Stem Cells In Drug Discovery 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 stem cells in drug discovery carried out in June 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 stem cell vendor community. The main objectives were to comprehensively document current end user opinions, practices, and preferences for the use of stem cells in drug discovery applications and to understand future requirements.
- The survey looked at the following aspects of stem cells in drug discovery as practiced today (2011) and in some cases as predicted for the future (2013): use of stem cells relative to other cell types; disease areas utilizing stem cells; percentage of stem cell research done with different stem cell types; species derivation of stem cells used; stem cell types used for different drug discovery related applications; key objectives of using stem cells; different types of phenotypic assays performed using stem cells; main plate format and number of wells per typical phenotypic screen; obstacles to working with stem cells; extent to which stem cell culture limits work; problems with stem cell culture; use of feeder cell layers for work with induced pluripotent stem (iPS) cells; scale of stem cell production and cryo-storage; technologies used for reprogramming to create iPS cells; characterization methods used to analyze/validate stem cells and their derivatives; stages of the drug discovery and development process where stem cells are used; whether respondent's stem cell work is linked to cell therapy; annual budget for stem cell related spending and its component breakdown; most used commercial suppliers in stem cell research workflow areas; what factors most influence stem cell-related purchasing; biologically relevant information respondent's hope to derive from using stem cells; and awareness of any unmet needs in the area of stem cells.
- The main questionnaire consisted of 26 multi-choice questions and 6 open-ended questions. In addition, there were 5 questions related solely to survey demographics.
- The survey collected 82 validated responses, of these 79% provided comprehensive input.
- Survey responses were geographically split: 56% North America; 33% Europe; 7% Asia (excluding Japan); 3% Rest of World and 1% Japan.
- Survey respondents were drawn from persons or groups interested in and/or using stem cells in drug discovery applications.
- Respondents came from 47 University/Research Institute/Government Lab (Not-for-Profit) Facilities; 14 Biotech; 7 Large Pharma; 7 Hospital/Clinic; 3 Medium-Small Pharma; 2 Academic Screening Center; 1 Contract Research Organisation; and 1 Other.
- Most survey respondents had a senior job role or position which was in descending order: 14 professors/ assistant professors; 14 senior scientists/researchers; 12 research scientists; 11 others; 8 post-docs; 8 principal investigators; 4 directors; 4 department heads; 2 section/group leaders; and 2 lab managers.
- Respondents represented the following labs: 32 basic research; 16 applied research; 9 labs with a combination of drug discovery roles; 8 other; 5 target identification/validation; 4 assay development; 4 primary screening (HTS); 2 secondary screening; and 2 leads-to-candidate.
- 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) Large Pharma; 2) Smaller Screening Labs; 3) Academic Research Labs; 4) Europe; and 5) North America.
- Respondent's current (2011) usage of stem cells relative to other cell types was 48% of all cell work.
- Most respondents were utilizing stem cells for drug discovery applications in the oncology/cancer disease/therapeutic area.
- The stem cell type respondents were making greatest use of was mesenchymal stem cells.
- The majority of respondent's stem cells research was done with human-derived cells.
- The stem cell type respondents utilize to the greatest extent in the areas of drug discovery were: induced pluripotent stem cells in primary screening, secondary screening, and generation of disease models; mesenchymal stem cells in toxicity testing, cell therapy, and screening compound libraries for modulators of stem cell differentiation; and induced pluripotent stem cells or cancer stem cells/tumor initiating stem cells were both equally most utilized in compound profiling.
- The key objective of stem cell research was inducing differentiation to culture specific cell types.
- The phenotypic assay most performed on stem cells was cell proliferation.

- The median size of a phenotypic assay screen performed today (2011) on stem cells was 100-1K wells/screen.
- The microplate format most used for a phenotypic assay screen was the 96-well plate.
- Expense was ranked the most limiting obstacle in stem cell research.
- Most respondents thought that stem cell culture-related problems moderately limit their work.
- Problems with stem cell culture or the culture of stem cell derived lines were documented.
- Most stem cell culture work was done with serum-based media that included extra-cellular matrix proteins.
- The median percentage of induced pluripotent stem cell work done with feeder-based systems was 30% today (2011).
- The typical scale of stem cell operations reported was a median of 5 million stem cells produced per week and 10 million stem cells stored in a cryobank.
- Lentiviral was the most used technology for reprogramming to create induced pluripotent stem cells.
- The characterization methods most used to analyze/validate stem cells and their derivatives in house was cell surface antibodies/immunocytochemistry, and respondents were most interested in accessing via outsourced services gene expression (chips).
- The stages in the drug discovery and development process where stem cells are most used today (2011) were target identification, preclinical and target validation.
- The biggest proportion of respondents drug discovery efforts involving stem cells are expected to lead to or are linked with cell therapy.
- The median annual budget allocated by respondents for spending on stem cell research today (2011) was $50K - $100K.
- The biggest proportion the stem cell research budget was allocated to cell culture media and assay reagents/components.
- A bottom-up model was developed around the respondent's annual spending on stem cell research to estimate the global market for stem cells in drug discovery. The global 2011 market for stem cells in drug discovery was estimated to be around $400M. CAGR estimates for 2013 are given in the full report.
- Better characterization/validation was ranked the most important reason that would influence respondent's future purchasing of stem cells.
- The most preferred commercial suppliers of all stem cell-related products were Life Technologies/ Invitrogen and BD Biosciences. Together they were estimated to have about 1/3rd market share.
- The biologically relevant information respondent's hope to derive from the use of stem cells was documented.
- Some unmet needs in stem cell research were 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 (2013). It also highlights a few interesting differences between the survey groups, particularly Large Pharma and Smaller Screening Labs versus Academic Research 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 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 one review 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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