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Colombian results of the interlaboratory quality control exercise 2015

J.J. Builes[a,b,*], D.P. Aguirre[a], L. Mendoza[a,c], L. Gusmão[d,e]

[a] GENES SAS Laboratory, Medellín, Colombia
[b] Institute of Biology, University of Antioquia, Medellín, Colombia
[c] School of Health Sciences, Pontificia Bolivariana University, Medellín, Colombia
[d] IPATIMUP, Institute of Molecular Pathology and Immunology of the University of Porto, Portugal
[e] DNA Diagnostic Laboratory (LDD), State University of Rio de Janeiro (UERJ), Rio de Janeiro, Brazil

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ABSTRACT

Currently, all agencies of conformity assessment testing laboratory favor the participation in proficiency testing as a mechanism for quality assurance. In Colombia, the Genes Laboratory has been designated, since 2008, to perform, design and implement proficiency testing for all the interested laboratories. In this report, the results of Colombian exercise Interlaboratory Quality Control for the year 2015 are presented. The exercise consisted of one practical component, one theoretical mandatory component, and an optional theoretical component. Twenty laboratories participated, representing six different countries of Latin America and the Caribbean. For the practical component each participant laboratory received; (1) samples of blood, saliva, and semen stains, in this part they should report the routine own laboratory markers for each sample, (2) three optional theoretical cases of varying complexity, (3) a mandatory theoretical approach about a biological relationship of paternal grandparents – granddaughter case. In the last two components of the exercise, they had to submit only the calculations. For the practical component the consensus of 70 STR markers, distributed between autosomal and linked to the sex chromosomes, was achieved with an error rate of 0.80% in genotyping, 1.0% nomenclature and/or format discrepancies and 3.8% non-reporting. On the other hand, 99.4% of the reported values were correct, only two values were not correct (0.6%) but were within the range of 5% of the correct value, being acceptable values within the rules of the exercise. This inter-laboratory exercise has become an important mechanism for quality assurance and ongoing training in the region.

1. Introduction

The practical work of laboratories that perform paternity tests can be evaluated using Interlaboratory comparisons, which are extensively used. Looking for an improvement in the quality of the results, these exercises are very useful for the laboratories, and the public itself which can relay in the quality of the essays.

Colombian Reference National Laboratory, GENES SAS, had organized and coordinated since 2008 the Quality Control Exercise for laboratories undertaking paternity, maternity and forensic tests with DNA markers. In 2015 Laboratories from Colombia, Brazil, Ecuador, Peru, Dominican Republic, and Chile participated in the exercise. In this report, the results of Colombian Exercise Inter-Laboratory Quality Control for the year 2015 are presented.

2. Materials and methods

The laboratories received an invitation containing conditions, value and registration form for the exercise. Subsequently, we sent the samples for the enrolled laboratories, the results form and the instructions to make and report the results of exercise. In 2015, the exercise consisted in one practical component, one theoretical mandatory component and a theoretical optional component. For the practical component, each participant laboratory received; (1) samples of blood, saliva, and semen stains, in this part they should report the routine own laboratory markers for each sample, (2) three optional theoretical cases of varying complexity, (3) a mandatory theoretical approach about a biological relationship of paternal grandparents – granddaughter case. In the last two components of the exercise, they had to submit only the calculations. Consensus was established with a minimum of three (3) laboratories with the same genotyping for each marker, therefore the result must match 70% of the laboratories that send results to a marker. For analysis of the results were taken into account the findings from previous years [1–3] and the recommendations of both the ISFG [4] and the GHEP-ISFG [5].

* Corresponding author at: Genes SAS Laboratory, Medellín, Colombia.
E-mail address: jjbuilesg@une.net.co (J.J. Builes).

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Table 1
List of STRs markers under consensus.

STR	MARKERS UNDER CONSENSUS											
Autosomal	Amelogenina	CSF1PO	F13A01	F13B	FES/FPS	FGA	LPL	TH01	TPOX	VWA	ACTBP2(SE33)	D1S1656
	D2S1338	D2S441	D3S1358	D5S818	D6S1043	D7S820	D8S1179	D10S1248	D12S391	D13S317	D16S539	D18S51
	D19S433	D21S11	D22S1045	Penta D	Penta E							
Y chromosome	DYS 19	DYS 385	DYS 389 I	DYS 389 II	DYS 390	DYS 391	DYS 392	DYS 393	DYS 437	DYS 438	DYS 439	DYS448
	DYS456	DYS458	DYS 460	DYS 461	DYS635	GATA A10	GATA H4	DYS 576	DYS 481	DYS 549	DYS 533	DYS 570
	DYS 643	DYS627	DYS518	DYS449	DYF38751							
X chromosome	HPRTB	DXS8378	DXS7423	DXS7132	DXS10103	DXS10134	DXS10074	DXS10101	DXS10135	DXS10146	DXS10079	DXS10148

3. Results and discussion

In the exercise Colombia Inter-Laboratories of the year 2015 participated 20 laboratories. For the practical component, the consensus of 70 STR markers, distributed between autosomal and linked to the sex chromosomes, was achieved (Table 1). The error was of 0.80% in genotyping, 1.0% of nomenclature and/or format discrepancies and 3.8% non-reporting. On the other hand, 99.4% of the reported values were correct, only two values were not correct (0.6%) but were within the range of 5% of the correct value, being acceptable values within the rules of the exercise. This inter-laboratory exercise has become an important mechanism for quality assurance and ongoing training in the region, with various countries participating (Fig. 1).

4. Conclusion

The Proficiency Test conducted through the Colombian National Reference Laboratory has become a useful tool for quality assurance of all Colombian laboratories and some of Latin America that perform DNA testing to establish biological relationships. It is presented as an excellent opportunity for ongoing training of experts from the region and a way to achieve high quality results from all the laboratories.

Conflict of interest

None.

Fig. 1. Countries with laboratories participating of the exercise in green. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)