



DNA-Prokids: Genetic Identification of Missing Children to Fight Child Trafficking & Illegal Adoptions

Paper by José Antonio Lorente

Trafficking in Human Beings: Modern Slavery

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INTRODUCTION

UNICEF estimates that ca. 300 millions of children – all around the world – are involved in events such as violence, exploitation and others kind of abuses, including child work exploitation, armed conflicts and other harmful practices such as female genital mutilation/cutting and child marriage.

Figures from the United States only begin to demonstrate the magnitude of the missing children problem within a country. Approximately 800,000 children are reported missing each year, although most of these cases are solved immediately without representing a real criminal problem. Out of the 800.000 cases, approximately 360,000 are runaways, 340,000 are classified as “missing with benign explanation”, and about 100,000 are abducted either by family members or other known individuals or are lost and/or injured. While these figures are disturbing, they relate to mostly domestic situations and do not represent the greater international problem where children are illegally sold for often malevolent purposes.

Since the advent of forensic DNA analysis there have been two main objectives: 1) the identification of those who could be the source of biological evidence, which includes associations of individuals due to some alleged kinship; and 2) to exclude individuals wrongly associated with evidence.

The generation of reliable genetic profiles from unknown and reference samples, systematic and objective interpretation practices, and providing a statistical evaluation of the results are tantamount to a robust forensic DNA identification program. Large databases house DNA profiles from convicted felons (and in some jurisdictions arrestees), from forensic evidence, human remains, and direct and family reference samples of missing persons.

There is a demand to type more samples to place in these databases to help develop more investigative leads for solving crime. This need has motivated the community (government, academia and industry) to work collaboratively to develop and validate standard DNA typing kits that contain the reagents necessary to type core identity genetic markers and the concomitant automation of a number of processes (extraction, quantitation, amplification and to some degree interpretation of the results) to facilitate typing. The ability, for example, to type a reference blood or buccal sample without extracting the DNA away from interfering compounds would not have been imagined possible a few years ago and yet today such technology is readily available.

The standard genetic markers used in essentially every forensic DNA typing laboratory in the world are autosomal short tandem repeat loci (STRs). The standard operating procedures employ a set of 10-17 STR loci, which provide a high level of diversity and resolution for identity testing. Commercially available kits, such as AmpFLSTR® Identifiler® PCR Amplification Kit (Applied Biosystems, Foster City, CA), or the PowerPlex® 16 System (Promega Corp., Madison, WI), enable analysis with high quality materials and forensic samples. These kits, and STR loci, have been used extensively for identification of human remains as well as in kinship cases, such as paternity testing and family reconstructions. While these STRs apply to the majority of biological evidence analyses, there are situations where autosomal STRs cannot yield sufficient information.

Evidence, such as mixtures with a large amount of female DNA and a small amount of male DNA, and kinship cases where the reference sample derives from a relative separated several generations from the individual of interest require other markers, e.g., Y-STRs, X-chromosome linked markers, or mitochondrial DNA (mtDNA). These lineage based systems provide additional power because of their unique biological qualities compared with autosomal markers.

Additionally, when performing familial searching, i.e., searching for relatives of the true source of the sample, these lineage markers are extremely useful for reducing the number of adventitious associations in candidate

lists. Mitochondrial DNA sequencing is used to strengthen the genetic evidence when there are maternal relatives available to serve as references. Mitochondrial DNA, inherited through the maternal line, has a special property that makes it particularly useful for samples that are severely degraded and/or of limited quality, such as human remains in missing persons and mass disaster cases. There are hundreds to thousands of mtDNA molecules in a cell, compared to only two copies of nuclear autosomal genetic markers. Thus, when STR typing does not yield a result, there still is a good chance to obtain a result via mtDNA typing.

DNA-PROKIDS is an initiative of the University of Granada Genetic Identification Laboratory, supported by the Spanish Government. Since 2009, the University of North Texas Center Health Sciences Center, Center for Human Identification (UNT-HSC - CHI) is collaborating with the University of Granada. Beside the Government support, we are supported through donation from BBVA, CajaGRANADA, Fundacio#n Boti#n (Banco Santander), D. C. Zogbi from Mexico and Life Technologies (USA).

This project accounts with the collaboration of many institutions all around the world such as Guatemala (National Institute of Forensic Sciences, INACIF), Bolivia (National General Attorney); El Salvador (National Civil Police); Indonesia (Ejkman Institute); Mexico (Federal General Attorney (PGR), State General Attorneys (PGJs) of Baja California, Guanajuato, Chihuahua, Michoacan & Chiapas); Paraguay (National General Attorney); Peru (National Police); Philippines (University of the Philippines); Sri Lanka (University of Colombo); Thailand (Royal Thai Police); Nepal (National Forensic Science Laboratory).

This program accounts with a specific kit (DNA-PROKIDS KITS) specially designed for the collection of the samples in an easy way and avoiding contamination or degradation of DNA. The kit is prepared by UNTCHI & Bode Technologies and it contains the following parts:

- Buccal swab or finger prick device.
- Chain of custody and voluntary consent forms.
- Minimal personal information (name, relationship to child, place of sample collection).
- No information on related case or the context of the sampling.
- Educational sheets.

There is equipment which is provided to select countries. This DNA-PROKIDS equipment accounts with:

- Digital Polaroid camera.
- Computers with software for law enforcement to store case-related information.
- Scanners to digitize sample collection cards.
- Software to perform DNA profile comparisons.

RESULTS

Since the creation of this international project called DNA-PROKIDS in 2004 to 31st of June 2013 there are around of 9.200 samples in databases (Figure 4). Among all of these data, there is a classification of 638 positive identifications (match between a missing, unknown child a relative); 257 illegal adoptions detected (DNA proved that the person trying to give the child for adoption was not a biological relative as claimed (usually the mother)); and 218 negative identifications (DNA proved that a child was wrongfully identified by alleged relatives (usually in an involuntary way, people looking for a missing child that thought they have found him/her; usually happens with children under 12 months old)).

FUTURE PERSPECTIVES & DEVELOPMENT

DNA-PROKIDS is an international collaboration that places forensic DNA approaches at the forefront of efforts to combat global trafficking in children. Their missions mainly are to identify the victims and return them to their families (reunification) but also to hamper traffic in human beings thanks to identification of victims, and to gather information on the origins, the routes and the means of this crime (police intelligence), key elements for the work of police forces and judicial systems.

Human trafficking is an illicit international business that is perpetuated by several social, economic, cultural, and political drivers and calls for a proactive, comprehensive response. In many countries, criminal organizations have been operating for decades and may have connections within the local or national governments.

Genetic identification of trafficking victims relies upon the generation and comparison of two databases: the Reference Database (RD) containing DNA profiles of relatives of missing persons, and the Questioned Database (QD) comprised of DNA profiles from unknown remains. DNA-PROKIDS aims to ultimately establish

worldwide DNA registries. These registries will be used to identify trafficked children, provide law enforcement a scientific methodology to build investigations and develop police intelligence.

ILLEGAL ADOPTIONS

An important issue that I want to cover with some detail is the one related to illegal adoptions. Most of these “illegal” adoptions could end up as “legal” adoptions, since documents are easily falsified, and faked passports will show whatever traffickers want them to show.

Therefore, operationally, I do classify the adoptions in 3 groups: completely legal, completely illegal, and legal but illegal. I'll try to explain it.

1.- Completely legal adoption is the one where all the procedures established by the laws were followed, and basically these are cases where the parents or relatives voluntarily went to the designated agency to handle adoptions.

2.- Completely illegal adoption is the one where no legal procedure was followed. These are cases of usually originated by “wealthy” people that do not want to wait too long to adopt a child, or a family that wants to choose the age, sex, and country of origin of the adoptee. The adopting family pays money and the mafias and traffickers get the baby to be sold, usually stolen babies, although there are cases of children bought to poor families.

3.- Legal but illegal adoption is the one where the families adopting a child proceed legally from the very beginning; they follow all the procedures, contact the right, authorized agency in the country of origin of the adoptee, and receive –along with the baby- all the documentation. A number of these child could have been stolen and given for adoption by a young woman that claims that she is the mother and that she has no money to feed the child.

No child should be given for adoption without checking that it is his/her biological mother or father (or any other relative who could have the right to do that, i.e., grandparents) the one giving voluntarily the child for that purpose. A simple DNA analysis will be able to prove this link.

In those cases where children are found abandoned and no one is looking for them, the authorities should do DNA analysis to ensure that – if in the future –their families look for them, they will be informed.

If we could progressively pass laws to ensure that all children who are adopted must have their DNA registered in their countries of origin, we would take a giants step.

Global initiatives to encourage the utilization and growth of these DNA databases may provide authorities with additional tools that could significantly increase the likelihood of identifying and apprehending the individuals responsible for committing these crimes against children. Ultimately, the goal of our and similar efforts is to reunite victims with their families or communities.

Finally, I'd like to mention and point out that special laws, like the Alba- Keneth Law from Guatemala (enacted 13/SEPT/2010) endorsing and requiring DNA analysis from missing, unidentified children and from relatives of missing children (art. 13 of that law) play and will play an important role to protect children and their families. This is nevertheless a topic to be covered in this meeting by Dr. Jorge N. Cabrera, from Guatemala, and therefore I will not enter in a detailed explanation. To finish I want to mention that this is the first and so far unique law of its kind in the world.

The University of Granada, with the support of the Spanish Government, is organizing a meeting – to be held along next spring 2014 (April or May) in Granada/Spain – to coordinate all efforts and initiatives made so far, and not only from a scientific point of view, but also from a legal, social and mass communication perspective.

Our goal is to promote the creation of an International Observatory or Center that should coordinate and supervise all the above mentioned initiatives, and to facilitate all kind of information, experience and available support to those countries who want to get started to use similar, compatible tools to fight this terrible, heinous crime.