

Label Free Binding Analysis Trends 2010



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Executive Summary

- This market report summarizes the results of HTStec's 2nd global web-based benchmarking survey on label free (LF) binding analysis carried out in January 2010.
- The study was initiated by HTStec to document the challenges faced when investigating biomolecular interactions and binding analysis using LF approaches; to detail the current status with regard to the search/acquisition for new LF assay technologies; and to better understand future market needs within this area. The report is intended as a source of information for vendors developing novel LF binding analysis systems, and provides up to date market intelligence in this rapidly changing area.
- Equal emphasis was given to soliciting opinion from Pharma, Biotech and Academic Research segments, active in either small molecule drug discovery or protein and biological characterisation, in both North America and Europe.
- The survey looked at the following aspects of LF binding analysis as practiced today (2010) and in many cases as predicted for the future (2013): techniques commonly used to assess binding interactions; use and familiarity with LF detection; current level of awareness, understanding and perception of LF technologies/suppliers/systems; current status of ownership of LF binding analysis systems; types of analyses and information wanted; main benefits and weaknesses; targets analysed; immobilization requirements; protein tags/capture agents used; use of pre-coated chips and tips; time spent trouble shooting regeneration conditions; throughput requirements; processes respondents want to change by implementing a new technology; whether LF will emerge into new application areas; barriers to the adoption of new technology; what influences the choice and the decision to purchase new LF detection systems; importance placed on desirable attributes or characteristics and their vendor associations; plans to purchase new LF detection systems; impact of price on the purchasing decision; annual capex and consumable budgets; use of array-based LF multiplexing instruments and the perceived value of multiplexed technology.
- The main questionnaire consisted of 29 multi-choice questions and 1 open-ended question. In addition, there were 6 questions related solely to survey demographics.
- The survey collected 149 validated responses (117 complete and 32 partially filled out).
- Survey responses were geographically split: 73% North America; 24% Europe; 1% Rest of World; and 1% Japan.
- Survey respondents were drawn from persons actively engaged (key end users) in studying biomolecular interactions and binding analysis using LF approaches. Feedback was also obtained from persons currently considering the application of LF technologies to binding analysis.
- Respondents represented 70 University/Research Institute/Government Labs; 38 Medium-Small Pharma & All Biotech; 33 Large Pharmas; 4 CROs; 1 Diagnostics Company and 1 Other.
- Most survey respondents had a senior job role or position which was in descending order: 29 Research Scientists; 21 Principal Investigators; 19 Section/Group Leaders; 18 Senior Scientists/Researchers; 16 Post-Docs; 12 Professors/Assistant Professors; 10 Directors; 10 Others; 6 Department Heads; 5 Lab Managers; and 3 Vice Presidents.
- Respondent's main area of works was: 38% Small Molecule Drug Discovery & Development; 34% Basic Research; 13% Therapeutic Antibody Discovery & Development; 6% Therapeutic Protein Discovery & Development; 5% Other Areas; 3% Immunodiagnostic Development; and 1% Vaccine Development.
- Survey results were expressed as an average of all survey respondents. In addition, the data was fully reanalyzed after sub-division into the following 7 survey groups: 1) Small Molecule Focus; 2) Protein Focus; 3) Large Pharma; 4) Medium/Small Pharma & All Biotech; 5) University, Research Institute & Government Laboratory; 6) Europe; and 7) North America.
- The majority of respondent's interest in LF binding analysis resided in assay development.
- 38% of respondents had a small molecule focus, 56% a protein & biological characterization focus.
- Surface plasmon resonance (SPR) was rated the technique most used to assess binding interactions.
- 89% of respondents were using and 96 % had familiarity with LF detection for binding analysis.
- Awareness and understanding of LF binding analysis technologies/suppliers/systems was greatest for SPR: GE Healthcare, Biacore™.
- The current perception of different binding analysis LF technologies/suppliers/systems was most positive for SPR: GE Healthcare, Biacore™.
- Respondents had in there labs a total of 301 LF systems used for binding analysis purchased in the last 10 years. The majority of these installed systems came from GE Healthcare.

- Affinity was rated the most wanted type of analysis and information from a LF detection system.
- Direct measurement of binding was rated the most relevant benefit of LF detection as opposed to label-based techniques.
- Cost of instrumentation was rated the major weakness of LF detection.
- The target classes/biomolecules most investigated today (2010) using LF binding analysis were recombinant proteins.
- The median immobilization requirements for binding analysis reported were: 0.01–0.1 µg/DP – acceptable amount of target or protein per data point; 100–150KD – maximum molecular size of target or protein; and 0.1–0.5mM – weakest affinity that must be measured.
- Biotin and HIS were rated as the protein tags/capture agents most used for immobilization.
- Respondents used a median 2 to 4 chips pre-coated with capture agents per week.
- Respondents used a median 26 to 50 tips pre-coated with capture agents per week.
- Respondents spend <25% of the total time they devote to running an assay to troubleshooting the regeneration and optimizing other conditions.
- The median daily throughputs achieved for LF binding analysis today (2010) were <100 different samples processed per 8h day.
- Assay development was rated as the process respondents most wanted to change by implementation of a new technology for biomolecular binding analysis.
- Only 33% of respondents think LF binding analysis technology will emerge into new areas. Details of the new application areas where respondents think LF might emerge are documented.
- Investment costs were rated as the barrier to change that would most limit the adoption of a new technology.
- Affinity measurements were rated as the type of analysis that was most important for the future investment in a LF detection system.
- Sensitivity was rated the most important product attribute in the choice of a new LF detection system.
- Instrument technical field support was rated the most important factor related to the supplier and business relationship that influenced the choice of a new LF detection system.
- Past experience or existing business relationship with vendor was ranked as the factor that most impacted a purchasing decision.
- Confidence in data was ranked most important from a list of desirable characteristics or attributes in their decision to purchase a new LF technology, and GE Healthcare was chosen as the LF instrument vendor most associated with the majority of these desirable characteristics or attributes.
- Price and running (consumable) costs appear to be having a greater impact on instrument purchasing decisions today (2010) than prior to the economic downturn (in 2008).
- The median annual capex budget today (2010) for purchasing LF binding analysis instruments was \$100K–\$150K per lab.
- The median annual consumables budget today (2010) for purchasing LF binding analysis consumables (i.e. chip, tips and plates) was \$10K–\$25K per lab.
- Only 23% of respondents are using an array-based LF detection instrument today capable of a multiplexing functionality. The perceived main value of multiplexed technology was higher throughput.
- A total of 123 new LF binding analysis instrument purchases were planned by respondents over the next 5 years. Market interest in GE Healthcare instruments was greatest, followed by Corning, TA Instruments, Bio-Rad, SRU Biosystems and then ForteBio.
- A bottom-up model was developed around respondent's purchasing plans identified in this survey to calculate the global pharma/biotech market for LF binding analysis instruments. The total market was estimated to be around \$200Million in 2010, equivalent to sales of at least 400 units per year. The market was segmented between Large Pharma and Medium/Small Pharma & All Biotech, and between Small Molecule Drug Discovery & Development and Protein & Biological Characterisation. CAGR estimates were made for the market segments.
- 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, particularly the small molecule focus versus protein focus.
- PLEASE NOTE: This report is about biomolecular interactions and binding analysis, it does NOT cover cell-based LF detection, cell-based assays, Mass Spec or NMR approaches.

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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. During the past 7 years HTStec has published over 50 market reports on drug discovery and life science related 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.
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