

## PH 109

## HIGHLY ACIDIC BLOOD CELLS IN ASCIDIANS CONTAIN HIGH AMOUNTS OF VANADIUM IONS.

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Following Henze's first discovery of 1 N acidity (Henze, 1911), it was widely accepted that a homogenate of ascidian blood cells indicated a low pH value and the mechanism of accumulation of vanadium ions by the cells was associated with the low pH value. However, recent measurements based on new technology including NMR, ESR, and trans-membrane equilibrium gave spurious results of pH values, varied between 1.8 and 7.19.

Since ascidians have six to nine different types of blood cell, one of the reasons for the variation in pH values is probably caused by the measurement of pH without cell fractionation. Therefore, the present study was planned to isolate acidic blood cells and examine whether the cells are identical with the so-called vanadocytes, using a combined technique involving cell fractionation by density gradient centrifugation, a microelectrode for pH measurement and neutron-activation analysis for vanadium determination.

As a result, it becomes clear that in all species examined in the present experiment, signet ring cells contain a high amount of vanadium ions and the layer containing the signet ring cells among four fractionated layers show a low pH value: *Ascidia ahodori*, 2.67; *A. gemmata*, 2.42; *A. sydneiensis samea*, 4.20.

## PH 110

STRUCTURE OF WATER PERMEATING CELLS IN THE EPIDERMIS OF THE TREEFROG, *Hyla arborea*

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Ventral pelvic skin of Japanese treefrogs was extremely permeable to water, while dorsal skin was water-resistant. Larval skin was also waterproof. In this study, larval and adult skins of the treefrog were investigated morphologically in relation to the water permeability. Epidermis of adult frogs consisted of two to three layers of cells, of which outer cells, the granular cells, showed remarkable difference between dorsal and ventral skins. The granular cells in the ventral skin showed very dense cytoplasm and contained small amount of shorter tonofibrils, while those in the dorsal skin were rich in bundles of long tonofibrils and showed moderate cytoplasmic density. Cytoplasmic granules which characterized these cells were scarce in the dorsal cells. The granular cells of the ventral skin showed extensions of cytoplasmic processes by which they interdigitated with neighbouring cells. Granular cells appeared at the late prometamorphic phase and proliferated to cover whole outer surface of the ventral pelvic skin before beginning of the metamorphic climax. During these periods, neural elements appeared among granular cells. A bundle of axons were also observed passing through the basal lamina suggesting innervation in the epidermis.

## PH 111

## FEEDING AND GROWTH IN HYDRA

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The response of *Hydra* to reduced glutathione is composed of at least 5 components (R1-R5), each of which is specifically depressed by various growth factors. In the body fluids of mammals, that is, cerebrospinal fluid from the rat brain and human serum, R4 depressing activity was observed greatly elevated after food intake. This elevated activity is proposed to be closely related to acidic fibroblast growth factor (aFGF), which may be participated in feeding regulation in the brain.

In *Hydra*, we observed the elevated labelling index of cell proliferation for epithelial cells and interstitial cells, and also observed the R4 depressing activity in culture medium after feeding. It is interesting to see the relationship between the activity which leads to cell proliferation and another which is released into the medium after feeding. To examine closely the latter activity, we extracted the activity from the culture medium after feeding. The activity could be purified after concentration with Butyl-TOYO PEARL by a heparin-Sepharose column and reverse phase HPLC with a C4 column, which are the same chromatographic procedures as aFGF is purified from bovine brains. However, the obtained material was too small for analyses.

## PH 112

## REGULATION OF IRIDOPHORE MOVEMENTS IN GOBIIDAE FISHES.

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Regulation of movements of motile iridophores of the paradise goby, *Rhinogobius giurinus* was examined. High  $K^+$  solution and electric stimulation induced dispersion of the platelets within the cells. These stimuli became ineffective in denervated scale preparations, showing that the movements of the iridophores are under the nervous regulation. Noradrenaline (NA) also induced dispersion of the platelets. The responses of the iridophores to electric stimulation and to NA were inhibited by alpha adrenergic blockers, but not beta adrenergic ones. These results show that the nerve regulating the iridophores is of adrenergic and the transmitter, being assumed as NA, acts on alpha adrenoceptors to induce platelet dispersion. Forskolin was effective in inducing aggregation of the platelets, suggesting that an increase in intracellular cAMP induces platelet aggregation. Melatonin accelerated the aggregation response of the iridophores. The hormone caused platelet dispersion in *Odontobutis* iridophores. This suggests that melatonin receptors include two separate types. Differences in the regulatory mechanisms on movements of iridophores and of leucophores were discussed.