



CRISPR/Cas technology: An imperative application for Crop Improvement

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Abstract: Plant breeding and crop research has been revolutionized with the recent advancements of genome engineering. Superior cultivars possessing desired characters can promptly be created by modifying genetic material of plant. Genetic engineering has introduced plenty of approaches to alter plant genome like introduction of exogenous DNA fragments, deletion of DNA segments, introduction of new nucleotides and epigenetic alterations. Targeted alterations are mediated through sequence specific nucleases (SSNs) like zinc-finger nucleases (ZFNs), transcription activator-like effector nucleases (TALENs) and CRISPR (Clustered regularly interspersed short palindromic repeats)-Cas (CRISPR associated proteins) techniques. CRISPR/Cas9 technique implicates simple designing and cloning methods with the same Cas9 being potentially available for use with disparate guide RNAs targeting multiple sites in the genome. Besides gene editing technologies, improved delivery systems of exogenous DNA into plant cells have raised the tempo of successful gene editing incidents. To reduce off-target cleavage (e.g., Nmcas9, Sacas9, and Stcas9) and to improving target specificity, proof-of-concept has been used in crop plants involving the primary CRISPR-Cas9 module and several modified Cas9 cassettes. To enhance specificity and efficiency of gene editing techniques several bacterial species are used as an alternative option to procure Cas9 enzymes. CRISPR/Cas9 technology not only bestows the additional options available to various researchers to elevate crop improvement but also exhibits reports where CRISPR/Cas9 has been employed for augmenting biotic and abiotic stress tolerance. Use of CRISPR/Cas9 technology result in the development of non-genetically modified crops containing desirable characters which further can contribute to raise stress productivity potential under extreme environmental conditions

Biography: Yamini Tiwari has completed her PhD in Biotechnology from Jayotividyapeeth Women's University. She is Assistant Professor, in Department of Agriculture, at Vivekananda Global University, India. She has published 5



Publications:

1. Evaluating the Mechanical Properties of Admixed Blended Cement Pastes and Estimating its Kinetics of Hydration by Different Techniques
2. Genetic Diversity Using Random Amplified Polymorphic DNA (RAPD) Analysis for *Aspergillus niger* isolates
3. Au-Ag-Cu nanoparticles alloys showed antifungal activity against the antibiotics-resistant *Candida albicans*
4. Induce mutations for Bavistin resistance in *Trichoderma harzianum* by UV-irradiation
5. Biliary Sludge. Analysis of a Clinical Case

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