

## FOR THE RECORD

*John W. Peterson,<sup>1</sup> Ph.D.; Thomas M. Reid,<sup>1</sup> Ph.D.; Christopher M. Kraemer,<sup>1</sup> B.S.; David A. Ingala,<sup>1</sup> B.S.; Michael L. Baird,<sup>1</sup> Ph.D.; Susannie C. Lee,<sup>1</sup> Ph.D.; and Richard F. Lee,<sup>1</sup> Ph.D.*

# Distribution of Penta B, Penta C, and Penta E Alleles in Asian, Black, Caucasian, and Hispanic Populations

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**POPULATIONS:** Asian, Black, Caucasian, and Hispanic

**KEYWORDS:** forensic science, Penta B, Penta C, Penta E, short tandem repeats, population genetics, human identification

DNA samples were isolated from unrelated individuals in four populations: Asian, Black, Caucasian, and Hispanic, using a modified alkaline lysis method (1). Alleles at Penta B (HUMUT5805), Penta C (MGC14836), and Penta E loci were amplified using Penta BEC Multiplex Primers according to the manufacturer's recommendations (Promega Corp., Madison, WI). Amplified PCR products were analyzed with an ABI Prism 3100 Genetic Analyzer (Applied Biosystems, Foster City, CA). Population data were analyzed for Hardy-Weinberg equilibrium (2) and other population parameters (3). The complete dataset is available upon request via email from [jwp@dnacenter.com](mailto:jwp@dnacenter.com).

<sup>1</sup> DNA Diagnostics Center, Fairfield, OH.

## References

1. Rudbeck L, Jorgen D. Rapid, simple alkaline extraction of human genomic DNA from whole blood, buccal epithelial cells, semen, and forensic stains for PCR. *Biotechniques* 1998;25:588-92. [\[PubMed\]](#)
2. Schneider S, Roessli D, Excoffier L. Arlequin: A software for population genetics analysis. Version 2.000. University of Geneva, Geneva, Switzerland: Genetics and Biometry Lab, Department of Anthropology, 2000.
3. <http://www.promega.com/geneticidtools/powerstats>

Additional information and reprint requests:

John Peterson, Ph.D.  
DNA Diagnostics Center  
205 Corporate Court  
Fairfield, OH 45014  
E-mail: [jwp@dnacenter.com](mailto:jwp@dnacenter.com)

TABLE 1—Penta B allele frequencies among Asian, Black, Caucasian, and Hispanic populations.

Penta B Allele	Asian		Black		Caucasian		Hispanic	
	Number	Frequency	Number	Frequency	Number	Frequency	Number	Frequency
5			1	0.005			1	0.005
6	2	0.009	1	0.005				
7	1	0.005	6	0.030			2	0.010
8	1	0.005	20	0.099	6	0.029	8	0.038
9	25	0.115	28	0.139	4	0.019	3	0.014
10	29	0.133	38	0.188	17	0.082	6	0.029
11	35	0.161	22	0.109	36	0.173	30	0.143
12	71	0.326	20	0.099	27	0.130	55	0.262
13	18	0.083	20	0.099	25	0.120	29	0.138
14	26	0.119	13	0.064	36	0.173	38	0.181
15	9	0.041	12	0.059	21	0.101	20	0.095
16	1	0.005	8	0.040	9	0.043	5	0.024
17			8	0.040	11	0.053	3	0.014
18			2	0.010	5	0.024	4	0.019
19			1	0.005	2	0.010	2	0.010
20			2	0.010	4	0.019		
21					3	0.014		
22							1	0.005
23					1	0.005		
24							1	0.005
26							1	0.005
27					1	0.005	1	0.005
<i>n</i>	218		202		208		210	
H-W Equilibrium, exact test ( <i>p</i> )		0.256		0.092		0.485		0.396
Observed Heterozygosity		0.798		0.842		0.875		0.848
Expected Heterozygosity		0.855		0.897		0.895		0.850
Power of Discrimination (PD)		0.935		0.970		0.969		0.953
Power of Exclusion (PE)		0.596		0.678		0.745		0.690
Typical Paternity Index (PI)		2.477		3.156		4.000		3.281

TABLE 2—Penta C allele frequencies among Asian, Black, Caucasian, and Hispanic populations.

Penta C Allele	Asian		Black		Caucasian		Hispanic	
	Number	Frequency	Number	Frequency	Number	Frequency	Number	Frequency
5	12	0.046	7	0.031			6	0.026
7			2	0.009	3	0.013		
8	19	0.073	6	0.027	2	0.009	8	0.035
9	78	0.298	37	0.164	33	0.146	54	0.237
10	17	0.065	12	0.053	15	0.066	15	0.066
11	88	0.336	56	0.248	100	0.442	78	0.342
12	39	0.149	60	0.265	42	0.186	42	0.184
13	6	0.023	39	0.173	29	0.128	21	0.092
14	3	0.011	5	0.022	2	0.009	2	0.009
15			1	0.004			2	0.009
16			1	0.004				
<i>n</i>	262		226		226		228	
H-W Equilibrium, exact test ( <i>p</i> )		0.238		0.609		0.329		0.106
Observed Heterozygosity		0.733		0.814		0.726		0.807
Expected Heterozygosity		0.793		0.810		0.733		0.781
Power of Discrimination (PD)		0.908		0.930		0.883		0.904
Power of Exclusion (PE)		0.481		0.626		0.469		0.612
Typical Paternity Index (PI)		1.871		2.690		1.823		2.591

TABLE 3—*Penta E allele frequencies among Asian, Black, Caucasian, and Hispanic populations.*

Penta E Allele	Asian		Black		Caucasian		Hispanic	
	Number	Frequency	Number	Frequency	Number	Frequency	Number	Frequency
5	15	0.059	14	0.059	13	0.058	13	0.058
7	7	0.027	34	0.144	32	0.142	19	0.084
8	2	0.008	52	0.220	1	0.004	3	0.013
9	4	0.016	12	0.051	2	0.009	4	0.018
10	10	0.039	7	0.030	17	0.075	16	0.071
11	41	0.160	14	0.059	36	0.159	21	0.093
12	35	0.137	25	0.106	46	0.204	41	0.181
13	6	0.023	22	0.093	28	0.124	20	0.088
14	7	0.027	16	0.068	9	0.040	17	0.075
15	38	0.148	17	0.072	10	0.044	22	0.097
16	21	0.082	8	0.034	10	0.044	14	0.062
17	22	0.086	10	0.042	10	0.044	14	0.062
18	9	0.035	2	0.008	7	0.031	8	0.035
19	9	0.035	1	0.004			6	0.027
20	16	0.063	2	0.008	4	0.018	4	0.018
21	3	0.012			1	0.004	4	0.018
22	6	0.023						
23	2	0.008						
24	1	0.004						
26	2	0.008						
<i>n</i>	256		236		226		226	
H-W Equilibrium, exact test ( <i>p</i> )		0.608		0.562		0.097		0.105
Observed Heterozygosity		0.891		0.907		0.867		0.867
Expected Heterozygosity		0.908		0.891		0.885		0.914
Power of Discrimination (PD)		0.978		0.970		0.966		0.977
Power of Exclusion (PE)		0.776		0.809		0.729		0.729
Typical Paternity Index (PI)		4.571		5.364		3.767		3.767