

**CHAPTER VI**

*Summary*

*And*

*Conclusion*

### Summary and Conclusion

Studies on effect of submandibular gland secreted growth factor on various organs is being carried out in different laboratories. Effect of epidermal growth factor on reproductive organs and spermatogenesis in male mice, effect of epidermal growth factor on gastrointestinal tract, effect of salivary glucagon on blood sugar level etc.

The various organs of the body have long been known to be influenced by these growth factors. Atterdi in 1965 studied effect of a fraction of submandibular gland of mouse on tissues of mesodermal origin in vitro. He had purified and precipitated the active fraction of salivary gland with streptomycin sulphate and ammonium sulphate, gel filtration and column chromatography. The precipitate was dissolved in little distilled water dialyzed and run through Sephadex G 100 column. He had observed three peaks, most of the biological activity was being associated with third peak. He has separated the third peak and its biological activity was tested in vitro on tissues dissected from chick embryos. The same salivary fraction was then tested on skeletal muscle explanted from neck region of an 11 day chick embryo cultured in synthetic liquid medium, for 24 hrs without and with active fraction of salivary gland extract.

Then Atterdi had observed almost complete loss of myosin which was indicated by loss of eosinophilia in myoblast of experimental cultures. From

his experiment Atterdi had concluded that change in the muscle tissue in the culture is due to a component which is secreted by submandibular gland and having esterase and peptidase like activity.

Atterdi in 1967 again tried to characterize material further and to determine its possible mode of action on embryonic muscle tissue and he had found that highly purified material was a protein containing both esterase and peptidase activities.

After 1967 no body had tried to study effect of salivary gland secreted polypeptides on any mesodermal tissue muscle. So our attempt is to study whether the polypeptide secreted by submandibular gland affect the skeletal muscles. To study this effect we have sialoadenectomised the mice at the age of 20 days when the polypeptides are started to be secreted by the submandibular gland. Then muscles are allowed to develop in absence of salivary gland secreted polypeptides and after 20 days, 40 days, 60days and 80days we have studied the protein content, electrophoretic separation of protein, LDH activity and electrophoretic separation of LDH in the three skeletal muscles i.e. gastrocnemius, soleus and rectus abdominis. We have selected these three muscles because Rectus abdominis is white/type I muscle, soleus is red/ type II muscle and gastrocnemius is mixed muscle.

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In our study we have found that in the estimation of protein the protein content in sialoadenectomised mice was increased as compared to normal in all the three muscles of all groups i. e. 40days old, 60days old, 80days old and 100days old while in electrophoretic separation some of the protein bands especially myosin heavy chain and actin bands were disappeared in sialoadenectomised mice as compared to normal mice. In biochemical estimation the water soluble proteins i.e. sarcoplasmic proteins were estimated while in electrophoretic separation the  $\beta$ -mercaptoethanol was used for the extraction so myofibrillar proteins was separated. This clearly shows that sialoadenectomy increases the sarcoplasmic proteins but decreases the myofibrillar proteins in the skeletal muscles

The scientist Preedy showed that increase in glucagons decreases the protein concentration in muscles. Here, by sialoadenectomy we have removed the submandibular gland which is the source of immunologically reactive glucagon (IRG). So the absence of this IRG results in the increase of sarcoplasmic proteins. While, Atterdi *et al.*, showed that mesodermal growth factor (MGF) from submandibular gland is responsible for proper differentiation of muscle tissue. Due to sialoadenectomy the MGF is removed from the body. The absence of it may result in decrease of structural proteins of the muscle which are nothing but myofibrillar proteins.

In our study it is found that LDH activity was increased after sialoadenectomy in all muscles of all groups. In electrophoretic separation also

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it is revealed that the staining intensity of the bands especially fifth band increases after sialoadenectomy than the normal mice. The LDH-V band is specific for muscle type and is responsible for conversion of pyruvate to lactate under anaerobic conditions. Hence from this we can conclude that sialoadenectomy produces the anaerobic environment inside the body which is the indication of pathological condition of the body.