1st World Congress on

Olfaction & Issues

Modulation of Physiological Responses

Applications in the Pharmaceutical, Food & Cosmetic Industries

Latest Advances, Future Prospects & Directions

Symposium on Pheromones:
Scientific Credibility &
Practical Applications in Humans

November 4-5, 2010

Maison de la Recherche, Paris, France

Conference Produced by

TAKAYAMA

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Scientific Committee and Speakers

Dr Moustafa Bensafi, France
Mr Nicolas Chabot, France
Mr Pascal Charlier, France
Mrs Creezy Courtoy, Belgium
Pr Karl Grammer, Austria
Pr Manfred Gratzl, Germany
Pr Tim Jacob, United Kingdom
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Pr Edmund Rolls, United Kingdom
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Conference Produced by

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…Olfaction "the Forgotten Sense" must be more Investigated For health and well-being…

Dear Colleagues,

On behalf of the organizing committee of Olfaction & Issues Conference, we are pleased to welcome you in Paris for this strategic conference.

Why organizing a conference on olfaction?

It was in 2007, during my chairing the **International Conferences on Obesity**; we wished to award an original project who can prevent obesity and diabetes. It was difficult to select the most innovative ideas. My attention was attracted during the round table discussion about the credibility of "The Aroma sliming Concept". We debated whether olfaction can prevent or treat obesity, by the presence of olfactory gastric receptors as satiety modulators, or decrease stress, anxiety, pain and can increase seniors' appetite and well-being.

As chairman of this conference, I wish to highlight the *Olfaction, as "the Forgotten Sense", which must be more investigated for human health and our well-being… I believe that we* ***can modulate many physiological responses*** *by acting on olfaction. The industrial applications in food, pharmaceutical and others like cars manufacture, airports… are huge."*

Latest years, industrials started to be interested in sensorial effects of their products on the consumer. New markets were created, in the field of touch, hearing, taste and sense of sight, with products more and more original. The efficacy of human sense of smell, very complex and quite unknown mechanism, has been studied since few years and has enabled to discover amazing effects. The opportunities in the market are now becoming very hopeful.

The aims of Olfaction 2010: Modulation of physiological responses are to:

- Debate on a complex and relatively unknown subject

- Consider possible applications in cosmetic, pharmaceutical and food industry

- Discuss of latest breakthrough in this area

We will also underline the:

** Umami trends and Olfaction: Opportunities & Perspectives of the 5th sense for the flavor industries*

** Olfactive logo and Marketing communication*

The 1st World credible **Symposium dedicated to "taboo subject" will be about Pheromones: Scientific Credibility & Practical Applications in Humans**.

On behalf of the Organizing Committee and Agence Takayama, we would like to express our sincere gratitude to all speakers and participants for their contributions:

Dr Valery Matarazzo, Neurobiology and Neurophysiology Research Center, Marseille, France
Pr Tim Jacob, School of Biosciences, Cardiff University, UK
Pr Manfred Gratzl, Prof. of Anatomy and Biochemistry, Ludwig Maximilian University, Munich, Germany
Pr Edmund T. Rolls, Oxford Centre for Computational Neuroscience, University of Oxford, UK
Dr Brigitte Palouzier-Paulignan, Université Claude Bernard Lyon1, France
Pr Antje Welge-Lüssen, University of Basel, Switzerland
Pr Bettina Pause, University of Dusseldorf, Germany
Dr Moustafa Bensafi, CNRS Neurosciences Sensorielles, Comportement, Cognition, Lyon, France
Pr Karl Grammer, Department of Anthropology, University of Vienna, Austria
Pr Stephen Michnick, Department of Biochemistry, University of Montréal, Canada
Dr Tamsin Saxton, Philosophy, Psychology and Language Sciences, University of Edinburgh, UK
Dr Jacques Vergriete, Sexologist, Créteil, France
Mr Philippe Charlier, General Manager, Air Berger, Balma, France
Mr Nicolas Chabot, CEO, Air Aroma France, Paris, France
Mrs Evelyne Lorphelin, Cap Bleu Communication, Bruz, France
Mrs Creezy Courtoy, Founder and chairman of International Perfume Foundation, Belgium
Dr Michael Moisseeff, Asquali, France

It gives us a great pleasure to thank also here all those who have enabled the conference to be held in favourable conditions and especially the sponsors, the Medias and press partners.

Pr Marvin Edeas,
Chairman of the Organizing Committee

1st World Congress on Olfaction & Issues

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Dr Valéry Matarazzo

Neurobiology and Neurophysiology Research Center, Marseille, France

Valéry Matarazzo is a tenured associate professor in neurobiology at Aix-Marseille University.

He performed his PhD degree on the identification and caraterization of olfactory receptors. To provide tools for olfactory receptor deorphanization, he has developed a strategy based on a quantitative pharmacological odorant screening using a live imaging method.

After his postdoctoral positions at the Johns Hopkins University (USA) and the Developmental Biology Institute of Marseille-Luminy (CNRS-IBDML, Fance), he recently joined the Neurobiology-Neurophysiology Research Center of Marseille (CNRS-CRN2M, France) to work on neuronal plasticity and repair strategy based on transplantation of olfactory cells.

Presentation: **Olfaction: Scientific Credibility and Generalities**

Pr Tim Jacob

School of Biosciences, Cardiff University, UK

Tim Jacob is currently a Professor in the School of Biosciences, Cardiff University and has held this post since 1995.

He did his first degree in Biochemistry at Sussex University and his PhD in Biophysics at the University of East Anglia. He has been awarded Honorary Professorships at Guandong Medical College, Zhanjiang, China and Jinan University, Guangzhou, China.

He has written or contributed to over 75 publications (including 7 book chapters) and >70 conference presentations. He is a leading authority on issues concerning smell and taste, maintaining top websites (by Google search) on “Smell” and “Taste”, and frequently contributing to film, radio & TV programmes on subjects relating to taste and smell.

He has worked with many commercial organizations including Pfizers, Proctor and Gamble, Reckitt Benckiser, Unilever, Bush Boake Allen and International Flavors & Fragrances. His research has been funded by the Medical Research Council, the Wellcome Trust and the Royal Society.

His research interests include:

- how we learn to smell and how smell alters our behaviour
- how we distinguish to “good” and “bad” smells
- brainwave patterns and psychophysiological response to smell
- human chemical signalling – human pheromones
- measuring olfactory function
- the contribution of smell to flavour

Presentation: **Olfaction, odour signalling and the secondary effects of odours in humans**

Pr Manfred Gratzl

Prof. of Anatomy and Biochemistry,
Ludwig Maximilian University, Munich, Germany

Manfred Gratzl, born 1943, studied between 1963 and 1969 Biochemistry and Medicine at the Universities of München and Tübingen. Then he worked as a medical doctor in University hospitals in Tübingen (Internal Medicine and Surgery) and as a research assistant at the Institute of Biochemistry (University of Saarland in Homburg) and at the Institute of Medical Physiology (University of Copenhagen). In 1982 Manfred Gratzl moved to the University of Ulm (Department of Anatomy and Cell Biology).

Since January 1995 he is full professor and chairman at the Institute of Anatomy of the Technical University Munich and since October 2000 of the Ludwig-Maximilian University Munich. He has initiated the Graduate Research Program 'Biology of Human Diseases' and the Marie Curie Training Site 'Cellular Signalling in Human Diseases' funded by DFG and EC, respectively.

His main scientific interests concern the mechanism and the regulation of membrane fusion during exocytosis, the development of the nervous and the endocrine system and the analysis of related tumors. More recently he investigated the function of oxygen sensors regulating respiration and of sensor systems present in the human gut. Furthermore he edited the most popular German histology textbook and launched the online program Body-Explorer that enables users worldwide (in 14 languages) to interpret computer tomography, magnetic resonance imaging, digital X-ray and sonography.

Presentation: **Taste, Olfaction and effects on the gut**

Pr Edmund Rolls

Oxford Centre for Computational Neuroscience, University of Oxford, UK

Professor Edmund T. Rolls, M.A., D.Phil, D.Sc., Hon. D.Sc. is at the Oxford Centre for Computational Neuroscience, Oxford, and at the International Digital Laboratory, University of Warwick, UK.

Edmund T. Rolls is a neuroscientist with research interests in computational neuroscience, including the operation of real neuronal networks in the brain; functional neuroimaging of vision, taste, olfaction, feeding, the control of appetite, memory, and emotion; neurological disorders of emotion, psychiatric disorders including schizophrenia and the brain processes underlying consciousness.
These studies include investigations in patients, and are performed with the aim of contributing to understanding the human brain in health and disease, and of treating its disorders.

He has published more than 478 full length research papers on these topics, which are shown, with many .pdfs available, at http://www.oxcns.org. His books include:

- *Rolls,E.T. (2005) _Emotion Explained._ Oxford University Press: Oxford.*
- *Rolls,E.T. (2008) _Memory, Attention, and Decision-Making: A Unifying Computational Neuroscience Approach._ Oxford University Press: Oxford.*
- *Rolls,E.T. and Deco, G. (2010) _The Noisy Brain: Stochastic Dynamics as a Principle of Brain Processing_. Oxford University Press: Oxford.*

Presentations: **Olfaction, appetite, and obesity: brain mechanisms**
Umami as a combination of the 5th taste and a consonant odor

Dr Brigitte Palouzier Paulignan

Professor Associate at the University of Lyon 1 – CNRS UMR5020, Laboratory of Sensory Neuroscience, Behavior, Cognition, Lyon, France

Her current research focuses on the understanding of some of the neural processes which take place in the first two stages of the olfactory system i.e. the olfactory mucosa and the olfactory bulb. Using various in vitro electrophysiological recordings performed on brain slice, acute explant and cell culture, she investigates how these networks are modulated particularly by the peptides regulating the food-intake and by the blood sugar level. Indeed, since it has been demonstrated that the nutritional states influence the olfactory abilities of the animals, she works to further the understanding of the complex interaction between nutritional status and olfactory processing.

Methodology: Whole cell and perforated patch-clamp recording techniques, In vivo unitary extracellular recordings, Pharmacology, Ion channel modulation

Presentation: **The olfactory system: as a metabolic sensor?**

Dr Antje Welge-Lüssen

University of Basel, Switzerland

Presentation: **Olfaction and Ageing: Can we increase seniors' appetite and well-being?**

Pr Bettina Pause

University of Dusseldorf, Germany

Presentation: **Olfactory Communication of Stress and Anxiety**

Dr Moustafa Bensafi

CNRS Neurosciences Sensorielles, Comportement, Cognition, Lyon, France

Researcher at CNRS Laboratory of Sensory Neuroscience, Behavior, Cognition, Lyon (France)

Research fields: psychology and neuroscience of smell in humans, relationships emotion / cognition in the sense of smell

Methodology: psychophysics, experimental psychology, psychophysiology, neuroimaging functional

Presentation: **Olfaction and application in cosmetic industry**

Dr Mark Sergeant

Division of Psychology, University of Nottingham Trent, UK

Dr Mark Sergeant is a senior lecturer in Psychology at Nottingham Trent University in the United Kingdom.
His research and teaching activities focus on sexual behaviour in humans, particularly in relation to olfactory processes.

Since 2003 his research activities have been concentrated on the olfaction in non-heterosexual individuals.

As part of this research he has undertaken an ECRO travelling fellowship at the Monell Chemical Senses Center in Philadelphia, USA.

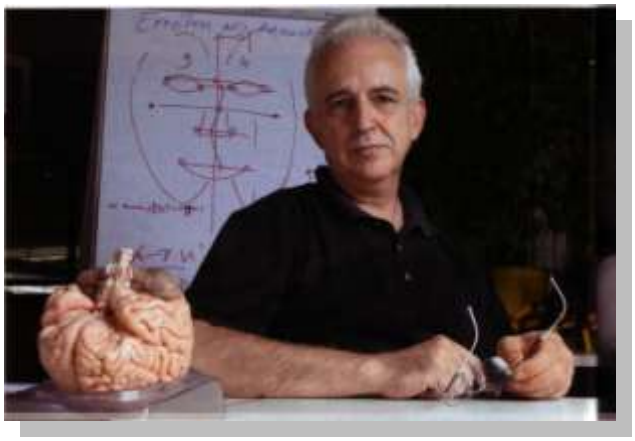
Presentations: **Olfaction, Sexual Orientation and Impact on product selection**
Olfaction, Pheromones and Sexual Behaviour

Mrs Creezy Courtoy

Founder and chairman of International Perfume Foundation, Belgium

Vice Chairman, International Luxury Brands Adviser EMPIRE Group China
Luxury Expert, founder of New Luxury Code, Member of Luxury Society
Chairman at Perfume Foundation
Owner CREEZY! The Agency, Owner Luxury Network International
Expert at European Commission - Advisor for EU, UNESCO and government organizations on the new development of the perfume industry.
Advocate of using flowers and natural ingredients in perfumes and perfumed products to help solve environmental and consumer health problems related to the use of synthetic, non tested molecules. Author of the book PERFUMOTHERAPY. Journalist, historian and anthropologist

Presentation: **Olfaction, dangers or benefits**



Pr Karl Grammer

Department of Anthropology,
University of Vienna, Austria

Karl Grammer (1950) studied Zoology, Physics and Anthropology at the University of Munich and received his Masters Degree in 1979 in Biology at the University of Munich and the Research Institute for Human Ethology, Max-Planck-Society, under the direction of I.Eibl-Eibesfeldt.

His Masters Thesis was: Helping and supporting behavior in preschool children. He received his PhD in Biology in 1982 at the University of Munich and the Research Institute for Human Ethology, Max-Planck-Society.

His Dissertation was: Competition and Cooperation: intervention in conflict among preschool children. In 1983 he became an Assistant Professor at the Research Institute for Human Ethology, Max-Planck-Society. In 1990 Habilitation at the University of Vienna and in 1991 he became the Scientific Director (together with Prof.Dr.I.Eibl-Eibesfeldt) of the Ludwig-Boltzmann-Institute for Urban Ethology in Vienna. In 1992 Dr. Grammer became the Secretary of the International Society for Human ethology. In 2000 he was appointed Professor by the University of Venna .

In 2002 he received the Zdenek-Klein Award for his integrative scientifc work. In 2003 he received thef first prize in the International competion Vienna-Cooperate for outstanding scientific and technological innovation. Since 2010 he directs the Human Behavior Research Group at the Department of Anthropology – University of Vienna. Currently he is working on visual and olfactory communication research and non-verbal behavior simulation.

Presentation: **The olfacto-sexual function: love in the nose?**

Dr Stephen Michnick

Department of Biochemistry,
University of Montréal, Canada

Stephen Michnick received his B. Sc. and Ph. D. from the University of Toronto and did postdoctoral training at the Department of Chemistry, Harvard University.
He is presently Professor of Biochemistry and Canada Research Chair in Integrative Genomics at the University of Montreal.

He has developed experimental and conceptual tools to study the structure and dynamics of biochemical networks in living cells and their responses to external and internal queues. His specific interests include molecular mechanisms of cell fate decisions, genomic organization, dynamics and evolution and the evolution of protein interaction networks.

Prof. Michnick has received several distinctions, including Burroughs-Wellcome New Investigator and Medical Research Council of Canada Scientist Awards.

Presentation: **Pheromones and Seduction: the powerful of chemistry**

Dr Tamsin Saxton

Division of Psychology, School of Social and Health Sciences, University of Abertay Dundee, UK

Dr Saxton works in the area of human mate choice, with a particular focus on: face, voice, odour attractiveness; the development of attractiveness judgments during childhood and adolescence; and the effects of experience on attraction.

She carried out her PhD research at the University of Liverpool, and is currently working at the University of Edinburgh.

Presentation: **Odour and Pheromones: Attraction and Eroticism**

Dr Jacques Vergriete

Sexologist, Créteil, France

Dr Vergriete Jacques is a doctor and sexologist.

His work is mostly liberal. He took an early interest in the practical use of pheromones in sexological practice.

He is the author of an article entitled: «Les phéromones ont-elles un intérêt en sexologie?»

Presentation: **Pheromones and sexuality in human: the point of view of a sexologist**

Mrs Evelyne Lorphelin

Cap Bleu Communication, Bruz, France

Presentation: **The opinion of communication agency: when and how to start?**

Dr Michael Moisseeff

Asquali, France

Presentation: **Acquiring an olfactive identity in the media: DO's & DON'T's**

Mr Pascal Charlier

General Manager, Air Berger, Balma, France

Executive Manager of Air Berger, created in 1997 and bought in 2003 by the Lampe Berger Group.

Company specialized in developing olfactory ambiance of outlets: creation of broadcasters, catalog design for perfumes and signatures, installation and maintenance systems.
5000 Park broadcasters in France / 2000 Customers / many signs equipped / A network of export partner.

Presentation: **Scent Marketing: How to prove a real benefit through a survey?**

Mr Nicolas Chabot

CEO, Air Aroma France, Paris, France

Branding and marketing professional with over 15 years experience in cosmetics and luxury business for major international players (Estée Lauder, LVMH, Richemont group).

Currently using skills and expertise by bringing sens, desire, innovation concepts in branding strategies through the scent dimension.

Helping brands to get to the next level, using scent as addition to traditional branding tools. Passionate about cosmetics, high value added products, arts & design. EMBA Sorbonne-Celsa.

Presentation: **How can scent branding work for you and your customers?**

Session 1:
Recent Advances on Olfaction

Last scientific breakthroughs about olfactory receptors. What kind of physiological responses expected?

Valery Matarazzo,

Neurobiology and Neurophysiology Research Center (CRN2M), CNRS-UMR 6231, Université Aix-Marseille III, Avenue Escadrille Normandie Niemen, 13397 Marseille, France.

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Through the sense of smell, mammals can detect and discriminate between a large variety of odorants present in the surrounding environment.

The first breakthrough on olfaction appeared in the last decade of the 20th century with the discovery by R. Axel and L. Buck of the nature of Olfactory Receptors (ORs). Mammalian ORs are heterotrimeric guanine nucleotide-binding G-protein-coupled receptors (GPCRs). ORs are located in the cilia of the olfactory sensory neurons which lie in the main olfactory epithelium of the nose. ORs recognize odorant molecules and translate the information present in chemical molecules into neural activity. To ensure early olfactory perception and discrimination of thousands of odorant molecules, ORs constitute the largest protein family among GPCRs. They comprise roughly 1035 and 250 putatively functional ORs in mice and humans, respectively, making it also one of the largest gene families in the mammalian coding genome since ORs are produced from monoexonic gene.

The second breakthrough was the discovery that within the olfactory epithelium of the nose, each of the individual 10 million of olfactory sensory neurons expresses only one single ORs gene, and neurons expressing the same type of receptor project their axons to one or a few glomeruli in the olfactory bulb, creating a map of ORs inputs. The information is then passed on to other regions of the brain, leading to odorant perception. To understand how the olfactory system discriminates between odorants, it is necessary to determine the odorant specificities of individual odorant receptors. These studies are complicated by the large number of structurally diverse odorant molecules to screen, the extremely large size of the OR family and by the poor functional expression of these receptors in heterologous cells. Up to now, the deciphering of ORs pharmacology has been obtained for fewer than 50 mammalian ORs. It appears clear that discrimination depends on a combinatorial receptor activation code in which most odorants are identified not by the activation of a single receptor, but by the pattern of receptors that are activated. Second, individual receptors are activated by subsets of odorants. Exception is made for few receptors that respond to specific odorants. Third, odorants can produce not only activation but also inhibition of receptors leading to the idea of receptor antagonism between odorants.

The last breakthrough appeared in the past few years with the identification of new odor receptor families, and the consideration that there is a mutiplicity of olfactory organs.

Indeed, beside the main olfactory epithelium which lies in the dorsal cavity of the nose, the vomeronasal organ, the septal organ of Masera, the Grueneberg ganglion, are organs which also lie in the nose cavity and contain sensory neurons that detect volatile compounds. Up to now, if diverse physiological responses such as social, sexual, feeding, stress behaviors are elicited by these four sensory organs, the molecular events still need to be discovered.

Session 2:
Olfaction Science & Food Applications

Olfaction, odour signalling and the secondary effects of odour in humans

Liwei Wang, Harriet Gunney, Nicola Flaum, Angharad Lewis, Emily Limb, Abeer Al-Shammari,
Simon O'connor & Tim Jacob
School of Biosciences, Cardiff University, Cardiff, UK, CF10 3AX - jacob@cardiff.ac.uk

What is odour perception and how do we measure it? Moncrieff, in 1955, started by looking at what happened to the odour molecule – he found it had to adsorb to the surface of the olfactory apparatus. He believed that smell had to be airborne but other experimenters cast doubt on this idea and it is still undecided as to whether we can smell underwater. Physics says we should be able to. The star-nosed mole smells underwater but does so by blowing a bubble at potential food and then breathing it back in, thereby sampling the odour in air, not water. Bocca et al (Acta Oto-Laryngol, 59, 1965) injected odorants intravenously and found that subjects only perceived the odour when they sniffed. No sniff, no smell. But then the sniff itself was found to be unnecessary, as when odourless nitrogen was passed through the nose, odour perception returned. Airflow therefore seems to be a requirement for odour perception.

Early investigators developed olfactometers and there has been a steady evolution in design from simple "blast" olfactometers in the 1930s to complex air-dilution olfactometers in use today. Precise odour stimuli can be delivered by these devices and with this kind of technique one can analyse the biophysics of the olfactory system studying, for example, evoked potentials, the response at different sites, the response to different odorants, and whether different people give the same response to the same odorant. But, when we look closely we find that the information we can gain is limited and, besides, this is not how we smell. We smell during natural breathing and smell is analysed along two main dimensions, intensity and valence, the analysis being performed by different regions of the brain (amygdala and orbitofrontal cortex). However, the olfactory bulb (OB) is the first processing station in the olfactory system so this is the first region that should be addressed. Modern imaging techniques (fMRI, PET) cannot image the OB because of its small size and the variation in the density of the tissues surrounding it. The olfactory bulb is therefore *terra incognita* for physiologists. Using EEG electrodes and natural breathing we have measured the electrical activity at a point as close to the OB as we can get. During odour exposure, gamma oscillations (30-80Hz) increase on the inspiratory phase of the respiratory cycle. We do not observe this in more central brain regions (recorded at Cz). Using more ecologically valid odour stimulation we have detected significant changes in physiological parameters (e.g. blood pressure and heart rate) in response to vanillin, an odour that is loaded with psychological significance. Smell is at the interface of mind and body, between psychology and physiology, and in order to understand it more fully, we need to use both disciplines simultaneously. My laboratory has started using psychological probes such as Raine's Schizotypal Personality Questionnaire alongside more traditional olfactory measures to investigate individual responses to odour. I personally don't believe that we will get to a point where we can say we have isolated the physiological correlates of specific emotions. So, rather than separating psychological and physiological techniques, using them in parallel we cans add extra degrees of experimental freedom and achieve greater statistical power. In this approach we would be following the Greek physician Galen who appreciated the aesthetics of smell and believed that the organ of smell was not the nose but was in fact the brain.

Enterochromaffin Cells in the Human Intestine "Sniff" via Olfactory Receptors and Release Serotonin

PROF. DR. Manfred Gratzl

Institut für Anatomie, Biedersteiner Str. 29, 80802 München, email: Gratzl@lrz.uni-muenchen.de

Enterochromaffin cells release serotonin, in response to mechanical stimulation or in response to certain nutrients in the lumen of the intestine. The secreted serotonin then stimulates sensory components of the enteric nervous system, ultimately controlling gut peristalsis as well as water and chloride transport by enterocytes. It has been hypothesized that enterochromaffin cells may be able to sense other substances that cause serotonin release. Microarray gene chip data suggested that enterochromaffin cells might express olfactory G-protein– coupled receptors that are typically found in the nose. Laser capture-microdissected human intestinal enterochromaffin cells and a cell line derived from human enterochromaffin cells were found to express the same 4 olfactory receptor genes by RT-PCR: OR73, hOR17-7/11, OR1G1, and hOR17-210. Thymol, which binds to OR1G1, is a component of thyme spice. Thymol triggers a transient rise in intracellular calcium and a dose-dependent increase in serotonin release, whereas phenol does not. Other odorant ligands showed similar responses: eugenol and isoeugenol (binds OR73), methylsalicylate (receptor unknown), geraniol (binds hOR17-7/11 and OR1G1), bourgeonal (binds hOR17-7/11 and hOR17-4), and helional (binds hOR17-7/11 and hOR17-40) increased intracellular calcium, and stimulated serotonin release by exocytosis.

This study indicated that enterochromaffin cells express olfactory receptors that may be stimulated by odorant ligands in the intestinal lumen to release serotonin. The study suggests that luminal odorants may influence gut motility and secretion.

Olfaction, appetite, and obesity: brain mechanisms

Edmund T Rolls, DSc, Hon DSc
Oxford Centre for Computational Neuroscience, Oxford, UK.
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Recordings of neuronal recordings, and functional neuroimaging in humans, show that the primary taste cortex in the anterior insula provides separate and combined representations of the taste, temperature, and texture (including fat texture) of food in the mouth independently of hunger and thus of reward value and pleasantness. One synapse on, in the orbitofrontal cortex, these sensory inputs are for some neurons combined by learning with olfactory and visual inputs, and these neurons encode food reward in that they only respond to food when hungry, and in that activations correlate with subjective pleasantness.

Cognitive factors, including word-level descriptions, and attention, modulate the representation of the olfactory and taste reward value of food in the orbitofrontal cortex.

Further, there are individual differences in the representation of the reward value of food in the orbitofrontal cortex, in that for example the orbitofrontal and anterior cingulate cortex reward systems respond more to the sight and flavour of chocolate in chocolate cravers than in non-cravers.

After the reward value of stimuli has been represented in the brain, a choice decision is taken by a third cortical tier of processing in the ventromedial prefrontal cortex, area 10, and this decision-making is probabilistic because of the randomness of the firing times of populations of neurons.

It is argued that over-eating and obesity are related in many cases to an increased reward value of the sensory olfactory, taste and texture inputs produced by foods, and their modulation by cognition and attention, that over-rides existing satiety signals.

It is proposed that control of all rather than one or several of the factors that influence food reward and eating may be important in the prevention and treatment of overeating and obesity.

Rolls,E.T. (2010) Taste, olfactory, and food texture reward processing in the brain and obesity. International Journal of Obesity Electronic publication 3 August.

Rolls,E.T. and Deco,G. (2010) The Noisy Brain: Stochastic Dynamics as a Principle of Brain Function. Oxford University Press: Oxford.

Rolls,E.T., Grabenhorst,F. and Deco,G. (2010) Choice, difficulty, and confidence in the brain. Neuroimage 53: 694-706.

Rolls,E.T., Grabenhorst,F. and Parris,B. (2010) Neural systems underlying decisions about affective odors. Journal of Cognitive Neuroscience 10: 1068-1082.

Rolls,E .T. and Grabenhorst,F. (2008) The orbitofrontal cortex and beyond: from affect to decision-making. Progress in Neurobiology 86: 216-244.

Rolls,E.T. and McCabe,C. (2007) Enhanced affective brain representations of chocolate in cravers vs non cravers. European Journal of Neuroscience 26: 1067-1076.

Rolls,E.T. (2005) Emotion Explained. Oxford University Press: Oxford.

The olfactory system: a sensor of the metabolic status?

B. Palouzier-Paulignan1, A. Savigner2, P. Aimé1, A. K. Julliard1.

1Université Lyon1, CNRS UMR 5020, Lyon, France

2Department of Neuroscience, University of Pennsylvania, School of Medicine, Philadelphia, PA, United States

The control of food intake involves internal (endocrine, metabolic) and external (sensory characteristics of food) signals. Olfaction is one of the external clues that regulate food consumption and conversely the nutritional status modulates the olfactory detection. We hypothesized this interplay between olfaction and food intake is mediated by a direct action of endocrine and metabolic molecules on the olfactory system. Indeed, hormones receptors and specific glucose transporters are described at the peripheral (olfactory epithelium) and the central (olfactory bulb, OB) levels. This strongly supports the idea that these olfactory structures (epithelium and bulb) could be sensors of the metabolic status in the same way as the hypothalamus.

In order to test this hypothesis, we used in vitro electrophysiological recordings and a behavioral approach. First, we demonstrated that anorexigenic hormones (insulin or leptin), in the olfactory epithelium, decreased the global signal-to-noise ratio of the receptor neurons and, in the OB, modified the firing of mitral cells (MCs). These cellular effects underlie the decrease of the olfactory detection we evidenced, using behavioral tests following an intracerebroventricular injection of anorexigenic hormones. Next, using enzymatic glucosensors, we showed, in anesthetized rats that the bulbar glucose concentration follows the physiological fluctuations of glycaemia without exceeding 2.5 mM. *In vitro*, we observed that the MCs firing is modulated according to the external glucose content.

In conclusion, the olfactory system shows a sensitivity to the metabolic status allowing to adapt the food detection to the metabolic status and consequently to regulate the food intake. Moreover in the nostril, the exposition of the olfactory epithelium to the external environment enables to modulate the central control of food intake, e.g. by intranasal deliveries. Enhancing our knowledge about the metabolic capacities of the olfactory system will open new ways to fight against metabolic disorders.

Olfaction and Ageing: Can we increase seniors´ appetite and well-being?

Pathophysiologic changes of olfaction with age – influence of olfactory disorders on appetite and food intake

Dr Antje Welge-Lüssen

University Hospital Basel, Department of Otorhinolaryngology, Petersgraben 4, 4031 Basel, Switzerland.

awelge@uhbs.ch

Olfactory receptor cells regenerate continuously through life. With aging receptor cell death is likely to override cell regeneration to a large extent. If this was not the case, anosmia rates of almost 25% in those between 65 and 80 years of age and nearly 50% in those over 80 years are difficult to explain. Olfactory loss is usually gradual and therefore not consciously noted by most of those affected. Such loss may, however, underlie the reduced appetite, reduced food intake and malnutrition in the elderly thus lead to major medical problems. With a growing number of the independent elderly in our society we are likely to underestimate the impact of the loss of smell on their life style. Different aspects of pathophysiological changes with increasing age on nasal mucosa as well as on the olfactory epithelium and olfactory bulb will be discussed. Typical cases will be presented and discussed. Possibilities to influence and / or improve a persons well being given a persisting disorder will be discussed as well.

Session 3:
Olfaction & Applications in Pharmaceutical Industries

Olfactory Communication of Stress and Anxiety

Bettina M. Pause
Department of Experimental Psychology
University of Duesseldorf, Federal Republic of Germany

Social communication of stress through chemosensory signals is advantageous because chemical signals possess a high longevity, can be used in darkness and have a potentially high specificity. In vertebrates and invertebrates physiological adaptations to stress can be transmitted chemosensorily from the stressed animal to conspecifics. The alarm reaction to chemical stress signals includes an allocation of energy, the activation of the sympathetic system, and furthermore the initiation of withdrawal behaviour.

Several recent studies have shown that humans also respond to chemical signals of stress and anxiety on different physiological and mental levels. In the context of chemosensory anxiety signals the perceptual acuity for social safety signals (happy facial expressions) is reduced whereas the perceptual acuity for social warning signals (fearful facial expressions) is increased. Furthermore, the perception of chemosensory anxiety signals is accompanied by a strengthening of withdrawal related reflexes (startle reflex). Whereas the perception of chemical stress signals is mediated within the amygdala, the perception of chemical anxiety signals is mediated by brain structures known to be involved in empathy.

Here, we will present new data, showing that the relevance of social chemosignals of anxiety is increased in socially anxious participants and decreased in pregnant women.

Session 4:
Olfaction & Applications in Cosmetic Indutries

Effects of odors and fragrances on mood and physiology during normal aging

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Objectives

Studies on sensorial familiarization revealed multiple influences on cognition and brain activity. The present study aimed at testing whether olfactory familiarization may affect mood and physiology during normal aging.

Methodology

To this end, forty eight 55-65 years old women were involved in a between-subjects design whereby 24 of them applied a skin care product containing a pleasant smell (test group) and 24 applied the same product but unscented (control group).

Both groups used the skin care product at home daily for 5 days and filled in mood and emotions questionnaires before and after the daily care. After one week familiarization with the product, subjects came to the laboratory for another mood evaluation and for physiological recordings while exposed to the pleasant smell (S1) contained in the scented product and another pleasant smell (S2) used as control.

Results

The use of scented skin care product for one week induced a decrease in negative mood in the test group ($p<.05$). These effects on mood were associated with an increase in facial zygomatic activity (implicit index of positive mood) specifically in response to S1 in the test group ($p<.03$).

Conclusion

Taken together, these results suggest that the pleasant smell of a cosmetic product may contribute to the well-being in a population of aged women. They also suggest that there are benefits in using olfactory familiarization protocols to improve mood during normal aging.

Olfaction, sexual orientation and impact on product selection: Olfactory abilities in non-heterosexual individuals

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An individual's sexual orientation has a significant impact on a range of psychologically-relevant characteristics (LeVay, 2010; Wilson & Rahman, 2005). A growing number of studies have now demonstrated that sexual orientation also influences human olfactory abilities. This presentation will review the existing literature on olfactory function among non-heterosexual individuals and consider its potential impact on product selection. Topics to be discussed include the effects of sexual orientation on the properties and perceptions of body odour (Martins et al., 2005; Sergeant, Dickins, Davies, & Griffiths, 2007), the neural processing of certain social odorants (Berglund, Savic, & Lindström 2006; Savic, Berglund, & Lindström, 2005), performance on olfcatory tasks eliciting a sex difference (Sergeant, Louie, & Wysocki, submitted), the importance of olfaction during partner selection (Sergeant & Dickins, in preparation) and fragrance preferences (Rudd, 1996).

Short Oral Presentations

The chemistry of seduction
Could the mystery of seduction lie in perfumes?

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In order to be convinced by this hypothesis and to innovate in its future proposals, we have conducted a wide survey intended for women, about desire, sensual sensations and feelings.
Looking for sense…Facing the camera (while we stay behind, like inquisitive and intrigued spectators, slightly voyeurs...), women at home, of different ages and cultures, reveal their personal views about sensuality, various ways to seduct and their intimate sensations... with amazing results in terms of unaffectedness, decency and coarseness.
Touching messages, sometimes bold or funny, but always close to real-life. All these Women, between 25 and 45 years old, participated with complete freedom in this "confession talk". In the end, they show in their own way the most secret part in ourselves... the part of our private life and most basic instincts.

About the universal theme of desire and being desirable, the youngest women (aged 25 to 45) seem above all to search for well-being sensations in their private moments. They are romantic, prefer cocoon and muffled atmospheres and favor rather tact, discretion and subtlety.
The mature women, more extrovert and bold, don't hide that they are attracted to specific effects like playing with stimulation, body presentation, unusual situations or with more or less forbidden games…

In order to desire and to be desired, they confess that they enjoy preparing and taking care of themselves (thanks to bathes, massages, and oriental rituals).
Their body become conditioned and prepared for new sensual experiences.
A symbolic combination of sensuality and utmost opposite evocations: wild or quiet nature, smoothness and bestiality, basic instincts and asserted pride: « desire is a desire for living. And to live is to desire. »
But the desire of a skin or a body is nothing but the touch of this skin or body, and the take over of its odour. Here again and without affect, they tell us how they feel some elements, immaterial or physical matters (air; water, oil, earth, fire, massages and fabrics). They evoke regressive and smooth odours or in the contrary the heavy smell of cigars or the earth.

They associate wonderfully ideas about nudity smells (organic odours) in comparison with sophisticated perfumes (hot oriental atmospheres). Their words flow freely, their gesture become explicit. When they are asked about erotic sensations, they spontaneously think of food, savors, colors, tastes, and sounds, cold and heat, dryness and humidity…..Eroticism seems to be immediately associated with opposite thermal sensations or moist sensations combined with pastry, tropical jungle…

If they could buy the ideal cosmetic product tomorrow, they would doubtless choose the one able to provide new sensations and a double mixed effect smooth/stimulating or relaxing/exciting.

Olfaction, Dangers or Benefits

Dr CREEEZY COURTOY

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Perfume has been used in therapy by all civilizations since the antique world
If in Egypt they use to say « who breath flowers smells breath flower soul, in India, doctors were called "perfumero" and in China the same character is used for saying « perfume » and « remedy ». A Chinese proverb also says «A perfume is always a medicine»
In Europe, the therapeutic and "disinfecting" role of perfumes was always very present to fight against epidemics: the cholera, the plague and all kinds of illnesses; perfume was used in the form of smelling antiseptic pastilles, burnt in incense burners. In Russia, perfumes were only sold in pharmacies. Pharmacies had their own laboratories, their own flower fields and their own glass bottles factories.

Today, will you allow your kids to smell perfume?
Perfumes are now in the hands of the chemical industry and are not properly tested for breathing. Therefore it is dangerous for kids to smell to much as perfumes are everywhere from household products to cosmetic products, we are surrounded by a mixture of uncertain chemical substances. I had the chance to spent a lot of time next to gorillas, observing the way these animals have the luck to use their olfactory sense at 100%; it is for them, an essential element of survival. Gorillas know which plants to eat but also which plants to smell to cure them.

Each plant possesses precise characteristics and is associated not only to an organ, but also to an emotion. By inhaling, the individual can restore in the same time his mental (the emotion) and his physical (the organ) state. This is an important advantage, when we know, that every illness and every alteration of our organs is due to the shattered condition of our nervous system that is provoked by our own emotions.
In «perfumotherapy», two reactions to smells are stated: first psychological; it acts onto the brain and the mood and second physiological; it acts onto the body and the organs.
The physiological aspect is divided into two effects, one has a direct impact onto the nervous system, and the other has an indirect effect onto the cells and the organs.
Certain plants contain more than 10.000 different molecules. There is a whole market to develop, a whole research to put in place.
If a product is perfect from his composition, as a rose, where all molecules are joining effort to make a perfect product, if you replace this by a synthetic cheap rose, you will have much lesser molecules but also you are not certain of the result, inhalation could bring to your body. When you breathe, you give a direct access to molecules to your body. Therefore we definitely need some more research, some more test and be aware of the benefit and the dangers of olfaction.
But it is a real future for this industry.
We already know the power and particularity of each plant. Traditional medicine, botanical studies have registered these criteria
Some people on the planet still know and can transmit their knowledge.
To understand the benefits of olfaction, it is important to understand the dangers of olfaction.

Implicit odour processing.
A way to preserve Parkinson's disease patients from Bradykinesia

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Introduction: A wide range of literature reports that idiopathic Parkinson's disease (IPD) patients show substantial olfactory dysfunctions preceding the motor symptoms. Nonetheless, it has not been clarified whether this population show an impaired implicit processing of olfactory stimuli

Objectives: To investigate whether the presence of an odour, which cannot be consciously perceived by IPD patients, modulates their ability to perform a reach-to-grasp movement towards an object.

Methodology: A bend-sensing technology set in a glove (CyberGlove®) was used to measure the hand kinematics of 12 IPD patients. Two control groups were considered: 12 vascular PD (VPD), in which normal smell abilities are typically reported and 12 neurologically healthy participants. By means of a computer-controlled olfactometer, either a 'size' congruent (e.g., strawberry or apple, respectively) or incongruent (e.g., apple or strawberry, respectively) odour was delivered. Then, participants reached towards and grasped either a small (e.g., almond) or a large (e.g., orange) target.

Results: Facilitation effects were evident for all groups when considering movement time. A preceding delivery of a congruent rather an incongruent odour shortened the duration of the reach-to-grasp movement. Facilitation effects emerged also for both the IPD and the VPD groups when considering maximum grip amplitude. When no odour was delivered, grip amplitude was smaller than following the presentation of a congruent odour.

Conclusions: The present results suggest that in IPD patients an influence in motor control and a decreased level of bradykinesia can be promoted by implicit odour processing. Such evidence might be considered when developing future rehabilitation strategies in PD.

Measuring Emotions among Perfume Consumers by EMG technique

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The purpose of this study was to review electromyography (EMG) Technique for measuring emotions in perfume consumers where they have been shown to play an important role in decision-making on preference.

There are three approaches in the measurement of emotions in consumer research: Self-report, autonomic measures and brain imaging. Self-report is the most commonly used technique to measure emotions. Autonomic measures rely on bodily reactions that are partially beyond the individual's control. Autonomic measures include facial expressions, electrodermal reactions, cardio vascular responses and eye-tracking. Facial expression among autonomic measures is the technique commonly used and can be measured by either Facial Action Coding System (FACS) or EMG Technique .

EMG in measuring changes in facial emotional expressions is a precise, sensitive and objective technique. Electromyography (EMG) measures minute changes in the electrical activity of muscles which reflects minute muscle movements. EMG technique have been applied to certain facial muscles. And facial muscle activity has been shown to be capable of measuring facial muscle activity to weakly evocative emotional stimuli even when there is no visual facial changes.

Facial EMG measures give an objective and quantitative aspect to future oriented emotional studies in consumer research. The subject and interest of this review is the applications of EMG techniques in perfume consumer research due to the number of reports on this technique to odor stimulus is very limited.

In this review, the studies on measuring facial emotional changes to fine fragrances by EMG technique is updated; besides advantages and disadvantages of this technique is discussed.

Umami Trends & Olfaction: Opportunities & Perspectives of the 5th Sense for the Flavor Industries

Umami as a combination of the fifth taste and a consonant odor: What makes umami pleasant?

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The cortical processing of umami, the fifth taste, reveals what makes it pleasant and appetitive. The pleasantness of umami reflects and is correlated with processing in the secondary taste cortex in the orbitofrontal cortex and tertiary taste cortex in the anterior cingulate cortex, whereas processing in the primary (insular) taste cortex reflects physical properties such as intensity.

However, glutamate (an umami taste stimulus) presented alone as a taste stimulus is not highly pleasant, and does not act synergistically with other tastes (sweet, salt, bitter and sour). When glutamate is given in combination with a consonant, savory odor (vegetable), the resulting flavor, formed by a convergence of the taste and olfactory pathways in the orbitofrontal cortex, can be much more pleasant. This pleasantness is reflected in much greater activation of the medial orbitofrontal cortex and pregenual cingulate cortex than the sum of the activations by the taste and olfactory components presented separately. Further, activations in these brain regions were correlated with the pleasantness and fullness of the flavor, and with the consonance of the taste and olfactory components.

The concept is therefore proposed that umami can be thought of as a rich and delicious flavor that is produced by a combination of glutamate taste and a consonant savory odor. Glutamate is thus a flavor enhancer because of the way that it can combine supra-linearly with consonant odors in cortical areas where the taste and olfactory pathways converge far beyond the receptors.

Cognitive and attentional modulation of the orbitofrontal cortex also contribute to the pleasantness and appetitive value of umami.

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Symposium on Pheromones:

Scientific Credibility & Practical Applications in Humans

Session 1:
Last Advances on Pheromones Sciences

Olfaction, pheromones and sexual behaviour:
The role of olfaction on human sexual behaviour

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An increasing number of studies have examined the impact of odours on interpersonal attraction and mate selection among humans (reviewed in Herz, 2007; Wyatt, 2003). A number of studies have also examined how important individuals rate olfactory cues during these processes (Havlicek et al., 2008; Herz, 2002; Sergeant, Davies, Dickins, & Griffiths, 2005). However, very few studies have looked at the direct impact of human odours on actual sexual behaviour. This presentation will review the limited number of studies in this area (including McCoy & Pitino, 2002; Rako & Friebeley; 2004) highlighting the strengths and limitations of this research. Also considered are the challenges faced when researching sexual behaviour and the potential commercial applications of this research.

Session 2:
Pheromones:
Attraction & Erotism

Human Pheromones and Behavior

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Olfactory communication is very common amongst animals, and since the discovery of an accessory olfactory system in humans, possible human olfactory communication has gained considerable scientific interest. The importance of the human sense of smell has by far been underestimated in the past. Humans and other primates have been regarded as primarily 'optical animals' with highly developed powers of vision but a relatively undeveloped sense of smell. In recent years this assumption has undergone major revision. Several studies indicate that humans indeed seem to use olfactory communication and are even able to produce and perceive certain pheromones; recent studies have found that pheromones may play an important role in the behavioural and reproduction biology of humans. The presented evidence on pheromones suggest that the model of humans being only optical animals has to be revised. Human sociosexual interactions are influenced by pheromones, even if they cannot be detected consciously. Pheromones have the potential to influence human behaviour and physiology and so there has to be asked the question, in which way the modern striving for cleanliness and odourlessness affects our everyday social lives and human reproductive success in the future. The current state of knowledge, as many studies in the last few years have pointed out, is that humans, like other animals, use olfactory signals for the transmission of biologically relevant information.

Making a Pheromone-Driven Decision in Four Easy Steps

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Evolution has resulted in numerous innovations that allow organisms to increase their fitness by choosing particular mating partners, including secondary sexual characteristics, behavioural patterns, chemical attractants and corresponding sensory mechanisms. The haploid yeast *Saccharomyces cerevisiae* selects mating partners by interpreting the concentration gradient of pheromone secreted by potential mates through a network of mitogen-activated protein kinase (MAPK) signalling proteins. The mating decision in yeast is an all-or-none, or switch-like, response that allows cells to filter weak pheromone signals, thus avoiding inappropriate commitment to mating by responding only at or above critical concentrations when a mate is sufficiently close. This decision follows first, a series of graded responses in which when potential mates are far apart in space, yeast polarize cell division in the direction of the concentration gradient of pheromone emitted by a cell of the opposite mating type. When two opposite mating type cells are in sufficient proximity and therefore a critical threshold concentration of pheromone is reached, cells undergo a sudden differerentiation into a polarized pre-fusion state called a "shmoo". The molecular mechanisms that govern the switch-like mating decision are poorly understood. We have discovered that the switching mechanism arises from competition between the MAPK Fus3 and a phosphatase Ptc1 for control of the phosphorylation state of four sites on the scaffold protein Ste5[1]. This competition results in a switch-like dissociation of Fus3 from Ste5 that is necessary to generate the switch-like mating response. Thus, the decision to mate is made at an early stage in the pheromone pathway and occurs rapidly, within two minutes, perhaps to prevent the loss of the potential mate to competitors. We argue that the architecture of the Fus3–Ste5–Ptc1 circuit generates a novel ultrasensitivity mechanism, which is robust to variations in the concentrations of these proteins. This robustness helps assure that mating can occur despite stochastic or genetic variation between individuals. The role of Ste5 as a direct modulator of a cell-fate decision expands the functional repertoire of scaffold proteins beyond providing specificity and efficiency of information processing. Similar simple mechanisms of polarization and differentiation may occur in metazoan development, particularly in differentiation of cells in response to morphogens and such circuits would be predicted to be particularly vulnerable to mutation, resulting in decoupling of morphogen signals from terminal differentiation of cells into specific states as may occur in diseases such as cancers.

[1] ***Malleshaiah, M.K., Shahrezaei, V., Swain, P.S., and Michnick, S.W. (2010). The scaffold protein Ste5 directly controls a switch-like mating decision in yeast. Nature 465, 101-105.***

Odour and pheromones: attraction and eroticism

Can odours modulate human attraction?

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Interpersonal attraction is key to human relationships, and can be influenced by many different factors. Can odours affect interpersonal attraction? Scientific surveys have suggested that humans make use of odour cues in forming romantic relationships, and that women in particular have a conscious awareness of the importance of odour for partner choice and sexual arousal. In addition, there may be specific chemicals of human origin that can modulate human interpersonal attraction.

A maternal semiochemical controls fear reactions in children (18 to 36 months-old) experiencing routine examination in a pediatric hospital.

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In 1999, our team has identified the H.A.P. (Human Appeasing Pheromone), a secretion released by Montgomery glands from the areolae named and a synthetic analogue of it was prepared. This paper describes the effects of HAP in children (18 to 36 months-old), experiencing a routine physical examination in a pediatric hospital.

Material and Methods. 100 children, 18 to 36 months old, presented for routine examination, have been enrolled in the Department of Pediatric Medicine of the Hospital of La Seyne-sur-Mer (France). The parents were informed about the study and after they accepted to participate in it, their children were enrolled in the study. Treatment, HAP or placebo, was allocated at random.

The semiochemical was delivered by the mean of a tissue doll stuffed with a biopolymer (MaterBi®) containing 10% of synthetic HAP. Placebo doll were stuffed with pure MaterBi®. The doll was given 5 min before the examination.

Two principle parameters were studied: the Mean Heart Rate (MHR), calculated from 5 measurements (waiting room, beginning and end of examination by the nurse, beginning and end of examination by the pediatrician); and the mean behavioural score (MBS from 0, easy examination, to 5 examination requires someone to help in controlling the child) measured in the same time as the heart rate.

The groups were compared using Student t test for “age” and χ^2 for “sex”. Having two principle parameters, a Bonferroni correction was applicable and the alpha risk was 2.5%. Two factors variance analysis (treatment and pediatrician) was used for MHR and MBS. For MBS, we also used Scheirer Ray Hare test.

Results. The two groups were comparable regarding sex and age. In HAP group, both MHR and MBS were very significantly lower ($p<0.001$) and this difference was confirmed using Scheirer Ray Hare test. Interaction between “pediatrician” and “treatment” was not significant.

Discussion – Conclusion. As observed in veterinary medicine with homologous maternal semiochemicals, the use of synthetic analogues of maternal odorous secretions, appears to be a promising technique. Both autonomic and behaviours are affected in presence of maternal semiochemicals, controlling the severity of the clinical signs displayed by patients facing stressing situations.

Workshop & Demonstrations: Olfactive Logo & Marketing Communication

The Opinion of Communication Agency:

When and How to start?

Mrs Evelyne Lorphelin

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Acquiring an olfactive identity in the media: DO's & DON'T's

Michael Moisseeff: Head Nose

Asquali, Olfactive Culture

Communicating through the use of olfactory stimuli sounded a wee weird idea, when we started our research and actions by the end of the 80's.

And we presented a first lecture at the International Essential Oils Congress in Digne, in September of 1989.

Since then, this idea has been transformed in everyday practices, and we've seen the birth of many companies, doctorate researches, not to mention tons of media matter.

We've been involved in the creation of dozens of olfactive events every year, some went nicely, and some went nasty…

The latter, though quite rare, were hard to swallow, but helped us to progress in the mapping of these new territories.

We will try, here to share the fruit of these experiences.

Let's present some the most important points to study, in order to offer the most meaningful olfactory events to our clients.

For a quick starter, creating an efficient olfactory event means establishing:

- A truthful communication with the patron, in order to establish precisely the effect to achieve
- Which exact fragrance is to be used,
- Which technical support to use for diffusion,
- What interaction with the other communicating devices used during the action
- The impact on the budget
- …

The first thing is to establish a coherent dialog with the client and the other actors operating on the scène of action, as soon as possible.

Then, it is necessary to check the physical parameters of the place : climate, air movements, temperature changes, type of matter occurring in the environment, energy resources, security legislations, etc, in order to pick up the perfect system to be use to propagate the chosen fragrance…

In brief: we need communication, coherence, olfactory showbiz technique and strategy know-how, topography and climatology apprehension, a nice fragrance, and a heavy dose of Zen

Through this lecture, we hope to disseminate new ideas, among creators and communication professionnals, to obtain the recognition of olfactory communication as what it is: a real language to be used for story telling in this still new XXIst century…

Scent marketing: how to prove real benefits?

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Scent marketing: the issue of the investment

- ✓ How to convert a cost into an investment
- ✓ How to associate concret and proven benefits to a concept?

Air Berger's target and limits : to prove the impact of the concept

Experimental protocol defined by BVA : cautions to take

Test Methodology

- ✓ Selection of the points of sales
- ✓ Definition of the periods of survey
- ✓ Week 1
- ✓ Week 2

Analysis of the results

How scent can work for you and your customers?

NICOLAS CHABOT

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People perceive the world through all their senses simultaneously.
Our sense of sound, sight, smell and touch have a powerful effect on us

Scent is the most emotional way to communicate
Sensory stimuly can influence environments, improve the shopper experience
So the more sensory an experience, the more engaging it will be

We will see during this presentation how through Scent Marketing, businesses are breaking though the overused marketing gimmicks to reach customers emotionally while incorporating smell into the business of marketing and branding.

We will see how Scent as a communication tool can be used in

1. Scent Marketing
2. Scent Branding
3. Scent for services / hospitality

To bring another dimension and create positive appeal

Posters Presentations

The effect of congruent ambient odors and empathy on the evaluation of public goods

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Many studies and the real life experience suggest the role of the odors as adaptive signals that guide behavior. Similarly, emotions direct in a very fast way our approach and avoidance behaviors and the decision making process too. In addition, the personality has a key role in the emotional information processing. Individuals who have high empathy level could be more sensitive to the other's feelings and often are "in the other's shoes"
The aim of the study is to show the influence of the ambient odor and empathy on the evaluation of a public good. Our hypothesis is that a pleasant and congruent odor (semantically related to the public good) and high empathy level will lead to an increase of the WTC (willingness to contribute).

Two fragrances were chosen with a pilot study. Vanilla and pine essential oil were similar in the intensity, familiarity, pleasantness and unpleasantness evaluation scores (Labeled Magnitude Scale, Green et al, 1993). The pine fragrance results semantic related to the forest ecosystem, while the vanilla fragrance not.
The experiment has a between subject design with 3 conditions of ambient odor stimulation (pine fragrance, vanilla fragrance and no odor condition). The fragrance was diffused in a previously aired room and the participants (N=150, 50% female) were not aware of the presence of the ambient odor.

Our work focuses on the public goods (*e.g.* a forest ecosystem), which do not have a market price. In order to estimate their economic value was created the Contingent Evaluation.
In particular, we used this procedure to ask to the participants if they are willing to give an amount of money to save a forest ecosystem from a parasite infestation. After the decision task we assess the empathy level with the Mehrabian and Epstein Empathy Questionnaire (MEEQ, Mehrabian and Epstein, 1972).

The results show both an effect of olfactory stimulation and empathy level on the WTC in a congruency related manner. In particular, in presence of an ambient odor, more participants are willing to contribute to the public good than in a room without fragrance.
Regarding the congruence effect, the results show three significantly different level of WTC. The conditions with a pleasant odor report a significantly higher level of WTC in comparison to the control condition (no odor condition/forest ecosystem). In addition, with a pleasant and congruent stimulus (pine/forest ecosystem) the WTC is significantly higher than in the condition with a pleasant but non-congruent ambient fragrance (vanilla/forest ecosystem).
Empathic individuals expose to the congruent odor (pine) offer more frequently a contribution than non-empathic. This effect is present also in the other odor conditions (vanilla and no-odor) and show that empathic individuals are more generous in congruent odor condition than in other ones (vanilla and no-fragrance).
In conclusion, our findings support the hypothesis that personality and ambient fragrances influence an economic decision like the willingness to support public goods.

Olfaction in cognitive disorder patients associated with dementia differential threshold as a predictive tool in diagnosis

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Olfactory dysfunction appears to be one of the earliest signs of several age-related neurodegenerative disorders. To rate performance and olfactory deficits in patients with cognitive disorders, various olfactory tasks have been used such as odor detection, discrimination, recognition memory, identification and naming but no study has been focused on just noticeable difference (JND), a more sensitive tool than classical detection threshold. The aim of this study was to investigate and compare variations in JNDs in the elderly and in patients with cognitive disorders associated with dementia. The results showed that olfactory JNDs were significantly higher in a population with cognitive disorders associated with dementia - i.e a lower olfactory detection performance - than in a control population paired in age.

Left/right nostril differences in wine olfactory threshold: Comparison between experts and novices

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The study of olfactory lateralization in humans has given rise to many publications, but few studies have been focused on possible differences in relation to the experience towards specific odorants. The aim of the present study was to compare unilateral detection thresholds for three wines between expert and novice judges. Additionally, irritation and hedonic valence were also estimated monorhinally. Results showed that the novices had lower detection thresholds with the left nostril whatever the wine, compared to experts, without gender effect.