Preface

Cell biologists and scientists interested in membranes tend to regard the red cell ambivalently. On the one hand it is often considered a dead cell. Mammalian red cells lack nuclei and the various intracellular organelles. They are biochemically limited, and atypical in the sense of being highly specialized for a particular respiratory function. On the other hand, the red cell presents an excellent model for membrane transport studies. Although it lacks electrically-excitable channels, it does possess a suprising variety of transport systems, both active and passive, some of which are also widely distributed amongst other animal cells. Unlike the plasma membrane of giant cell systems like the squid axon, the red cell membrane is directly exposed to the bulk solution in which it is suspended. Furthermore, reversible haemolysis and selective ionophore treatments allow the composition of the internal medium of red cells to be controlled better than in any other cell.

It is the main purpose of this book to present the reader interested in membrane physiology with an overall picture of the transport systems peculiar to red cells, and of the use of the red cell membrane as an experimental model for the study of more general transport mechanisms. Such a project has to reflect the variety and versatility of transport systems currently being investigated in red cells from various species.

Original contributions were requested from active workers in each of the different fields covered. The organisation of these contributions into an appropriate sequence was simply done by grouping the different chapters into four sections: cation transport; anion transport and the related problems of pH and potential; non-electrolyte transport and finally comparative and clinical studies. Inevitably there are differences both in style and in scientific interpretation, but no editorial attempts have been made to avoid overlapping or conflicting views, since we feel that these can be fruitful and positive components of a multiauthor work like this. Allowing the contributors literary freedom necessarily leads to differences in terminology. In the discussion of membrane potential, where semantic confusion might have arisen we requested a clarifying comment from S. B. Hladky.

We hope that the collection of articles presented here bring to the attention not only of the specialist but also of scientists and clinicians

working in related fields the range and sophistication of the transport processes that exist in the red cell membrane.

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