Sakaguchi, B. Kyushu University, Fukuoka, Japan. Effects of chloramphenicol and actinomycin-D on SR spirochetes in Drosophila.

In order to examine whether SR spirochetes in SR flies are artificially eliminated by antibiotics, chloramphenicol and actinomycin-D were injected into female flies of a SR line of D. melanogaster, Oregon strain, with nebulosa SR spirochetes. Concentrations of chloramphenicol and actinomycin-D were 1400 μg and 400 μg per milliliter respectively. The injected volume was 0.5 microliter per fly. The injected SR flies were kept for 27, 50 and 190 hours in 25°C and their hemolymphs were sucked into a micropipette, then they were injected into each 15 normal female flies of Oregon inbred line. Sex ratios of progenies from the injected flies were examined. These results are summarized in the Fig. 1 and 2.

It has been demonstrated from dilution experiments of the SR spirochetes by Sakaguchi and Poulson (1961) that the SR flies of a certain species of Drosophila have a large number of the SR spirochete in their hemolymph and the time of appearance of SR condition in the progenies from the flies injected with the spirochete was dependent upon the number of the micro-organisms. It can be said from the facts that sensitivities of the SR spirochetes to chloramphenicol and actinomycin-D will be seen by the length of time in appearance of SR condition in the progenies from normal female flies injected with the SR hemolymphs treated by those antibiotics.

When hemolymphs from SR females of 27 and 50 hours after injection of chloramphenicol were injected into normal females, SR condition which produces one hundred percent females in the progeny, appeared from the first to the successive broods (Fig. 1). In the case of hemolymphs from SR females of 190 hours injected into normal females, SR condition appeared at the 15th day brood (Fig. 1). The concentration of chloramphenicol was very high and the injected SR females never produced their progenies. However, effect of the concentration of the antibiotics on the SR spirochetes was rather weak.

When hemolymphs from SR females of 27 and 50 hours after injection of actinomycin-D were injected into normal females, SR condition appeared at the 21st and the 24th day brood (Fig. 2). With the concentration used in this experiment of actinomycin-D, they never produced their progeny, but the SR spirochetes were not completely eliminated by the antibiotics.

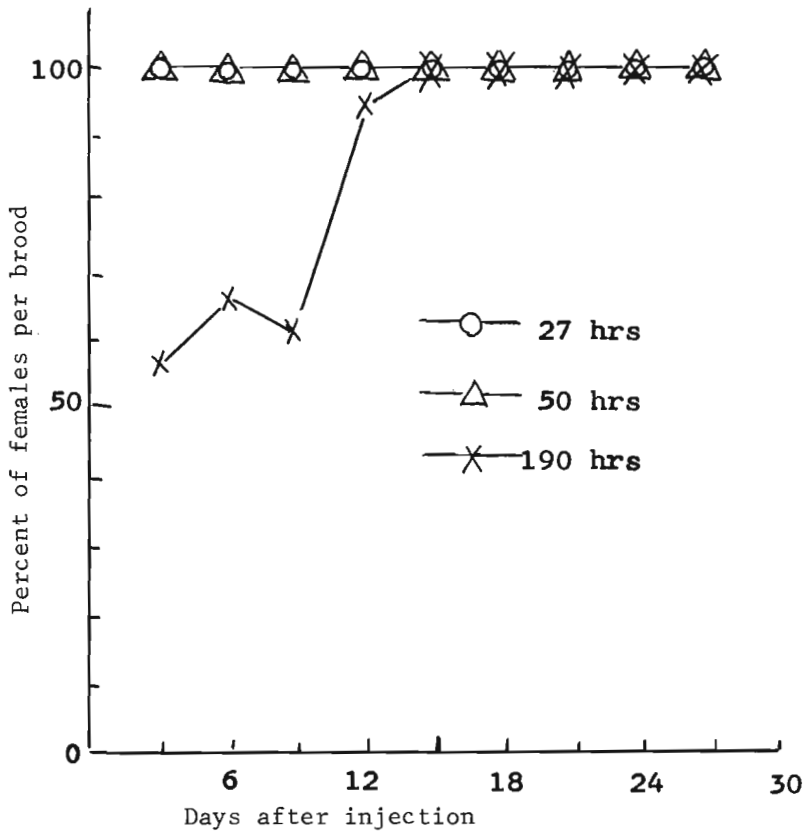

Fig. 1. Effect of chloramphenicol on SR spirochetes.

Solution of chloramphenicol was injected into SR females flies and hemolymphs of the injected flies were sucked out at the time of indication in the figure. The hemolymphs were then injected into normal females of Oregon strain and were examined for female percent per brood.

These results show that the effect of actinomycin-D which inhibits DNA-dependent RNA synthesis on inactivation of the SR spirochete is more predominate than chloramphenicol which inhibits protein synthesis.

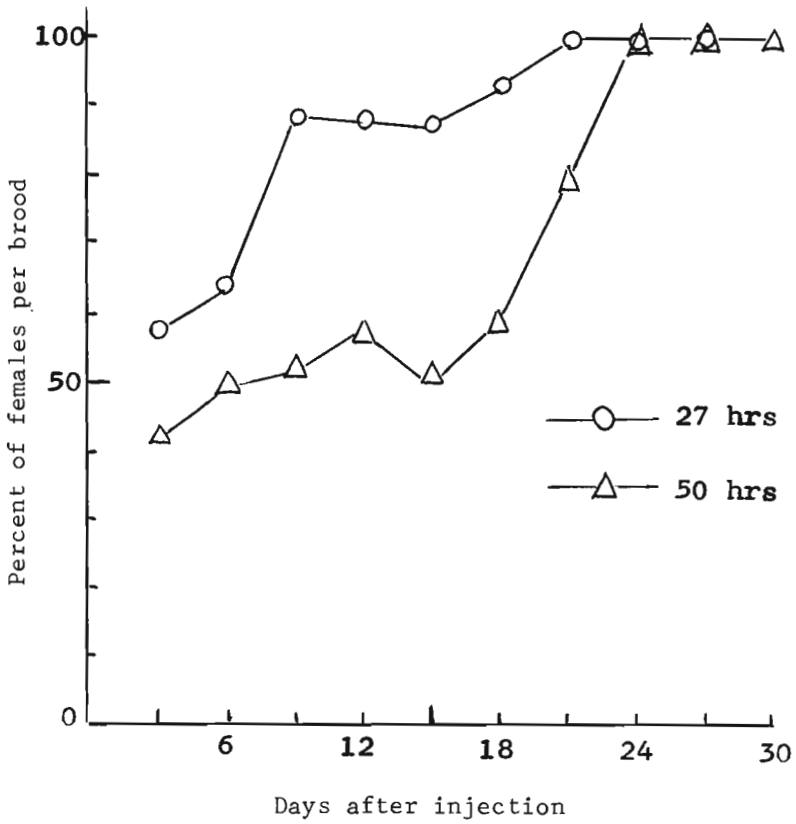

Fig. 2. Effect of actinomycin-D on SR spirochete.

Procedures of this experiment were the same as in Fig. 1.

To make clear the properties of multiplication of the SR spirochete, a more detailed examination of this sort is now underway. (Support by PHS Grant GM10238 of USA and a Grant 36001 from the Ministry of Education of Japan.)

Yoon, J.S. and W.C. Kim. Yonsei University College of Medicine, Seoul, Korea. Genetic effects of a synthetic ovarian steroid in D. melanogaster.

Effects of a synthetic ovarian steroid on genetic materials were studied in Drosophila treated with Lyndiol 2.5 (Lynostrenol 2.5 mg and Mestranol 0.075 mg/tablet). Germ cells of males ($sc^8.y.B^S/y^2\ w^i\ ct^6\ f^1$) reared on the medium containing 0.5 ml of Lyndiol (50% in Drosophila Ringer's) solution through imaginal stages were tested for genetic damage. When males treated were crossed individually to multipurpose virgin (y sc^{S1} In49 sc^8;dp bw;st p^p),

Table 1. Mutations and chromosomal abnormalities in D. melanogaster treated with Lyndiol 2.5.

	Treated		Control	
Aberrations	Total No. Studied	% With Aberration	Total No. Studied	% With Aberration
Loss of Y	8,829	0.14	6,605	0.08
Nondisjunction	18,453	0.37	12,323	0.14
Visible mutations	18,453	0.07	12,323	0.00
Lethal mutations	1,628	0.49	1,389	0.07
Translocations	1,558	0.00	1,215	0.00

increased nondisjunctions, losses of the Y chromosome, and other visible mutations were found. The rate of sex-linked recessive lethal mutation was 0.5% (8 out of 1,628 chromosomes tested) in the group treated, and no translocation was found (Table 1). The data suggest that the hormone may act as a mutagen in Drosophila.