

GATERSLEBEN LECTURE



Speaker: Prof. Dr. Philip N. Benfey
Department of Biology and HHMI, Duke University; Hi Fidelity Technologies, Durham/USA



Title: The dynamics of root development

Time: Tuesday, September 20, 2022, 2 pm

Hybrid meeting: IPK, Lecture Hall and VCS Zoom

<https://ipk-gatersleben-de.zoom.us/j/89671975475?pwd=dHJJul1ppQnNUTnpYZGZWNjB0NFNGQT09>

Meeting-ID: 896 7197 5475

Kenncode: 932082

Abstract:

To understand the dynamics of root cell specification, root growth and root passage through soil we have developed new experimental, analytical and monitoring methods. To identify networks functioning within different cell types and developmental stages of the root we generated an atlas based on single cell RNA sequencing of over 100,000 cells. We are particularly interested in a subnetwork that regulates a key asymmetric cell division of a stem cell and the regulatory networks that control differentiation of the stem cell's progeny. To quantify dynamic aspects of these networks, we used high resolution time-lapse imaging of living roots to quantify accumulation of the different network components. How roots explore their soil environment determines their ability to acquire nutrients and water. We identified the molecular mechanism underlying the circular movement of the root tip known as circumnutation. In work with Hi Fidelity Technologies we have developed a technology platform able to monitor root growth in soil in controlled environments and under field conditions.

Short CV:

EDUCATION/TRAINING

Postdoctoral Fellow	The Rockefeller University, N.Y., NY 1987-1990 Laboratory of Nam-Hai Chua, Plant Molecular Biology
Graduate	Harvard University, Cambridge, MA 1981 - 1986 Ph.D in Cell and Developmental Biology Advisor - Dr. Philip Leder
Undergraduate	University of Paris VI, Paris, France 1979 - 1981 DEUG (equivalent to B.Sc) in Biochemistry

PROFESSIONAL APPOINTMENTS

2017-	HHMI Investigator
2012-2017	HHMI-GBMF Investigator
2007-2013	Director, Duke Center for Systems Biology
2003-	Paul Kramer Distinguished Professor of Biology, Duke University
2002-2007	Professor and Chair, Department of Biology, Duke University
2001-2002	Professor, Department of Biology, New York University
2000-2002	Co-Director, NYU Center for Comparative Functional Genomics
1996-2001	Associate Professor, Department of Biology, New York University
1991-1996	Assistant Professor, Department of Biology, New York University
1991-1992	Assistant Professor, Lab Plant Molecular Biology, Rockefeller University

LAST PUBLICATION

Shahan R, Hsu CW, Nolan TM, Cole BJ, Taylor IW, Greenstreet L, Zhang S, Afanassiev A, Vlot AHC, Schiebinger G, **Benfey PN***, Ohler U*. A single-cell Arabidopsis root atlas reveals developmental trajectories in wild-type and cell identity mutants. Dev Cell. 2022 Feb 28;57(4):543-560.e9. doi: 10.1016/j.devcel.2022.01.008. PMID: 35134336.(*co-corresponding authors)

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