

4524

Maternally Transmitted Immunity to *Bacillus Sordellii*.

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During our efforts¹ to produce antitoxic and agglutinating serums against *Bacillus sordellii* (*C. oedematoides*), one of our immunized rabbits accidentally became pregnant and gave birth to 10 young of which she succeeded in raising 4. When these were weaned it occurred to me to test their immunity toward the organism which had been used in the immunization of their mother.

Since details of immunization of the mother preceding and during gestation, as well as during lactation may be of some significance for the interpretation of the immunity conferred upon her young, they are here noted in tabular form.

Female rabbit No. 261 was immunized against *B. sordellii* 1302 as shown in Table I.

The following schedule is submitted in detail as an example of successful immunization against whole cultures of *B. sordellii*. We have never succeeded in immunizing rabbits against whole cultures by the intravenous route and sacrificed many in attempting to do so. Even animals as completely immunized as this rabbit was at the end, have succumbed to small doses of whole cultures administered into the vein.

It is clear that this rabbit possessed a well established antitoxic immunity before or about the time gestation started. This is shown by the fact that in spite of the relatively large doses of toxin received, she continued to gain weight and showed no alarming symptoms, only a moderate degree of localized oedema after each subcutaneous inoculation. Serum separated from the blood drawn after the first week of gestation also possessed definite protective power for guinea pigs inoculated simultaneously with filtered cultures of *B. sordellii* and *C. oedematoides*. Furthermore, repeated inoculations of this pregnant rabbit did not cause her to abort, as so often happens, and she continued to gain weight both during gestation and after parturition in spite of constantly increasing doses of first toxin, and later, whole cultures. However, she lost 6 of the young at an early age from an unknown cause. When the 4 re-

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TABLE I.

Date	Wt. in gm.	Dose
Mar. 7	1500	1 cc. (1-10) toxin B* intravenously.
" 12	1500	1 " (1-9) " " "
" 15	1600	1 " (1-8) " " "
" 19	1650	1 " (1-6) " " "
" 22	1750	1 " (1-4) " " subcutaneously.
" 26	1875	1 " (1-3) " " "
" 29	1875	1 " (1-2) " " "
Apr. 2	2000	0.7 " " " "
" 5	2050	0.8 " " " "
" 10	2250	1.25 " " " "
" 13	2350	2 " " " "
" 17	2450	2 " " " "
" 20	2600	2 " " " "
" 25	2700	2 " toxin G† "
" 28	2750	3 " " " "
Accidentally bred about this time.		
May 2	2900	4 cc. toxin G subcutaneously.
" 8		Bled about 30 cc. from heart; 1 cc. serum protects guinea pigs against 4 M.L.D. of toxin.
" 9	3050	
" 12	3150	5 cc. toxin G subcutaneously.
" 15	3225	5 " " " "
" 19	3300	
" 26	3500	1 cc. 7 day whole culture subcutaneously.
" 29	3550	1 " 2 " " " "
" 30	3100	10 young born.
June 1	3250	1 cc. 1 day whole culture subcutaneously.
" 6	3250	1.7 " 4 " " " "
" 9	3450	1.7 " 3 " " " "
" 15	3550	2 " 3 " " " "
" 19	3700	2 " 3 " " " "
" 22	3625	2 " 3 " " " "
" 25	3750	2 " 3 " " " "
" 28	3750	2 " 3 " " " "
July 6	3750	Bled about 15 cc. from ear. Agglutination titre 1-2000; 4 remaining young weaned.
" 11	3500	2 cc. 1 day whole culture subcutaneously.
" 14	3600	5 " 2 " " " "
" 19	3550	5 " 2 " " " "
" 24	3600	5 " 2 " " " "
Aug. 1	3600	Bled about 15 cc. from ear. Agglutination titre 1-5120.

* Toxin B contained less than 1 guinea pig M.L.D. per cc.

† Toxin G contained 2 guinea pig M.L.D. per cc.

maining young were weaned at 5 weeks, the agglutination titre of the mother was about 1-5120 against all 6 strains of *B. sordellii* and *C. oedematoides*.

July 11, the young rabbits were tested for any immunity that may have been transmitted to them from the mother, either congenitally or through her milk, by injecting them subcutaneously with different sized doses of a 24 hour glucose broth culture of *B. sordellii* 1302, the same strain used in the immunization of the mother. A somewhat larger rabbit from another litter was used as a normal

control; this animal received the smallest dose (0.1 cc.) similarly to one of the supposed immune litter. The results are shown in the following protocol:

TABLE II.

Rabbit No.	Weight	Dose	Results
	gm.	cc.	
300	600	0.1	No effect, gained 250 gm. in 7 days.
202	625	0.5	Marked oedema; died on 7th day.
235	700	2.5	Marked oedema; died on 3rd day.
209	735	10.0	Died during 1st day.
197*	1200	0.1	Marked oedema; died on 3rd day.

* Normal control.

Rabbit No. 300 was finally killed November 2, 1928, by a blow on the head. It then weighed 2600 gm. and was normal in every way. All of the other animals that died showed the characteristic lesions of infection by *B. sordellii*, *i. e.*, extensive subcutaneous oedema, with a little congestion but no emphysema.

The normal control rabbit, though much larger than the immune rabbits, showed approximately the same development of lesions and died in about the same time as the immune test rabbit (No. 235) which received 25 times as large a dose of the culture. The results clearly indicated that immunity to *B. sordellii* may be transmitted from female rabbits to their offspring, but whether by placental transmission or by lactation is, of course, impossible to state from this experiment.

4525

The Buffered Diluent for Schick Toxin.

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The instability of diphtheria toxin in diluted state has always presented obstacles to the preparation of outfits for the Schick test. It has been the custom to supply a small amount of undiluted toxin (or toxin in a small amount of glycerin) in one container and the required amount of saline diluent in another container, which required the mixing of toxin and diluent by the physician at the time of performing the Schick tests. A ready-made dilution of toxin which