

**Tissue Immunity, HLA and Action of the Gravity**

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**Abstract**

Haecckel proposed the biogenetic law as "ontogeny recapitulates phylogeny". From the view point of the biogenetic law, tissue immunity system of archetype vertebrate is thought analogous to that of the embryo of mammals. Present research aims to prove for development of tissue immunity through genetic expression by the gravitation during terrestrialization. In ontogeny, embryo has no tissue immunity, which is called immuno-tolerance. However, mechanisms of immuno-tolerance is not known. Self and not-self immunology is in vogue in these days. However, this concept is defined only in tissue immunity. The authors proposes hypothesis in development of tissue immunity by change of the gravity of 1G during landing in phylogeny from 1/6G in sea water as well as in ontogeny during landing from amniotic fluid by delivery. Xenotransplantation of various tissues between archetype vertebrates of chondrichthyes(sharks), and mammals(dogs) are carried out. As results, xenotransplantation of tissues can be successfully carried out. As conclusion genetic expression of major histocompatibility complex(MHC) is triggered by the gravity, just as development of bone marrow hemopoiesis triggered by it in phylogeny as well as ontogeny.

key words: Immune system, Major Histocompatibility Complex(MHC), Gravity, Hematopoiesis, Evolution

**Introduction**

In sharks the major histocompatibility complex(MHC) of class I as well as class II are well known to exist<sup>1)</sup>. Therefore, in archetype vertebrates MHC is masked in genetic expression just as immuno-tolerance in embryos of higher

animals. Without genetic expression of MHC xenotransplantation can be successfully carried out. Therefore MHC exists not only to distinguish self or not-self in organism but also to function for cellular level digestion.

## Materials and Methods

Following xenotransplantation between archetype and higher vertebrates are carried out.

- i) Shark skin graft of 3 nekos to 3 dochis.
- ii) Shark cartilage and muscle transplantation to two dogs.
- iii) Xenopus muscle transplantation to sharks (3 cases).

## Result

All xenotransplantations are successfully carried out. Successful xenotransplantation of xenopus muscles to dorsal muscle of shark postoperatively 4 months is shown in Fig.1,2, dermal graft of neko -shark to dochi-shark (Fig.3) and shark vertebral cartilage to dog's dorsal muscle (Fig.4). Neither rejection nor infection were occurred(Fig.4).

## Discussion

It is known that in stage of embryo immune system is in tolerance. Therefore transplantation between chicken and quail can be carried out successfully in embryo stage. Haeckel's biogenetic law indicates that ontogeny repeats phylogeny in morphology. The authors clarified development of bone marrow hemopoiesis during terrestrialization of vertebrates<sup>2,3,4</sup>. The cause of hemopoiesis immigration is the gravity of the earth. Archetype vertebrate chondrichthyes, i.e., shark wriggled during landing because of suffocation. Then hypertension of blood pressure took place. After that streaming potential of blood around cartilage elevated. By the elevated potential gene expression of mesenchymal cells occurred. Thus the cartilage of sharks changed into bone with marrow, in which hemopoiesis immigrated from the spleen<sup>5,6</sup>. At the same time gene of MHC, i.e., HLA in human is triggered by streaming potential<sup>7</sup>.

Xenotransplantation between different sharks, xenopus and shark, shark and dog can be successfully carried out. Through experiments it is evidenced that immune system of archetype vertebrates is in same condition of the embryo of higher animals.

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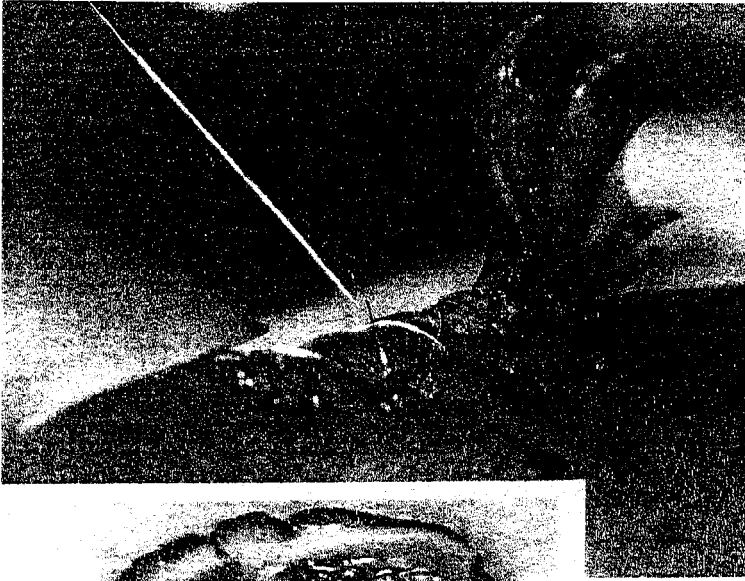


Fig.1A

Xenotransplantation: muscles of xenopus is transplanted into shark dorsal muscle.



Fig.1B

Cross section of the shark. Xenopus muscle is successfully transplanted.



Fig.2A

Dermal graft of xenopus to shark dorsal derm. Transformed placio are developed.

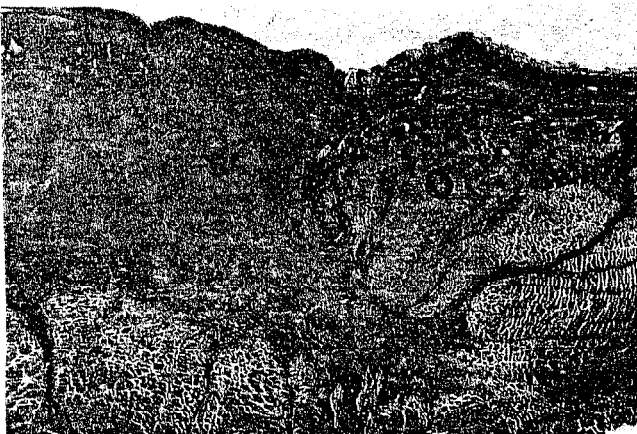


Fig.2B

Low magnification of the figure 2A. Derm of left side is that of xenopus.



Fig.3  
Shark derm of neko-shark  
is transplanted to dochi(left).  
Different placodes are seen.



Fig.4  
Shark vertebral cartilages are  
transplanted into dog dorsal  
muscle.  
Neither rejection nor  
infection is seen.