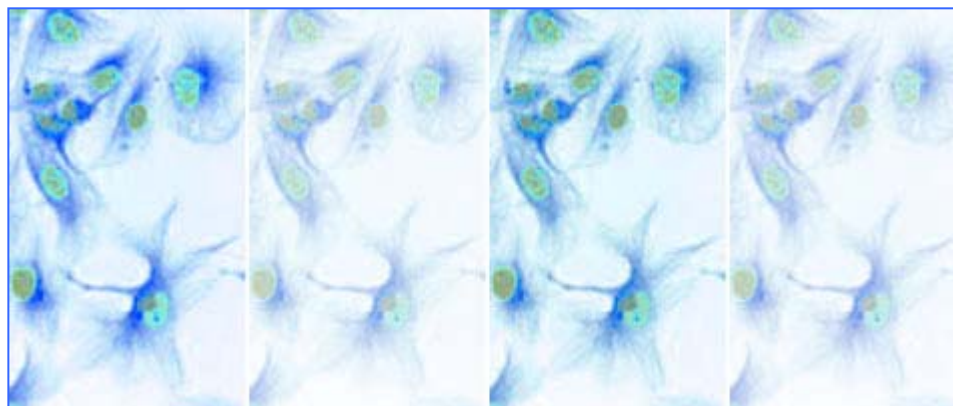


# Cell Based Assays: A Survey of Cell Biologists



## Executive Summary

## Introduction

In both drug discovery and basic research cell based assays are an invaluable tool. Cell based assays allow researchers to examine cellular processes at the molecular level, something that is not always possible *in vivo*. For drug discovery, cell based assays are an important indicator of toxicity and effectiveness of potential candidates. While in basic research cell based assays help develop a better understanding of disease progression and normal development in humans.

New developments in cell based assay technology allow researchers to more closely approximate *in vivo* conditions. By observing cellular pathways using detection methods that cause minimal interference these assays are becoming more and more useful in determining new drug targets and uncovering the natural order of the cell.

***“Through the development of fluorescent sensors for intracellular signaling molecules coupled with improved microscopic imaging techniques, it has now become possible to investigate signal propagation in cells with high spatial and temporal resolution.”***

Cornelis J. Weijer, *Science* 2003 April 4; 300: 96-100

Whether studying cell signaling or apoptosis, cell biologists have a bevy of tools at their disposal. In order to better understand the needs of this market segment, Biocompare has surveyed cell biologists regarding their usage of cell based assays. This report, *Cell Based Assays: a Survey of Cell Biologists*, uncovers the preferred assays and detection methods of these scientists as well as how they find new assays for their research.

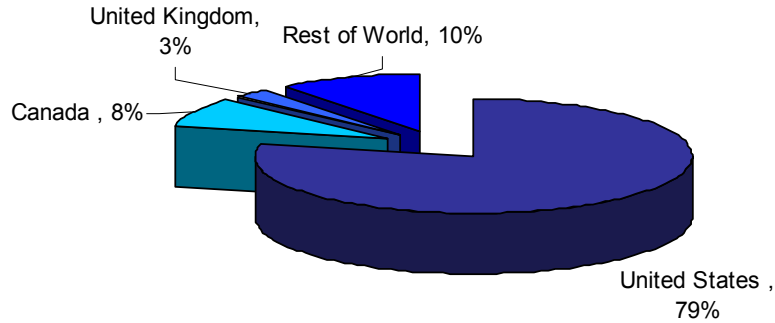
## Methodology

This report, *Cell Based Assays: A Survey of Cell Biologists*, is based on the responses of 440 scientists who completed a survey online between December 13 and December 23, 2003. Survey invites were sent via email to 6140 researchers whose interests include cell biology. Additionally, attendees of ASCB were invited to take the survey at Biocompare's booth.

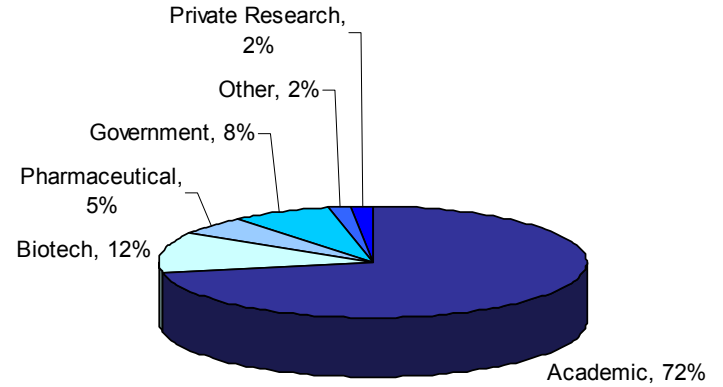
The survey consisted of 22 closed or partially closed ended questions designed to reveal the survey takers' opinions, practices and purchasing plans regarding Cell Based Assays. All participants were required to complete demographic profiling questions to characterize their role in the laboratory, their main research focus and their purchasing authority.

Survey respondents in this report were limited to those scientists who completed the majority of the questions in the survey and fit the demographic requirements.

### Country

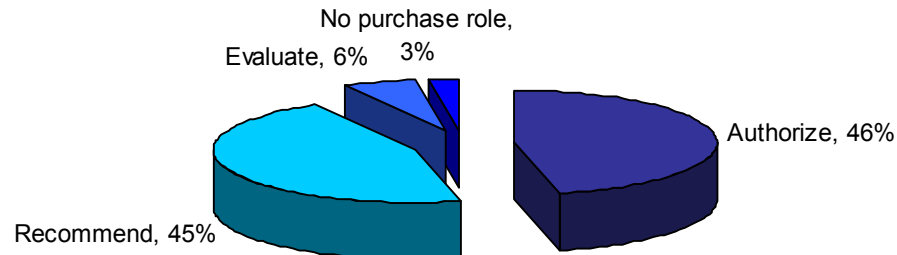


### Type of Institution



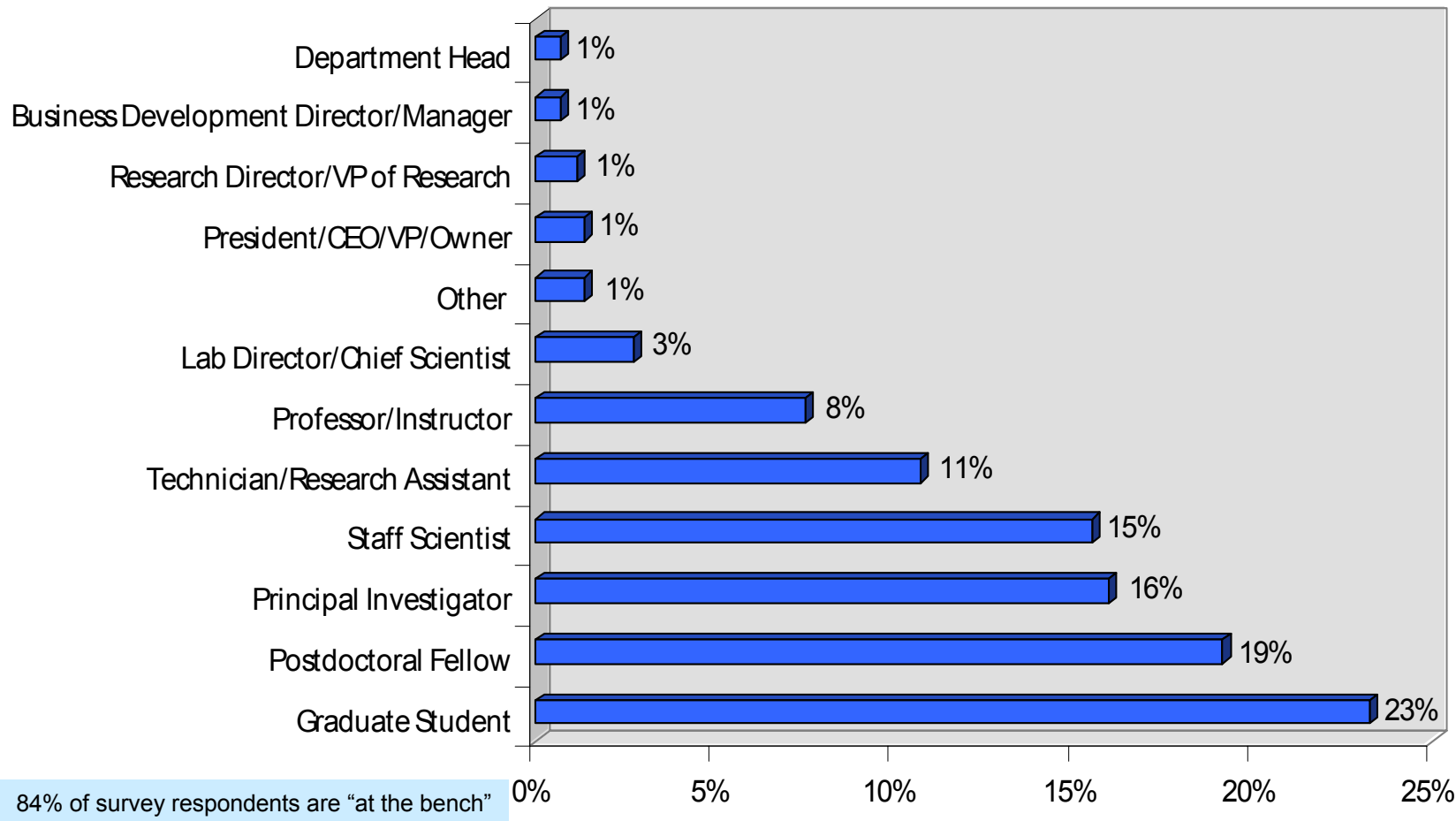
87% of survey takers are in North America  
72% in academia, 17% in Biotech or Pharma  
91% either recommend or authorize purchases

### Purchasing Role



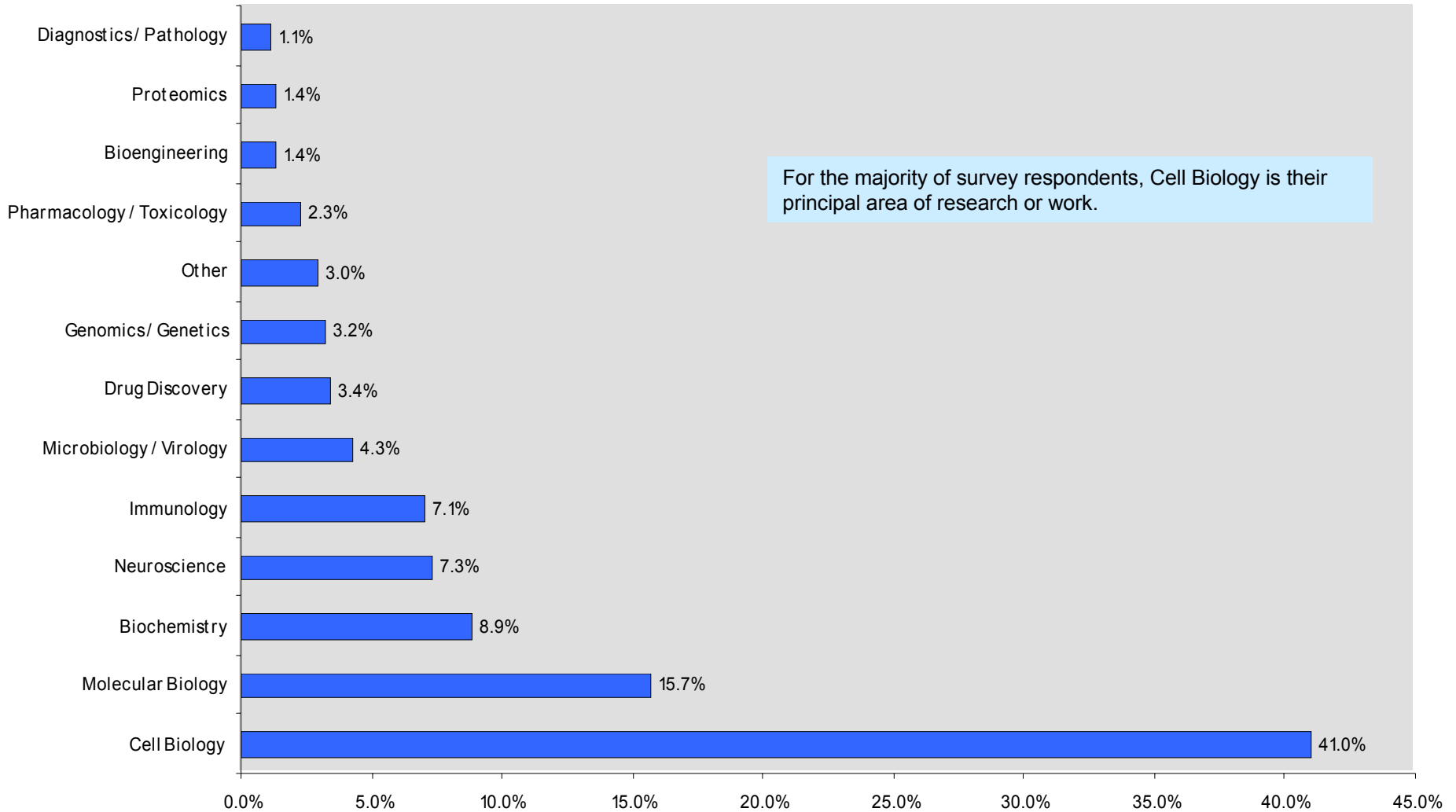
n=439

### Title



n=439

## Principle area of research or work



n=439

**What tools and techniques do you use? (check all that apply)**

- Protein expression
- Protein purification
- Protein visualization
- Protein identification & characterization
- Protein separation

**Which of the following assays do you currently use? (check all that apply)**

- Apoptosis Assays
- Cell Based Absorption Assays
- Cell Motility / Morphology Assays
- Cell Signaling Assays
- Cell Viability/Proliferation Assay
- Diagnostic Assays
- Fusion Tag Assay Kits
- Hormone Assay
- Ion Channel Assays
- Kinase Assays
- Membrane Potential Assays
- Phosphatase Assays
- Phosphodiesterase Assays
- Protease Assays
- Protein Translocation Assays
- Reporter Gene Assays
- RNAi Assays
- Toxicology Assays

**Do you prefer to use fixed or live cell assay formats?**

- Live
- Fixed

**Which of the following transfection reagents do you use?**

- Cell line specific transfection reagents
- siRNA transfection reagents
- In-vivo transfection reagents
- Liposomal transfection reagents
- Non-liposomal transfection reagents
- Protein transfection reagents
- Primary cell transfection reagents

**What type of cells do you use?**

- Epithelial-like cells (HeLa; CaCo2....)
- Fibroblast-like cells (HEK 293; COS-7.....)
- Endothelial-like cells (HUVEC; BAEC.....)
- Hepatocyte-like cells (HEPA-1; HepG2....)
- Neuroblastoma (CLBPEC; SHEP.....)
- Leukemia cells/lymphoblasts (Jurkat; K562.....)
- Melanoma
- Monocytes/macrophages
- Myotubes/myoblasts/muscle cells
- Keratinocytes
- Primary Cells

**Which of the following detection technologies do you use?**

- Labeled antibodies
- Fluorescent dyes
- pH sensitive dyes
- Radioactive labels
- FRET

**Which of the following detection platforms and technologies are you currently using?**

- Microscope/Imager using fluorescent labeled Antibodies
- Microscope/Imager using fluorescent proteins (GFPs)
- Microscope/Imager using other fluorescent detectors
- Flow Cytometer using fluorescent labeled Antibodies
- Flow Cytometer using fluorescent proteins (GFPs)
- Flow Cytometer using other fluorescent detectors
- Plate Reader for fluorescence intensity readout
- Plate Reader for fluorescence polarization readout
- Plate Reader for FRET readout
- Plate Reader for time resolved fluorescence readout
- Plate Reader for bioluminescence readout
- Plate Reader for chemiluminescence readout
- Plate Reader for colorimetric readout
- Scintillation Counter

**What are the major target classes and biological areas that you study?**

- Apoptosis
- Cell Biology of Infectious Diseases
- Cell Cycle Regulation
- Cell Motility / Molecular Motors
- Cell Proliferation
- Cell Signaling
- Cytoskeletal Dynamics
- Developmental Biology
- Endocytosis
- ECM / Integrin Signaling
- Lipids in Membrane Dynamics / Signaling
- Neurobiology
- Nucleocytoplasmic Transport
- Organelle Maintenance and Inheritance
- Organogenesis
- Protein Degradation and Quality Control
- RNA Localization and Degradation
- Stem Cells
- Vesicle Trafficking
- Other (Specify)

**How do you find out about new cell based assays?**

- Online resources
- Colleagues
- Sales Representatives
- Journal advertisements
- Journal articles
- Catalogs

## Surveys

**Which of the following are most important to you when performing cell based assays? (check all that apply)**

- Multiplexing
- Tissue culture automation
- Miniaturization
- Imaging automation
- Validation
- Optimal culture conditions

**How would you classify your current cell based assays?**

- Primary screening
- Target validation
- Secondary screening
- Quality control
- Toxicology
- Other

**What is your current throughput requirement for cell-based assays?**

Low  
Medium  
High

**How do you prefer to image your cells?**

- Slides
- Microtiter plates
- Tissue Microarrays

**Do you use flow cytometry or cell sorting techniques?**

Yes  
No

**What cell types do you sort or scan?**

- Mammalian cells
- Human cells
- Bacteria
- Plant Cells
- Other

**What type of cell analyzers/sorters do you use?**

- Cell counting systems
- Bench top analyzing systems
- Flow cytometry systems
- Magnetic bead sorting systems

## Surveys

**Do you use flow cytometry for any of the following types of analysis?**

- Cell sorting
- Apoptosis assays
- Cell counting
- Cell surface receptor expression
- Cell size/shape
- Cell culture monitoring
- DNA cell cycle/ploidy
- Proliferation assays
- Protein Phosphorylation
- Viability measurements
- Cytokine expression
- Immunophenotyping
- Calcium flux
- Intracellular assay detection
- Molecular analysis interactions (FRET)
- Membrane permeability
- Membrane potential
- Multiplex for cell health (e.g. apoptosis and proliferation)
- Cytoplasmic granularity
- Oxidative cell measurements
- None of the above

## Other Reports Available from Biocompare

Fall Purchasing Survey 2003

Price: \$4000

Antibodies: Tools for Discovery

Price: \$2250

Neuroscience, Microscopy, Imaging and Image Analysis

Price: \$2495

### Upcoming Reports

Year in Review: An analysis of user viewing and searching on Biocompare's site for 2003

Price: \$3000

Mass Spectrometry Survey

Price: \$3500

RNAi Survey

Price: \$3000

Protein Arrays Survey

Price: \$3000

**Thank you for participating in Biocompare's Cell Based Assays survey. If you have any questions about this survey or any of Biocompare's other marketing services please contact us at:**

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