

Preface

Genome editing, or genome editing with engineered nucleases (GEEN) is a type of genetic engineering in which DNA is inserted, deleted or replaced in the genome of an organism using engineered nucleases, or “molecular scissors.” These nucleases create site-specific double-strand breaks (DSBs) at desired locations in the genome. The induced double-strand breaks are repaired through nonhomologous end-joining (NHEJ) or homologous recombination (HR), resulting in targeted mutations (“edits”). There are currently four families of engineered nucleases being used: meganucleases, zinc finger nucleases (ZFNs), transcription activator-like effector-based nucleases (TALEN), and the CRISPR-Cas system. Genome editing was selected by Nature Methods as the 2011 Method of the Year. The CRISPR-Cas system was selected by Science as 2015 Breakthrough of the Year¹.

In the present book, thirty typical literatures about genome editing published on international authoritative journals were selected to introduce the worldwide newest progress, which contains reviews or original researches on genetic engineering, biotechnology, medical science, etc. We hope this book can demonstrate advances in genome editing as well as give references to the researchers, students and other related people.

¹https://en.wikipedia.org/wiki/Genome_editing. (Accessed 4/30/21, China)