Ion Channel Screening Trends 2011

March 2011

www.htstec.com

Conditions Under Which This Market Report Is Sold

Executive Summary

- This market report summarizes the results of HTStec's seventh industry-wide global web-based benchmarking survey on ion channel screening carried out in February 2011.
- The study was initiated by HTStec as part of its ongoing tracking of emerging life science marketplaces. The questionnaire was compiled to meet the needs of the ion channel screening vendor community.
- The main objectives of this year's study were to better understand respondent's interest and experience of: 1) ion channels screened, assay technology used and screening metrics generated; 2) the use and purchase of automated patch clamp (APC) systems for ion channel screening; 3) cell requirements for ion channel assays; and 4) the use of outsourced ion channel testing services. Equal emphasis was given to soliciting opinion from Pharma, Biotech and Academic Research segments, in North America, Europe and Japan.
- The survey looked at the following aspects of ion channel screening, as practiced to date (2011) and in some cases as predicted for the future (2013): interest in different classes of ion channels; ion channel activities undertaken; where hERG liability testing is initiated; technologies used to study ion channels in different areas of drug discovery; number of ion channel targets or programs under investigation; areas where ion channels assays are increasing; number of ion channel primary screens and compounds tested per screen; the most important variables when using APC systems; how compounds are tested in different areas of drug discovery; under what circumstances APC would be used for primary screening; future plans to purchase new APC systems; most important APC software capabilities; opinion on population patch recordings; what most represents good quality in APC measurements; changes in outsourcing interest over the past year and expected turnaround time; types of assays that respondents prefer to outsource; what influences the decision to chose an outsourcing partner; size of a compound library that respondents would consider sending for outsourced primary screening; most trusted and most used fee-for-service providers; importance given to using primary cells or more relevant cell backgrounds; where in the drug discovery process more relevant cell backgrounds should be preferentially used for ion channel testing; main source of ion channel cell lines; what most influences the decision to purchase an ion channel cell line; where cryopreserved cells are used in preference to freshly cultured cells for ion channel assays; investigation of ion channel trafficking inhibition during drug discovery; unmet needs in commercial ion channel assay offerings; and annual ion channel testing budgets for in house consumables, CAPEX purchases (instruments), and outsourced testing at fee-for-service providers.
- The survey questionnaire consisted of 32 mainly multi-choice questions. In addition, there were 7 questions related solely to survey demographics.
- The survey collected 133 validated responses, of these 56% provided comprehensive input.
- Survey responses were geographically split: 38% North America; 32% Europe; 21% Japan; 6% Rest of World; and 3% China.
- Survey respondents were drawn from persons or groups actively involved in ion channel screening, selectivity profiling and safety assessment against ion channel liabilities in house, as well as persons involved in outsourcing these activities to fee-for-service providers. Many respondents were also experienced users of FLIPR-like instruments and APC systems.
- Respondents came from: 36 Large Pharma; 31 University/Research Institute/Government Lab/Not-for-Profit Facilities; 30 Medium-Small Pharma; 20 Biotechs; 10 CROs; 5 Academic Screening Centers; and 1 Other Organisation.
- Most survey respondents had a senior job role or position which was in descending order: 37 research scientists; 22 senior scientists/researchers; 22 section/group leaders; 13 professors; 10 others; 8 directors; 8 principal investigators; 7 department heads; 4 lab managers; 1 vice president; and 1 post-doc.
- Respondents represented the following labs: 30 labs with a combination of drug discovery roles; 20 safety assessment; 17 basic research; 16 assay development; 13 therapeutic area (target ID/ validation); 8 hits-to-leads (lead optimization); 7 primary screening (HTS); 6 other; 6 applied research; 6 secondary screening; and 4 compound profiling.
- 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 6 survey groups: 1) Large Pharma; 2) Medium/Small Pharma, Biotech & Academic Screening Labs; 3) University, Research Institute, Government Laboratory & Not-for-Profit; 4) Europe; 5) North America; and 6) Japan.
- The class of ion channels of most interest to respondents was voltage-gated sodium channels.

- Of the ion channel activities undertaken in house most respondents were carrying out screening of lead compounds against specific ion channel targets.
- Most respondents begin looking at hERG liability testing in hits-to-leads (lead optimization).
- The main assay technologies used by respondents in house to study ion channel targets in drug discovery were: manual patch clamp in target identification/validation and safety assessment (e.g. hERG compliant assays); automated patch clamping (APC) in assay development, primary screening of focused/targeted libraries, secondary screening, hits-to-leads, compound profiling and early non-compliant hERG liability testing; and fluorescent-based ion flux assays in primary screening of full diversity libraries.
- A median of 3 ion channel programs were under investigation in respondent's organisations.
- A median of 2 ion channel primary screens will be undertaken in 2011, each with a median of 10K to 50K compounds tested per screen.
- The preferred mode of ion channel testing in all areas of drug discovery was multiple concentrations /dose-response analysis, except for primary screening (HTS) where a single concentration was preferred.
- Patch success rates were the most important variable when using an APC system.
- An APC system would be considered for primary screening if the cost per data point equals the cost of existing primary screening technology (e.g. FLIPR costs), OR if they respondents see that a direct assay will increase compound specific information significantly.
- 61 respondent labs were planning to purchase a total of 104 new APC systems over the next few years. The APC systems respondents expressed greatest interest in purchasing over the next few years were MDC Ionworks Barracuda and Sophion QPatch HT/HTX.
- Easy set-up of assay development routines was the most important capability required of APC software.
- With respect to population patch recordings most respondents indicated they valued improved consistency and success rates of population recording more than high seal resistance. Respondents also indicated they were willing to pay up to 50% extra per data point for gigaseal resistances in population recordings. Feedback on a range of other controversial topics related to population patch recordings was also obtained.
- Most respondents thought gigaseal resistances represents best quality in APC measurements.
- Most respondents reported no change in their outsourcing interest of different ion channel assay types over the past year.
- Most respondents expect a turnaround of 2 weeks when outsourcing most ion channel assay types.
- Respondents prefer to run in house the majority of their ion channel testing activities, apart from safety assessment (compliant) assays which they mainly outsource.
- Data quality most influences a decision to select an outsourcing partner for ion channel testing.
- Respondents have or would consider sending a median library size of 1K-10K compounds to a fee-for-service provider for outsourced primary screening/HTS.
- The most trusted and most used fee-for-service provider of ion channel testing was ChanTest.
- Medium/high importance was given to using primary cells or more relevant cell backgrounds for ion channel testing, particularly in the hits-to-leads (lead optimization) area.
- In house development was the main source of ion channel cell lines.
- Target availability most influences respondent's decision to purchase a commercial ion channel cell line.
- Respondents currently make most use of cryopreserved cells today in primary screening/HTS.
- Only a small minority of respondents assess ion channel trafficking inhibition during drug discovery.
- Most respondents believe that commercial ion channel assays are available for most of their targets of interest.
- The median 2011 annual budgets for ion channel testing were: $50K-$100K for in house consumables; $25K-$50K for CAPEX purchases (instruments); and $5K-$10K for outsourced testing at fee-for-service providers.
- Several bottom-up models were developed around the respondent's budgets to estimate the global Pharma & Biotech markets for ion channel testing. The total market in 2011 was estimated to $110M for in house consumables, the biggest proportion of which was spent on APC patch plates; $144M for CAPEX purchases (instruments); and $121M for outsourced testing at fee-for-service providers. The markets were segmented and CAGR estimates for 2013 were made.
- The full report provides the data, details of the breakdown of the responses for each question, its segmentation and the estimates for the future (2013). It also highlights some interesting differences between the survey groups.

Table of Contents

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 more than 50 market reports on drug discovery technologies and authored over 30 review articles in Drug Discovery World (at least article one per issue).
- 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.
- HTStec aims to be the premier global provider of highly focused market research on enabling technologies in drug discovery.
- To get information or to request free executive summaries of published reports please contact john.comley@htstec.com.
- HTStec Limited is a privately owned UK Company, registered in England and Wales Number 4875933.