



Pfizer: Searching Protein Expression patterns with ProteinMine™.

Discovering and introducing one new drug to the public market typically costs a pharmaceutical or biotechnology company over a billion US\$ and takes nearly 15 years to deploy. Studying a drug's mechanism of action on to targeted cellular proteins is critical in the lead identification processes. It is important to precisely identify specific protein expression patterns. Pfizer uses ProteinMine™, a 2D gel analysis and data mining application from BioImagene Inc, to facilitate faster and more-informed decision-making.

Situation:

Many proteins display specific expression patterns in the presence of a drug. Identifying these patterns on 2D gels is critical to understanding the underlying mechanisms of toxicity and efficacy. Given the fact that there are several replicate gels to an experiment, analyzing the resultant gel data forms the most strenuous and time consuming task, let alone looking for specific protein expression patterns.

BioImagene's Solution:

ProteinMine™ - is a 2D gel analysis and data mining application developed by BioImagene Inc. It completely automates signature searches for specific protein expression patterns and also provides:

- High quality spot detection and background subtraction.
- Fully automatic high quality gel alignment / match tables
- Oracle based, web-interface 2D gel analysis product that is truly client / server
- Integration with mass spectrometer
- Integration with Spot Picker
- Integration with 3rd party statistical tools
- Integration with LIMS

Result:

Pfizer used **ProteinMine™** extensively to mine its 2D gel database to identify compounds with toxic, novel, and unprecedented mechanisms of action (MOA). This proteomics database has enabled researchers to diagnose MOA for >50% of the compounds tested. Pfizer tested a compound that appeared to have *in vitro* potential for inhibition of topoisomerase (acting similar to novobiocin). However 2D studies indicated that it actually had a different MOA and *in vivo* experiments confirmed that it has a closer match to a compound with an unfavorable MOA. Early information about MOA accelerated their research and led to quick decision-making. As a result, Pfizer was able to reorganize and redirect the efforts of 6 chemists (\$24,000/week) to other more promising compounds.