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April 24, 2019

Dear CellRaft AIR System user,

We are pleased to announce the release of an exciting new software update! It contains several revisions designed to enable more workflows and streamline formerly manual processes. The main highlights are:

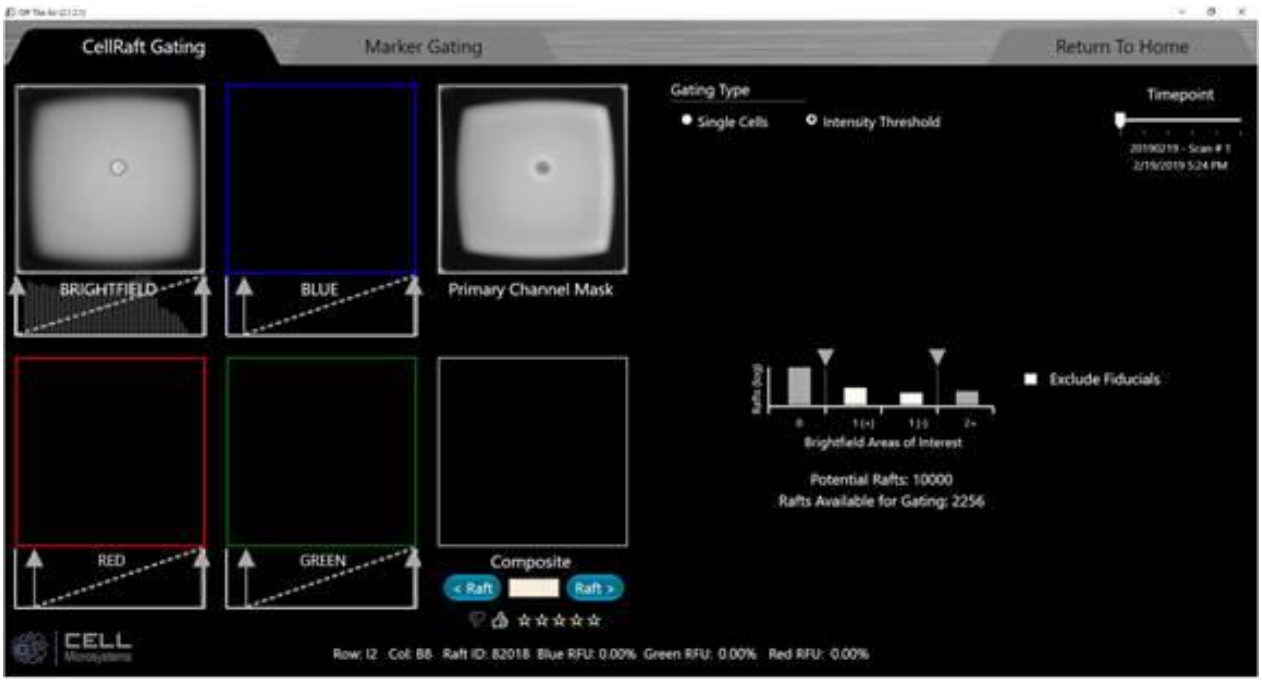
1. Ability to identify and sort cells by brightfield only (no fluorescence required)
2. Ability to identify and sort cells by total fluorescence or brightfield signal (not just single cell sorting)
3. Ability to sort cells based on changes in fluorescence and brightfield signals over time
4. Ability to score, rank, and filter cells via new CellRaft Organizer

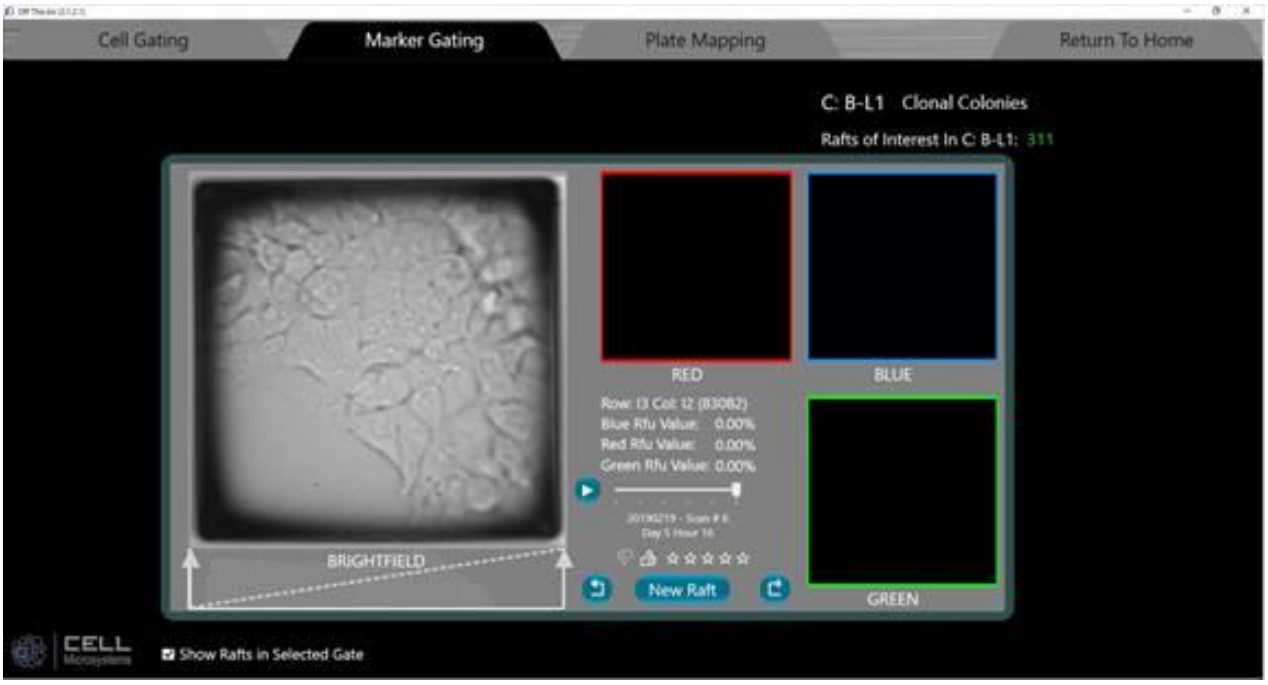
These new features enable faster, more automated sorting for single cell and multi-cell CellRafts. Applications in CRISPR gene editing, cell line development, single cell genomics, and more sophisticated functional genomics are all improved with this release.

See the latest version of the CellRaft AIR System manual on our Technical Support webpage for details.

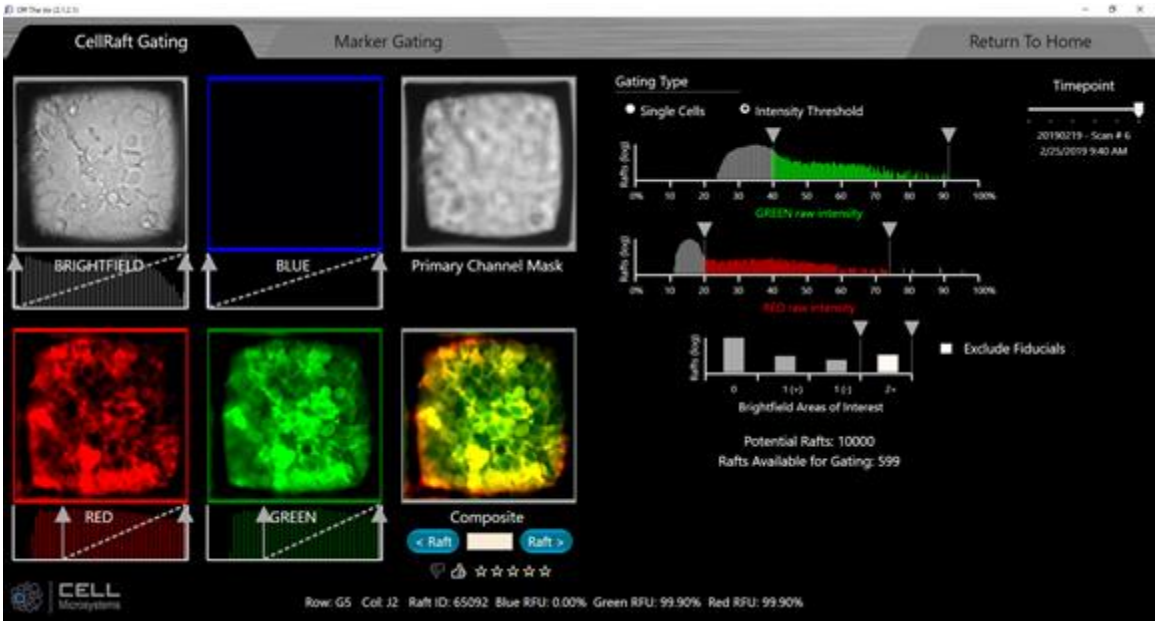
FEATURE	BENEFIT
Addition of two gating modes on the initial CellRaft Gating screen within Cytometric Image Analysis mode (in addition to single-cell detection of a nuclear stain):	
1. Based on fluorescence intensity thresholds	Gating with fluorescence intensity thresholds allows selection of more nuanced phenotypes and/or colonies, not simply the presence or absence of a single cell.
2. Based on the number of cells on a CellRaft as estimated from its brightfield image	Gating based on brightfield images allows single-cell or colony selection without subjecting cells to fluorescent dyes or stains, some of which are known to be harmful to cell viability or inhibit downstream genomic analysis.
Addition of several histogram display options on the Marker Gating screen within Cytometric Image Analysis mode (in addition to relative fluorescence intensities):	
1. The number of cells on a CellRaft as estimated from its brightfield image	Gating based on brightfield images allows single-cell or colony selection without subjecting cells to fluorescent dyes or stains, some of which are known to be harmful to cell viability or inhibit downstream genomic analysis.
2. The confluence of colony growth on a CellRaft as estimated from it brightfield image	Plotting confluence within the CellRaft allows colony selection based on growth and can be used to determine the optimal timeframe to isolate colonies that maximizes viability after isolation.
3. The change in relative fluorescence intensity, number of cells, or confluence between two full array scans	Measuring change in fluorescence or change in colony growth can inform users about rate of cell growth, rate of gene editing, or other co-culture dynamics within a CellRaft
Addition of a CellRaft Organizer screen with the ability to: 1. Display a table of CellRafts in the CytoSort Array 2. Filter the CellRaft table based on star rating, thumbs up/down rating, Cytometric Marker Gates, collection plate, color group, isolation status, and time since modified or viewed 3. View images of CellRafts selected from the table 4. Map collection plates from the CellRaft table or modify existing plate maps	The CellRaft Organizer is a tool to view, sort, and filter CellRafts based on user-defined criteria. The organized list of CellRafts can provide greater insight to best select the CellRafts that meet the needs of the experiment.
Implementation of Cytometric Marker Gate "promotion" for a gate population to be available during Plate Mapping, included in the list of Marker Gates on the Home screen, and included in the Marker Gate filter list in the CellRaft Organizer	Provides a cleaner and more user-friendly approach to segment and organize cells of interest so they can be mapped to a collection plate.
Ability to assign "tags" to CellRafts in the form of star ratings and thumbs up/down to track CellRafts of interest over time or to exclude CellRafts from cytometric analyses	Allows the user to manually annotate particular CellRafts to help rank, score, include, exclude, promote, or demote so Collection Plates only include the 'best' or 'favorite' CellRafts.
Minor edits to instruction screens	Provides clarity for proper system operation to improve the user experience.

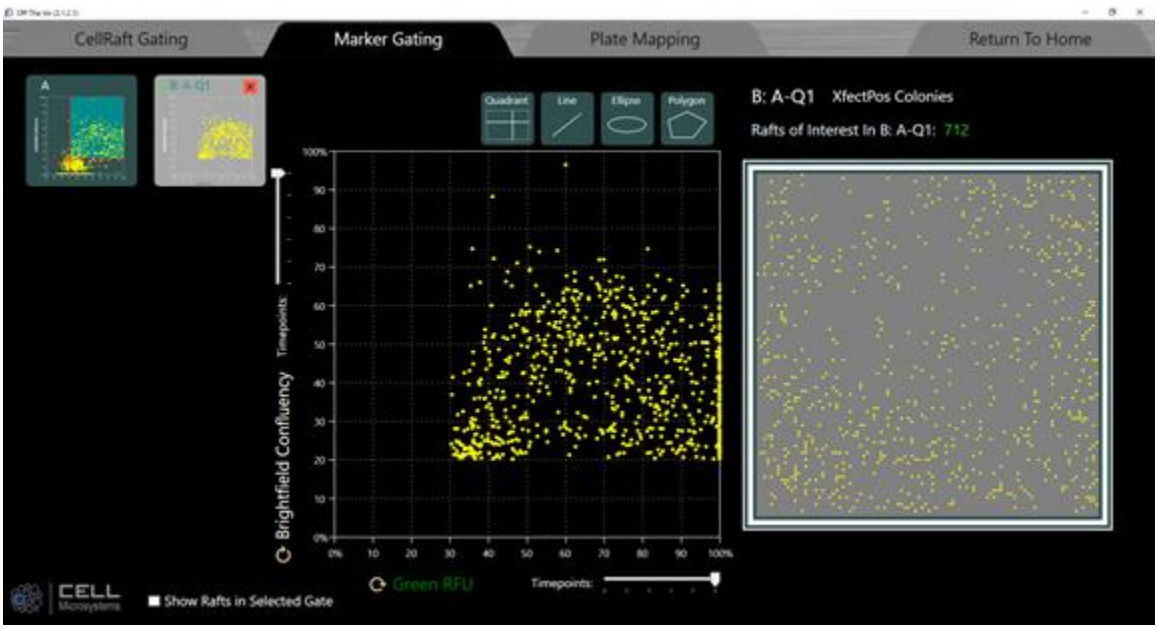
Identify and sort cells by brightfield



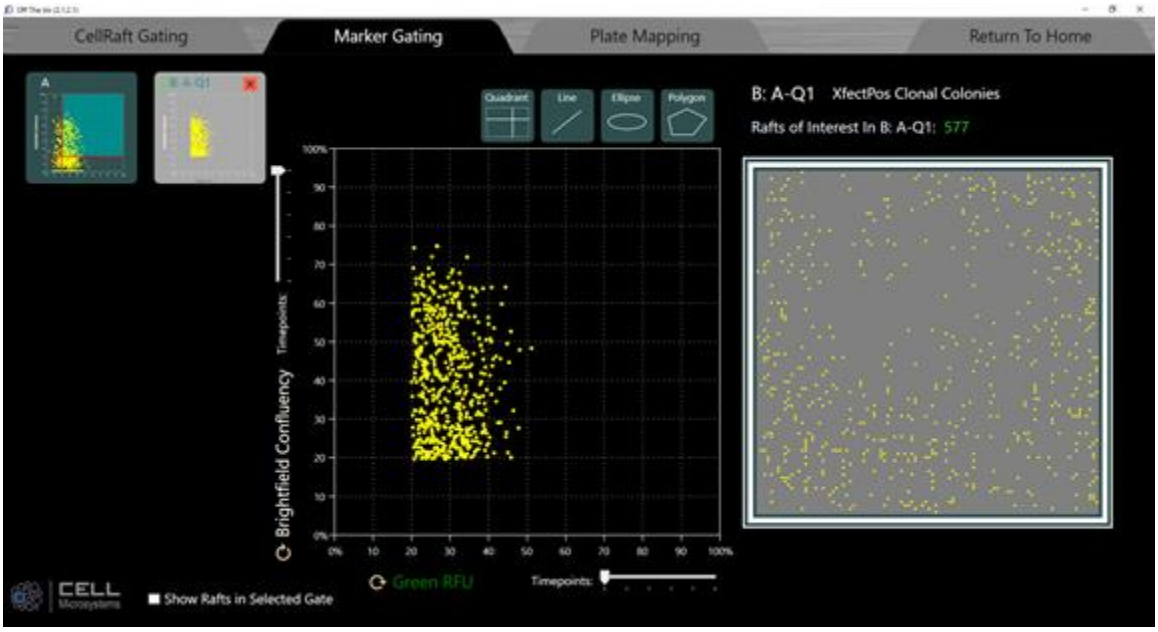


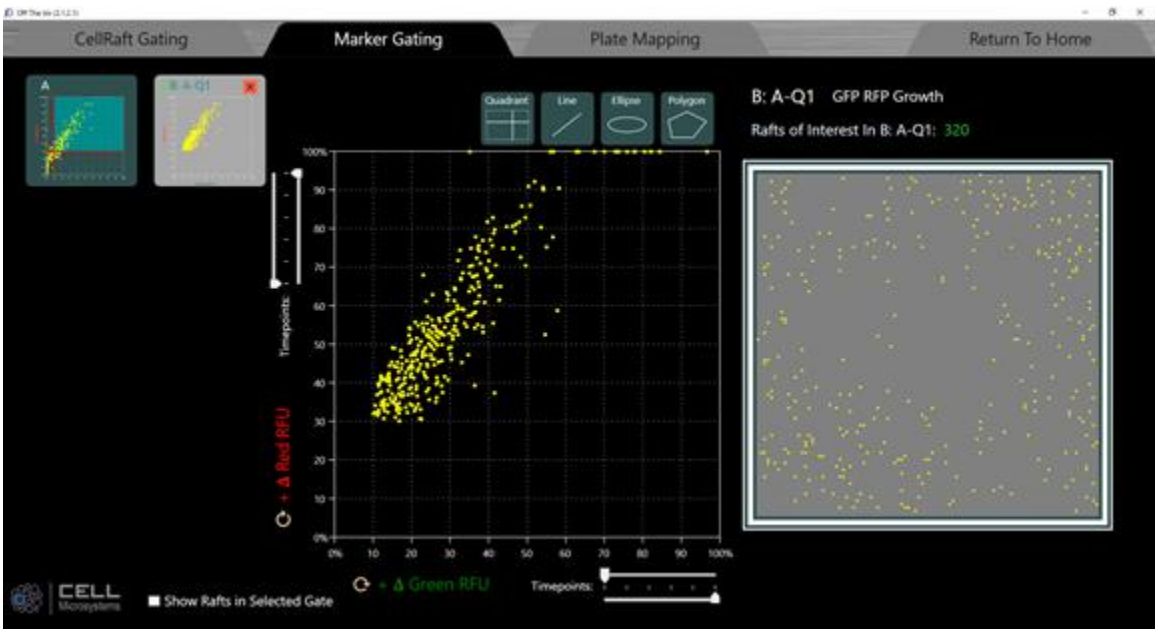
Identify and sort cells by total fluorescence or brightfield signal



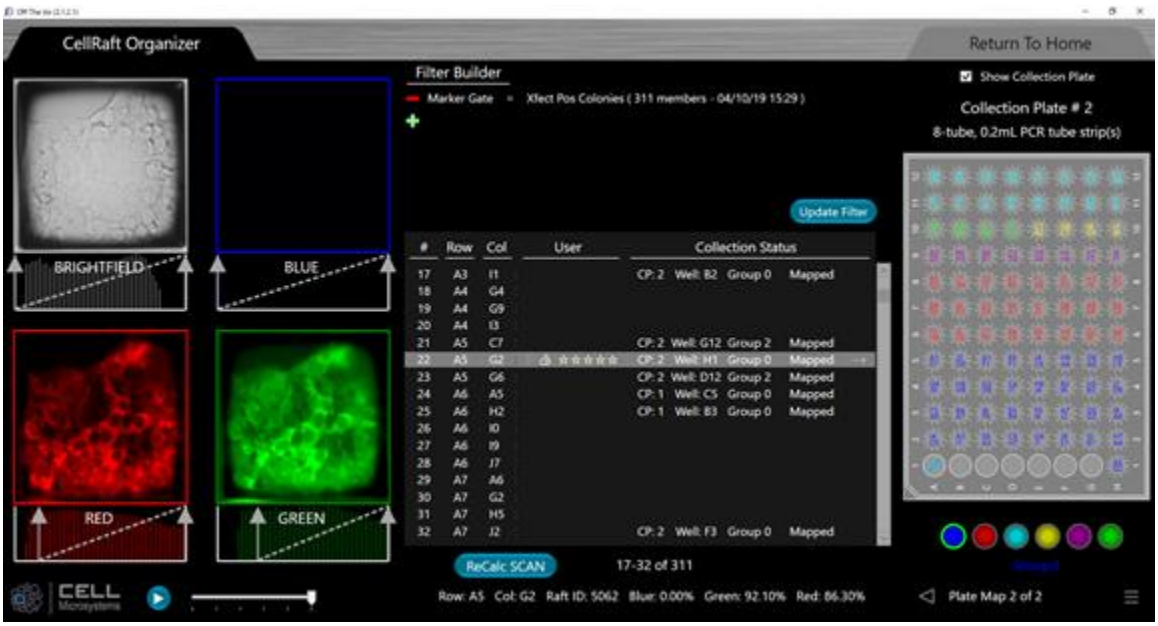


Sort cells based on confluency and changes in signal over time





Score, rank, and filter cells via CellRaft Organizer



Update your Software

We encourage everyone to update their software to the new version when convenient for your research projects. The new software acquires more information for each scan, so data generated with the old software and opened in the new software will have some empty data fields. We suggest all related datasets in the database to be consistent across your experiments. For this reason, we recommend completing ongoing experiments using the prior version, while initiating new experiments with the upgraded version. Installation of the updated software does not impact your ability to use the previous version.

Please contact us at support@cellmicrosystems.com, for questions, concerns, and access to the new software and installation instructions.

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CellRaft AIR™ System