

Preface

When I began my academic career in Hamburg, I worked on the solid-state chemistry of organic compounds. By chance, our group identified a solid-state reaction which led to a polymer (polyglycolide), a class of biodegradable polyesters which a literature survey showed to have many applications in clinical medicine. This finding led in turn to my first contacts with physicians and their ideas about implants, biomaterials, and bone. As a member of a graduate school on bone in the medical faculty, I learned that biomaterials usually depend on biomineralization – that is, the cellular action and similarity to the corresponding hard tissue. I also became aware for the first time of the great importance of pathological calcifications in our society.

The process of biomineralization is based on the formation of inorganic crystals, and is strongly controlled by organic molecules which are themselves controlled by cells. As a chemist, I was familiar with the first part of this story, but I had much to learn about biomolecules, the different cell types, and also the clinical treatments of diseases. Fortunately, in Hamburg, as well as in the subsequent institutions where I worked – at Bochum and Essen – I met people from the field of medicine who were interested in conducting joint studies. When all parties had learned to communicate – due to the different vocabulary of their disciplines – many fruitful collaborations developed, and in this respect I am deeply indebted to my colleagues (listed in alphabetical order), Prof. M. Amling, Prof. G. Delling, Prof. S. A. Esenwein, Prof. H. Eufinger, Prof. P. Gängler, Prof. W. Jähnen-Dechent, Dr. A. Klocke, Prof. M. Köller, Dr. P. Lanzer, Dr. W. Linhart, Prof. G. Muhr, Prof. J. M. Rueger, Prof. W. Ruether, Dr. I. Schmitz, and Dr. S. Weihe, from whom I learned much about the clinical aspects of biomineralization.

Therefore, I was very excited when Edmund Bäuerlein asked me jointly to edit a volume of the *Handbook of Biomineralization*. We quickly selected the three main topics which are relevant in medicine, namely bone, teeth, and pathological calcifications, and also were fortunate to find many competent authors from all over the world who agreed to contribute. Many aspects of biomineralization in medicine are highlighted in this book, and I sincerely hope that it will contribute to our understanding of this field of research, as it is not only of academic inter-

est but also covers many general aspects of biomineralization. Indeed, it can be said that good health is dependent on correct biomineralization!

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