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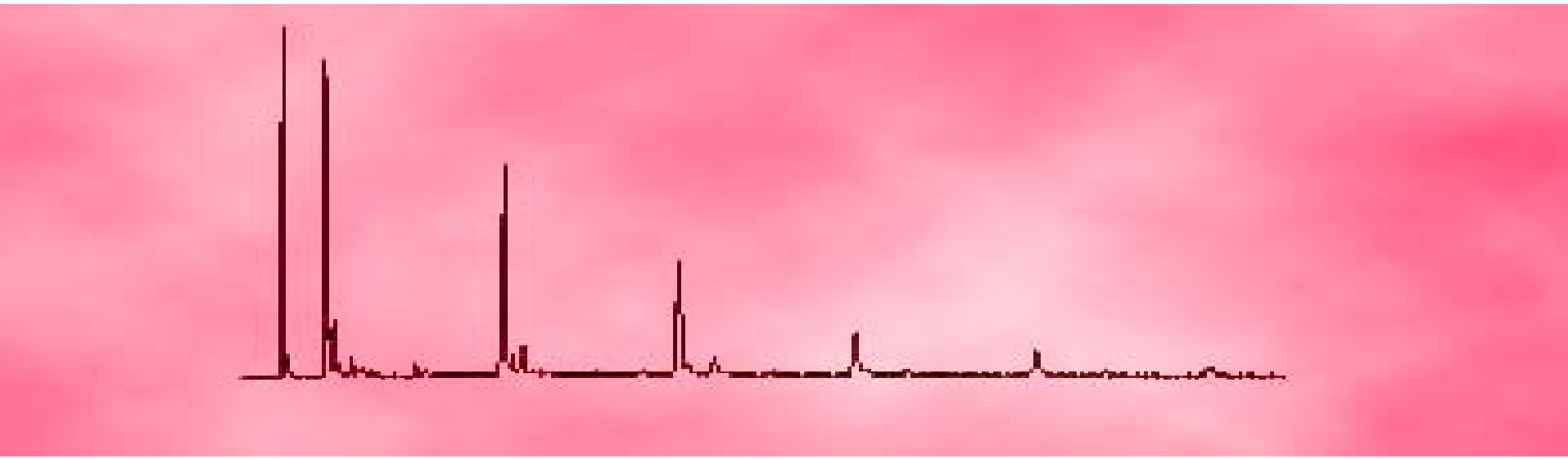
Surveys

Mass Spectrometry:
Fueling Discovery



Executive Summary

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Mass Spectrometry: Fueling Discovery

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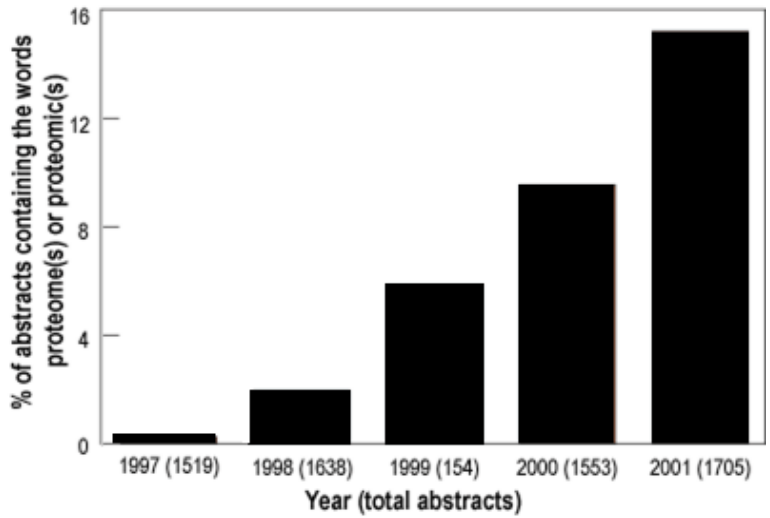
Introduction

Although mass spectrometry was first developed in the early 20th Century, its use in the life sciences is a fairly recent development. The expansion of mass spectrometry into the life science market has come about as a result of new ionization methods developed in the early 1990s that allowed the high-resolution analysis of biomolecules.[1]

In fact, the use of mass spectrometers in the life sciences has grown faster than expected. This is due, in part, to the completion of the human genome project. The sequencing of the human genome has shown that the old dogma of one-gene-one-protein was a gross underestimation. In the wake of this realization a new scientific frontier appeared - the decoding of the proteome. This has led to an increase in basic research in protein biochemistry as well as efforts to use proteomics in the field of drug discovery. Today, mass spectrometry has become the central technology in the field of proteomics.

In this report, Biocompare has surveyed the mass spectrometry market to determine who the market leaders are, find out what the most challenging aspects of using this technology are and to gauge the growth of the market by identifying the purchasing plans of mass spectrometry users.



Percentage of presentation abstracts (posters or oral) at the American Society for Mass Spectrometry Conference on Mass Spectrometry and Allied Topics that include the word proteome(s) or proteomic(s), 1997–2001.
Source: American Society of Mass Spectrometry conference abstract databases, www.asms.org

"The ability of mass spectrometry to identify and, increasingly, to precisely quantify thousands of proteins from complex samples can be expected to impact broadly on biology and medicine."
Aebersold, R. and Mann, M. *Nature* **422**, 198 - 207 (13 Mar 2003)

[1]**Mass Spectrometry: Principles and Applications, 2nd Edition** Edmond De Hoffmann, Vincent Stroobant

Methodology

This report was compiled from the responses of 147 mass spectrometry users who completed a survey online between February 16th and February 20th, 2004. The survey consisted of 23 closed- or partially closed-ended questions designed to reveal respondents' current and planned use of mass spectrometry as well as their purchasing plans regarding mass spectrometry systems and laboratory equipment.

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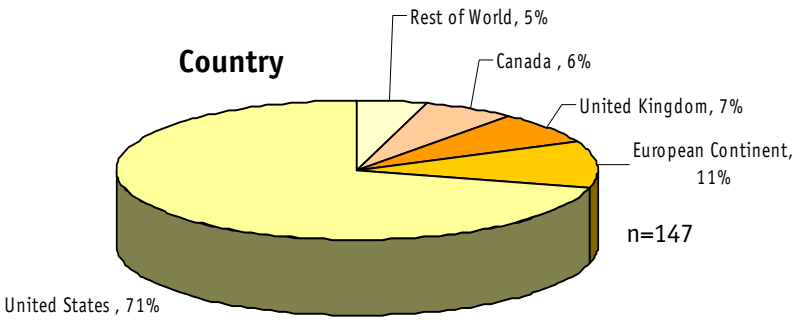

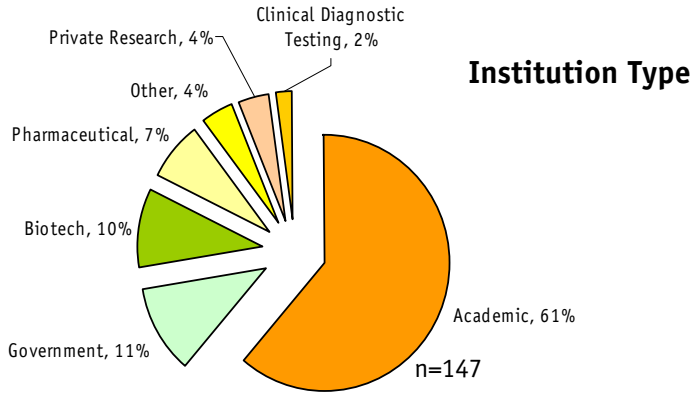

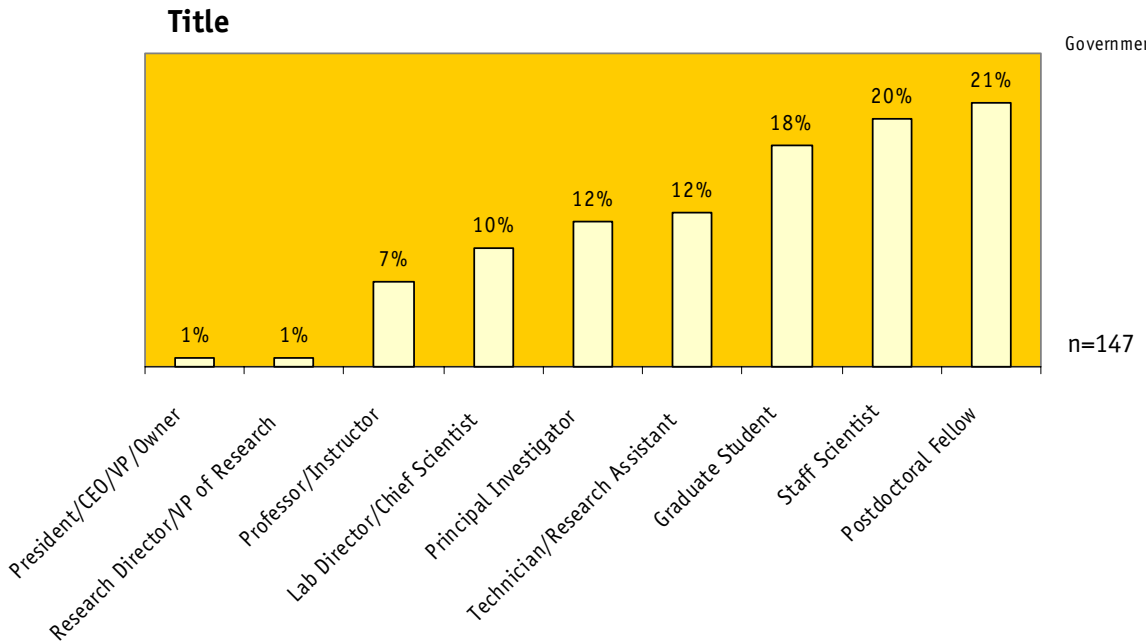

Survey Taker Demographics

The majority of survey takers are from North America and Europe with 5% from the rest of the world

21% of survey takers are in Biotech or Pharma

61% of survey takers are in Academia

71% of survey takers are 'at-the-bench'

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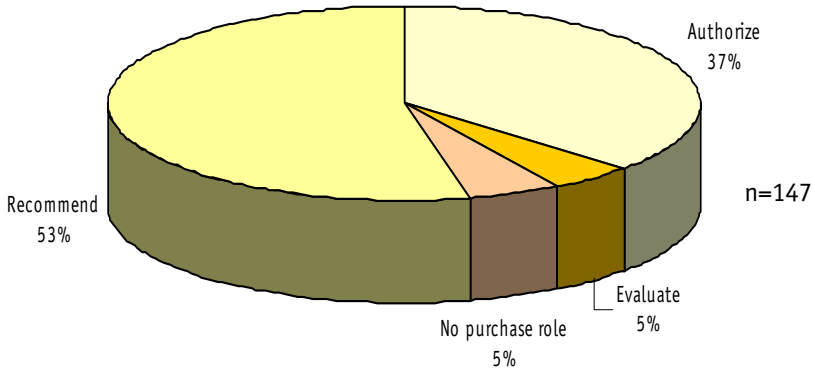
Purchasing authority



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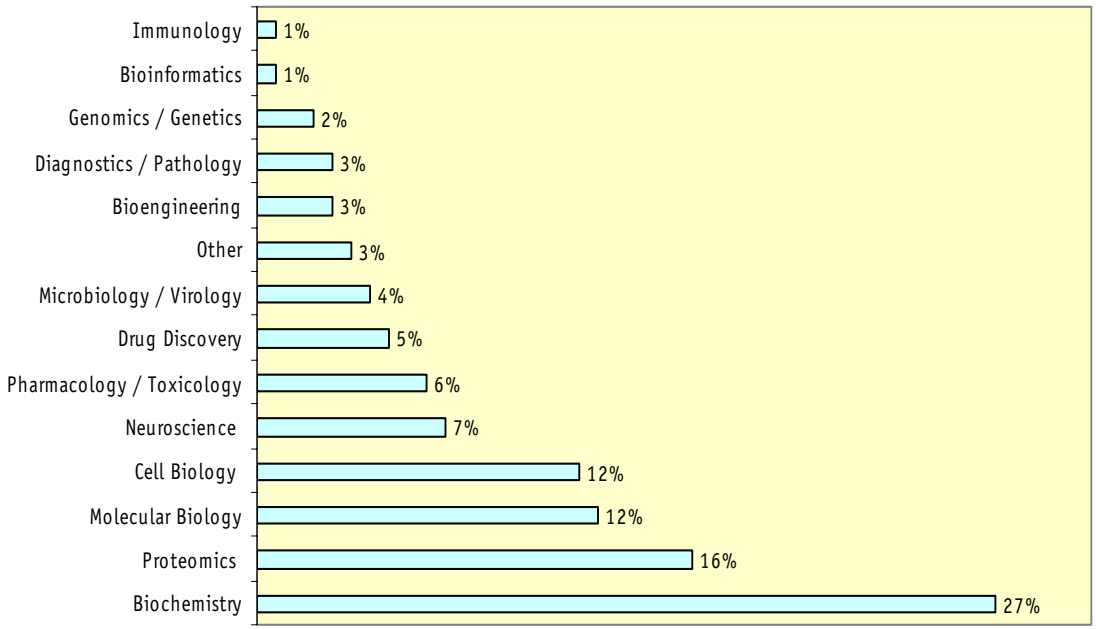
Decision Makers
90% of respondents either recommend or authorize purchases
43% of survey takers' principal area of research or work is either proteomics or biochemistry

Principal area of research or work



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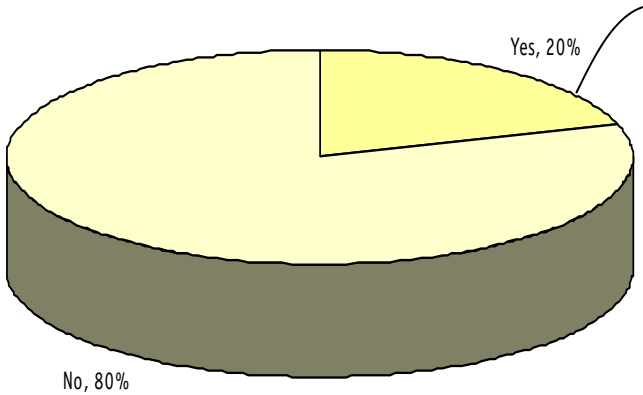
Are you planning to start a new lab?



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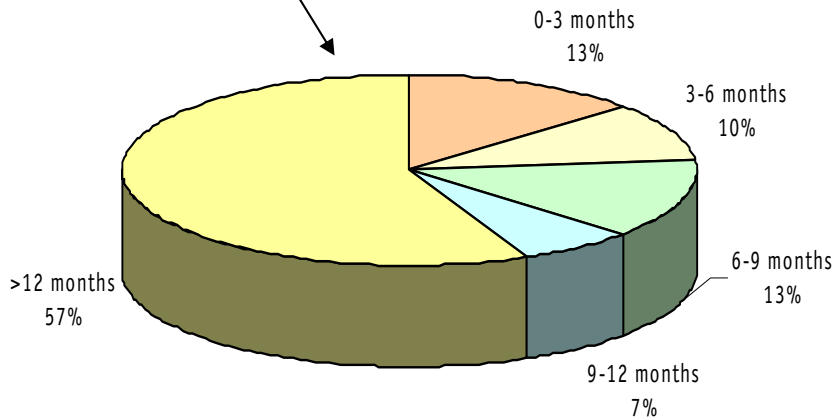
New Labs
Of those planning to start a new lab, nearly half plan to start their new lab in the next 12 months

If so, when?



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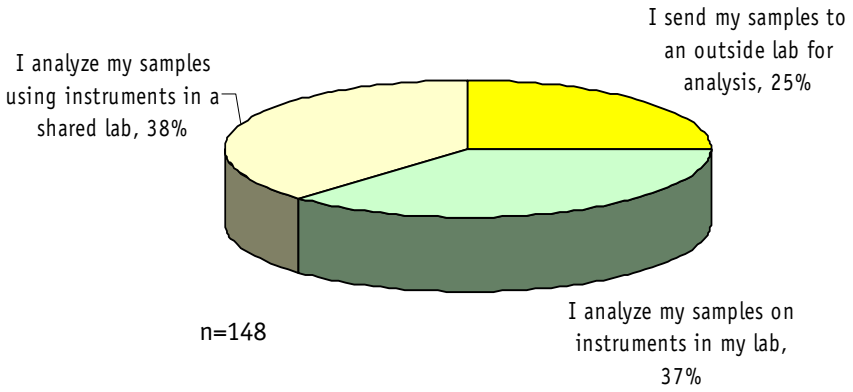
How would you characterize your mass spectrometry use?



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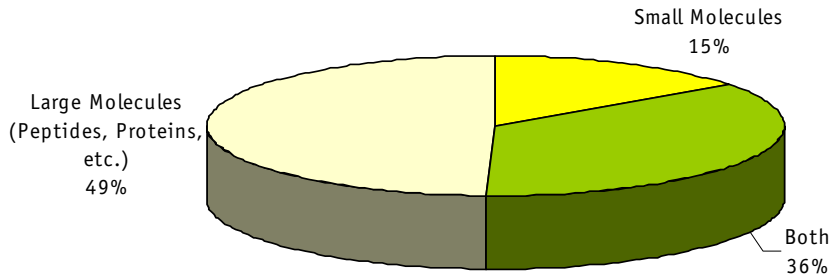
Mass Spectrometer Operators
75% of survey takers analyze their own samples either on their own instruments or those in a shared lab
85% are analyzing peptides and proteins with mass spectrometry

What type of analysis do you do with mass spectrometry?



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Which of the following equipment/systems do you plan to purchase in the next 3-6 months?
Fume hoods
Microfuidics equipment
Nucleic Acid Synthesizers
Mass Spectrometers
HTS Plate Handling/Storage
Hybridization Ovens
Incubators
Autoclave/Sterilizers
Nucleic Acid Sequencers
DNA Array Equipment
HPLC/FPLC Systems
Gel Electrophoresis Systems
Water Purification Systems
Imaging/Gel Documentation Systems
Spectrophotometers
Flow Cytometrs
HTS Workstations
Microscopes
Peptide Synthesizers
Clean Room Equipment
Heating Blocks
Centrifuges
Real Time Thermal Cyclers
Balances
Thermal Cyclers
Tissue Culture Hoods
Water Baths
2D Electrophoresis Systems
Cell Analyzers
2D-LC (nanobore multidimensional liquid chromatography)
LC-MS

What type of proteins do you analyze? (Check all that apply)
hydrophobic proteins
low molecular weight
membrane proteins
intracellular proteins
high molecular weight
acidic proteins

Who is the manufacturer of the mass spectrometer you use?
Advion Biosciences
Agilent
Amersham Biosciences
Applied Biosystems
Bio-Rad
Bruker Daltonics
JEOL
MDS Sciex
Perkin Elmer
Shimadzu Biotech
Thermo Electron
Thermo Finnigan
Varian
Waters Corporation
Other (please specify)

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Are you planning to purchase a mass spectrometry system in the next 12 months?
Yes
No

If so, which company would you consider purchasing from (check all that apply)?
Advion Biosciences
Agilent
Amersham Biosciences
Applied Biosystems
Bio-Rad
Bruker Daltonics
JEOL
MDS Sciex
Perkin Elmer
Shimadzu Biotech
Thermo Electron
Thermo Finnigan
Varian
Waters Corporation
Other (please specify)

Do you use Mass Spectrometry sample prep kits?
Yes
No

If so, which company's sample prep kits do you use (check all that apply)?
Gilson
Tecan
Bay Gene
Varian
Bruker Daltonics
Shimadzu Biotech
Waters Corporation
Millipore
Perkin Elmer
Thermo Electron Corporation
Amersham Biosciences
Other (please specify)

Which type of Ion Source do you currently or prefer to use?
ESI
Nanospray
MALDI
ICP
FAB
Other (please specify)

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Which type of Mass Analyzer do you currently or prefer to use?
TOF
Ion Trap
Quadrupole
Triple Quadrupole
FTMS
Other (please specify)

Which types of protein analysis do you currently perform or are you planning to perform using Mass Spectrometry?
Differential Expression
Post-Translational Modifications (PTM)
Differential Quantification
Protein-Protein Interaction
Protein Fingerprinting
Protein Identification
Quality of Synthetic Proteins/Peptides
Detection of Mutations

How do you prepare your samples for Mass Spectrometry?
1-D Electrophoresis
2-D Electrophoresis
Liquid Chromatography
1-DE/LC
2-DE/LC
LC/LC
HPLC
CE
GC

What influences your decision to purchase a mass spectrometry system?
Capacity
Size
Cost
Training
Service
Technical Support
Software Package
Complete System

Which of the following do you find most challenging about mass spectrometry?
Sample Quantity Requirements
Lack of Start-to-Finish Automation
Sample Prep
Analyzing PTM
Operating Mass Spectrometer
Other (please specify)

How do you currently keep up-to-date with MS technologies?
Company Road shows
On-site seminars
Web Sites
Application Notes/ Technical Bulletins
National Meetings
Local Meetings
Webinars (Webex)
Journals
Newsletters

Other surveys and reports available from Biocompare

UPCOMING SURVEYS

siRNA/RNAi - March 2004 **$3500***
Description: A survey of AACR attendees investigating use of RNAi and siRNA in their research.
*Purchase by March 24th to get a $500 discount and the opportunity to include a question of your own design

Protein Arrays - April 2004 **$3500***
Description: A survey of FASEB attendees regarding protein arrays.
*Purchase by April 14th to get a $500 discount and the opportunity to include a question of your own design

COMPLETED REPORTS AVAILABLE

Cell Based Assays: A Survey of Cell Biologists **$2495**
Description: For this report we surveyed more than 400 Cell Biologists regarding cell based assays including plate based, tissue array based and flow cytometry based assays.

Neuroscience, Microscopy, Imaging and Image Analysis: Seeing is Knowing **$2495**
Description: In this survey of over 500 scientists Biocompare answers such questions as: what types of equipment and software are currently being used, what are important factors in the decision to buy a microscope, how much is budgeted for imaging equipment in FY2004.

Fall Purchasing Survey 2003 **$4000**
Description: For this report we surveyed over 2000 life scientists asking them about their product and brand preferences, as well as which conferences they plan to attend, their budget forecasts for 2004 and which equipment they plan to purchase in 2004.

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