DNA and RNA Isolation Techniques: Market Developments, Growth Areas and Opportunities 2014

Description: 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 areas:

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, defence, 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.

7. 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.

8. 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.
9. 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.

10. 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.

11. 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.

12. 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.

13. 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.

14. 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.

15. 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).

16. 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].

17. 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].

18. 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].

19. 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].

20. Current preferred solid-phase method (non-kit method), indicated by participants by listing the solid-phase medium and principal solutions) and company supplier.
21. 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.

22. 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].

23. 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].

24. 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.

25. 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.

26. 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].

27. 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].

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

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

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

31. 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.

32. Current applications: Participants were asked to indicate their current top three applications, relating to their work on isolation of DNA or RNA relate. The applications considered were allele size detection, cloning, disease detection, DNA quantification, epidemiology analyses, epigenetics, gene expression (mRNA), gene mutations or alterations, generating genetic probes, genetic mapping, genetic material amplification, genomic DNA, haplotypes, microRNA studies, pathogen detection/identification, phylodynamic analyses, ribosomal DNA (rRNA) studies, RNA Studies, sequencing, small interfering RNA (siRNA) studies, small nuclear RNA (snRNA) studies, species identification, STR typing, tissue typing, transfer RNA (tRNA) studies, other.

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 relate. The applications considered were allele size detection, cloning, disease detection, DNA quantification, epidemiology analyses, epigenetics, gene expression (mRNA), gene mutations or alterations, generating genetic probes, genetic mapping, genetic material amplification, genomic DNA, haplotypes, microRNA studies, pathogen detection/identification, phylodynamic analyses, ribosomal DNA (rRNA) studies, RNA Studies, sequencing, small interfering RNA (siRNA) studies, small nuclear RNA (snRNA) studies, species identification, STR typing, tissue typing, transfer RNA (tRNA) studies, other.

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

35. 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, small nuclear RNA, single nucleotide polymorphisms (SNPs), TRs or SSRs, tissue typing, virus detection and other (if other, indicated).

36. 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.

37. Disease marker 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).

38. 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 $250.

39. 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 $250.

40. 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).
14.3 Study of Disease Biomarkers
14.4 Current Disease Biomarkers
14.5 Future Disease Biomarkers
14.6 Biomarker utility
14.7 Discussion and Opportunities

Chapter 15. Budgets and Expenditure
15.1 This Chapter
15.2 Market Questions
15.3 Cost per Sample (Non-Kit)
15.4 Cost per Sample (Kit)
15.5 Current Budget Breakdown
15.6 Future Budgets
15.7 Discussion and Opportunities

Chapter 16. Consumables
16.1 This Chapter
16.2 Market Questions
16.3 Consumables
16.4 Discussion and Opportunities

Chapter 17. Discussion and Opportunities
17.1 Discussion and Opportunities

Appendices

Figures

Figure 2.1 Top ten countries and the percentages of individuals who participated in DNA RNA 2014
Figure 2.2 Regions and associated percentages of individuals who participated in DNA RNA 2014
Figure 2.3 Professional positions (and %) of individuals who participated in DNA RNA 2014
Figure 2.4 Participants' 'years of experience' in the use of techniques to extract DNA and RNA (Study DNA RNA 2014)
Figure 2.5 Organisation types indicated by participants in DNA RNA 2014
Figure 2.6 Field types indicated by participants in DNA RNA 2014
Figure 3.1 Current nucleic acid forms studied by participants in DNA RNA 2014
Figure 3.2 Nucleic acid forms anticipated to be studied in three years from now, by participants in DNA RNA 2014
Figure 4.1 Current techniques used for the isolation of DNA or RNA, indicated by participants in DNA RNA 2014
Figure 4.2 Future techniques used for the isolation of DNA or RNA, indicated by participants in DNA RNA 2014
Figure 5.1 Overall current use of kit and non-kit methods for the isolation of DNA and RNA, reported by participants in DNA RNA 2014
Figure 5.2 Overall anticipated use of kit and non-kit methods for the isolation of DNA and RNA in three years from now, reported by participants in DNA RNA 2014
Figure 5.3 Current use of kits for the isolation of all nucleic acid forms, reported by participants in DNA RNA 2014
Figure 5.4 Anticipated use of kits for the isolation of all nucleic acid forms in three years from now, reported by participants in DNA RNA 2014
Figure 5.5 Current use of non-kit methods or the isolation of all nucleic acid forms, reported by participants in DNA RNA 2014
Figure 5.6 Anticipated use of non-kit methods or the isolation of all nucleic acid forms in three years from now, reported by participants in DNA RNA 2014
Figure 5.7 Current use of other isolation methods for all NA forms, reported by participants in DNA RNA 2014
Figure 5.8 Use of other isolation methods for all NA forms in three years from now, reported by participants in DNA RNA 2014
Figure 5.9 Current isolation methods for genomic DNA, reported by participants in DNA RNA 2014
Figure 5.10 Anticipated use of isolation methods for genomic DNA in three years from now, reported by participants in DNA RNA 2014
Figure 5.11 Current isolation methods for microRNA, reported by participants in DNA RNA 2014
Figure 5.12 Isolation methods anticipated to be used for microRNA in three years from now, reported by
Figure 5.13 Current isolation methods for microRNA, reported by participants in DNA RNA 2014
Figure 5.14 Isolation methods anticipated to be used for microRNA in three years from now, reported by participants in DNA RNA 2014
Figure 5.15 Current isolation methods for ribosomal RNA, reported by participants in DNA RNA 2014
Figure 5.16 Isolation methods anticipated to be used for ribosomal RNA in three years from now, reported by participants in DNA RNA 2014
Figure 5.17 Current isolation methods for SI RNA, reported by participants in DNA RNA 2014
Figure 5.18 Isolation methods anticipated to be used for SI RNA in three years from now, reported by participants in DNA RNA 2014
Figure 5.19 Current isolation methods for snRNA, reported by participants in DNA RNA 2014
Figure 5.20 Isolation methods anticipated to be used for snRNA in three years from now, reported by participants in DNA RNA 2014
Figure 5.21 Current isolation methods for tRNA, reported by participants in DNA RNA 2014
Figure 5.22 Isolation methods anticipated to be used for tRNA in three years from now, reported by participants in DNA RNA 2014
Figure 5.23 Main methods used for the isolation of DNA and RNA, reported by participants in DNA RNA 2014
Figure 5.24 Changes in the use of Kit and Non-Kit methods over the next three years (2014 – 2016), reported by participants in DNA RNA 2014
Figure 6.1 The top five current solution phase (non-kit) methods for the extraction of DNA/RNA, reported by participants in DNA RNA 2014
Figure 6.2 Top current preferred suppliers of solution phase (non-kit) products for the extraction of DNA/RNA, reported by participants in DNA RNA 2014
Figure 6.3 The top five preferred solution-phase (non-kit) methods for the isolation of DNA/RNA in three years from now, reported by participants in DNA RNA 2014
Figure 6.4 Top preferred suppliers of solution phase (non-kit) methods for the isolation of DNA/RNA in three years from now, reported by participants in DNA RNA 2014
Figure 6.5 Advantages of solution phase (non-kit) methods for the isolation of DNA/RNA, reported by participants in DNA RNA 2014
Figure 6.6 Disadvantages of solution phase (non-kit) methods for the isolation of DNA/RNA, reported by participants in DNA RNA 2014
Figure 7.1 Top current preferred solid-phase (non-kit) methods for the isolation of DNA/RNA, reported by participants in DNA RNA 2014
Figure 7.2 Top current preferred suppliers of solid-phase (non-kit) methods for the isolation of DNA/RNA, reported by participants in DNA RNA 2014
Figure 7.3 Top anticipated preferred solid-phase (non-kit) methods for the isolation of DNA/RNA in three years from now, reported by participants in DNA RNA 2014
Figure 7.4 Top anticipated preferred suppliers of solid-phase (non-kit) methods for the isolation of DNA/RNA in three years from now, reported by participants in DNA RNA 2014
Figure 7.5 Advantages of solid-phase (non-kit) methods for the isolation of DNA/RNA, reported by participants in DNA RNA 2014
Figure 7.6 Disadvantages of solid-phase (non-kit) methods for the isolation of DNA/RNA, reported by participants in DNA RNA 2014
Figure 8.1 Preferred current suppliers of kits for isolating DNA, reported by participants in DNA RNA 2014
Figure 8.2 Preferred anticipated future suppliers of kits for isolating DNA, reported by participants in DNA RNA 2014
Figure 8.3 Current preferred suppliers of kits for isolating RNA, reported by participants in DNA RNA 2014
Figure 8.4 Future preferred suppliers of kits for isolating RNA, reported by participants in DNA RNA 2014
Figure 8.5 The advantages of using DNA and RNA isolation kits, reported by participants in DNA RNA 2014
Figure 8.6 The disadvantages of using DNA and RNA isolation kits, reported by participants in DNA RNA 2014
Figure 9.1 The use of automated methods for the isolation of DNA and RNA, reported by participants in DNA RNA 2014
Figure 9.2 The current percentage of DNA and RNA isolation methods that are automated, indicated by participants in DNA RNA 2014 who use automated methods
Figure 9.3 The percentage of DNA/RNA isolation methods anticipated to be automated in three years from now, indicated by participants in DNA RNA 2014 who use automated methods
Figure 9.4 Top five preferred companies for the automation of DNA isolation, indicated by participants in DNA RNA 2014 who currently use automated methods
Figure 9.5 Top three preferred companies for the automation of RNA isolation, indicated by participants in DNA RNA 2014 who currently use automated methods
Figure 10.1 Top current applications associated with DNA and RNA isolation methods, used by participants in DNA RNA 2014
Figure 10.2 Top applications associated with DNA and RNA isolation methods that are
anticipated to be used in three years from now, by participants in DNA RNA 2014
Figure 11.1 Top therapeutic areas associated with DNA and RNA isolation methods used by participants in DNA RNA 2014
Figure 12.1 Top specialist areas associated with the use of DNA and RNA isolation methods, reported by participants in DNA RNA 2014
Figure 12.2 Top purposes or reasons associated with the use of DNA and RNA isolation methods, reported by participants in DNA RNA 2014
Figure 13.1 Top study samples processed using DNA and RNA isolation methods used by participants in DNA RNA 2014
Figure 14.1 The study of disease biomarkers associated with the use of DNA and RNA isolation methods, indicated by participants in DNA RNA 2014
Figure 14.1 Top current disease biomarkers associated with the use of DNA and RNA isolation methods, indicated by participants in DNA RNA 2014
Figure 14.2 Top disease biomarkers associated with the use of DNA and RNA isolation methods anticipated to be studied three years from now, indicated by participants in DNA RNA 2014
Figure 14.3 Top disease biomarkers clinical utilities relating to their use of DNA and RNA isolation methods, indicated by participants in DNA RNA 2014
Figure 15.1 Per-sample non-kits costs and associated percentages of end-users, indicated by participants in DNA RNA 2014
Figure 15.2 Per-sample kits costs and associated percentages of end-users, indicated by participants in DNA RNA 2014
Figure 15.3 Budget costing areas relating to the isolation of DNA and RNA, indicated by participants in DNA RNA 2014
Figure 16.1 Top three consumables (by cost) in the isolation of DNA or RNA, indicated by participants in DNA RNA 2014
Appendix 1. Top three consumables (by cost) used in the isolation of DNA or RNA, indicated by participants in DNA RNA 2014

Tables

Table 2.1 Countries, percentages and numbers (No) of individuals who participated in DNA RNA 2014
Table 2.2 Regions, associated percentages and numbers (No) of individuals who participated in DNA RNA 2014
Table 2.3 Professional positions (% and number, No) of individuals who participated in DNA RNA 2014
Table 2.4 Participants' 'years of experience' in the use of techniques to extract DNA and RNA (Study DNA RNA 2014)
Table 2.5 Organisation types indicated by participants in DNA RNA 2014
Table 2.6 Field types indicated by participants in DNA RNA 2014
Table 2.7 Other field types indicated by participants in DNA RNA 2014
Table 3.1 Current nucleic acid forms (as % total) and those anticipated to be studied three years from now (as a % of total), indicated by participants in DNA RNA 2014
Table 6.1 Current solution-phase (non-kit) methods for the isolation of DNA/RNA, reported by participants in DNA RNA 2014
Table 6.2 Current preferred suppliers of solution phase (non-kit) products for the extraction of DNA/RNA, reported by participants in DNA RNA 2014
Table 6.3 Preferred solution-phase (non-kit) methods for the isolation of DNA/RNA in three years from now, reported by participants in DNA RNA 2014
Table 6.4 Preferred suppliers of solution phase (non-kit) methods for the isolation of DNA/RNA in three years from now, reported by participants in DNA RNA 2014
Table 6.5 Advantages of solution phase (non-kit) methods for the isolation of DNA/RNA, reported by participants in DNA RNA 2014
Table 6.6 Disadvantages of solution phase (non-kit) methods for the isolation of DNA/RNA, reported by participants in DNA RNA 2014
Table 7.1 Current preferred solid-phase (non-kit) methods for the isolation of DNA/RNA, reported by participants in DNA RNA 2014
Table 7.2 Current preferred suppliers of solid-phase (non-kit) methods for the isolation of DNA/RNA, reported by participants in DNA RNA 2014
Table 7.3 Anticipated preferred solid-phase (non-kit) methods for the isolation of DNA/RNA in three years from now, reported by participants in DNA RNA 2014
Table 7.4 Anticipated preferred suppliers of solid-phase (non-kit) methods for the isolation
of DNA/RNA in three years from now, reported by participants in DNA RNA 2014
Table 7.5 Advantages of solid-phase (non-kit) methods for the isolation of DNA/RNA, reported by participants in DNA RNA 2014
Table 7.6 Disadvantages of solid-phase (non-kit) methods for the isolation of DNA/RNA, reported by participants in DNA RNA 2014
Table 8.1 Preferred current suppliers of kits for isolating DNA, reported by participants in DNA RNA 2014
Table 8.2 Preferred kits currently for isolating DNA, reported by participants in DNA RNA 2014
Table 8.3 Preferred anticipated future suppliers of kits for isolating DNA, reported by participants in DNA RNA 2014
DNA RNA 2014
Table 8.4 Future preferred kits for isolating DNA reported by participants in DNA RNA 2014
Continued Table 8.4 Future preferred kits for isolating DNA, reported by participants in DNA RNA 2014
Continued Table 8.4 Future preferred kits for isolating DNA, reported by participants in DNA RNA 2014
Table 8.5 Current preferred suppliers of kits for isolating RNA, reported by participants in DNA RNA 2014
Table 8.6 Current preferred kits for isolating RNA, reported by participants in DNA RNA 2014
Table 8.7 Future preferred suppliers of kits for isolating RNA, reported by participants in DNA RNA 2014
Table 8.8 Future preferred kits for isolating RNA, reported by participants in DNA RNA 2014
Table 9.1 Preferred companies for the automation of DNA isolation, indicated by participants in DNA RNA 2014 who currently use automated methods
Table 9.2 Automation platforms and companies for DNA isolation, indicated by participants in DNA RNA 2014
Table 9.3 Preferred companies for the automation of RNA isolation, indicated by participants in DNA RNA 2014 who currently use automated methods
Table 9.4 Automation methods and companies for RNA isolation, indicated by participants in DNA RNA 2014
Table 10.1 Current applications associated with DNA and RNA isolation methods, used by participants in DNA RNA 2014
Table 10.2 Applications associated with DNA and RNA isolation methods that are anticipated to be used in three years from now, by participants in DNA RNA 2014
Table 11.1 Therapeutic areas associated with DNA and RNA isolation methods used by participants in DNA RNA 2014
Table 12.1 Specialist areas associated with the use of DNA and RNA isolation methods, reported by participants in DNA RNA 2014
Table 12.2 Purposes or reasons associated with the use of DNA and RNA isolation methods, reported by participants in DNA RNA 2014
Table 13.1 Study samples processed using DNA and RNA isolation methods used by participants in DNA RNA 2014
Table 14.1 Current disease biomarkers associated with the use of DNA and RNA isolation methods, indicated by participants in DNA RNA 2014
Table 14.2 Disease biomarkers associated with the use of DNA and RNA isolation methods anticipated to be studied three years from now, indicated by participants in DNA RNA 2014
Table 14.3 Disease biomarkers clinical utilities relating to their use of DNA and RNA isolation methods, indicated by participants in DNA RNA 2014
Table 15.1 Per-sample non-kits costs and associated percentages of end-users, indicated by participants in DNA RNA 2014
Table 15.2 Per-sample kits costs and associated percentages of end-users, indicated by participants in DNA RNA 2014
Table 15.3 Budget costing areas relating to the isolation of DNA and RNA, indicated by participants in DNA RNA 2014
Table 15.4 Future overall budget relating to the isolation of DNA and RNA, indicated by participants in DNA RNA 2014
Table 16.1 Top three consumables (by cost) used in the isolation of DNA or RNA, indicated by participants in DNA RNA 2014
Appendix 1. Top three consumables (by cost) used in the isolation of DNA or RNA, indicated by participants in DNA RNA 2014

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