

## What is DNA?

DNA is the acronym for “deoxyribonucleic acid”, a molecule found inside almost all living cells which carries the genetic information that is responsible for all cellular processes. DNA typing is a powerful tool for human identification.

## What is DNA typing?

DNA typing is a process of extracting and analyzing the DNA of a biological sample taken from an individual. This process generates a “DNA profile”, and every person - with the exception of identical twins - has a unique DNA profile.

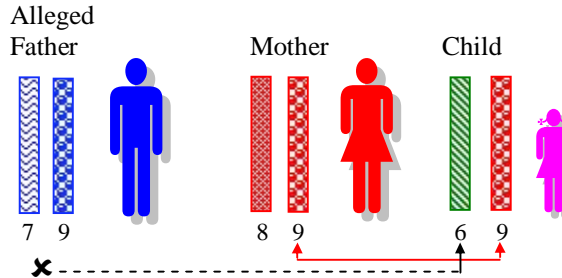
## How is DNA typing used in testing paternity?

Everyone has two copies of autosomal DNA, one inherited from each biological parent. To resolve a case where the paternity/maternity of a child is in question, DNA profiles from the alleged parent, other parent and child should be generated and compared.

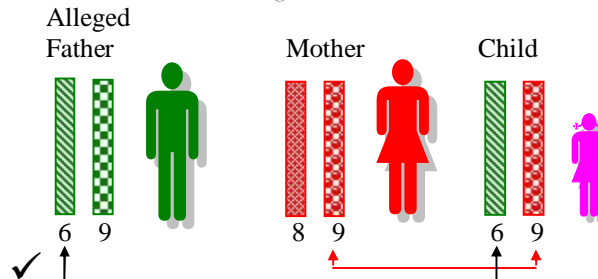
At the UP-NSRI DNA Analysis Laboratory (UP-NSRI DAL), DNA profiles are determined by typing the genetic material in at least 15 autosomal Short Tandem Repeat (aSTR) regions of the DNA, also referred to as DNA markers. This is the most widely used and accepted method of DNA testing today. To determine possible filiation, the child’s DNA profile is checked to see if it is consistent with the alleged parent’s profile at 15 or more aSTR-DNA regions tested. Refer to figure “Two possible results in filiation testing.” If the profiles are not consistent, this is a mismatch (Situation 1). However, if the profiles are consistent (Situation 2), statistical analysis is performed on the results of DNA testing. The chance that an individual is the biological parent of the child is compared to the chance that the individual is a person in the Philippine population unrelated to the child. The probability that the alleged parent is the biological parent is calculated. A probability of 99.9% or greater is considered presumptive proof of parentage by the Philippine Supreme Court.

## Two possible results in paternity testing:

### Situation 1: Exclusion of Alleged Father as Candidate Father



### Situation 2: Inclusion of Alleged Father as Candidate Father



*Patterned bars and numbers represent different DNA types in one aSTR-DNA marker. The child has inherited type 9 from her mother; type 6 must therefore come from her father who does not have this DNA type. This is a mismatch. When three or more mismatches are found between an alleged parent and a child, they are presumed to be biologically unrelated. In situation 2, the alleged father possesses allele 6. The probability of paternity must therefore be calculated.*

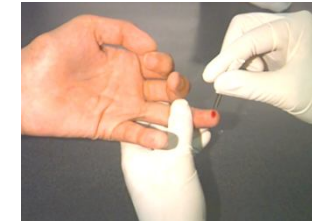
For more information, contact:

### DNA Analysis Laboratory

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## DNA Typing from Start to Finish

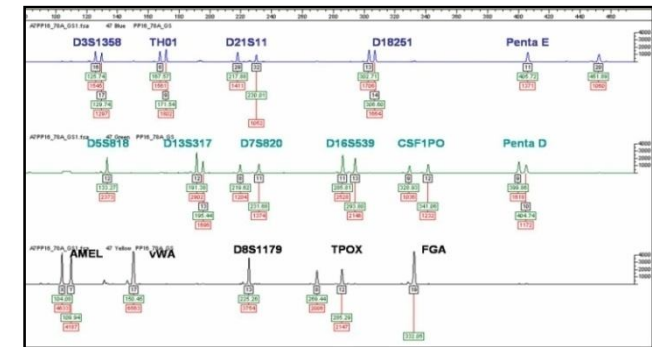
1. Briefing and signing of documents
2. Blood sample collection



3. DNA extraction
4. PCR amplification of extracted DNA



5. Automated DNA analysis
6. Comparison of DNA profiles and statistical analysis of DNA profiles, if needed



7. Report of findings and recommendations

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## Frequently Asked Questions (FAQs)

### • Why choose the UP-NSRI DNA Analysis Laboratory?

The UP-NSRI DAL has well-trained technical personnel and modern facilities. The Laboratory is capable of conducting DNA profiling services using at least 15 autosomal STR-DNA markers for parentage cases, 11 Y-chromosomal STR-DNA markers for male-specific identification and mitochondrial DNA sequencing for maternal relationship testing or typing of aged samples. Since 2006, 100% of all paternity trio inclusions had a probability of paternity of > 99.9%.

### • What is required for DNA typing?

The following are required from each individual to be tested:

- Recent 2"x2" ID photo;
- Valid photo ID card (bearing the owner's signature);
- NSO Birth certificate (original).

The following are required for each case:

- Full payment (cash or manager's check) at the time of sampling;
- Signing of appropriate agreement by both parties concerned;
- Authorization from legal guardian and proof of legal guardianship when a minor is to be included in the test;
- Valid photo ID card (bearing the owner's signature) of each witness.

### • How much does DNA typing cost?

The cost of DNA typing depends on the number of samples and the type of analysis to be performed, and will be agreed upon before samples are taken and testing begun. These prices cover only the costs of DNA testing. Standard costs are:

P 5,000.00	Sampling, extraction and storage of a biological sample for 5 years
P 45,000.00	Individual DNA profile
P 45,000.00	Two parents, one child
P 65,000.00	One parent, one child

### • How do I make an appointment for DNA testing?

Please call or email the laboratory to make arrangements for testing.

### • What biological samples will be taken for DNA testing?

Blood or buccal samples will be taken. Only blood samples will be archived for five years.

### • Can samples be collected outside the UP-NSRI DNA Analysis Laboratory?

Yes. The UP-NSRI DAL has a Sampling Kit that can be sent to a specified licensed medical person who may collect samples and mail the accomplished kit back to the laboratory via courier. Alternatively, arrangements can be made for a team from the UP-NSRI DAL to collect samples at other locations.

### • When will the results of DNA testing be ready?

Results of routine DNA tests are ready within 14 working days from the date of sampling and completion of all requirements. More complex cases will require more time.

### • Can the results of DNA-based filiation testing be used in court?

Yes. DNA testing has been ordered and results admitted as evidence in cases of child support, inheritance disputes and settlement of estate, insurance and for immigration purposes. The Philippines Supreme Court promulgated the "Rule on DNA Evidence" in October 2007. The full text of the Rule may be downloaded from the Supreme Court website:

<http://sc.judiciary.gov.ph/resolutions/2007/oct/A.M.06-11-5-SC.pdf>

### • In which court cases has DNA testing and/or the UP-NSRI DAL been cited?

- Lejano vs. People of the Philippines. Promulgated by the Supreme Court *En banc*. December 2010.
- People of the Philippines vs. Umanito. Promulgated by the Special Second Division of the Supreme Court. April 2009.
- Estate of Rogelio G. Ong vs. Minor Joanne Rodjin Diaz, Represented by Her Mother and Guardian, Jinky C. Diaz. Promulgated by the Third Division of the Supreme Court. December 2007.
- Agustin vs. Court of Appeals and Prollamente. Promulgated by the Third Division of the Supreme Court. June 2005.
- Herrera vs. Alba. Promulgated by the First Division of the Supreme Court. June 2005.
- People of the Philippines vs. Yatar. Promulgated by the Supreme Court *En banc*. May 2004.
- People of the Philippines vs. Vallejo. Promulgated by the Supreme Court *En banc*. May 2002.
- Tijing and Tijing vs. Court of Appeals and Diamante. Promulgated by the Second Division of the Supreme Court. March 2001.

## Recommended References

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- Maiquilla SMB *et al.* 2011. Y-STR DNA analysis of 154 female child sexual assault cases in the Philippines. *International Journal of Legal Medicine* (eprint December 2010).
- Delfin F *et al.* 2011. The Y-chromosome landscape of the Philippines: extensive heterogeneity and varying genetic affinities of Negrito and non-Negrito groups. *European Journal of Human Genetics* (2011)19:224-230.
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## The UP-NSRI DNA Analysis Laboratory

# A Primer on DNA-based Parentage Testing

