

Cell-Based Label Free Detection Trends 2009



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Executive Summary

- This market report summarizes the results of HTStec's 2nd global Pharma and Biotech web-based benchmarking survey on cell-based label free (LF) detection carried out in December 2009.
- The study was initiated by HTStec to comprehensively document current interest, application focus and future market requirements for cell-based LF detection. The report aims to be a source of valuable information for vendors developing novel cell-based LF detection systems and assays, and provides updated market intelligence in this rapidly emerging area.
- 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 LF detection as practiced today (late 2009) and in many cases as predicted for the future (2012): familiarity with plate-based LF technologies; % of cell-based assays performed using LF technologies; plans to purchase new cell-based LF instruments; most important factors in the decision to purchase a plate-based LF technology; what respondents must be convinced about to move forward with the purchase of LF technology; reasons why the purchase of LF technology did not proceed; why some groups are still putting off adopting cell-based LF technologies; % of cell-based assays performed in different microplate formats; the importance of coated plates and of different microplate coatings; target class/application area where LF cell-based assays are expected to make the greatest impact; the GPCR application areas respondents are most interested in developing using LF technologies; additional areas of interest for cell-based LF applications; interest in high throughput chemotaxis and cell migration assays on a LF system; important factors in primary cell LF assays; use of LF detection to successfully perform testing of 'difficult' targets; main advantages and limitations of LF cell-based assays; whether cell-based LF technologies are complimentary with or will displace existing assay technologies; real throughput (data point) experiences for cell-based LF technologies; features or functionalities needed in a new microplate cell-based LF detection system; annual capex instrument and consumable cell-based LF budgets; and maximum price points for LF biosensor plates that could be used for cell-based assays.
- The main questionnaire consisted of 26 relatively simple multi-choice questions and 3 open-ended questions. In addition, there were 6 questions related solely to survey demographics.
- The survey collected 66 validated responses (59 complete and 7 partially filled out) from 43 different organisations.
- Survey responses were geographically split: 50% Europe; 48% North America; & 2% Asia (excluding Japan).
- Survey respondents were drawn from persons or groups that are actively engaged (key users) in assay development and screening of cell-based assays who are currently using LF detection. Feedback was also obtained from persons considering the application of new plate-based LF technologies to cell-based assays in the future or those about to initiate the investigation/evaluation of LF readouts.
- Respondents came from 30 Large Pharmas; 15 Medium-Small Pharma & All Biotech; 9 Univ./Res. Inst./Gov't Lab/Not-for-Profit Facilities; 7 Academic Screening Centers; and 5 CROs.
- Most survey respondents had a senior job role or position which was in descending order: 22 Section/Group Leader; 11 Senior Scientist/Researcher; 8 Principal Investigator; 6 Director; 5 Others; 5 Research Scientist; 4 Department Head; 3 Professor/Assistant Professor; 1 Lab Manager; and 1 Vice President.
- Survey respondents represented: 20 labs with a combination of drug discovery roles; 18 primary screening (HTS) labs; 8 assay development labs; 4 secondary screening labs; 3 primary screening (focused libraries) labs; 3 hits-to-leads labs; 3 life science research labs; 3 other labs; 1 therapeutic area lab; 1 compound profiling lab; 1 leads-to-candidate lab; and 1 basic research lab.
- Survey results were expressed as an average of all survey respondents. In addition, the data was fully reanalyzed after sub-division into the following 6 survey groups: 1) Using Cell-Based LF Assays Today; 2) NOT Using Cell-Based LF Assays; 3) Large Pharma; 4) Medium/Small Pharma & All Biotech; 5) Europe; and 6) North America.
- Respondent's familiarity with plate-based LF technologies with application to cell-based assays was greatest for Corning Epic®, closely followed by MDS Analytical Technologies CellKey™ System.

- The median proportion all cell-based assays performed today (2009) using LF technologies was <5%, and is expected to increase to 11–25% of assays in the future (2012).
- Quality of information was rated the most important decision factor in the purchase a plate-based LF technology with application to cell-based assays.
- Data reliability and robustness were rated the greatest influence that respondents must be convinced about before considering the purchase of a LF technology.
- The main reason given for not proceeding with the purchase of a LF technology for cell-based assays was not enough interest across the organization to justify purchase at this time.
- We have other technologies that meet our need was rated as the main reason for not adopting LF.
- The majority of cell-based assays are performed today (2009) in 384-well plates, this plate format is expected to be the most used in the future (2012).
- The majority of survey respondents said that the availability of coated plates for LF cell-based assays was very important, with around a half of all LF cell-based assays needing coated plates.
- Poly-D-lysine (PDL) was the microplate coating most often used for cell-based assays.
- GPCRs were rated the target class where LF cell-based assays are expected to impact the most, with primary cell assays as the key cell-based application.
- Beyond GPCRs respondents were most interested in applying cell LF assays to ligand-gated ion channels.
- There was significant interest in high throughput chemotaxis and cell invasion assays on a LF system. The ability to work with primary or non-engineered cells was the most important system feature.
- When working with primary cells and LF detection using <1000 cells/assay well was the key requirement.
- 29% of respondents have successfully used LF detection to perform testing against 'difficult' targets.
- The ability to work with primary or non-engineered cells was rated the main advantage of LF assays.
- Interpretation of the results was rated the most significant limitation of cell-based LF assays.
- The majority of respondents don't see LF displacing any existing cell-based assay technologies; they view LF to be complimentary with existing assay technologies.
- In terms of real screening experiences with the available commercial platforms for cell-based LF detection only limited throughput has been so far been demonstrated, with Corning Epic® demonstrating the highest number of wells (data points) processed per week.
- Thermal control as rated the feature/functionality respondents most needed in a new microplate-based cell-based LF detection system.
- Although all respondent's median annual budget for capex purchases of cell-based LF instruments was none, 41% have budget plans to purchase LF instruments in 2009. Capex budgets are expected to increase moderately over the next few years (up to 2012).
- Respondent's median annual budget for cell-based LF consumables (i.e. biosensor plates) was \$5K–\$10K. Consumable budgets will increase moderately over the next few years (up to 2012).
- The median maximum price points for available 384-well LF biosensor plates were: for low volume use (i.e. <100 plates/year) – \$0.25/well; for moderate volume use (i.e. 100–2,500 plates/year) – \$0.20/well; and for high volume use (i.e. >2,500 plates/year) – \$0.10/well.
- Respondent's feedbacks on the unmet needs in cell-based drug discovery which they feel LF technologies may be able to address are documented.
- A total of 75 new cell-based LF instrument purchases were identified over the next 3 years. Market interest was greatest for Corning Epic® and SRU Bioystems BIND.
- A bottom-up model was developed around respondent's purchasing plans and budgets identified in the survey to calculate the global market for cell-based LF instruments sales. The total market was estimated to be around \$15Million in 2010, equivalent to sales of around 70 units per year. Significant growth is expected in 2011 and 2012.
- A bottom-up model was developed around respondent's budgets identified in the survey to calculate the global market for cell-based LF consumables (i.e. biosensor plates). The total market was estimated to be around \$30Million today (2009), equivalent to sales of around 300,000 plates. Moderate growth is expected up to 2012.
- Both market estimates were segmented between Large Pharma and Medium/Small Pharma & All Biotech, and between Europe and North America. CAGR estimates were made for all market segments.
- The full report provides the data, details of the breakdown of the responses for each question, its segmentation and the estimates for the future (2012). It also highlights some interesting differences between the survey groups, particularly Large Pharma and Medium/Small Pharma & All Biotech.

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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. Over the past 7 years HTStec has published 50 market reports on drug discovery technologies and authored 30 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 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.
- 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.
- Critically HTStec's Trends reports have generated much interest and acclaim amongst survey respondents, to whom they are made available free of charge (subject to acceptance of HTStec's copyright terms) so they can benchmark their internal processes.
- 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.
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