Getting Started with GeneSpring®

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Introduction to GeneSpring

When is GeneSpring useful for me?

GeneSpring is an expression analysis tool that assists in answering your biological questions, especially when genes are differentially expressed. Data from the following platforms can be analyzed by GeneSpring:

- Microarray data
  - One-color
  - Two-color (such as Agilent or spotted arrays)
- Quantitative Real-Time PCR
- Serial Analysis of Gene Expression (SAGE) data
- Etcetera

What can GeneSpring do for me?

GeneSpring is a suite of tools that accomplishes the following:

- Visualization
- Experiment Set Up
- Statistical Analysis
- Gene Annotation Update and Management
- Advanced Data Analysis Algorithms
- Project Management
- Higher level data management when used in conjunction with Signet

How do I learn more about expression analysis using GeneSpring?

Listed below are a variety of resources available to learn how to use GeneSpring for your expression analysis projects (in suggested order of reference). We'll point you to specific modules with respect to particular data analysis needs in the next section.

GeneSpring QuickStart Guide
Consult this concise guide for an outline of the steps needed to get up and running with GeneSpring.

GeneSpring Tutorial
Follow instructions for working with sample data provided with GeneSpring to learn how to navigate the interface and how to use basic features. Access via the **Help menu | Tutorial** in GeneSpring.

Animated Tutorials
View short (5–10 minute) animations that illustrate specific tools.

Webinars
Join hour-long live or recorded web conferences hosted by GeneSpring technical support specialists.

Analysis Guides
Read in-depth guides on advanced algorithms and statistics available in GeneSpring.

FAQs and **Tech Notes**
Use the **Index** or Search box online to find answers to specific questions from our online knowledge base. Additional resources can be found on the **GeneSpring Extras** page.

GeneSpring User Manual
Access the comprehensive manual via the GeneSpring 'Help' menu.

Workshops
Learn how to analyze your data better using GeneSpring. We offer comprehensive onsite workshops run by experienced trainers that target all skill levels.

GeneSpring Discussion Group
Join our email discussion group to engage in discussions with other GeneSpring users.

Using GeneSpring

Specific choices of data analysis depend in large part on the primary goals and experimental design of the data set. However, all genomic or microarray expression studies follow the common general workflow below.

The Data Analysis Workflow

The following section will highlight these major steps and the specific resources available to help you achieve your experimental objectives. To begin, we will highlight resources useful for learning the interface.

Learning the Interface

- Chapter 1, Introduction (GeneSpring Tutorial)
- Introduction and GeneSpring Interface (User Manual, Chapter 1 and Chapter 2)
- Introductory GeneSpring Demonstration (Animated Tutorial)
- Basic GeneSpring Nomenclature (Animated Tutorial)
- Views, Coloring and Classifications (Tech Notes)
- Microarray Data Analysis I/II (Workshop)

Import and Set Up Experimental Data

Working with a new array or genome for the first time

- Step 1. Load Gene Array Information (GeneSpring QuickStart Guide)
- Importing Genomes (User Manual, Chapter 4)
- Loading a Custom Genome (Animated Tutorial)
- Genome Manager (Animated Tutorial)
- Loading Genomes (Tech Notes)
- Genome-Related Questions (FAQ)
- Microarray Data Analysis I/II (Workshop)

Importing expression data

- Step 2. Load Experimental Data (GeneSpring QuickStart Guide)
- Working with Experiments (User Manual, Chapter 5)
- Loading Affymetrix Data (Animated Tutorial)
- Loading Custom Array Data (Animated Tutorial)
- Loading GenePix Data (Animated Tutorial)
- GeneSpring Data Loadings (Webinar)
- Loading Experiments (Tech Notes)
- Microarray Data Analysis I/II (Workshop)

Setting up experiments, parameters, interpretations and normalizations

- Chapter 4, Making Use of Replicate Data (GeneSpring Tutorial)
- Step 3. Specify Data Setup (GeneSpring QuickStart Guide)
- Working with Experiments; Normalizing Data (User Manual, Chapter 5 and Chapter 10)
- Setting Parameters and Interpretations (Animated Tutorial)
- Pre-Analysis Data Processing (Webinar)

- Normalization for One-Color Data (Webinar)
- Normalization for Two-Color Data (Webinar)
- Create Experiment (Animated Tutorial)
- Experiment Normalization (Tech Notes)
- Normalization-Related Questions (FAQs)
- Microarray Data Analysis I/II (Workshop)

Quality Control

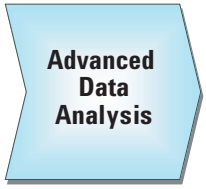
- Chapter 3, Filtering Genes (GeneSpring Tutorial)
- Filtering Data (User Manual, Chapter 9)
- Filtering on Control Signal (Animated Tutorial)
- Filtering on Flags (Animated Tutorial)
- Filtering (Tech Notes)
- Microarray Data Analysis I/II, Microarray Data Analysis IV (Workshop)

Filter for Differential Expression

- Chapter 2, Finding Interesting Genes; Chapter 5, Clustering Expression Data; Chapter 3, Filtering Genes (GeneSpring Tutorial)
- Step 4. Analyze Data (GeneSpring QuickStart Guide)
- Filtering Data, Finding Differentially Expressed Genes (User Manual, Chapter 9 and Chapter 13)
- Filtering on Fold Change for One-Color Chips (Animated Tutorial)
- Basic Statistics (Webinar)
- One-Way ANOVA and Post-Hoc Tests (Animated Tutorial)
- One-Way ANOVA and Post-Hoc Tests (Tech Notes)
- One-Way ANOVA (Analysis Guides)
- Two-Way ANOVA (Animated Tutorial)
- Filtering (Tech Notes)
- Statistics and the Error Model (Tech Notes)

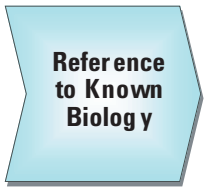
- Multiple Testing Corrections (Analysis Guide)
- Microarray Data Analysis I/II (Workshop)
- Microarray Data Analysis III (Workshop)
- Microarray Data Analysis IV (Workshop)

Advanced Data Analysis



- Chapter 5, Clustering Expression Data (GeneSpring Tutorial)
- Finding Genes with Similar Expression Profiles; Clustering and Characterizing Data (User Manual, Chapter 14 and Chapter 15)
- Expression Profile Correlations (Tech Notes)
- Find Similar Genes (Animated Tutorial)
- Principal Components Analysis (Animated Tutorial)
- Principal Components Analysis (Analysis Guide)
- Hierarchical Clustering: The Gene Tree and Condition Tree (Animated Tutorial)
- Clustering (Tech Notes)
- QT Clustering (Analysis Guide)
- Class Prediction (Analysis Guide)
- Microarray Data Analysis III (Workshop)
- Microarray Data Analysis IV (Workshop)

Reference to Known Biology



- Chapter 6, Evaluating Biological Functions (GeneSpring Tutorial)
- Annotating Genes; Working with Gene Lists (User Manual, Chapter 11 and Chapter 12)
- View Genes by Classification (Animated Tutorial)
- Lists and Annotations (Tech Notes)
- Pathways (Tech Notes)
- Microarray Data Analysis III (Workshop)
- Microarray Data Analysis IV (Workshop)

Agilent Technologies

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