International Symposium on Olfaction and Taste

EDITOR

Thomas E. **FINGER**

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International Symposium on Olfaction and Taste

Edited by
THOMAS E. FINGER

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International Symposium on Olfaction and Taste

ANNALS OF THE NEW YORK ACADEMY OF SCIENCES

Volume 1170

International Symposium on Olfaction and Taste

Editor
THOMAS E. FINGER

This volume presents data and information discussed at the **International Symposium on Olfaction and Taste (ISOT) 2008**, held on July 21–26, 2008 in San Francisco, California.

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Preface

The International Symposium on Olfaction and Taste (ISOT) has convened every 3–4 years since 1962, when the first meeting convened in Stockholm, Sweden under the direction of Yngve Zotterman. The 15th ISOT meeting was held in San Francisco, California on July 21–26, 2008 under the umbrella of the Association for Chemoreception Sciences (AChemS) in combination with the 30th annual meeting of the AChemS. The quadrennial meeting of the ISOT is an important event in the field of chemoreception research and in 2008 had an attendance of over 1000 participants. The meeting is an opportunity for colleagues from around the world to assemble to meet and to discuss exciting new findings in the field. This meeting often serves as the venue for the first public description of unpublished findings from the participating laboratories.

The ISOT originally met in association with the meeting of the International Union of Physiological Sciences (IUPS) but separated from IUPS over a decade ago. The venue for the ISOT meeting now rotates among locations in the United States, Europe, and Japan under the sponsorship of the three major chemoreception research organizations: AChemS, the European Chemoreception Research Organization (ECRO), and the Japanese Association for the Study of Taste and Smell (JASTS).

The purpose of the ISOT meetings is to bring together scientists throughout the world to discuss active areas of research in the broad field of chemical senses. This field includes not only the obvious senses of taste and smell but also trigeminal chemoreception and visceral chemoreception, including the gut and airways. The meeting is designed to provide an integrative approach as well as a historical context for modern research in the field. The general organization of the meeting includes oral presentations in the form of organized symposia and thematic collections of volunteer papers, as well as extensive poster sessions.

This volume is a compendium of short papers relating to the 23 symposium proceedings, workshops, and special lectures held during ISOT XV. The meeting also included over 650 volunteer presentations. For a full listing of the abstracts from all presentations at the ISOT XV meeting, the reader should refer to *Chem. Senses* 33: S1–S175, 2008 http://chemse.oxfordjournals.org/cgi/reprint/33/8/S1.

ISOT Meetings to Date

I	1962	Stockholm, Sweden	IX	1986	Snowmass, USA
II	1965	Tokyo, Japan	X	1989	Oslo, Norway
III	1968	New York City, USA	XI	1993	Sapporo, Japan
IV	1971	Starnberg, Germany	XII	1997	San Diego, USA
V	1974	Melbourne, Australia	XIII	2000	Brighton, England
VI	1977	Paris, France	XIV	2004	Kyoto, Japan
VII	1980	Noordwijkerhout, the Netherlands	XV	2008	San Francisco, USA
VIII	1983	Melbourne, Australia			

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Scientific Themes

The meeting was organized into symposia as well as volunteer presentations. For purposes of this volume, the symposia are divided into four broad groupings, but there is considerable overlap where presentations in a symposium in one division may fully complement presentations in another grouping. During the meeting itself, the symposia were intermingled so that symposia from each theme were offered each day of the meeting. The four principal themes for the ISOT XV symposia were (1) peripheral chemoreceptors, including transduction, development, and modulation of peripheral chemoreceptive end organs; (2) central processing of chemoreceptive inputs, including structural and functional representation and integration of information in brain centers devoted to chemosensation; (3) chemical signals and animal behavior, including how diverse organisms respond to feeding and social cues; and (4) chemical senses in human health, including epidemiology, degenerative diseases, and normal aging.

The symposium presentations reflect the significant advances that have been made in the last decade since the molecular identification of receptors for both olfaction and taste. Many of the receptors are being de-orphaned and downstream signaling pathways elucidated, giving evidence to the richness of the chemoreceptor signaling systems. No longer is a monolithic view viable that ascribes all chemosensory function to a single receptor or transduction cascade. Our better understanding of the molecular basis of chemosensory transduction is mirrored by a better understanding of central processing of the signals emanating from chemosensory end organs. New functional imaging techniques and ensemble recording methods permit a more rigorous analysis of temporal signatures and synchrony in areas of the brain devoted to processing chemosensory signals. In this context as well, with the advent of functional imaging in humans, particularly fMRI, our ability to understand the central aspects of chemosensory function has witnessed seminal advances.

Of similar import is a more complete understanding of the meaning of different chemosignals in the context of different species. For example, we realize that birds, which were long considered to have minimal olfactory capabilities, have a rich repertoire of conspecific chemical signals that may indicate territory or offspring. Likewise, even aquatic mammals have the capability of detecting odorants by blowing bubbles underwater. The pheromonal signaling systems of insects—once thought of as a simple system with limited chemical species—are now understood to contain a richness and subtlety offered by blends and mixtures of several chemicals.

The ISOT meeting also commemorated seminal findings in the field, including the discovery of dendrodendritic synapses in the olfactory system, the first description of glutamate as a unique "umami" tastant, and the discovery of an olfactory alarm substance in fishes. Featured speakers or symposia placed new results in the historical context of the earlier paradigm-shifting discoveries.

The meeting would not have been possible without the support of a variety of sponsors and agencies listed below. In addition, the overall planning and organization of this meeting was undertaken with the encouragement and input of the ICOT (International Committee on Olfaction and Taste) planning committee: Anne Cunningham (Australasian Association for ChemoSensory Science), Annick Faurion (ECRO), Charles A. Greer (AChemS), Bill S. Hansson (ECRO), Yuzo Ninomiya (JASTS), Takeshi Kimura (JASTS), and especially Diego Restrepo, the president of the Association for

Chemoreception Sciences. I also wish to acknowledge the hard work and input of the program committee members: Linda Barlow, Richard Doty, Debra Ann Fadool, Kevin Kelliher, Sue Kinnamon, Robin Krimm, Robert Lane, Trese Leinders-Zufall, Michael Leon, Alan Nighorn, Wayne Silver, Noam Sobel, Steven St. John, Beverly Tepper, Kazushige Touhara, Helen Treloar, Leslie Vosshall, Joel White, and Don Wilson.

A meeting is only as successful as the scientific contributions of the participants. I am pleased to say that the ISOT meeting was scientifically superb, and I heartily thank all those who contributed to the meeting content. I hope this volume will prove useful as a record of the state of the field in 2008.

Statement by Diego Restrepo, President of the Association for Chemoreception Sciences, 2007–2008

I want to give special thanks to Tom Finger, program chair of ISOT XV. The success and "flavor" of an ISOT meeting is critically dependent on the organizer, and our community was fortunate to have Tom as program chair. The depth of his understanding of the chemical senses shows in the organization of ISOT XV, a meeting that was successful at pushing the limits of our understanding of the chemical senses. This compendium is a reflection of the rich environment that the participants of the meeting experienced. Thank you, Tom, for your commitment to our field!

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