Forensic Science Regulator
Overseeing Quality

DNA ANALYSIS SPECIALIST GROUP

DRAFT - Notes of the twenty-first meeting, held at 12:30pm on 10 July 2015, at 5, St Philip's Place, Colmore Row, Birmingham

Item 1.0: Opening and welcome

1.1 The Chair welcomed those present to the 21st meeting of the DNA Analysis Specialist Group, especially the new members Surryia Jagatiya from National DNA Delivery Unit (NDU), Nicola Renwick from Scottish Police Services Authority (SPSA), and Stephen Doak from Forensic Science Ireland (FSI).

1.2 See Annex A for the full list of attendees and apologies.

Item 2.0: Minutes from the last meeting, and matters arising

2.1 In section 4.12 of the 11 March 2015 minutes, relating to DNA profiles from DNA mixtures, the two terms "clear major profile" and "complete major profile" effectively have the same meaning but FSPs use these terms differently and the CJS believe them to have distinct meanings . Subject to this amendment the minutes of the meeting on 11 March 2015 were agreed.

2.2 The Chair reviewed the actions from the previous minutes. Action 1: The work on Y-chromosome short tandem repeats (Y-STR) was not yet in progress and the work plan had not been updated accordingly. The other actions were all either cleared or were agenda items, although a second copy of Action 5 on nomenclature was appended in error to Action 7 on relationship testing, in the minutes.

Action 1: June Guiness, Gillian Tully and Sue Pope to develop the work plan for this group to include Y-STR analysis.

Item 3.0: Adventitious Matches and Primer Binding Site Mutations

3.1 Adam Shariff introduced the item, which related to the new DNA-17 chemistries and the risk of Primer Binding Site Mutations (PBSM). This work on adventitious matches and PBSM had been requested by the National DNA Delivery Unit (NDU). There had been concerns regarding false adventitious DNA profile matches and a request from the judiciary for confidence calculations in this regard. The work was commissioned to two Forensic

Service Providers (FSP): Principal Forensic Services (PFS) and LGC Forensics, who had produced the four papers circulated to the DNASG.

3.2 The intention was for the paper entitled “Adventitious match probability for autosomal profiles when primer binding site mutation is possible” to be published and the other papers on DNA match probabilities, adventitious matches, database searching, and the impact of PBSMs on discrimination, to become primer documents or scientific guidance papers, aimed at the judiciary or jurors. Primers would explain agreed science while case-specific issues would be dealt with in the normal way in court. The entries: “Reviewing data” in the fourth paper, in a table of Polymerase Chain Reaction (PCR) chemistries, indicated unfinished work, which would be completed. Initial feedback had been received from the Chief Scientific Adviser and Gill Tully, the Forensic Science Regulator (FSR).

3.3 Feedback from the DNASG was invited on the four papers and the following comments were provided:

- an executive summary should be added
- publication should be sought in Science and Justice and the first three primers should be made annexes to the fourth published paper
- further work on partial DNA profiles and PBSM was a possibility
- a query on concepts of Matching Probability (MP) and Likelihood Ratio (LR) was out of scope for this work, but could be in a wider scope of work on primers
- more examples on DNA-17 could be provided rather than SGM-plus
- multiple DNA-17 chemistries with non-concordance between DNA-17 chemistries to be considered in the main paper

Action 2: Sue Pope to deal with the points raised on the four PBSM and adventitious match papers.

Action 3: Nicola Renwick to feed back to DNASG on how PBSM affected DNA profiling in Scotland.

Item 4.0: Update to the DNASG Terms of Reference

4.1 Changes had been drafted to the DNASG Terms of Reference and circulated to the DNASG as a tracked changes document. Gill Tully explained the proposed revisions and the following comments were made:

- under composition: Forensic Science Laboratory, Ireland should be changed to Forensic Science Ireland and Metropolitan Police force was not listed.
- under remit: the term “profiling” should be changed to “DNA analysis” (the DNASG would also consider RNA, but retain DNA in its title)

- under confidentiality: wider discussion held by the DNASG, which is not recorded in the minutes, must be regarded as confidential.

Action 4: June Guiness to update the DNASG Terms of Reference as agreed.

Action 5: Gill Tully to send the DNASG Terms of Reference to Jo Ashworth at the NPCC DNA Operations Group.

Item 5.0: Syntenic Loci VWA and D12: weight of evidence calculations

5.1 Roberto Puch-Solis explained the paper on the weight of evidence calculation for DNA profiles that include syntenic loci vWA and D12S391. Several DNA multiplexes contain vWA and D12S391 and, although they are only weakly linked, in some situations a correction for this linkage is needed. This paper detailed when a correction needed to be applied for these loci. A set of recommendations has been derived from the paper and the paper would be published shortly.

5.2 The following comments were made:

- the FSR was grateful to Roberto Puch-Solis and Tim Clayton for the paper
- the KCL DNA laboratory used many syntenic loci and so had calculated corresponding corrections - they aimed to publish this work
- David Balding at UCL was separately publishing corrections for certain syntenic loci
- the Global Filer DNA analysis system used by Scottish Police had other syntenic loci
- the mention of particular DNA laboratories needed to be removed from the paper before publication.

Action 6: June Guiness to describe the approach for dealing with syntenic loci as interim FSR guidance.

Action 7: An addition to be made to the work plan for more formal statistical guidance on syntenic loci to be considered once the various syntenic loci documents had been published.

Item 6.0: DNA Laboratory Cleaning Validation

6.1 Denise Syndercombe Court introduced a paper on cleaning validation. Practical methods to clean DNA analysis laboratories are been reviewed and generally, repeated cleaning (double spraying and double wiping) were effective. One of the reagents tested inhibited the Polymerase Chain Reaction (PCR) and another could cause corrosion on metal if the item was not subsequently wiped down. The paper systematically compared the advantages and disadvantages of the various products in comparative tests.

The final summary was that Activ8™ for small areas and Presept™ for large areas such as floors was implemented by MPS. FSI stated they used Virkon and distilled water.

6.2 There was concern that if the document was published it might force DNA analysis laboratories to use a more expensive product. However the FSR was not making recommendations on this topic and so laboratories would be free to choose their cleaning products. Denise Syndercombe-Court of King's College London will be submitting the research paper for publication.

Item 7: Standards

DNA Primer or Scientific Guidance Paper

7.1 The Lord Chief Justice had earlier requested a number of primers (scientific guidance papers) on forensic topics and currently he sought two primers, neither of which covered DNA. He hoped for sign-off for these papers at the highest level; the Royal Society. The Chartered Society of Forensic Practitioners would assist with the drafting. The papers could be in PowerPoint presentation format with printed copies made available.

7.2 A basic DNA primer had previously been drafted, which would be updated, completed and circulated for comments. The four DNA papers could then be annexed to it. The DNA Primer would be sent to Judge Mark Wall, and Lord Kitchen, on behalf of the Judiciary. It would become a FSR publication and set the style for other primers.

Action 8: Gill Tully and June Guiness to scope what could be provided as an immediate draft.

Recommendations on DNA mixtures Proficiency Testing follow up

7.3 This item related to the recommendations listed in the previous minutes of 11 March 2015 on DNA mixtures analysis. Two pieces of work would be contracted out to meet these recommendations. The first contract would cover recommendations 1, 2, 3, 5, 6, 7 and 8, and the second contract would cover recommendation 9 on the performance and validation standards for software to calculate likelihood ratios. Volunteers for a small specialist group to work on the user requirements for these would be sourced, however, due to potential conflicts of interest, membership of the sub-group would make members ineligible to tender for the ensuing contracts. Some work had already been done on recommendation 8 on syntenic loci.

Action 9: June Guiness to draft the user requirement on interpretation of mixtures to include recommendations 1, 2, 3, 5, 6, 7, and interpretation mixture software to include recommendation 9 from the previous minutes of 11 March 2015.

7.4 Related to some of the DNA mixtures analysis recommendations, Jeff Adams was leading work on providing a top level generic evaluative interpretation standard, and AFSP were assisting. In October the draft would be sent to Judge Mark Wall on behalf of the judiciary. If the document was accepted then it would be included in the Criminal Practice Directions. This work would cover general forensic standards.

Streamlined Forensic Reporting (SFR)

7.5 Gill Tully thanked the group for the work on partial mixtures and SFR. Statistical analysis could not be undertaken on partial DNA mixtures and therefore they would not be suitable to process using the simplified SFR 1 form procedure. This advice had been circulated to both police forces and Forensic Service Providers, and two queries had been received. It would be included in the next NDU Technical Standards to be published in September 2015.

QA/QC Table on all DNA chemistries and methods

7.6 Denise Syndercombe-Court explained the work on current DNA chemistries. Susan Hales of Metropolitan Police had worked with Des Van Hinsbergh on the QA/QC table. It was regarded as a useful look-up guide, but included some complex terms, so these needed to be added to a glossary or terms and definitions. It was unfortunately not practical to cross-reference the table to related materials because the references would require constant updating due to new chemistries being developed.

Action 10: Des Van Hinsbergh, June Guiness, and Susan Hales to finalise QA/QC requirements in readiness to be added to the next version of the DNA appendix and liaise with National DNA Delivery Unit on what the technical requirements were once completed.

Guidance on Control and avoidance of contamination in DNA laboratories

7.7 The DNASG reviewed the draft guidance on control and avoidance of contamination in laboratory activities involving DNA evidence recovery and analysis, on which June Guiness and Kevin Sullivan from PFS had been working, post-consultation. 161 comments had been received, of which DNASG views were sought mainly on 14. The guidance would be submitted to QSSG and subsequently FSAC in early November. Given BIS rules on regulatory requirements, it could be published either in December 2015 for implementation April 2016 or April 2016 for implementation October 2016. April 2016 was agreed as the implementation date for the guidance.

7.8 The drafting points discussed included the following. There was a need for a log to be kept to detail where a DNA sample had been opened to indicate possible contamination risks. This log was needed in particular when a sample was passed from one organisation to another. Other issues included:

- environmental monitoring

- use of arm covers, aprons or disposable lab coats
- cleaning between cases, items or batches
- detailed procedure on donning two pairs of gloves on entry to the lab and;
- whether scientists or cleaners cleaned the DNA analysis laboratory and how frequently.

June Guiness would add a reference in the guidance to use of arm coverings

7.9 June Guiness would update the anti-contamination guidance. Any comments on the other 150 changes listed for the anti-contamination appendix were invited by the end of July.

Action 11: June Guiness to update paragraph 8.1.7 of the anti-contamination paper, on logging contamination risks for an exhibit, in the light of the issues discussed by DNASG.

Action 12: June Guiness to update paragraph 10.4.2 on disclosing detected contamination in the anti-contamination paper.

7.10 UKAS are only assessing against the codes of practice and not the appendices as no one has applied for extensions to these. There was a clarity issue for FSPs as to what they were being assessed against without incurring additional costs.

Action 13: Gill Tully to clarify with UKAS how the FSR appendices contribute to the UKAS assessments.

<u>Y chromosome short tandem repeats (Y-STR)</u>

7.11 A small working group was needed to do some work on DNA analysis using Y-STRs. The group would include Cellmark, LGC and one other Forensic Services Provider (FSP). John Wetton, Leicester University, and Denise Syndercombe Court of KCL would also take part. The group was to identify the issues, consider creating a document for Y STRs similar to that on DNA-17. Any resulting Y-STR data might be added to Y-STR Haplotype Reference Database (YHRD).

Action 14: A sub group on Y-STRs to be set up and a work plan devised.

<u>ISO 18385.2015 Standard</u>

7.12 The committee discussed the new ISO 18385:2015 standard on minimising the risk of human DNA contamination in products used to collect, store and analyse biological material for forensic purposes. At the last ISO standard PC272 meeting over 180 comments had been received for the committee to review and agree. A final draft had been agreed. As it was a minimum standard there were two additional UK requirements to ensure consistency with PAS 377 :

- for ethidium oxide treatment to either carry out post-production batch testing, or demonstrate effectiveness by using internal controls; and,

- if batch QC testing involved STR profiling then to amplify using an extra PCR cycle to that recommended by the manufacturer of the kit to test for contamination.

7.13 The ISO 18385:2 standard would partially replace the earlier PAS 377:2012 standard which specified consumables used for forensic analysis. June Guiness would communicate the update to HO Commercial for procuring against the new standard.

Item 8: Professional and Scientific Updates

Body Fluid Forum (BFF)

8.1 All were content with the update received from the Body Fluid Forum which listed its objectives and explained its activities in the last six months. In particular, BFF carried out collaborative work under the auspices of the Association of Forensic Science Providers (AFSP). June Guiness could forward any queries to them

European Network of Forensic Science Institutes (ENFSI)

8.2 Jim Thomson had presented on the DNA mixtures collaborative exercise at the ENFSI DNA working group in April 2015 and had circulated a copy to DNASG. It detailed the Regulators collaborative study in which five DNA mixtures of increasing complexity were presented to a number of DNA laboratories. The labs used their standard procedures to analyse the mixtures and present conclusions.

8.3 One suggestion from DNASG was that more complex exercises on analysis of DNA mixtures be carried out.

International Society for Forensic Genetics (ISFG)

8.4 ISFG would meet in September in Krakow for its 26th Congress. It would discuss in particular Next Generation Sequencing, mitochondrial DNA and related topics. Some members from the DNASG would attend the meeting.

The European Forensic Genetics Network of Excellence (Euroforgen)

8.5 There were six exemplar forensic research projects under way at Euroforgen. This research included use of different body fluids such as nasal mucosa and specific types of blood. It also covered phenotypic markers for ancestry testing, balding, hair morphology and methylation in different body tissues.

Item 9: AOB

9.1 Nicola Renwick reported details of a contamination problem with the DNA analysis kits supplied to Scottish police. They had noticed unusual results with their DNA analysis and had problems confirming details of the contamination with the suppliers although the supplied DNA kits proved to be the source of the contamination.

Action 14: Gill Tully to write to all DNA consumables manufacturers asking them to inform the FSR of any issues with their DNA analysis kits in future.

Item 10: Date of the next DNASG meeting

10.1 The next DNASG meeting would be held either in October or November 2015, shortly after the next FSAC meeting.

Action 15: The secretary to arrange the date for the next DNASG meeting which would be after the next FSAC meeting.

Annex A

Present:

Sue Pope	DNA Principal Forensics (Chair)
Stephen Doak	(for Dorothy Ramsbottom, FSI)
Ian Elkins	Crown Prosecution Service
June Guiness	Forensic Science Regulation Unit
Des Van Hinsbergh	Key Forensic Services
Brian Irwin	Forensic Service of Northern Ireland
Surryia Jagatiya	Home Office National DNA Delivery Unit
Shirley Marshall	Chartered Society of Forensic Sciences
Roberto Puch-Solis	Royal Statistical Society
Nicola Renwick	Scottish Police Services Authority
Adam Shariff	Home Office National DNA Delivery Unit
Denise Syndercombe-Court	International Society for Forensic Genetics
Jim Thomson	LGC Forensics
Huw Turk	Orchid Cellmark
Andy Ward	United Kingdom Accreditation Service

In Attendance

Ian Evett	Principal Forensic Services
Mike Taylor	Home Office (Secretary)

Apologies

Nic Clayson	Body Fluid Forum
Kathryn Dagnall	Metropolitan Police
Shazia Khan	Metropolitan Police
Ben Mallinder	Scottish Police Authority
Dorothy Ramsbottom	Forensic Science Ireland
Andrew Thomson	National DNA Database Delivery Unit