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FRACTALS in BIOLOGY and MEDICINE

Volume II

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Foreword

This volume contains oral and poster presentations given at the Second International Symposium on *Fractals in Biology and Medicine* held in Centro Seminariale Monte Verità, Ascona, Switzerland, from March 6–9, 1996. Scientists from around the world came together again to present and discuss in an exciting atmosphere their research papers as well to exchange information on their more recent experimental findings and theoretical interpretations. Since the publication of Benoit Mandelbrot's book, *The Fractal Geometry of the Nature*, the fractal concept has been rapidly pushed forward essentially by mathematicians and physicists alike. Significant progress has been made over the last years in understanding of how to analyze natural shapes and structures, favoured also by the continuing improvements in computational capabilities. Hence, the time has come to embrace the fields of biology and medicine. Indeed, most of the participants have been focused some or all of their activities on biomedical research problems so that the potential of the fractal geometry and its practical use for describing and measuring irregular biological objects such as organs, tissues and cells as well as for understanding several complex pathogenetic processes could be explored with the adequate criticism. A special emphasis has been devoted to the complex field of human tumours, by addressing the role of fractals in the design, organization and measurement of cellular and molecular structures and the growth patterns in breast and skin carcinoma, in leukemic and lymphoma cells, in bone, lung, nervous and renal diseases.

In presenting the different contributions in this volume, we did not follow the chronological sequence of sessions. Rather, we arranged the proceedings as to grouping similar topics together.

We are particularly indepted to the following renowned institutions: International Society for Stereology, International Society for Diagnostic Quantitative Pathology, Swiss National Science Foundation, Swiss Academy of Sciences, Institute for Scientific and Interdisciplinary Studies, Research Center for Mathematics and Physics, who accepted to confer their scientific patronage and also to the sponsors, Dipartimento dell'Istruzione e Cultura del Canton Ticino, Maurice E. Müller Foundation, Swiss National Science Foundation, Becton Dickinson AG., and Beckman Instruments International SA., who made the achievement of this symposium possible.

Our thanks are also due to Dr. Mauro Martinoni, head of the Ufficio Studi Universitari del Canton Ticino for his precious support, to our collaborators Dr. Riccardo Graber and Christian Castelli and to Mr. Luca Albertini, managing director of the Centro Seminariale Monte Verità, who made the conference run «fractally».

Monte Verità, Ascona 1996 — The Editors

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