CHAPTER FIVE

SUMMARY AND CONCLUDING REMARKS

A critical analysis of the existing literature shows that there are several reports on effects of diabetes mellitus on salivary glands metabolism (Liu & Lin, 1969 a,b; Szymczyk et al., 1971; Murakami et al., 1974; Zebrowski and Brimmer, 1978; Anderson and Shapiro 1979; 1980; Anderson and Johnson, 1981; Anderson, 1983; Kotz, 1984; Shubnikova et al., 1984; Cheong et al., 1985; Anderson, 1987; Pillai and Nadar, 1987; Pillai et al., 1989). But no one has described effects of diabetes mellitus on tissue specific lipase in salivary glands. The effects of diabetes mellitus on lipase activity has been studied in various organs like muscles, heart, kidney, diaphragum, adipose tissue and plasma (Wing and Robinson, 1968; Borensztajn et al., 1970; Krauss et al., 1973; Linder et al., 1976; Elkeles and Humbly, 1977; Orimo et al., 1977; Tan et al. 1977; Nilsson-Ehle et al., 1980; Berry et al., 1981; Koauer et al., 1982; Nomura et al., 1982, 1984; Severson et al., 1987). The study on lipase during diabetic condition is essential because there is increase in concentration of triglycerides in Plasma. The lipase enzyme is a key enzyme involved in the removal of plasma triglycerides from plasma towards pheripheral organs (Hahu, 1943; Cryer et al., 1975; Pykalisto et al., 1975; Olivercrona et al., 1977; Lithell et al., 1978; Pagano Mirani-Oastdijk et al., 1983). But plasma triglycerides are not removed during diabetes mellitus. It means that changes in the body bring about more concentration of plasma-triglycerides in the plasma that the lipase is unable to clear them all or there must be some change in lipoprotein lipase activity. We have carried out estimations of lipase activity in rat salivary glands after the induction of diabetes. 72 hrs, 144 hrs after

the alloxan administration diabetic rats along with fasted and fasted fed controls were sacrifies and their salivary glands lipase was estimated. It was observed that lipase activity was insulin dependant as it was reduced in fasted and diabetic rats.

There are several reports describing the formation of free radicals in various tissues which leads to the formation of lipid peroxidation (Asayama et al., 1984; Hildebrandt et al., 1973; Nishigaki, 1981; Malaisse et al., 1981; Malaisse, 1982; Pritchard et al, 1986) in diabetes mellitus. The formation of lipid peroxides activate lysosomal enzymes and finally there is formation of lipofuschin granules (Berlin and Wallace, 1976; Glees and Hasam, 1976; Schlote and Boellaard, 1983; Armstrong et al., 1978; Peters and Vaughan, 1981; Samorajski et al., 1964) there are only two reports describing activity of lysosomal enzymes, in diabetic salivary gland, Anderson and Johnson, 1981; (peroxidase) and Pillai and Nadar, 1987; (acid phosphatase and β-glucuronidase). In the present investigation we have studied esterase, a lysosomal enzyme involved in the hydrolysis of P-nitrophenol esters. Results showed that there was several fold increase in esterase activity in diabetic salivary glands, this might be due to activation of lysosomal enzymes by ketone bodies or formation of lipid peroxides in diabetic condition.

Inspite of the hard work to complete present investigation, there are several lacunae left behind, which we are

planning to complete in our future research programme -

i) We have induced diabetes chemically, if we would have induced diabetes by glucose loading or removal of pancreas in the present study, it would have been more effective.

ii) Insulin therapy was essential in induced diabetic rats.

iii) We have not used normal rats along with controls.

iv) It was necessary to use female rats along with male because there is difference in lipoprotein metabolism between males and females.

v) Isolation and characterization of lipase and esterase, were essential.

vi) Histochemical demonstration of these enzymes in salivary glands would have been more picturesque in describing the effect of diabetes on enzyme activities.

vii) Administration of vitamin E, studies on lipofuschin granules would describe more about effects of free radicals in diabetic condition.