SPECIAL ISSUE ON BIOLOGICAL ODOR SENSING SYSTEMS AND THEIR APPLICATIONS

PREFACE

The current broad requirements for odor sensors to facilitate food and water quality control, dangerous substance and drug detection, disease diagnosis, and robot olfaction highlight the need for innovative odorant sensing technologies for sensing various types of odorants with high sensitivity and selectivity beyond that of existing odor sensors. To address these concerns, odor sensors based on the olfaction of living organisms have attracted considerable attention due to the highly sensitive, selective, and real-time odor detection abilities they possess. Furthermore, the odor-source searching strategies of living organisms have been the inspiration for model systems to develop odor-source searching robots.

This special issue contains some very interesting papers focusing on these topics, including new methodologies to unravel the functional properties of human odorant receptors, to develop odor sensor robots based on insect antennae and insect behavior, and to understand how animals integrate multi-sensory information to achieve efficient odor-source localization. We hope this special issue helps readers to find new research directions to realize bio-based and bio-hybrid odor sensor technologies as well as to understand how animals recognize odor information at molecular and behavioral levels.

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