



## Risk analysis of duo parentage testing with limited STR loci

M.X. Zhang<sup>1,2</sup>, H.M. Gao<sup>1,2</sup>, S.Y. Han<sup>1</sup>, Y. Liu<sup>1,2</sup>, Y.L. Tian<sup>1</sup>, S.H. Sun<sup>1,2</sup>,  
D.J. Xiao<sup>1,2</sup>, C.T. Li<sup>3</sup> and Y.S. Wang<sup>1,2</sup>

<sup>1</sup>Jinan Central Hospital Affiliated to Shandong University, Jinan, Shandong, China

<sup>2</sup>Jinan Di'en Legal Expertise Institute of Forensic Medicine, Jinan Central Hospital, Jinan, Shandong, China

<sup>3</sup>Institute of Forensic Sciences, Ministry of Justice, Shanghai, China

Corresponding author: Y.S. Wang

E-mail: sdjnwys@163.com

Genet. Mol. Res. 13 (1): 1179-1186 (2014)

Received December 18, 2012

Accepted July 15, 2013

Published February 27, 2014

DOI <http://dx.doi.org/10.4238/2014.February.27.2>

**ABSTRACT.** The aim of this study was to evaluate whether the Goldeneye 20A system (containing 19 short tandem repeats) can avert the shortage of duo parentage tests. Among routine cases typed by the Identifiler system, we identified 42 motherless cases, 2 fatherless cases, and 34 trio cases containing 1 locus mismatch and 4 motherless cases with 2 locus mismatches. One true trio case was rejected by fatherhood testing because of the omission of the mother's genotype and because the genotype of the putative father matched that of the child. All of the cases were retyped by the Goldeneye 20A system with the mother's or father's sample. In total, 39 motherless cases were verified by one mutation, 3 motherless cases were rejected for paternity, and 4 motherless cases with 2 locus mismatches were ruled out by fatherhood testing. After adding the father's genotype, 1 motherless case was confirmed by a single-locus mutation, whereas another case was rejected by motherhood testing. The mutation and exclusion rates detected with the Goldeneye 20A system accorded with the corresponding rates identified in the Identifiler system. The trio case also rejected fatherhood without

the mother's genotype, and we found only 2 locus mismatches. Neither the Identifiler system nor the Goldeneye 20A system compensates for the absence of genetic information from the mother or father.

**Key words:** STR; Parentage testing; Duo case; Mutation of STR