

PREFACE

The Supplemental Problems provided in this book have been designed as learning opportunities rather than exercises to be completed by rote. They were written specifically to accompany *Genetics: Analysis of Genes and Genomes*, Fifth Edition, by Daniel L. Hartl and Elizabeth W. Jones, and have been organized into chapters that parallel those of the book. All of the problems can be solved through application of the concepts and principles explicated in *Genetics*, 5/e.

The objective of this student supplement is to help the student develop skills in problem solving. Many of the problems require the understanding and application of only a single concept, such as Mendelian segregation or polypeptide translation. Other problems require application of several concepts in logical order, for example, problems that combine segregation and recombination or that consider the consequences of a mutation on the amino acid sequence of a polypeptide.

Most chapters include one or more questions that call for definitions of some of the key terms from the main text. Some chapters also include a few multiple-choice questions as practice in the genre. However, the vast majority of problems emphasize reasoning skills. Some call only for verbal proficiency, asking for a very short essay explaining how relevant concepts can be used alone or in combination to account for biological observations. Other questions are quantitative and require a precise numerical answer. Problems requiring calculation make use of only simple arithmetic or algebra and draw upon the genetically relevant laws of probability and statistics explained in the text. Students should be encouraged not only to give a numerical answer but also to think a problem through, in terms of "order of magnitude," in order to verify their approach and method of solution as well as to catch any howling mistakes caused by miscalculation.

The answers to the Chapter-End Problems from the main text as well as the answers to all Supplemental Problems included here have been worked in full and the reasoning explained in detail. You, the student, are strongly urged to try to work a problem before giving up and consulting the answer. If the method of solution is not immediately apparent, do not go to the answer immediately. Think about it for a while, consult the corresponding chapter in the text, or perhaps come back to it later. Look up the

answer only after a few tries. With this approach, you will be pleased to learn that problems that at first look very difficult are often within your capability. A willingness to be patient, to let your mind work quietly and subconsciously on a problem before looking at the answer, pays rewards of positive feedback and increased self-confidence. Even when you are unable to solve a problem after several attempts, a delay in looking at the answer will give the problem more impact, and the method of solution will be less likely to be forgotten.

The problems are graded in difficulty. Although some chapters contain a few problems that are admittedly difficult, they nevertheless do not require any concepts or principles beyond those discussed in the main text. Some problems are intended to be challenging, and even if you are unsuccessful in solving them, you will gain additional understanding of genetics when you look at the answer.

I will be glad to have any feedback from students or instructors who make use of these problems. I welcome comments and suggestions, corrections, and especially additional problems for inclusion in later renditions of this collection. I can be contacted by electronic mail at elozovsk@oeb.harvard.edu.

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