

On-line autosomal and Y-STR reference database of Argentina

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Abstract. Allele frequencies represent the basic tool for statistical evaluation of molecular studies based on DNA typing used in personal identification and forensic casework. To offer to the forensic and the molecular anthropology communities, a rapid access by Internet on-line inquires a STR reference database has been organized in the website www.ffyb.uba.ar/bdg. The database has a user-friendly access to the required information from each province of the country. On a karyotype scheme, it can be located from each of the thirteen CODIS markers and, on the Y chromosome, each of the minimal haplotype STRs were included initially at the www.yhrd.org. The frequencies are updated every September, except for the previous years in order to confirm previous calculations. In addition to the database that includes over 2700 genotypes, a complete list of references is included. Anonymous genotypes are included and most samples were obtained from routine casework. At present, over nine provinces are included and an additional support will be offered for aboriginal population data; that is, mainly well-defined ethnic groups typed either by autosomal and Y STRs as well as SNPs and mtDNA sequence data. Although it is completely free of charge, it requires registration before access. © 2005 Elsevier B.V. All rights reserved.

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1. Introduction

Automation of DNA typing laboratories ensured a high throughput of typing results. The emerging information represents the raw material for molecular anthropological investigations, even taking into account autosomal and Y- and X-short tandem repeats,

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autosomal and sex-chromosomes, SNPs or mitochondrial sequence data. Besides the fine tuning of the anthropological interpretation, the availability of direct access to reference database represents a most important tool for forensic scientists, prosecutors and defence attorneys. This facility allows an immediate access to data in order to confirm expert's results during a trial.

The population of Argentina was considered, up to now, to be of European ancestry. However, it exhibits a certain degree of substratification with an important genetic contribution of the original Amerindian communities, mostly detectable out of the most populated urban areas.

In order to provide an efficient way for estimating statistical parameters of forensic interest an on-line reference database was constructed by the Servicio de Huellas Digitales Genéticas of the Faculty of Pharmacy and Biochemistry, University of Buenos Aires.

This reference database includes the data from individual provinces of the country. A friendly format allows to choose the province and the genetic marker of interest. At the moment, the markers include the 13 CODIS STRs as well as the 9Y-STRs of the minimal haplotype.

The structure of the database allows incorporation of additional markers (e.g. autosomal and sex chromosomal SNPs as well as mitochondrial DNA sequence data).

The aim of this effort is to contribute with both the forensic and molecular anthropology communities.

2. Populations

A total of 2710 unrelated donors from 10 provinces of Argentina were investigated at least with the 13 short tandem repeats included in the FBI's CODIS System. A set of 239 unrelated males were typed by means of the minimal Y-STR haplotype.

Table 1 summarizes the distribution of the samples in each province considered.

3. Searching process

The search of a required allele frequency will demand to define if the search should be focused to a specific province or to the whole country (Fig. 1). When the geographical location has been defined, a schematic karyotype appears in the screen and allows to

Table 1
Samples distribution in 10 provinces of Argentina

	Autosomal STR	Y-chromosome STR
Buenos Aires	516	43
Santa Fe	562	23
Mendoza	290	39
Río Negro	593	49
Chubut	320	39
Misiones	169	19
Salta	83	17
Formosa	78	7
Chaco	56	1
Corrientes	73	6

BASE DE DATOS DE REFERENCIA
Servicio de Huellas Digitales Genéticas

Usuario: Contraseña:

Seleccione una provincia:

Buenos Aires	Misiones
Catamarca	Neuquén
Chaco	Río Negro
Chubut	Salta
Córdoba	San Juan
Corrientes	San Luis
Entre Ríos	Santa Cruz
Formosa	Santa Fé
Jujuy	Santiago del Estero
La Pampa	Tierra del Fuego
La Rioja	Tucumán
Mendoza	Todo el País

Ayuda

Cantidad de muestras Autosómicas: 2710
 Cantidad de muestras Cromosoma Y: 239
 Fecha última actualización: 04/08/2004

Fig. 1. Geographical search page indicating the selectable provinces.

choose the desired autosomal STR. Once selected, the allele frequency is displayed; moreover, the genotype frequency distribution can be requested by registered users.

In addition, if the Y chromosome is selected on the karyotype, an enlarged Y chromosome appears in the screen allowing to select the haplotype combination by means of pop-down menus. The haplotype frequency immediately becomes available for analysis. The structure of the database is flexible and allows to increase the number and type of genetic polymorphic markers. In addition, an updated reference list including the publication of polymorphic markers attributes for the region is presented. Detailed technical protocols are also offered.

This on-line reference data base has been recently published [1–3] and it represents a renewed version of the original reference database of genetic markers for Argentina previously published [4].

The aim of the on-line reference database is to offer a user-friendly service to access to genetic-population attributes of the most frequently used genetic markers, to offer updated bibliography and share technical protocols to be used in DNA typing either for forensic investigation or molecular anthropological research.

References

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