Inheritance of Some Electrophoretic Phenotypes of Human Hair

Schimkat M[1], Baur MP[2] and Henke J[1]

1 Laboratorium für forensische Blutgruppenkunde, Otto-Hahn-Strasse 39, D-4000 Düsseldorf 13, Federal Republic of Germany
2 Institut für medizinische Statistik, Dokumentation und Datenverarbeitung der Universität Bonn, D-5300 Bonn, Federal Republic of Germany

Materials and Methods

The method used was a one-dimensional SDS electrophoresis of low sulfur proteins in the presence of urea which was developed by Gerhard (1987). Hairs of 5 families with 3 or 4 generations and 6 to 56 members were examined. Hair fragments were extracted in a solution of 50 mM DTT, 8 M urea, and 2 % w/v SDS. Polypeptids were stained with CBB-R 250.

Results

Four electrophoretic phenotypes could be distinguished. They were named K1, K1m, K3 and K3m. The distribution of these phenotypes is listed in table 1.

Discussion

We think that the four phenotypes observed are inherited in an autosomal dominant-recessive way, and that they are controlled by two independent loci *K* and *m*. Data from our random sample do not contradict to this hypothesis. The pedigrees indicate that the genotype of K1 is $*K^1/*K^1$, whereas the genotype of K3 is $*K^3/*K^1$ in this series. The genotype of non-m is *non-m/*non-m and the genotype of m is *m/*non-m. K3 is dominant and K1 is recessive. The modifying gene *m is dominant, while *non-m can be called recessive. The statistical evaluation of observed and expected data supports our assumption concerning the mode of inheritance. Although the sample size was very small (n=33) and K3m occured only once in the entire random sampling, the X^2 of 0,072 indicates the goodness of fit of our model.

Table 1. Distribution of Phenotypes

	observed		expected	
Phenotype	n	%	n	%
K1	23	69.70	23.27	70.51
K1m	6	18.18	5.85	17.73
K3	3	9.09	3.10	9.40
K3m	1	3.03	0.78	2.36
Σ	33	100.00	33.00	100.00

$X^2 = 0.072$; 1 d.f.; $p = 0.794$

Reference

Gerhard M (1987) Electrophoretic variability in human head hair: Polyacrylamide gel electrophoresis of hair proteins in the presence of sodium dodecyl sulfate and urea. Electrophoresis 8:153-157.

Advances in Forensic Haemogenetics 3
Edited by H. F. Polesky and W. R. Mayr