

siRNA Screening Trends 2010



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Executive Summary

- This market report summarizes the results of HTStec's industry-wide global web-based benchmarking survey on siRNA screening carried out in October 2010.
- The survey was initiated by HTStec as part of its tracking of emerging life science marketplaces. The questionnaire was compiled to meet the needs, requirements and interests of the siRNA screening vendor community. The main objectives were to comprehensively document current practices and preferences in siRNA screening, and to understand future user requirements.
- Equal emphasis was given to soliciting opinion from Pharma, Biotech, Academic Screening and University Research labs in both North America and Europe.
- The survey looked at siRNA screening as practiced today (2010) and in some cases as predicted for the future (2013). Specifically the following were investigated: level of interest in siRNA screening; current level of adoption of siRNA library screening in house; main application areas of siRNA library screening; what constitutes large-scale siRNA screening; final assay volume used for transfections; plate format mainly used for siRNA delivery (transfections) and screening; level of throughput achieved by in house siRNA screening programs; main endpoints (readouts) monitored when undertaking siRNA primary screening; cell types used for siRNA screening; preferred siRNA delivery methods; product names and main suppliers of transfection reagents and other silencing chemistries; source of the majority of the siRNAs that make-up respondent's primary screening library; vendor compiled siRNA's library groupings of greatest interest; species against which the majority of siRNAs are directed; size of libraries typically investigated in siRNA primary screens; main bottlenecks encountered in siRNA library screening; steps which most obstruct respondent's ability to perform faster siRNA screening; main hurdles in siRNA sample preparation and liquid handling; extent to which automation has been applied to siRNA library screening; most important benefits of applying automation to siRNA screening; factors of greatest importance when choosing new automated instrumentation platform/tools for siRNA screening; product names and main suppliers of instrumentation (i.e. liquid handling, sample prep and automated assay platforms) used for siRNA screening; in house siRNA screening reagents budget and its breakdown into components; main suppliers of siRNA reagents; average cost per single target gene investigated by siRNA screening; level of interest in outsourcing siRNA library screening to a fee-for-service provider; and any unmet needs that exist in siRNA screening today.
- The main questionnaire consisted of 25 multi-choice questions and 4 open-ended questions. In addition, there were 5 questions related solely to survey demographics.
- The survey collected 80 validated responses, of these 64% provided comprehensive input.
- Survey responses were geographically split: 41% Europe; 35% North America; 19% Asia (Excluding Japan); and 5% Rest of World.
- Survey respondents were drawn from persons or groups interested in the gene silencing or RNAi area, and were undertaking or planning future investigation of siRNA screening.
- Respondents came from 53 University/Research Institute/Government Lab (Not-for-Profit) Facilities; 10 Biotech; 9 Large Pharma; 5 Academic Screening Centers; and 3 Medium-Small Pharma.
- Most survey respondents had a senior job role or position which was in descending order: 17 research scientists/associates; 11 principal investigators; 9 section/group leaders; 9 senior scientists/researchers; 8 professor/assistant professors; 7 post-docs; 7 other job roles; 6 lab managers; 3 directors; 2 vice presidents; and 1 department head.
- Respondents represented the following labs: 21 life science research; 15 basic research; 9 labs with a combination of drug discovery roles; 8 assay development; 6 primary screening (HTS); 5 therapeutic area (target identification); 4 preclinical research; 4 compound profiling; 4 therapeutic area (target validation); 2 other; 1 hits-to-leads (lead optimization); and 1 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) Smaller Screening Labs; 3) Academic Research Labs; 4) Europe; and 5) North America.
- The current level of interest in siRNA screening by the majority of respondents was high i.e. already implemented in house or accessing via outsourcing.
- The current level of adoption of siRNA screening in house by the majority of respondents was moderate i.e. setting up and processing medium-scale screens on an occasional basis.

- Identification of new therapeutic targets was the main application area of siRNA screening.
- Large scale siRNA screens were defined by respondents with a median of <1000 target genes screened.
- The final assay volume used for siRNA transfection today had a median of 50µL to 100µL.
- The microplate format most used for siRNA delivery and screening today was 96-well.
- The microplate format most suited to high throughput siRNA screening was 384-well (std. volume).
- The siRNA screening throughput achieved today had a median <100 wells per week.
- The endpoint (readout) monitored most when undertaking siRNA screening was plate-reader based monitoring of whole cell responses (e.g. viability, cell proliferation).
- The cell type most used today for siRNA research was transformed or recombinant cell lines.
- The siRNA delivery method most used today was standard chemical (lipid-mediated) transfection.
- The delivery method regarded as having greatest potential for high throughput siRNA library screening was viral transfection.
- The majority of siRNAs that make up respondents primary screening library were sourced off-the-shelf as pre-plated libraries e.g. covering target class, druggable genome or genome-wide.
- The vendor compiled siRNA libraries of most interest to respondents were target class specific libraries e.g. kinases, proteases, GPCR, ion channels etc.
- The species that the majority of siRNAs in respondent's libraries were directed against was human.
- The median library size investigated in primary siRNA screens was: <100 target genes silenced; representing <500 different siRNAs; with a median of 3 siRNAs per target gene.
- Hit follow-up was ranked the greatest obstruction to performing faster siRNA screening.
- Optimising transfection conditions (i.e. minimising cytotoxicity) were rated as the aspect of siRNA sample prep and liquid handling that most limits screening efficiency.
- Overall minimal levels of automation have been applied to siRNA screening today.
- Less variability of cellular response was rated the most important potential benefit of applying automation to siRNA screening.
- Reliability/robustness was rated as the most important factor when choosing automated instrumentation platforms/tools for siRNA screening.
- The median cost per single target gene investigated by siRNA screening was \$2.5-\$5 today.
- Most respondents had no interest in outsourcing siRNA screening to a fee-for-service provider today.
- The median in house siRNA screening reagent budget was \$10K-\$25K per lab per year today.
- The breakdown of the in house siRNA screening reagent budget was relatively evenly spread across various components, with the greatest share allocated to knockdown detection chemistries, antibodies and readout assays.
- All Respondents main and also secondary supplier from who they purchased most of their siRNA reagents was Life Technologies. The next most used supplier was Thermo Scientific.
- A bottom-up model was developed around respondent's annual budgets to estimate the global market for in house siRNA screening reagents. In 2010 this market was estimated to be around \$120M. The market was segmented by organization and geography. CAGR estimates for 2013 were made for the market segments.
- Respondent open-ended feedback was documented on the following topics: 1) the main bottlenecks encountered in siRNA library screening; 2) the product names/suppliers of transfection reagents mainly purchased for siRNA screening; 3) the main instrumentation (products/suppliers) they have used to date for siRNA screening automation; and 4) the unmet needs that exist today in siRNA screening.
- 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 survey groups, particularly Pharma or 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.
- 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.
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