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ABSTRACTS

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Influence of neuropeptide y on bone marrow megacariocytes blood platelet count and blood glucose level.

Neuropeptide Y (NPY) (TATEMOTO et al.: Nature 1982, **296**, 659) coexists with catecholamines in the CNS (EVERITT et al.: 1984, **11**, 443) and in perivascular plexuses (LUNDBERG et al.: Acta Physiol. Scand. 1982, **116**, 477). Human (MINTH et al.: Proc. Natl. Acad. Sci. USA 1987, **81**, 4577) and rat NPY (LARTRAMMAR et al.: Proc. Natl. Acad. Sci. USA 1987, **84**, 2068) have identical aminoacid sequence; the peptide is synthesized in the nerve cell body, is packed into vesicles and transported through axons to nerve terminals (FRIED et al.: Acta Physiol. Scand. 1985, **125**, 145) where it is contained in dense-core vesicles together with NA.

NPY is widely distributed in perivascular nerves (LUNDBERG et al.: Acta Physiol. Scand. 1982, **116**, 477; Neurosci. Lett. 1983, **42**, 167) and the ganglion cells of origin.

MATERIALS and METHODS

Young male Wistar rats, weighing 261.7 ± 12.6 , kept at room temperature of 21 ± 2 °C, with free access to standard balanced chow were i.p. nembuthalized.

Carotid or femoral vein blood was tested before or after i.v. injection, within 7 min. of saline physiological NPY solution. RBC, WBC, Hb, HCT, MCV, Platelets, glucose were determined.

Bone marrow samples from left femur diaphysis were suspended in Hemagel or Solutran fluid, and incubated with or without NPY 10^{-12} M, during 120 min. or more, at the ambient temperature of about 20 °C. Some bone marrow samples were suspended after rats have been injected with NPT.

BONE MARROW INNERVATION: Many clinical and experimental researches support the hypothesis that hemopoietic activity is subjected to neurovegetative control (MONNIER: Hippokrates Verl., 1963). Myelinated and unmyelinated nerve fibers that innervate bone marrow are related with its vascular architecture (WICKAMASINGHE: Blakwell 1975; TRUBOWITZ et al.: C.R.C. press, 1982; LITTLE: Acad. Press, 1973; BOURNE: Acad. press, 1971). According to KWERCH & LEIBESTEDER (Wien. KLIN. WSCHR., 1951) sympathetic paralysis makes megacariocyte density to increase. Some nerve fibers are associated with endothelial cells of sinusoids, where they release chemical mediators (MILLER & KASAHARE: Anat. Rec., 1963; CALVO:

Am. J. anat., 1968). These nerve fibers are cholinergic and adrenergic (CALVO & FORTEZVILA: Am. J. Anat., 1969; MILLER & McCUSKEY: Scand. J. Hematol., 1973).

RESULTS

- 1 NPY BRINGS ABOUT A MODERATE RISE OF BLOOD PLATELET COUNT. (Fig. 1).
- 2 NPY induces no change in RBC count (Fig. 2), in WBC (Fig. 3), in Lymphocyte/Granulocyte ratio (Fig. 4). Glucose blood level raises moderately only concomitantly with blood platelet count elevation.
- 3 Bone marrow megacariocytes exhibit no apparently different granulation or committed membrane system aspect after in vivo or in vitro incubation with NPY.

Megacariocytes are located adjacent to sinusoids or against the gaps among the sinusoid cells (ZAMBONI & PEASE: J. Ultrastr. Res, 1961; WEISS: J. Morph., 1965 and Blood, 1970), and feel the effects of chemical mediators that are released by nerve fiber terminations.

NA is displaced by 5HT (McGRAW N.A.: Circulation Res., 1977), which plays an essential role, in adjunction to Melatonin, in the process of maturation, and production of platelets by megacariocytes (ROSSI & DI BELLA: Atti VI Conv. Naz. Primatol. 1991, **125**; LAUNAY J.M. et al.: J. Biol. Chem., 1992, **267**, 11344).

The object of the present report is to investigate the influence that NPY display on blood platelet count and megacariocyte maturation; the simultaneous blood glucose level determination informed us about the general metabolic course.

CONCLUSION

NPY plays a feeble activity only on blood platelet count, without changing RBC, WBC, Hb blood count. The unique moderate activity on blood platelet count is probable dependent both on megacariocyte maturation, and on bone marrow sinusoid endothelium (DALY & HIEBLE: Eur. J. Pharmacol. Sci., 1987, **138**, 445).

The apparent dual effect of NPY can be dependent on the stimulatory effect mediated by Y2 like receptors, and the simultaneous or following inhibitory effect mediated by Y1 like receptors (MICHEL: Trends Pharmacol. Sci., 1991, **12**, 389). The critical determinant of NPY receptor action is the proximity of N- and C-terminus of the molecule, that forms helix which lie antiparallel (SCHWARBE et al.: N.Y. Acad. Sci. 1990, **611**, 35); the kinetics of the structure seem to be time- and concentration dependent.