

## **Genome Editing in Cereal and Brassica Crops – Progress and Prospects**

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Genome editing using RNA-guided Cas9 (CRISPR / Cas9) is changing the way we approach functional genomics and offers valuable opportunities for the development of improved crops. The production of targeted gene knock-outs using CRISPR / Cas9 is now routine in a range of crops. Examples will be described for wheat, barley and *Brassica oleracea* that demonstrate the efficiency of the technology and show how it has contributed to diverse research projects. The occurrence of 'off-target' mutations in addition to 'on-target' mutations will also be considered. Barley has proved to be an excellent model crop in which to advance genome editing technologies; being a diploid cereal with a very efficient transformation protocol. Recent work to extend the use of CRISPR / Cas9 to create 'knock-ins' or targeted insertions will also be described and prospects for the future use of this technology in crops will be considered.