

## MATURATION AND DISTRIBUTION OF ELASTIC SYSTEM FIBER IN MOUSE TAIL TENDON WITH ADVANCING AGE.

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As elastin adds to microfibril, the elastic system fiber matures from oxytalan fiber, elaunin fiber, to elastic fiber. With the mouse tail tendon, we observed how the elastic system fiber matured and its distribution changed with advancing age.

Animals used were, 10 days to 14 months of age, mice of the IVCS strain. The tail tendon was taken from the basal portion of tail after perfusing with a fixative (Karnovsky), post fixed with osmic acid and embedded in Epon. Sections were stained with 0.5% orion tea extract (Suntory) and re-stained with uranyl acetate and lead citrate.

At 10 days of age, oxytalan fibers, which was a primitive fiber in the elastic system fiber, appeared near the tenocytes. At 30 days of age, an amount of the extracellular matrix increased and elastic fibers, which was a fully matured fiber in the elastic system fiber, existed away from the tenocyte.

The results suggested that, as the extracellular matrix increased with advancing age, the elastic system fiber might mature and might remove from the tenocyte.

## THYROID HORMONE INDUCES MORPHOLOGICAL TRANSFORMATION OF THE EPITHELIUM OF POSTERIOR INTESTINE OF LOACH LARVAE.

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The loach (*Misgurnus anguillicaudatus*) breathes through the intestine. In adult loach, the capillaries are distributed closely throughout the epithelium of the posterior intestine. These capillaries don't extend into the epithelium of larvae after hatching. We observed the capillaries in the epithelium in four or five months after hatching. Extended capillaries bring transformation to the epithelium of intestine. In the present experiment we treated loach larvae with  $T_4$  and thiourea (TU) to learn whether thyroid hormone affects the transformation of the epithelium. Loach larvae 34 days after hatching were separated into four groups. The water of each four groups contained 0.1 ppm  $T_4$ , 0.05 ppm  $T_4$ , 30 ppm TU and no added material. Hormone treatment was terminated at 33 days thereafter all animals were reared in normal water. At hormone treatment for 22 days, 0.1 ppm  $T_4$  treated animals were observed erythrocytes in the epithelium. At another three groups, we observed no erythrocytes in the epithelium until about 100 days after hatching. It is considered that the effect of thyroid hormone appeared.

## THE PHOTORECEPTOR ORGANS OF LAND PLANARIANS

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Histological observations were examined in the distribution and structure of photoreceptor organs (eyes) several land planarians were studied histologically by light and electron microscopy.

*Bipalium* has a row of eyes along the entire body margin. Eyes were observed not only on the dorsal surface but also on the ventral surface, and in the case of the latter, the edges of the lunate head and the neck showed concentrating of the organs. On the other hand, more posterior eyes were regularly arranged. We preliminarily reported that these organs consisted of a pigment cell and several visual cells, and were not retinal clubs concerned with nerve cells.

In this study, we observed a balloon shaped eye cup and some photosensitive cells projecting into the eye cup through its aperture. These organs were located under the basal membrane, and their closed membrane resembled a reversed lens, behind the neck.

However, along the head edge and in the neck, they were irregularly scattered or concentrated in small areas, facing various directions and with various shapes in addition the eye cup can be lacking or deformed. These observations suggest that eyes in *Bipalium* have various functions as visual and tactile organ.

MOVEMENT OF LAND LEECHES, *HAEMADIPS ZEYLANICA* VAR. *JAPONICA* IN WINTER (2)H. Inamura<sup>1</sup>, A. Abe<sup>1</sup>, M. Yamane<sup>1</sup>, I. Yamakawa<sup>1</sup>, C. Yamakawa<sup>1</sup>, <sup>1</sup>Dept. of Biol., Tokyo Med. Univ., <sup>2</sup>Dept. of Biochem., Tokyo Med. Univ., <sup>3</sup>Univ. Forest in Chiba, The Univ. of Forest, fac. of Agri., The Univ. of Tokyo

We have been observing the feeding activity and changing appearance of adipose cells in land leeches, since land leeches possess adipose cells and arachidonic acid (C20-4) in their fatty acid. When the humidity increases, they emerge from under dry leaves, small stones and pieces of wood, or near the roots of weeds. It is assumed they feed on passing deer. To gain a clear idea of their winter habitat, we collected them at a site in the forest of the University of Tokyo in Chiba once a month from November 1998 to April 1999. At the same time, we observed adipose cells in land leeches using light and electron microscopes. We assumed that they would inhabit relatively wet north hills to avoid danger of dryness out during winter, and passing deer would sustain them. We therefore placed wooden test blocks in such places. After a rain fall, we observed land leeches of two different colors gathered under the test blocks. One was dark brown, while the other was reddish-brown.

The dark leeches appeared hungry as they did not retain any animal blood in their alimentary ducts. However the others type had ample reserves in their alimentary ducts; moreover, swollen adipose cells in the shape of eggs displayed central nuclei, large lipid droplets 6  $\mu$ m in size a few ER, and mounts of glycogen particles. These results suggest that during winter, paths where deer of suitable feeding type for leeches pass and with ample humidity attracts land leeches, and also that adipose cells of leeches that have fed display lipid droplets of large size.

LOCALIZATION OF A 540-KDA CONNECTIN (TITIN)-RELATED PROTEIN IN MUSCLE CELLS OF THE PLANARIAN, *DUGESIA JAPONICA*.

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Connectin (titin)-related proteins are present in most of invertebrate muscles. In Platyhelminthes, high molecular weight ( $\approx 1000$  kDa) proteins had described as connectin in some species of land planarians (Locker, R. H. & Wild, D. J. C., 1986). In our previous study, we found a 540 kDa protein in muscle cells of freshwater planarian, *Dugesia japonica* and it cross-reacts to monoclonal antibody 3B9 against chicken skeletal muscle connectin.

In the present study, we studied the localization of 540 kDa protein in muscle cells of *D. japonica* by indirect immunofluorescence microscopy using monoclonal antibody 3B9 and a confocal laser scanning microscope. In pharynx muscle cells, the epitopes of 540 kDa protein seemed to be localized in the cytoskeletal domain and be arranged along the lines of the cytoskeleton.

General structure of the airway tract of red-bellied newt (*Cynops pyrrhogaster*)H. Naruse<sup>1</sup>, A. Kimura<sup>1</sup>, Y. Kikuchi<sup>1</sup>, T. Gomi<sup>2</sup>, K. Kishi<sup>1</sup>, <sup>1</sup>Dept. of Anat., Sch. of Med., Toho Univ., Tokyo, <sup>2</sup>Sch. of Health, Medical Treatment and Social Services (Anatomy), Saitama Prefectural Univ., Saitama

Serial sections of the airway tract (laryngotrachea and lung) of the red-bellied newt (*Cynops pyrrhogaster*) were stained by hematoxylin-eosin (H-E) staining and reconstructed to three dimensional image.

The laryngotrachea was a tubular structure that opens ventromedially into the esophagus via a slit-like opening in the slightly protruding aditus laryngis. Gradually, the aditus laryngis becomes flatter. The laryngotracheal lumen was narrow, covered with ciliated epithelium and still connected to the esophagus in cross-sections. Lateral cartilage plates could be seen on both sides. Initially, sections of the bilateral cartilage plates appeared round, becoming triangular and sickle-shaped towards the distal region. Cartilage reinforced end at the point where the laryngotrachea branches into two bronchi.

In the airway tract of the red-bellied newt, were divided into 6 regions (5 regions of laryngotrachea and 1 region of lung) were defined, based upon morphological criteria.