

International Criminal Police Organization

————— INTERPOL —————

INTERPOL HANDBOOK ON DNA DATA EXCHANGE AND PRACTICE

Recommendations from the Interpol DNA Monitoring Expert Group

First Edition
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PREFACE BY THE SECRETARY GENERAL

The *Interpol Handbook on DNA Data Exchange and Practice* is an official publication of the ICPO-Interpol. It has been produced in response to numerous enquiries from Interpol Member States about this powerful investigative tool. The Handbook should be referred to in all situations where DNA technology has to be used to assist ongoing national and transnational criminal investigations.

The main reference source for this Handbook was the "Final Report of the Interpol European Working Party on DNA Profiling" first presented to the 27th Interpol European Regional Conference in May 1998.

The recommendations in this Handbook have been formulated by the members of the Interpol DNA Monitoring Expert Group and promote the use of a standard DNA profiling technique as a powerful tool in criminal investigations. DNA profiling will provide a vital addition to the traditional techniques used for criminal investigations.

The overall aim of the Handbook is to encourage the police and forensic science services to make the most effective and efficient use of DNA profiling, both nationally and internationally. It provides recommendations relating to the practical use of DNA profiling in criminal investigations with a view to facilitating the international exchange of DNA data, and future international links between national DNA databases.

To maximize the benefits of using DNA profiling techniques, worldwide standards on DNA profiling, quality assurance, databases and training need to be defined. It is essential that standards be established and that rules on accreditation and auditing be applied at both national and international levels.

Such harmonization will facilitate the effective international exchange of DNA data to identify and combat national and international crimes. Linked criminal strategies can be analyzed and new criminal phenomena recognized. This will lead to more effective police management and corresponding savings in human, material and financial resources.

It is also hoped this Interpol Handbook on DNA Data Exchange and Practices will provide a link between the DNA profiling guides that already exist such as those from the Federal Bureau of Investigations in the United States, the Forensic Science Service in the United Kingdom and the Victoria Police in Australia.

Lastly I would ask you to send me your comments on this publication. This will allow me to take your professional viewpoint into consideration in the next update of the Handbook.



Ronald K. Noble

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in alphabetic order

2. TERMS OF REFERENCE

The purpose of the group is to set recommendations for international use of DNA by addressing the following areas:

- ☛ *Investigation of crimes and incidents*
 - Intelligence screens
 - Victim identification
 - Missing persons
- ☛ *Establishing protocols for the application of DNA*
 - Compatibility
 - Guidelines for facilitating quality assurance
 - Use of external proficiency testing
- ☛ *Databasing*
 - Data sharing and searching of profiles
 - Privacy
- ☛ *Facilitate training*
- ☛ *General awareness*
 - Consideration of social, privacy and ethical issues, in particular clarification of the use of non-coding regions
 - Scientific
 - Scene of crime
 - Legal
- ☛ *Providing assistance and support to developing countries a catalyst for the expansion of DNA applications*
- ☛ *Widening co-operation with law enforcement agencies, international leading societies and institutions dealing with or working on DNA profiling*

Through these terms of reference, the objective of the group is to act as an international point of reference facilitating the utilization and future development of DNA techniques.

INTERPOL DNA MEG
INTERPOL EUROPEAN
WORKING
GROUP ON DNA
PROFILING

ENFSI
EDNAP

PREPARATION OF
GUIDELINES

3. BACKGROUND

The Interpol DNA Monitoring Expert Group (Interpol DNA MEG) is the successor to the Interpol European Working Group on DNA Profiling. As the world's most important international police organization, Interpol recognizes the value of DNA profiling as well as its conclusiveness and is supporting this new investigative tool. The General Assembly, meeting in Cairo in October 1998 for its 67th session, recommended that the European Working Group should become a global one responsible for studying the use of DNA technology in criminal investigations. This was the beginning of the Interpol DNA MEG.

The Interpol European Working Party on DNA Profiling was originally established in 1996 to provide a forum where European experts on DNA profiling could meet to set up guidelines and recommendations with a view to promote the wider use of a standard DNA profiling technique in Europe.

Based on the experience from the countries already routinely using DNA profiling in their criminal investigations and taking into consideration the work already done in this field by other bodies such as the European Network of Forensic Science Institutes (ENFSI), the European DNA Profiling Group (EDNAP), the European Union Working Group on Police Co-operation and others, the Interpol European Working Party on DNA Profiling dealt with the following aspects of DNA profiling:

- technical and scientific requirements (DNA technology)
- principles for DNA sampling and evidence collection
- DNA databases
- categories of offenders
- quality control and accreditation
- legal aspects
- promotion and marketing.

The Final Report of the Interpol European Working Party on DNA Profiling was endorsed by the 27th European Regional Conference in Dubrovnik (Croatia), 13 to 15 May 1998 and then submitted to the 67th General Assembly Session (Cairo, 22 to 27 October 1998). The Working Party was instructed to prepare guidelines and recommendations with a view to promoting the wider use of a standard DNA profiling technique in Europe as a powerful tool in criminal investigation.

RECOMMENDATIONS

The Working Party based part of its research on the United Kingdom's and the Netherlands' experience in this field. The other countries represented on the Working Party also made a considerable contribution to the conclusions presented in the Final Report which recommended that:

- Member countries should use the powerful DNA profiling technique as a tool for criminal investigations and establish their own national DNA databases respecting the guidelines set out by the Interpol European Working Party on DNA Profiling in its Final Report, as well as the European Standard Set of loci recommended by the ENFSI DNA Working Group
- DNA databases of offenders and crime scene stains should be as comprehensive as possible in order to ensure maximum efficiency in terms of investigative requirements
- countries should adhere to the European standards for sampling, evidence collection and storage (as proposed by the ENFSI Working Group on Scene of Crime)
- countries should reconsider their scene of crime strategy in the light of experience which demonstrates what material can now provide a DNA profile
- all institutions involved in the chain of evidence regarding DNA profiling (Police, Forensic Laboratory, Prosecution) should implement a quality assurance system accredited by a National Accreditation Body
- countries should organize training, competence assessment and accreditation for those people involved in work with DNA evidence
- countries should exchange the DNA profiles via Interpol channels to assure the widest possible international co-operation in criminal investigations, with due respect for national legislation
- countries should develop an effective and dynamic national marketing strategy to ensure the creation and continuing success of their national DNA databases
- further developments in this dynamically changing field should be periodically monitored by an expert group, set up by the European Regional Conference; the group should be composed of both scientists and law enforcement representatives and should provide an update for the European Regional Conference every two years
- an international DNA users group conference should be organized by the expert monitoring group under the auspices of Interpol; the conference should be held approximately one year after the release of this report

- the work done by the Interpol European Working Party on DNA Profiling should be brought to the attention of all member countries by presenting it to the General Assembly; other regions should be encouraged, by a General Assembly resolution, to join the process of standardization of DNA profiling
- the Final Report should be brought to the attention of the widest possible range of scientific and law enforcement institutions playing any role in DNA profiling, and to any others who might benefit from its use.

INTERPOL DNA
HANDBOOK

This Final Report has now become the Interpol DNA Handbook on DNA data exchange and practice.

4. HISTORY

DECISION TO SET UP A DNA WORKING GROUP

The 25th European Regional Conference (Warsaw, 29 to 31 May 1996) requested that an Interpol European Working Party on DNA Profiling should be established because there was a need to promote good practice in the use of DNA profiling as an investigative technique within Europe. The Interpol European Committee therefore decided at its 15th Meeting on 5 November 1996 to set up a group of experts on DNA profiling.

A letter from the Secretary General dated 25 November 1996 (ref. 43-DNA/ELB/Nov/96) formally set up this Working Party. It comprised experts from Belgium, the Czech Republic, Germany, Hungary, Italy, Netherlands, Norway, Slovakia, Spain and the United Kingdom. In addition, two officials from the General Secretariat also participated in the Working Party's deliberations.

The Interpol European Working Party on DNA Profiling met on 27 and 28 January 1997, 5 and 6 June 1997, 27 and 28 October 1997 and 29 and 30 January 1998 in Lyon. The Working Party meetings were convened by the General Secretariat, which provided all the necessary facilities. All work of the Working Party was conducted in English. The Interpol European Committee closely monitored the Working Party's progress.

At its first meeting the Working Party discussed its terms of reference and all members gave their individual opinions on the main objectives of the Working Party. The participants exchanged views on the standardization of technology, minimal requirements for profile-exchange, DNA database architecture and categories of offenders to be included on any database.

INITIAL CONCLUSIONS

As a result of this general discussion, the Working Party reached some initial conclusions:

- DNA profiles are a powerful tool in identifying offenders and in their prosecution
- the Working Party should encourage all countries in Europe to introduce DNA technology, if this has not already been done
- the Working Party should consider, at a later stage, ways of helping countries to set up a forensic DNA technology
- attention should be paid to quality control and accreditation procedures.

The Working Party also recognized that DNA profiling could have a significant impact on crime investigations by:

- Establishing links between different scenes of crime
- linking offenders to scenes of crime.

EXCHANGE OF DNA PROFILES

It was therefore felt that the exchange of DNA profiles between European countries would improve international police co-operation and that the Working Party should examine the possibilities of such exchanges in addition to promoting the introduction of DNA technology.

There were two possible options:

- One large central database with DNA profiles only
- national databases (profiles, case information, etc.) with the possibility of exchanges using Interpol information technology.

In order to come up with recommendations for a model DNA database, the Working Party decided to build on the United Kingdom's experience with its database.

STANDARDIZING DNA TECHNOLOGY

The work done on standardizing DNA technology (requirements concerning DNA analysis, selection of loci, sampling and evidence collection methods) by other working groups (EDNAP, ENFSI) should be taken into consideration and the assistance of those groups should be sought in order to avoid duplication of effort and simplify administrative procedures.

The legal problems should be also discussed with a view to the further possible exchange of profiles.

The Working Party also agreed to deal with the promotion and marketing of DNA profiling among the law enforcement community, as well as among the wider public.

The second meeting (5 and 6 June 1997) dealt in detail with sampling and evidence collection, the principles for setting up DNA databases and the categories of offenders whose profiles should be included on such databases. The working programme was reviewed and modified to take account of the progress made by the Working Party.

The third meeting (27 and 28 October 1997) focused mainly on quality control and accreditation, the legal aspects of DNA profiling and the exchange of profiles, and the issues relating to the promotion and marketing of DNA profiling. During this meeting the Working Party also returned to the topics discussed at previous sessions and finalized its recommendations on them.

The fourth meeting (29 and 30 January 1998) was almost exclusively devoted to drafting the Final Report and discussing the future development in DNA profiling.

RECOMMENDATIONS FROM ENFSI

The Working Party's principal consultants on DNA technology were the ENFSI Working Group on DNA Profiling and EDNAP, the European DNA Profiling Group. For sampling and evidence collection, it consulted the ENFSI Working Group on Crime Scene Work and for quality control and accreditation, the ENFSI QA

Working Group. The recommendations of these groups were included in the Working Party's findings.

The exchange of information and development of activities with the European Union Working Group on Police Co-operation also had an impact on the Working Party's progress.

The Final Report of the Working Party was endorsed by the 27th European Regional Conference (ERC), held in Dubrovnik, 13 to 15 May 1998. The ERC drew up basic terms of reference for the Expert Group which was to be composed of both scientists and law enforcement representatives. The Expert Group was to:

- Periodically monitor the dynamically changing field of DNA analysis and provide an update for the European Regional Conference every two years
- organize an international DNA multidisciplinary conference including scientific, legal and police experts, under the auspices of Interpol; the first conference was to be held before the end of 1999.

INTERPOL EUROPEAN DNA MEG

The outcome of the discussions during the 27th ERC were presented by the Chairman of the Working Group during the 1st Meeting of the Interpol European DNA Monitoring Expert Group (Lyon, 31 August and 1 September 1998). The members of the Working Group agreed during this meeting to change the name of the Interpol European Working Group on DNA Profiling to the Interpol European DNA Monitoring Expert Group.

FINAL REPORT OF THE INTERPOL EUROPEAN WORKING PARTY ON DNA PROFILING

The Final Report of the Interpol European Working Party on DNA Profiling was discussed by the General Assembly in Cairo at its 67th session (22 to 27 October 1998). The Working Group was advised to take advantage of other countries' experience of DNA use in criminal investigations in order to achieve global harmonization. It was consequently agreed to invite representatives from all continents to join the Interpol European Working Party on DNA profiling.

EXTENSION OF THE EUROPEAN WG TO A GLOBAL ONE INTERPOL DNA MEG

During the 2nd Meeting of the Interpol European DNA Monitoring Expert Group, (Lyon, 21 and 22 January 1999) it was agreed to ask the Heads of the NCBs of Argentina, Australia, Japan, South Africa and the United States to send a representative to the next (third) DNA-MEG meeting, scheduled for 3 and 4 June 1999 at the General Secretariat in Lyon. The participants should be conversant with the subject, either being responsible for the DNA profiling itself or being users of DNA profiling results (senior CID officers, investigators, DNA database administrators, etc.). With reference to the ongoing extension it was also agreed that the Group should in future be known as the *Interpol DNA Monitoring Expert Group (Interpol DNA MEG)*. It was also decided to send a DNA questionnaire to all NCBs in order to get a global overview

NEW MEMBERS FROM OUTSIDE EUROPE

of the use of DNA profiling and the possibility of exchanging DNA profiles.

The first new DNA MEG member came from outside Europe and was a representative from the FBI laboratory in the United States. She was welcomed at the opening of the 3rd Interpol DNA MEG Meeting (Lyon, 3 and 4 June 1999). The final agenda for the 1st DNA Users' Conference to be held in Lyon from 24 to 26 November 1999 was thoroughly discussed and a detailed presentation was given on the first results of the DNA questionnaire, which had been sent to all 177 NCBs. The members of the DNA MEG were very pleased to welcome the new member from the United States. The other invited countries (Argentina, Australia, Japan and South Africa) had not been able to appoint a participant to the present meeting given such a short notice. The DNA MEG decided to invite those countries to the 1st DNA Users' Conference, 24 to 26 November 1999. The Chairman stressed the importance of taking advantage of the experience of other countries and of making every effort to achieve global harmonization of DNA profiles. The Group recognized the need for global harmonization of DNA profiles before plans could be made for any electronic DNA profile database. There would still be the possibility of setting up a DNA database at the General Secretariat.

1ST INTERNATIONAL DNA USERS' CONFERENCE

During the 1st International DNA Users' Conference (Lyon, 24 to 26 November 1999), 119 delegates from 47 different nations listened to 34 presentations given by 30 DNA experts from 16 different countries. The delegates were very satisfied with its organization, content and quality of the presentations given.

The Conference asked Interpol to act as the vehicle for transporting DNA-related information between forensic laboratories, scene of crime units and investigative units in different member countries via the NCBs and recommended:

- Using Interpol information technology for exchanging DNA profiles
- creating an Interpol DNA database at the General Secretariat
- produce a general reference handbook covering all the DNA-related subjects discussed at the conference; this would be of great assistance to countries with little experience of using DNA technology as an investigative tool (especially countries in Africa, Asia and South America).

CREATING AN INTERPOL DNA DATABASE

The Dutch Chairman of the DNA MEG unexpectedly announced his retirement as Chairman at the end of the Conference. The Secretary of the DNA MEG discussed the next step with the remaining members of the Group and it was decided to hold the next DNA MEG meeting in Innsbruck on 7 and 8 February 2000 and to look for a new Chairman in the meantime.

FINALIZATION OF THE DNA HANDBOOK

The 4th DNA MEG meeting was held in Innsbruck, Austria, 7 and 8 February 2000. The Head of the Austrian Central DNA Laboratory at the University of Innsbruck was elected as the new Chairman. The Group also welcomed three new members representing South America, Australia and the ENFSI. The most important results of this meeting were the new Terms of Reference, the production of a draft Interpol DNA Handbook, and the Recommendation on DNA Profiling by the Interpol DNA Monitoring Expert Group, following on from the Final Report on DNA Profiling. A Sub-Group on data exchange was also set up.

During the 5th DNA MEG meeting at Lyon, 18 and 19 May 2000, extensive progress in finalizing the Interpol DNA Handbook was made. Many new topics and modules were discussed and a title was adopted: "Interpol DNA Handbook - Recommendations on DNA Profiling by the Interpol DNA Monitoring Expert Group". It was agreed to approach DNA experts (police officers) from law enforcement agencies in Africa, the Near and Middle East and Western Asia with a view to having those regions also represented on the Expert Group in the future. The Sub-Group on DNA data exchange considered the situation with regard to the Interpol DNA Automated Search Facility (ASF) Database Project at the General Secretariat.

INTERPOL STANDARD SET OF LOCI: ISSOL

The 6th DNA MEG meeting took place in Melbourne, Australia, from 6 to 8 December 2000. The item on the Interpol DNA Handbook was again discussed at length. The title was changed to "Interpol Handbook on DNA Data Exchange and Practice". Another aim of the meeting was the review of the Interpol Database Project. A very important definition was adopted: the Interpol Standard Set of Loci - ISSOL. It provides the basis for input to the future Interpol DNA ASF Database and defines the minimum input criteria:

THE INTERPOL STANDARD SET OF LOCI - I S S O L		
Loci	Example	
VWA	15	20
TH01	3	6
D21S11	8	9.3
FGA	5	5
D8S1179	12	13
D3S1358	15	R
D18S51	13	15
Option		
Amelogenin	X	Y

The minimum input to the Interpol DNA ASF database is 6 STRs

R = rare allele which is not mentioned in the list of alleles accepted in the national DNA database(s)

A DNA expert, appointed by the NCB Pretoria and representing the South African Police Service, was elected as a new member of the Interpol DNA MEG. The Group agreed not to ask any other DNA experts to join the Interpol DNA MEG until the current members came to the end of their terms of office in the Spring of 2002.

2ND INTERNATIONAL DNA USERS' CONFERENCE

Arrangements for the 2nd International DNA Users' Conference for Investigative Officers, Lyon, 7 to 9 November 2001 were also discussed. The agenda will contain two main topics:

Topic I - DNA Databases

The programme will not focus on the basic science of DNA but will concentrate on DNA databases and their use in law enforcement. The following key points will be discussed:

- Implementation, development, and maintenance of DNA databases
- how to establish a DNA database
- experience of countries with established DNA databases, of those currently setting up DNA databases and of those planning to set up DNA databases
- links between DNA databases and other forensic databases
- expectations and limitations (information from scientists about the use of DNA technology as an investigative tool and its limitations).

Topic II - Case Studies

This topic will focus on the practical use of DNA techniques as a key tool for criminal investigations. Presentations will be given on:

- Cases involving organized crime offences, terrorist acts, murder, armed robbery, drug-related offences, sexual assaults (including pedophile investigations), illegal trafficking of human beings, vehicle crime, illegal trafficking of body parts, mass disasters and other cases of note
- Interpol DNA projects.

5. SOCIAL ASPECTS

DYNAMIC MARKETING STRATEGY

The members of the Interpol DNA Monitoring Expert Group are convinced that an effective and dynamic marketing strategy is fundamental to the establishment and continuing success of national DNA databases. Countries wishing to set up their own databases will gain maximum benefit from this initiative if they first develop their own marketing strategy. Those countries which already have their own database or whose plans to set up a database are well advanced, will also find that this approach offers significant advantages. An effective marketing plan will maximize interest in the project and create opportunities that did not previously exist.

PROMOTIONAL ACTIVITIES

This section will provide ideas and information on the various marketing and promotional activities that have proved useful in certain countries which have already developed their own databases. It will also outline a suggested marketing plan that incorporates the key elements for a successful strategy.

IDENTIFYING THE PRODUCT

IDENTIFYING THE PRODUCT

Publicizing and marketing any activity requires a clear understanding of the "product" to be created. In the case of a national DNA database, understanding, and therefore awareness, of its potential benefits for any country is likely to vary widely depending on each individual's personal knowledge and his/her particular responsibilities.

In some countries, the level of awareness among the general population may be very low or non-existent and be confined entirely to the scientific community in universities and forensic laboratories. Politicians, in particular, may be ignorant of its advantages for their criminal justice systems and the cost benefits it can provide in the investigation of crime.

In other countries, the overall level of awareness may be much higher but the political interest in a database may not exist. As a result of this, there is a lack of progress, inadequate funding often being a key factor. Where sufficient funds have been made available, or where there is already the political interest, effective marketing will serve to further heighten awareness wherever necessary.

Consequently, identifying the "product" may involve establishing a primary level of awareness amongst the target audience (see below) to create a demand for a database. For example, to gain the interest of a legislature that has previously resisted the idea of setting up a database, it may only be necessary for those who are knowledgeable on the subject (e.g. forensic scientists and police

officers) to lobby politicians and thus create an awareness of the subject.

LEVEL OF AWARENESS

That primary level of awareness will be different for each target group. For example, politicians will not have the same requirements as police officers. Political considerations and the wider interests of justice may be paramount for a government but of less interest to those responsible for the investigation of crime. Police officers are likely to be more attracted to the practical benefits that a database can offer, such as the speedy elimination of suspects or the significant increase in the evidential value of crime scene material.

Countries that have not yet considered establishing a database are therefore urged to mobilize all the parties concerned to create that primary level of awareness, particularly amongst politicians and senior police officers.

In the case of politicians the aim should be to obtain a commitment to introduce any necessary legislation and then ensure that commitment is kept. Senior police officers have a key role to play during this phase. Some may themselves have little knowledge of the benefits of a database and may need to be "educated" before they can in turn impact on politicians. The MEG's rule will be to provide support to each of these groups.

MEDIA INTEREST

The media will also have an important role to play at this stage. It is likely that they will be aware of high profile cases in other countries where the benefits of DNA technology have been obvious and can therefore usefully create pressure in support of the view that a database is not just desirable but essential for all Interpol Member States, the theme being - "Would our country want to be left behind?"

Providing the press with details of successful cases from other countries may be particularly helpful. This, coupled with briefings on progress and new developments, will maintain a high public profile for the topic.

NEED FOR A DNA DATABASE

Once the basic need for the database has been established, other groups may have to be targeted to raise their awareness of the benefits of a database and of its advantages for all. The general public should not be ignored in this regard. Their own level of knowledge may be limited to the use of DNA in paternity cases, or they may only have heard that science can now identify the ancestors of some ancient dynasty. Creating an awareness that DNA technology can be a very effective weapon in the fight against crime can make the public a powerful ally, as everyone is a potential victim.

TARGET GROUPS

TARGET AUDIENCE

Having identified the "product" in the eyes of those who are in a position to initiate change, the focus of attention can then turn to identifying, and impacting on, those target groups that may be able to lend their support. This advice reflects the experience of the databases of certain highly developed countries in this field, and is considered vital to this phase of the process.

The level of awareness within any criminal justice system will vary enormously and each group of people concerned will have different requirements. The following groups can be identified:

Medical Personnel

Doctors who are employed by police, including pathologists involved in post-mortem examinations, may be unaware of developments in DNA technology and the value of DNA as evidence. It is essential to ensure that samples are collected in the most satisfactory way.

Investigators

THE PRINCIPLE BENEFICIARY: POLICE AND JUSTICE

The police will be the principal beneficiary when DNA technology is used to assist criminal investigations. But it is not just senior police officers that should be aware of its potential. The first officers are the crime scene together with scene of crime officers (both police and civilian) will require re-training and the concept of using DNA technology as an investigative tool should become a standard item in the training given to new police recruits.

Senior officers can be powerful allies in this regard and they can lobby politicians very effectively. They should therefore be strongly encouraged to create a "DNA culture" within their police services, and possibly even in some justice departments.

Scientific establishments

Scientists and staff at forensic laboratories, together with lecturers and students at university departments teaching related subjects will all benefit from the input of other professionals, such as police officers and prosecutors, who use DNA technology in the course of their investigations. It is to be hoped that interest among university students will spark a willingness to promote the subject in whatever field of science they undertake as a career, thereby creating a further demand for both improvements and maximum usage.

Judges and Prosecutors

In particular - Judges, court staff, prosecutors and other officials in the trial process will benefit from:

- Personal briefings
- publication of articles on DNA technology in their professional journals
- involvement of DNA scientists in their forensic training
- regular meetings with prosecutors to promote the value of DNA in ongoing and future investigations.

General Public

LAWFUL ACTIVITIES

As DNA technology is a relatively new development, the public at large may fear a threat to their lawful activities. Promoting the positive aspects of DNA as an investigative tool is an effective way of minimizing any fears that DNA may pose a threat to civil liberty and natural justice. It needs to be understood that the greatest application of DNA technology has been the elimination of innocent persons who had been suspected of being involved in a crime. Some consideration should also be given to ethical issues, notably clarification of the use of non-coding regions.

Once again, positive briefing of the media will help counter any such fears and ensuring that successful prosecutions in high profile cases are given maximum publicity will create a better understanding of the incontestable aspects of the science. Lectures by DNA scientists and other practitioners to a range of public organizations will also be helpful.

Publicity

Once a database has been established and is in operation, the need for effective publicity will still exist. For example, politicians will need to be re-assured that their money has been well spent and that the best possible value for money has been achieved. The lack of immediate results may require regular explanation.

EFFECTS

Judicial officers and lawyers (particularly defense lawyers) will challenge DNA evidence in every case and scientific experts presenting DNA evidence in court must therefore ensure that the evidence presented is the best possible.

An intelligence database can only be effective if it contains unsolved crimes that are to be systematically compared against offender's samples. This needs to be understood by the police who therefore will be responsible for collecting not only samples from individuals but also those from unsolved crimes.

The following are recommended as options:

- Training material such as videos and reference books
- posters for both public and specific audiences
- media briefings
- internal (police) publicity of DNA cases of particular interest

- visits to DNA laboratories
- articles in professional journals
- presentations to interested groups
- publication of a DNA newsletter (particularly useful as a database is set up)
- management information for the police on the effectiveness of different samples from either crime stains or from offenders
- proactive educate investigating officers about new developments.

INTERPOL WEBSITE ON THE INTERNET

WEBSITE NEWS

The Interpol website on DNA profiling is accessible at the address "<http://www.interpol.int/>" under the topic *Forensic*. This website contains general information on Interpol DNA projects, the activities of the Interpol DNA Monitoring Expert Group and updated information on Interpol DNA conferences and meetings. Links to relevant external websites are also available.

6. THE USE OF DNA TECHNIQUES FOR CRIMINAL INVESTIGATION

INTRODUCTION

CRIME SCENE MANAGEMENT

The effective and efficient examination of the crime scene in major enquiries, such as homicide, is recognized as one of the critical steps in the investigation. Recent advances in science and technology have further demonstrated the importance of the crime scene as a source of information that will lead to the perpetrator and provide evidence for subsequent court proceedings.

PRESERVING EVIDENCE

Preserving evidence is a very complex task and requires securing, recording and examining the scene of crime even before any samples are collected. The increased sensitivity of DNA technology has meant that enhanced crime scene examination management is essential to ensure that appropriate anti contamination precautions are adopted at all times.

PREVENT CONTAMINATION UNBROKEN CHAIN OF EVIDENCE

A crime scene search is a carefully planned and coordinated operation carried out by law enforcement officials within a strict legal framework in order to locate physical evidence. The best strategy in each case will depend on local circumstances. Searching for DNA evidence at the scene of crime is little different from searching for any other type of physical evidence. All possible precautions must be taken to prevent contamination and the record must show an unbroken chain of evidence from crime scene to examination site to court room (see anti contamination guidelines).

REFERENCE TO CRIME SCENE INVESTIGATION MANUALS

This handbook will not discuss the different approaches and techniques for crime scene work because that is primarily a matter for the specialized national or local law enforcement training bodies and many excellent manuals on crime scene work have been produced world wide. Further advice on obtaining such manuals can be obtained from the MEG.

THE CAPABILITY OF DNA PROFILING

DNA PROFILING TO SAVE RESOURCES

With its capability to implicate or eliminate, DNA profiling offers investigators a powerful new tool as they seek to unravel criminal cases. DNA profiling is therefore a vital addition to the techniques traditionally available to investigators. Linked criminal strategies can be analyzed and new criminal phenomena recognized, resulting in more effective police management and corresponding savings in human, material and financial resources.

DNA IN GENERAL CRIME SCENES

OCCURENCE OF DNA

DNA profiles can be obtained from most biological materials such as blood, tissue, bone, semen, and faeces. The improved sensitivity of DNA technology has meant that profiles can now be obtained from contact traces even after minimal contact between a person and the object. Examples of contact traces are fingerprints, ear prints, facial contact smudges, saliva on drink cans, material expelled from coughing and sneezing.

ALL CRIME SCENES

The potential for recovering DNA trace evidence must be borne in mind when investigating all incidents of criminal activity. In cases of missing persons, mass disasters or unidentified bodies DNA offers the opportunity of body identification.

7. INTELLIGENCE LED DNA SCREENING

Confidential

8. THE INTERPOL DNA DATABASE AND EXCHANGE OF DNA PROFILES

INTERNATIONAL DNA DATABASE

Interpol is proposing to establish an international database of attributable and non attributable DNA profiles (i.e. from crime scene samples and reference samples) for use by its Member States. Countries will be able to add profiles from their national or regional databases and compare their profiles with those supplied by participating Interpol Member States. The system will allow three types of search: reference sample/ reference sample, crime scene/ reference sample and crime scene/crime scene. Investigators/scientists will be able to access the database from the NCBs, using an Interpol Internet browser interface developed by the General Secretariat.

PROFILES CONTROLLED BY NCBs LIST OF DNA LOCI ACCEPTED

The DNA profiles in the database will be the property of the Member States supplying them and control of the data will be through their local NCBs. Mixed profiles will not be stored in the database, only profiles containing at least six of the seven loci in the Interpol Standard Set of Loci (ISSOL) will be stored. A list of recognized loci has been produced by the Interpol DNA MEG (see appendix). Only loci on that list will be permitted. The system will compare all additions to the database with the profiles already stored. If a matching profile is found, the system will alert the Member States involved. It will be the responsibility of the Member States receiving positive replies to act on the information provided. Interpol can not vouch for the quality of the DNA data provided and so will include a warning in its reply indicating that the information given is subject to confirmation from the Member States concerned.

HOW WILL THE SYSTEM WORK?

Member States will have the option of submitting DNA profiles for addition to the Interpol DNA database via the NCBs, and will be able to make subsequent searches.

ACCORDANCE WITH NATIONAL LAWS

Member states must ensure that the transfer and searching of DNA data processes are in compliance with the national laws. The information will be processed in compliance with the Interpol rules and regulations.

Access to the Interpol DNA database will be agreed by Member States in compliance with national legislation including Data Protection Acts and police codes of practice. Member States will also be able to restrict access to their DNA profiles to specified countries or law enforcement agencies where appropriate. Participating Member States will be responsible for the maintenance of the data including the regular removal/weeding

of profiles and it will not be possible for a country to delete or amend information supplied by another country.

WHAT DNA PROFILES SHOULD BE SUBMITTED?

TRANSNATIONAL INVOLVEMENT

The NCBs should submit all DNA profiles where there is thought to be some connection with transnational crime. The Interpol database is not intended to be a substitute for countries' national databases. The only profiles submitted should be those of known criminals operating internationally or those of unknown stains found at crime scenes when it is suspected that the offender might be a foreign national.

How should the DNA profiles be sent to the General Secretariat?

TRANSMISSION OF PROFILES

In the first instance the DNA profiles should be sent electronically to the General Secretariat via the Interpol communications system. In the absence of electronic systems then these profiles should be sent as a hard copy by fax. The recommended minimum number of loci must be respected (see the Interpol Standard Set of Loci – appendix) and all requests which do not meet the required standard will be returned unprocessed.

Result list

ALERT SYSTEM

The requesting Member State will receive a reply for each search that is made. If the search cannot be made the reply will indicate the reason. In the case of a match with a profile already stored in the Interpol DNA database all the Member States concerned will be notified that a match has been made. It will be the responsibility of the NCBs in those States to contact each other and decide what action should be taken as a result of the match. Interpol's reply will state that the information provided has to be verified with the country of origin before any action is taken.

Launch date

The Interpol DNA database should be brought into service during 2001.

Requests for DNA Profile Search in National or Regional DNA Databases via the NCBs

SEARCH REQUEST FORM

In response to numerous enquiries from Interpol Member States a standard form for the international exchange of DNA profiles has been produced. The Interpol DNA profile search request form should help to avoid transmission errors and facilitate the global exchange of DNA profiles for crime investigation purposes.

9. QUALITY ASSURANCE

Adherence to quality assurance procedures and the use of trained personnel for each step of the chain of evidence (scene of crime - forensic laboratory - court room) are essential elements of a forensic DNA program

Good management of the following should be the normal practice:

- Competence requirements and job descriptions for all personnel at the scene of crime, the forensic laboratory the interface between the scene of crime and the laboratory, and in the legal process
- training for all personnel involved in the different stages of the law enforcement chain, including the need for confidentiality, and concluding with an effective process for regular competence assessment and certification
- quality systems including procedures for sample receipt, handling exhibits, managing accommodation and equipment, test methods and reference materials, record keeping, the interpretation of scientific findings (where permitted by the national justice system), the production of reports and the monitoring of laboratory performance. The whole process has to ensure the chain of custody.

Forensic laboratories and DNA database

The forensic laboratories and the DNA database in any country should be accredited or in compliance with standards such as the new International Standard Organization (ISO) Guide ISO/IEC 17025 (which is to be introduced by 2002). Existing standards such as ISO guide 25, the ISO 9000 series EN 45001 and the UKAS M10 standard in the UK are embraced in the new ISO Guide ISO/IEC 17025. Additional information relevant to forensic DNA profiling should also be considered. Examples of such guidance are NIS 46 (shortly to be replaced with ILAC guidelines) (UK), NIS 96 (Lab 32) (UK), NATA DNA Guidelines (Australia). For Europe, the European Network of Forensic Science Institutes (ENFSI) DNA Working Group has developed a DNA Quality Assurance Program that outlines all of the requirements to be addressed for compliance with ISO/IEC 17025. In the United States there are now National Standards issued by the Director of the FBI which are also available for consideration. The latter standards and supporting documentation require the use of common key materials, quality control samples and proficiency tests to achieve and to demonstrate good performance and the compatibility of data.

NATIONAL ACCREDITATION BODIES

National accreditation bodies which conduct quality assurance audits exist in many countries. Examples are UKAS (United Kingdom), Raad voor Accreditatie (Council for Accreditation, The Netherlands), American Society of Crime Laboratory Directors Laboratory Accreditation Board (ASCLD-LAB), National Forensic Science and Training Center (NFSTC-USA) and SWEDAC (Sweden, National Association of Testing Authorities (NATA-Australia), BELTEST (Belgium).

Scene of crime

STANDARD FORMATS

All procedures regarding scene preservation, control and recording should be fully documented and available to all police and other forensic personnel who have legitimate business at scenes of crime. There are international standard formats for documenting these procedures under the ISO Guidelines and while it is not essential to use them, they serve as a ready and uniform platform for this purpose and are recommended as a good starting point. The detail of the process will be left to each specific police agency but the principles underlying the process must be in compliance with standards such as ISO/IEC 17025. In addition standards of performance and assessment guidance for crime scene management have been developed in Europe, further details may be obtained from Interpol.

Quality assurance in the law enforcement chain

Quality principles need to be applied to every part of the law enforcement chain (crime scene/suspect, laboratory, investigative process, court room). Quality management models provide the opportunity to benchmark comparable organizations on their performance and ensure continuous oversight and improvement.

10. FUTURE DIRECTIONAL WAY FORWARD

The greatest impact of DNA technology has been its use in criminal investigations where its application has resulted in the elimination of innocent individuals. It has changed policing procedures to such an extent that substantial resource savings have been made from the efficient prioritization of lines of enquiry. Where national legislation has enabled the establishment of national DNA databases, these databases have provided both intelligence and evidence from DNA. The benefits have meant that many offences, particularly rape and homicide, would never have been detected, and the offenders convicted, if the DNA databases had not existed.

DNA profiling is a new powerful technology but does not replace other technologies such as fingerprints, fibres etc. However, because of its superior discriminating power it should be the technology of choice and used in parallel with other technologies. Ideally, the forensic DNA laboratory should be developed within a multidisciplinary forensic structure in order to maximize the use of evidence from scenes of crime.

The Interpol DNA MEG makes the recommendations summarized as follows:

- the powerful DNA profiling technique should be used as a tool for criminal investigations.
- a national DNA database should be established following the recommendations given.
- the sampling of offenders and crime scene stains for inclusion on the DNA database should be as comprehensive as possible in order to ensure maximum efficiency in terms of investigative requirements. In addition, the structure should be flexible in order to accept future developments in technology.
- countries should develop an effective and dynamic national marketing strategy to ensure the creation and continuing success of a national DNA database. DNA technology and associated improvements to techniques are changing so rapidly that all countries need to move forward in order that Criminal Justice Systems benefit from these advances.
- scene of crime management strategies should be reviewed in the light of the increased sensitivity of DNA technology;
- all institutions involved in the chain of evidence regarding DNA profiling (Police, Forensic laboratory, prosecution) are advised to implement a quality assurance system that is accredited by a National or International Accreditation Body. The MEG will widen the co-operation with law enforcement agencies, international leading societies and institutions

dealing with or working on DNA profiling. This should enable the development of a more uniform standard approach to the investigative techniques and in due course to the routine sharing of DNA data internationally

- countries should organize training, competence assessment, and certification as well as continuing education of all people involved in work with forensic evidence, in particular with DNA. It is essential that those individuals who attend the scene of crime receive the necessary forensic awareness training.
- countries are encouraged to exchange the DNA profiles via Interpol channels to assure the widest possible international co-operation in criminal investigations with respect to their national legislation.
- countries should develop an effective and dynamic national marketing strategy towards the legal system and the public to ensure the creation and continuing success of their national DNA database. DNA technology and associated improvements to techniques are changing so rapidly that all countries need to move forward in order that Criminal Justice Systems benefit from these advances.

INTERNATIONAL FOCAL POINT

The Interpol DNA MEG will act as an international focal point to facilitate the world-wide utilization and future development of DNA techniques. Initially this will be achieved via future DNA Users' Conferences where specific issues will be targeted in order to address the different requirements of users.

In addition the MEG will act as the contact point for all users ensuring that appropriate advice and support is available to developing countries/laboratories. Recommendations on the implementation of new DNA technologies will be made via the DNA MEG and adhere to internationally agreed standards.

1. WHAT IS DNA PROFILING

Deoxyribonucleic acid (DNA) is the genetic material that resides in nearly every cell within the human body. DNA may be stored within the cell in different areas of a cell. Nuclear DNA is found within the nucleus of the cell and half of the DNA is inherited from both mother and father, except the DNA based on the male Y-chromosome, which can only be inherited through the paternal line. Mitochondrial DNA is found in the organelles of the cell known as mitochondria and is only inherited through the maternal line. Though these two types of DNA differ in source and function, structurally, they are similar. Both types of DNA may provide valuable evidence in criminal investigations, however, the national DNA databases and the Interpol DNA database to come include nuclear DNA information only. The process known as DNA profiling begins when DNA recovered from minute samples taken from evidential human tissue or body fluids such as blood or semen is analyzed; 'typed' and 'profiled' are synonyms in this respect. The resulting profile is a series of alpha numeric codes that can be compared to reference or known standards fairly easily and ultimately stored by a computer. If sufficient areas of the DNA are typed, the final profile may be relatively unique for each individual, or the paternal/maternal line respectively.

PROFILING DNA

Today, DNA profiling is relatively straightforward. The process includes: collecting samples from the scene of the crime and reference samples from the victim(s) and suspect(s); extracting, purifying and quantifying DNA from all the samples; copying or "amplifying" short segments of the DNA; visualizing the fragments; analyzing and transforming the results into numeric codes and comparing them visually or by the computer.

NON-CODING AREAS

All DNA systems referred to in forensic analysis focus on the non-coding areas of the genome. This means that this systems do not include information about physical or psychological characteristics, diseases or disposition of diseases.

HISTORIC REVIEW: RFLP

In 1985, Dr. Alec Jeffreys first described the DNA "fingerprinting" technique. The technology using Restriction Fragment Length Polymorphisms (RFLP typing) was the initial method used in forensic DNA testing and it was adopted for use in several countries. Because it requires a high amount of non-degraded DNA, the RFLP technology is no longer the preferred approach in the majority of forensic DNA testing laboratories. The following information concerning the RFLP methodology is included because some of the principals applied in RFLP testing are applicable to the more current technology.

RFLP testing was based on the analysis of segments of human DNA known as highly variable regions that exist in the human genome. This variation consists of variable numbers of tandem repeats (VNTRs) at different locations or loci (the singular form of loci is locus) of the DNA. A repeat is a specific sequence of a number of base pairs. A variant of the number of repeats on a locus is called an "allele".

TANDEM REPEATS

The simultaneous detection of tandem repeats by a radioactive or chemo luminescent multi locus probe, both within a locus and between several loci, results in a multiple banding pattern, the similar to a bar code pattern. This banding pattern is relatively unique to each individual. The resulting DNA patterns in body fluid mixtures were complex for interpretation. The use of a single locus probe (SLP) for the detection of only one locus at a time was an important step forward in DNA fingerprinting as it resulted in simple patterns of either one or two bands at a time. By investigating with several single locus probes, one after another, a series of band profiles was generated. The resulting combination of band profiles provided a discriminating power equal to the multi locus probes. Radioactive detection was replaced by chemo luminescent detection yielding a more rapid method for routine identification of forensic biological stains .

TODAY'S TECHNOLOGY: THE PCR TECHNOLOGY

POLYMERASE CHAIN REACTION

A method known as the Polymerase Chain Reaction (PCR) is used to amplify or copy regions of DNA and this enables DNA profiles to be obtained from trace amounts of DNA. The PCR process so revolutionized the field of molecular biology that the inventor, Dr. Kary Mullis, received a Nobel Prize for his discovery. Using the PCR process, millions of copies of selected segments of the variable DNA are produced and are available for profiling or typing.

The significant advantage of the PCR method over RFLP testing is the small amount of DNA required for characterization. The DNA amplification technique is also fast and extremely useful for obtaining DNA profiles from degraded or partly decayed biological samples. For these reasons, PCR based testing has become the standard practice in most forensic laboratories.

Typing of short tandem repeat (STR) loci (i.e. stretches of repetitive DNA in which the polymorphic repeat units generally consists of two to five base pairs) by PCR is now the preferred technology for the identification of human DNA. Tetranucleotide and pentanucleotide tandem repeats appear to be most robust for PCR based typing. These STR's can reliably be amplified from even sub nanogram quantities of DNA. Separation of the amplified fragments is performed either by gel or capillary

electrophoresis. Simultaneous amplification of STR loci using multiplex PCR technology and automated detection of the DNA fragments provides a rapid and sensitive system with high sample throughput and power of discrimination.

MITOCHONDRIAL DNA (mt-DNA)

MT-DNA IN SPECIAL CASES
ONLY

Depending on the type of evidence, and in the context of forensic DNA analysis there are several important advantages to the use of mitochondrial (mt-DNA) as an alternative choice for DNA amplification and analysis. Because there are a high number (more than 1000) of mt-DNA copies per cell, high sensitivity is inherent in the mt-DNA test.

Mitochondrial DNA analysis can be used in cases where only a limited amount of high quality nuclear DNA can be obtained from the evidential sample. For example, extracts of bones, teeth and hairs can contain such a small amount of nuclear DNA that they fail to give a complete STR profile. In this context, mt-DNA analysis is particularly useful. Several studies have showed that the sequencing of amplified stretches of mt-DNA is a valid and a reliable method of forensic testing. Mixtures of body fluids are unsuitable for mitochondrial analysis and comparison between mitochondrial and nuclear DNA profiles is not possible.

One feature of mt-DNA analysis is that, besides siblings, all maternally relatives share the same mt-DNA sequence; this means that within such groups, individuals cannot be identified separately. As a result of this, family relationships are recognized very easily.

Potential drawbacks of the technique are its complexity including possible heteroplasmy, and its extreme susceptibility to background contamination. Additionally, it is time and cost consuming and the results have less discriminatory power than results obtained from typing genomic DNA.

THE PERFORMANCE OF THE FORENSIC DNA LABORATORY

RIGOROUS PROCEDURES
FOR SAMPLE HANDLING

The forensic laboratory must have the rigorous procedures for sample handling. Although a minute risk of error exists in a forensic setting where manual operations are inherent to the process, it is important that forensic laboratories use a high degree of documentation and adhere to strict quality control practices to minimize this risk.

Contamination of the crime sample by the investigative or laboratory personnel may result in an incorrect interpretation. Therefore guidelines and training concerning the sampling at the scene of crime, preservation and delivery of biological evidence to

the laboratory are necessary to ensure the chain of evidence and to guarantee the integrity of the sample (see appendix).

The critical success factor for the performance of the forensic DNA laboratory is the full application of the principles and rules which are referred in the chapters Quality Assurance and Training.

POPULATION GENETIC ISSUES

There has been a lot of controversy on how to express the strength of the evidence in the forensic report when the incriminating DNA profile matches the suspect's profile. To assess this the forensic scientist has to calculate the frequency of the DNA profile obtained and/or the probability that the incriminating DNA profile matches that of a randomly selected innocent person.

Alternative approaches have been developed to address these problems i.e. National Research Council NRC II, National Academy Press, 1996 and European Network of Forensic Science Institutes ENFSI Guidelines.

DNA profiles are created by analyzing inherited loci. The frequency of the DNA profile in a random population may be based on Bayesian statistical rules.

Generally speaking, when the DNA profile of the incriminating stain and the suspect match at a large number of loci, it is reasonable to presume that the crime stain could have come from that person.

HARMONIZATION OF THE DNA TECHNOLOGY WORLD-WIDE

HARMONIZATION OF QUALITY ASPECTS

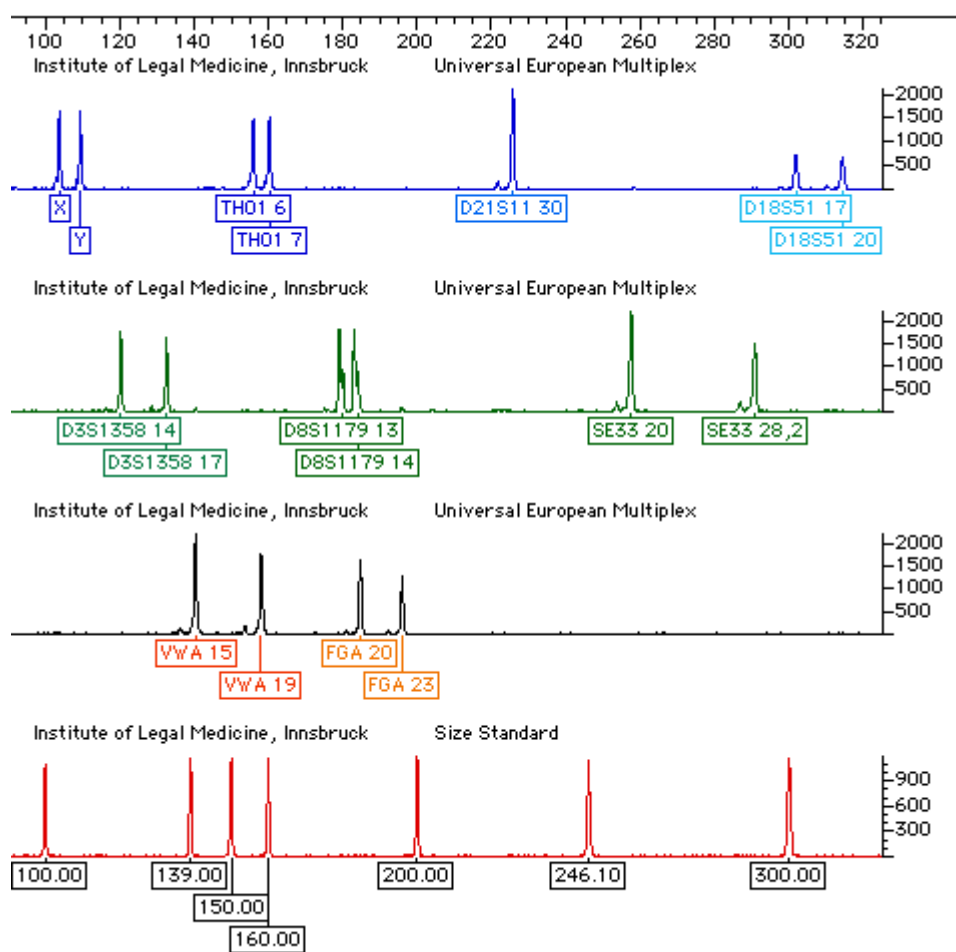
International criminal investigation requires that the qualitative aspects of the DNA investigation be the same in the various countries so comparable results can be exchanged. National databases have to be based on the use of standardized DNA loci and internationally acknowledged quality control and quality assurance systems.

Different working groups have achieved considerable progress in standardization. In 1989 the European DNA Profiling Group (EDNAP) initiated a series of experiments to achieve common standards on nomenclature. Standardized methodology has been developed by the DNA Working Group of the ENFSI (European Network of Forensic Science Institutes). The ENFSI working groups on Quality Assurance and Scene of Crime are also contributing with respect to harmonization of the DNA technique. In addition to EDNAP and ENFSI in Europe, groups such as the Scientific Working Group on DNA Analytical Methods (SWGDM) in the United States and the National Association of

Testing Authorities (NATA) in Australia have addressed these issues.

DNA PROFILE

A DNA profile is a computerized alpha-numeric value obtained from the visualized output of the DNA analytical process. An example of such a DNA profiling result investigating eight loci is shown below:



This profile is added to the database and is ready to be searched or exchanged in the following format:

VWA		TH01		D21S11		FGA		D8S1179		D3S1358		D18S51		Amelogenin		ISSOL [®]
15	19	6	7	30	30	20	23	13	14	14	17	17	20	X	Y	
TPOX		CSF1P0		D13S317		D7S820		D5S818		D16S539		D2S1338		D19S433		other loci
PentaD		PentaE		FES		F13A1		F13B		SE33		CD4		GABA		other loci
										20	28.2					

Figure shows a typical DNA profile of the seven Interpol Standard Set of Loci (ISSOL) plus an optional locus.

The choice of the set of loci used in the DNA technology has a crucial influence on the profile obtained. Therefore, to facilitate exchange of DNA profiles, a minimum set of loci (so-called core loci) should be used in every forensic laboratory.

2. DNA SAMPLING AND EVIDENCE COLLECTION

These guidelines indicate what is required to produce DNA sampling kits and outline the procedures of sample collection for DNA analysis. The advice given applies to the investigation of all crimes where body fluids are deposited, such as sexual offence cases, robberies, burglaries, etc. Collection of the samples should be undertaken by authorized persons only and according to legal or police procedures these persons can be physicians, scene of crime officers, or other competent police officers. The administration and transportation requirements are also addressed.

DEFINITIONS

Crime stain/sample

Evidential material deposited at the scene of a crime.

Contamination

The accidental pollution of the crime stain with other biological substances. This could have occurred as a result of touching, sneezing or speaking over the crime stain/sample.

Control sample

A control sample is a sample taken from an area adjacent to the crime stain.

Swabs

Sterile swabs which are to be used for the recovery of biological samples from individuals and or crime scenes.

Blood device

Sterile devices (tubes, containers or other items) which are to be used for the recovery of biological samples from individuals and or crime scenes.

Tamper evident bag

Plastic bag (preferably breathable bag) which once sealed will indicate if the seal has been interfered with in any way.

Breathable bag

Plastic or paper bag which allows moisture to pass through the bag thereby enabling damp/wet samples to dry out within the bag without deteriorating/degrading.

Reference sample (Synonym: Person sample)

Sample provided by a known person, for instance a victim or suspect for DNA analysis.

Elimination sample

Samples provided by all personnel involved in the forensic process. These would include police, all forensic personnel attending scene of crime, other persons having legitimate access to the scene of crime (e.g. legal officers, emergency services), and laboratory staff. The DNA profiles from these individuals will be used to eliminate innocent or accidental contamination of the crime stains

PERSONAL PROTECTION GUIDELINES

- All body fluids should be regarded as potentially infective.
- Cover any cuts or grazes on hands with waterproof dressings.
- Wash hands often especially when beginning or ending a new task, before break or meal times, before smoking, and at the beginning and end of duty periods.

DISINFECTION GUIDELINES

Commercial thick bleach can be used for spillages of biologically hazardous materials. This should be left in contact with the contaminated area before rinsing and wiping dry.

For general disinfection e.g. work surfaces after handling biological specimens a 1 in 10 dilution of commercial thick bleach should be used as above. It should be noted that dilutions of thick bleach do not remain effective for periods in excess of a few days. An alternative good cleaning solution is Microsol 3'.

SPECIFICATION AND CONTENTS OF DNA REFERENCE SAMPLING KITS

A DNA reference sampling kit needs to contain at least the following items:

- Documented check-list
- Sterile sampling system for the taking buccal cells, blood or hairs
- Unique numbered and/or barcoded seals, forms and sample containers
- Pair of disposable gloves
- 1 x tamper evident bag/container (for return of sample)
- Documented sampling instructions and guidance

Instructions and Guidance for Taking DNA Reference Samples

The person taking the sample must wear the gloves provided throughout the whole sampling procedure.

Open the sampling kit and assure that the kit is complete by checking off each item against the check-list provided. Follow the sampling instructions.

If at any time during the sampling process the sample taken is dropped or comes into contact with any other surface the procedure should stop and the sampling kit disposed of. Samples will then be taken using a new DNA sampling kit.

Once the samples have been successfully taken collect up the wrappers and gloves and dispose of these using designated receptacles.

Insert the details of the donor and other necessary information on the form provided.

Place the form together with the samples in the tamper evident container, store and send to the laboratory as per legal instructions.

SEXUAL OFFENCES MEDICAL EXAMINATION KITS

The contents of sexual offences medical examination kit is for police surgeon use only.

A sexual offences medical examination kit needs to contain at least the following items:

- Instruction booklet
- Breathable evident bags/containers which are unique numbered or barcoded
- 1 x large sheet of paper in a polythene bag
- Pair(s) of disposable gloves
- Plain sterile cotton swabs
- Cocktail sticks in small self-seal polythene bags for fingernail scrapings
- Combs in polythene bags for hair combings
- Self seal bags (for swabs, hair samples, blood and saliva bottles etc)
- A form with relevant information on the victim or suspect

Packaging material for clothing should be made available by the police.

Instructions and Guidance for Medical Examinations

Separate medical examination kits must be used for each individual. The medical examination kit will contain explicit

examination instructions and a medical examination form which should be completed at each examination.

This kit will address the provision of a reference sample in addition to the crime stains from the victim/suspect.

CONTENTS OF SCENE OF CRIME STAIN SAMPLING KITS

The contents of scene of crime sampling kit are to be used for collecting blood, semen, saliva and other biological stains only.

A scene of crime sampling kit needs to contain at least the following items:

- Documented check-list
- Instructions on the use of the sampling kit
- Breathable tamper evident bags/containers and/or cardboard packaging, which are unique numbered or bar-coded
- Sterile (self wetting) swabs (extra swabs available if necessary)
- Sample/vial of sterile water
- Pair of disposable gloves
- 1 x Form/label with relevant information on the sample (chain of custody).

Sampling procedure for scene of crime samples

The person taking the sample must wear the gloves provided throughout the whole sampling procedure. Masks should be worn if suffering from a cold.

Open the sampling kit and ensure that the kit is complete by checking off each item against the check-list provided.

Take one of the sterile swabs taking care to hold the stem end of the swab. Either activate a self wetting mechanism or moisten swab with a minimal amount of the sterile water provided.

Swab in the crime stain ensuring that the biological stain recovered is concentrated on a small area on the tip of the swab. A control sample needs to be taken when relevant.

See below for further guidelines for sampling different types of biological samples.

Place the swab in the swab container and/or the small breathable tamper evident bag provided. Seal the bag and record crime scene details on the chain of custody form/label (use unique numbered seals/bar codes and/or police references).

If at any time during the sampling process the swab is dropped or comes into contact with any other surface ideally the procedure

should stop and the sampling kit disposed of and samples taken using a new DNA sampling kit. However since it is likely that only small amounts of crime stain are present then the exact chain of events should be documented and submitted together with the sampling kit.

Once the samples have been successfully taken collect up the wrappers and gloves and dispose of these using designated receptacles.

Place the samples in the large tamper evident bag, store and send to laboratory as per legal or police force instructions.

Contents of a specific Scene of Crime sampling kit for cigarette ends, chewing gum and drinking vessels

A scene of crime sampling kit needs to contain at least the following items:

- Documented check-list
- Instructions on the use of the sampling kit
- Seals and/or breathable evident tamper bags/containers and/or cardboard packaging, which are unique numbered or barcoded
- Pair of disposable gloves
- Form/label with relevant information on the sample (chain of custody).

Sampling procedure for cigarette end, chewing gum and drinking vessels

The person taking the sample must wear the gloves provided throughout the whole sampling procedure. Masks should be worn if suffering from a cold.

Open the sampling kit and ensure that the kit is complete by checking off each item against the check-list provided.

Place the cigarette ends, chewing gum or drinking vessels in the breathable tamper evident bag provided. Seal the bag and record crime scene details on the chain of custody form/label (use unique numbered seals/bar codes and/or police references).

Once the samples have been successfully taken collect up the wrappers and gloves and dispose of these using designated receptacles.

Place the samples in the large tamper evident bag, store and send to laboratory as per legal or police force instructions.

GENERAL GUIDELINES FOR SAMPLING DIFFERENT TYPES OF BIOLOGICAL SAMPLES

- Blood on moveable objects/items: Wherever possible the whole object/item should be submitted.
- Blood on immovable objects/items: Liquid blood - collect using a sterile syringe or pipette and place in sterile plastic container with screw cap or use a sterile swab.
- Other biological stains wet or dry, blood, semen, saliva: Scene of crime sampling kit should be used taking care to maximize the recovery of the crime stain in question.
- Balaclavas, sheets, clothes: Package in strong paper bags (with transparent panel)
- Wet items: where possible allow to air dry in a sterile cabinet. If this is not possible transport to the laboratory immediately (must be agreed with the laboratory) or store frozen but ensure that the sample does not thaw and refreeze out at any time. It should be noted that any wet biological sample may decompose at ambient temperature.
- Breathable tamper evident bags: where breathable tamper evident bags are used then the samples may be stored at room temperature. If these are not available the paper bags should be used to transport wet samples. These samples should be stored in a cool place or refrigerated.

ANTI-CONTAMINATION GUIDELINES

- Due to the sensitivity of current DNA techniques extreme caution, including wearing a face mask must be taken if the person undertaking the crime stain sampling has a medical condition that causes the shedding of body fluids or particles e.g. colds coughs or influenza. Other conditions such as eczema or severe dandruff may require the wearing of additional barrier clothing.
- All containers used for transportation e.g. cool boxes crates, boxes should be cleaned prior to and after use.
- Scene of crime officers work area should be cleaned regularly with wipes containing chlorhexadine.
- Wherever possible sterile disposable sampling materials should be used.
- Disposable gloves must always be worn over top cuffs and should be changed after handling individual items/objects. Barrier clothing should also be used as often as possible.
- For serious offences wear disposable face masks overshoes and suits fully done up with the hood up.

- Handle items as little as possible and do not re-open items for interview purposes – use paper bags with transparent panels.
- Always handle one item at a time.
- Where possible take the container to the evidence and not the evidence to the container.
- Contact between victim and suspect samples should be avoided at all times.
- Ensure that any person attending a crime scene has no contact with a suspect or his/her clothing.
- Multiple suspects, the victim and their clothing must be kept apart at all times and should not be allowed to come into contact with the same objects e.g. police car, interview room, custody suite.
- Each item should be packaged sealed and labeled as soon as it is taken.
- Never pack several items/objects together.
- Use bags of a suitable size or shape, do not force items into packaging that are too small, bags may tear or lids may be forced off.
- Seal all packaging securely, use adhesive tape on all edges.
- Never use staples or pins to seal packages.
- Never reuse packaging.
- If an item will not fit or packaging is used in error do not use it for a different item. It must be discarded.
- Never eat drink or smoke when recovering evidential samples.

CONDITIONS FOR STORING THE SAMPLES

- Dry samples should be kept at room temperature (cool if possible) and out of direct sunlight. Dry samples stored at ambient temperature should not deteriorate / decompose / degrade and will remain suitable for future DNA analysis. Breathable bags, cardboard packaging and brown paper bags will allow samples to dry out whilst safely packed away and should be stored as above.
- If samples are air dried then this must take place in an area free from any contaminant for example in a sterile drying cabinet. If this is not achievable and there is any risk of minor contamination then samples should not be air dried.
- If samples are frozen then they should be kept frozen and never be allowed to thaw and or refreeze since this will cause the break down of DNA.

- Plastic bags can on rare occasions be used to transport very wet items but this should be on the instruction of the local forensic science laboratory.

TRANSPORT TO THE LABORATORY

All samples containing biological materials should be placed into suitable secondary packaging for transport to the laboratory. Local transportation regulations should be adhered to. This can include the use of the international biohazard sign.

Samples should be transported to the (local forensic science) laboratory as per legal or local police force procedures and guidelines.

3. TRAINING

The following information is aimed at providing all participating member countries (including countries developing forensic DNA profiling capability) with a framework upon which international standard procedures can be built. These procedures will naturally differ between jurisdictions depending on legal, social and cultural aspects but will all have in common adherence to the same high standards required for the various phases of the DNA profiling process.

SCENE

Under this section both first officers at the scene (“first responders”) and specialist scenes of crime officers are addressed.

FIRST OFFICERS/ FIRST RESPONDERS

For such police personnel their Standard Operating Procedures should be the reference point for any action they decide to take. This is similar to the documented procedures that specialist scene of crime officers would follow in their scene examination processes.

First responders also require particular DNA awareness training that would be provided by either specialist crime scene examiners or the local DNA providing forensic agency, or preferably both. While there are international standards that define forensic agency requirements, general duties police would normally not be required nor expected to meet those standards.

The training needs of first responders are as follows:

AVOID CONTAMINATION

The main issue with regard to DNA samples is to avoid contamination of samples by first actions at the scene, whether these be life-saving, public safety or containment activities. The other issue is to avoid contamination between samples one to the other and by the collecting persons. (* the term DNA samples will be used throughout this Guideline to mean DNA swabs, body fluid samples, stains, deposits, etc rather than extracted DNA from laboratory separation processes).

The first responder must use disposable gloves collecting DNA samples and new clean gloves are required for each such collection. Additionally, light-weight surgical face masks must be utilized through the collection process particularly where trace DNA samples are the focus of the collection activity. Masks are compulsory to avoid mouth aspirations from conversation, and expiration of DNA containing material from coughing and sneezing.

First responders should be limited to collections using sterile swabs only as other techniques require further training and understanding. Such collections can relate to saliva, blood, other biological material and obvious marks/smudges from skin contact such as finger/palm marks, facial smudges etc.. Awareness of the value of such marks for ridge detail, and therefore possible individual identification, must be always borne in mind.

The vessel holding the DNA sample must also be sterile and plastic screw cap containers, sealable plastic bags and paper bags for wet/semi-wet items are essential in this process. All operators must be trained in the use of the appropriate containers for specific samples, so that DNA sample deterioration is also minimized.

Any DNA samples collected by first responders, must be kept fully separated one from the other and details of the collection point, condition, reason, time and date must be clearly and accurately recorded. This is not only for continuity purposes (chain of custody), but also for later interpretation of DNA results and assistance to investigators for any subsequent hearing that may occur.

SPECIALIST SCENE OF CRIME EXAMINERS

All procedures regarding scene preservation, control and recording should be fully documented and available to all police and other forensic personnel who have legitimate business at scenes of crime.

There are international standard formats for documenting these procedures under the ISO Guidelines, and while it is not essential to use them, they serve as a ready and uniform platform for this purpose and are recommended as a good starting point.

As for first responders the main issue with regard to DNA samples is to avoid contamination of samples one to the other and by the collecting persons. (* as above, the term DNA samples will be used throughout this Guideline to mean DNA swabs, body fluid samples, stains, deposits, etc rather than extracted DNA from laboratory separation processes).

To avoid contamination several measures can be taken and these will vary according to country/jurisdictional practice. While DNA procedures need to be consistent with those practices, they must also be at an acceptable standard as defined in QA and/or accreditation systems in those countries/jurisdictions. That is the detail of the process will be left to each specific police agency but the principles underlying the process must equate to acceptable quality standards as defined in ISO Guidelines or equivalent.

As a minimum disposable gloves must be utilized in collecting DNA samples and new clean gloves are required for each such collection. Additionally, light-weight surgical face masks must be utilized through the collection process particularly where trace DNA samples are the focus of the collection activity. Masks are compulsory to avoid mouth aspirations from conversation, and expiration of DNA containing material from coughing and sneezing.

Both these measures are seen to be relatively and acceptably low cost and allow for all currently reported contamination issues at scene collection.

First police attending, police who have a role in DNA sample collection and specialist crime scene personnel must be trained in such techniques utilizing the protective attire to minimize the possibility of contamination in any form.

The collecting mediums also need some clarification and definition to enable consistency as far as desirable in these guidelines.

Sterile swabs of various configurations, sterile tweezers/scissors/scalpels/etc are all acceptable and crime scene personnel must be adequately trained and assessed in the effective use of these items.

The vessel holding the DNA sample must also be sterile and plastic screw cap containers, sealable plastic bags and paper bags for wet/semi-wet items are essential in this process. All operators must be trained in the use of the appropriate containers for specific samples, so that DNA sample deterioration is also minimized.

It probably goes without saying that scene samples must be collected and stored separately as their origin cannot be (generally) absolutely known, until after DNA analysis. Considerable theoretical and practical training is essential to ensure crime scene personnel skills are adequate to make such assessments under often complex and unique scene circumstances.

Recording of the nature, position, amount and condition of DNA samples is essential so that scene and/or activity reconstruction is as accurate as possible. The detail and accuracy of this information is critical to maximizing the evidential value of DNA profiling results and significant training is necessary for this skill area.

Finally from the scene DNA sample collection viewpoint, the capabilities and limitations of DNA analysis is important to the process of efficiently and effectively gathering evidence that will realize the best results in attempting to establish what happened at the scene. (Refer "Kits" Section). The minimum standards that apply for the laboratory process must be understood particularly in those many situations where the forensic laboratory service is

separate and distinct from the police agency conducting the scene examination and responsible for evidence recovery.

The crime scene DNA sample collection procedures established within a country/jurisdiction must ideally be identical with, or at the very least be compatible with those documented procedures in the forensic laboratory and vice-versa. This will ensure as far as humanly possible that training of the scene personnel matches that of the laboratory staff who will analyze the DNA sample.

Summary

- Training needs to distinguish between First Responders and Crime Scene Examiner Specialists, and both to be based on documented programs with clearly identified learning outcomes
- This training must link with the procedures/processes of the servicing DNA laboratory
- This training must include all the normal elements of first responder SOP's and those for comprehensive and high quality crime scene examination techniques
- This training must include understanding of DNA profiling capabilities & limitations
- Training programs should be competency based programs with formal assessment and formal authorization to conduct that work on successful mastery of the competencies tested
- This training should be included in some form of accreditation program or equivalent standards set for general duties police scene attendance.

LABORATORY

ACCREDITATION

The first issue with respect to DNA analysis by a laboratory is that sample receipt procedures are fully documented as an integral part of the facility's standard operating procedures established on the framework of the local accrediting agency. This should address security issues to insure the full chain of custody can be identified at all stages. Accreditation in turn should be based on appropriate ISO guides relevant to DNA profiling processes.

The laboratory must have fully documented training procedures and methods manuals and which prescribe QA requirements that are to be understood and met in the analysis program generally and in the practice of DNA profiling particularly. Training of laboratory personnel will be assessed formally and staff will be authorized to perform the various aspects of the DNA profiling process for which they have been trained. The actual form of these programs is up to each country/jurisdiction to formulate and these guidelines to apply thereto.

INTERNATIONAL STANDARDS

There are also well established international standards for the conduct of forensic DNA profiling, that relate to the physical requirement to separate critical steps of the process in space and time. Laboratory staff must be made aware of these physical standards in their training to ensure a uniformly high standard of DNA profiling reliability.

Other parts of forensic accreditation programs must also be fully adhered to and become essential elements in the training process. Some of these relate to the qualifications of staff undertaking certain functions, the ongoing training and development of lab staff, and the QA critical requirements for proficiency testing both internal and external. The intimate connection between training requirements and QA requirements is evident here, where adherence to these accreditation standards is an integral part of the training program for forensic DNA laboratory personnel.

IN-LABORATORY TRAINING

Another aspect of in-laboratory training is appropriate awareness of relevant DNA legislation. This can and does vary enormously from country to country, and in some countries such as Australia and the USA, varies within the country between the member States. Elements of such legislation require knowledge by the DNA analyst as several issues of sample legality, privacy, status for testing, etc., impinge on the validity and reportability of DNA profiling results.

Transfer of data from DNA sample analysis between countries is similarly effected by such considerations and DNA analysts must be fully trained in these aspects.

EXPERT EVIDENCE

The provision of expert evidence in the area of DNA profiling has drawn extensive attention world-wide. The debate has transgressed all possible areas of the DNA analysis process, the scientific interpretation of results and the reporting of these results in terms of likelihood's/probabilities/population genetics, etc. The DNA analyst must be trained to express scientific terms and concepts in understandable but accurate language.

Training in this area must ensure awareness of simple approaches to reporting results, documented processes for statistical reporting, and installation of skills to determine the direction of questioning which could cause confusion or worse distortion of the DNA evidence.

Civil liberty and privacy issues continue to emerge and awareness training and understanding of these issues is a critical part of the DNA evidence giving process. The issue of current DNA databases utilizing information from non-coding areas of DNA is important to get across not only by laboratory personnel in Court, but for the judicial officials and the general public also. These aspects are covered in the next two sections of this Guideline.

Summary

- Training must be based on documented programs with clearly identified learning outcomes
- Training programs should be written in accordance with international accreditation guideline formats
- Training programs should be competency based programs with formal assessment and formal authorization to conduct that work on successful mastery of the competencies tested
- These programs should be delivered on a mastery basis allowing for differences in learning rates but with upper time limits to ensure efficient and cost effective training schedules
- Besides all relevant technical aspects of the methods employed, these programs should also cover QA, proficiency testing and audits
- Training on statistical approaches to DNA evidence is essential
- Training must also include comprehensive understanding of the relevant legislation
- Training programs must include expert evidence training, preferably utilizing local Public Prosecutor/Defender office personnel, and things such as video techniques
- Training programs should also contain awareness information regarding privacy and civil liberty issues
- These programs to be delivered within forensic laboratory training systems, via associated tertiary education institutes, and formalized programs with legal offices responsible for prosecution/defense and court services.

LEGAL COURTS AND THE JUDICARY

CLEAR UNDERSTANDING OF WHAT DNA IS

Perhaps the greatest requirement under this heading is to ensure all parties have a clear understanding of what DNA actually is and the forensic DNA profiling process we employ to provide evidence to Courts.

The fact that forensic DNA profiling utilizes non-coding areas of the DNA molecule is fundamental to understanding the significant variability that can be demonstrated between individuals. It is also fundamental in dealing with the emotional and often erroneous arguments/discussion/issues raised by privacy and civil libertarian spokespersons.

It is therefore essential that any jurisdiction commit significant effort to educating/training court officers in regard to the process, the capabilities and the limitations of forensic DNA analysis. There are many issue, situations and scenarios that must be appreciated by these people in order that the full value of DNA

KEY EDUCATION REQUIREMENT

evidence is realized in the various tribunals in which it is introduced.

Trace DNA, degraded sample, mixtures of more than one persons' DNA, and contamination from the environment in which the sample is left or from interfering agents that may be present, all impinge on the DNA results obtainable. Some awareness and understanding of these, perhaps as limitations to the process are important training issues.

Another key education requirement is a clear understanding of the extensive QA systems we employ for forensic casework, including DNA and why and how this is used to ensure as far as humanly possible that no errors escape detection in the quality robust procedures established under accreditation programs. We must continually draw attention to the Manuals we develop describing training, methods, proficiency testing, quality controls, etc that are integrated into the forensic analysis system.

An understanding also of the various statistical approaches to reporting DNA results and why such techniques are employed is also vital in the court context. While it cannot be expected that all judicial officers can/will have a comprehensive understanding of the stats, we must ensure sufficient awareness so that the inherent value of DNA evidence is not compromised.

Summary

- Training information for this group is equally educational information
- Information must start with a clear understanding of what DNA actually is and how forensic DNA profiling systems work (non-coding areas)
- Information regarding capabilities, limitations and the extensive analytical controls in place, is critical
- An understanding of the use of statistics and the various general approaches to DNA stats is essential
- develop a clear understanding that while DNA evidence is not identity, it is extremely powerful definitive evidence, both inclusive and exclusive
- This information/understanding to be provided via: seminars, laboratory open days, articles in legal publications, handbooks, pamphlets, newspaper articles and testimony.
- Feedback on understanding should be gained from question and answer sessions, programme critiques, and questionnaires.

PUBLIC, COMMUNITY AND GENERAL AWARENESS

COMMUNITY EDUCATION

Last but by no means least we need to concern ourselves with community education and training so that general public awareness is as high as possible. The importance of this part of the “training package” is that public confidence is reflected in government policy through legislation and budget. Privacy debates and lingering civil liberty concerns can erode public confidence and replacement of misinformation with factual DNA information is essential.

The community must be satisfied that the integrity of DNA samples from the crime scene, through the laboratory process and the results of analysis of those samples presented in the courts, is at the highest level.

QUALITY ASSURANCE

They must be fully apprised of the extensive QA systems in place to monitor each and every step of the analytical DNA process. Of the extensive checks and balances inherent in legislation covering DNA sampling and analysis, and of the extensive efforts made in the presentation of DNA evidence in courts to provide the best assessment of the value of that evidence in scientific and statistical terms.

Public awareness of the capabilities and limitations of forensic DNA typing can be dealt with through information that details the robustness and reliability of the techniques.

Summary

- Training information for this group is equally educational information
- General understanding of what DNA actually is and how forensic DNA profiling systems work (non-coding areas)
- General information regarding capabilities, limitations and the extensive analytical controls in place, is important
- This general information/understanding to be provided via: public seminars, articles in community publications, pamphlets, newspaper articles and laboratory open days.

4. INTERPOL STANDARD SET OF LOCI: ISSOL

THE INTERPOL STANDARD SET OF LOCI - I S S O L

Loci

VWA

TH01

D21S11

FGA

D8S1179

D3S1358

D18S51

Example

15

3

8

5

12

15

13

20

6

9.3

5

13

R

15

The minimum input to the Interpol DNA ASF database is 6 STRs

R = rare allele which is not mentioned in the list of alleles accepted in the national DNA database(s)

Option

Amelogenin

X

Y

62

5. INTERPOL DNA PROFILE SEARCH REQUEST FORM

INTERPOL DNA PROFILE SEARCH REQUEST									
R E Q U E S T									
NCB:			REF:				DATE:		
NATIONAL OFFICE REQUESTING SEARCH:						REF:			
E-MAIL ADDRESS / PHONE / FAX NUMBER:									
TO NCB:									
INFO NCB:									
OFFENCE									
CATEGORY:									
PLACE:						DATE:			
ADDITIONAL INFORMATION:									
DNA PROFILE									
SUSPECT <input type="checkbox"/>		CONVICTED <input type="checkbox"/>		CRIME STAIN <input type="checkbox"/>		OTHERS <input type="checkbox"/>			
VWA	THO1	D21S11	FGA	D8S1179	D3S1358	D18S51	Amelogenin	ISSOL ①	
TPOX	CSF1P0	D13S317	D7S820	D5S818	D16S539	D2S1338	D19S433	other loci	
Penta D	Penta E	FES	F13A1	F13B	SE33	CD4	GABA	other loci	
IN CASE OF A NEGATIVE SEARCH PLEASE REPEAT THE SEARCH OF THE PROFILE IN YOUR DATABASE									
NO <input type="checkbox"/>		MONTHLY <input type="checkbox"/>		QUARTERLY <input type="checkbox"/>		ANNUALLY <input type="checkbox"/>			
R E P L Y									
BY NCB:			REF:				DATE:		
TO NCB:									
INFO NCB:									
FOLLOWING RESULT HAS BEEN OBTAINED AFTER SEARCH									
Disclaimer: No responsibility can be taken for the accuracy or quality of the information provided									
NEGATIVE SEARCH YES <input type="checkbox"/>									
PROFILE MATCH(ES) MADE				YES <input type="checkbox"/>		HOW MANY			
SUSPECT <input type="checkbox"/>		CONVICTED <input type="checkbox"/>		CRIME STAIN <input type="checkbox"/>		OTHERS <input type="checkbox"/>			
PROFILE ADDED TO SEARCHED DATABASE:						YES <input type="checkbox"/>		NO <input type="checkbox"/>	
PROFILE WILL BE SEARCHED				NO <input type="checkbox"/>		MONTHLY <input type="checkbox"/>		QUARTERLY <input type="checkbox"/>	
ANNUALLY <input type="checkbox"/>									
FOLLOWING MATCH(ES) FOUND IN DATABASE SEARCHED ②									
Match No. <input type="checkbox"/> ②									
NCB REFERENCE:					SAMPLE REFERENCE:				
VWA	THO1	D21S11	FGA	D8S1179	D3S1358	D18S51	Amelogenin	ISSOL ①	
TPOX	CSF1P0	D13S317	D7S820	D5S818	D16S539	D2S1338	D19S433	other loci	
Penta D	Penta E	FES	F13A1	F13B	SE33	CD4	GABA	other loci	
ADDITIONAL INFORMATION:									

①

① ISSOL = The Interpol Standard Set Of Loci

② In case of additional matches use numbered copies of the reply-part of this form.

GUIDELINES FOR COMPLETING THE INTERPOL DNA PROFILE SEARCH REQUEST FORM

This form should be used for manual exchange i.e. by fax or hard copy.

1) Name of the requesting National Central Bureau of Interpol.

2) Category of the offence. Use main headings only; i.e. murder, rape, etc.

3) Place where the crime has been committed or detected or place where the crime stain has been taken.

4) Date when the crime has been committed or detected.

5) The DNA profile(s) for exchange should have been developed in accordance with an established quality assurance program.

6) In case of additional matches numbered copies of the reply-part of this form should be used.

INTERPOL DNA PROFILE SEARCH REQUEST											
REQUEST											
NCB: ①			REF:			DATE:					
NATIONAL OFFICE REQUESTING SEARCH:						REF:					
E-MAIL ADDRESS / PHONE / FAX NUMBER:											
TO NCB:											
INFO NCB:											
OFFENCE											
CATEGORY: ②			③			DATE: ④			⑧		
PLACE:											
ADDITIONAL INFORMATION:											
DNA PROFILE											
SUSPECT <input type="checkbox"/>			CONVICTED <input type="checkbox"/>			CRIME STAIN <input type="checkbox"/>			OTHERS <input type="checkbox"/>		
VWA	THO1	D21S11	FGA	D8S1179	D3S1358	D18S51	Amelogenin	ISSOL ①			
TPOX	CSF1P0	D13S317	D7S820	D5S818	D16S539	D2S1338	D19S433	other loci			
Penta D	Penta E	FES	F13A1	F13B	SE33	CD4	GABA	other loci			
IN CASE OF A NEGATIVE SEARCH PLEASE REPEAT THE SEARCH OF THE PROFILE IN YOUR DATABASE											
NO <input type="checkbox"/> MONTHLY <input type="checkbox"/> QUARTERLY <input type="checkbox"/> ANNUALLY <input type="checkbox"/>											
REPLY											
BY NCB:			REF:			DATE:					
TO NCB:											
INFO NCB:											
FOLLOWING RESULT HAS BEEN OBTAINED AFTER SEARCH											
EXAMPLE: INTERPOL HAS NO POSITIVE RESULTS FOR THE ABOVE PROFILE INFORMATION PROVIDED IN THE PETITION											
NEGATIVE SEARCH YES <input type="checkbox"/>											
PROFILE MATCH(ES) MADE YES <input type="checkbox"/> HOW MANY											
SUSPECT <input type="checkbox"/>			CONVICTED <input type="checkbox"/>			CRIME STAIN <input type="checkbox"/>			OTHERS <input type="checkbox"/>		
PROFILE ADDED TO SEARCHED DATABASE: YES <input type="checkbox"/> NO <input type="checkbox"/>											
PROFILE WILL BE SEARCHED NO <input type="checkbox"/> MONTHLY <input type="checkbox"/> QUARTERLY <input type="checkbox"/> ANNUALLY <input type="checkbox"/>											
FOLLOWING MATCH(ES) FOUND IN DATABASE SEARCHED ②											
Match No. ⑥			⑦			SAMPLE REFERENCE: ⑦					
NCB REFERENCE:											
VWA	THO1	D21S11	FGA	D8S1179	D3S1358	D18S51	Amelogenin	ISSOL ①			
TPOX	CSF1P0	D13S317	D7S820	D5S818	D16S539	D2S1338	D19S433	other loci			
Penta D	Penta E	FES	F13A1	F13B	SE33	CD4	GABA	other loci			
ADDITIONAL INFORMATION: ⑧											
① ISSOL = The Interpol Standard Set Of Loci ② In case of additional matches use numbered copies of the reply-part of this form.											

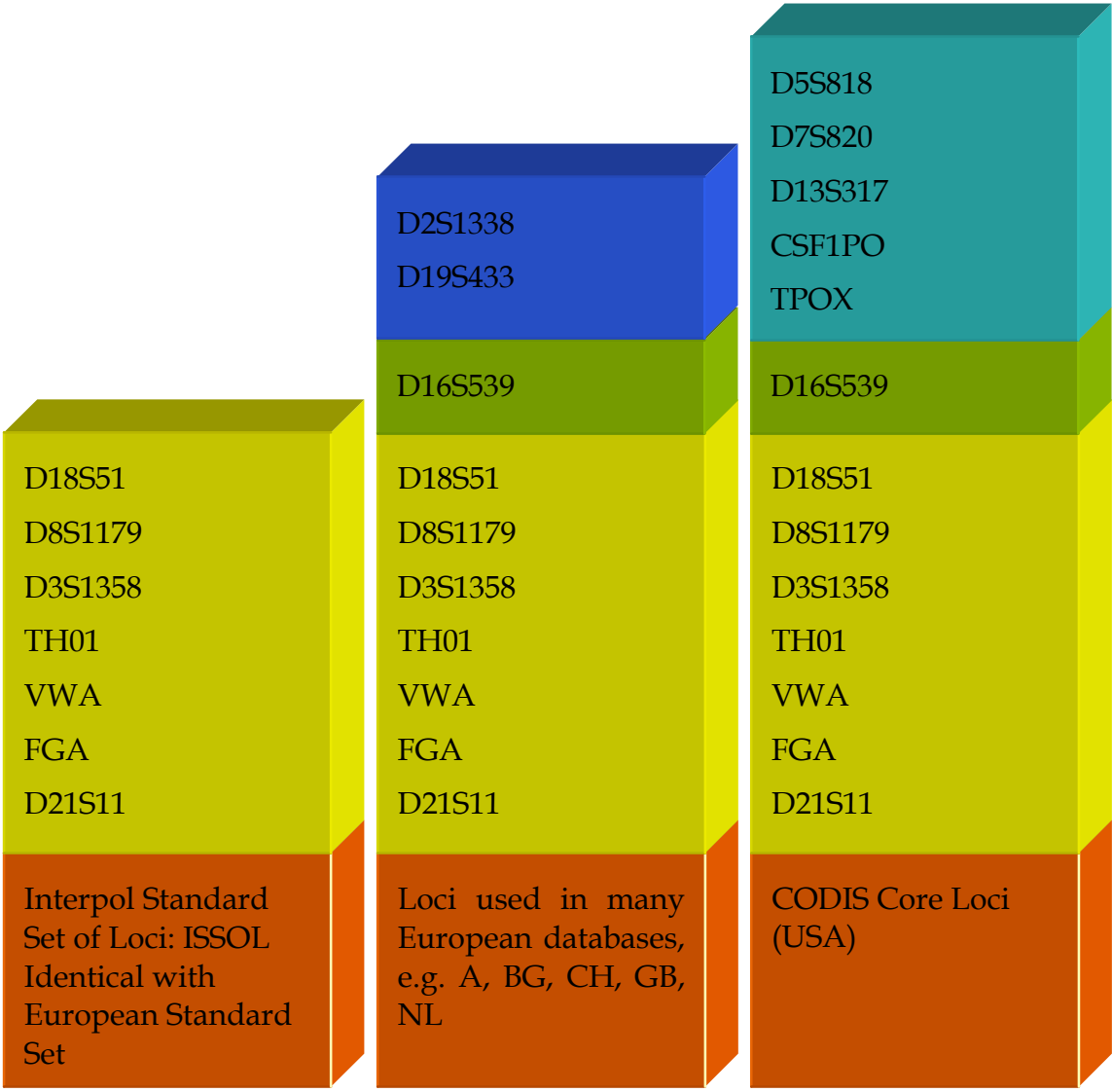
.....

.....

individual NCB reference number and to an individual sample reference number.

8) Space for any relevant information that could be of assistance for the investigation.

6. TABLES OF WORLDWIDE MOSTLY USED LOCI



Supplier	PE - Biosystems					Promega	
LOCUS	SGM Plus	Profiler	Profiler Plus	Cofiler	Identifiler	Power-Plex	PowerPlex 16
D21S11 ^{(1) (2)}	✓		✓		✓		✓
FGA ^{(1) (2)}	✓	✓	✓		✓		✓
VWA ^{(1) (2)}	✓	✓	✓		✓	✓	✓
THO1 ^{(1) (2)}	✓	✓		✓	✓	✓	✓
D3S1358 ^{(1) (2)}	✓	✓	✓	✓	✓		✓
D8S1179 ^{(1) (2)}	✓		✓		✓		✓
D18S51 ^{(1) (2)}	✓		✓		✓		✓
D16S539 ⁽¹⁾	✓			✓	✓	✓	✓
TPOX ⁽²⁾		✓		✓	✓	✓	✓
CSF1P0 ⁽²⁾		✓		✓	✓	✓	✓
D13S317 ⁽²⁾		✓	✓		✓	✓	✓
D7S820 ⁽²⁾		✓	✓	✓	✓	✓	✓
D5S818 ⁽²⁾		✓	✓		✓	✓	✓
D19S433	✓				✓		
D2S1338	✓				✓		
Penta D							✓
Penta E							✓
Amelogenin ⁽¹⁾	✓	✓	✓	✓	✓	✓	✓

(1) ISSOL (identical with the European Standard Set ESS, recommended by ENFSI with one exception: for ISSOL Amelogenin is optional only)

(2) 13 Codis Loci

7. LIST OF MEMBERS OF THE INTERPOL DNA MEG

MEMBERS OF THE INTERPOL DNA MONITORING EXPERT GROUP		
COUNTRY	NAME	DUTIES AND ADDRESS
ARGENTINA	PADULA Ricardo Agustin	Subcomisario, Jefe de la Division Laboratorio Químico de la Super-intendencia de Policia Cientifica, BUENOS AIRES
AUSTRALIA	GIDLEY David	Director of the Victoria Forensic Science Centre, Macleod, MELBOURNE
AUSTRIA	SCHEITHAUER Richard	Director of the Central DNA Laboratory, Institute of Legal Medicine, University of INNSBRUCK Chairman of the Interpol DNA MEG
BELGIUM	LERICHE Anne	Directeur adjoint, Institut national de Criminalistique et de Criminologie, BRUXELLES
FRANCE	PALEOLOGUE Anne	Ingénieur principal, Chef de section Biologie du Laboratoire de Police scientifique, LYON
NORWAY	NILSEN Reidar	Detective Superintendent, National Criminal Investigation Services, Laboratory Division, OSLO
SOUTH AFRICA	SHEZI Adeline	Reporting Officer for Casework, Forensic Analyst, Captain in the Forensic Science Laboratory, South African Police Service, PRETORIA
SPAIN	ANDRADAS HERANZ José	Jefe Servicio de Analytica, Comisaria General de Policia Cientifica, MADRID
UNITED KINGDOM	FEREDAY Lyn	Implementation and Improvement Manager, Forensic Science Service, WOODLEY
	HODGSON Paul	Detective Chief Inspector, National Crime Faculty, BRAMSHILL
USA	SMITH Jenifer	FBI Laboratory, Chief DNA Analysis Unit I, WASHINGTON
GENERAL SECRETARIAT LYON/ FRANCE	SCHULLER Werner (A)	Specialized Officer, Head of DNA Unit
	BRANCHFLOWER Mark (UK)	Head of Fingerprint Section

May 2001

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