

# GATERSLEBEN LECTURE



**Speaker: Natalia Dudareva, PhD.**  
Director for the Center for Plant Biology,  
Distinguished Professor, Purdue University,  
West Lafayette, IN, USA



**Title: Fascinating World of Plant Volatiles:  
Beyond the traditional View**

**Time: Tuesday, December 13, 2022, 2 pm**

**Hybrid meeting:** IPK, Lecture Hall **and** VCS Zoom

<https://ipk-gatersleben->

[de.zoom.us/j/66956656557?pwd=TXIHRkJRZU9HWW81bnZ4NzNjN0w3QT09](https://ipk-gatersleben-de.zoom.us/j/66956656557?pwd=TXIHRkJRZU9HWW81bnZ4NzNjN0w3QT09)

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## **Abstract:**

Plants synthesize an amazing diversity of volatile organic compounds (VOCs) that facilitate interactions with their environment, ranging from attracting pollinators and seed dispersers to protecting themselves from pathogens, parasites, and herbivores. Plants are also targets of released compounds as a part of plant-plant communication, as well as plant-insect and plant-microbe interactions. They are constantly exposed to atmospheric VOCs and can differentiate and respond to specific cues. Therefore, VOC release out of the cell and perception of emitted volatiles are an essential part of information exchange. Given the VOC multifunctionality, significant progress has been made toward understanding the biosynthesis of plant VOCs and their regulation and, in recent years, the molecular mechanisms involved in VOC emission. However, to date little is known about how VOCs are taken up by plants and trigger cellular response(s). To be released from cells into the atmosphere, VOCs have to cross the plasma membrane, hydrophilic cell wall, and finally the waxy cuticle. It was long assumed that VOCs passively diffuse across each barrier. However, plants would need to accumulate toxic levels of VOCs in cellular membranes to drive observed emission rates. The presented results will cover different aspects of VOC biosynthesis and emission including the involvement of heterodimeric enzymes in VOC biosynthesis, the role of transporters and lipid transfer proteins in VOC trafficking across the plasma membrane and the cell wall, and the function of the cuticle as an integral member of the overall VOC biosynthetic network. This presentation will also discuss the latest knowledge about VOC perception: from an inter-organ aerial transport of VOCs via natural fumigation and hormone-like function for terpenoid compounds to a signaling pathway(s) involved.

## **Short CV:**

Natalia Dudareva is a Distinguished Professor in the Department of Biochemistry and a Director for the Center for Plant Biology at Purdue University in West Lafayette, Indiana. She received her M.S. in Biology and Biochemistry from Novosibirsk State University, Russia and her PhD training at the Institute of Biochemistry, Kiev, Ukraine and the University of Louis Pasteur, Strasbourg, France. Research in Dudareva laboratory focuses on understanding biochemical and molecular mechanisms controlling the formation of primary and secondary (phenylpropanoid and terpenoid) metabolites in plants using the power of genetic and biochemical approaches combined with metabolic flux analysis and modelling. Dr. Dudareva published more than 150 papers, 28 book chapters and 3 books, and has given more than 200 invited lectures at conferences and other universities. Recent work from her lab appears in *Nature Chemical Biology* (Weng et al., 2021; Liao et al., 2021; Lynch et al., 2020; Boachon et al., 2019); *Nature Communications* (Huang et al., 2022; Qian et al., 2019); *Nature Plants* (Henry et al., 2018), and *Science* (Adebesin et al., 2017).

**Prof. Dr. Nils Stein**  
(Organizer and Host)

**Dr. John D`Auria**  
(Chair)