

Primary Cells in Drug Discovery Trends 2009



October 2009

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Executive Summary

- This market report summarizes the results of HTStec's industry-wide global web-based benchmarking survey on primary cells in drug discovery carried out in October 2009.
- The study was initiated by HTStec as part of its ongoing tracking of emerging life science technologies and marketplaces. The main objectives of this global benchmarking study were to comprehensively document current end user opinions, practices, and preferences obtained using primary cells in drug discovery applications and to understand future requirements.
- The survey looked at the following aspects of primary cells in drug discovery as practiced today (2009) and in many cases as predicted for the future (2012): use of different cell types in cell-based research; use of primary cells in primary and secondary screening assays; use of primary cells in drug discovery applications; the impact of being able to run assay technologies currently available in recombinant cells lines with comparable ease using primary cells; main reasons for using primary cells; main limitations on the use of primary cells; pattern, frequency and annual amount of spending on primary cells at commercial suppliers; factors influencing the purchase of primary cells; types of primary cells purchased and wanted from a commercial supplier; animal source of primary cells used; how primary cells are obtained; reasons for isolating primary cell in house; reasons for obtaining primary cells from commercial suppliers; the leading supplier/provider of primary cells; most used commercial suppliers of primary cells; main criteria when choosing a commercial supplier; importance and awareness of conditional immortalization; interest in pre-plated kits of primary cells that enable a particular assay or model system; validation required when purchasing primary cells; use of fresh versus cryopreserved hepatocytes; reasonable versus maximum price for cryopreserved hepatocytes; and unmet needs in primary cells supplied today.
- The main questionnaire consisted of 23 multi-choice questions and 3 open-ended questions. In addition, there were 5 questions related solely to the administration of survey. The survey collected 220 validated responses (142 complete and 78 partially filled out).
- Survey responses were geographically split: 41% Europe; 38% North America; 12% Asia (Excluding Japan); 7% Rest of World; and 2% Japan.
- Respondents came from 117 University, Research Institute, Government Labs or Not-for-Profit Facilities; 37 Medium-Small Pharma and All Biotech; 35 Large Pharma; 14 Others; 8 Academic Screening Centers; 8 Contract Research Organizations; and 1 Agrochemical Company.
- Most survey respondents had a senior job role or position which was in descending order: 42 Research Scientists; 37 Others; 28 Senior Scientists/Researchers; 22 Principal Investigators; 17 Directors; 16 Section/Group Leaders; 14 Department Heads; 11 Post-docs; 6 Lab Managers; and 5 Vice Presidents.
- Respondents represented: 53 Labs With A Combination of Drug Discovery Roles; 52 Life Science Research Labs; 32 Basic Research Labs: 25 Primary Screening (HTS) Labs; 16 Other Labs; 15 Assay Development Labs; 13 Therapeutic Area Labs; 9 Leads-To-Candidate Labs; 3 Hits-To-Leads Labs; and 2 Compound Profiling Labs.
- Survey results were expressed as an average of all survey respondents. In addition, where appropriate the data was reanalyzed after segmentation into the following 5 survey groups: 1) Large Pharma; 2) Medium/Small Pharma & All Biotech; 3) University, Research Institute & Government Labs; 4) Europe; and 5) North America.
- 35% of respondent's cell-based research used primary cells in 2009.
- A median of <20% of primary screening assays were made in 2009 using primary cells.
- A median of <20% of secondary screening assays were made in 2009 using primary cells.
- The main drug discovery application of primary cells used or evaluated to date (2009) was gene expression assays.
- The majority of respondents thought that being able to run assay technologies currently available in recombinant cell lines with comparable ease using primary cells would have a major impact on their work.
- Biologically relevant was ranked as the most important reason for using or considering the use of primary cells.
- The availability of relevant cells was ranked as the greatest limitation to the use of primary cells.

- The pattern of spending on primary cells today (2009) by the majority of respondents was predominantly in house.
- The frequency of spending on primary cells today (2009) by the majority of respondents was rarely i.e. once or twice per year.
- The median budget allocated by respondents for commercial spending on primary cell purchases in 2009 was \$1K – \$10K.
- A bottom-up model was developed around the respondent's commercial spending on primary cells to estimate the global Pharma+Biotech market for primary cells purchases. This global 2009 market for primary cells was estimated to be around \$50M. The full report details the 2012 estimate, % CAGR, and its segmentation.
- Availability of specific primary cell types was ranked the most important reason that would influence respondents purchasing of primary cells.
- The primary cell types respondent's had most purchased to date (2009) were fibroblasts, hepatocytes and endothelial cells.
- Respondent feedback on the primary cells types they want to use/source, that are not commercially available are documented.
- The main source of primary cells used in respondent's labs was from within their organization.
- The majority of primary cells used in respondent's labs were isolated by themselves. The reasons respondents gave for isolating primary cells themselves are fully documented.
- Difficulty to source appropriate human or animal tissues was ranked as the most important reason to for obtaining primary cells from commercial suppliers.
- The companies that immediately come to the mind as the leading suppliers/providers of primary cells were ATCC and Lonza.
- The commercial supplier of primary cells that respondents have purchased most from to date (2009) was Lonza.
- Respondent feedback on their primary supplier of stem cells were documented with respect to the reason for choosing the supplier, satisfaction with the supplier and primary cells purchased, and whether or not they would recommend the supplier. 78 primary suppliers, representing 12 different companies, were rated in this respect.
- Cell quality/viability was ranked as the most important criteria when purchasing from a commercial supplier.
- The majority of respondents thought conditional immortalization of primary cells was moderately important and were moderately aware of the issues surrounding the concept.
- Most respondents do not think vendors should focus more of their primary cell effort on kits that enable a particular assay or model system. Those respondents that did want to see more effort on kits gave their suggestions for particular assays or model systems, these were documented.
- The majority of respondents think there is a need for better validation when purchasing hESC or iPS stem cells as a potential source for cell types from rare tissues. Respondent suggestions for the validation needed when purchasing hESC and iPS stem cells are documented.
- All Respondents feedback on the barriers to using primary cells generated by the following methods: hESC, iPS and humanized animals are documented.
- A median of 50% of human hepatocytes used today (2009) by respondents were freshly isolated (i.e. not cryopreserved).
- <\$600 and <\$1,000 were the respective median reasonable and maximum prices respondents would pay for a vial containing 5 million cryopreserved human hepatocytes.
- Respondent feedback on the main unmet needs they would like to see addressed by a commercial primary cell vendor/provider was documented.
- 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 University, Research Institute & Government Labs.

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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 6+ years HTStec has published 49 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.
- HTStec aims to be the premier global provider of highly focused market research on enabling technologies in drug discovery.
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