

1536 Progress 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 1536 progress carried out in April 2009.
- The study was initiated by HTStec to meet the needs of the survey sponsors and was part of HTStec's ongoing tracking of emerging life science technologies and marketplaces.
- The objectives were to understand how widely 1536 plates have been adopted in drug discovery, what success has been achieved, which aspects are still problematic and what restricts its wider implementation. 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 1536 progress as practiced to date (2009) and in some cases as predicted for the future (2011): areas where 1536 plates are used in respondent's organization; proportion of total effort in various drug discovery areas done in 1536; main drivers when considering or enabling assays in 1536; success in assaying target types or assay classes in 1536; how various proprietary assay technologies have performed in 1536; total assay volume adopted for the majority of 1536 assays; average number of cells used per 1536 well to generate a data point for various target types or assay classes; typical cost savings achieved in 1536; primary supplier of 1536 microplates; average price paid per 1536 plate; number of plates purchased per year; most used 1536 plate type; preferred 1536 detection platform for aspects of the drug discovery process; overall opinion on commercially available liquid handling offerings that support 1536; level of satisfaction with available liquid handling instrument manufacturers product offerings; liquid handling problems that are persistent issues in 1536; the dispense volumes ranges most needed/used to support 1536 assay assembly, compound reformatting and dose-response analysis; the %CV routinely achieved and the throughput needed for non-contact and contact dispensing in 1536 for the dispense volumes ranges investigated; liquid handling capabilities or tools that are expected to most advance 1536 dispensing; general fixes or solutions that have been adopted to make 1536 assays doable; how mixing is addressed in 1536 plates; whether respondents store an aliquot of their liquid compound library in 1536 plates and details of the volume stored, how the plates were covered, number of aliquots removed and storage temperature; what aspects have most limited the implementation of 1536 assays; number of 1536 plates processed per batch; daily throughput achieved and what most limits throughput; level of satisfaction with available fully automated systems and vendors for 1536 assays; interest in being able to undertake 1536 washing and main applications requiring washing; strategy for control wells in 1536; and how much has been spent on equipping respondent's site/lab to work with 1536 and future budget allocation.
- The survey questionnaire consisted of 29 multi-choice and 5 open-ended questions. In addition, there were 5 questions related solely to survey demographics.
- The report is based on the feedback of 56 end users of 1536 plates drawn from 27 different organizations. 41 were actively using 1536 plates today, with the remaining 15 having previously used or have made preliminary investigations (pilot studies) in 1536 plates, but were not using today.
- Survey responses were geographically split 57% North America and 43% Europe.
- Respondents came from 39 Large Pharma Labs; 7 University/Research Institute/Gov't Laboratory; 4 Medium-Small Pharma; 4 Biotech Company; and 2 Academic Screening Centers.
- Survey respondents had the following job roles or positions which were in descending order: 23 Section/Group Leader; 7 Senior Scientist/Researcher; 7 Director; 5 Research Scientist; 5 Principal Investigator; 4 Lab Manager; 3 Department Head; and 2 Vice President.
- The main group activity of the survey respondents was: 52% Primary Screening (HTS); 20% A Combination Of Drug Discovery Areas; 9% Assay Development; 7% Other; 3% Hits-To-Leads; 3% Leads-To-Candidate; 2% Compound Profiling; 2% Life Science Research; and 2% Basic Research.
- Survey results were expressed as an average of all survey respondents. In addition, where appropriate the data was reanalyzed after sub-division into the following 4 survey groups: 1) Large Pharma; 2) All Other Organizations; 3) Europe; and 4) North America.
- Feedback from non-users of 1536 during the survey process confirmed that the majority (around 70%) of 1536 current use and implementation was primarily confined to Large Pharma.
- 94% of survey respondents were applying 1536 to primary screening today, with 60% of respondent's total primary screening effort currently done in 1536 plates.

- Throughput (speed) enhancements were ranked as the main driver when considering/enabling 1536.
- Greatest success (i.e. worked fine, with robust Z') was reported in assaying enzyme (biochemical) and reporter gene assays in 1536.
- Cisbio HTRF was rated as the proprietary assay technology which performed best in 1536.
- Feedback on the target types or assay classes where the results (e.g. IC50) obtained in 1536 differed significantly from those obtained in other formats (e.g. 96 or 384) were documented.
- The median total assay volume used for the majority of all 1536 assays today (2009) was 5–10 μ L.
- The median number of cells used in most 1536 assays was 1,000–2,500 cells/data point.
- The median cost savings achieved in 1536 relative to assays in a 384 standard well plates was 2–3X.
- The most used primary suppliers of 1536 microplates were Greiner Bio-One, Corning and Aurora Biotechnologies.
- The median average price paid for a 1536 plate was \$10.00–\$12.50.
- The median number of plates purchased was 5K–10K plates per lab per year.
- Respondents made greatest use of polystyrene, white wall, white bottom, low base 1536 plates and polystyrene, black wall, clear bottom, low base 1536 plates.
- The most used 1536 detection platform for primary screening and hit-retest was the whole plate multi-mode imager, all other aspects of drug discovery in 1536 made greatest use of PMT filter-based plate readers.
- Only 47% of respondents were generally satisfied with existing commercially available liquid handling that supports 1536. Respondents rated Labcyte as the liquid handling vendor whose products they were most satisfied with.
- Tip clogging, particularly on small orifice devices, was rated the most persistent liquid handling issue in 1536.
- Compatibility with all types of HTS fluids including cells and beads was the liquid handling improvement respondents think will most advance 1536 dispensing.
- The fix or solution most adopted to make 1536 assays doable was a specially designed (e.g. reduced evaporation) plate lid.
- Most respondents rely on liquid handler pipetting/force of droplet ejection to address 1536 mixing.
- 60% of respondents stored an aliquot of their liquid compound library in 1536 plates and used it for reformatting.
- Infrastructure requirements (e.g. IT, liquid compound library etc.) was ranked the factor most limiting the ability to implement 1536.
- The median batch size and typical throughput achieved was 50–75 plates processed per 8h day. The assay itself (i.e. complexity/length of incubation) most limited 1536 screening throughput.
- The most used/installed fully automated systems vendor for 1536 assays was from Agilent (Velocity 11). GNF Systems was the fully automated systems vendor whose products respondents were most satisfied with.
- The majority of respondents were highly interested in being able to undertake 1536 plate washing, which they most wanted to apply to the removal of unbound (free) fluorescent label in adherent cell-based or HCS assays.
- The most used 1536 control well strategy adopted was 128 wells positioned in 4 side columns.
- The median estimated cost of equipping a lab/site to work with 1536 was \$2M–\$2.5M, with 74% of labs allocating money for future 1536 technology upgrades.
- The median expected future change in the number of 1536 plates used over the next few years was a minor increase (0–25% rise).
- Respondent's feedback on: 1) 1536 plates types/coatings that are wanted, but not available; 2) needed improvements in existing 1536 detection platforms; 3) liquid handling problems that currently limiting productivity in 1536; 4) liquid handling improvements they most want to see implemented in 1536; and 5) unexpected advantages derived from working on 1536 are documented.
- The full report provides the data, details of the breakdown of the responses for each question and some estimates for the future (2011). 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 5.5 years HTStec has published 45 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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