

**ALLELE FREQUENCIES OF FOUR STRs (HUMTH01, HUMVWFA31,
HUMF13A01, HUMFESFPS) IN NORTH-EAST OF SPAIN**

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System and locus: HUMTH01 (11p15.5)
HUMVWFA31 (12p12-pter)
HUMF13A01 (6p24-25)
HUMFESFPS (15q25-qter)

Population and sample: Catalonia (N.E. of Spain)
N: 116 (TH01), 120 (VWF), 118 (FESFPS), 117 (F13)

Methods:

Primers and PCR amplification conditions: GenePrint STR system (Promega) in a Linus DualCycler thermocycler.

Electrophoretic method: vertical electrophoresis on 0.75 mm thick 4% denaturing polyacrylamide gels (19:1 acrylamide:bisacrylamide, 7M urea, 24 cm length) and silver staining [1]. The electrophoresis ran for 1h (45 min for VWF) at a constant voltage of 1000V with a fixed temperature of 51°C.

Alleles were assigned by means of ladders supplied by Promega. ISFH recommendations were followed [2,3,4].

Results:

Table 1. Allele frequencies.

| HUMTH01 | | HUMVWFA31 | | HUMFESFPS | | HUMF13A01 | |
|---------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Allele | Frequency | Allele | Frequency | Allele | Frequency | Allele | Frequency |
| 5 | 0.00431 | 14 | 0.12500 | 8 | 0.02119 | 4 | 0.11111 |
| 6 | 0.16379 | 15 | 0.12083 | 9 | 0.00424 | 5 | 0.21368 |
| 7 | 0.13362 | 16 | 0.17500 | 10 | 0.25847 | 6 | 0.25214 |
| 8 | 0.15948 | 17 | 0.25833 | 11 | 0.47881 | 7 | 0.39316 |
| 9 | 0.25431 | 18 | 0.21667 | 12 | 0.19492 | 8 | 0.00427 |
| 9.3 | 0.28448 | 19 | 0.09167 | 13 | 0.03814 | 9 | 0.00427 |
| | | 20 | 0.01250 | 14 | 0.00424 | 14 | 0.01709 |
| | | | | | | 15 | 0.00427 |

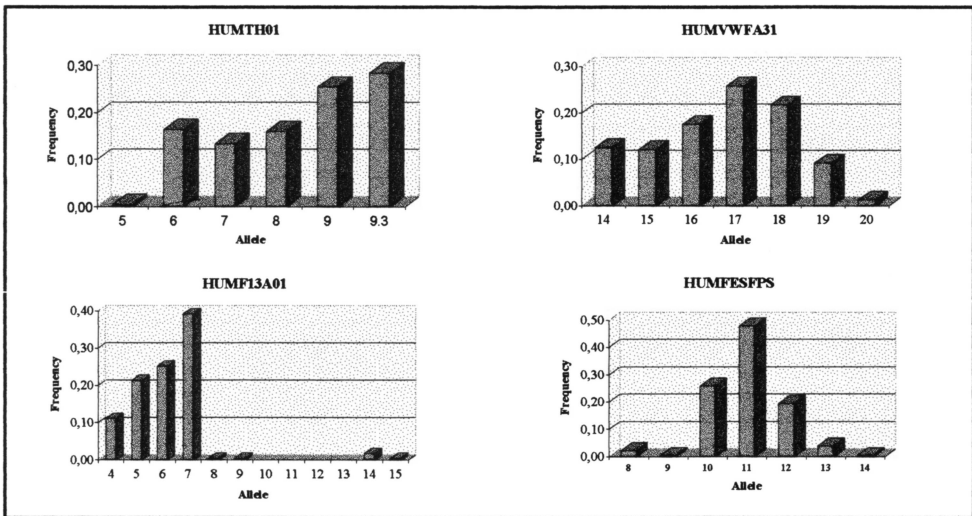


Figure 1. Allele frequency distribution of four STR's in north-east of Spain

Table 2. Observed genotypes

| HUMTH01 | | | | | | | | | | | |
|-----------|-------|-------|-------|-------|---------|-------|-------|-------|-------|-------|-------|
| Gen. | 5-9 | 6-6 | 6-7 | 6-8 | 6-9 | 6-9.3 | 7-7 | 7-8 | 7-9 | 7-9.3 | 8-8 |
| Obs. | 1 | 1 | 6 | 6 | 12 | 12 | 1 | 8 | 5 | 10 | 3 |
| Gen. | 8-9 | 8-9.3 | 9-9 | 9-9.3 | 9.3-9.3 | | | | | | |
| Obs. | 10 | 7 | 7 | 17 | 10 | | | | | | |
| HUMVWFA31 | | | | | | | | | | | |
| Gen. | 14-14 | 14-15 | 14-16 | 14-17 | 14-18 | 14-19 | 15-16 | 15-17 | 15-18 | 15-19 | 15-20 |
| Obs. | 2 | 4 | 4 | 8 | 7 | 3 | 3 | 11 | 7 | 2 | 2 |
| Gen. | 16-16 | 16-17 | 16-18 | 16-19 | 17-17 | 17-18 | 17-19 | 17-20 | 18-18 | 18-19 | |
| Obs. | 4 | 11 | 11 | 5 | 9 | 10 | 3 | 1 | 4 | 9 | |
| HUMFESFPS | | | | | | | | | | | |
| Gen. | 8-10 | 8-11 | 8-12 | 8-13 | 9-11 | 10-10 | 10-11 | 10-12 | 10-13 | 11-11 | 11-12 |
| Obs. | 2 | 1 | 1 | 1 | 1 | 6 | 30 | 15 | 2 | 25 | 26 |
| Gen. | 11-13 | 12-12 | 12-13 | 12-14 | | | | | | | |
| Obs. | 5 | 1 | 1 | 1 | | | | | | | |
| HUMF13A01 | | | | | | | | | | | |
| Gen. | 4-4 | 4-5 | 4-6 | 4-7 | 5-5 | 5-6 | 5-7 | 5-8 | 6-6 | 6-7 | 6-14 |
| Obs. | 2 | 6 | 7 | 9 | 6 | 13 | 18 | 1 | 8 | 20 | 3 |
| Gen. | 7-7 | 7-9 | 7-14 | 7-15 | | | | | | | |
| Obs. | 21 | 1 | 1 | 1 | | | | | | | |

Table 3. Evaluation.

| LOCUS | Power of discrimination PD [5] | Power of exclusion PE [6] | Allelic diversity h (\pm s.e.) [7] | P value Chi square test |
|-----------|-----------------------------------|------------------------------|--|----------------------------|
| HUMTH01 | 0.919 | 0.574 | 0.788 \pm 0.038 | 0.70 |
| HUMVWFA31 | 0.941 | 0.635 | 0.820 \pm 0.035 | 0.55 |
| HUMFESFPS | 0.833 | 0.409 | 0.667 \pm 0.043 | 0.25 |
| HUMF13A01 | 0.877 | 0.483 | 0.727 \pm 0.041 | 0.29 |
| Combined | 0.999 | 0.952 | | |

Comments:

For all STRs loci the Hardy-Weimberg equilibrium was tested by Chi square test, and no significant deviations were found (table 3).

These STR systems show a high power of discrimination (combined power of exclusion of 0.9999) and probability of exclusion (cumulated probability of exclusion of 0.95). The use of these four STRs provides an important tool in forensic and paternity testing. Now we use them in routinely forensic casework.

References:

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