P R E F A C E

It is difficult to give a balanced account of our knowledge about aging, as the flow of publications in the field of aging has increased dramatically over the past few decades. However, Biologists have attempted to cover the fundamentals of aging process, Clinicians have approached geriatrics from patients point of view and sociologists have presented their evaluations of the individual problems of the elders in the society. A large number of scientists are studying aging in various fields of biology, such as, genetics, physiology, cell-biology and molecular biology, which can be grouped together into gerontology. Scientists have proposed various theories of aging. Being students of cell biology, we have concentrated on cross linkage theory, free radical hypothesis and Orgel's theory of protein missynthesis. The first two theories describe age related decline in the efficiency to cellular organelle due to formation of cross linkages between molecules and formation of lipofuscin granules in the cytoplasm. Missynthesis of proteins leads to decline in the synthesis of proteins at transcriptional level. An eminent free radical damage in the cell could be the membrane damage associated with lipid peroxidation. The origin and accumulation of lipofuscin has been emphatically linked with cellular lipid peroxidation by various workers. However, we

propose that an increase in the rate of accumulation of lipofuscin granules in aging may be due to insufficiency of lysosomes in the degradation of damaged membranes. Insufficiency of lysosomes may also be due to leakage of lysosomal enzymes from the lysosomes or there might be the formation of nonfunctional enzyme molecules due to cross linkages inbetween them.

A number of scientists have concentrated their study on lysosomal enzymes in aging, since it has been established that lipofuscin granules accumulation is hullmark of aging. Brain, heart, retinal pigment epithelium, lymphocytes and liver form the target organs for their study of lysosomes and lysosomal enzymes in aging process. Surprisingly some of the lysosomal enzymes showed decrease while others at the same time in the same tissue, showed increase. In our laboratory, simultaneous study was carried out in brain and heart of rat during aging. In the brain there was a decrease, whereas in the heart there was an increase in the acid phosphatase activity. However, kinetic study showed identical behaviour of the enzyme in both the organs.

The earlier studies by others on lysosomal enzymes in aging indicate paucity of research separately on microsomal and lysosomal forms of the enzymes. The present attempt therefore has been made to study activities of microsomal and lysosomal acid phosphatase and its kinetics in the liver of male mice of different age groups. Since it was not possible to separate exactly

adult and old mice, therefore while selecting the colour of their skin, body-weight and their chronological age were taken into consideration.

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