

High Throughput qPCR Assay Trends 2012



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Executive Summary

- This market report summarizes the results of HTStec's global web-based benchmarking survey on high throughput real-time quantitative PCR (HT qPCR) assays carried out in January 2012.
- The study was initiated by HTStec as part of its ongoing tracking of emerging life science technologies and marketplaces. The questionnaire was compiled to address the needs and interests of the HT qPCR vendor community.
- The main objectives were to comprehensively document HT qPCR assay metrics, reagents and equipment used, and to understand future user requirements. For the purpose of this survey HT qPCR was defined as annually processing 250,000 or more qPCR assays per calendar year.
- The report is a source of useful information for vendors developing HT qPCR instruments, assays or related products, and provides the latest market information about this rapidly changing area.
- Equal emphasis was given to soliciting opinion from all organizations where HT qPCR is currently practiced, with no geographic bias in the distribution of persons contacted.
- The survey looked at the following aspects of HT qPCR assays as practiced today (2012) and in many cases as predicted for the future (2015): main type of qPCR activity; main applications of qPCR investigations; types of analysis performed on qPCR results; main origin of nucleic acid analyzed; main sources for nucleic acids processed; nucleic acid extraction/preparation techniques currently used; satisfaction with current nucleic acid extraction technology; number of unique samples extracted/prepared for processing by qPCR per year; number of qPCR reactions set up per year; number of qPCR reactions processed in the average processing run; main qPCR format used; level of multiplexing used; total reaction volume used in qPCR assays; cost per reaction (data point) for qPCR assay chemistry/reagents and consumable labware; annual budget for qPCR assay consumables and its component breakdown; preferred suppliers of qPCR reagent chemistries; number of qPCR thermal cycling instruments per lab; manufacturer's qPCR thermal cyclers most used; most important factors when evaluating qPCR thermal cycling instrumentation for purchase; plans to purchase new real-time qPCR thermal cyclers; most appealing new real-time qPCR thermal cycler manufacturer; requirement for high resolution melt analysis; type of sample prep instrumentation used to add cDNA and mastermixes; aspects of HT qPCR assays that are automated; awareness of new or promising technologies that could enhance or replace current work with HT qPCR today; interest in a new isothermal real time HT qPCR assay; interest in adopting a new assay format and high throughput processing instrument for qPCR; unmet needs in HT qPCR instrumentation solutions; and interest in receiving more information or to become a beta-tester of new HT qPCR instruments or assay products.
- The main questionnaire consisted of 28 multi-choice questions and 3 open-ended questions. In addition, there were 7 questions related solely to the administration and demographics of survey.
- The survey collected 48 validated responses, of these 65% provided comprehensive input.
- All respondents met the following criteria: 1) were currently undertaking qPCR assays; 2) make or influence purchasing decisions for qPCR equipment, reagents, or consumables and; 3) were currently processing, or hope to within 1 year, 250,000 or more qPCR reactions or assays per calendar year.
- Survey responses were geographically split: 44% Europe, 25% Asia, 23% North America, 6% Rest of World and 2% South America.
- Respondents came from 18 Academic/University/Research Institute/Not-for-Profit Facilities; 8 Biotech; 5 Agri Biotech/Plant Genomics; 5 Diagnostics; 3 CROs; 3 Hospital/Clinic; 2 Pharma; 2 Animal Biotech/Veterinary; 1 Forensics/Police; and 1 Other.
- Most survey respondents had a senior job role or position which was in descending order: 13 research scientists; 9 senior scientists/research associates; 6 professors/assistant professors; 5 lab/research managers; 4 section/group leaders; 4 principal investigators; 2 post-docs; 2 directors; 1 department head; 1 president; and 1 other.
- 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 4 survey groups: 1) academic research; 2) other organizations; 3) mainly using standardized assays; and 4) mainly using custom assays.

- 31% of respondents were currently processing 250,000 or more qPCR reactions per year.
- The qPCR activities typically run were mainly custom assays with a variable number of targets.
- The main application of qPCR investigations was gene expression profiling.
- The type of analysis mainly performed on real-time qPCR results today was a standard curve.
- mRNA was ranked the main origin of nucleic acids analyzed by HT qPCR.
- Humans were the main source of nucleic acids processed by HT qPCR.
- The nucleic acid extraction/preparation techniques most used for HT qPCR setup was column-based purification.
- The majority of respondents were happy with the current extraction/purification technology they used for HT qPCR setup.
- A median of <250K unique samples were extracted/prepared for processing by HT qPCR per lab per year today.
- A median of <250K HT qPCR reactions were setup per lab per year today.
- A median of <2.5K HT qPCR reactions were processed per average run today.
- The main HT assay qPCR format used today was the 96-well plate.
- A median of 2 dyes were multiplexed in HT qPCR reactions today.
- A median of 10–25µL total reaction volume was used in HT qPCR processing today.
- A median cost of \$0.20–\$0.50 per qPCR reaction was spent on assay chemistry/reagents today.
- A median cost of \$0.050–\$0.10 per qPCR reaction was spent on assay consumable labware today.
- A median budget of \$25K–\$50K per lab per year was allocated for HT qPCR assay consumables today. The biggest share of this budget was allocated to commercial qPCR master mixes.
- The global market for qPCR assay consumables used specifically in higher throughput processing labs was estimated to be around \$64M in 2012.
- The preferred supplier of qPCR reagent chemistries was Life Technologies (Invitrogen, ABI, Ambion).
- A median of 3 qPCR thermal cycling instruments were actively used in HT qPCR labs today.
- The thermal cycler most used in respondent's lab today was from ABI (Life Technologies).
- Instrument reliability was rated as the most important decision factor when evaluating qPCR thermal cycling instrumentation.
- A median annual capex budget of \$50K–\$100K per lab per year was allocated for real time qPCR thermal cyclers today. This budget was expected to purchase a median of 2 units.
- The global market for qPCR thermal cyclers used specifically in higher throughput processing labs was estimated to be \$20M in 2012.
- The top 3 real time qPCR thermal cyclers respondents find most appealing to purchase were from ABI (Life Technologies), Roche and Fluidigm.
- Most respondents thought a high resolution melt (HRM) capability on a thermal cycler was not needed today.
- The sample prep instrumentation most used by respondents for adding cDNA or mastermixes when setting up HT qPCR assays was a multi-channel pipettor or a single channel pipettor. Liquid handling instruments used came mainly from Eppendorf, Gilson and Tecan.
- Most respondents have applied automation to some liquid handling steps only in HT qPCR assays today.
- Respondent interest in adopting a new assay format and processing instrument for HT qPCR was mostly rated likely or almost certainly.
- Respondents had limited awareness of any new or promising technologies that could enhance or replace the work they are currently doing with HT qPCR.
- Some feedback was given on the applications respondents would consider using with a new isothermal real time HT qPCR assay technology.
- 52% of respondents were interested to receive more information about new HT qPCR instruments or related assay products.
- 30% of respondents were interested to beta-test new HT qPCR instruments or related assay products.
- Some feedback on unmet needs in HT qPCR instrumentation solutions today was documented.
- The full report provides the data, details of the breakdown of the responses for each question, its segmentation and all the estimates for the future (2015). It also highlights some interesting differences, particularly between survey groups 'Academic Research' and 'Customized Assays' versus 'Other Organizations' and 'Standardized Assays'.

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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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