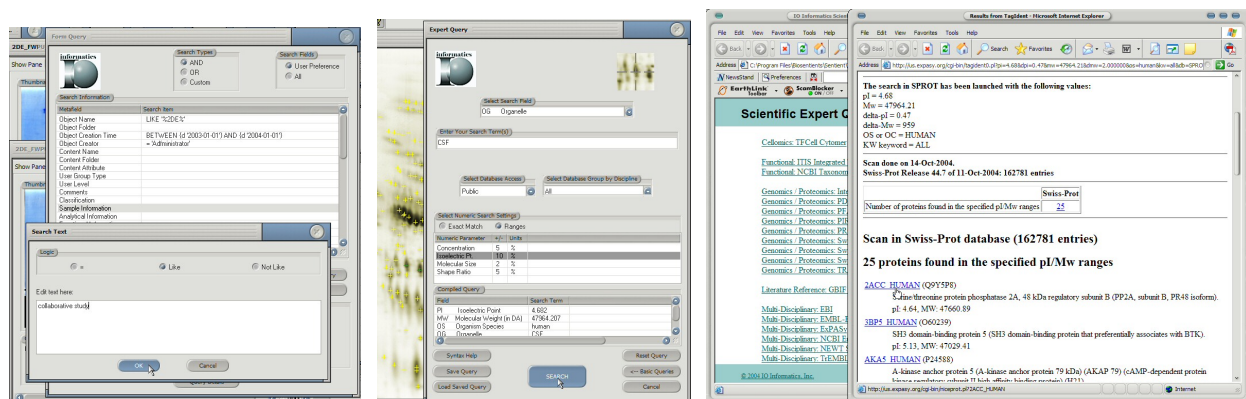


# Beyond LIMS: Next Level of Scientific Information Integration and 2DE Analysis

**Erich A. Gombocz**  
IO Informatics, Inc.  
Emeryville, CA, USA.



## Abstract:

Scientific processes are never successful without proper information management. This is especially true, if series of processing steps or experimental procedures require results from previously obtained data or external data sources. The story gets even more complex in cases like 2D electrophoresis, where proper experiment performance and gel analysis represents only the very first step to further identify the separated molecules by follow-up procedures and secondary analytical methods such as mass spectrometry, sequencing or specific assays to characterize the biological function of individual peptides.

IO Informatics presents a new approach to solve this complexity which goes beyond the common LIMS approach. Using "Intelligent Multidimensional Objects" which allow communicating, knowing their content and their environment, documents and data from any phase within the entire workflow can be linked and assessed in the framework of specific project tasks. The new 2DE analysis module allows for automatic normalized spot mapping and color-coded abundance comparisons of all proteins within a given gel set. It not only presents a state-of-the art in quantitative comparisons, it also allows for querying of over 100 public web databases directly off the gel image through a point-&-click interface. Results from those queries can be saved, recalled, linked back to the spot on the gel and all its related experiments; thus, allowing for applying all available identification criteria to any given experimental data set. The PC or laptop desktop solution provides secure collaborations across networks, integrated query and reporting tools, multi-level log and auditing functions for all analytical steps and queries. It provides a common, easy to use form-based user interface for cross-database queries without the need for middleware, standards or dedicated server back-ends. The system is easy to set up and provides immediate benefits even in small laboratories. It scales for larger environments without the need to change IT infrastructure or existing database back-ends.

A live demonstration of the IO Informatics 2DE module in the context of the Sentient Desktop will demonstrate speed, precision and accuracy in comparative analysis as well as annotating peptide spots with results from ad-hoc web queries to confirm identification.