
- » 5 micron filter gap captures even the smallest CTCs
- » Made of PDMS, glass, and a protective plastic case

SelectChip kit contains

- » One microfluidic chip with two independent channels
- » Two sets of sample loading tubing
- » Two 5 mL polypropylene syringes

SelectChip Retrieval

SelectChip Retrieval is a single use microfluidic cartridge designed to enrich target rare cells and output them into a small volume in a microcentrifuge tube. The Retrieval chip sorts whole blood with high purity, allowing for direct coupling to many downstream analysis methods.

- » Excellent recovery and high purity enrichment of live rare cells
- » Completely disposable fluid path prevents contamination
- » Gentle processing and low shear stress maintain the integrity of the cells

**The SelectChip Retrieval, as well as other specialized chips designed for higher purity nucleic acid analysis, are currently in the final development stages and may not be ready for immediate purchase.*



Reagents

MiCareo has design several reagent kits for isolating CTCs and other rare cells for specific use with the MiSelect R platform. Use our validated SelectKit combination kits to sort and identify target cells, or pick individual SelectSort and SelectProbe reagents to target your cells of interest.

Our current available offerings

Sorting reagents

- » SelectSort EpCAM
- » SelectSort EGFR

CTC identification

- » SelectProbe CTC
- » SelectProbe CTC Plus HER2
- » SelectProbe CTC Plus PD-L1

Kits for sorting & identification

- » SelectKit CTC
- » SelectKit CTC EGFR Enhanced
- » SelectKit CTC Plus HER2
- » SelectKit CTC Plus PD-L1

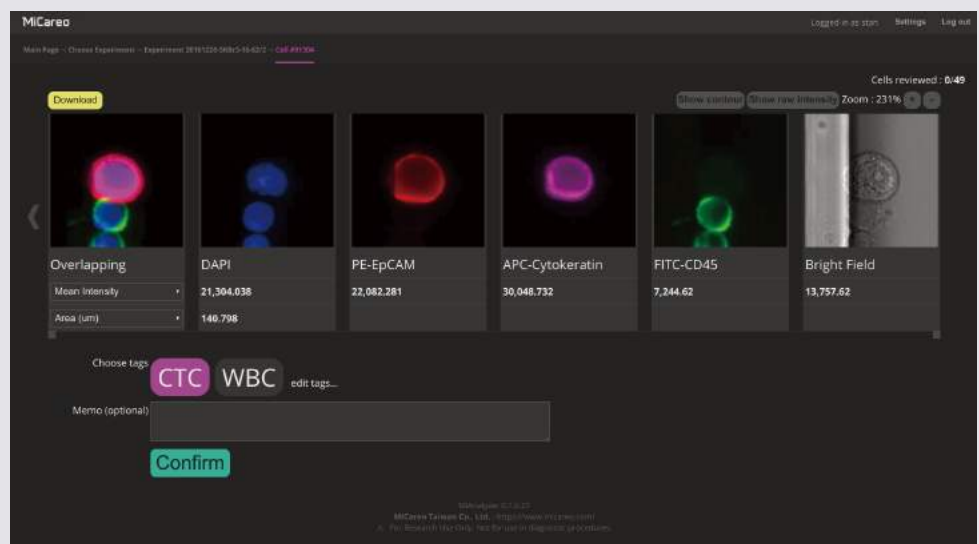
Immune reagents

- » SelectKit Immuno PD1
- » SelectKit Immuno CTLA-4

Cell Image Analysis

High resolution images produced by MiSelect can be analyzed and reviewed using the bundled software. Cells can be grouped and categorized using quantitative measurements of their fluorescent biomarkers as

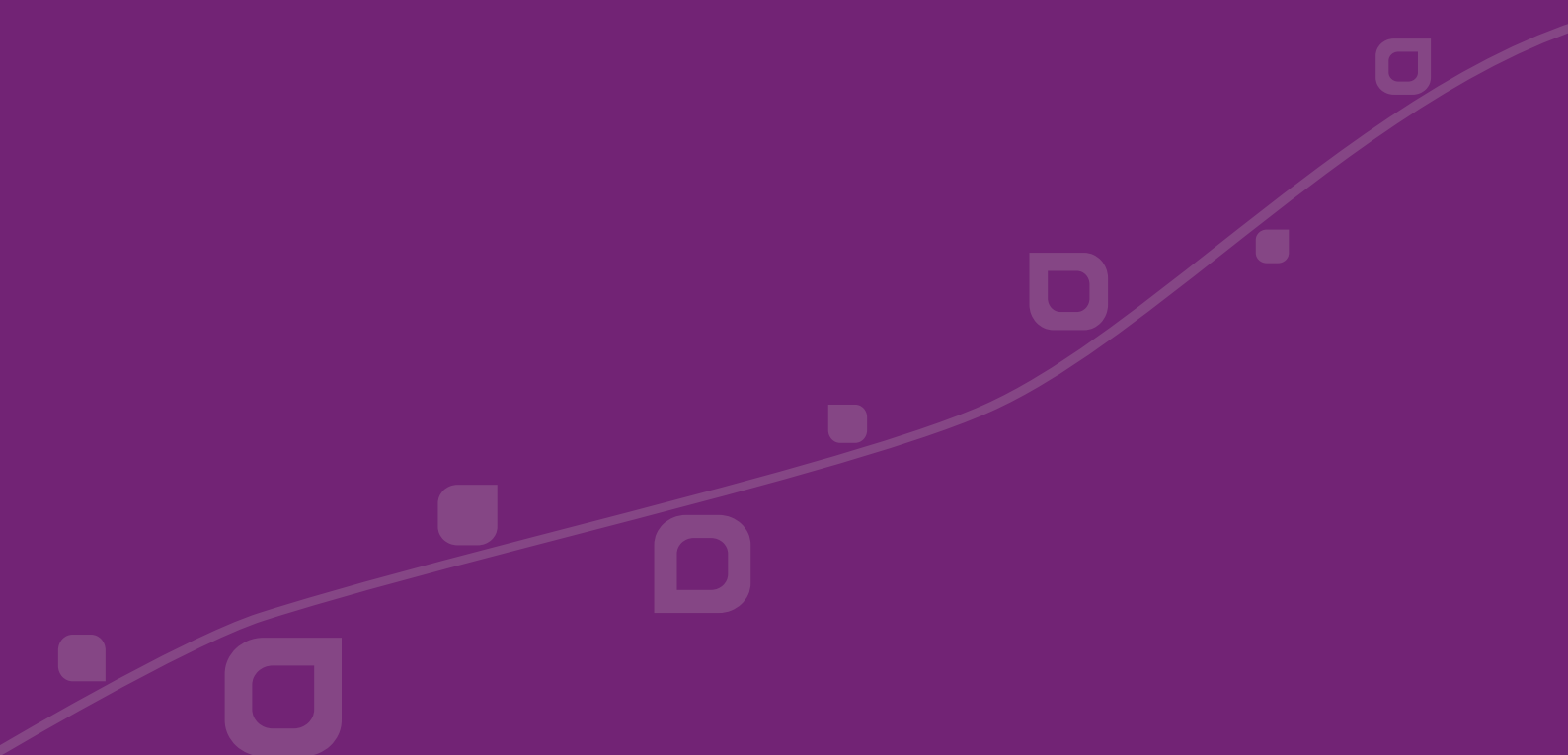
well as morphological features, such as nuclear size. Analyzed cells can be generate quick reports on the different numbers and subtypes of cells found in the sample.



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