

Preface

Breathing is performed by the rhythmic contraction of respiratory muscles. It maintains homeostasis of the organism by taking in the oxygen necessary to live and work and by controlling the level of CO₂ within the organism. At first glance, breathing seems simple; however, it is produced by a complex system in the brain with various afferents and efferents. The control of breathing is of the utmost importance in sustaining life, and although more than 150 years have passed since research on breathing control was first begun, many unsolved mysteries still remain. Breathing is like watching the tides at a beach that are created by the vast, complex open sea.

The first Oxford Conference on Modeling and Control of Breathing was held 30 years ago in September of 1978 at the University Laboratory of Physiology in Oxford, England. During this first conference, the participants engaged in a hot discussion on the problem of whether breathing rhythm was produced by pacemaker cells or a neural network. This was before the discovery of the Bötinger complex in the medulla, and at the time, central chemoreceptive areas were still the focus of research. This conference was an especially unforgettable moment in the dawning of the new age of respiratory research. It has since been held every 3 years in various countries around the globe and is widely appreciated as the best respiratory meeting in the world.

We were very much honored to organize the XIth Oxford Conference in Nara, the ancient capital of Japan, and it was timely that the city was just beginning the celebration of its founding as the capital 1300 years ago. Nara is famous for its ancient temples, ruins, and forests, which collectively form the Historic Monuments of Ancient Nara, a UNESCO World Heritage Site. The conference was held at the Noh Theater in Nara Park and included 43 oral and 71 poster presentations focussing mainly on the control of breathing. More than 140 participants from 15 countries attended, and we believe that the participants could feel the tradition of old Japan and at the same time discover new frontiers in respiratory control in Nara. At the business meeting of the Oxford Conference, the international committee decided that the next Oxford Conference will be held in Groningen, Holland.

We are very grateful to all the participants who attend the Conference and to the local program committees. The Editors especially offer their heartfelt thanks to Lena Akai, Michiko Iwase, and the members of Department of Physiology, Showa University School of Medicine, for editorial assistance in the production of this book. Publication of this book was supported by Private University High Technology Research Center Project.

The Editors

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