



Exploring Facets of Flavor

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When we initially launched *Chemosensory Perception*, the intent was to bring together three distinct areas of research that all delve into separate aspects of perceiving chemicals: (1) flavor chemistry, (2) neuroscience/molecular biology, and (3) psychology/sensory science. These fields tend to work with little communication between the groups, even when investigating the same issues. We wanted to enhance our understanding of taste, smell, and flavor by exposing one another to the latest insights in our areas and spark insights along the interfaces of the fields.

This special issue brings together contributions across all the areas of psychology, neuroscience, and flavor chemistry. We begin this issue with a contribution by Flaherty and Lim, “Individual Differences in Retronasal Odor Responsiveness: Effects of Aging and Concurrent Taste.” Their work indicates that age-related deficits in retronasal smell can often go unnoticed in foods, and that this seems to be due to the presence of a congruent taste. This ability to overcome the olfactory deficit with the presence of a taste has profound implications for designing foods for an aging population, where one of the most common taste enhancing chemicals, sodium chloride, is often restricted. Additionally, this finding should be considered when conducting taste tests with an aging population. Experimental approaches that have worked with younger cohorts will not necessarily work with their older counterparts.

The next article by Bensafi et al. expands upon this phenomenon in their work titled “Dysosmia-Associated Changes in Eating Behavior.” In agreement with the findings of Flaherty and Lim, they found that losses in

olfaction were not significant for most aspects of food enjoyment. However, they discovered that those with losses were less attracted to novel foods. This insight is instructive for designing foods for aging cohorts, and suggests that ramping up the familiar is more likely to improve food enjoyment than would creating novel foods.

Hummel et al. delved into neuroscience in the next offering, “Electro-olfacto-grams in Humans in Response to Ortho- and Retronasal Chemosensory Stimulation.” Their investigation suggests that the well-documented difference in perceived intensity between ortho- and retronasal olfaction begins at the olfactory epithelium, with the intensity of a physically identical stimulus being lower after retronasal stimulation. Interestingly, this held true for olfactory compounds regardless of their ability to activate trigeminal sensations. The utility of this dichotomy to the organism is difficult to understand, and perhaps reflects the dual nature of olfaction.

The remaining articles in this issue have a flavor chemistry focus. Ikes and Cadwallader explored the “Effects of Ethanol on Flavor Perception in Alcoholic Beverages.” Their review revealed an interesting phenomenon, whereby increasing the concentration of ethanol generally decreases the volatile headspace in static systems, but it increases in dynamic systems. Furthermore, changing the ethanol level changes the flavor release profile, as well as the consumer’s perception of aroma, taste, and mouthfeel.

Continuing in a similar vein, Johnson et al. also examined the influence of alcohol on perception in their work entitled, “Aroma Perception and the Chemistry of Bitters in Whiskey Matrices: Modeling the Old-Fashioned.” Despite their relatively simple system, they found both additive and suppressing interaction effects by bitters and whiskeys in both the volatile concentrations and sensory character. One assumes the complexity would only increase in more complex, “real food” systems, which highlights a limitation of studies examining molecules in isolation or binary mixtures.

Qian et al. examined the appropriateness of an aroma extraction technique for wine in “Comparative Characterization

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of Aroma Compounds in Merlot Wine by LiChrolut-EN Based Aroma Extract Dilution Analysis and Odor Activity Value.” Their work confirmed the applicability of LiChrolut EN-SPE as an alternative extraction method for wine characterization. This finding has the potential to improve laboratory efficiency, while at the same time minimizing the use of organic solvent.

The final entry of our special issue illustrates how the combination of human perception and analytical chemistry techniques can be leveraged in the reconstitution of complex natural odors. In “Characterization of the Major Aroma-Active Compounds in Peel Oil of an HLB-Tolerant Mandarin Hybrid Using Aroma Extraction Dilution Analysis and Gas Chromatography- Mass Spectrometry/Olfactometry,” Huang et al. use olfactometry and aroma extract dilution analysis in their efforts to determine the key contributing molecules in natural mandarin oil.

This special issue highlights much of the breadth and depth that we strive to deliver to our readers with every issue. By

bringing new and exciting work in these disparate fields together in one volume, we present our readers with new perspectives on their own areas of specialty by sharing the findings of adjacent specialties. We hope you enjoy this special issue on the “Facets of Flavor.”

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Compliance with Ethical Standards

Conflict of Interest Jeannine F. Delwiche declares that she has no conflict of interest.

Human and Animal Rights and Informed Consent This article does not contain any primary studies with human or animal subjects.