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Nota di contenuto	Advanced Genetic Analysis; Contents; Preface; Introduction; 1: Mutation; 1.1 Types of mutations; 1.1.1 Muller's classification of mutants; 1.1.2 Modern mutant terminology; 1.1.3 DNA-level terminology; 1.2 Dominance and recessivity; 1.2.1 Dominance and recessivity at the level of the cell; 1.2.2 Difficulties in applying the terms ""dominant"" and ""recessive"" to sex-linked mutants; 1.3 The genetic utility of dominant and recessive mutants; Summary; Gallery of model organisms; 1.1 Our favorite organism: Drosophila melanogaster; 1.2 Our second favorite organism: Saccharomyces cerevisiae 1.3 Our third favorite organism: Caenorhabditis elegans1.4 Our new favorite organism: zebrafish; 1.5 Phage lambda; 1.6 Phage T4; 1.7 Arabidopsis thaliana; 1.8 Mus musculus (the mouse); 2: Mutant hunts; 2.1 Why look for new mutant?; 2.1.1 Reason 1: To identify genes required for a specific biological process; Box 2.1 A screen for embryonic lethal mutations in Drosophila; Box 2.2 The balancer chromosome; 2.1.2 Reason 2: To isolate more mutations in a specific gene of interest; Box 2.3 A screen for sex-linked lethal mutations in Drosophila 2.1.3 Reason 3: To obtain mutation tools for structure-function analysis2.1.4 Reason 4: To isolate mutations in a gene so far identified only by molecular approaches; 2.2 Mutagenesis and mutational mechanisms; 2.2.1 Method 1: Ionizing radiation (usually X-rays and

gamma-rays); 2.2.2 Method 2: Chemical mutagens; 2.2.3 Method 3: Transposons as mutagens; 2.2.4 Method 4: Targeted gene disruption (a variant on transposon mutagenesis); Box 2.4 Making phenocopies by RNAi and co-suppression; 2.3 What phenotype should you screen (or select) for?; 2.4 Actually getting started
2.4.1 Your starting material2.4.2 Pilot screens; 2.4.3 Keeping too many, keeping too few; 2.4.4 How many mutants is enough?; Summary; Box 2.5 Reviews of mutant isolation schemes and techniques in various organisms; 3: The complementation test; 3.1 The essence of the complementation test; Box 3.1 A more rigorous definition of the complementation test; Box 3.2 An example of using the complementation test in yeast; 3.2 Rules for using the complementation test; Box 3.3 Transformation rescue is a variant of the complementation test
Box 3.4 One method for determining whether or not a dominant mutation is an allele of a given gene, or how to make dominants into recessives by pseudo-reversion3.3 How might the complementation test lie to you?; 3.4 Second-site non-complementation (SSNC) (non-allelic non-complementation); 3.4.1 Type I SSNC (poisonous interactions): the interaction is allele-specific at both loci; Box 3.5 Pairing-dependent complementation: transvection; Box 3.6 Synthetic lethality and genetic buffering; 3.4.2 Type 2 SSNC (sequestration): the interaction is allele-specific at one locus
3.4.3 Type 3 SSNC (combined haplo-insufficiency): the interaction is allele-independent at both loci

Sommario/riassunto

Advanced Genetic Analysis brings a state-of-the-art, exciting new approach to genetic analysis. Focusing on the underlying principles of modern genetic analysis, this book provides the 'how' and 'why' of the essential analytical tools needed. The author's vibrant, accessible style provides an easy guide to difficult genetic concepts, from mutation and gene function to gene mapping and chromosome segregation. Throughout, a balanced range of model organisms and timely examples are used to illustrate the theoretical basics. Basic principles - Focuses students attention on t