



PATERNITY TEST FOR TWO FAMILIES IN BAGHDAD

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ABSTRACT

Paternity test using DNA is conducted to prove paternity in two cases for two families offered to a court in Baghdad. DNA testing is accepted worldwide as the most accurate method of determining paternity. Blood samples were collected from two families. The samples were taken from the vein of specimens. The Methods used included three stages: isolation DNA, PCR and Genetic analyzer. In the present study, 18 genetic loci were obtained during genetic analysis, using power plex kit. Results confirmed the validity of paternity of one family and denied paternity in the second family.

KEYWORDS: DNA fingerprint, Paternity test, court case.

INTRODUCTION

Identification and parentage testing using DNA technology has become an important tool in both the legal and medical fields (Butler, 2007). Although numerous techniques have previously been employed to establish parentage or kinship, the use of DNA testing has become the benchmark since it is highly accurate (99.9%) and has improved significantly over the past 20 years (Jeffreys *et al.*, 1985). The genetic results are evaluated by using standard statistical parameters to compare the likelihood that the alleged father is the biological father of the child with the likelihood that the alleged father is not the biological father of the child (Wenk *et al.*, 1996). Increasing paternity testing and use of DNA techniques in clinical and judicial procedures implies that paternal discrepancy will be identified increasingly (Butler, 2006). Paternity testing is based on the fact that a child inherits half of his/her DNA from the mother and half from the father (Mixich *et al.*, 2004). The fundamental basis of paternity exclusion is that if there are a sufficient number of paternal "obligate" alleles (more than 2) absent from the DNA profile of the alleged father, this would provide evidence against paternity. Currently, the most popular DNA technology used in parentage testing concerns short tandem repeats (STR's) which consist of short, repetitive DNA elements 3 to 7 base pairs in length. These highly polymorphic repeats are widely distributed throughout the human genome and are easily detected using polymerase chain reaction (PCR) technology (Butler, 2007).

MATERIALS & METHODS

Paternity test using DNA is conducted to prove paternity in two cases for two families offered to a court in Baghdad. The samples were taken from the vein of specimens. The Methods used included three stages: isolation DNA, PCR and Genetic analyzer (Henke *et al.*, 2005; Butler, 2007). In the present study, 18 genetic loci were obtained during genetic analysis, using power plex kit. FTA® card for extraction and isolation DNA, Gene Amp® PCR system 9700 Manufacturing company in Applied Biosystem to amplified DNA, Genetic analyzer 3130 XL instrument Manufacturing company in Applied

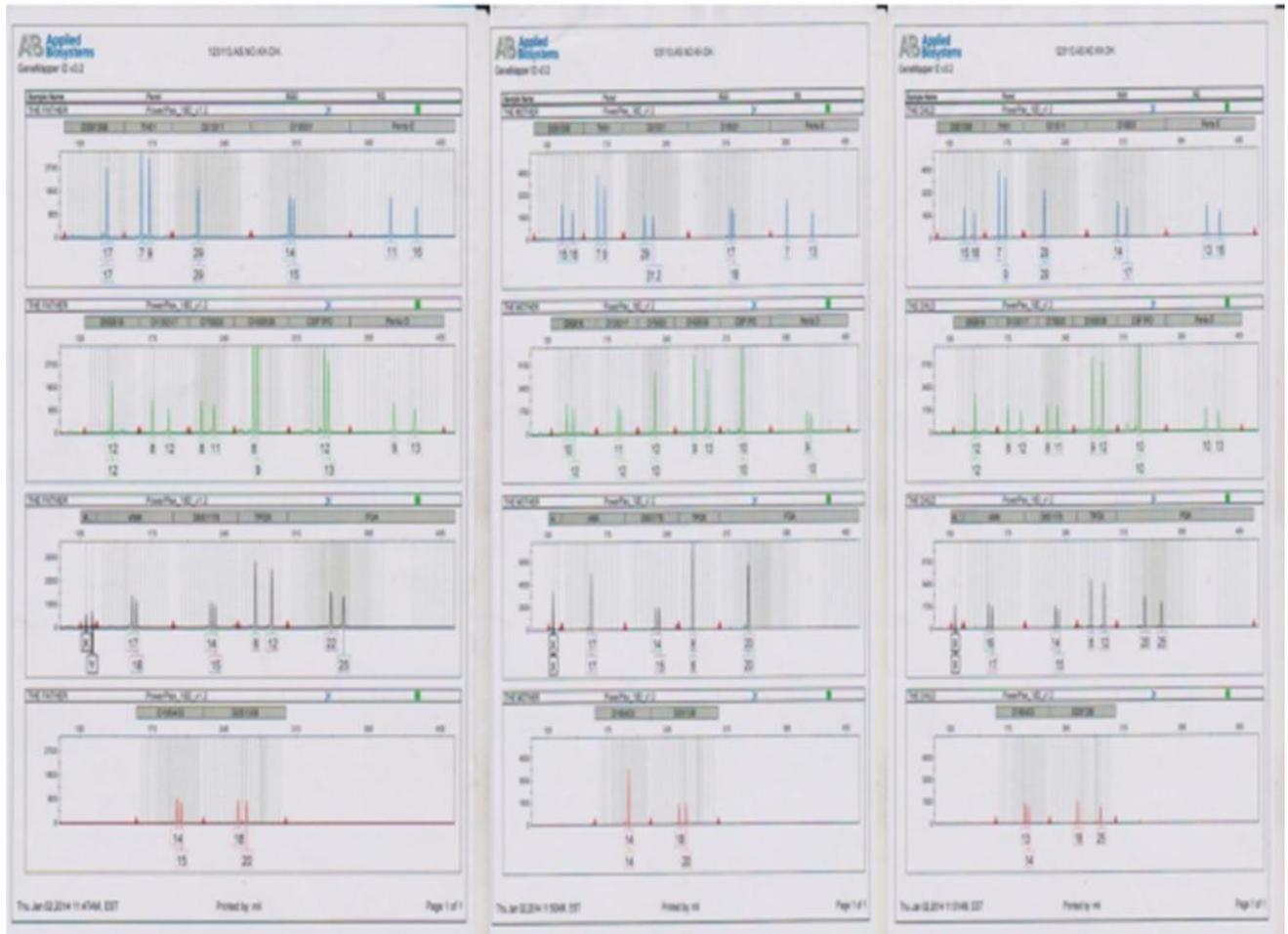
Biosystem, PCR kit Contain (primers set, distal water, Master Mix include Buffer and Taqpolymerase)

RESULTS & DISCUSSION

In the present study, 18 genetic loci "loci is the distance between position and other in power plex kit" were obtained during genetic analysis, using power plex kit. Every one (loci) contain two curves; the first represent the father whereas the second represent the mother, as each of parents transmit half of own genetic information to their progeny. The fluctuated curved form at each site represents a high DNA concentration in the sample, as difference in the height of the curves depends on DNA concentration. Each loci has a private (special) label may return to the name of explorer scientist such as (THO1 loci) or as result of specialization of chromosome like in (D3S1358) and may due to the chromosomal variations as shown in (A...Loci). Results revealed that the sequences at first loci for the first family are 17, 17 in father, 15, 18 in mother and 15, 18 in child. The genetic sequence of child was matched with the mother and father with inversion. Results also confirmed that the loci (2, 3, 4, 5, 6, 7, 11, 13, 14, 15) were identical with both parents, while just one loci (8) was non-identical with mother. Loci of (9, 10, 12, 16, 17) were inversion with father. So the genetic analysis of child was identical with his parents in just 10 loci, while 7 loci were varied in their non-identification (mismatched) with the mother sometime (one) and father (6) at other times. Since the genetic analysis of child was denied with (six & one) loci out of 18 loci with the father and mother respectively, so this child is not their son. In family (2), DNA test results of the child were matched with father and mother for all loci (18). Thus this examination is proved the sonship of father and mother to this child. At last, in family (1), the child was female and denied in one loci with the mother, this result confirmed the absence of sonship between the child and the mother. On the other hand, if this child was male the result will point out to the sonship despite his denial of one loci with mother. As there is a possibility to occurrence a mutation in any loci in males, Whereas these mutations usually does not occur in females due to be polar body during the process of derision (meiosis) which

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is shorthand) this mutation and thus females rarely mutated in this loci.



(A)

(B)

(C)

FIGURE 1: DNA tests for family 1 (genetic analysis) that give 18 genetic loci by using power plex kit; (A) genetic analysis for the father, (B) genetic analysis for the mother, (C) genetic analysis for the child

DNA Extraction: Chelex Phenol Kit EZ1 M48

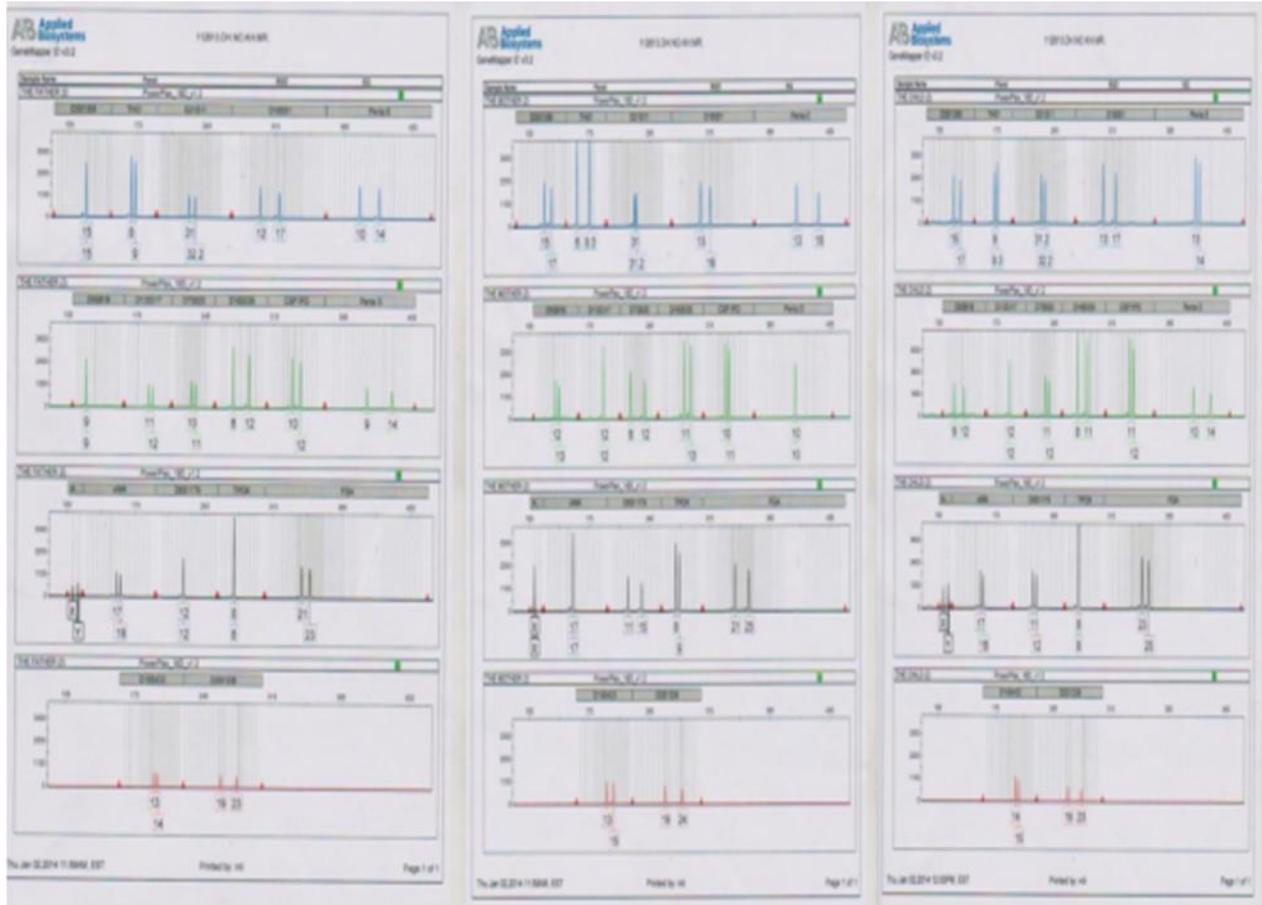
Real Time PCR:

Direct ✓

Promega (Power Plex-18) GA3130d GA310 : DNA Typing البصمة الوراثية

	17	7, 8	20	14	11	10	12	8	12	8	11	8	9	12	13	9	13	17	18	14	15	8	12	12	25	14	15	18	20	X,Y						
1 Father	17	7, 8	20	14	11	10	12	8	12	8	11	8	9	12	13	9	13	17	18	14	15	8	12	12	25	14	15	18	20	X,Y						
2 Mother	15	18	7	9	20	5, 2, 17	18	7	13	10	12	11	12	10	10	9	13	10	10	9	10	17	17	14	15	8	8	20	14	14	18	20	X,Y			
3 child	15	18	7	9	20	29	14	17	13	16	12	12	8	12	8	11	9	12	10	10	10	13	16	17	14	15	8	12	20	25	13	14	18	25	XX	
identical with father	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
identical with mother	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

FIGURE 2: The results of comparison between child loci with father and mother in family 1 (mismatched)



(A) (B) (C)
FIGURE 3: DNA tests for family 2 (genetic analysis) that give 18 genetic loci by using power plex kit; (A) genetic analysis for the father, (B) genetic analysis for the mother, (C) genetic analysis for the child

DNA Extraction: Chelex Phenol KR EZ1 M48

Real Time PCR: Direct

Promega (Power Plex-18) GA3130d GA310 : DNA Typing البصمة الوراثية

Family (2)

N	Name	D15S11	D18S11	D21S11	D18S21	CSF1P	Profilin	AWA	D15S11	D18S11	D21S11	D18S21	CSF1P	Profilin	AWA	D15S11	D18S11	D21S11	D18S21	XY																	
1-	Father	15	15	8	9	31	32	2	12	17	10	14	7	9	11	12	10	11	8	12	10	12	9	14	17	18	12	12	8	8	21	23	13	14	19	23	Xy
2-	Mother	15	17	8	9	31	31	2	13	16	13	18	12	13	12	12	8	11	13	10	11	10	10	17	12	11	15	8	9	21	25	13	15	19	24	YX	
P-	child	15	17	9	9	31	32	2	13	17	13	14	9	12	12	12	11	12	8	11	11	12	10	14	17	18	11	12	8	8	23	25	14	15	19	23	Xy
	identical with father	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	identical with mother	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

FIGURE 4: The results of comparison between child loci with father and mother in family 2 (matched)

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