

From the table it is seen that of the procedures tried, only heating of the ultrafiltrate to charring destroyed the accelerating effect on the clotting process.

The substances known to influence blood clotting which might be removed by dialysis are sulfhydryl compounds² and perhaps cephalin, the latter possibly by adsorption on the walls of the dialyzing membrane. Tests made to determine if these materials were in any way concerned gave negative results. Addition of sulfhydryl compounds in the form of cysteine and thioglycollic acid and of an ether extract of brain to supply cephalin did not produce a reduction in the clotting time of the artificial plasma.

8351 C

Fibrinolytic Titer of Scarlatinal Streptococci.*

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Applying the Tillett-Garner plasma-clot technic¹ with rate of thrombolysis as the quantitative index, Dack, Woolpert and Hoyne² found a slight correlation between thrombolytic titer and clinical severity of scarlet fever. At the time of the publication of their paper a similar study of scarlatinal streptococci was in progress in our laboratories. We had selected the more delicate isolated fibrin-clot technic, however, with serial-dilution methods of determining lytic titer.

The 60 strains of *S. scarlatinae* used in this study were originally isolated in The Connaught Laboratories, University of Toronto. With 43 of these strains Dick-toxin titrations have been made by one of us (F). The fibrinolytic titrations were made in Stanford University (M). Both series of titrations are summarized in Table I.

From Table I it is seen that there is a slight correlation between toxin-titer and fibrinolysin-titer with scarlatinal streptococci. The

² Carr, L. J., and Foote, F. S., *Arch. Surg.*, 1934, **29**, 227.

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¹ Tillett, W. S., and Garner, R. L., *J. Exp. Med.*, 1933, **58**, 485.

² Dack, G. M., Woolpert, O. C., and Hoyne, A. L., *Proc. Soc. Exp. Biol. and Med.*, 1935, **32**, 1431.

TABLE I.

Correlation Between Toxin-titer and Fibrinolysin-titer.

Each fibrinolytic titration was made in triplicate, using 3 different sub-cultures and 3 different samples of presumably normal human fibrin, quantities, dilutions, temperatures, etc., being identical with those used by Tillett and Garner.¹ The maximum serial dilution of a 24-hour broth culture giving complete liquefaction of the serum-free human fibrin-clot, by the end of 2 hours, was assumed to contain one lytic unit.

The table records average titers, expressed in terms of the nearest routine serial dilution. Thus, all strains giving average fibrinolytic titers between 200 to 300 units per cc. are grouped under the routine titer 256 units. Strains giving toxin-titers, between 3000 to 6000 units, are grouped under the routine titer 4000 units (4M).

In order to determine the degree of correlation, the total population was divided into 4 approximately equal population quadrants (see lines). The upper left-hand quadrant (*TF*) is composed of strains simultaneously superior in both fibrinolysin (*F*) and toxin (*T*) production. The lower right-hand quadrant (*tf*) is composed of strains simultaneously inferior in both these functions. The 2 other quadrants consist of strains with one superior or one inferior function. A rough percentage of correlation may be calculated from the equation:

$$C = (TF + tf) / \text{Population.}$$

Fibrinolytic units per cc.	No. of strains yielding the following number of toxin-units per cc.									
	32M	16M	8M	4M	2M	M	500	250	<125	
1024	—	—	—	—	—	—	—	—	—	
512	1	2	3	—	—	—	—	—	1	
256	1	—	5	—	1	—	—	—	1	
128	—	—	2	3	—	—	1	—	—	
64	1	—	1	—	1	—	—	1	—	
32	1	1	—	—	1	—	1	—	—	
16	—	—	1	—	—	1	2	—	—	
8	—	—	—	—	—	1	1	—	—	
<4	—	1	1	—	—	2	1	1	2	

$$TF = 17 \text{ strains. } tf = 15 \text{ strains. } (17 + 15) / 43 = 75\%$$

2 population quadrants composed of strains either simultaneously superior, or simultaneously inferior in both fibrinolysin and toxin production, together contain 32 strains, or 75% of the population.

TABLE II.

Correlation Between Toxin-titer and Symptomatology.

Classification of the cases as "mild," "moderate," or "severe" was based on the temperature, duration of illness and number of complications. Correlation percentage calculated as in Table I by dividing the total population into four population groups (see lines).

Symptomatology	No. of strains yielding the following number of toxin units per cc.										Horizontal group-ratio
	32M	16M	8M	4M	2M	M	500	250	<125		
Severe	1	1	9	2	1	1	1	—	1	13:4	
Moderate	—	—	—	—	—	1	2	—	—		
Mild	3	3	4	1	1	2	3	2	2	11:13	
Vertical group-ratio	13:11				4:13			(13 + 13) / 41 = 63%			

An attempted correlation of toxin-titer and symptomatology is recorded in Table II.

From Table II it is seen that there are 13 strains in the left-upper quadrant in which high toxin-titer is associated with "severe" symptoms, and 13 strains in the right-lower quadrant in which low toxin-titer is associated with "mild" or "moderate" symptoms. These 2 quadrants together contain 26 strains or 63% of the population.

An attempted correlation of fibrinolysin-titer with symptomatology is recorded in Table III.

TABLE III.
Correlation Between Fibrinolysin-titer and Symptomatology.

Symptomatology	No. of strains yielding the following number of fibrinolytic units per cc.								Horizontal group-ratio	
	1024	512	256	128	64	32	16	8		<4
Severe	—	4	9	7	1	—	—	—	1	20:2
Moderate	—	2	—	—	1	2	2	—	1	
Mild	—	3	3	1	3	4	3	2	6	9:24
Vertical group-ratio				20:9		2:24		(20 + 24)/55 = 80%		

Table III shows an 80% correlation between fibrinolysin-titer and symptomatology, as contrasted with the 63% correlation between toxin-titer and symptomatology.

Since practically all of the "severe" cases in this series had one or more complications, and since the great majority of the milder cases were uncomplicated, the 2 relative percentages (80%:63%) confirm the conclusion of Dack and his coworkers, that high fibrinolysin-titer plays a demonstrable rôle in determining complications in scarlet fever.

8352 P

Gonadotropic Substance in the Blood of Normal Humans.

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It has been shown that, by utilizing the synergistic action of certain pituitary extracts, otherwise unappreciable amounts of a "prolan-like" gonadotropic substance may easily be demonstrated in adult male urine concentrates¹ and in the urine of male and female