

**Speaker:** Prof. Dr. Yves van de Peer  
VIB-UGent Center for Plant Systems Biology,  
Bioinformatics and Evolutionary Genomics,  
Zwijnaarde, Belgium



**Title:** Life with more than one genome.

**Time:** Tuesday, November 14, 2023, 2 pm

**Place:** IPK Lecture Hall

VCS Zoom: [https://ipk-gatersleben-](https://ipk-gatersleben-de.zoom.us/j/61965910022?pwd=aENjUWlCQzFGbzFaYTZlV1B4K3lpUT09)

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Meeting-ID: 619 6591 0022

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Skype for Business: <https://ipk-gatersleben-de.zoom.us/skype/61965910022>

**Abstract:**

The importance of whole genome duplication (WGD), or polyploidy, for evolution, is controversial. Whereas some view WGD mainly as detrimental and an evolutionary dead end, there is growing evidence that polyploidy can also help overcome environmental change, stressful conditions, or periods of extinction. However, despite much research, the mechanistic underpinnings of why and how polyploids might be able to outcompete or outlive non-polyploids at times of environmental upheaval remain elusive, especially for autopolyploids, in which heterosis effects are limited. On the longer term, WGD might increase both mutational and environmental robustness due to redundancy and increased genetic variation, but on the short – or even immediate – term, selective advantages of WGDs are perhaps harder to explain. I will explain how, considering the structure and topologies of Gene Regulatory Networks (GRNs), duplicated GRNs – and thus duplicated genomes – show higher signal output variation than non-duplicated GRNs. This increased variation leads to niche expansion and can potentially provide polyploids with substantial advantages to survive environmental turmoil. In contrast, under stable environments, GRNs might be maladaptive to changes, a phenomenon that is exacerbated in duplicated GRNs. We believe that these results provide further insights into how genome duplication and (auto)polyploidy might help organisms to adapt quickly to novel conditions and to survive ecological uproar or even cataclysmic events.

**CV:**

Yves van de Peer (YVdP) obtained his PhD in 1996 at the University of Antwerp, Belgium. After a postdoctoral fellowship with Axel Meyer at the University of Konstanz, Germany, he was hired at Ghent University (BE) as Group Leader of VIB (Center for Plant Systems Biology) in 2000 and as an Associate Professor at Ghent University in 2001, and promoted to Full Professor in 2008. YVdP's research group is considered a genome analysis powerhouse specialized in the study of the structure and evolution of (plant) genomes. Because of their unique expertise and experience in gene prediction, genome annotation, and genome analysis, his research group has been, and still is, involved in many international genome projects. YVdP is particularly interested in the study of gene and genome duplications as well as in the evolution of novel gene functions after duplication. YVdP published more than 550 papers, many of which in high-profile journals such as Nature, Nature Genetics, Nature Plants, Nature Communications, Nature Reviews Genetics, Science, PNAS, Genome Research, and The Plant Cell. YVdP has an H-index of 135 and his work has been cited more than 91,000 times (Google Scholar). For many consecutive years, YVdP has been a Highly Cited Researcher. In 2013, YVdP received an ERC Advanced Grant entitled "DOUBLE-UP: The evolutionary significance of genome duplications for natural and artificial organism populations", and in 2018 another one entitled "DOUBLE-TROUBLE: Replaying the 'genome duplication' tape of life: the adaptive potential of polyploidy in a stressful or changing environment". YVdP has been Organizer and Chair of the bi-annual international Current Opinion Conference on Plant Genome Evolution. This meeting was held in 2011, 2013, 2015, 2017, and 2019. In 2019, YVdP also organized the triannual International Conference on Polyploidy, Ghent, Belgium. YVdP is a member of the Royal Flemish Academy of Belgium for Science and the Arts (KVAB; since 2012) and serves on the Editorial Boards of five international journals (The Plant Journal, PeerJ, Genome Biology and Evolution, Current Plant Biology, Frontiers in Genetics). YVdP is also part-time professor at the Department of Biochemistry, Genetics and Microbiology, at the University of Pretoria, South Africa, and at the College of Horticulture at Nanjing Agricultural University, China.

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