

## The Blood Group Antigen Co<sup>b</sup> (Colton) in a German Population

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**Summary.** A group of 300 unrelated and healthy individuals of Northrhine-Westphalia were screened for the red cell antigen Co<sup>b</sup>. The phenotype frequency of Co(b+) was found to be 7.3%.

**Key word:** Red cell antigen Co<sup>b</sup>, phenotype frequency

**Zusammenfassung.** Die Häufigkeit des Phänotyps Co(b+) betrug in einer Stichprobe von 300 unverwandten Probanden aus Nordrhein-Westfalen 7,3%.

**Schlüsselwort:** Erythrozytenmembranantigen Co<sup>b</sup>, Phänotypfrequenz

This paper aim at giving a brief report about the frequency of the phenotype Co(b+) in Northrhine-Westphalia.

The finding of three antibodies of the specificity anti-Co<sup>a</sup>(2), as well as the discription of the antithetical antibody anti-Co<sup>b</sup>(1) made the Colton system very useful in human genetics.

### Material and Methods

Three hundred unrelated and healthy probands living in the Düsseldorf area were investigated.

#### *Sera*

The following sera were used:

Anti-Co<sup>a</sup> (Penwarden) Courtesy Hamilton Center, Canadian RC.

Anti-Co<sup>b</sup> (Sweeney) Courtesy John J. Moulds and John Case Gamma Biologicals, Houston, Texas, USA

Anti-Co<sup>b</sup> (111039) Biotest-Serum-Institut, Frankfurt/Main

All sera worked well and reliably using the antiglobulin technique. The sample of anti-Co<sup>a</sup> was not included in the general screening because of its rarity.

## Results

### *Dosage*

In our series we observed the reaction patterns of the two anti-Co<sup>b</sup> sera. They both gave medium and negative reactions. There was no hint for a dosage effect as it is known in anti-Co<sup>a</sup> sera (2).

### *Phenotype Frequency*

Co (b+)	= 22	= 7.3%
Co (b-)	= 278	= 92.7%.

### *Gene Frequency*

Assuming that the phenotype Co (b-) is based on the genotype Co<sup>a</sup>Co<sup>a</sup>, the gene frequencies in our series can be calculated as follows:

Co <sup>a</sup>	= 0.963	Co <sup>a</sup> Co <sup>a</sup>	= 0.9274	
		Co <sup>a</sup> Co <sup>b</sup>	= 0.0712	
Co <sup>b</sup>	= 0.037	Co <sup>b</sup> Co <sup>b</sup>	= 0.0014	= 0.0726

### *Studies with Anti-Co<sup>b</sup> in 60 Unselected Paternity Cases*

Anti-Co<sup>b</sup> sera were included in the examination of paternity cases. In one family tests with anti-Co<sup>a</sup> were performed. The results are given below:

#### A. Exclusion from paternity

<i>n</i>	Child	Mother	Putative father	Exclusions in other systems
1	Co (b+)	Co (b-)	Co (b-)	yes
20	Co (b-)	Co (b-)	Co (b-)	yes
1	Co (b-)	Co (b+)	Co (b-)	yes
2	Co (b-)	Co (b-)	Co (b+)	yes

#### B. No exclusions

<i>n</i>	Child	Mother	Putative father
30	Co (b-)	Co (b-)	Co (b-)
2	Co (b+)	Co (b-)	Co (b+)
2	Co (b-)	Co (b+)	Co (b-)
1	Co (b+)	Co (b+)	Co (b-)
1	Co (a-b+)	Co (a+b+)	Co (a+b+)

## Discussion

The result of this examination was the finding that Co(b+) blood occurred less frequently than expected, although the observed difference was not significant ( $\chi^2 = 0.3384$ ;  $P > 0.05$ ). We found 7.3% Co(b+) blood compared to 8.6% or 9.7% in other series [4, 6].

The Colton system is presumably independent of other genetic markers [5, 6], although it is difficult to find a family showing independence of the Colton and the Cartwright blood group systems [5].

By these investigations we obtained further evidence that the Colton blood group system is quite interesting in human genetics [3, 6].

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