Entry No. IRRC-0498

Category	: International Rice Research Conference
Select Theme	: Genetic improvement
Endorsement email	:
Keyword 1	: Pre-breeding
Keyword 2	: Genome editing
Keyword 3	: Mutagenesis
Title of Entry	: Manipulating the CenH3 gene to look for a Haploid Inducer in Rice
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Select only one type of presentation	: 15 minute oral presentation
Abstract	: Induction of haploids followed by chromosome doubling leads to instant fixation of homozygosity. The doubled haploid (DH) system shortens the breeding cycle and increases the efficiency of selection. In rice, haploids have been produced primarily through anther culture but there is no established protocol for haploid production or a method that is genotype independent. An in vivo method of haploid induction has been reported in recent years by inducing substantial changes to centromere-specific histone H3 (CenH3) gene. CenH3 replaces the canonical histone H3 in a subset of nucleosomes that occupy the centromeric chromatin, which in turn determines the position of the centromere. Centromeres are essential for faithful segregation of chromosomes during cell division and form the foundation of the kinetochore complex assembly. The current study aims at generating null alleles of this gene using CRISPR/Cas9 and complementing them with synthesized mutant alleles. We have also identified homozygous and heterozygous TILLInG mutants in the Histone Fold Domain (HFD) of CenH3, which are being analyzed for their ability to act as haploid inducer. The results of the project will be updated.

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