

be expected in diakinesis and metaphase I. If they were homologous, 15 bivalents would be expected. Figure 4 shows a spermatocyte with 15 bivalents. From over 60 diakinesis figures examined, no deviation from 15 bivalents was observed.

The Robertsonian fusion in the present case, therefore, is believed to involve a pair of homologous acrocentrics. Theoretically, such a translocation should result in 50% sterility. It is interesting to note that this anomaly was found in 2 separate collections exactly 1 year apart. Furthermore, only 1 animal with the presumed normal constitution (30 chromosomes) was found among 7 individuals examined from Silver City, indicating that animals with this anomaly not only survive, but possibly predominate in the population in question¹.

Zusammenfassung. Die diploide Chromosomenzahl von *Sigmodon minimus*, einem Nager der Familie der Cricetiden ist 30. Im Karyotyp befindet sich kein grosses metazentrisches Chromosom. Bei Tieren aus einer Popula-

tion von Silver City, New Mexico, wurden 29 Chromosomen gefunden. Eines davon war relativ gross und metazentrisch. Beim Paaren der Chromosomen in Meiose ist es evident, dass das metazentrische Chromosom das Fusionsprodukt von 2 homologen Chromosomen ist.

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Antagonism of Polymyxin B and Kanamycin Sulfate by Liquoid (Sodium Polyanetholsulfonate) in vitro

Sodium polyanetholsulfonate (Liquoid®), a synthetic anticoagulant, has been used in media for human blood cultures, since it is known to be anticomplementary and antiphagocytic¹⁻³. During the course of experiments involving the interaction of bactericidal antibiotics and the bactericidal activity of fresh human serum in vitro, it was found that Liquoid not only abolished the bactericidal activity of serum, but, in addition, greatly reduced the activity of kanamycin sulfate and polymyxin B against Gram-positive as well as Gram-negative organisms. This preliminary report briefly describes our results obtained with the broth dilution technique. Liquoid did not influence the activity of ampicillin, tetracycline, cephalothin, or chloramphenicol; its inhibitory effect thus far has been found to be limited to kanamycin sulfate and polymyxin B. Tables I and II summarize our findings with regard to the latter 2 antibiotics. Kanamycin sulfate was obtained through the courtesy of the Bristol Laboratories, Syracuse, N.Y.; polymyxin B was a gift from Chas. Pfizer and Co., Inc., New York City, N.Y.; Liquoid was generously provided by Hoffmann-La Roche, Inc., Nutley, N.J. Four different broths were employed: nutrient broth (Difco), Mueller-Hinton broth (Difco), trypticase soy broth (BBL), and thioglycollate broth with 0.5% added dextrose (Difco); the latter 2 media are commonly employed for the culture of human blood. The data presented in Table I show that Liquoid raised the minimal inhibitory concentrations (MIC's) of kanamycin (expressed in µg/ml) considerably, in nutrient broth and Mueller-Hinton broth. However, this effect was absent or considerably reduced in the case of trypticase soy broth and thioglycollate broth, raising the question of whether the results obtained with Liquoid in the former 2 media were media-dependent. However, the addition of 10% fresh serum to all 4 media resulted in an enhanced antagonistic effect of Liquoid, particularly in the case of trypticase soy broth and thioglycollate broth. When polymyxin B (concentrations expressed in units/millilitre; 10 U = 1 µg) and Liquoid were examined (Table II), there was a clear-cut antagonism between

the 2 substances in all 4 media tested, regardless of whether they had been enriched with 10% fresh serum or not. It may be added that Liquoid, in concentrations of 0.05–0.0125%, was found to inhibit the 2 antibiotics in question. All results were reconfirmed using new lots of antibiotics, Liquoid, and media, as well as different strains of test organisms.

These data suggest that Liquoid will be a useful antagonist against kanamycin and polymyxin B in blood cultures from patients receiving these drugs, since Liquoid raised the MIC's of the 2 antibiotics to levels considerably above those obtained with any single medium alone.

It is of interest to note that Liquoid antagonizes 2 different antibiotics with different mechanisms of action. Kanamycin is known to inhibit bacterial protein synthesis, whereas polymyxin B acts at the bacterial cell membrane through its surface-active properties⁴.

A thorough search of the literature during the completion of this manuscript indicated¹⁰ that Liquoid had been found to exert a slight antagonistic effect against streptomycin, diminishing its activity from 2- to 8-fold when 0.05–0.2% of Liquoid had been employed. Furthermore, it had been found previously¹¹ that Liquoid at a

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Table I. Diminution of the activity of kanamycin sulfate by 0.05% Liquoid

Medium	Fresh serum (10%) added	Liquoid (0.05%) added	Test organisms <i>Staphylococcus aureus</i>		<i>Escherichia coli</i>	
			MIC ($\mu\text{g/ml}$)	No. organism/ml	MIC ($\mu\text{g/ml}$)	No. organism/ml
Nutrient broth	—	—	0.4	6×10^5	0.8	3.1×10^6
	—	+	12		50	
	+	—	2	9×10^5	1	5×10^6
	+	+	> 250		> 250	
Trypticase soy broth	—	—	12	8×10^5	50	3.1×10^6
	—	+	50		100	
	+	—	125	9×10^5	30	5×10^6
	+	+	> 1000		> 1000	
Mueller-Hinton broth	—	—	4	6.1×10^5	8	3.8×10^6
	—	+	250		60	
	+	—	4	4×10^5	8	3.8×10^6
	+	+	> 1000		> 1000	
Thioglycollate broth with dextrose	—	—	100	7.5×10^5	50	4×10^6
	—	+	100		100	
	+	—	125	9×10^5	30	5×10^6
	+	+	> 1000		> 1000	

Table II. Antagonism of the activity of polymyxin B by Liquoid

Medium	Fresh serum (10%) added	Liquoid (0.05%) added	Test organisms <i>Escherichia coli</i>		<i>Pseudomonas aeruginosa</i>	
			MIC (U/ml)	No. organism/ml	MIC (U/ml)	No. organism/ml
Nutrient broth	—	—	6	1.9×10^6	25	1.6×10^6
	—	+	250		> 250	
	+	—	30	7.5×10^6	60	4.6×10^6
	+	+	> 1000		> 1000	
Trypticase soy broth	—	—	125	2.7×10^6	12	2.3×10^6
	—	+	> 1000		250	
	+	—	125	7.5×10^6	60	4.6×10^6
	+	+	> 1000		> 1000	
Mueller-Hinton broth	—	—	15	3.8×10^6	15	3.1×10^6
	—	+	250		125	
	+	—	30	3.8×10^6	30	3.1×10^6
	+	+	> 1000		> 1000	
Thioglycollate broth with glucose	—	—	100	4×10^6	50	2.2×10^6
	—	+	> 1000		> 250	
	+	—	60	7.5×10^6	60	4.6×10^6
	+	+	> 1000		> 1000	

concentration of 0.5 mg/ml (0.05%) reduced the activity of polymyxin B cream considerably in vitro. However, there are no published observations relating to the antagonistic effect of Liquoid on kanamycin.

Our present experiments are aimed at defining the way in which Liquoid exerts its inhibitory effect against kanamycin and polymyxin B in vitro¹².

Zusammenfassung. Polyanetholsulfosaures Natrium (Liquoid), in einer Konzentration von 0,05–0,0125%, hemmt die Aktivität von Kanamycinsulfat wie auch von Polymyxin B in vitro. Die Verwendung von Liquoid in menschlichen Blutkulturen wird weiter unterstrichen, speziell bei kanamycin- und polymyxinbehandelten Pa-

tienten. Liquoid war unwirksam gegen Ampicillin, Tetracyclin, Chloramphenicol und Cephalothin.

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