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Mechanisms and origins of targeted DNA repair in plants

LE JEUDI 10 NOVEMBRE 2022 À 12 H 30

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Abstract:

Mutation is the ultimate source of genetic variation. Mutation rate variability has been observed within plant genomes, but mechanistic details have been unclear. We previously demonstrated that mutation occurs less often in functionally constrained regions of the genome in *Arabidopsis thaliana* and that H3K4me1, a histone modification found in the gene bodies of actively expressed and evolutionarily conserved genes in plants, predicts this mutation rate reduction. We reanalyzed de novo germline single base substitutions in rice and found the same reduction in mutations associated with H3K4me1, gene bodies, and conserved genes as in *Arabidopsis*, suggesting conserved mechanisms for mutation reduction in plants. Here, we present a model of targeted DNA repair to explain these observations; These findings inspire further research to characterize the origins of mechanisms that target DNA repair and their consequences on tuning the evolutionary trajectories of plant genomes.

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