

# THE DISTRIBUTION OF ABH-BLOODGROUP SUBSTANCE IN SEMINAL STAINS

Richard SCHEITHAUER, Joachim LÖTTERLE  
Institute for Forensic Medicine, University  
Erlangen-Nürnberg, 8520 Erlangen, West Germany  
(Director: Prof.Dr.med.H.-B. Wuermeling)

## 1.1. SUMMARY

To guarantee an economical utilization in bloodgrouping of seminal stains the various bloodgroup systems should be investigated in the region of their maximum concentration. The distribution for the Gm and PGM<sub>1</sub> system is already known. In the present study the distribution of the ABH-substance was investigated using artificially made seminal stains and an inhibition test ("master titration"). The results demonstrate that in samples of equal size the absorption and therefore the concentration of bloodgroup substances is higher in peripheral sections, or at least not lower than in other regions of the seminal stain.

## 1.2. ZUSAMMENFASSUNG

Um eine ökonomische Verwertung der oft geringen Spermaspuren zu gewährleisten, sollten die verschiedenen Blutgruppensubstanzen am Fleck dort untersucht werden, wo sie am höchsten konzentriert sind. Für das Gm- und PGM<sub>1</sub>-System ist die Verteilung bereits bekannt. In der vorgelegten Arbeit wurde die Verteilung der ABH-Substanz an künstlich angelegten Spermaflecken mit Hilfe eines standardisierten Absorptionstests untersucht.

Es konnte gezeigt werden, daß die Absorption und damit die Konzentration der ABH-Substanz in den äußeren Abschnitten des Spermaflecks am höchsten, wenigstens aber nicht geringer als in anderen Abschnitten ist.

## 2. MATERIAL AND METHOD (Picture 1)

### 2.1. Stains

20 stains of A-secretors and 10 stains of group O-secretors were produced by dropping 300 µl of liquified human sperm on one point of fine woven cotton. At the time of examination the age for the stains was between one day and one year.

### 2.2. Preparation

The stains were divided in 4 concentric zones of the same width (Zone 1 = central; ... zone 4 = peripheral). 6 threads lying side by side were taken out reaching from the centre to the periphery. The threads were cut according to their sectional distribution; the particular segments had a length of 5 to 7 mm, dependend of the

diameter of the stain.

### 2.3. Inhibition

The segments of the threads were placed separately in the wells of microtitre plates and one drop of the corresponding antiserum was added in a series of 6 geometrical dilutions ("master titration"). The specimens were incubated for 20 hours at 4° C, then the antiserum was transferred to the test tubes.

### 2.4. Tube test

One drop of 0.1 erythrocyte suspension of the corresponding bloodgroup in 2% bovine albumine was added. After a further incubation of 2 hours at 4° C and 30 minutes at a room temperature the tubes were centrifuged for one minute with 1000 g. The reactions were read through the microscope.

## 3. RESULTS (picture 2)

### 3.1. A-substance

The 1+ -endpoint dilution differed from stain to stain just as inside the stains up to 3 degrees of dilution. 15 out of 20 stains proved to have the highest absorption in the peripheral section, 5 of the stains had a constant distribution, in one case the highest absorption was found in the second zone.

### 3.2. H-substance

In 8 out of 10 stains the highest absorption was found in zone 4, 2 stains showed a constant distribution.

### 3.3. Age of the stains

The age of the stains had no influence of the investigation.

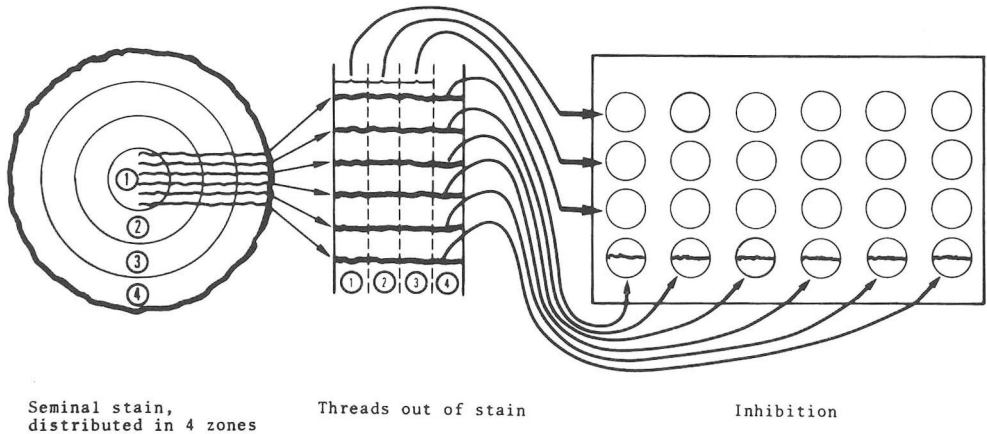
## 4. DISCUSSION

The acquired test method, a master titration, has turned out to be appropriate for the investigation of small differences in the concentration of ABH-bloodgroup substances in seminal stains. For the routine laboratory the standard inhibition or inhibition-elution test remains the method of choice.

Our artificially produced stains should serve to be a model for e.g. underwear or bed-linen made of cotton, that are often to be investigated in the routine.

According to our results presented we suggest to use peripheral zone of seminal stains to test in the ABH-system.

Picture 1, MATERIAL AND METHOD



Picture 2, RESULTS: Average endpoint dilution

