From sample preparation to protein analysis, Bio-Rad's expression proteomics tools provide choices in methodology, protocols, and products. Expression proteomics focuses on three technologies: sample preparation, two-dimensional (2-D) electrophoresis, and imaging and analysis. Each technology is ideally suited to a 2-D gel electrophoresis approach to analysis of sample proteins.
A Total Solution for Expression Proteomics

High-quality sample preparation prior to 2-D electrophoresis is critical for producing meaningful, reproducible results. Bio-Rad offers the most comprehensive suite of products available for general-purpose sample cleanup to enhance resolution, and for sample fractionation to reduce sample complexity.

2-D electrophoresis is one of the most powerful protein separation techniques, separating thousands of proteins simultaneously in a single gel. Bio-Rad's first-dimension electrophoresis system, the PROTEAN® IEF cell and ReadyStrip™ IPG strips, offers the most complete range of pH and strip length for reproducible isoelectric focusing. Second-dimension separation options include a full line of mini, midi, and large format gels for reproducible protein separation. From power supplies to gel stains, Bio-Rad offers a complete workflow solution.

Bio-Rad also offers a broad range of software products for the latest gel analysis and bioinformatics technologies. The scientific expertise of Bio-Rad software engineers ensures reliability and workflow convenience in every product. Proteomweaver 2-D analysis software is an addition to Bio-Rad's portfolio of informatics software products and includes many new tools for advanced 2-D gel analysis and reporting.

Proteomweaver Software for 2-D Gel Analysis

Proteomweaver 2-D analysis software is a powerful software solution that accelerates the process of protein analysis in the area of 2-D gel electrophoresis. Proteomweaver contains leading-edge core algorithms for spot identification, spot quantitation, and spot matching. Proteomweaver is based on precision, speed of execution, and automation, and is able to handle large amounts of experimental data by utilizing advanced database technology.

**Precision**
- Recognizes and compensates for irregularities in gels
- Recognizes and filters out contamination in gels
- Analyzes and remedies local distortions in gels
- Includes built-in quality controls for spot detection and spot matching

**Speed**
- No need for precalculation time
- Calculations can be performed immediately upon loading gel images
- Bookmarks enable simple, quick navigation between previously marked locations on gel images

**Automation**
- Spot detection and matching can be carried out with a single click
- Overlays are calculated to visually inspect matching quality
- Spot detection includes the calculation of spot intensities
- Spot matching includes the calculation of regulation factors
- Spot quantitation is based on precise 3-D analysis

**Support for Different Experiment Types**
- Standard silver, Coomassie Blue, and SYPRO Ruby gel staining
- Multifluorescence experiments, including difference gel electrophoresis (DIGE)
- Gel puzzling for gels overlapping in pH
- Cross-experiment analysis
- Up to 500 gel images per experiment

Expression Proteomics Workflow

1. Sample preparation
2. 1-D and 2-D electrophoresis
3. Imaging and analysis

Detection of protein spots on each gel
Flexible Image Visualization
- Zoom view
- Fully interactive 3-D view
- Color scheme control
- Filtered image view
- Contrast enhancement
- Overlay images
- Average gel images
- Intelligent Spot Detection
  - Automatic noise removal
  - Extremely fast
  - User-friendly and intuitive Spot Detection Parameter wizard
- Spot editing functions with "undo" functionality

Accurate Gel Matching
- Fast and reliable 2-pass algorithm allows matching of every gel with every gel
- Manual match editing
- Unique and editable multimatching with automatic match conflict resolution

Reliable Spot Quantitation
- Spot domain and spot gray value statistics
- Subtraction of local background
- Optional spot statistics in gel
- Optional matching information

Advanced Statistical Analysis
- Configurable spot table for reviewing individual spots
- Bar charts showing spot intensity
- Scatter plot showing average intensities
- Pie chart showing regulation factors
- Pie chart for frequency of spot occurrence
- Statistical functions: Student's t-test, F test, Kolmogorov-Smirnov test, Mann-Whitney U test
- Analysis sets filter spots according to user-defined properties

DIGE Analysis
- Multifluorescence analysis (MFA) module
- Accurate and highly reproducible results in minutes

Additional Features
- Undo, operations history, and audit trails
- Easy creation of XML- and HTML-based reports for experimental documentation
- Laboratory and proteomic data management
- Cross-referencing to external sequence databases
- Powerful database search interfaces

Supported Databases
- Microsoft Access and SQL Server
- MySQL
- Oracle

Fully Flexible Gel Image Format Compatibility
- Standard 8- and 16-bit TIFF, JPEG, and PNG formats
- All Bio-Rad image formats from Molecular Imager® camera, laser, and densitometer systems
- Fuji FLA logarithmically scaled TIFF format
- GE Healthcare Typhoon square-root encoded gel image

Spot Cutter Integration
- Bio-Rad EXQuest™ spot cutter
- Bruker Daltonics PROTEINEER proteomics suite
- GE Healthcare Ettan spot picker
- Genetix GelPix system
- Genomic Solutions Investigator ProPic workstation

System Requirements
- AMD Athlon XP or Intel Pentium 4 2.4 GHz processor or better
- 1,024 MB RAM
- Graphics card with 3-D support
- Windows 2000 or Windows XP Professional operating system
From images to results in 6 easy steps

Intelligent 2-D Gel Analysis

1. View gel images.

2. Run automatic spot detection and quantitation.

3. Match all gels automatically and precisely.

4. Use powerful statistical tools to filter out your spots of interest.

5. Document your results with the comprehensive HTML reporting tool.

6. Pick interesting spots with any spot cutter.
### Proteomweaver 2-D Analysis Software Selection Guide

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<thead>
<tr>
<th>Catalog #</th>
<th>Description</th>
</tr>
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<tr>
<td>165-9770</td>
<td>Proteomweaver 4.0 Professional 2-D Analysis Software</td>
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<td>165-9775</td>
<td>Proteomweaver 4.0 Professional 2-D Analysis Software, with multifluorescence analysis (MFA)</td>
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### Bio-Rad's proteomics software portfolio — the complete and flexible solution.

- **iDQuest™** proteome curation software
- **PDQuest™** and **Proteomweaver** 2-D analysis software
- **QPQuest and Proteomweaver** 2-D analysis software
- Flexible and streamlined 2-D analysis
- **FPQuest™ and InfoQuest™** proteomics software
- Workflow management
- **Quantity One®** 1-D analysis software

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