PREFACE

The research on muscle metabolism has potentially great significance due to its dominant role for speed, power and endurance in any physical performance. The proper functioning of the muscle tissue was also an important prerequisite for good health and hence the functional activity of the muscles might explain several important mechanisms required for the well being of the body. Exercise physiology presents the material for understanding the relevant changes in the various mechanisms of the body that occur during the onset of exercise. It has great clinical significance in that it offers the mechanisms of various body disorders and their possible rectifications. Whole organism exercise represents the most complicated system in which it will be difficult to analyze the factors which might affect the composition of blood and also the precise behaviour of muscle towards exercise. The electrical stimulations in in vivo condition have been successfully applied towards the arrest of muscle wastage during muscle disorders like atrophies and dystrophies. The greater utility of this therapeutic procedure requires sound knowledge on changes in the normal muscle metabolism in order to apply the same for the
successful treatment of muscle disorders. The adaptability of the muscle metabolism towards endurance training programme has shown suitable modifications towards the efficient metabolic machinery of the muscles. These studies pertaining to training programmes were limited to the immediate effects of exercise and the stipulated period of training but not to sequential studies. Moreover, most of these studies on training programmes were confined to whole animal exercises. In comparison to voluminous work on whole animal exercise and training, there has been little information on the localized muscular exercise and training and hence this aspect needs further investigations. There has been little information about the changes in the physicochemical properties of proteins during contractile activity and practically least information on the pattern of side group ionisation of proteins during exercise and training. It was not clear about the factors responsible for inactivation and activation of enzymes during exercise and training respectively.

In the present dissertation, the author has attempted to contribute some information into the above said lacunae during muscular exercise and training programme. Since the heterogeneous environment of the cell-

free system is in the closest similarity to living state, the author has confined his work to cell-free extracts. The author could not proceed into confirmatory studies owing to restrictions posed by the equipment and other facilities. The author would very much wish to utilize the earliest opportunity to conduct the experiments on several unattempted aspects in the field of exercise and training.

At the same time the author would feel highly gratified if this simple work could contribute even as a minute fraction in the extension of the understanding of muscular exercise, exhaustion and impact of training on the muscle metabolism.