

the methodology established by the USA panel. Resulting data indicated that the developed flavor descriptive analysis procedure can be used either in Spain or USA with similar outcomes. Orange juices prepared using similar processes in both countries had comparable flavor characteristics. Thus, hand-squeezed orange juices were described with citrus fruits, green and floral attributes. Pasteurized products were also described as citrusy, green and sweet fruit along with cooked descriptors of low intensity. Refrigerated from concentrate juices had an intense orange peel oil, cooked, caramel, noncitrus fruits and chemical attributes while canned from concentrate juices no longer tasted like orange juice and were characterized by tropical fruits, chemical and cooked attributes.

Poster Session 6

258. Modeling of the Psychophysical Response Curves Using the Grand Canonical Ensemble in Statistical Physics

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This work represents a contribution to the study of the taste mechanism by using the grand canonical ensemble in statistical physics. This study allowed us to better understand this process and to interpret this phenomenon at the microscopic level. We have carried out an experimental part to obtain psychophysical curves relative to four sweet taste sugars (sucrose, fructose, glucose and maltitol). These curves represent the intensity of sugars according to their concentration in solution. For that, a sensory measuring unit for recording flux (SMURF) device was used to carry out the different curves. To model these curves we have established the expressions of some models using a grand canonical ensemble formalism in statistical physics and making some simplifying approaches. The adjustment of the psychophysical data with the suitable model by numerical simulation allowed deducing the different parameters intervening in the expression of the models. We have explained the choice of the appropriate model and we attempt to interpret the behavior of the physico-chemical parameters. These parameters are classified in two categories: the first one is a steric aspect such as the density of taste receptor site and the number of molecules per receptor site and the second was an energetic aspect such as the concentration at half saturation which gives indirectly the interaction sweet molecule-receptor site energy. The evolution of these parameters with the properties of each stimulus is discussed. It's turned out that the calculated interaction energy is linked to the sweetness of the studied molecules.

259. How Do Neurones of the Fish Olfactory Bulb Discriminate between Skin Extracts from Different Species?

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Crude skin extract contains alarm substances which in many fishes initiate antipredator behaviour upon olfactory detection, but in addition a multitude of odorants such as amino acids, bile salts and sex pheromones. This complex mixture of chemicals could help olfactory

bulb neurones to detect and discriminate between skin extracts from different fish species. The teleost olfactory system shows a distinct chemotopy; there is clear subdivision of neurones into spatially different regions that each respond specifically to different classes of odorants (Lastein et al. 2006. *Chem Senses* 31:69). Nervous activity from type I neurones (Hamdani, Døving. 2003. *Chem Senses* 28:181) in different parts of the olfactory bulb in crucian carp was recorded while stimulating with skin extracts from four different cyprinid species. Preliminary results show that neurones in the lateral bulbar region sensitive to amino acids and polyamines, often respond to all or none of the four different extracts. Neurones in the posterior region of the dorso-medial part of the bulb, sensitive to alarm substances, have more varied response profiles, responding equally often to 1, 2, 3 or 4 extracts. The discriminatory power seems better at lower than higher concentrations. These findings demonstrate that bulbar neurones in different regions are sensitive to skin extracts, but indicate a spatial segregation in the discriminative capacity.

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260. Exploratory Analysis of the Rat Olfactory Bulb Activity

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Olfactory perception and its relation to the olfactory system architecture has been an exciting topic of research in the last decade. This paper explores a database of images of the glomerular activity in the olfactory bulb of rats when exposed to different odorants. The clustering analysis performed reveals the existence of spatial order in this glomerular activity, and the existence of modules that respond in a similar manner to different chemicals. The database can be found at the URL address <http://leonlab.bio.uci.edu/>. This archive contains the averaged activity maps generated from the glomerular response to selected odorants in rat olfactory bulbs, as assessed by 14C 2-deoxyglucose uptake. At the moment of starting this analysis we downloaded 94 images from 54 different chemicals. Some chemicals appear at different levels of concentration. Images can be either dorsal centered or ventral centered. Several clustering algorithms have been used in order to explore the stability of the results. We have chosen Fuzzy C-means, Gaussian Mixture Models and Fuzzy-ART. First examination of the figures shows the appearance of topologically connected regions that react in a similar manner to the chemicals. Results confirm the existence of spatial order within the bulb, that seems to be invariant among different individuals. On the other hand, this is noteworthy since such an ordering has not been found at the level of the olfactory epithelium. On the other hand, we may observe that several clusters appear in a consistent manner across the different clustering algorithms, while some others appear with slightly different borders.

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261. Relationship between Olfactory Reactivity and Food Rejections in Infants

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The role of hedonic reactions to odours on determining rejections of foods in infants is still debated. To answer this question, the first requirement is to have an instrument to test infants' olfactory reactivity. Indeed, except in neonates, there is a lack of validated method. This study presents results of a new method designed to assess olfactory reactivity of 7- to 8-month-old infants. This method is based on the observation of infants' reactions while they explored different rattles. The rattles were visually identical but differed in their odours (neutral or with a food odour). Two sequences of 6 rattles were presented to each infant. Eight odorants were used. Four odorants were chosen to evoke odours of often rejected foods and four were chosen to evoke odours of often liked foods. The hedonic valence was previously checked with an adult panel. These odours were also equated for intensity and had a very low perceived trigeminal component. Forty infants were tested and videotaped. These videotapes were subjected to frame-by-frame analysis to measure a variety of behaviours supposed to reflect the infants' hedonic reaction (e.g., times spent to mouthing or pushing away the rattle). Duration of these events for each odorized rattle was compared to those observed for the control rattles. It thus allows getting a reactivity index per odorant and over all odorants. Reactivity of infants to these odorants was related to infants' reactions to food during weaning, evaluated by the mother. Methodological considerations concerning the reliability of measures of hedonic reactivity in infants will be discussed. The issue of whether young children experience odours as pleasant or unpleasant will be discussed in relation with their food experiences.

262. Major Urinary Proteins (MUPs) as a Perspective Model in Genetics of Aggression: Methodological Consideration and Experimental Evidence

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Aggressive behavior represents an important type of social communication system in mammals. Aggression takes place between at least two animals and consists of extremely complicated information exchange between individuals. Thus the unit of genetic analysis involves dynamically changeable and reciprocal interactions of the leading sensory modalities. The model of pheromonally mediated aggression in *Mus musculus* was first applied in behavior genetic analysis 30 years ago. In the given report several genetic models of the pheromonally mediated social behaviors in laboratory mice developed during last decade are reviewed in lights of rapidly growing data in pheromone chemistry and major urinary proteins (MUPs) neurobiology. The obtained results on differential Mup genes expression by steroid induction are described by the formulae "gene → protein → pheromone → behavior" strongly support the idea of fruitfulness of the MUPs model for the fine dissection of the behavioral phenotype in order to visualize the multichain chemosensory pathways from gene(s) to olfactory mediated social behaviors.

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263. Difference of Cognitive Influences on Perceptual Aspects in Typical Odor Pollutants

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It is not easy to control odor pollution because the effects on perception from exposure to odorants were mediated not only by direct chemicals but also by cognitive variable. Last ECRO we reported that the variety of time-intensity curves for 10 min. exposure of triethyl amine was related to the individual perceptual aspects. In the present study we compared the cognitive influence on perceptual aspects of typical odor pollutants. One hundred fifty two healthy women and men were exposed to 1 of 3 odors (ethyl acetate, hydrogen sulfide and ammonia), regulated as the odor pollutants in Japan, after receiving 1 of 3 instructions that the odorant was harmful, healthful, or neutral. Two concentrations were used for ethyl acetate and hydrogen sulfide, and one concentration for ammonia, considering perceived intensity and the security. Participants rated continuously the odor intensity as time-intensity, which was recorded in every 50 ms, during 10 min. exposure of odorant and odorless air before and after odorant. They completed questionnaires on the odor unpleasantness and odor quality after odorant exposure. As the results, cognitive effects on perceptual aspects, such as the unpleasantness, the odor quality, and the total sum of intensity calculated from time-intensity data were not same in 3 odor pollutants; the largest effects in ethyl acetate, the next in hydrogen sulfide, and the smallest in ammonia. The unpleasantness was related to cognitive factors, however more related to the perceived odor quality in ethyl acetate. And the effects were larger for lower concentration in ethyl acetate and hydrogen sulfide. These results suggest several variables to enlarge the cognitive effects in odor pollutants.

264. Psychophysical Tests of the Vibration Theory of Olfaction

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A recent psychophysical study testing predictions of the vibration theory of olfaction found that humans could not discriminate between deuterated and undeuterated versions of acetophenone. Here I present results of a series of double-blind triangle tests in which I test the ability of human smellers to discriminate deuterated and undeuterated versions of acetaldehyde, acetophenone and pyrazine, as well as the two enantiomers of carvone. Contrary to expectation, humans could discriminate between the two versions of acetaldehyde at rates substantially better than chance, and close to the rate at which the carvones could be discriminated. Furthermore, deuterated and undeuterated versions of acetophenone, in this study, could be discriminated at rates better than chance. The ability to discriminate between the versions varies with concentration used. The implications of these results will be discussed.

265. Electrophysiological Properties of Ion Channels Implicated in Olfactory Transduction

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Olfactory transduction is the cellular process that converts the binding of odor molecules to olfactory sensory neurons into electrical