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ECRO supported **2009**

SUMMER SCHOOL on
HUMAN OLFACTION

July 19th, to Juli 25th, of 2009, in Dresden, Germany.

Aim: The conference is meant to provide an informal platform for scientific exchange between established scientists and younger researchers in the fields related to chemosensation. In addition, it is meant to provide participants with up-to-date knowledge on various aspects of the human chemical senses not only through seminars - there will be a strong focus on practical demonstrations and experiments.

Location: It will be organised through the [Smell & Taste Clinic](#) of the [Department of Otorhinolaryngology](#) of the University of Dresden Medical School, Fetscherstrasse 74, 01307 Dresden, Germany, phone +49-351-458-4189. The meeting will be held in the vicinities (the lecture hall - "Hörsaal") of the [Herzzentrum Dresden](#), Fetscherstrasse 76, 01307 Dresden, Germany, phone +49-351-450-0.

Fee for participation is 250 Euro. This fee covers breakfast, conference dinner at [Schloss Eckberg](#), a welcome buffet at [BELLAN Restaurant](#), a barbecue, and an excursion to the surroundings of Dresden. **The number of applicants will be limited to 22**

Sunday afternoon there will also be a chance to join a **guided city tour** through Dresden. It starts at 1 p.m. at the Hotel Artushof.

Also, Sunday afternoon, between 3.30 and 6.30 p.m. you have a chance to visit the University Clinic, Department of Neuroradiology, Haus 59, MRI I, to join us in order to **get functional images or structural images** of your brain/olfactory bulb.

The welcome gettogether will take place on Sunday evening (July 19th) between 7 and 12 p.m., at the Bellan Villa Germania, [Loschwitzer Str. 36, Dresden](#) (how to get there: [see also PDF for download](#))

For housing please contact [Thomas Hummel](#) for details. We would recommend to stay at the [Hotel Artushof](#) at Fetscherstrasse 30 which is closeby to the Clinic (how to get there: please [click here](#) or, for larger map, click here), and where we also receive a special rate.

Deadline for registration is the **1st of May 2009**. Please send an **informal application** including your CV plus bibliography to [Thomas Hummel](#).

http://www.tu-dresden.de/medkhno/riechen_schmecken/summerschool_05_plus.htm (see also at bottom of this page for [2003 participants](#) and [2005 participants](#))

Lecturers

Abstracts of [lectures](#) / [demonstrations](#)

Timetable

http://www.tu-dresden.de/medkhno/riechen_schmecken/talks2.pdf

[Previous participants 2003](#)

[Previous participants 2005](#)

[Previous participants 2007](#)

Contact

The following **lecturers** will participate:

[Maria Larsson](#) (Stockholm, Sweden) - [cognition, odor memory](#)

[Matthias Laska](#) (Linköping, Sweden) - [chemosensory discrimination](#)

[Steven Nordin](#) (Umea, Sweden) - [olfactory psychophysics](#)

[Bettina Pause](#) (Düsseldorf, Germany) - [pheromones](#)

[Philippe Rombaux](#) (Brussels, Belgium) – structural MR imaging

[Ariel Schoenfeld](#) (Magdeburg, Germany) – functional imaging

[Benoist Schaal](#) (Dijon, France) - [chemosensory development](#)

[Christian Margot](#) (Geneva, Switzerland) - structure-odor relations, assessment of odor thresholds

[Silvain Lacroix](#) (Geneva, Switzerland) - [neurogenic inflammation of the nasal mucosa and olfaction impairment](#)

[Nancy Rawson](#) (Philadelphia, USA) - [Human olfactory cell biology in health and disease: methods and models](#)

[Mats Olsson](#) (Upsala, Sweden) - odor mixtures

[Martin Zapotocky](#) - [Biophysics of olfactory adaptation](#)

lecturers from Dresden will include:

[Johannes Gerber](#) & Emilia Iannilli - [functional MR imaging of chemosensory induced activation](#)

[Thomas Hummel](#) - [evoked potential olfactometry, recordings from the mucosa](#)

[Antje Hähner](#) - [olfaction in Parkinsonian syndromes](#)

[Martin Witt](#) - [morphology of human olfaction](#)

In addition to the demonstrations/experiments given by/performed together with each of the lecturers, among others there will be practical demonstrations of [endoscopy of the nasal cavity](#), [rhinomanometry](#), [blood flow](#), [acoustic rhinometry](#), and clinical aspects of olfactory dysfunction (diagnosis, treatment).

Contact:

[Thomas Hummel, M.D.](#)

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Abstracts

[Maria Larsson](#), Ph.D.

Cognition, odor memory

The talk and demonstration will include theoretical and methodological aspects in the assessment of life-span changes in chemosensory functioning. One important issue concerns cross-sectional vs longitudinal assessment, advantages and disadvantages with the respective method (e.g., practice effects, costs, environmental confounders). Also, various aspects of olfactory cognitive processing will be highlighted. In particular, the relationship between various forms of odor memory and how they relate to the different memory systems will be addressed (e.g., the most simple forms of olfactory learning, conditioning as contrasted with the most complex form - episodic odor recognition). The theoretical part will be combined with a practical demonstration of behavioral assessment of episodic and semantic odor memory and how these two forms of memory are related.

[Matthias Laska](#), Ph.D.

Discrimination of odors? or: why does it smell different ?

Humans are capable of discriminating between an enormous number of odors. The question of how the olfactory system achieves this amazing ability is one of the central topics in olfactory research and is of both theoretical and practical interest. This lecture aims at giving an overview with regard to the present knowledge about

the neural basis of odor discrimination, odor structure-activity relationships, the psychophysical methods used to measure discrimination performance, and comparative data on discriminability of structurally related odorants. Experiments performed by the participants shall illustrate the advantages and disadvantages of different methods and their influence on the outcome of odor discrimination tasks.

[Bettina Pause](#), Ph.D.

Conception and evaluation of pheromone studies in humans

Several chemicals are commercially available, which are promised to show pheromonal effects in humans. However, in this seminar, it will be questioned whether human pheromones exist at all. Therefore, studies in humans will be critically evaluated in terms of methodological considerations. In detail, a brief overview on the pheromone concept will be given and possible chemical messengers will be discussed. Additionally, it will be a major topic of the seminar to choose the appropriate kind of human response for the study in question. In general, one could measure pheromone effects on a perceptual (subliminal or supraliminal) or on a behavioural (subjective, physiological or motor response) level. Hereby, recent advances in EEG methodology will be focused. The main aim of the seminar is to guide the students in designing their own pheromone study.

Mats Olsson. Ph.D.

Odor mixtures

The perception of odor mixtures offers an intriguing problem in olfactory perception. This lecture will describe the rules for mixture processing and will also offer some hands-on experience.

[Steven Nordin](#), Ph.D.

Olfactory Psychophysics

Psychophysics refers to the relation between psychological function (e.g., sensation, perception, cognition) and the physical or chemical properties of the stimulus (e.g., intensity, structure) that underlies the psychological function under study. Olfactory psychophysics is commonly applied in both clinical and research settings that involve humans. In a lecture we will discuss the psychophysical methodological domains of detection, intensity discrimination, and scaling. The lecture will be followed by a demonstration in which the participants will get hands-on experience with the assessment of olfactory detection and intensity scaling by means of the methods of constant stimuli and magnitude estimation.

[Benoist Schaal](#), Ph.D.

Chemosensory development: Assessing olfaction in preverbal humans

The study of perception has generated contrasted models of development where nativist and constructivist views oppose. Olfaction is no exception, but this talk will present data that reconcile both conflicting parties in showing that the odour environment strongly influences olfactory development from very early on, long before birth. Data will be presented on the structural development and functional

onset of olfaction, on the developmental course of olfactory sensitivity and discriminative power, and on learning and memory processes. The performance of the sense of smell will be described in the context of issues of communication and adaptation, emphasising evolved and learned perceptual predispositions. Experimental paradigms to investigate odour perception and cognition will be described in early human development with special emphasis on the numerous issues that remain to be resolved. Finally, the value of using animal models will be highlighted to test hypotheses that are raised in the human, or conversely to import new questions to the understanding of our own species.

[Nancy Rawson](#), Ph.D.

Human olfactory cell biology in health and disease: methods and models.

This lecture will cover the functional characteristics of olfactory receptor cells, methods for assessing the integrity and function of these cells *ex vivo* and *in vitro*, and discuss cellular dysfunctions that may contribute to olfactory loss in various diseases such as Parkinson's disease and chronic rhinosinusitis.

[Martin Witt](#) , M.D.

Morphology of Human Olfaction

Part 1. Histology of olfactory epithelium

You will be given a short introduction of common (immuno)histological techniques and a guide how to read a histological specimen. Subsequently you will be able to examine some slides showing mouse and human olfactory and vomeronasal epithelium.

Part 2. Gross Anatomy of the Human Nasal Cavity and the Human Brain

This is intended as an introduction into olfaction-related structures in the anatomical dissection room.

[Martin Zapotocky](#) , Ph.D.

Biophysics of olfactory adaptation

The lecture will review the known physiological mechanisms of adaptation of the olfactory response. Emphasis will be placed on the level of the olfactory epithelium and the olfactory bulb. The dynamics of adaptation in olfactory sensory neurons will be described in detail. Analogies and differences between adaptation mechanisms in olfaction and in color vision will be discussed

[Silvain Lacroix](#) , M.D., Ph.D.

Neurogenic inflammation of the nasal mucosa and olfaction impairment

The nose is an air conditioner and is involved in the protection of the lower airways against inhalation of exogenous particles and airborne irritants. The nasal mucosa is therefore densely innervated by sensory nerves containing several neuropeptides. In

the airways, activation of sensory C and Adelta fibres leads to the release of multiple neuropeptides. In addition to their involvement in vasodilatation and nasal airway obstruction, plasma protein exudation and mucus secretion, sensory neuropeptides also participate in inflammatory cell recruitment. This neurogenic inflammation contributes to the intensity of nasal blockage and subsequent olfaction disorders, rhinorrhea, and headaches, the most common symptoms in chronic rhinosinusitis. The concentration of pro-inflammatory sensory neuropeptides is increased in the nasal mucosa of patients suffering from chronic rhinosinusitis. In contrast, the activity of the enzymes involved in the degradation of these sensory neuropeptides is markedly reduced. These observations should contribute to a better understanding of the pathophysiological mechanisms of one of the most frequent chronic inflammatory diseases.

This presentation will be held in conjunction with the demonstration by [Basile Landis](#) ([see below](#))

Abstracts of additional demonstrations

Practical demonstrations of endoscopy of the nasal cavity; assessment of nasal airflow and stimulus activated changes of nasal blood flow

[Basile Landis](#), M.D.

When contemplating olfactory problems and questions, one has to bear in mind that not only cells are busy picking up olfactory cues using molecules dispersed in our environment, but that a whole organ is designed to that task besides helping with respiration: the nose.

When the problem of olfactory loss is encountered, a thorough examination of the nose is necessary. During this demonstration, the nose will receive a closer look using rigid and flexible endoscopy technique. Special attention will be paid to the appearance of the vomeronasal duct, as well as to the nasoplatine duct. Major reasons of olfactory loss due to alterations of nasal conditions will be demonstrated. Attendants will have the chance to practise endoscopy to have a look at cavity that hosts the sensory system they deal with during this Summer School. This course will also provide an introduction of the current nasal function measurement techniques. The methods presented will be: anterior rhinomanometry, acoustic rhinometry, and Laser Doppler Flowmetry. The techniques will be discussed and a practical demonstration will be given.

Evoked potential olfactometry, recordings from the mucosa

Volker Gudziol, M.D., Mandy Scheibe, M.D., Benno Schuster, M.D.

During this summerschool an introduction to olfactometry will be given. This will consist of both, a more theoretical introduction to this area of research, and a hands-on, practical approach. During the practical demonstrations it will be shown how electrodes for recordings of electro-olfactograms are prepared, flows are adjusted, temperatures measured, humidity is controlled, and odor concentrations are assessed.

Olfaction in Parkinsonian syndromes

[Antje Müller](#) , M.D.

Olfactory function is differentially impaired in distinct Parkinsonian syndromes. The clinical data presented in this talk suggest that psychophysical olfactory testing provides an important clue in the diagnosis of idiopathic Parkinson's disease (IPD). These findings seem to be of particular significance as IPD has a clinical misdiagnosis rate of approximately 20%. Preserved or mildly impaired olfactory function is more likely to be related to atypical parkinsonism such as multiple system atrophy, progressive supranuclear palsy or corticobasal degeneration. Patients with IPD exhibit a specific decrease of olfactory function which appears to take place during very early stages of the disease.

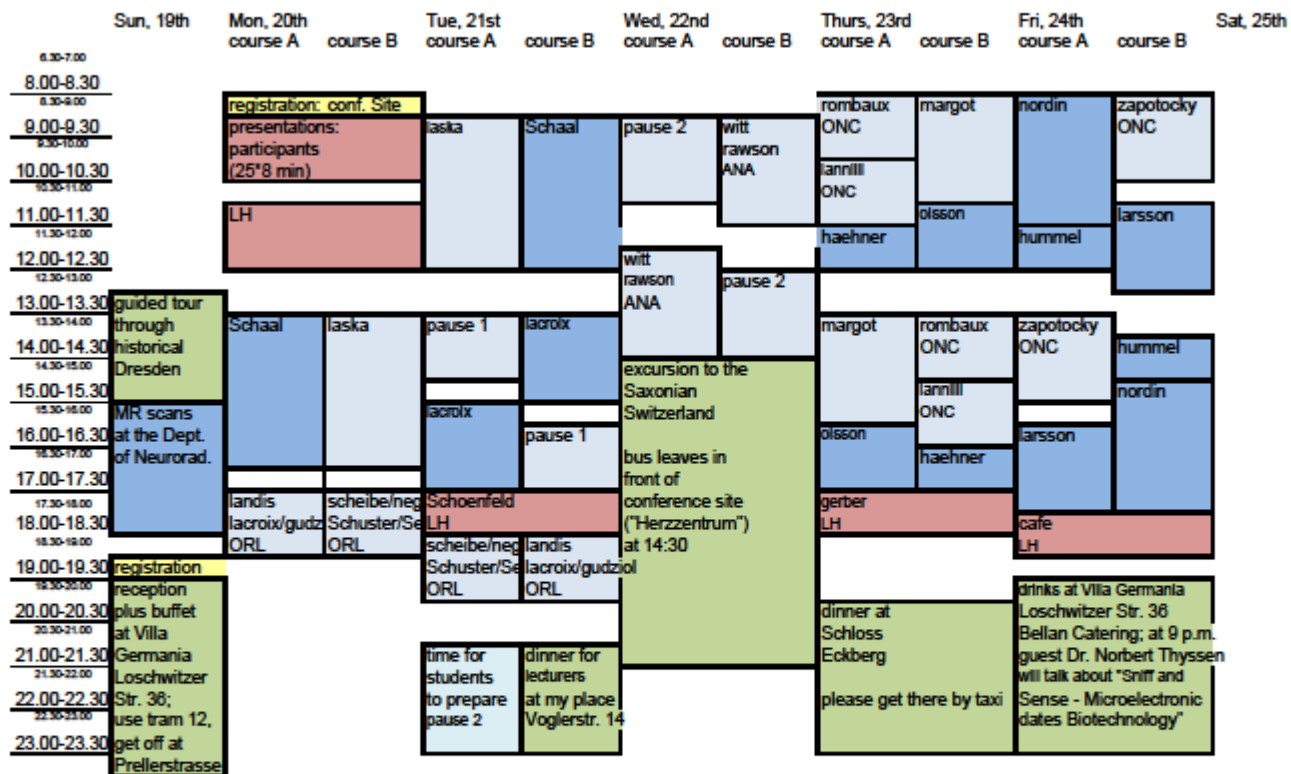
Functional MR imaging of olfactory induced activation

[Johannes Gerber](#), M.D.

Starting from known neuroanatomic correlates of olfaction, functional imaging methods will be introduced. The most widely used functional imaging method being MRI, we will concentrate on this modality. We will look at all steps of a fMRI-study, beginning with the methodological background, passing by the study-design, to finally interpret the results of the complex data analysis procedures. Besides the great advantage of good anatomical resolution, fMRI has a rather poor temporal resolution. Possible remedies for this problem will be discussed. In a second, more practical part, we will visit a MR-scanner to better understand the specific demands of this environment and to perform one or two simple fMRI-experiments.

Timetable

- [click here to download PDF](#)
- [click here to go to timetable directly](#)



ONC=ONC
LH=lecture
ORL=Dept.
ANA=Dept.
RAD=dept.

[How to get to the Hotel Artushof ?](#)

from airport and main station

- Take the train from the airport to the main station of dresden
- There you take the tram 10 in direction Fetscherplatz
- The hotel is directly situated at the crossroad.

by car and from motorway A4

- Leave at junction Dresden-Altstadt
- Turn right in direction of the center (Zentrum)
- Head straight forward until the next big crossroad
- Follow the main street by turning halfleft
- Go straight on at the next crossroad for about 500m
- Turn halfleft into the Bremer street

- Now always follow the main street and pass the congress centre and the famous Terrassenufer with the steamers
- After passing the Terrassenufer turn right at the next crossroad
- After about 500m, you turn left again at the next crossroad
- Head straightforward until you reach the Fetscherplatz
- There you find the hotel directly at the crossroad.

The following people participated in our previous Summerschool in 2003

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