Bio/CMOS Interfaces and Co-Design

*Do you want to sell sugar water for the rest of your
life or come with me and change the world?*

Steve Jobs

Sandro Carrara

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Springer

Sandro Carrara
Faculties Sciences et Techniques de l'Ingénieur
and Informatique et Communications
Labo. Systèmes Intégrés (LSI)
Lausanne, Switzerland

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*To the girls of my life: Chiara, Noemi,
and Lorella!*

Foreword

The search for efficient means of linking biological to electrical–optical and information systems gravitates around the design and implementation of biosensors and biointerfaces, which are the key links between the living and the computing worlds. Biosensors and chemical sensors are based on a wide variety of techniques. Even a simple classification would require spanning a variety of axes, ranging from the targets to the sensing elements to the transduction mechanisms. Moreover, nanotechnology has greatly improved the performance of biosensors due to both quantum confinement effects and the match in size between engineered nanostructures and biological entities.

Understanding and mastering the key area of biointerfaces requires a plurality of skills going beyond traditional disciplines. Indeed, biosensor design requires knowledge of biology and chemistry, surface and semiconductor technology, and electronics. It is still uncommon to find textbooks that span these fields and provide the necessary background to understand this complex and evolving field.

This book is an excellent introduction to biosensing. It provides the reader with information in the various areas that are fundamental to biosensor and biointerface design. The book will appeal to engineers and scientists who wish to enter this domain and to students seeking an introduction to this fascinating discipline. The book will also serve as a reference point to engineers and scientists in the field; it describes a wide set of technologies and provides a comprehensive and unified scientific platform.

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Giovanni De Micheli

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