BIKEN JOURNAL Vol. 18, 275–276, 1975

PRELIMINARY REPORT

LOWER PRODUCTION OF CIRCULATING INTERFERON IN CONGENITALLY ATHYMIC (NUDE) MICE INDUCED BY INTRAVENOUS ADMINISTRATION OF NEWCASTLE DISEASE VIRUS

YOSHITAKE YOKOTA and TSUNATARO KISHIDA

Department of Microbiology, Kyoto Prefectural University of Medicine, Kawaramachi-Hirokoji, Kyoto

KOZABURO ESAKI

Central Institute for Experimental Animals, Nogawa, Kawasaki, Kanagawa

JUNICHI KAWAMATA

Department of Experimental Chemotherapy, Research Institute for Microbial Diseases, Osaka University, Yamada-kami, Suita, Osaka

(Received July 4, 1975)

In the preceding paper (Yokota et al., 1975) we reported production of interferon (IF) in congenitally athymic (nude) mice by intraperitoneal injection of a synthetic double-stranded nucleic acid, polyriboinosinic-ribocytidylic acid (poly I:C). No remarkable difference was observed between the IF titers of the serum of organs of nude and heterozygous mice and of homozygous normal mice. We also reported that IF produced in nude mice was lower than in heterozygous mice after Newcastle disease virus (NDV) injection.

This paper reports data on the strain difference between athymic nude and heterozygous, thymus bearing mice in IF production following intravenous injection of NDV. For comparison, the effects of endotoxin or poly I:C are also reported. Nude mice (BALB/c-nu/nu) and heterozygous mice (BALB/c-nu/+) were bred in the Central Institute for Experimental Animals, Kanagawa under "SPF" conditions in plastic film isolators mating BALB/c-nu/+ females with BALB/c-nu/nu males. The female mice were used at 6 weeks of age. Throughout the experiments, groups of mice were housed in plastic cages and kept in a hood placed in a bacteriological sterile room. The mice were injected intravenously wit 6.5×10^7 PFU of NDV in 0.1 ml sterile saline solution. Specimens of blood were taken 2, 4, 6, 8 and 24 hr after virus injection. The treatment of specimens and assay of IF were as described in our preceding paper (Yokota et al., 1975). As shown in Table 1, circulating IF was found in both nude and heterozygous mice. In nude mice the IF titer reached a maximum 6 hr after NDV injection. In heterozygous mice, however, the IF titer reached a maximum after 8 hr. The level in heterozygous mice was still higher than in nude mice 24 hr after virus injection. From these results it is clear that nude mice responded less than

heterozygous mice to NDV injection. When *Escherichia coli* endotoxin (Difco Laboratories, Inc., Detroit, Mich.) was used as IF inducer, the serum IF titers of nude and heterozygous mice were similar when assayed at 1 and 3 hr after intravenous injection of 50 μg/mouse of endotoxin dissolved in 0.2 ml sterile saline solution. In the case of poly I : C induction, the serum IF titer was assayed only at 4 hr after intraperitoneal or intravenous injection of 100 μg/mouse of poly I : C (P-L Biochemicals, Inc., Milwaukee, Wisc.) dissolved in 0.2 ml of sterile saline solution. As already reported in the preceding paper (Yokota et al., 1975), in this case also no appreciable difference was detected between the titers in the two strains, irrespect of the route of administration of the inducer.

TABLE 1. *Serum interferon titers*[a] *in congenitally athymic (nude) and heterozygous mice after NDV injection*

Hr after iv injection of NDV	Athymic (nu/nu)		Hetero (nu/+)	
2	100[b]	(82.5)[c]	150	(137.5)
	60		130	
	90		120	
	80		150	
4	500	(487.5)	900	(1100.0)
	450		1500	
	600		1200	
	400		800	
6	750	(587.5)	1800	(3075.0)
	700		2300	
	400		2400	
	500		5800	
8	400	(262.5)	4500	(4400.0)
	300		3600	
	150		3500	
	200		6000	
24	30	(52.5)	110	(136.3)
	50		170	
	60		95	
	70		170	

[a] International units.
[b] Individual titers.
[c] Arithmetic mean titer.

Nagata et al. (1967) claimed that thymectomy of rats had no measurable effects on the circulating IF titer after Sindbis virus injection. This result differs from ours possibly due to a difference between congenitally athymic mice and surgically thymectomized ones. It is most probable that in viral induction of IF in vivo, thymus or T-cells are involved in IF production. Thus, the role of the transplanted T-cells in IF production in nude mice is being investigated.

ACKNOWLEDGMENTS

We thank Dr. T. Nomura, Director of the Central Institute for Experimental Animals, Kanagawa, for supplying the animals used in this work and for valuable discussion. This work was supported in part by a Grant in Aid for Cancer Research from the Ministry of Education, Science and Culture.

REFERENCES

Nagata, I., A. Kunii and S. Ono. 1967. Unpublished observations cited in Ito, Y., A. Kunii, N. Mori, and I. Nagata. 1971. Effects of splenectomy on production of endotoxin-type interferon in mice. Virology 44: 638–641.

Yokota, Y., T. Kishida, K. Esaki, and J. Kawamata. 1975. Induction of interferon in congenitally athymic mice. Biken J. 18: 183–185.