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NONSPECIFIC CELL-MEDIATED CYTOTOXICITY OF PERIPHERAL BLOOD
LYMPHOCYTES DERIVED FROM SUCKLING PIGLETS

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It is well known that suckling piglets are prone to be immunodeficient because of the poor differentiation of lymphocytes into antibody-forming cells.

In the present investigation, we examined nonspecific cell-mediated cytotoxicity of peripheral blood lymphocytes (PBL) derived from suckling piglets for the purpose of understanding immunoresponsiveness in the suckling stage.

Cytotoxic activities of PBL from both adult pigs and suckling piglets were tested in a 4-hr ^{51}Cr -release assay against porcine B cell tumor cell line Mitsukaido and human chronic myelogenous leukemia cell line K562.

The results of the experiments are summarized as follows.

1) Fresh PBL from adult pigs showed natural killer (NK) activity against the Mitsukaido cell line.

Cytotoxic activity of PBL from adult pigs against the Mitsukaido line increased after incubation of adult PBL in glass petri dishes at 37°C for 16hr.

2) The effect of culture containers on cytotoxic activity of adult PBL cultured at 37°C for 16hr was examined. Adult PBL cultured in glass petri dishes showed higher cytotoxic activity against the Mitsukaido line than those cultured in test tubes.

3) The relationships between cytotoxic activity of adult PBL cultured in glass petri dishes at 37°C for 16hr and the effector: target (E: T) cell ratio was examined. Cytotoxic activity of the PBL both against the Mitsukaido line and the K562 line increased the number of effector cells.

Higher cytotoxic activity of the adult PBL was shown against homogeneous Mitsukaido than heterogeneous K562 in the same adult pig.

4) Cytotoxic activity against the Mitsukaido line of suckling piglets PBL cultured in glass petri dishes at 37°C for 16hr was not observed during 1 to 3 weeks of age. However, the activity rose slightly at 4 weeks old and it remarkably increased at 5 weeks old.

On the other hand, cytotoxic activity of cultured PBL derived from suckling piglets against K562 was not seen during 1 to 4 weeks of age, but at 5 weeks old it was clearly recognized.

Cytotoxic activity of suckling piglets against homogeneous Mitsukaido was higher at 4 to 5 weeks of age than was heterogeneous K562.

These results indicated that the function of lymphocytes was insufficient in the suckling stage of swine as far as the nonspecific cell-mediated cytotoxicity was concerned.