# gemstone 2.0

GemStone™ is a revolutionary approach to high-dimensional flow, spectral, and mass cytometry data analysis. Based on patented Probability State Modeling™ technology*, GemStone's approach is scalable, science-based, and reproducible.

Simple wizards guide you through model development and automatically generate beautiful reports. Cen-se' ™ and overlay plots reveal the hidden correlations in your data.

GemStone is built from the ground up for automated, high-dimensional analysis, integrating supervised and unsupervised approaches.
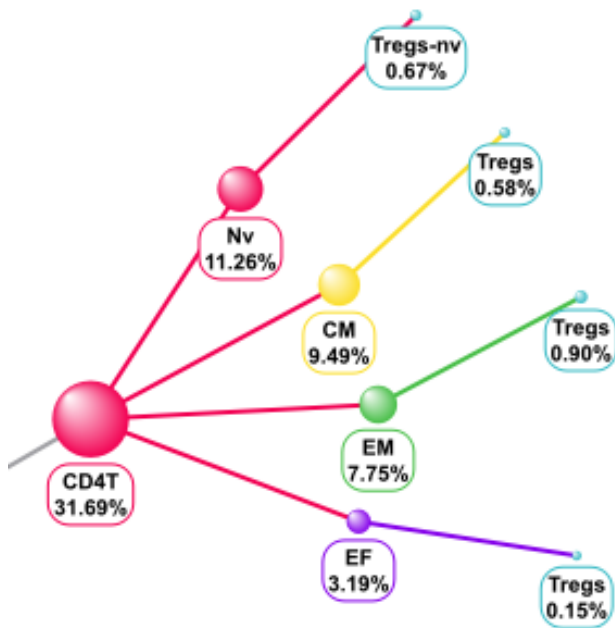
Force-directed map provides a visual summary of all populations and subsets defined in the supervised model.

High resolution Cen-se' cleanly identifies populations in an unsupervised, improved t-SNE labeled by the model.
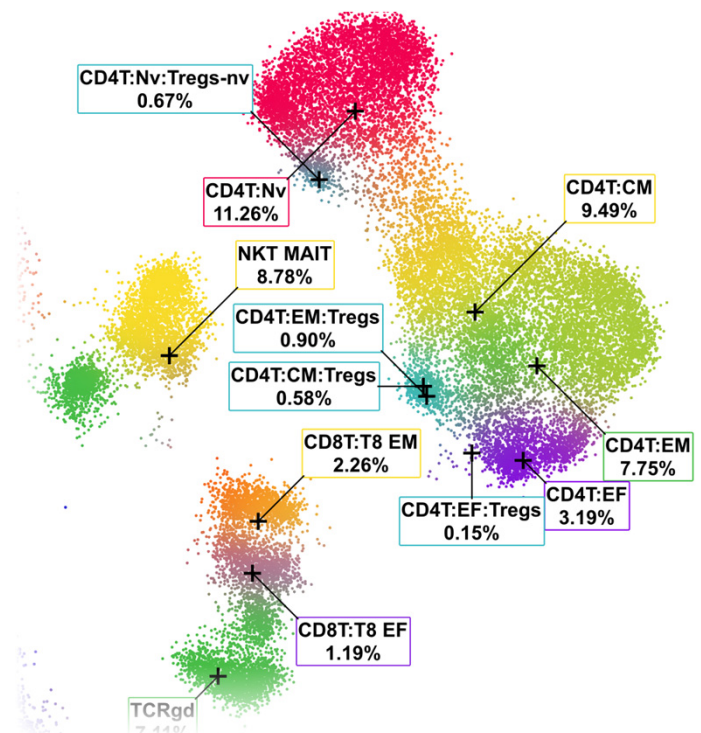
*US Patent 7,653,509, EU Patent EP2183681

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Comfortable interface
Comfortable, like you already know how to use it.

Probability-based
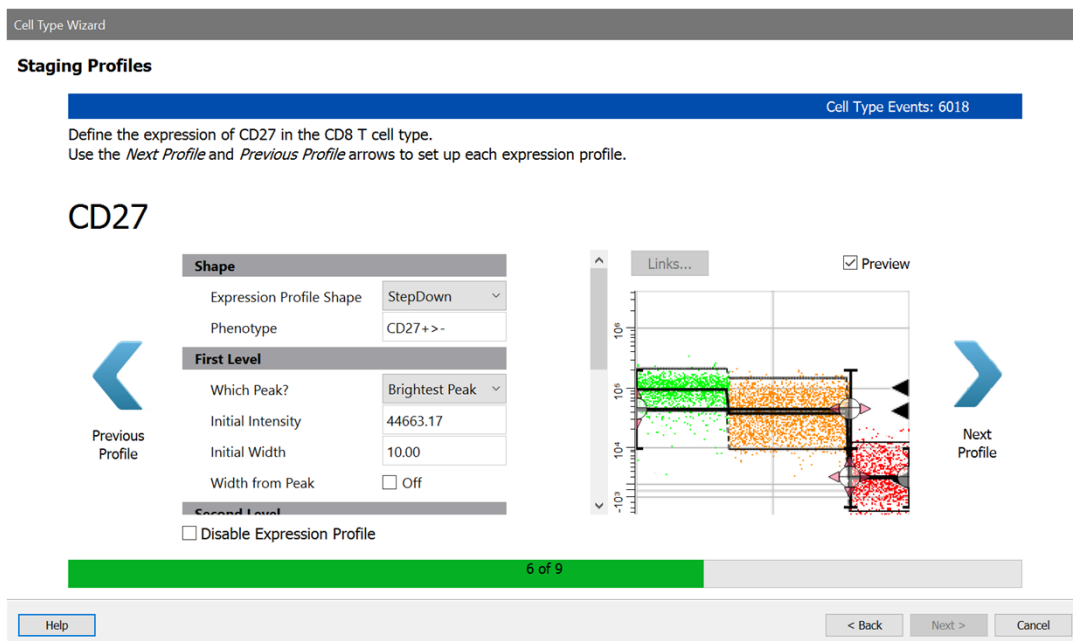Forget gates. Let probabilities define your populations.

Automated analysis
Design your model with wizards and you're ready to roll.

Reproducible results
In study after study, everyone gets the same answers.

www.vsh.com   Windows 7, 10+   MacOS 10.12+

Verity Software House
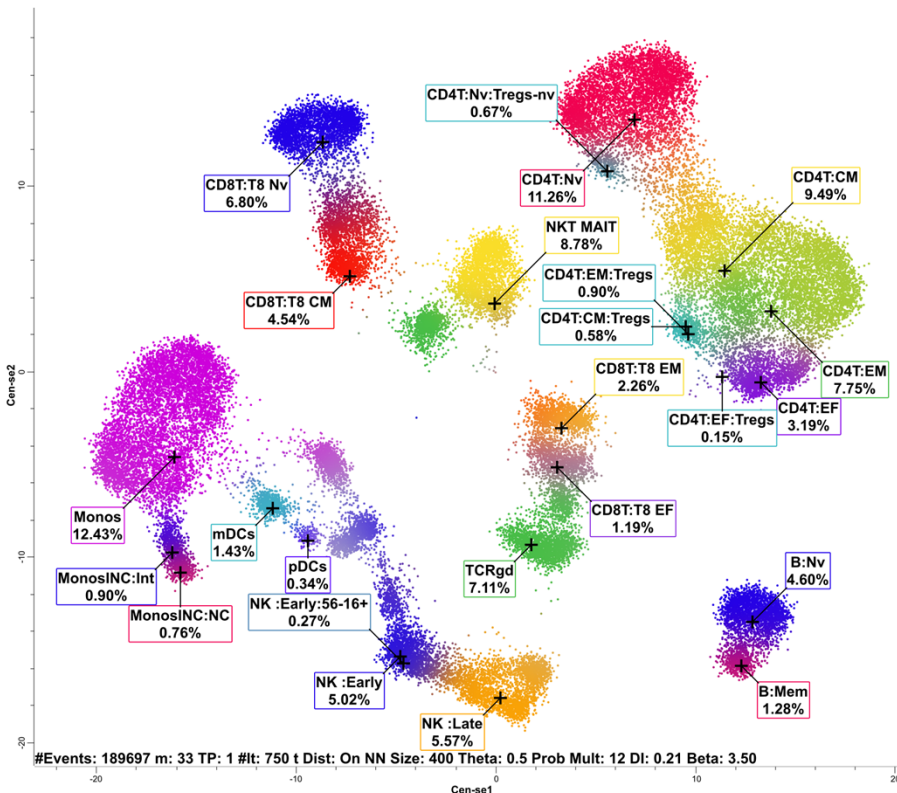
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Understand your cells
Coplot markers to see coordinated changes in expression.

Export results
Easily integrates with LIS and spreadsheets.

Best of both worlds
Leverage supervised and unsupervised analysis in one, integrated approach.
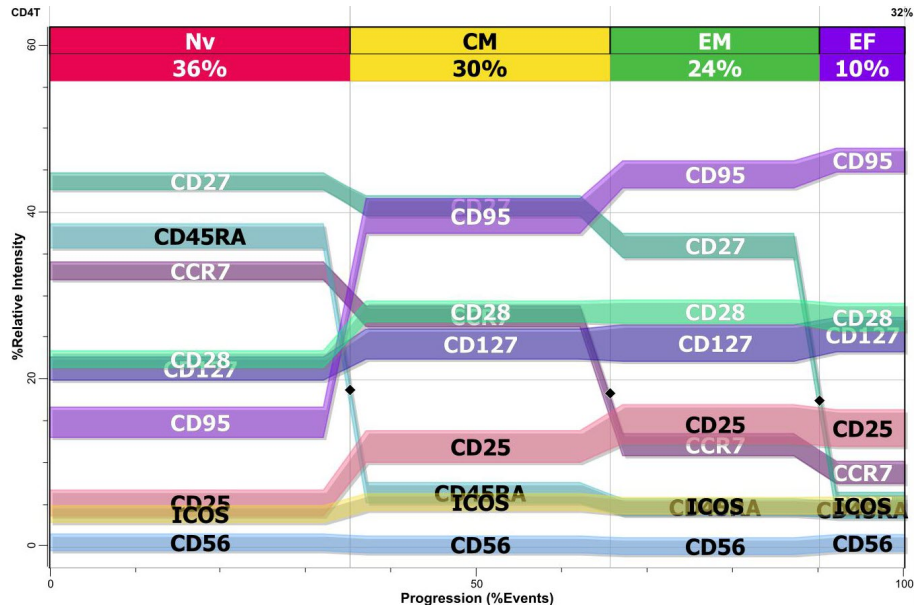
Cen-se'
Faster than t-SNE, better than UMAP, and labeled.

Share your work
Share your analysis with free GemStone Reader.

Exploration tools
Interactively explore populations using animation to understand relationships.

Features and Benefits

Analysis

Probability-based
Probability State Modeling is an objective, science-based approach.

Reproducible
Different users at different sites get the *same* results.

Cell type wizard
Identifying populations is a breeze, and report pages are created automatically.

Batch files
Drop in your files and go! Easy, versatile, and automated batch processing.

HD ready
From the ground up, GemStone is built for high dimensional data.

Scalable
Adding a measurement only requires one additional plot in a cell type.

Performance
An objective, statistical assessment of how well each cell type in the model is performing.

Ratios
Create ratios and other calculated measurements quickly and easily.

Automation

Automatic analysis
Designed for automation, GemStone adjusts your model to your data, along with saving graphics, reports, and database.

Unlimited files
Your experiment can be as large as you want!

Easy batch setup
Choose batch options from simple selections.

Save graphics
Export the graphics where you want them to go, in the format you want!

Dimensionality Reduction

Cen-se'
Based on t-SNE, the Cen-se' algorithm provides better separation and much better performance. You need to see 300,000 events? Not a problem.

Automatic labels
Because Cen-se' is integrated with the model, it can display population labels on the plot automatically. No other solution provides this level of integration.

High speed
Cen-se' is multi-threaded, allowing it to process more events in less time.

Consistent locations
Cen-se' uses the model to determine where populations are oriented on the plot, so you'll find them in the same location each time you run the model.

User Interface

Project based
Keep all your project files together. FCS, PDF, graphics, templates, results - all within the same project.

Ribbon interface
A ribbon with clean, vibrant, and meaningful icons makes finding what you want easy.

Measurement wizard
Easily edit measurement names, setup transforms and scaling, and check staining.

Context menus
Right-click any object to perform related actions.

Quality Control

Fully tested
Written under the strictest quality guidelines, GemStone doesn't go out the door until it passes extensive testing.

Stain assessment
Select positive and negative populations for each stain and get detailed stain assessment plots and results.

Alerts
Flag out-of-range values and missing measurements and include flags in reports.

No double-counting
Each event belongs to one and only one cell type. You never have to worry about double-counting due to overlapping gate definitions.

Built-in QC
Reduced Chi-Square for each cell type, customizable alerts for out-of-range stats, and a model performance table provide solid QC.

Statistics and Database

Custom equations
Create user-defined equations to compute additional statistics for reports and database.

Database
GemStone creates a comprehensive database of results which can be automatically exported for integration with LIM systems.

Statistics
Medians, means, SD, robust SD, event counts, percent of total, percent of cell type, SSMD, and more.

Tables
Create tables to display results and sample information.

Graphics

Popular formats
Save graphics in PDF, SVG, PNG, JPG, and all other popular formats.

Printing
Get high-quality hard copy of your reports at any printer resolution.

PDF
Generate PDF output with user-defined resolution.

Publication quality
Output in vector format with SVG, or up to 1200dpi for raster formats.

Overlay plot
Unique to GemStone, the overlay plot allows visualization of correlated markers in one graph to examine changes in staging, timing of marker expression, and progression.

Summary map
The summary map is a force-directed graph of all cell type populations, with labels and frequencies.

Reports

Automatic pages
The Cell Type wizard generates a clean and comprehensive report page for each population automatically.

Customizable
A master page makes it easy to add logos and header text to all pages. All elements can be customized, and new elements added to any page.

Comprehensive
Add 1P and bivariate plots, expression profiles, Cen-se', TriCOM™, and overlay plots. Other objects include tables, legends, text, lines, arrows, boxes, ellipses.

Reusable
Report layouts can be saved and reused for other projects.

Import and Export

FCS files
Read all popular data file formats from major vendors.

CSV files
Import data from CSV and tab-delimited text files.

Export FCS
Export FCS files for further analysis in other software.

Export database
The database can be exported in tab-delimited text format.

Archive
Projects can be archived in ZIP format and tagged with keywords for later retrieval.

Share projects
Projects can be easily shared with collaborators using the ZIP format.

Support

User guide
A comprehensive user guide with meaningful tutorials is included.

Training
Contact us to find out when our next in-house training class will be or to arrange on-site training at your facility.

Video tutorials
Check out our comprehensive library of video tutorials on YouTube.

Responsive
Our tech support representatives are here to help via phone or email!

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