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Yonglun Luo *Editor*

CRISPR Gene Editing

Methods and Protocols

 Humana Press

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Yonglun Luo



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CRISPR Magnus Lundgren,Emmanuelle Charpentier,Peter C. Fineran,2015 This volume presents a list of cutting edge protocols for the study of CRISPR Cas defense systems and their applications at the genomic genetic biochemical and structural levels OCLCbr A0 CRISPR Methods and Protocols OCLCbr A0 guides readers through techniques that have been developed specifically for the analysis of CRISPR Cas and techniques adapted from OCLCbr A0 standard protocols of DNA RNA and protein biology OCLCbr A0 Written in the highly successful OCLCbr A0 Methods in Molecular Biology OCLCbr A0 series format chapters include introductions to their respective topics lists of the necessary materials and reagents step by step readily reproducible laboratory protocols and tips on troubleshooting and avoiding known pitfalls OCLCbr A0

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Yonglun Luo,2019 This detailed volume guides readers through strategic planning and user friendly guidelines in order to select the most suitable CRISPR Cas system and target sites with high activity and specificity Methods covering CRISPR gRNA design CRISPR delivery CRISPR activity quantification indel quantification and examples of applying CRISPR gene editing in human pluripotent stem cells primary cells gene therapy and genetic screening are included Written for the highly successful Methods in Molecular Biology series chapters include introductions to their respective topics lists of the necessary materials and reagents step by step readily reproducible laboratory protocols and tips on troubleshooting and avoiding known pitfalls Authoritative and invaluable CRISPR Gene Editing Methods and Protocols will assist undergraduates graduates and researchers with detailed guidelines and methods for the vitally important CRISPR gene editing field Chapter 3 is available open access under a CC BY 4 0 license via link [springer.com](https://www.springer.com) *Plant Genome Editing with CRISPR Systems*

Yiping Qi,2019-01-04 This volume provides readers with wide ranging coverage of CRISPR systems and their applications in various plant species The chapters in this book discuss topics such as plant DNA repair and genome editing analysis of CRISPR induced mutations multiplexed CRISPR Cas9 systems CRISPR Cas12a Cpf1 editing systems and non agrobacterium based CRISPR delivery systems Written in the highly successful Methods in Molecular Biology series format chapters include introductions to their respective topics lists of the necessary materials and reagents step by step readily reproducible laboratory protocols and tips on troubleshooting and avoiding known pitfalls Comprehensive and thorough Plant Genome Editing with CRISPR Systems Methods and Protocols is a valuable resource for any researcher interested in learning about and using CRISPR systems in plants **Genome Editing in Animals** Izuho Hatada,2023-02-11 This second edition provides new and updated protocols that can be used for generation of knockout animals Chapters guide the reader through basic protocols for three genome editing technologies target design tools and specific protocols for each animal Written in the successful Methods in Molecular Biology series format chapters include introductions to their respective topics lists of the

necessary materials and reagents step by step readily reproducible protocols and notes on troubleshooting and avoiding known pitfalls Authoritative and cutting edge *Genome Editing in Animals Methods and Protocols* Second Edition aims to be a useful practical guide to researchers to help further their study in this field CRISPR Guide RNA Design Tudor A. Fulga, David J. H. F. Knapp, Quentin R. V. Ferry, 2020-11-19 This detailed volume focuses on the CRISPR associated guide RNA and how it can be designed modified and validated for a broad repertoire of purposes Beginning with a section on computational design of target specific guide RNAs the book continues by covering chemical modifications to alter guide RNA stability specificity and efficiency as well as to create inducible guide RNAs append additional functional domains and express guide RNAs in a conditional manner It concludes with methods for measuring off target guide RNA activity Written for the highly successful *Methods in Molecular Biology* series chapters include introductions to their respective topics lists of the necessary materials and reagents step by step readily reproducible protocols and tips on troubleshooting and avoiding known pitfalls Authoritative and essential *CRISPR Guide RNA Design Methods and Protocols* provides a comprehensive pipeline for guide RNA design and aims to be an invaluable resource in applying this powerful technology to basic research and therapeutic applications Plant Functional Genomics Fatemeh Maghuly, 2024-04-24 This detailed book gathers hands on techniques to characterize identify localize profile and determine genome functions in plants Volume 2 opens with metabolomic methods that uncover chemical intricacies exploring glycome mixtures cell wall components and computational metabolomics and it continues with sections on plant genome validation computational approaches and bioinformatic tools and case studies exploring the biological effects of magnetic fields and the study of cyanobacteria Written for the highly successful *Methods in Molecular Biology* series chapters include introductions to their respective topics lists of the necessary materials and reagents step by step and readily reproducible laboratory protocols and tips on troubleshooting and avoiding known pitfalls Authoritative and comprehensive *Plant Functional Genomics Methods and Protocols* serves as an ideal guide to the immense promise of functional genomics spanning from fundamental evolutionary studies to practical advancements in crop improvement Chapter 7 is available open access under a Creative Commons Attribution 4.0 International License via link.springer.com **Agrobacterium** Claudia Stange Klein, 2025-03-27 This volume details *Agrobacterium* strain methods such as plant genotype transient and stable transformation of plants for gene overexpression silencing transplastomic and editing Transformation protocols are focused mainly in plants with economic importance such as cereals and fruit trees including diploids and polyploids and in non plant species such fungi and algae Written in the highly successful *Methods in Molecular Biology* series format chapters include introductions to their respective topics lists of the necessary materials and reagents step by step readily reproducible laboratory protocols and key tips on troubleshooting and avoiding known pitfalls Authoritative and cutting edge *Agrobacterium Methods and Protocols* aims to be a useful and practical guide to new researchers and experts looking to expand their knowledge *Applications of Genome Modulation and Editing* Paul John

Verma,Huseyin Sumer,Jun Liu,2022-06-13 This volume details generation of gene edited cell lines and organisms as models for human diseases pest control and large animal welfare and production outcomes Chapters guide readers through gene regulation editing screening of cell lines genome editing and an overview of the tools for efficient genome editing including ZFNs TALENs and CRISPR Written in the format of the highly successful Methods in Molecular Biology series each chapter includes an introduction to the topic lists necessary materials and reagents includes tips on troubleshooting and known pitfalls and step by step readily reproducible protocols Authoritative and cutting edge Applications of Genome Modulation and Editing aims to be a useful and practical guide for researchers to commence or advance their study in this field

Neuroprotection Swapan K. Ray,2024-03-01 This volume contains cutting edge molecular biology methods on neuroprotective mechanisms and specific preclinical models of the CNS injury iseases and planning translation Chapters guide readers through neuropathology neuroprotection Alzheimer s disease amyotrophic lateral sclerosis ALS Huntington s disease multiple sclerosis Parkinson s disease spinal cord injury traumatic brain injury and ischemic brain injury Written in the highly successful Methods in Molecular Biology series format chapters include introductions to their respective topics lists of the necessary materials and reagents step by step readily reproducible laboratory protocols and tips on troubleshooting and avoiding known pitfalls Authoritative and cutting edge Neuroprotection Methods and Protocols aims to ensure successful results in the further study of this vital field

Transgenesis Thomas L. Saunders,2023-03-30 This detailed volume focuses on genotyping and validation in addition to information on how to produce gene edited cells and animals for research Future advances in biomedical research will benefit greatly from the use of precise gene targeting of transgenes in the genome as CRISPR technology supersedes earlier methods that relied on random transgene integration which this collection reflects Written for the highly successful Methods in Molecular Biology series chapters include introductions to their respective topics lists of the necessary materials and reagents step by step and readily reproducible laboratory protocols as well as tips for troubleshooting and avoiding known pitfalls Authoritative and practical Transgenesis Methods and Protocols serves as an ideal guide for researchers working with or working on genetically modified models

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