



JMP® GENOMICS

Discover the biological patterns in genomics data.

From the two most trusted names in analytic software: SAS and JMP.

What is JMP® Genomics?

JMP Genomics is a statistical discovery software solution from the two most trusted names in analytic software: SAS and JMP. Research organizations use JMP Genomics to uncover meaningful patterns in high-throughput genetics, expression microarray and proteomics data. Dynamically interactive graphics and analysis dialog boxes make it easy to explore data relationships using a comprehensive set of traditional and advanced statistical algorithms.

Why is it important?

Research organizations want to maximize their return on investment of the time, money and resources required to generate high-quality genomic data sets. Specialized statistical analyses can help identify the “nuggets of gold” hidden in long lists of candidate genes or biomarkers. Whether it’s used to identify potential drug targets, to explore the biology of a model organism or to develop a predictive disease model, JMP Genomics helps researchers gain a competitive advantage by quickly identifying key genes or proteins.

Who should use it?

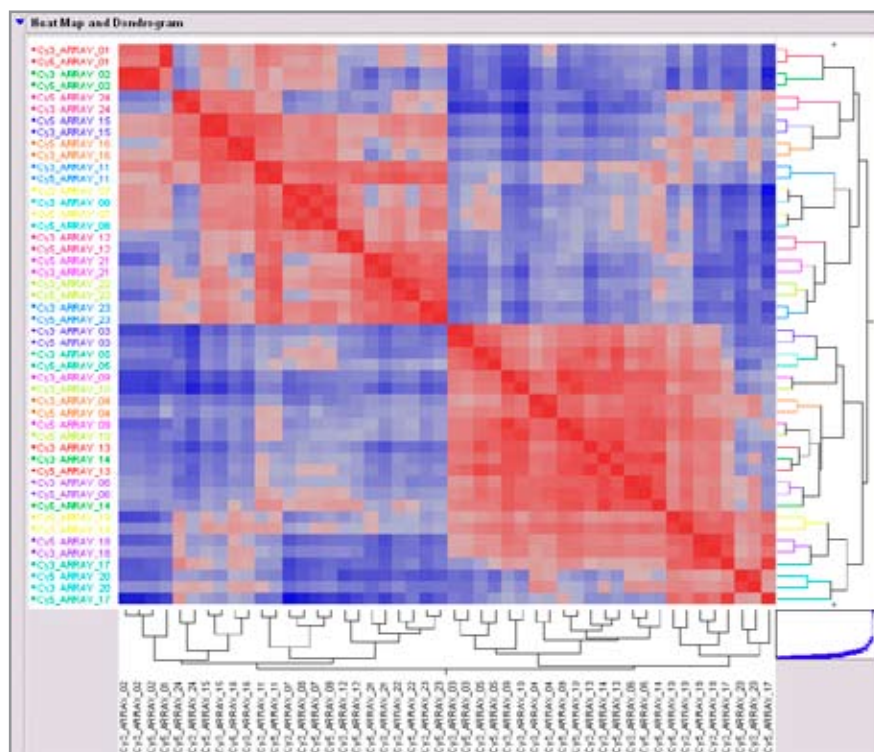
JMP Genomics is designed for biologists, chemists and biostatisticians engaged in analyzing data. It delivers a comprehensive set of analysis methods in a single desktop software package. Adopting new software across a large organization can be challenging. That is why JMP Genomics offers genetics, microarray and proteomics analytics in the same package, making it easy for you to move into all areas of genomics as the scope of your research expands.

In the rapidly advancing field of genomics, the ability to conduct sophisticated analyses on huge volumes of data and visually summarize significant findings adds a vital new dimension to scientific research.

JMP® Genomics software from SAS brings high-powered, sophisticated genomic data exploration and analysis to the desktop. Designed to help research scientists and biostatisticians understand data generated from genetics, expression or exon microarray and proteomics studies, JMP Genomics dynamically links advanced statistics with graphics to provide a complete and comprehensive picture of your research results.

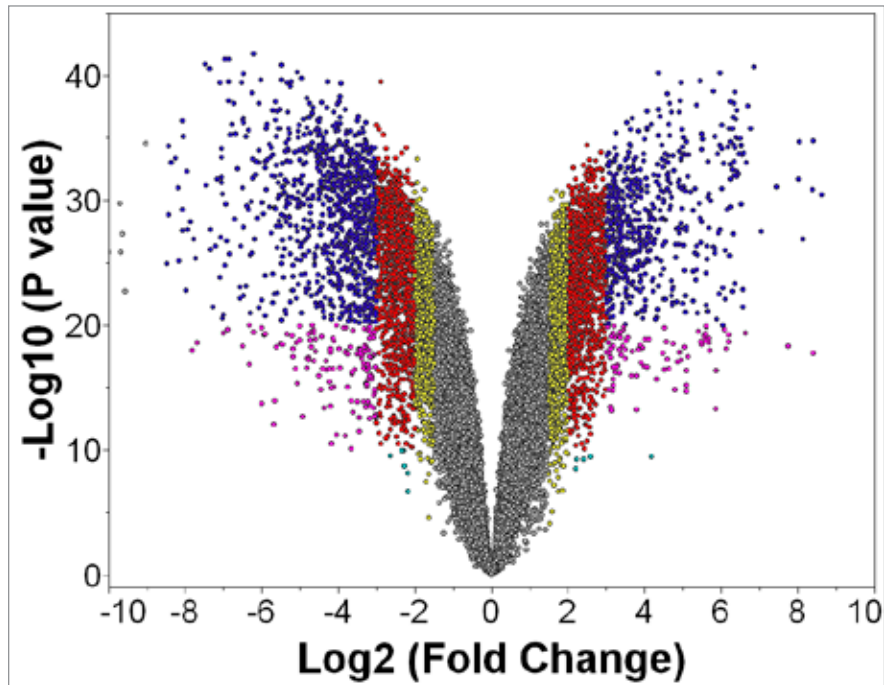
With JMP Genomics, you enjoy the full power of the JMP statistical discovery platform enhanced with industry-leading SAS® analytics tailored for heavy-duty processing of genomics data sets. Our menu-driven system simplifies workflow throughout the process, and JMP data visualization capabilities translate results into interactive graphical displays at the end.

If you are more interested in scientific discovery than in learning another programming language, don’t worry—you don’t need programming skills or advanced statistical training to take full advantage of the unique capabilities of JMP Genomics. Point-and-click menus let you select from a variety of



Prebuilt quality control procedures in JMP® Genomics let researchers easily identify correlations among arrays in large data sets, as this heat map illustrates.

**STATISTICAL
DISCOVERY.™
FROM SAS.**



Interactive volcano plot graphics allow easy identification and selection of sets of significantly changing genes.

powerful, prebuilt SAS analytic processes and easily choose customized options appropriate for your genomic data sets. Just point, click and you're on your way to discovering the important trends in your data. It's powerful analysis made easy.

More than 100 procedures for genetics, microarray and proteomics analysis make JMP Genomics an all-in-one solution, whether you're screening a genome for significant genetic markers, looking for meaningful patterns from expression microarrays, or examining high-throughput spectral data in a proteomics lab. As your genomic studies expand to new areas, you can explore new data in a familiar environment—without wasting time and money on new software packages and the training required to master them.

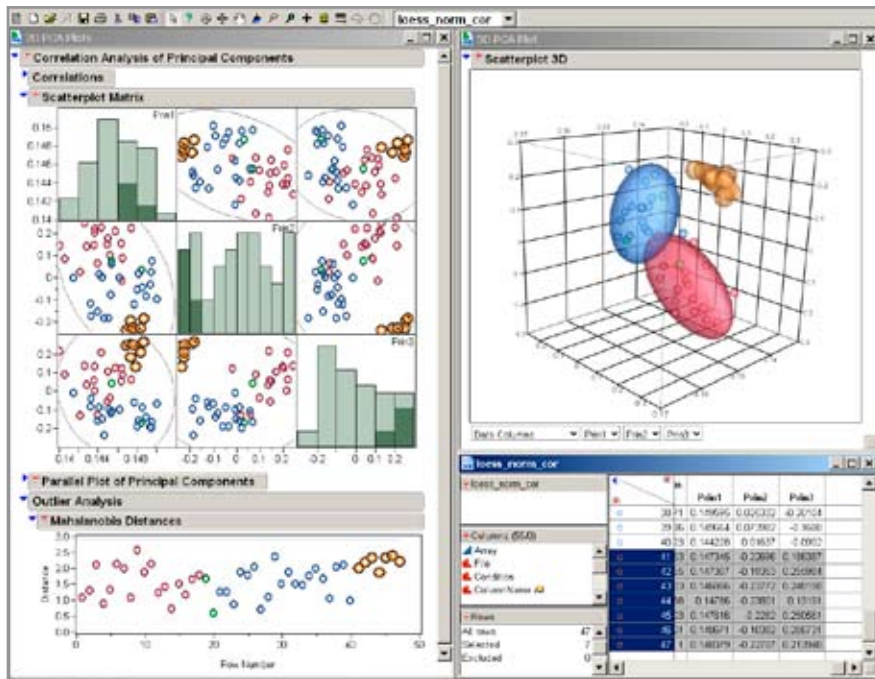
Beyond the comprehensive genomics menu, JMP Genomics includes full access to the extensive analysis and graphical features of the JMP platform, a powerful statistical tool for the rest of your laboratory needs. You can design experiments that are large yet efficient, and intuitively construct a variety of dynamically interactive graphics driven by a host of generic statistical methods. For example, basic copy-number analysis is straightforward. With JMP Genomics, you are never restricted to a small subset of specialized analysis tools, and you don't need to mix and match multiple software packages to handle different data types.

Research scientists use JMP® Genomics to:

- **Enhance the quality of genomics research.** Get a clear picture of data quality and relationships, even in massive volumes of data. Pinpoint potential problems with research methods early on, then take appropriate steps to optimize lab procedures and enhance data quality. JMP Genomics lets you identify and remove the effects of uninteresting experimental variability. And you'll never miss an opportunity to identify a key biomarker.
- **Generate graphical summaries automatically.** You don't need advanced technical skills to produce graphical representations of your data. JMP Genomics provides standard graphical outputs that are dynamically linked to your data, plus the flexibility to create your own summaries using JMP's extensive graphing capabilities. You can even cut and paste selected graphics into your publications or presentations.
- **Provide context to research findings.** Annotation features in JMP Genomics make it easy to link to functional information from a variety of sources, including publicly available databases and tools.

Biostatisticians use JMP® Genomics to:

- **Plan experiments.** Make the most of limited resources by increasing efficiency in the design-of-experiment process. Estimate power and sample size, and construct and customize powerful designs that include sufficient replication over all important factors.



Visual representations of genomics data make it simple to see patterns in your data. JMP Genomics links graphics and data tables for easy browsing of significant results. Output of principal components analysis in JMP Genomics includes both 2-D and 3-D plots, both shown here, where enlarged markers in the graphics correspond to selected rows in the data table.

- **Adapt existing SAS[®] code.** Run your own customized SAS programs from JMP Genomics menus to accomplish specialized tasks. Easily construct GUIs for your code with a convenient XML syntax, then share these files with others to standardize commonly used procedures.
- **Remove bottlenecks.** Import data quickly from a variety of sources, assess its quality, and analyze it. Then distribute results to colleagues using JMP journals and JMP Scripting Language (JSL) scripts. Or help more people in less time by creating custom tutorials to guide other users through standard workflows.

Corporate, government and academic licenses for JMP Genomics are available by annual subscription. For more information, visit our Web site at www.jmp.com/genomics.

“The ability to instantly recreate any analysis by opening the saved script means that I can determine exactly what analysis was done, even when the student forgets what options they selected. And JMP Genomics uses SAS data sets, allowing me to move easily between SAS and JMP Genomics tools.”

Lauren McIntyre, PhD
Associate Professor
Department of Molecular Genetics and Microbiology
University of Florida Genetics Institute

**Analyze large data sets. Discover biological patterns. Translate results into interactive graphical displays.
All with JMP® Genomics.**

Customized SAS® analytics running behind a JMP® user interface:

- Allow all users to get started quickly.
- Require no previous SAS programming knowledge.
- Present point-and-click options: selection boxes, menus and radio buttons.
- Offer 100 analytic processes (APs) for data import, quality control, preprocessing, analysis, annotation and pattern discovery, plus all standard features of the JMP software platform.

Interactive graphics and summary tables that are generated automatically during analysis:

- Link points in a graph to lines in a corresponding table for easy viewing.
- Allow selection of sets of interesting points to subset to new tables.
- Produce easy-to-understand summaries of large data sets.

JMP® Genomics imports a variety of data formats, including:

- Affymetrix and Illumina SNP and standard genotype data.
- Affymetrix, Agilent and Illumina expression data.
- GenePix, QuantArray and several other popular image processors.
- ABI Analyst, single- and multiple-text files.
- Text, Excel and comma-separated formats.

Mine genetic marker data from families and unrelated individuals to:

- Perform whole-genome SNP analysis.
- Summarize information about phenotypes and genetic markers.
- Explore associations between genetic markers and binary or quantitative traits.
- Select tagSNPs for haplotypes or areas of high linkage disequilibrium.
- Reconstruct haplotypes and discover haplotype-trait associations.

Identify key genes from large microarray data sets to:

- Assess quality-control metrics to identify and remove outlier arrays.
- Normalize within and across arrays to remove effects of experimental biases.
- Perform gene-by-gene modeling to discover statistically significant differences.
- Reveal biological insight with pattern discovery and predictive modeling tools.

Find protein biomarkers, using spectral data to:

- Bin, detrend and find peaks in 2-D spectra.
- Plot 2-D and 3-D spectra for graphical browsing.
- Align 3-D spectra across multiple data sets.
- Analyze preprocessed proteomics data with ANOVA and other methods.

Annotate results using public or proprietary sources of information to:

- Merge in annotation files during analysis.
- Search public databases to construct tables of annotation hyperlinks.
- Upload results to Ingenuity Pathways Analysis to seek points of interaction between significantly changing gene and protein lists.
- Color KEGG pathways to identify co-regulated genes.



JMP HEADQUARTERS and SAS AMERICAS 1 (919) 677 8000 WWW.JMP.COM

JMP Headquarters
SAS Institute Inc.
SAS Campus Drive
Cary, NC 27513
USA
Tel: +1 919.677.8000
Fax: +1 919.677.4444
jmpsales@jmp.com
www.jmp.com

JMP Europe
SAS Institute
Henley Road
Medmenham
Marlow
SL7 2EB
United Kingdom
Tel: +44 (0)1628 486 933
Fax: +44 (0)1628 483 203
jmpsaleseur@jmp.com
www.jmp.com

JMP Japan
SAS Japan Head Office
Inui Bldg. Kachidoki
1-13-1 Kachidoki
Chuo-ku Tokyo 104-0054
Japan
Tel: +81 3 3533 3887
Fax: +81 3 3533 1600
jmpjapan@jmp.com
www.jmp.com/japan

JMP China
SAS China
25/F POS Plaza
1600 Century Avenue
Pudong New District
Shanghai 200122
PRC
Tel: +86 21 6876 5353
Fax: +86 21 6876 9010
jmpsalesprc@jmp.com
www.jmp.com