

# Label-Free Binding Analysis Trends 2012



January 2012  
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## Executive Summary

- This market report summarizes the results of HTStec's 3<sup>rd</sup> global web-based benchmarking survey on label-free (LF) binding analysis carried out in January 2012.
- The study was initiated by HTStec as part of its bi-annual tracking of this life science marketplace. The questionnaire was compiled to address the needs and interests of the LF binding analysis vendor community.
- The main objectives of this global benchmarking study were to comprehensively document current experience of and future interest in investigating biomolecular interactions and binding analysis using LF technologies. The study also examined in detail the market landscape, new application areas (including protein carbohydrate analysis) and throughput considerations.
- The report is a valuable resource for vendors selling/developing LF binding analysis systems, and provides the latest market information about 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 biologics characterization, in both North America and Europe.
- The survey looked at the following aspects of LF binding analysis as practiced today (2012) and in some cases as predicted for the future (2014): functions where respondent's principal interest resides; techniques used to assess binding interactions; LF instruments currently available in respondent's lab; most recognizable LF instrument brands; current perception of different LF instrument suppliers; application areas where LF is expected to become a preferred technological approach; use of different methods for protein carbohydrate analysis; respondent's interest in lectin-based carbohydrate profiling; main value of LF lectin-based carbohydrate analysis; interest in investigating biosimilars and biogenerics using LF; interest in learning more about specific applications of LF; usefulness of different capture mechanisms in LF assays; importance of the availability of different 'off-the-shelf' biosensor chemistries; need for regenerability in 'off-the-shelf' biosensor chemistries; typical throughput achieved in LF binding analysis; most attractive approach to increase sample throughput; number of channels of simultaneous LF detection that would satisfy future throughput needs; need for higher throughput in respondent's LF assays, and whether this is achieved through purchasing an array-based LF system; whether respondents have automated any LF devices and their experience; main value of multiplexing LF; processes which would benefit from the use of LF protein assay technologies; main barriers to the adoption of custom biosensor services; importance of price in a purchasing decision to acquire a new LF system; LF vendors most associated with desirable characteristics or attributes; likelihood of future purchasing new LF instruments and most appealing vendor's systems; annual LF capex and consumable budgets; resources most relied upon to learn about LF; and any unmet needs in LF binding analysis.
- The main questionnaire consisted of 28 relatively simple multi-choice questions and 1 open-ended question. In addition, there were 6 questions related solely to survey demographics.
- The survey collected 130 validated responses, of these 75% provided comprehensive input.
- Survey responses were geographically split: 54% North America; 40% Europe; 3% Japan; 2% Rest of World and 1% Asia (excluding Japan).
- Survey respondents were mainly drawn from persons actively engaged (i.e. key end users) in studying biomolecular interactions and binding analysis using LF technologies.
- Respondents came from 52 University/Research Institute/Government Lab/Not-for-Profit Facilities; 32 Biotech; 22 Large Pharma; 14 Medium-Small Pharma; 4 CROs; 3 Diagnostics; and 3 Others.
- Respondent's main areas of work were: 28% Therapeutic Antibody Discovery & Development; 17% Small Molecule Drug Discovery & Development; 16% Basic Research; 11% Immunodiagnostic Development; 10% Applied Research; 8% Therapeutic Protein Discovery & Development; 7% Other Areas; and 3% Vaccine Development.
- Most survey respondents had a senior job role or position which was in descending order: 37 research scientists/associates; 22 senior scientists/researchers; 18 section/group leaders; 12 principal investigators; 10 directors; 8 professors/assistant professors; 7 others; 6 post-docs; 6 department heads; 3 lab managers; and 1 vice president.
- Survey results were expressed as an average of all survey respondents. In addition, where appropriate the data was reanalyzed after sub-division into the following 7 survey groups: 1) Small Molecule Focus; 2) Protein Focus; 3) Pharma; 4) Biotech; 5) Academic Research; 6) Europe; & 7) North America.

- 17% of respondents had a small molecule focus and 39% had a protein focus.
- 84% of respondents were actively using LF detection today for binding analysis.
- The function where most respondent's principal interest in binding analysis resided was basic research.
- ELISA was the technique most commonly used today to assess binding interactions.
- The LF binding analysis instruments most frequently encountered in respondent's labs today were from Fortebio and GE Healthcare Biacore.
- The top 5 most recognizable LF instrument brands used for binding analysis were in descending order: GE Healthcare Biacore, ForteBio Octet, Bio-Rad ProteOn, GE Healthcare MicroCal and Corning EPIC.
- The current perception of different LF binding analysis vendors ranked GE Healthcare Biacore and ForteBio most positively.
- The applications where LF binding analysis is most expected to become the preferred approach were affinity and kinetics (off and on rates).
- HPLC was rated the most used method of protein carbohydrate analysis.
- Most respondents had only limited interest in lectin-based carbohydrate profiling.
- Rapid time to result was ranked the main perceived value of LF lectin-based carbohydrate analysis.
- Monitoring of in vitro target affinity binding was rated the most interesting application of LF technologies when investigating biosimilars and biogenerics.
- Measuring protein-protein interaction affinity was rated the LF application respondents most wanted to learn more about.
- Streptavidin was rated the most useful capture mechanism in LF assays.
- High importance was given to the availability of 'off-the-shelf' biosensor chemistries for LF assays.
- High importance was placed on regenerability when considering the use of an 'off-the-shelf' biosensor for low throughput assays.
- The median typical throughput of LF analysis achieved today (2012) was 10-100 unique samples analysed per month.
- Lower consumable costs were ranked the most attractive approach to increase sample throughput of LF technologies.
- A median of 16 channels of simultaneous LF detection would satisfy most future throughput needs.
- Around half of respondents could use higher throughput in their LF binding analysis assays.
- Few respondents claimed to have achieved higher throughput by purchasing an array-based SPR system.
- Most respondents had not investigated or applied automation to LF assays.
- More information per experiment was the perceived main value of multiplexing LF binding analysis.
- Screening of biologics was the process which respondents thought would most benefit from the expanded use of LF protein assay technologies.
- Projects sound too expensive was rated as the main barrier to the adoption of custom biosensor services.
- Price was rated a major decision factor in the purchase of new LF instruments.
- The first and second choice LF instrument vendors most associated with a list of desirable characteristics or attributes was equally split between GE Healthcare and Fortebio.
- The median likelihood that respondents will purchase a new LF instrument for binding analysis over the coming years (up to 2014) was possible (i.e. 25%-75% probability).
- The LF instrument vendors survey respondents expressed greatest interest in future purchasing from were: ForteBio, GE Healthcare Biacore, Bio-Rad and Corning.
- Colleague experience was the resource most used and relied upon to learn about LF technologies.
- Feedback on the unmet needs identified by respondents was documented.
- The median capex budget for new LF binding analysis instruments in 2012 was \$100K-\$150K p.a.
- A bottom up model developed to estimate the global market for LF binding analysis instruments, using data on the capex budgets derived from this survey, gave a value of around \$230M.
- The median budget for LF binding analysis consumables in 2012 was \$10K-\$25K p.a.
- A bottom up model developed to estimate the global market for LF binding analysis consumables, using data on the consumable budgets derived from this survey, gave a value of around \$45M.
- The full report provides the data, details of the breakdown of the responses for each question, its segmentation and the estimates for two years' time (2014). It also highlights some interesting differences between the survey groups.
- PLEASE NOTE: This report is mainly about LF biomolecular interactions and binding analysis, it does **NOT** cover cell-based LF 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. HTStec's initial focus was on assisting clients delivering novel enabling platform technologies (liquid handling, laboratory automation, detection instrumentation, assay reagent technologies etc.) to drug discovery. This has now been extended to include broader coverage of new bioassay technologies across the life sciences.
- Over the past 9 years HTStec has published more than 75 market reports on drug discovery technologies and authored over 40 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 initiated both in response to a sponsor's specific requests or speculatively as part of HTStec's tracking of fast-moving or emerging marketplaces.
- 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, Academic and Research Institute labs are participants.
- Produced extremely rapidly and typically published within 3 weeks of starting the collection phase.
- Reports are short (around 50 pages), 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 any 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 niche market research on enabling technologies in drug discovery and the life sciences.
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