Pathway Analysis (Signal Transduction) Trends 2011

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Conditions Under Which This Market Report Is Sold

Executive Summary

- This market report summarizes the results of HTStec's industry-wide global web-based benchmarking survey on pathway analysis (signal transduction) carried out in August 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 and interests of the cellular assay reagent vendor community. The main objectives of this global benchmarking study were to comprehensively document current end user opinions, practices and preferences in the pathway analysis (signal transduction) assays used in drug discovery, and to understand future requirements.
- The survey looked at the following aspects of pathway analysis (signal transduction) as practiced today (2011) and in some cases as predicted for the future (2013): disease areas targeted; signaling pathways and protein classes of greatest interest; most important signal transduction pathways as cancer targets; cellular signaling targets in different research areas; platform technologies used to investigate pathway analysis; technologies used for the detection of cellular protein phosphorylation; main limitations of current pathway analysis technologies; new technologies that are transforming pathway analysis research; cell types used in pathway analysis; stem cell types or stem cell-derived phenotypes used in pathway analysis; most important drivers for investigating pathway analysis; stages in the drug discovery process investigating pathway analysis assays; informatics tools used to investigate/analyze pathway data; preferred ways of investigating pathway analysis; defined groups of interest with respect to pathway analysis annotation; use of reporter gene assays to measure pathway activation; preferred format to perform a reporter gene assay; criteria used to demonstrate suitability for screening of a pathway when using a reporter gene assay; pros and cons of using reporter gene assays to measure pathway activation; the main alternatives to reporter gene assays for measuring pathway activation; the main potential use of proteins identified using a mass-spec proteomic front-end discovery tool; use of RNAi follow-up assays in vivo; annual budget for investigating pathway analysis assays and its breakdown into components; proportion of pathway analysis research effort made using commercial assays versus homebrew; main commercial suppliers/vendors of pathway analysis assay products; interest in outsourcing pathway analysis assays; and any unmet needs in pathway analysis.
- The main questionnaire consisted of 24 multi-choice questions and 6 open-ended questions. In addition, there were 7 questions related solely to survey demographics.
- The survey collected 120 validated responses, of these 56% provided comprehensive input.
- Survey responses were geographically split: 42% Europe; 34% North America; 16% Asia (excluding Japan); 6% Rest of World and 2% Japan.
- Survey respondents were drawn from persons or groups interested in and/or investigating pathway analysis (signal transduction) assays in drug discovery.
- Respondents came from 71 University/Research Institute/Government Lab (Not-for-Profit) Facilities; 15 Biotech; 13 Large Pharma; 12 Medium-Small Pharma; 4 Academic Screening Centers; 3 Contract Research Organizations; and 2 Agrochemical Companies.
- Most survey respondents had a senior job role or position which was in descending order: 22 senior scientists/researchers; 20 research scientists; 17 professors/assistant professors; 12 section/group leaders; 12 principal investigators; 8 post-docs; 8 directors; 7 others; 6 lab managers; 4 department heads; and 4 vice presidents.
- Respondents represented the following lab types: 36 basic research; 17 with a combination of drug discovery roles; 13 systems biology; 12 applied research; 8 therapeutic area (target identification/ validation); 6 primary screening (HTS); 5 other; 4 compound profiling; 4 hits-to-leads (lead optimization); 2 leads-to-candidate (ADME tox/preclinical research); and 2 secondary screening.
- Survey results were expressed as an average of all survey respondents. In addition, where appropriate the data was fully reanalyzed after sub-division into the following 5 survey groups: 1) Pharma; 2) Biotech; 3) Academic Research; 4) Europe; and 5) North America.
- The majority of survey respondents were investigating/targeting pathway analysis in the oncology/cancer disease area.
- The signal transduction pathway of greatest interest was PI3K/AKT signaling.
- The protein class of greatest interest was transcription factors.
- AKT/PKB and mTOR was ranked as the signal transduction pathway of most importance as a therapeutic target in cancer.

- Feedback on the main cellular signaling targets in cancer, neuronal, immunology, systems biology and toxicity/adverse events research were documented.
- Western blot was rated the platform technology most used to investigate pathway analysis.
- Western blot was rated the technology most used to detect cellular protein phosphorylation.
- Feedback on the main limitations of current pathway analysis technologies and the main technologies that are transforming pathway analysis research were documented.
- The most used cell type to investigate pathway analysis today (2011) was transformed or recombinant cell lines.
- The stem cell type or stem cell derived phenotypes most used to investigate pathway analysis were cancer stem cells or tumor initiating stem cells.
- Efficacy was ranked as the most important driver for investigating pathway analysis.
- The stage in the drug discovery process most investigating pathway analysis was target identification /validation (therapeutic areas).
- The informatics tool most used to investigate/analyze signaling pathway data was in house developed informatics.
- The preferred experimental approach to investigate pathway analysis was by pathway.
- The preferred experimental approach to investigate pathway measurement was multiple pathways at a time.
- The preferred experimental approach to pathway annotation was as broad general pathways.
- The defined group of great interest in pathway analysis annotation was transcription factors.
- 58% of survey respondents were using reporter gene assays for pathway analysis.
- The preferred format for reporter gene assays today (2011) was a transient transfection of a response element-containing plasmid responding to the pathway of interest.
- Signal strength was ranked as the most useful criteria when demonstrating suitability for screening of a pathway using a reporter gene assay.
- The pros and cons of reporter gene assays to measure pathways analysis and the alternatives to reporter gene assays to measure pathway activation were documented.
- Most respondents think that the main potential use of proteins identified by a mass spec proteomic drug discovery tool was to identify potential pathways.
- The majority of survey respondents have plans to follow-up on in vitro pathway analysis assays by deploying RNAi technology in vivo.
- The median budget allocated by respondents for spending on pathway analysis assays today (2011) was $25K - $50K. The biggest proportion of this budget was allocated to commercial assay kits.
- A bottom-up model was developed around the respondent's spending on pathway analysis assays to calculate the global market, in 2011 this was estimated be around $56M. Segmentation and CAGR estimates are given in the full report.
- The most used commercial suppliers/vendors of pathway analysis assay products were Life Technologies, Cell Signaling Technology, Promega, EMD-Millipore and Sigma-Aldrich. Together these suppliers were estimated to have around 45% market share.
- The median of 30% of all pathway analysis assay research efforts were made using commercial assay products today (2011).
- The majority of survey respondents have no plans at present to outsource pathway analysis assays. Those considering outsourcing were most interested in external analysis of samples derived from in house cell experiments.
- A few unmet needs in the area of pathway analysis (signal transduction) assays were highlighted.
- 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 a few 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. Over the past 8 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 one article 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.

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