CHAPTER 1

INTRODUCTION TO BIOCHEMISTRY

Biochemistry deals with chemical or metabolic processes which take place in tissue cells. These metabolic reactions take place in the material called protoplasm which is the basis of all forms of life.

As long as these reactions take place in an organized form, we remain healthy. The moment there occurs disorganization in these reactions; we fall ill or even die.

It is amazing to note that all the elements that collectively give rise to living organisms are by themselves inanimate. However, when present in optimum amounts and in optimum combinations, they make life possible. An Urdu poet (Birj Narayan Chaksbat), a non-scientist, has best illustrated this in the following verse:-

Compared to other biological sciences, biochemistry is quite young. This is because investigators in this field had to wait for developments to take place in other branches of chemistry, i.e. inorganic, organic and physical. It is only in the second half of the twentieth century that biochemistry that started as an offshoot of physiology emerged as an independent discipline. In 21 st century it is one of the most dynamic sciences whose frontiers are expanding at a fantastic rate. This great leap forward in biochemistry has been of enormous help in providing explanations for the mechanisms of many physiological processes which were hitherto unknown or were shrouded in mystery. Other medical sciences, i.e. physiology, pharmacology, bacteriology and

pathology and even therapeutics have also greatly benefited from new discoveries in biochemistry. All these medical sciences have contributed to the great strides made in medicine and a major part of the credit goes to biochemistry.

Biochemistry has assumed an increasingly important role in various branches of medicine and biochemists have frequently been called upon to provide the special techniques and knowledge to the solution of clinical problems. Biochemical investigations can lead quite directly to the suggestion of remedies. For example, the discovery of specific biochemical deficiencies in rickets, pellagra, beriberi, scurvy and pernicious anemia led rapidly to the successful therapy by a rational method. The biochemist has provided vitamins and hormones in pure conditions and has aided in the preparation of vaccines, antitoxins, sera, etc. The fields of enzyme inhibitors, recombinant DNA technology, genetic engineering, gene mapping, DNA profiling and cloning have opened a new era in medicine. Last, but not the least, he has provided a large number of chemical tests as aids in the diagnosis of diseases.