

Imaging and Analysis Tools: An End User Study

Executive Summary

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Report Introduction

The 2007 Imaging and Analysis End-User Survey comprises an overview of the life sciences imaging market, the results of each survey question in graphical and tabular format, a discussion of the survey results, and conclusion/recommendations.

The Market Overview provides a summary of the imaging market in terms of customer segments, projected growth rates and major players. Overall, the market is predicted to experience an average growth rate of 10.4% over the next 3 years with heavy growth predicted in the electron microscopy and scanning probe microscopy segments. Major players in the arena include Carl Zeiss, Nikon, Olympus, Leica, and JEOL. Digital camera and imaging software companies also play an important role in the growth of this industry.

The imaging survey explores topics such as current and future usage of imaging instruments, the sample and cell types being used, the specific imaging applications being performed and preferred instrument brands. Other questions surround usage and preferences for digital camera features, instrument warranties, and image analysis software. The survey also includes sections on in vivo/molecular imaging and high content analysis, however, only a small number of respondents qualified to complete these two sections.

The survey results are summarized in the Discussion of Survey Findings section. The complete questionnaire and the results of each survey question are presented in tabular and graphical format in the Appendix along with the complete questionnaire.

Market Overview

The appetite for imaging devices shows little sign of waning as researchers remain hungry for technologies that enable the observation of live cells and the efficiency of high throughput experiments. Along with the advances in the chemistry of dyes, imaging devices are allowing progress in several markets, including the industrial, clinical and life science sectors.

Semiconductor manufacturing companies and nanotechnology researchers are big customers, using microscopes to examine materials and product quality. According to a report by the Business Communications Company¹, these two sectors are actually leading growth with a compound annual growth rate (CAGR) of 10.2% for semiconductor manufacturing and 19.4% for nanotechnology. Research and development budgets for nanotechnology research enjoy governmental backing and the funds to purchase high end equipment, such as microscopes. Currently, according to the report, semiconductor manufacturing makes up 31% of the total market, followed by life sciences with 27%, materials with 24%, and nanotechnology with 10%. By 2012, the semiconductor sector is expected to account for 34% of the microscope market while nanotechnology will rise to make up 17%.

In general, growth has been driven by the need for digitization and automation, requiring the replacement of traditional microscopes with digitally-integrated microscopes that feature analysis software and seamless data connection to a personal computer. Advanced imaging technologies and innovations are also driving sales for new equipment providing capabilities that previously weren't available. This includes newer electron microscopes and scanning probe microscopes.

“The microscopy industry has been constantly witnessing developments in laser scanning cytometry, biomedical microscopic imaging, and electron confocal microscopy,” according to a report on microscopes by Global Industry Analysts². “One of the major growth drivers in the imaging technology market is the technological capability of microscopes to provide a clear and deep image of the cells' internal structure.”

All tolled, the global sales of microscopes and other imaging devices was worth an estimated \$1.99 billion in 2006, according to the report by Global Industry Analysts³, which projected 2007 sales to reach \$2.2 billion. The CAGR of 10.37% should bring sales to \$3.17 billion by 2010 with the United States as the largest market, accounting for \$685 million in 2006. With a CAGR of 9.67%, the U.S. market is expected reach \$1 billion in sales by 2010.

Growth in the sales of the various types of imaging instruments reflects trends in current and future applications. With a CAGR of 7.12%, the classical light microscope is the slowest growing segment, bringing in \$182.35 million in 2005 and an estimate of \$267.21 by 2010⁴. The confocal microscope segment is growing at a CAGR of 8.08%. The segment's 2005 revenues of \$27.74 million should increase to an estimated \$44.04 million by 2010. With some units priced in the \$1 million range, electron microscopes accounted for the biggest proportion of sales, bringing in \$353.35 in 2005. The CAGR of 10.4% means an estimated \$628.02 million in revenues by 2010.

Market Overview (continued)

The widespread use of scanning probe microscopes is a major reason for its top-ranking growth. In physics, the technology is particularly important in the study of semiconductors and microelectronics. Chemists use scanning probe microscopes for studying surface reactions and conducting materials. The life sciences have come to depend on these devices for investigations at the molecular level, such as studying the structure of DNA molecules. According to the report by Global Industry Analysts⁵, sales of scanning probe microscopes enjoy a CAGR of 13.71%. With 2005 revenues of \$59.97 million, the instruments will bring in \$124.46 million in sales by 2010.

Developed with Nobel Prize award-winning technology, scanning probe microscopy, also called scanning tunneling microscopy, has blossomed into a wide array of devices, such as atomic force microscopes. The technique uses a stylus stationed at a distance equivalent to the diameter of an atom's diameter from the object. This distance changes as the stylus encounters different atoms on the surface of object. The vertical movement of the stylus provides data to produce a computer-generated contour map of the object's surface.

"They are in significant demand from a wide range of end-user industries," according to an article by Frost & Sullivan⁶.

Among optical microscopes, which include compound and stereo microscopes, sales of digital imaging systems are growing fastest, according to Instrument Business Outlook's recent report on microscopes⁷. Fluorescent dyes allowing unprecedented analysis of subcellular components and real-time viewing of live cells is drawing buyers. Also attractive is the technology's safety for live specimens and relatively low price. "Advances in software as well as camera and detector technologies, driven by growing interest in cell-based approaches, have intensified competition," according to the report. "Unlike confocal systems, optical image microscopes collect all emitted wavelengths, producing a full spectrum image.

Major players in the global microscope market include Carl Zeiss, Inc., Nikon Corporation, Olympus Corporation, Leica Microsystems, JEOL Ltd., and Hitachi, Ltd., according to analysis by Frost & Sullivan. "Most of the companies offer ready-to-use modular systems, which can be used by a researcher to choose the needed components."

More specialized imaging systems include microplate readers, which can act as high throughput ultraviolet visible spectrophotometers, scintillation counters, luminometers, fluorometers or time resolved fluorometers, according to a report by Global Industry Analysts⁸. Together the readers brought in estimated revenues of \$865.3 million in 2006. With a CAGR of 9.3%, that figure could climb to \$1.3 billion by 2010.

References

- 1 Andrew McWilliams, "Microscopy: The Global Market", Business Communications Company, June 2007.
- 2 Global Industry Analysts, "Microscopes", August 2006.
- 3 Ibid.
- 4 Ibid.
- 5 Ibid.
- 6 Koundinya L, "Looking Under The Microscope", Frost & Sullivan, November 12, 2006.
- 7 Instrument Business Outlook, "A Close Look At Optical Microscopy", March 11 2007
- 8 Global Industry Analysts, "Microplate Instrumentation and Supplies," August 2006.

Appendix

Survey Methodology

The 2007 Imaging Survey consisted of 46 questions. Of these, 16 questions included “other” as an answer choice, providing an opportunity for survey participants to compose a more appropriate answer to the particular question that was asked. Demographic information was obtained from answers to 5 of the survey questions including the country of origin of survey participants. Screening questions were included in the survey to qualify participants before allowing them to complete the survey or answer specific questions. The survey was administered online from August 13th-August 16th, 2007 and the data tabulated and presented here.

Respondent Profile: Imaging Usage and Demographics

Do you currently use or plan to use imaging techniques in your research or work? (Screening Question)

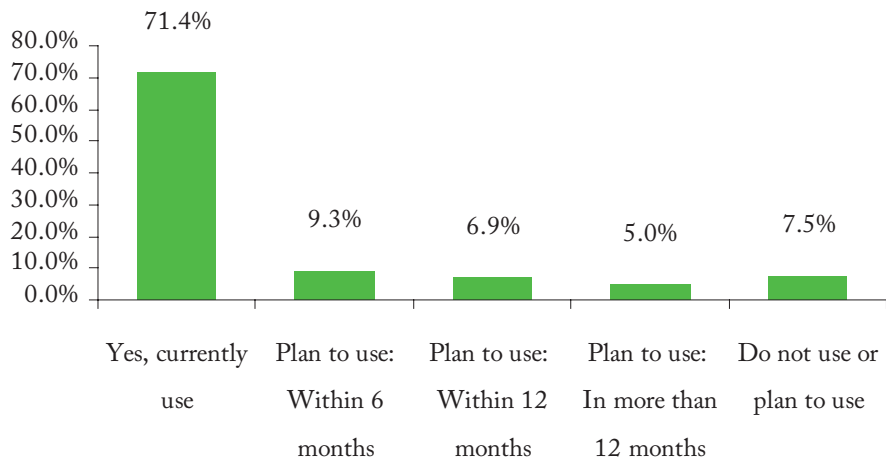
Over 70% are current users of imaging techniques, 21% plan to use imaging technologies in the future.

N = 657

Respondents who selected "Do not use or plan to use" were screened out of the survey. Those who plan to use imaging techniques were asked a limited number of survey questions.

| | Count | % |
|-------------------------------------|-------|-------|
| Yes, currently use | 469 | 71.4% |
| Plan to Use: Within 6 months | 61 | 9.3% |
| Plan to use: Within 12 months | 45 | 6.9% |
| Plan to use: In more than 12 months | 33 | 5.0% |
| Do not use or plan to use | 49 | 7.5% |

Imaging Usage



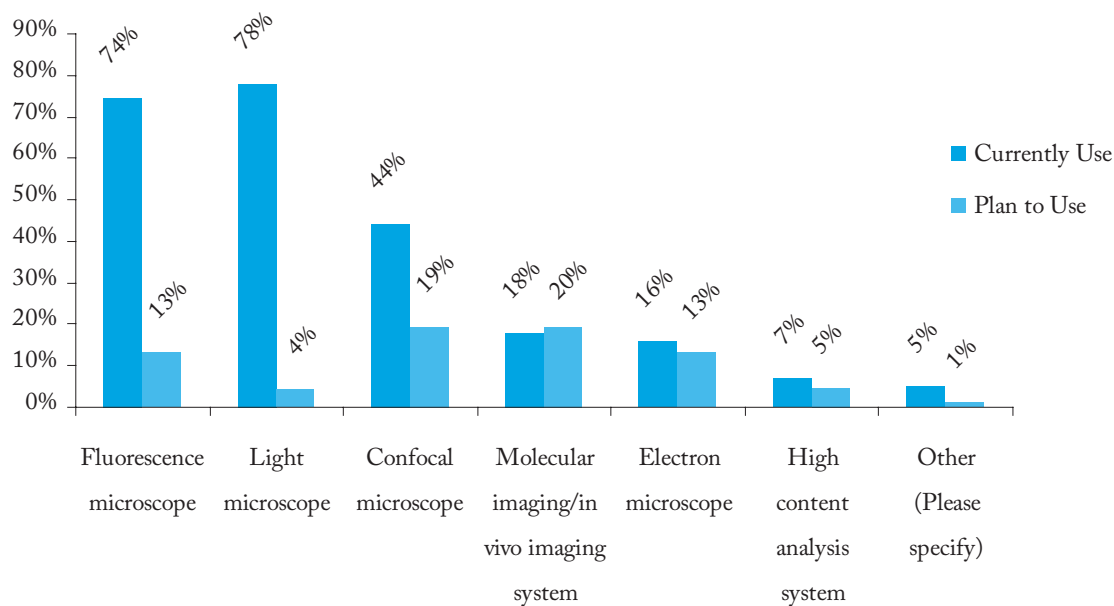
Which of the following equipment types do you currently use or plan to use?

87% of survey participants either currently use or plan to use a fluorescence microscope; 82% either currently use or plan to use a light microscope.

N = 577

| | Currently Use | | Plan to Use | | Total | |
|---|---------------|-----|-------------|-----|-------|-----|
| | n | % | n | % | n | % |
| Fluorescence microscope | 429 | 74% | 75 | 13% | 504 | 87% |
| Light microscope | 449 | 78% | 24 | 4% | 474 | 82% |
| Confocal microscope | 256 | 44% | 111 | 19% | 367 | 64% |
| <i>In vivo</i> / molecular imaging system | 104 | 18% | 113 | 20% | 217 | 38% |
| Electron microscope | 91 | 16% | 75 | 13% | 166 | 29% |
| High content analysis system | 40 | 7% | 27 | 5% | 67 | 12% |
| Other (Please specify) | 28 | 5% | 6 | 1% | 34 | 6% |

Microscope/Imaging System Type



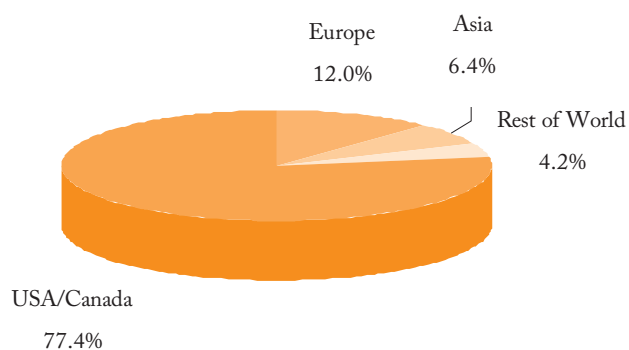
Country

77% of survey respondents are from the United States or Canada; 12% are from Europe; 6% from Asia; and 4% from the ROW.

N = 566

| Country | Count | % |
|---------------|-------|-------|
| United States | 438 | 77.4% |
| Europe | 68 | 12.0% |
| Asia | 36 | 6.4% |
| Rest of World | 24 | 4.2% |

Country/Region



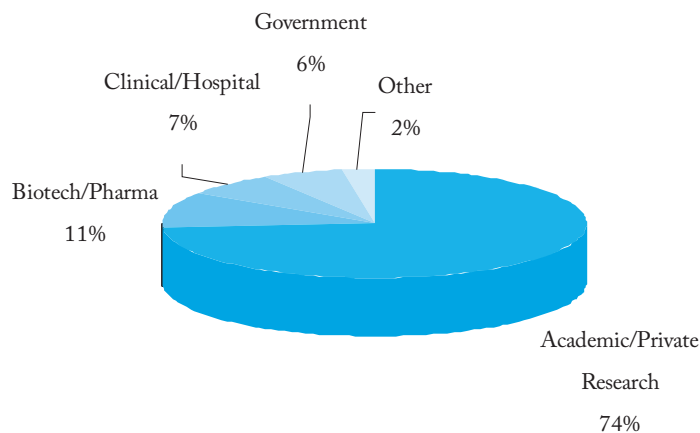
What is your Institution Type?

Survey participants are from Academia/Private Research (74%), Biotech/Pharma (11%), Clinical/Hospital (7%) and Government institutions (6%).

N = 577

| Institution Type | Count | % |
|---------------------------|-------|-------|
| Academic/Private Research | 425 | 73.7% |
| Biotech/Pharma | 62 | 10.8% |
| Clinical/Hospital | 40 | 6.9% |
| Government | 36 | 6.2% |
| Other (Please specify) | 14 | 2.4% |

Institution Type



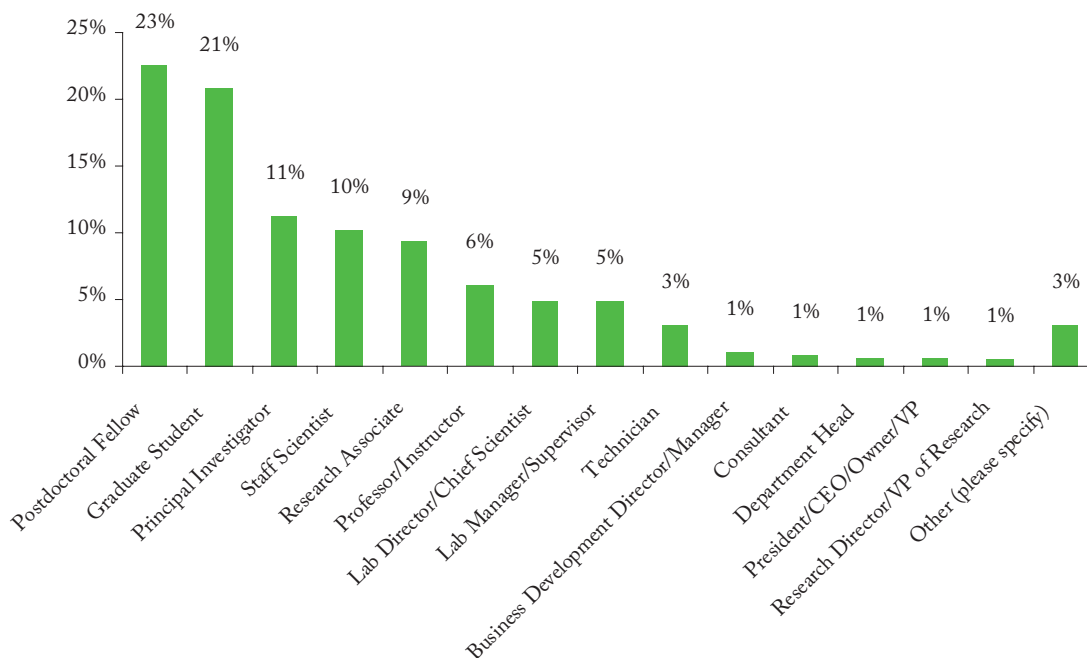
Which title best applies?

77% of the survey audience work at the bench.*

N = 577

| Title | Count | % |
|----------------------------------|-------|-------|
| Postdoctoral Fellow | 130 | 22.5% |
| Graduate Student | 120 | 20.8% |
| Principal Investigator | 65 | 11.3% |
| Staff Scientist | 59 | 10.2% |
| Research Associate | 54 | 9.4% |
| Professor/Instructor | 35 | 6.1% |
| Lab Director/Chief Scientist | 28 | 4.9% |
| Lab Manager/Supervisor | 28 | 4.9% |
| Technician | 18 | 3.1% |
| Biz Dev Director/Manager | 6 | 1.0% |
| Consultant | 5 | 0.9% |
| Department Head | 4 | 0.7% |
| President/CEO/Owner/VP | 4 | 0.7% |
| Research Director/VP of Research | 3 | 0.5% |
| Other (Please specify) | 18 | 3.1% |

Title/Position



*Includes: Postdoctoral Fellow, Staff Scientist, Graduate Student, Research Associate, Principal Investigator, Technician.

**Which of the following are your key areas of research or work?
(check all that apply)**

The majority of participants identified Cell Biology and Molecular Biology as their key areas of research or work.

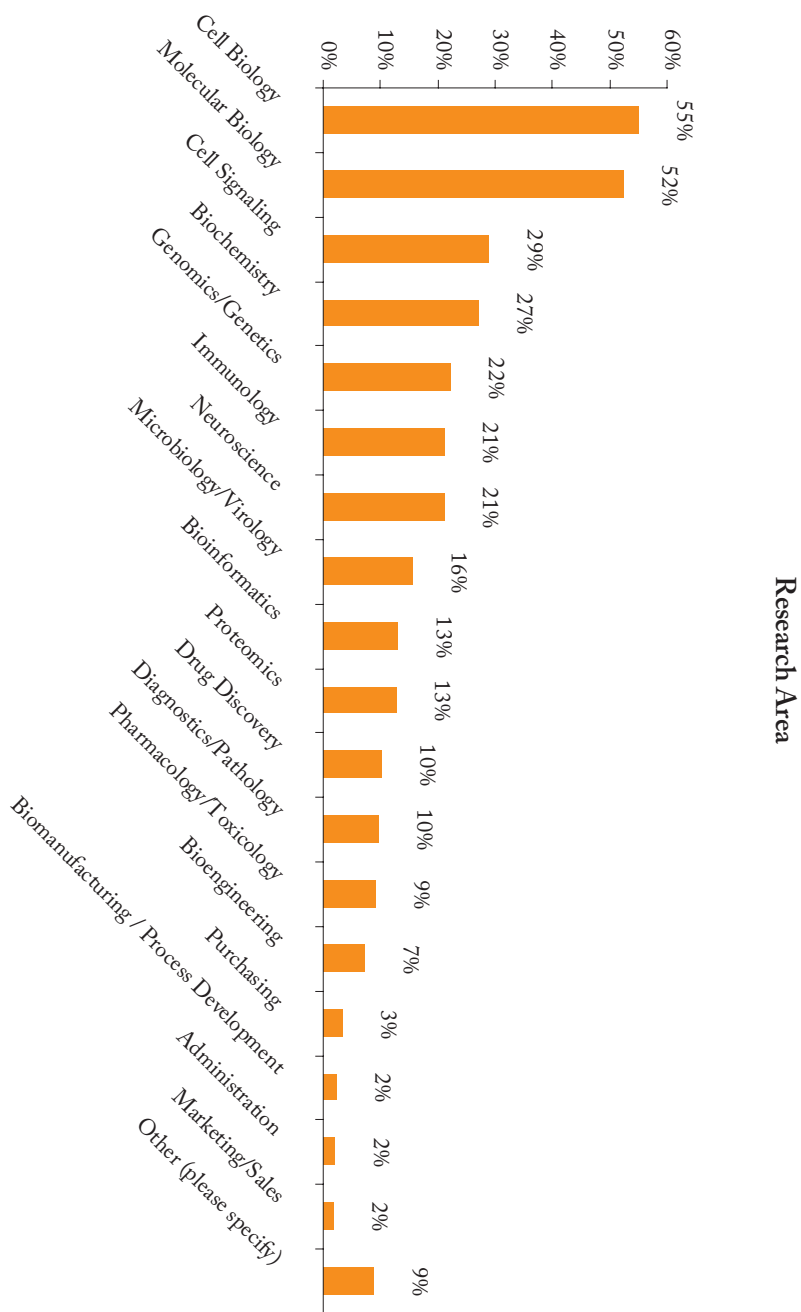
N = 577

| Research Area | Count | % |
|--------------------------------------|-------|-------|
| Cell Biology | 317 | 54.9% |
| Molecular Biology | 302 | 52.3% |
| Cell Signaling | 167 | 28.9% |
| Biochemistry | 156 | 27.0% |
| Genomics/Genetics | 128 | 22.2% |
| Immunology | 122 | 21.1% |
| Neuroscience | 122 | 21.1% |
| Microbiology/Virology | 90 | 15.6% |
| Bioinformatics | 75 | 13.0% |
| Proteomics | 74 | 12.8% |
| Drug Discovery | 59 | 10.2% |
| Diagnostics/Pathology | 56 | 9.7% |
| Pharmacology/Toxicology | 52 | 9.0% |
| Bioengineering | 42 | 7.3% |
| Purchasing | 19 | 3.3% |
| Biomanufacturing/Process Development | 13 | 2.3% |
| Administration | 12 | 2.1% |
| Marketing/Sales | 10 | 1.7% |
| Other (Please specify) | 51 | 8.8% |

Which of the following are your key areas of research or work?
(check all that apply)

The majority of participants identified Cell Biology and Molecular Biology as their key areas of research or work.

N = 577



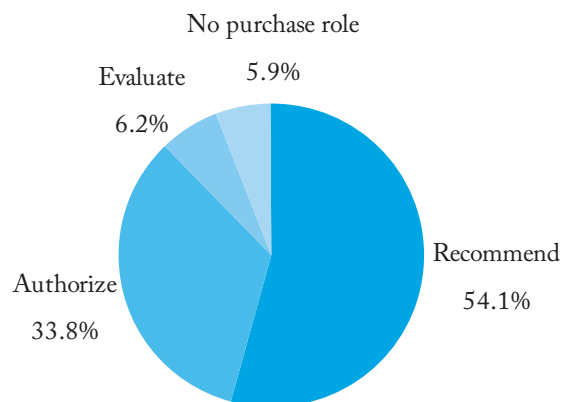
Which best describes your purchasing authority?

88% of survey participants either authorize or recommend purchases.

N = 577

| Purchasing Authority | Count | % |
|----------------------|-------|-------|
| Recommend | 312 | 54.1% |
| Authorize | 195 | 33.8% |
| Evaluate | 36 | 6.2% |
| No purchase role | 34 | 5.9% |

Purchasing Authority



Questionnaire

1. Do you currently use or plan to use imaging techniques in your research or work?

- Yes, currently use
- Plan to use: Within 6 months
- Plan to use: Within 12 months
- Plan to use: In more than 12 months
- Do not use or plan to use (*screened out of survey*)

2. What is the purpose of your research?

- Basic research
- Target validation
- Clinical diagnostics
- Drug screening
- Lead characterization
- Forensics
- Other (Please specify)

3. Which of the following do you currently use / plan to use in your imaging experiments?

| | Currently Use | Plan to Use |
|------------------------|---------------|-------------|
| Cell lines | | |
| Primary cells | | |
| Whole animals | | |
| Organs | | |
| Tissues | | |
| Plants | | |
| Gels / blots / arrays | | |
| Other (Please specify) | | |

4. What cell types and cell lines do you currently use / plan to use?

| Cell Line | Cell Type (Please specify below) |
|--|----------------------------------|
| Epithelial-like cells (HeLa, CaCo2) | |
| Fibroblast-like cells (HEK 293, Cos-7) | |
| Hepatocyte-like cells (HEPA-1, HepG-2) | |
| Neuroblastoma (CLBPEC, SHEP) | |
| Leukemia cells/lymphoblasts (Jurkat, K562) | |

| Cell Line | Cell Type (Please specify below) |
|---------------------------------|----------------------------------|
| Melanoma | |
| Monocytes/macrophages | |
| Myotubes/myoblasts/muscle cells | |
| Keratinocytes | |
| Primary cells | |
| Other (Please specify) | |
| Don't know/can't remember | |

**5. Which of the following applications do you currently run / plan to run in your cellular work?
(Select all that apply)**

| | Currently Run | Plan to Run |
|-------------------------------------|---------------|-------------|
| Apoptosis | | |
| Cell count | | |
| Cell cycle | | |
| Cell differentiation | | |
| Cell migration | | |
| Cell morphology | | |
| Cell proliferation | | |
| Cell surface markers | | |
| Cell viability | | |
| Cellular signal | | |
| Cytotoxicity | | |
| Fluorescence protein expression | | |
| Gene reporter | | |
| Ion flux | | |
| Kinetic analysis | | |
| Organelle localization and function | | |
| Receptor binding studies | | |
| Second messenger | | |
| Sub-population analysis | | |
| Translocation / trafficking | | |
| Other (Please specify) | | |
| None of the above | | |

6. Which of the following equipment do you currently use / plan to use? (Select all that apply)

| | Currently Use | Plan to Use |
|--|---------------|-------------|
| Fluorescence microscope | | |
| Confocal microscope | | |
| Light microscope | | |
| Electron microscope | | |
| High content analysis system | | |
| Molecular imaging/ <i>in vivo</i> imaging system | | |
| Other (Please specify) | | |

7. Who is the manufacturer of your[Imaging Instrument]? (Select all that apply)

There will be a separate question for each instrument type selection in Q6.

- Andor Technology
- Applied Precision
- BD Biosciences (formerly Atto Biosciences)
- Biomedical Photometrics
- Carl Zeiss
- Cellomics / Thermo Fisher Scientific
- FUJIFILM Life Science
- GE Healthcare (formerly Amersham Biosciences)
- Kodak Molecular Imaging Systems (now Carestream Molecular Imaging)
- Kubtec
- Leica
- LI-COR Biosciences
- Molecular Devices (now part of MDS Analytical Technologies)
- Motic
- Nikon
- Olympus
- PerkinElmer
- I don't know / can't remember
- Other (Please specify)

8. Please indicate how long ago this microscope or imaging system was purchased?

Separate drop down for each equipment type selected

- Less than 6 months ago
- 6 months to 1 year ago
- 1 to 2 years ago
- 2 to 3 years ago

- 3 to 4 years ago
- 4 to 5 years ago
- More than 5 years ago
- I don't know/can't remember

9. Which of the following detection technologies do you use? Please rank your selections (1 = Most frequently used)

- Labeled antibodies
- Cell stains (e.g. hematoxylyn, eosin, etc.)
- Radioactive dyes
- Fluorescent dyes
- Quencher dyes
- FRET
- pH sensitive dyes
- Quantum dots (i.e. nanospheres)
- Other (please specify)

10. Do you use a digital camera that is the same brand as your microscope / imaging system to document images?

- Yes
- No
- Do not use a digital camera

11. (If yes) Would you consider a future upgrade to another camera model, or does your existing camera cover all of your imaging needs?

- Yes, I see reason for a future upgrade
- No, my current camera covers all of my imaging needs

12. Please indicate what brand digital camera you use. (Select all that apply)

- Andor Technology
- Apogee
- Canon
- Carl Zeiss
- CRi
- Diagnostic Instruments (SPOT)
- Hamamatsu
- Kodak
- Leica
- Lumenera
- Motic

- Olympus
- Optronics
- Nikon
- Panasonic
- Photometrics / Roper
- Pixelink
- Polaroid
- QImaging
- Redlake
- Sony Electronics
- Other (Please specify)
- I don't know/can't remember

13. What level of resolution do you find adequate in a cellular imaging documentation system or camera?

- 1 – 2 megapixel
- 2 – 4 megapixel
- 4 – 6 megapixel
- 6 – 8 megapixel
- 8 – 10 megapixel
- 10 – 12 megapixel
- 12+ megapixel

14. What digital camera frame rate do you require?

- Less than 1 fps (frame per second)
- 1-10 fps
- 11-30 fps
- Over 30 fps

15. Which connectivity interface do you prefer?

- PCIe Card
- USB 2.0
- Firewire
- GigE
- Any plug-n-play (USB2.0, FireWire, GigE)
- Don't know/don't care/not a purchasing requirement

16. Typically, what is the price/budget range for your digital camera purchases?

- Under \$5,000
- \$5,000 - 10,000
- \$11,000 - 15,000
- \$16,000 - 20,000
- Over \$20,000

17. Which of the following sensor technologies best meets your needs?

- CCD
- CCD-Interline (eg Sony ICX 285)
- EMCCD (electron multiplying)
- ICCD (intensified)
- EBCCD (electron bombardment)
- CMOS
- Other (APDs, PDAs) (Please specify)

18. When deciding on a digital camera, which of the following factors ranks most highly in your purchasing decision? Please rank in order of importance (1 = Most important)

- Brand recognition
- Recommendation from peer in the same field of research
- Vacuum/cooling capability of the camera
- Interface options (e.g. USB, Firewire)
- 3rd party software compatibility
- Relationship with local representatives of the camera
- Quality/support reputation of the manufacturer
- Other (Please specify)

19. How important is a manufacturer's warranty in your purchase decision?

- Not at all important
- Somewhat important (A contributing factor)
- Very important (Absolutely essential)

20. How often do you buy a service contract (beyond the standard warranty) for your equipment? (Either at the time of purchase or at a later date)

- Never
- Sometimes
- Always

21. Which best describes how you budget for support / service contracts?

- Common pool /purchasing department
- Ongoing maintenance budget for my lab
- Apply for funding separately

22. For what length of time would you purchase a typical service contract?

- 1 year
- Up to 3 years
- 3 years or more

23. How much would you be prepared to spend on a service contract per year?

- Up to 5% of camera / system price
- 5 to 10% of camera / system price
- Over 10% of camera / system price

24. What areas of service support are most important?

(Please rank from 1 to 4, 1 = Most important)

- Service on-site
- Product only
- Software
- Application

25. Do you use image analysis software to extract quantitative information from your images?

- Yes
- No

26. What software do you use predominantly for your analysis?

- Software provided by the instrument manufacturer
- Software provided by a third party supplier (or open source)

27. Which third party software do you primarily use for image analysis? (single choice)

| Supplier | Software Name |
|---------------------------------|----------------------|
| Andor Technology | iQ |
| Applied Precision | DeltaVision softWoRx |
| Bitplane | Imaris |
| Definiens | Cellenger |
| Empix Imaging | Northern Eclipse |
| MCID | MCID |
| Improvision | Openlab |
| Improvision | Velocity |
| Intelligent Imaging Innovations | Slidebook Pro |
| Leica | QWin |
| Media Cybernetics | AutoQuant |
| Media Cybernetics | ImagePro |
| Molecular Devices | Metamorph |
| Molecular Devices | MetaXpress |
| Nikon | NIS |
| Olympus | Cell^ Series |

| | |
|---------------------------|------------|
| Open Source | ImageJ |
| Open Source | NIH Image |
| Open Source | XCOSM |
| Open Source | µManager |
| Zeiss | Axiovision |
| In-house written software | |
| Other (Please specify) | |

28. How would you rate your imaging supplier / software on the following features?

1 = Excellent 2 = Very good 3 = Neutral 4 = Good 5 = Fair 6 = Poor 7 = I don't know

- Range of features
- Price / Performance
- Ease of use
- Training
- Support
- Automation of analysis

29. Do you use any software for image deconvolution / restoration and 3D visualization?

- Yes
- No

30. Which supplier do you use for deconvolution / restoration software?

| Supplier | Software Name |
|---------------------------------|----------------------|
| Andor Technology | iQ |
| Applied Precision | DeltaVision softWoRx |
| BD Biosciences | Cytoprint |
| Bitplane | Imaris |
| Empix Imaging | Northern Eclipse |
| MCID | MCID |
| Improvision | Openlab |
| Improvision | Velocity |
| Intelligent Imaging Innovations | Slidebook Pro |
| Leica | QWin |
| Media Cybernetics | AutoQuant |

| | |
|---------------------------|--------------|
| Media Cybernetics | ImagePro |
| Mercury | Amira |
| Molecular Devices | Metamorph |
| Molecular Devices | MetaXpress |
| Nikon | NIS |
| Olympus | Cell^ Series |
| Open Source | Bioimage XD |
| Open Source | ImageJ |
| Open Source | NIH Image |
| Open Source | XCOSM |
| Open Source | µManager |
| SCI | Huygens |
| Vaytek | Microtome |
| Vaytek | VoxBlast |
| Zeiss | Axiovision |
| In-house written software | |
| Other (Please specify) | |

31. How would you rate your imaging supplier / software on the following features?

1 = Excellent 2 = Very good 3 = Neutral 4 = Good 5 = Fair 6 = Poor 7 = I don't know

- Quality & speed of deconvolution
- Quality & speed of 3D visualization
- Price / Performance
- Ease of Use
- Training
- Support

32. How important are the following analysis methods to you? (1 = Very important, 5 = Not important, 6 = I don't know)

- Cell counting
- Morphological measures (e.g. length, diameter etc)
- 2D Intensity measures
- 3D volume and density measures
- Co-localization analysis
- Tracking cell movement over time
- Phenotypic classification of cells
- Tissue analysis
- Tissue classification

33. How many images do you generate per week?

- Less than 10
- 10 to 100
- 101 to 1000
- 1001 to 5000
- 5001 to 10000
- More than 10000

34. How do you manage your image data?

- By using a database provided by the instrument manufacturer
- By using a database provided by the supplier of the analysis package
- By using a commercial third party database (please write in)
- By using an open source solution
- By using an in house developed solution
- By using the Windows file system
- Other method (Please specify)

35. Which *in vivo*/molecular imaging system do you use?

- CRi
- GE Healthcare/ART
- Kodak Molecular Imaging Systems (now Carestream Molecular Imaging)
- Kubtec
- LI-COR Biosciences
- Olympus
- Xenogen/Caliper
- Other (please specify)

36. How important to you are the following features of an *in vivo*/molecular Imaging System? (1 = Very important, 5 = Not at all important, 6 = Don't know)

- Low background
- Ability to image a wide range of animal sizes
- Ability to image a wide range of tissue types
- Multiplexing capability

37. How satisfied are you with your current *in vivo*/Molecular Imaging System on these features? (1 = Very satisfied, 5 = Not at all satisfied, 6 = Don't know)

- Low background
- Ability to image a wide range of animal sizes
- Ability to image a wide range of tissue types
- Multiplexing capability

38. Do you use bioluminescence or fluorescence reporters in your in vivo imaging experiments? Which do you prefer to use?

- Bioluminescence
- Fluorescence
- Fluorescence reporter genes (e.g. GFP, RFP)

39. What type of labeled optical agents would be useful for your research?

- Antibody
- Peptide
- Protein
- Small molecule or ligand
- Cell or virus
- Other (Please specify)

40. Which of the following automated high content analysis suppliers and imagers are you aware of, if any?

| Supplier | Instrument |
|--------------------------|---------------------------------------|
| Applied Precision | CellWorX |
| Applied Precision | Don't know the name of the instrument |
| Axon | ImageXpress |
| Axon | Don't know the name of the instrument |
| Beckman Coulter | EIDAQ |
| Beckman Coulter | Don't know the name of the instrument |
| Becton Dickinson | Pathway 415 |
| Becton Dickinson | Pathway 435 |
| Becton Dickinson | Pathway 855 |
| Becton Dickinson | Don't know the name of the instrument |
| Cellomics | CellWorX |
| Cellomics | Array Scan |
| Cellomics | Kinetic Scan |
| Cellomics | Don't know the name of the instrument |
| Evotec | Opera |
| Evotec | Don't know the name of the instrument |
| GE Healthcare / Amersham | In Cell 1000 |
| GE Healthcare / Amersham | In Cell 3000 |
| GE Healthcare / Amersham | Don't know the name of the instrument |

| Supplier | Instrument |
|-------------------|---------------------------------------|
| Genetix | Cell Reporter |
| Genetix | Don't know the name of the instrument |
| Imstar | Pathfinder Cellscan |
| Imstar | Pathfinder Wellscan |
| Imstar | Don't know the name of the instrument |
| Maia Scientific | MIAS-2: Multimode Microscopy Reader |
| Maia Scientific | Don't know the name of the instrument |
| Molecular Devices | Discovery 1 |
| Molecular Devices | ImageXpress MICRO |
| Molecular Devices | ImageXpress Ultra |
| Molecular Devices | ImageXpress 500A |
| Molecular Devices | Don't know the name of the instrument |
| Q3DM | EIDAQ |
| Q3DM | Don't know the name of the instrument |
| None of the above | |

41. Has your company / organization purchased an automated high content analysis system in the past 1 to 2 years?

- Yes
- No
- I don't know

42. Which automated HCA instrument/s has your company/organization purchased in the last 1 to 2 years? (same response options as in Q40)

43. How likely is your company/organization to purchase an additional automated HCA imager in the next 1 to 2 years?

- Very likely
- Somewhat likely
- Neither likely nor unlikely
- Somewhat unlikely
- Very unlikely
- I don't know

44. What is the maximum confocal resolution possible with the fluorescent bench top confocal imager that you use?

- >9 microns
- 5-7 microns
- 1-3 microns
- Other (Please specify)
- Don't Know

45. Which of the following technologies do you plan to adopt/systems you plan to purchase and what is your purchasing timeframe?

Within 3 months *Within 6 months* *Within 12 months* *In more than 12 months*

- Fluorescence microscope
- Confocal microscope
- Light microscope
- Electron microscope
- High content analysis system
- *In vivo* /molecular imaging system
- None of the above

46. How much do you have budgeted (in \$US) for cellular imaging equipment and software in the next year?

- \$0K
- Less than \$10,000
- \$10,000 to \$50,000
- \$50,000 to \$100,000
- More than \$100,000
- I don't know

Demographic Questions

1. In which type of institution do you work?

- Academic
- Pharmaceutical
- Private Research
- Biotechnology
- Government
- Clinical - Other (please specify)

2. Which title best applies?

- Professor/Instructor
- Lab Manager/Supervisor
- Business Development Director/Manager
- Department Head
- Account Manager
- Staff Scientist
- President/CEO/Owner/VP
- Postdoctoral Fellow
- Consultant
- Product Manager
- Process Engineer
- Research Associate
- Research Director/VP of Research
- Technician/Research Assistant
- Graduate Student
- Principal Investigator
- Lab Director/Chief Scientist
- Procurement Manager
- Other

3. Which of the following are your key areas of research or work?

- Bioinformatics
- Genomics/Genetics
- Drug Discovery
- Marketing/Sales
- Bioengineering
- Biomanufacturing /Process Development
- Microbiology/Virology
- Cell Biology
- Administration
- Pharmacology/Toxicology
- Neuroscience
- Purchasing
- Cell Signaling
- Immunology
- Diagnostics/Pathology
- Biochemistry
- Molecular Biology
- Proteomics
- Other

4. Which best describes your purchasing authority?

- Authorize
- Recommend
- Evaluate
- No Purchase Role