

ICAR-National Rice Research Institute (ICAR-NRRI) (An ISO9001:2015 Certified Institute) Cuttack - 753006





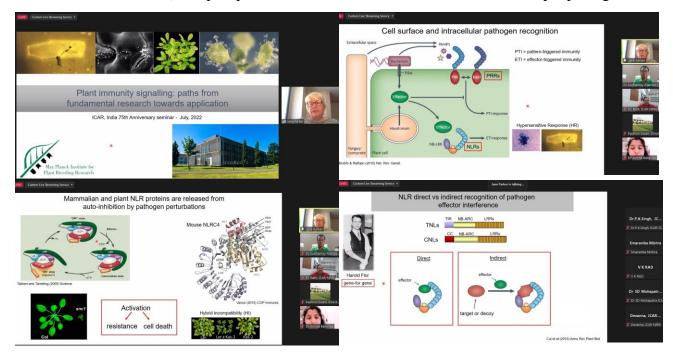
Azadi ka Amrit Mahotsav - Celebration of 75 Years of India's Independence at ICAR-National Rice Research Institute, Cuttack, India

Special Talk - "Plant immunity signaling: Paths from fundamental research towards application"

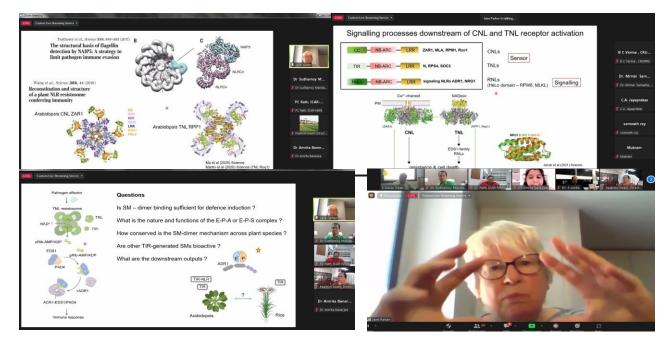
The ICAR-National Rice Research Institute, Cuttack is conducting a Special Talk series to celebrate 75 years of India's independence espoused as *Azadi ka Amrit Mahotsav* (AKAM). The tenth Special Talk in the series – **"Plant immunity signalling: Paths from fundamental research towards application"** was delivered by **Prof Jane E Parker, Research Group Leader, Max Planck Institute for Plant Breeding Research, Cologne, Germany** on 02 July 2022 at 12:30 p.m. IST (9:00 a.m. Central Euro Time) on virtual mode.

Prof Jane E Parker, a renowned German plant scientist of British origin, is a member of the Academy of Europe, EMBO, the German National Academy of Sciences 'Leopoldina' and the American Association for the Advancement of Science, and a recipient of the prestigious Alexander von Humboldt 'Sofja Kovaleskaja' award for excellence in science research (2001). She is on Science Editorial Board since 2011.

Prof Parker started off her lecture with basic concepts of cell surface and intracellular pathogen recognition, and subsequent pattern-triggered immunity (PTI) and effector-triggered immunity (ETI). She touched upon nucleotide-binding leucine-rich repeat (NLR) super-family protein receptors in animals and plants. Mammalian and plant NLR proteins are released from auto-inhibition by pathogen perturbations. She emphasized on gene-for-gene hypothesis of Harold Flor in NLR direct vs indirect recognition of pathogen effector interference. She pointed out that *Arabidopsis* TNL (Toll-like interleukin-1 receptor (TIR) domain in TIR-NLR) receptor pair RRS1 and RPS4 confers resistance to multiple pathogens.



A receptor pair with an integrated decoy converts pathogen disabling of transcription factors in immunity. She indicated presence of non-canonical domains embedded in plant NLR genes. She talked about engineering of plant NLR resistance genes. She delved into reconstitution and structure of a plant NLR resistosome (*Arabidopsis* CNL (coiled-coil (CC) domain in CC-NLRs ZAR1) conferring immunity. She mentioned her group's finding that appeared in Science (2020) - Direct pathogen-induced assembly of an NLR immune receptor complex to form a holoenzyme, along with TNL Roq1. She discussed at length how activated CNL and TNL receptors initiate signaling in different ways, and how signaling is processed downstream of CNL and TNL receptor activation. TNLs and TIRs induce immune responses via EDS1 and RNLs (helper NLRs). In *Arabidopsis*, TNLs and TIRs signal via two EDS1 - RNL signaling branches. EDS1 (enhanced disease susceptibility 1) forms exclusive heterodimers with SAG101 or PAD4. Positionally equivalent PAD4 and SAG101 residues contribute to dimer signaling specificity.



The scintillating talk by Prof Parker on "**Plant immunity signaling: Paths from fundamental research towards application**" elicited a lively discussion that drew many participants in the vortex. More than 100 participants attended the special talk in virtual mode from across the country.

The Special Talk was presided over by Dr. Padmini Swain, Director (A), ICAR-NRRI, Cuttack. Dr. P.C. Rath, Head (A), Crop Protection Division (CPtD) & Chairman, AKAM Committee at NRRI welcomed the Special Guest. Dr. Sudhamoy Mandal, Principal Scientist, CPtD & Convener, AKAM introduced Prof. Jane E Parker to the august audience. The program was beautifully moderated by Dr. Amrita Banerjee, Scientist, CRURRS, Hazaribagh. Dr Somnath Roy, Senior Scientist, CRURRS, Hazaribagh designed the elegant flyer and coordinated the virtual program. ARIS Cell of the institute hosted the virtual meeting successfully.