




## Summerschool 2019

This Summerschool is sponsored by: 

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### **ECRO supported 2019**

#### **SUMMER SCHOOL on HUMAN OLFACTION**


July 28<sup>th</sup> to August 2<sup>nd</sup>, of 2019 in Dresden, Germany.


**Links:** [General information](#) | [Lecturers](#) | [Contact](#) | [Abstracts](#) | [Registration](#) | [Site map of the clinic](#) | [How to get to the guesthouse](#) | [Previous participants](#)

#### General information

**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 (see program).

**Location:** It will be organized 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 start at the lecture hall/vicinities ("Hörsaal") of house number 19 at the area of the University Clinic Dresden, House number 21, and later continue at the Department of Otorhinolaryngology (house number 5).



**Fee for participation is 330 Euro ( [for details please click here](#) )** . Participants with an industrial background pay 1000 Euro. This fee covers conference dinner at  [Schloss Eckberg](#) , a barbecue, and an excursion to the surroundings of Dresden. **The number of applicants will be limited to 32.**

Sunday afternoon (28<sup>th</sup> of July) there will also be a chance to join a **guided city tour** through Dresden (it is free). It starts at 1 p.m. at the  [guesthouse](#) at Gutenbergstrasse 6, 01307 Dresden, and it will end at University Clinic, Department of Neuroradiology, Haus 27, MRI I.

Also, Sunday afternoon, between 3.30 and 6.30 p.m. you have a chance to visit the University Clinic, Department of Neuroradiology, Haus 27 (DINZ), MRI, to join us in order to **get structural images** of your brain/olfactory bulb (this is also free).

**Please let [Thomas Hummel](#) know in advance whether you would like to participate in either event.**

**The meeting will start with short 5-min presentations from every participant.**

For housing please contact Mrs. Schoenborn, phone +49-351-4445-60 or  [a.schoenborn@sbgdd.de](mailto:a.schoenborn@sbgdd.de). We booked rooms for participants at a  [guesthouse](#) (Sächsische Bildungsgesellschaft für Umweltschutz und Chemieberufe Dresden mbH, Gutenbergstraße 6, 01307 Dresden) very close to the Clinic, and where we also receive a special rate of 47 Euro per night (including breakfast). It is planned that all participants will stay at this place.

**Deadline** for registration was the **1st of June 2019**.

Continuing medical education: Participation in all aspects of the meeting will get you 45 points



(Category C).


Please contact [Thomas Hummel](#) for details.

 Timetable


to come


 Lecturers


The following **lecturers** will participate (needs to be confirmed):


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


Matthias Laska (Linköping, Sweden) - chemosensory discrimination


 [Steven Nordin](#) (Umea, Sweden) - Environmental Chemosensory Hypersensitivity

 [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, PA, USA) - Olfactory cell biology in health and disease: methods and models

 [Bettina Pause](#) (Duesseldorf) - Chemosensory Communication

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

Basile Landis (Geneva, Switzerland)

Benoist Schaal ( Dijon, France ) - chemosensory development

Charlotte Sinding (Dijon, France) – odor mixtures

Antje Hähner (Dresden, Germany) - neurodegeneration

Johannes Frasnelli (Quebec, Canada) - trigeminal function

Arnaud Frounel (Lyon, France) - functional imaging of chemosensory function

Alexander Fjaeldstad (Aarhus, Denmark) - the olfactory fingerprint

✉ [Wolfgang Georgsdorf](#) (Berlin, Germany) - large-scale olfactory stimulation - the SMELLER

Asifa Majid (Nijmegen, The Netherlands) - olfactory language

lecturers from Dresden will include:

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

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

Ilona Croy – olfaction and depression

Valentin Schriever – olfaction in childhood

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](#), recordings of electro-olfactograms, recordings of event-related potentials, and clinical aspects of olfactory dysfunction (diagnosis, treatment).

## Contact

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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.

Steven Nordin , Ph.D.

#### **Environmental Chemosensory Hypersensitivity**

This lecture will cover environmental chemosensory hypersensitivity from a broad perspective. In addition to sensory, cognitive and neural aspects of olfaction and chemosomatosensation, this topic will be approached by including aspects such as affect and personality. We will discuss various forms and diagnoses of this hypersensitivity, symptomology, quality of life, assessment, prevalence and co-prevalence with other types of environmental hypersensitivities and medically unexplained syndromes, risk factors, possible underlying mechanisms, and coping-strategies and social support.

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 adaption, 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.

#### **Olfactory cell biology in health and disease: methods and models.**

This lecture will cover the molecular and functional characteristics of olfactory receptor cells, provide insight into their developmental and cellular origins, present methods for assessing their function ex vivo and in vitro, and discuss how olfactory epithelial biopsies are becoming a tool for regenerative medicine. We will also examine signaling and regulatory pathways that may be impacted by medications, diseases and genetic disorders to assist the student in understanding how these factors may contribute to olfactory dysfunction.

Bettina Pause

#### **Chemosensory Communication**

The lecture will give an overview on chemical communication in humans. Single topics will be: Why should animals communicate via chemosignals? What are the characteristics of social chemosignals? How are social chemosignals produced? How are social chemosignals perceived? Are there human pheromones? How to study human chemosensory communication? Chemical signalling in humans?

Martin Witt , M.D.

#### **Morphology of Human Olfaction**

## Part 1. Introduction into "morphology of chemosensation"

You will be given a short introduction of what is known about structure/function relationship in vertebrate olfaction and taste at both macroscopic and microscopic levels.

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

In the anatomical dissection room you will be confronted with some organs and tissues such as a real human brain and a dissected head, in which we will demonstrate the olfaction- and taste-related structures.

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 A delta 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.

Antje Hähner

### **OLFACTORY DYSFUNCTION IN NEURODEGENERATIVE DISORDERS**

Impairment of olfaction is a characteristic feature of many neurodegenerative diseases. This lecture summarizes the available information about olfactory function in distinct neurodegenerative conditions and possible therapeutic strategies. It indicates the advantageous use of olfactory testing as a contribution to early and differential diagnosis in Parkinson's disease and Alzheimer's dementia. Deficits in the sense of smell may precede clinical motor and cognitive symptoms by years and might be helpful in assessing the risk for developing these diseases in otherwise asymptomatic individuals. Numerous studies suggest that olfactory disturbances in Parkinson's disease may have diagnostic utility for the differentiation from other movement disorders.

Thomas Hummel, M.D. and Basile Landis, M.D.

### **Olfactory and gustatory disorders**

The chemical senses gustation and of olfaction are important not only for the detection of potential dangers such as fire or spoiled food, but also for the quality of life of human beings. In this article, we review the characteristics of the sense of smell and give a short overview about possible olfactory dysfunctions and their therapy.

Charlotte Sinding, Ph.D.

### **Odour and Flavour objects**

Odours result from the integration by our olfactory sense of a complex mixture of odorants. The lecture will cover the different levels of odour perception from the receptor to the "odour object" integration. Flavours result from the integration of odour objects, taste, trigeminal, visual, and auditory stimulations released during food consumption. Flavour is our mental representation of food. The final part of the lecture will present the theory about flavour perception and integration.

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## **Demonstrations on Sunday afternoon**

### **Olfactory neuroanatomy on the basis of MR scans**

TBD

### **Volumetric assessment of the olfactory bulb**

Antje Hähner, M.D.

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## **Demonstrations on Monday and Tuesday**

### **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**

TBD

During this summerschool an introduction to olfactometry and gustometry will be given. This will consist of both, a more theoretical introduction to this area of research, and a hands-on, practical approach.

### **Psychophysical techniques for the assessment of chemosensory functions**

Valentin Schriever, M.D.

Assessing olfactory and trigeminal function is a key aspect not only in a clinical context but also in olfactory research. During the course different smell-tests will be demonstrated. The focus will be on the Sniffin Sticks test battery with its subtest for evaluating olfactory threshold, odor discrimination and odor identification, which can be experienced in this hands-on course. In addition two methods for assessing intranasal trigeminal function will be demonstrated.



### **Recordings from the olfactory epithelium**

TBD

Electro-olfactogram (EOG) are local-field potentials generated in the olfactory epithelium in response to an olfactory stimulus providing neural information from the peripheral olfactory level. EOGs are commonly characterized by the response amplitude that is a negative peak denoted by N1 and by the response latency that relates to the time point of the amplitude (L1). During the practical course, it will be shown how to (i) prepare electrodes for recordings; (ii) localize the EOG recording site; (iii) administer odorous stimuli; (iv) visualize EOGs responses to odorants.

### **Biospies, nasal endoscopy**

Volker Gdziel, 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.

### **Event-related potential olfactometry and gustometry**

TBD

EEG (Electroencephalography) is an electrophysiological method to record electrical activity of the brain, with a high temporal resolution. The brain processing of chemosensory perceptions could be measured and studied by the delivery of odors or taste solutions using olfactometers or gustometers. This practical course comprises the introduction to the principles of olfactometry and gustometry, demonstration of odor/taste stimulation and recording of event-related brain waves, and the time-frequency analytical method for olfactory EEG results. Specific applications of these measurements will also be discussed.

### **Registration**

Conference fees can only be paid in advance either by credit card or by money transfer. To pay by credit card please email the following information to [Thomas Hummel](mailto:thomas.hummel@carus.de)

#### **Credit Card** payment:

Last name, first name (as written on card)

Card Type (VISA or MASTERCARD)

Credit card number

Expiration date

Conference fee

Email for possible inquiry

#### **Money transfer** - please send the money to the following account:

Within Germany:

Carl Gustav Carus Management GmbH, Fetscherstr. 74, 01307 Dresden, Germany

Important: Please indicate as purpose of the payment "SUMMERSCHOOL\_2019" plus your name

Bank: Deutsche Kreditbank AG

BLZ: 120 300 00

Account number: 11 248 333

From outside of Germany:

Receiver: Carl Gustav Carus Management GmbH, Fetscherstr. 74, 01307 Dresden, Germany

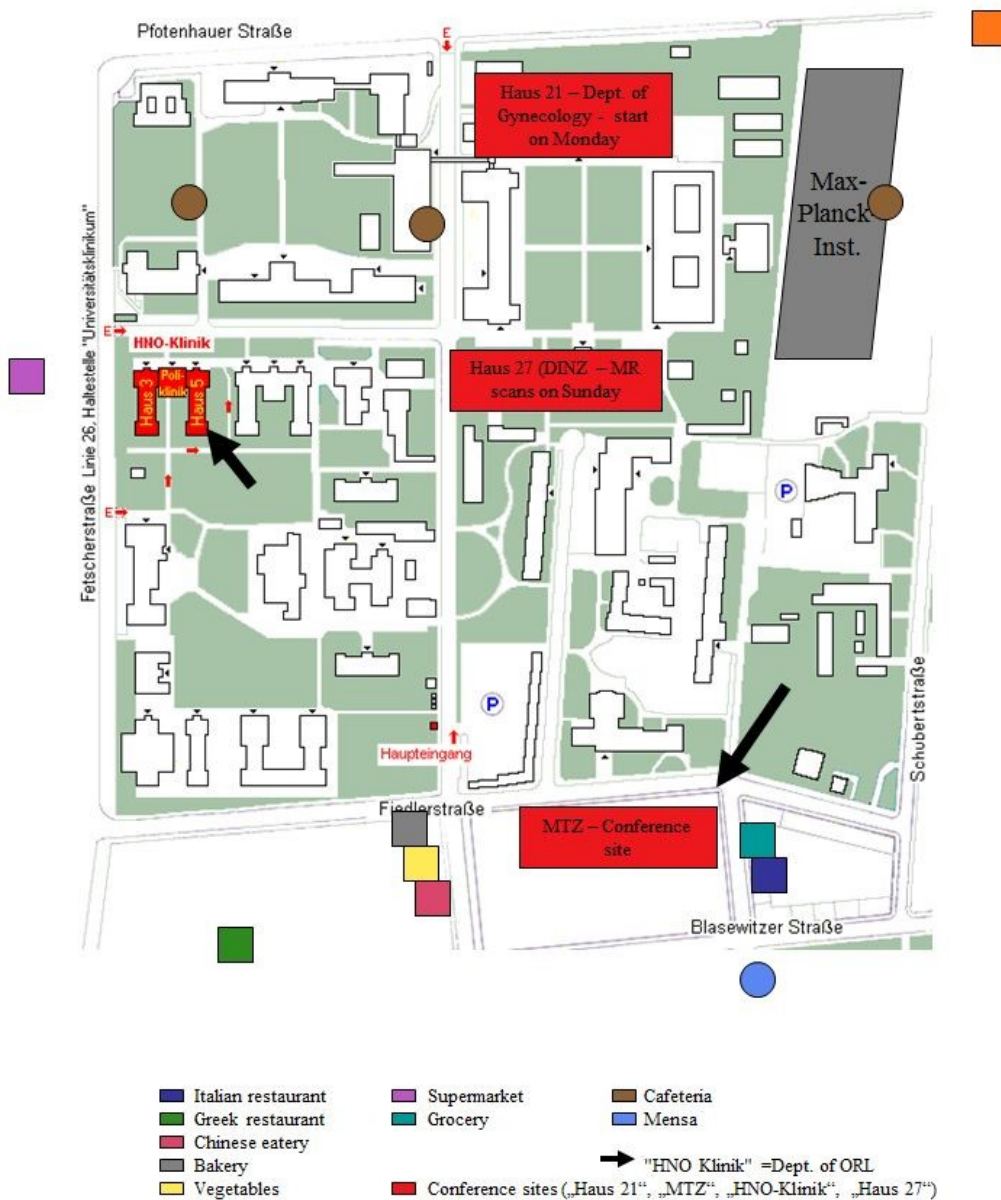
Important: Please indicate as purpose of the payment "SUMMERSCHOOL\_2017" plus your name

IBAN: DE 71 1203 0000 0011 248 333

BIC: BYLADEM 1001

### **Sitemap of the clinic area**

## Site map of the Clinic area



How to get to the guesthouse at Gutenbergstrasse 6, 01307 Dresden, Germany?

### from main station

- > Take the tram 3 until Pirnaischer Platz
- > Take the bus line 62 direction Johannstadt until stop Gutenbergstrasse
- > Taxi from the main station to the guesthouse is approximately 12 Euro

### from airport

- > Take the train from the airport to the station "Dresden Neustadt"
- > There you take the tram 6 until stop "St.- Benno- Gymnasium"
- > Take the bus line 62 direction Johannstadt until stop Gutenbergstrasse
- > Taxi from the airport to the guesthouse is approximately 18 Euro



### by car and from motorway A4

- > Leave at junction Dresden-Altstadt
- > Turn right in direction of the center (entrum)
- > Head straight forward until the next big crossroad
- > Go straight on at the next crossroad for about 500m
- > Turn half left 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 600m, you turn right again into Pfeiffenhannsstrasse
- > After about 250 m turn left again into Pfothenauerstrasse
- > After another 300 m turn left again into Gutenbergstrasse
- > Find the Sächsische Bildungsgesellschaft (the dormitory) after 150 m on the right

### Previous participants

#### The following people participated in our previous Summerschool in 2003

|           |          |                                 |             |
|-----------|----------|---------------------------------|-------------|
| Boyle     | Julie    | julie.boyle(at)mcgill.ca        | Canada      |
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**The following people participated in our previous Summerschool in 2005**

|         |           |                                  |         |
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|           |           |                               |     |

|           |                |                                      |     |
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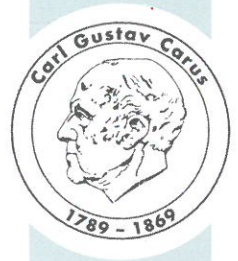
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Klinik- und Poliklinik für Hals-, Nasen- und Ohrenheilkunde des  
Universitätsklinikums Dresden

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