DNA and RNA Sample Preparation Markets: Market Developments, Growth Areas and Opportunities

Description: This report is a comprehensive global end-user study and market analysis relating to the use of DNA and RNA sample preparation techniques in the laboratory.

Market findings from this study are based on 'real world' laboratory data, provided by research scientists and clinicians who routinely use nucleic acid isolation methods. This study investigated 45 market areas on current activities, recent developments and trends, anticipated future growth, shrinkage and opportunities. Its findings provide market information on the current and developing use of nucleic acid isolation methods and assist companies selling into these markets to respond to laboratory users' current needs and their future plans.

This study involved the participation of scientists and clinicians and investigate in-depth, key areas of their current use of specialised laboratory techniques, and their plans for using these techniques over the next three years.

Background

Extraction methods used to isolate DNA and RNA are fundamental to most studies carried out in the molecular biology field. These molecules are isolated prior to downstream processing for a wide range of applications, from fundamental research to routine diagnostic and therapeutic decision-making. In the past, methods used to extract nucleic acids were often complex, time-consuming, labour-intensive and limited in throughput. Today, many specialized methods are available to scientists, from conventional solution-based approaches, to solid-phase systems that are often used in commercial kits.

Developments in this field are allowing scientists to evaluate new techniques in their own areas of application. Some of these are also amenable to automation, an increasing requirement in many of today's laboratories. Biopharm Reports has carried out a global market study of DNA and RNA isolation techniques involving the participation of 227 experienced end-users in this field. Participants mean 'years of experience' in the use of DNA and RNA isolation techniques was 14.4 years and the findings of this study provide a wealth of information relevant to suppliers in this field. In particular, these findings relate to end-users current and three-year plans, as well as their anticipated purchasing decisions from particular suppliers over the next three years (2013 - 2016).

This study was carried out to provide business information to developers, manufacturers and suppliers in the DNA/RNA extraction/isolation field. Its findings identify marketing and sales opportunities, end-user purchasing decisions, market growth and shrinkage and related information. It was conducted through specialist groups of experienced end-users in the DNA/RNA extraction/isolation field and its findings are therefore based on 'real world' market data.

Market Questions

1. Participant country, global region, job title, organisation and email address.
2. Participant experience: Participants' years of experience using laboratory techniques to isolate DNA or RNA from biological samples.
3. Organisation types of participants (e.g. university, research institute, small company, medium sized company, large international company, clinic, hospital, Government organisation, veterinary organisation or other.
4. Fields of participants: The three main fields in which participants work e.g. biology, biotechnology, clinical, defense, diagnostics, ecology, energy, environmental, food and drinks, forensics, healthcare, marine, medicine, natural products, pharmaceuticals, plants, veterinary or other.
5. Therapeutic areas: The three main therapeutic areas in which participants work, relating to their use of DNA or RNA isolation methods, e.g. arthritis, autoimmune diseases, bone metabolism, cancer, cardiovascular, central nervous system, dermatology, endocrine, gastrointestinal, genitourinary system, haematology, infections, inflammation, metabolic disorders, musculoskeletal disorders, nutrition, obstetrics and gynaecology, ophthalmology, pain, respiratory or other (if other, indicated).
6. Participant's own specialist area in the context of DNA or RNA isolation.
10. Purpose or reason: Participant's three main purposes or reasons for your work, relating to your use of DNA or RNA isolation methods, e.g. clinical research, routine diagnostics, routine screening, disease biomarkers, clinical trials, treatment decisions, treatment monitoring, diagnostics research, disease research, drug R&D, drug targets, pathology, toxicology or other.
7. Study samples: The three main sample types with which participants work, relating to their use of DNA or RNA isolation methods, e.g. animal tissues, cell isolates, cells, cerebrospinal fluid, genetic material, human tissues, in-vitro biological solutions, microbiological materials, plasma, saliva, serum, urine, whole blood or other.
8. Current DNA or RNA forms: the percentage (%) of participants work involving the isolation of DNA or RNA, involving the nucleic acid forms genomic DNA, microRNA, mRNA, ribosomal RNA (rRNA), small interfering RNA (siRNA), small nuclear RNA (snRNA), transfer RNA (tRNA) or other.
9. Future DNA or RNA forms: What percentage (%) of participant's work in three years from now, on the isolation of DNA or RNA, will related to the study of the nucleic acid forms genomic DNA, MicroRNA, mRNA, Ribosomal RNA (rRNA), small Interfering RNA (siRNA), small nuclear RNA (snRNA), transfer RNA (tRNA) or other.
10. Current solution-phase or solid-phase methods: What percentage (%) of participant's current techniques to isolate DNA or RNA involve either solution-phase or solid-phase methods. For clarity, an example of a solution-phase method is the conventional process based on guanidinium thiocyanate-phenol-chloroform, while silica is an example of a solid-phase medium used in the isolation of nucleic acids.
11. Future solution-phase or solid-phase methods: What percentage (%) of participant's work in three years from now, to isolate DNA or RNA, will involve either solution-phase or solid-phase methods. For clarity, an example of a solution-phase method is the conventional process based on guanidinium thiocyanate-phenol-chloroform, while silica is an example of a solid-phase medium used in the isolation of nucleic acids.
12. Current kit vs. non-kit methods. What current techniques (e.g. kit methods, Non-kit methods, others or none used) for the isolation of DNA or RNA, involve the use of kit or non-kit methods, relating to the nucleic acid forms genomic DNA, microRNA, mRNA, ribosomal RNA (rRNA), small Interfering RNA (siRNA), small nuclear RNA (snRNA), transfer RNA (tRNA) or other.
13. Future kit vs. non-kit methods. What techniques will participants be using three years from now (e.g. kit methods, Non-kit methods, other method or none used) for the isolation of DNA or RNA, involve the use of kit or non-kit methods, relating to the nucleic acid forms genomic DNA, microRNA, mRNA, ribosomal RNA (rRNA), small Interfering RNA (siRNA), small nuclear RNA (snRNA), transfer RNA (tRNA) or other.
14. Main methods. What are participant's main DNA or RNA isolation method types, e.g. solution-phase methods (non-kit), solid-phase methods (non-kit) or kit methods (if other, indicated).
15. Current preferred solution-phase method (non-kit method) and company supplier. In this question, the term 'solution-phase' means methods that involve the use of solutions throughout the isolation process, and do not involve the use of a solid-phase material at any stage in the process. The questions asked participants to indicate their current preferred solution-phase method and preferred company supplier for the isolation of DNA or RNA [by listing the main components e.g. guanidinium thiocyanate phenol chloroform].
16. Future solution-phase method (non-kit method) and company supplier. Participants were asked to anticipate their preferred solution phase method and supplier three years from now. In this question, the term 'solution-phase' means methods that involve the use of solutions throughout the isolation process, and do not involve the use of a solid-phase material at any stage in the process. The questions asked participants to indicate their future preferred solution-phase method and preferred company supplier for the isolation of DNA or RNA [done by listing the main components e.g. guanidinium thiocyanate phenol chloroform].
17. Advantages: Participants were asked to indicate the top three advantages of their preferred solution-phase DNA or RNA isolation methods, e.g. automation potential, applicability**, convenience, cost, ease of use, qualitative performance, quantitative performance, reliability, reproducibility, robustness, speed, versatility or other [applicability** in this context means its relevance or importance to the specific application(s) for which the methods are being used].
18. Disadvantages: Participants were asked to indicate the top three disadvantages of their preferred solution-phase DNA or RNA isolation methods, e.g. automation potential, applicability**, convenience, cost, ease of use, qualitative performance, quantitative performance, reliability, reproducibility, robustness, speed, versatility or other [applicability** in this context means its relevance or importance to the specific application(s) for which the methods are being used].
19. Current preferred solid-phase method (non-kit method), indicated by participants by listing the solid-phase medium and principal solutions) and company supplier.
20. Future preferred solid-phase method (non-kit method): Participants were asked to anticipate their preferred solid-phase method (indicated by listing the solid-phase medium and principal solutions) and company supplier, in three years from now.
21. Advantages: Participants were asked to indicate the top three advantages of their preferred solid-phase
DNA or RNA isolation method, where the options were automation potential, applicability**, convenience, cost, ease of use, qualitative performance, quantitative performance, reliability, reproducibility, robustness, speed, versatility or other. Here, applicability** in this context means its relevance or importance to the specific application(s) for which the methods are being used. **Applicability** in this context means its relevance or importance to the specific application(s) for which the methods are being used.

22. Disadvantages: Participants were asked to indicate their top three disadvantages of their preferred solid-phase DNA or RNA isolation method, where the options were automation potential, applicability**, convenience, cost, ease of use, qualitative performance, quantitative performance, reliability, reproducibility, robustness, speed, versatility or other. Here, applicability** in this context means its relevance or importance to the specific application(s) for which the methods are being used. **Applicability** in this context means its relevance or importance to the specific application(s) for which the methods are being used.

23. Current preferred kit method and company supplier. In this question, the term 'kit' means any pre-packaged DNA or RNA isolation product that contains the components or reagents (e.g. dry or dissolved substances, solutions, solid-phase media etc.), which allow most or all of the DNA or RNA isolation stages to be performed.

24. Future preferred kit method (non-kit method): Participants were asked to anticipate their preferred kit method and company supplier, three years from now. In this question, the term 'kit' means any pre-packaged DNA or RNA isolation product that contains the components or reagents (e.g. dry or dissolved substances, solutions, solid-phase media etc.), which allow most or all of the DNA or RNA isolation stages to be performed.

25. Advantages: Participants were asked to indicate the top three advantages of their preferred DNA or RNA isolation kit, where the options were automation potential, applicability**, convenience, cost, ease of use, qualitative performance, quantitative performance, reliability, reproducibility, robustness, speed, versatility or other [applicability** in this context means its relevance or importance to the specific application(s) for which the methods are being used].

26. Disadvantages: Participants were asked to indicate their top three disadvantages of their preferred DNA or RNA isolation kit, where the options were automation potential, applicability**, convenience, cost, ease of use, qualitative performance, quantitative performance, reliability, reproducibility, robustness, speed, versatility or other [applicability** in this context means its relevance or importance to the specific application(s) for which the methods are being used].

27. Automated methods: Participants were asked if they use automated methods in the isolation of DNA or RNA.

28. Current automated methods: Those participants who answered yes to Q27 were asked what percentage (%) of their current DNA or RNA isolation methods are automated.

29. Future automated methods: Those participants who answered yes to Q27 were asked to anticipate what percentage (%) of their current DNA or RNA isolation methods will be automated three years from now.

30. Preferred automation methods and supplier companies. Those participants who answered yes to Q27 were asked to indicate their preferred companies and automated methods for the isolation of DNA or RNA. **Applicability** in this context means its relevance or importance to the specific application(s) for which the methods are being used.

31. Current applications: Participants were asked to indicate their current top three applications, relating to their work on isolation of DNA or RNA. **Applicability** in this context means its relevance or importance to the specific application(s) for which the methods are being used.

32. Future applications: Participants were asked to anticipate their current top three applications three years from now, relating to their work on isolation of DNA or RNA. **Applicability** in this context means its relevance or importance to the specific application(s) for which the methods are being used.

33. Disease biomarkers: Participants were asked if their work on the isolation of DNA or RNA relates to the study of disease biomarkers.

34. Current disease biomarkers: Participants were asked to indicate the top three disease biomarkers to which their work on the isolation of DNA or RNA relates, e.g. DNA quantification, alternative spliced variants, bacteria detection, DNA methylation, gene copy number, gene expression, gene mutations/polymorphisms, haplotypes, microRNA, small interfering RNA, single nucleotide polymorphisms (SNPs), TRs or SSRs, tissue typing, virus detection and other (if other, indicated).

35. Future disease biomarkers: Participants were asked to anticipate their top three disease biomarkers to which their work on the isolation of DNA or RNA relate in three years from now, e.g. absolute DNA
quantification, alternative spliced variants, bacteria detection, DNA methylation, gene copy number, gene expression, gene mutations/polymorphisms, haplotypes, microRNA, small interfering RNA, small nuclear RNA, single nucleotide polymorphisms (SNPs), TRs or SSRs, tissue typing, virus detection and other.

If other, please indicate

36. Disease biomarker utility: Participants were asked what were the top three clinical utilities relating to their work to isolate DNA or RNA, e.g. disease prognosis, disease susceptibility or risk, disease stage or severity, drug type therapy decision-making, drug type therapy dose, drug discovery, early detection of disease, clinical trial endpoint, guiding treatment, response to therapy, safety or toxicity factors or other (if other, indicated).

37. Cost per sample/non-kit methods: participants were invited to estimate the 'per sample' costs of the top-three non-kit methods for DNA or RNA isolation, which they carry out. The cost range considered was <$1, $1 - $2, $2 - $3, $3 - $4, $4 - $5, $5 - $7, $7 - $10, $10 - $15, $15 - $25, $25 - $40, $40 - $60, $60 - $100, $100 - $150, $150 - $200, $200 - $250 and >$250.

38. Cost per sample/kit methods: Participants were invited to estimate the 'per sample' costs of the top-three kit methods for DNA or RNA isolation, which they carry out. The cost range considered was <$1, $1 - $2, $2 - $3, $3 - $4, $4 - $5, $5 - $7, $7 - $10, $10 - $15, $15 - $25, $25 - $40, $40 - $60, $60 - $100, $100 - $150, $150 - $200, $200 - $250 and >$250.

39. Current budget breakdown: Participants were asked to estimate what percentage (%) of their financial budgets for the isolation of DNA or RNA relate to 10 different areas, namely chemicals and reagents, consumables (e.g. plates, tips), sample storage, automation instruments, sample preparation instrumentation, other instrumentation, general overheads, instrument servicing, staff salaries or other areas (if other, indicated).

If other, please indicate

40. Overall Financial budget. Participants were asked to anticipate by how much (%) they anticipate their overall annual financial budget for the isolation of DNA or RNA will change, either increase or decrease, over the next three years.

41. Consumables: Participants were asked to indicate the top three consumables in terms of cost, relating to the isolation of DNA or RNA.
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