

Preface

Many beginning students find some aspects of genetics much more difficult to grasp than others. Not very surprisingly, this is especially true of the problem solving and calculations involved in Mendelian genetics, pedigree analysis, linkage and mapping, quantitative analysis, and population genetics. We have found that texts often lack the space to provide much feedback to students regarding problem sets. Even if the correct answer is given, a student who arrives at a wrong one may not know whether the incorrect answer resulted from a minor mathematical error or a more fundamental misunderstanding of the material. This primer of genetic analysis is designed to address some of these difficulties.

In order to help you build confidence in your grasp of the subject and in your ability to apply that knowledge, we start with an array of problems that test basic ideas. More complex problems then follow naturally. Most importantly, we have supplied all questions with detailed explanations of how to work them. You can therefore work at your own pace through the logical analysis. With this practice and some guidance on how to avoid common pitfalls, you will gain experience and confidence in your ability to solve problems in the major areas of genetics.

Each chapter begins with Study Hints, in which we suggest ways of organizing your approach to a topic or take you step-by-step through a problem-solving exercise. Some areas, such as linkage and mapping, are given special attention, since they are particularly well suited to practicing data analysis and interpretation. It is important to remember, however, that these Study Hints are not comprehensive. They are intended to complement the material in a general textbook. The hints and problems should also be useful in reviewing for examinations like the Medical Candidacy Aptitude Test (MCAT) or Graduate Record Examination (GRE). We strongly recommend that you attempt the problems before looking at the answers. It is one thing to agree that the answers we provide make sense, but quite another to arrive at them on your own.

In preparing this and the earlier editions, we have benefited from the helpful suggestions made by students in our courses. In addition, Fred B. Schnee, William E. Spivey, and Robert R. Tucker made many constructive recommendations during the writing of the first edition. Eric M. Weaver, Stanton B. Gray, and K. April Sholl helped us see the material again through the eyes of students for the second edition. Their suggestions led to the addition of several "overview" chapters that we have now updated. Coral McCallister Cashion, Clayton N. Hallman, D. Jeremy Madrid, and Christopher H. May also contributed significant suggestions and perspectives for this third edition.

Sadly our colleague Gerald Braver died before the third edition was completed, and it is dedicated to his memory. While we learned from him the excitement of genetics, he taught each of us a great deal more. One of his hobbies was writing limericks. Our effort does not approach his wit or creativity, but we thought it would be a fitting tribute to end with this:

There once was a teacher named Braver
Whose DNA problems did favor
Those students who caught
The ideas that they taught
On exams this was sure a life saver.