

## Communications to the Editor

[Chem. Pharm. Bull.]  
33(6)2585-2586(1985)]

## EFFECT OF EICOSAPENTAENOIC ACID ON MOUSE PERITONEAL EXUDATE CELLS

Mitsuru Ohsawa, Toyoyasu Kuwae and Munetsugu Kurata\*

Department of Physiological Chemistry, Faculty of Pharmaceutical  
Sciences, Josai University,  
1-1 Keyakidai, Sakado, Saitama 350-02, Japan

Intraperitoneal administration of eicosapentaenoic acid in mice gave rise to large numbers of polymorph nuclear cells which were about 100 times as many as are in normal mice.

KEYWORDS — eicosapentaenoic acid; intraperitoneal administration; thioglycolate; zymosan; polymorph nuclear cell

Injection of thioglycolate (TG) or zymosan into mouse peritoneal cavities induces peritoneal macrophages<sup>1)</sup> and injection of glycogen<sup>2)</sup> or casein<sup>3)</sup> solution induces polymorph nuclear leucocytes (PMN) in addition.

When we injected eicosapentaenoic acid (EPA, 97%, nissui) into the peritoneal cavity of mice, ICR-male mice 6-8 weeks old, large numbers of PMNs ( $2-3 \times 10^7$  cells/mouse) were obtained compared with other irritants. From a normal mouse peritoneal cavity, we collected about  $2-3 \times 10^6$  cells: populations were  $1.3-1.9 \times 10^6$  macrophages,  $0.6-0.9 \times 10^6$  lymphocytes and  $1.4-2.1 \times 10^5$  PMNs.

We injected into the peritoneal cavity of mice one of three irritants in the following amounts: 1 ml 3% TG, 200 mg of zymosan (per 0.1 ml of saline) or 0.05 ml EPA. Then after intervals of 6, 12, 24, 48 or 96 hours, 5 ml of minimum essential medium was injected and immediately removed from each mouse's peritoneal cavity. Cells were centrifuged at 3,000 rpm for 5 min. and stained using the Wright-Giemsa method.

In the zymosan groups, as shown in Fig. 1, from 6 hours to 96 hours, cell totals increased gradually; at first most of the cell populations were PMN but they gradually replaced by macrophages.

In the TG treated groups, maximum numbers of cells were obtained at 24 hours. The PMNs increased at first but decreased after 24 hours. The macrophages increased up to 48 hours and then plateaued.

The EPA treatment induced PMN cells to increase for 24 hours in parallel with total cell numbers. The percentage of PMNs to total cells were 80-85%, but after 48 hours the PMNs decreased to 55% while macrophages increased to 37%.

Our injection of EPA into mouse peritoneal cavities resulted in large numbers of PMN cells ( $2-3 \times 10^7$  cells/mouse) about 100 times that of normal mice, so it seems a very useful method for obtaining pure PMN cells.

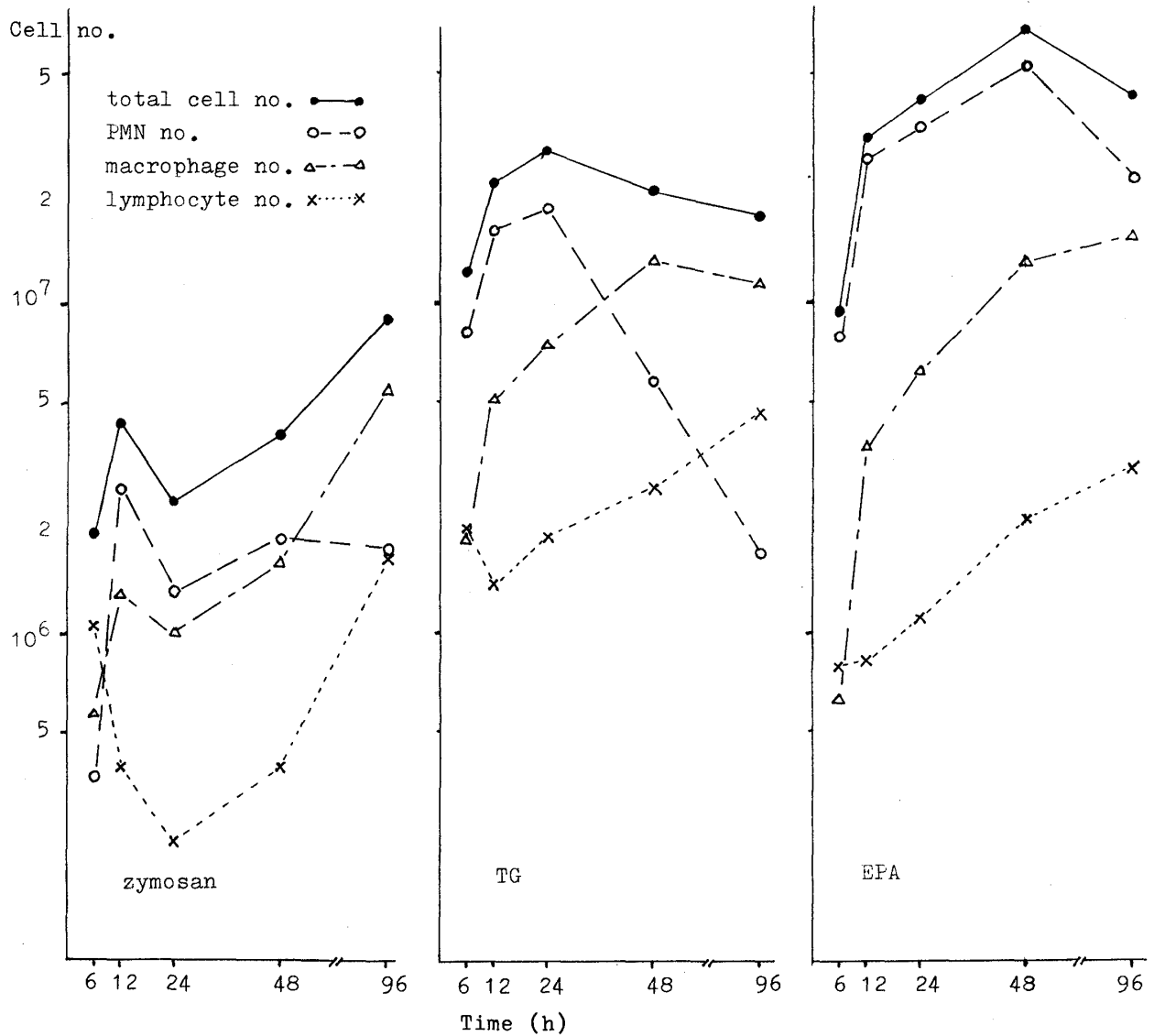


Fig.1. Mouse Peritoneal Exudate Cells Induced by Injections of 0.05 ml of EPA, 1 ml of 3% TG or 200 mg/0.1 ml of Zymosan (per 0.1 ml of Saline)

Samples were taken from mouse peritoneal cavities, 6, 12, 24, 48 or 96 hours after injection. Cells were stained by the Wright-Giemsa method. Data are means of three or four mice.

**ACKNOWLEDGEMENT** We thank Nissui Co. for supplying the eicosapentaenoic acid.

#### REFERENCES

- 1) H.B. Herscovitz, H.T. Holden, J.A. Bellanti and A. Ghaffar, "Manual of Macrophage Methodology", Marcel Dekker, New York, 1981, p.5.
- 2) A.J. Sbarra and M.L. Karnovsky, J. Biol. Chem., 234, 1355 (1959).
- 3) Z.A. Cohn and S.I. Morse, J. Exptl. Med., 110, 419 (1959).

(Received March 25, 1985)