

PREFACE

This volume of the Comprehensive Analytical Chemistry (CAC) series is devoted to Prof. Marco Mascini, for his outstanding contributions to the field of sensors and biosensors. Marco Mascini passed away on May 12, 2015.

Marco was a full professor in Analytical Chemistry at the University of Florence, till his retirement in 2010. At the beginning of his scientific career, he focused his attention on the development of electrochemical biosensors by coupling immobilized enzymes, bacteria, and intact tissues to ion-selective electrodes and amperometric sensors, focusing on obtaining new devices for clinical applications, and especially for *in vivo* monitoring. Soon he was also concerned with applying biosensors to food, environmental, and drug analysis.

Later he was one of the leaders in the field of piezoelectric and surface plasmon resonance-based biosensor. More recently, he dedicated much research effort to the construction and application of biosensors based on nucleic acids and aptamers. Marco's activity was always at the forefront of international work in biosensor technology. He was a reference point for students from all over the world and many scientists drew their inspiration from his brilliant scientific activity.

In 1998 at the second European Workshop on Biosensors for Environmental Monitoring in Berlin Prof. Mascini already presented his new DNA-disposable biosensor with immobilized single or double stranded calf thymus DNA at fixed potential onto screen-printed electrode surfaces. He continued his valuable pioneer research and practical applications later on with validation and correlation studies between DNA biosensors and international standardized methods on genotoxicity and identified priorities for future research and developments. Moreover, Marco's work on electrochemical genosensors in the last years was really impressive. Many different applications have been covered, always coupling dedicated sensor formats, mainly for multiplexed analysis, to optimized preanalytical procedures. One of his last interests was the analytical application of nucleic acid aptamers.

In 2016, a Special Issue of Trends in Analytical Chemistry was devoted to him, as a sign of appreciation of many of his friends and colleagues working on the field of biosensors.

This volume of the CAC series is born as a complement of that special issue. The same contributors were requested to deeply and critically evaluate most of the innovative topics in the field of biosensors and bioanalytical tools. Thus, most up-to-date biological and synthetic (biomimetic) receptors, along with the impact of nanotechnology and the integration of biosensors to data acquisition systems are reviewed. New trends in areas such as wearable biosensing, new transduction materials, and mobile analytics are also described in the different chapters.

Moreover, as Marco was an Analytical Chemist, who deeply believed in the role of this science for solving real problems in almost all areas of life, using the knowledge of chemistry, instrumentation, and statistics, this volume wants to have a practical vision.

Thus, the different issues, mentioned before, are mainly described starting from applications of biosensors and bioanalytical tools in clinical diagnostics, personal health, "real time" effects monitoring in the environment, and food safety.

We thank all of the authors for their excellent contributions!

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