

Cellular Assay Reagents Trends 2009



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Executive Summary

- This market report summarizes the results of HTStec's global Pharma, Biotech and Academic Screening web-based benchmarking survey on cellular assay reagents and cell-based assays carried out in January 2009.
- The study was initiated by HTStec to meet the specific needs, interests and focus of the survey sponsors. The objectives were to gain a better awareness of the metrics behind current and future cell-based assays (screening, profiling and high content assays). In particular, to learn how the market for cellular assay reagents is evolving, if new bottlenecks exist and how end-users are implementing changes to enhance their productivity. Equal emphasis was given to soliciting opinion from Pharma, Biotech and Academic Screening segments, in both North America and Europe.
- The survey looked at the following aspects of cell-based assays and screening as practiced to date (2008) and in some cases predicted for the future (2010): the proportion of primary screens that are cell-based; the number of primary cell-based screens; the average number of samples (wells) per screen; the main target or assay classes investigated using cell-based assays; interest in purchasing stable GPCR clones; interest in GPCR dimerization; interest in investigating cell signalling (protein phosphorylation); details of the cell signalling pathways investigated and which kinases were being measured in this respect; feedback on the pros and cons of different assay formats available for cell signalling pathways, and which parameters are most important; interest in investigating cellular modification assays; the main microplate formats used for cell-based primary screening; main plate density and microplate surface coatings used for primary cells, HCS, GPCR and ELISA assays; primary supplier of microplates; throughput requirements for different types of cell-based assays; use of frozen growth arrested GPCR cells; use of cells purchased in microplates; outsourcing of cell-based assays; plans to outsource cellular assay development projects; use of primary cells; average number of cells needed per data point generated in different microplate formats; vendors most recognized with various aspects of cell-based assays; preferred suppliers of cellular assay components; annual cellular assay reagent budgets and their breakdown into item groups purchased; proportion of that budget spend with various suppliers; price expectations per well screened; respondents focus for achieving enhanced productivity in cell-based assays; the main bottlenecks in the cell-based assays today; obstacles that have proven major hurdles in cell-based assays; and the biggest issues, problems or challenges faced today in cell-based assays.
- The survey questionnaire consisted of 35 multi-choice questions. In addition, there were 7 questions related solely to survey demographics.
- The survey collected 99 responses (78 complete and 21 partially filled out) from 73 different organisations. Survey responses were geographically split: 54% North America, 41% Europe, 4% Asia (Excluding Japan) and 1% Japan.
- Survey respondents were drawn from persons or groups actively involved in the development, screening and/or profiling of all types of cell-based assays.
- Respondents came from 38 Large Pharma; 32 University/Research Institute/Government Lab; 27 Medium-Small Pharma & All Biotech; 1 Contract Research Organisation; and 1 Agrochemical Company.
- Survey respondents represented: 33 labs with Multiple Drug Discovery roles; 23 Primary Screening labs; 12 Assay Development labs, 8 Life Science Research labs; 7 Other labs; 7 Hits-to-Leads labs; 3 Secondary Screening labs; 2 Basic Research labs; 2 Leads-to-Candidate labs; 1 Compound Profiling lab; and 1 Therapeutic Area lab.
- Most survey respondents had a senior job role or position which was in descending order: 26 Section/Group Leader; 20 Senior Scientist/Researcher; 15 Research Scientist; 9 Department Head; 9 Principle Investigator; 8 Director; 5 Lab Manager; 4 Professor/Assistant Professor; 2 Vice President; and 1 Assistant Director.
- Survey results were expressed as an average of all survey respondents. In addition, the majority of the data was reanalyzed after sub-division into the following 5 survey groups: 1) Large Pharma; 2) Medium/Small Pharma & All Biotech; 3) University, Research Institute & Government Laboratory; 4) Europe; and 5) North America.
- Respondents reported for 2008 a median of 50% of all their screening assays were cell-based, with 6 primary cell-based screens per year, each with a median of 50K-100K samples run per primary screen.

- The target type or general assay class most investigated using cell-based assays was receptors – GPCRs, this was followed by cell-toxicity assays.
- 35% of respondents were purchasing stable GPCR clones.
- Only 9% of respondents were investigating GPCR dimerization.
- 71% of respondents were investigating cell signalling pathways (protein phosphorylation). High Content Analysis was the preferred assay format, with the majority not using multiplexing.
- 30% of respondents were investigating cellular modification by assaying methylation and ubiquitination.
- The microplate format most used for primary cells assays was the 96-well plate and for HCS, GPCR and ELISA cell assays was the 384-standard well plate.
- The main plate coating most used for all types of cell-based assays was cell-culture treated.
- The main suppliers of microplates used for cell-based assays were Greiner Bio-One and Corning.
- The median throughputs wanted against a cell-based target in primary screening and high content assays was 1K–10K wells/8h day and in profiling 0.5K–1K wells/8h day. On average respondents achieved this desired throughput in 50%–75% of all cell-based screens.
- Only 10% of respondents were purchasing frozen growth arrested GPCR cells. In 2008 a median of 20% of all GPCR screening data points were made using frozen cells, with the majority sourced externally.
- 29% of respondents were outsourcing cell-based assays. Cerep was the preferred outsourcing provider.
- 20% of respondents have plans to outsource cellular assay development projects in 2009.
- 61% of respondents were using primary cells in 2008. The main task or application of primary cells was profiling, with a median of 50–75% of primary cells sourced internally.
- A median of 2.5K–5K cells was used to generate a single data point in 384-standard well.
- The vendor's most recognized with the following aspects of cell-based assays were: Invitrogen – the market leader; Invitrogen – general expertise; Invitrogen – specialized reagents or probes; Invitrogen – innovation & cutting-edge technology; Invitrogen – best reputation for assay quality, robustness and reliability; Both Cisbio and Invitrogen – best assay development support or service offering; and Invitrogen – greatest understanding of user requirements.
- The primary suppliers for the following cellular assay components were as follows: cellular immunoassay kits – Other (a supplier other than those on the list provided); GPCR cell lines – Other; GPCR cellular reagents – Cisbio; and HCS assay reagents – Invitrogen.
- 91% of respondents expressed satisfaction with the cell-based assay or reagent technologies they had purchased, acquired or licensed over the past 2 years.
- Optimizing the readout (achieving adequate signal window) was ranked by respondents as the obstacle in cell-based assays that has proved most limiting.
- Respondent's feedback on their bottlenecks, biggest issues, problems or challenges they face in enabling cell-based assays today are documented.
- Greater emphasis on reducing cycle time (i.e. start to finish of screen) was rated as respondents focus for achieving enhanced productivity with respect to cell-based assays.
- The price expectations per well screened for cell-based assays were as follows: median typical cost per well was \$0.25–\$0.50; median desired/target cost per well was \$0.10–\$0.25; and median maximum price per well was \$0.75–\$1.00.
- The median cellular assay reagent budget in 2008 was \$100K–\$150K/lab, with just over 70% of this budget spent on bulk reagents, disposable labware and off-the-shelf assay kits.
- A bottom-up model was developed around respondent's budgets to estimate the global market for cellular assay reagents. The total market was estimated to be around \$350Million in 2008. The market segmentation, the proportion allocated to the main items purchased and CAGR estimates for 2010 were made.
- Invitrogen was the supplier with greatest market share of the 2008 cellular assay reagent budget.
- The full report provides the data, details of the breakdown of the responses for each question and the estimates for the future (2010). It also highlights several interesting differences between the survey groups.

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General Information on HTStec and HTStec's Trends Market Reports

- HTStec Limited an independent market research consultancy founded in September 2003 whose focus is on assisting clients delivering novel enabling platform technologies (liquid handling, laboratory automation, detection instrumentation and assay reagent technologies) to drug discovery and the life sciences. Over the past 5 years HTStec has published 41 market reports mainly on drug discovery technologies and authored 27 review articles in Drug Discovery World.
- HTStec's Trends reports owe their origins to the need by developers and vendors of new enabling technologies in drug discovery to get up-to-date relevant market metrics on which to base informed business decisions.
- Typically focused on a specific market niche or segment, in many cases overlooked or frequently misunderstood by broader market studies.
- Investigations are mainly initiated in response to a sponsor's specific requests.
- HTStec's extensive experience of the market, both as a Pharma End-User and working for a major Life Science Tool Provider ensures the industry relevance of the market research collected.
- Based entirely on web-based feedback from potential customers typically drawn mainly from Pharma and Biotechs, although increasingly University and Research Institute labs are also being researched.
- Produced extremely rapidly and typically published within 3 weeks of starting the collection phase.
- Reports are short, concise and focused on giving readers the basic data, analyzed in several different ways.
- Limited to reporting the main findings alone, without exhaustive discussion on the relevance of the results.
- Market estimates are mainly based on bottom-up calculations and usually avoid attempts to forecast widely beyond the next 2-3 years. Full details on the derivation of market estimates are given so readers can apply their own factors and easily make alternative estimates if they prefer or know better.
- Owing to the sensitivity of some of the data collected, all reference to the origin of participating companies is removed, data is pooled to get an industry average and the anonymity of all respondents fully preserved and guaranteed.
- Unlike alternatives HTStec's Market Surveys and Report are aimed at giving readers, information they want and can rely on, not information they don't need, cannot easily discern or is of dubious authenticity.
- HTStec aims to be the premier global provider of highly focused market research on enabling technologies in drug discovery.
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