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Nota di contenuto	The Advent of Precision Immunology: Immunogenetics at the Center of Immune Cell Analysis in Health and Disease -- Next-Generation Sequencing-Based Clonality Detection of Immunoglobulin Gene Rearrangements in B-Cell Lymphoma -- One-Step Next Generation Sequencing of Immunoglobulin and T-Cell Receptor Gene Recombinations for MRD Marker Identification in Acute Lymphoblastic Leukemia -- Immunoglobulin/T-Cell Receptor Gene Rearrangement Analysis Using RNA-Seq -- Minimal Residual Disease Analysis by Monitoring Immunoglobulin and T-Cell Receptor Gene Rearrangements by Quantitative PCR and Droplet Digital PCR -- Quality Control for IG/TR Marker Identification and MRD Analysis -- cfDNA-Based NGS IG Analysis in Lymphoma -- Targeted Locus Amplification as Marker Screening Approach to Detect Immunoglobulin (IG) Translocations in B-Cell Non-Hodgkin Lymphomas -- Immunoglobulin/T-Cell Receptor Capture Strategy for Comprehensive Immunogenetics --

Immunoglobulin Gene Mutational Status Assessment by Next Generation Sequencing in Chronic Lymphocytic Leukemia -- NGS-Based B-Cell Receptor Repertoire Analysis in the Context of Inborn Errors of Immunity -- Generic Multiplex Digital PCR for Accurate Quantification of T-Cells in Copy Number Stable and Unstable DNA Samples -- Gene Engineering T-Cells with T-Cell Receptor for Adoptive Therapy -- Combined Analysis of Transcriptome and T-Cell Receptor Alpha Beta (TRA/TRB) Repertoire in Paucicellular Samples at the Single Cell Level -- AIRR Community Guide to Planning and Performing AIRR-Seq Experiments -- Adaptive Immune Receptor Repertoires (AIRR) Community Guide to TR and IG Gene Annotation -- Adaptive Immune Receptor Repertoires (AIRR) Community Guide to Repertoire Analysis -- Bulk gDNA Sequencing of Antibody Heavy Chain Gene Rearrangements for Detection and Analysis of B-Cell Clone Distribution: A Method by the AIRR Community -- Bulk Sequencing from mRNA with UMI for Evaluation of B-Cell Isotype and Clonal Evolution: A Method by the AIRR Community -- Single Cell Analysis and Tracking of Antigen-Specific T-Cells: Integrating Paired-Chain AIRR-Seq and Transcriptome Sequencing: A Method by the AIRR Community -- Quality Control: Chain Pairing Precision and Monitoring of Cross-Sample Contamination: A Method by the AIRR Community -- Immune Repertoire Analysis on High-Performance Computing Using VDJServer V1: A Method by the AIRR Community -- Data Sharing and Re-Use: A Method by the AIRR Community -- IMGT® Immunoinformatics Tools for Standardized V-DOMAIN Analysis -- IMGT/3Dstructure-DB: T-Cell Receptor TR Paratope and Peptide/Major Histocompatibility pMH Contact Sites and Epitope -- ARResT/Interrogate Immunoprofiling Platform: Concepts, Workflows, and Insights -- Purpose-Built Immunoinformatics for BcR IG/TR Repertoire Data Analysis.

Sommario/riassunto

This open access book explores techniques for working in the field of immunogenetics, i.e. fundamental and translational research into the adaptive immune receptor repertoire. Many chapters are dedicated to lab protocols, bioinformatics, and immunoinformatics analysis of high-resolution immunome analysis, exemplified by numerous applications. Additionally, the newest technological variations on these protocols are discussed, including non-amplicon, single-cell, and cell-free strategies. 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 practical, Immunogenetics: Methods and Protocols covers a broad spectrum of methodologies for applications in research and clinical diagnostics to illustrate the impact that immunogenetics has achieved and will further expand in all fields of medicine, from infection and (auto)immunity, to vaccination, to lymphoid malignancy and tumor immunity.