

Book review

Solving Problems in Genetics

Richard V Kowles

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Few subjects have the dual reputation among students of being both intriguing and scary. Learning genetics is one of them. Students find the subject intriguing, because it offers the ability to explore and even explain some of the most fundamental aspects of an organism's makeup and biological history. But it is also scary, because its quantitative precision and problem-solving approaches mean that one cannot simply memorize facts. One must actually understand the principles to apply them successfully. A book like Richard Kowles' guide to problem solving is an excellent way to help students bridge this divide.

One of this book's strengths is that it offers students the practice needed to gain a solid appreciation of the basic genetic principles of inheritance and genetic organization. Topics range from segregation, basic probability, and the cell cycle to gene mapping, deducing metabolic pathways, translation, population genetics, and special aspects of human genetics. These are topics that can easily be overlooked when placed beside more dramatic examples of modern genetic technology and their rapidly advancing applications in cell and molecular biology. But they are nonetheless as important as the flashy headlines.

Each chapter is introduced with a discussion of the topic and some hints to applying the principles in solving problems. This discussion is a very good review or quick reference, but it is not expected to stand on its own as the sole explanation of the subject. Worked examples are given. This is followed by a series of problems and then the answers. The worked answers are generally brief, yet sufficient to show a student where they made an error.

But sometimes, such as in the pedigree problems, additional explanation would be helpful. For example, in one pedigree problem the first question is 'What is the probable mode of inheritance?'; the text's answer, 'Y-linked (holandric)'. The second question, 'Are you positive about this conclusion?'; the text's answer, 'No'. The third question asks why they are not certain they gave the right answer the first time, and the answer in the book is 'Could also be sex-limited'. While accurate in content, this is not necessarily a sequence that would build a student's confidence in their problem-solving abilities.

The diagrams are plentiful and helpful. There is also a good index, although I was troubled that some reference material, such as the Chi square statistical table (Table 1.1), pedigree symbols (Figure 2.1), and the genetic code (Table 9.1), are placed in the text of a chapter but have no index entries of their own. That makes them inconvenient to find when doing later problem sets or class homework.

No text is going to satisfy everyone in all details, but I found this one to be quite well done and of value to students who will use it as intended. In other words, students need to try working the problems on their own, and not just go straight to the answers as less disciplined students are wont to do. As an assist to self-study, students gain practice in using their knowledge, much as they will ultimately do on examinations and in professional applications of this information. Even if they are sometimes left with questions about how to handle certain material, they will at least have a good idea of where their confusion lies. And that is where the teacher comes back into the picture.

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