Free up your workflow with

Freedom Flow™

- Compensation-free
- Autofluorescence-free
- Label-free

FLOW CYTOMETERS

KINETIC RIVER®

Where Light Meets Life™

TRFC

Kinetic River has pioneered a completely novel approach to cell analysis:

Time-Resolved Flow Cytometry, or **TRFC**. TRFC enables applications previously unachievable in flow cytometry, addressing many of the field's biggest pain points.

What is TRFC?

Using laser modulation, TRFC captures fluorescence signals on nanosecond timescales, adding a new dimension of measurement. TRFC can distinguish fluorophores with identical emission spectra based on their fluorescence decay—something no other analyzer can do.

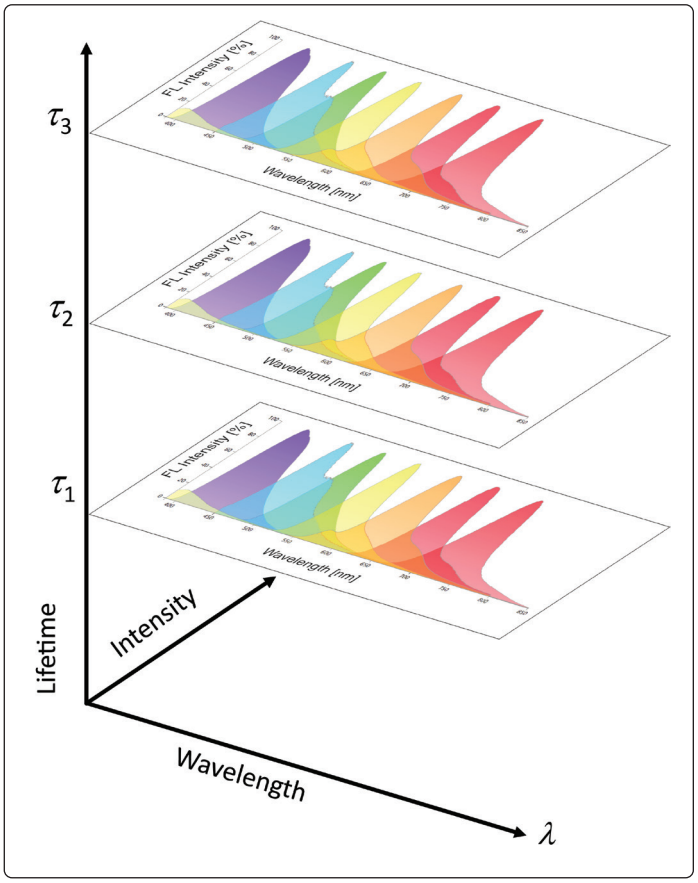
Freedom Flow™

Freedom Flow is a portfolio of new analyzers under development based on TRFC technology. Freedom Flow frees up your workflow, enabling **compensation-free** (*Arno*), **autofluorescence-free** (*Colorado*), and **label-free** (*Tiber*) cell analysis.

Free up your workflow with Freedom Flow!

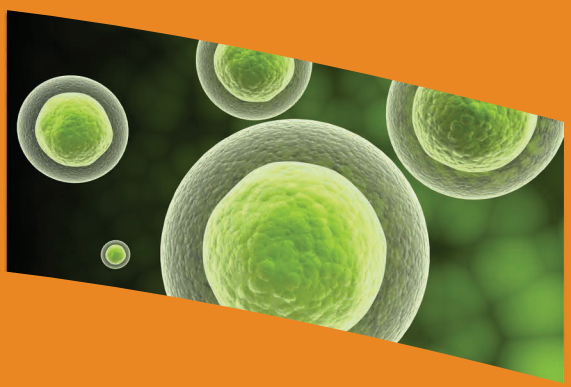
TRFC: *Freedom Flow™*

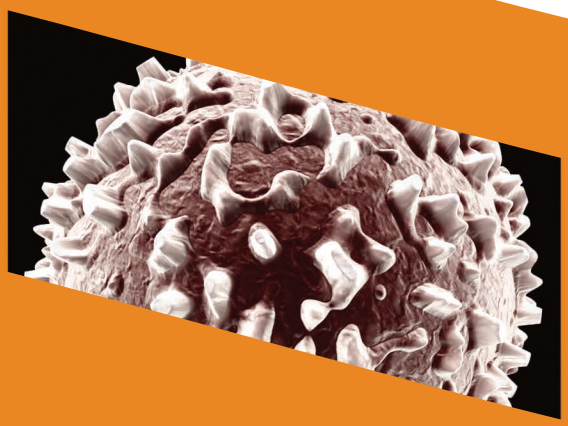
Compensation-Free Flow Cytometry	→	**simplified** protocols, **lower costs** of controls
Autofluorescence-Free Flow Cytometry	→	**lower** background, **higher** sensitivity
Label-Free Flow Cytometry	→	toward rapid **cancer cell** discrimination

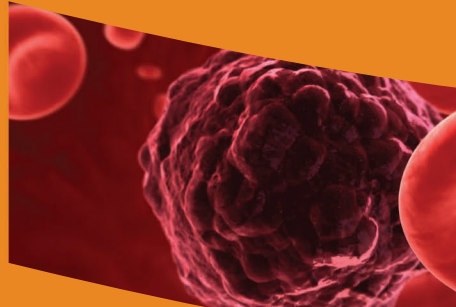


TRFC has the capability to triple the number of colors for each detector and can enable 8–12 colors per laser—or 40+ colors with 5 lasers with a greatly simplified workflow.

Freedom Flow is a portfolio of new analyzers based on TRFC technology.







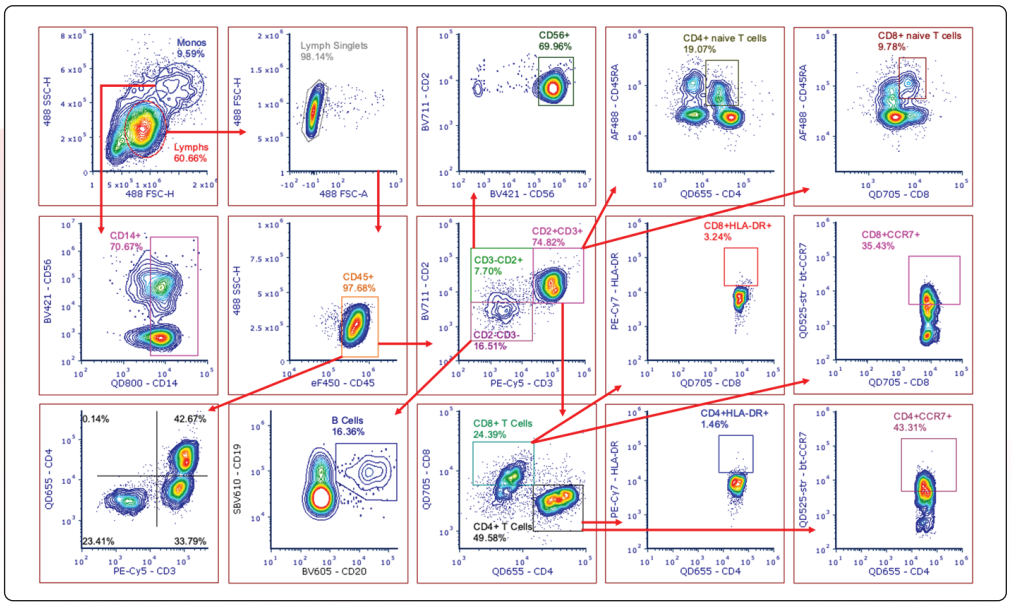
Arno

The *Arno* Compensation-Free Flow Cytometer

Hate compensation? So do we! The *Arno* does away completely with compensation and spectral unmixing.

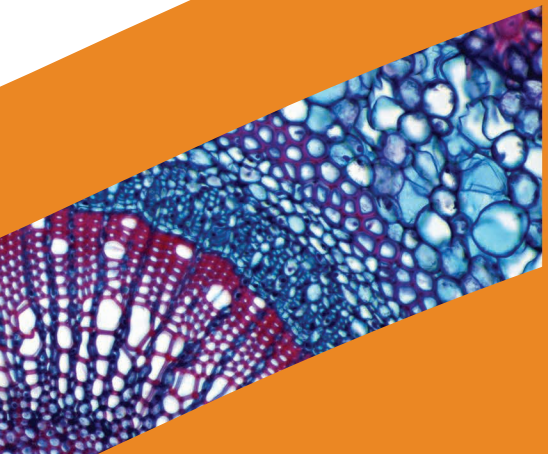
The *Arno* analyzer is capable of providing 12-color, **compensation-free** flow cytometry using only 2 lasers and 6 detectors. Powered by Kinetic River's TRFC technology, the *Arno* uses fluorescence decay, behind the scenes, as a means to distinguish two fluorophores.

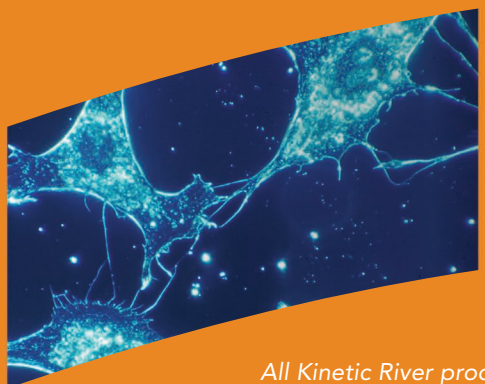
Results from a 12-marker assay on commercial mononuclear cells performed on the *Arno* using only two lasers (405 and 488 nm) and six fluorescence detectors. None of the measured parameters needed to be compensated for spectral spillover. Each detector collected emissions from two markers; the detected emissions were then separated by fluorescence lifetime using proprietary algorithms. Boxes and red arrows indicate the gating procedure for isolating cell subpopulations.

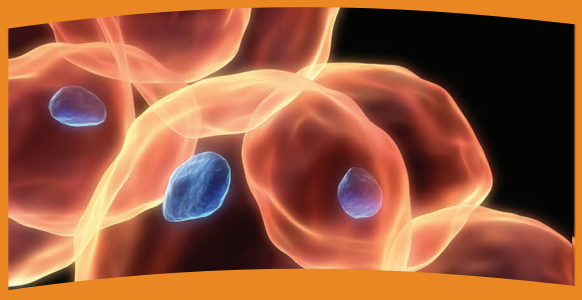


TRFC works behind the scenes—so there's no need for the user to worry about fluorescence lifetime.

Break free from compensation with the *Arno*.







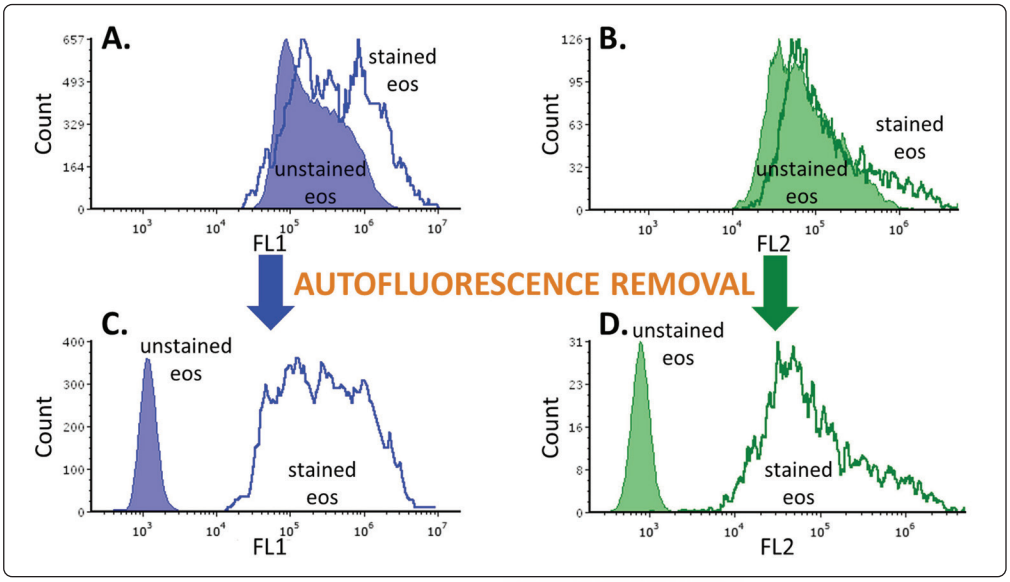
All Kinetic River products are named after rivers, canals, and dams. The Arno *is named after the river flowing through Tuscany, Italy; the* Colorado *is named after the river that carved out the Grand Canyon in the southwestern US; the* Tiber *derives its name from the river that flows through central Italy.*

Colorado

The *Colorado* Autofluorescence-Free Flow Cytometer

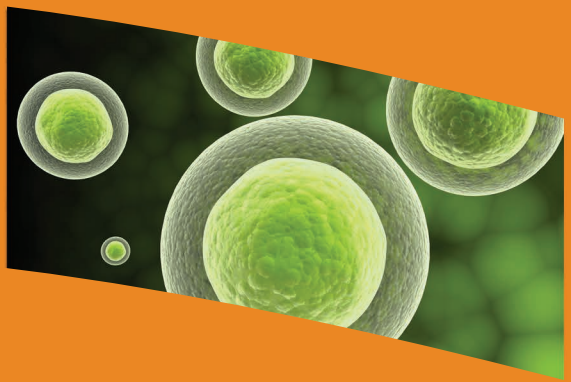
Most assays in flow cytometry rely on signals from exogenously added fluorescent labels. Autofluorescence—unwanted background due to fluorescence from a number of endogenous cellular components—can interfere with our ability to see and accurately quantitate this desired signal. The broad emission spectra of most cellular autofluorescence means that this troublesome background is present in almost all channels, making it nearly impossible to avoid.

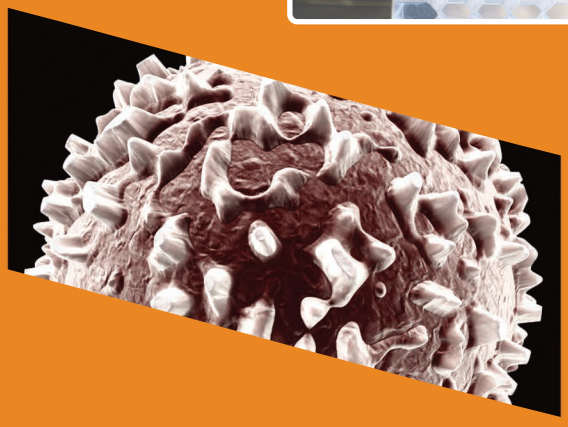
The *Colorado* analyzer is capable of providing **autofluorescence-free** flow cytometry. Powered by Kinetic River's TRFC technology, the *Colorado* uses fluorescence lifetime as a means to distinguish this undesirable fluorescence from true signal, increasing instrument sensitivity and Staining Index.

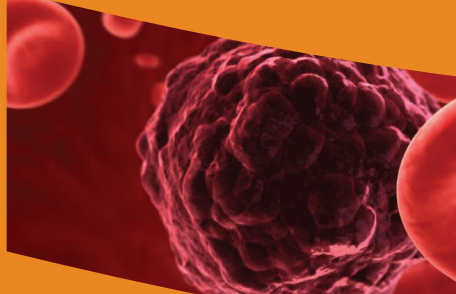


Without the need for the user to worry about fluorescence lifetime, using TRFC behind the scenes, the *Colorado* can automatically isolate the background coming from autofluorescence and remove its contribution from your samples—even from some of the most notoriously autofluorescent cells such as eosinophils.

Free yourself from autofluorescence with the *Colorado*.



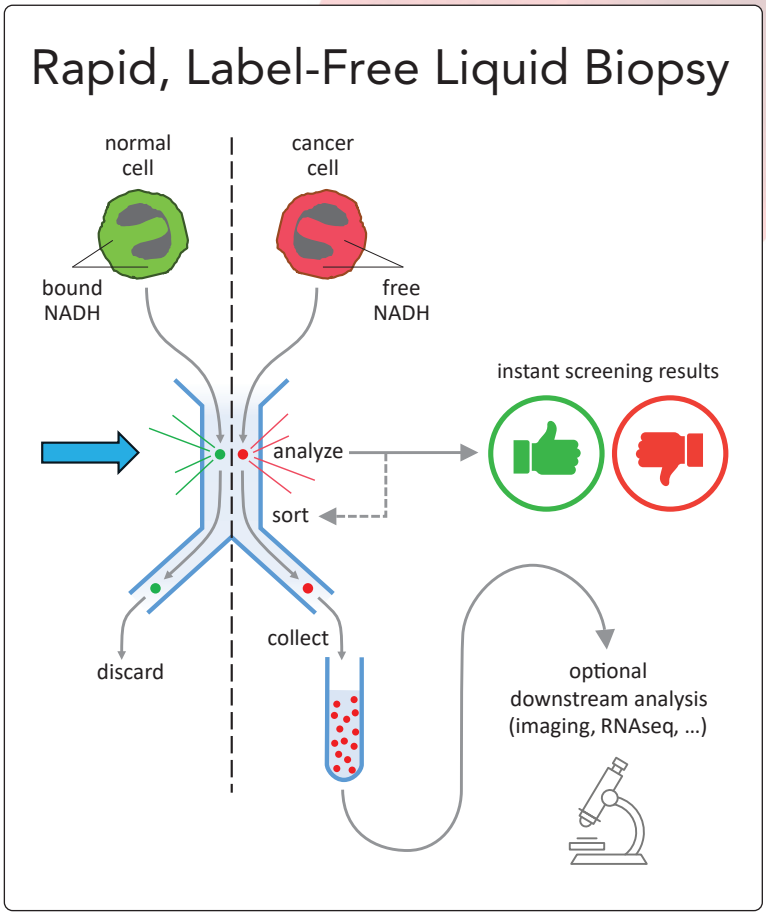




Tiber

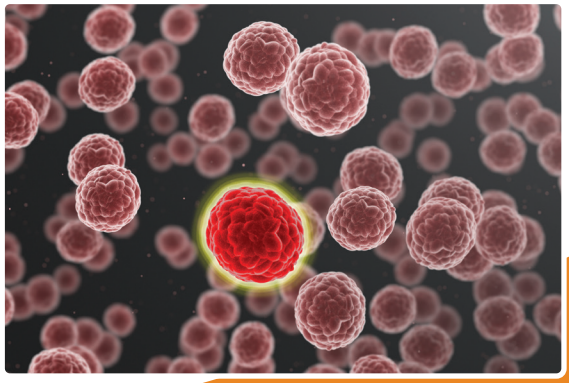
The *Tiber* Label-Free Flow Cytometer

Autofluorescence is not always unwanted. Rather, it can be used as an analytical tool. In many cells, slight changes in the lifetimes of endogenous fluorophores, such as NADH and FAD, can be used to assess fluctuations in a fluorophore's microenvironment within the cell—revealing a wealth of information about that cell. Changes to pH, local ion concentration, or whether the autofluorescing molecule is protein-bound or free, can all cause detectable variations in fluorescence lifetime.



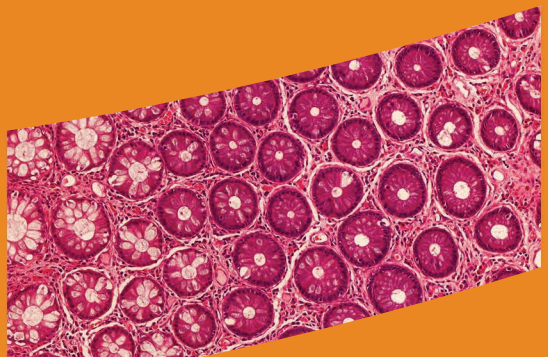
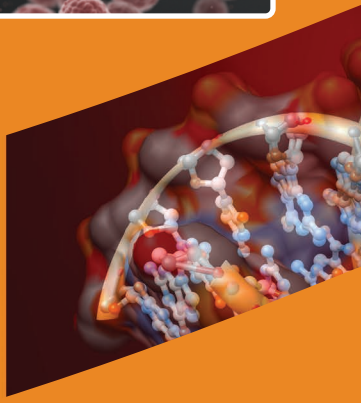
Kinetic River's *Tiber* analyzer provides you with **label-free** flow cytometry. Using powerful lasers intended to excite cellular autofluorescent entities, the *Tiber* has been used to detect differences in autofluorescence lifetime caused by protein binding in NADH—an established proxy for the metabolic state of cells. These metabolic differences are a fundamental hallmark of cancer, enabling discrimination of cancer cells from normal cells—without adding exogenous fluorophores.

The *Tiber* uses TRFC technology, which is completely compatible with sorting. We envision a version of the Tiber that provides instantaneous analysis for rapid screening of samples—a true label-free liquid biopsy. With the addition of sorting, the *Tiber* will enable collection of cancer cells for detailed downstream analysis. This will allow more accurate diagnosis, prognosis, and even personalized treatment.



Make the invisible visible—label-free—with the *Tiber*.



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The Freedom Flow technology, or use thereof, may be covered in whole or in part by patents in the U.S. and other jurisdictions. A current list of applicable patents can be found on our website at https://www.kineticriver.com/kinetic-river-corp-patents/.

KINETIC RIVER®

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