

Preface

Physical studies are really only learned by doing and struggling with problems. Every professor knows this and every student fears it. Problems are hard enough in courses where the main goal is to ensure familiarity with the major tools used in the discipline. In biophysical chemistry the problems are somewhat more difficult because not only is the student struggling with formulas and concepts but the questions and problems are often nuanced, deeply nested and complex.

We wrote this small manual as a companion to the new Edition of *The Physical Basis of Biochemistry: Foundations of Molecular Biophysics*. Our intention is to provide the students who are taking the course experience with solving problems and thinking about the concepts in the course without being overwhelmed. A fair number of the problems are straightforward but these are balanced with some that are real world and challenging. We know from using problems in our own teaching that a few questions that force thinking and analysis rather than only rote “drill and kill” lists are best for teaching the topics covered in biophysical chemistry.

Not every topic in the main textbook is covered in the solutions manual and we have not made this manual exhaustive in terms of complete coverage or overwhelming numbers of questions on every chapter. Instead we have tried to be judicious in choosing topics and scenarios that support teaching and learning and that will often take time and thought to accomplish. We hope that we have struck the balance that will encourage students to do the several problems and appreciate the depth that most answers explore rather than see the manual as an exercise obligation.

We did recognize as we worked through each problem ourselves that it is sometimes easy to expect one response to a question but instead to serve only confusion to the person solving it. We have tried to capture all errors, both computational and those generating confusion. It is unlikely that we have done so and we encourage all users to inform us of errors, confusion and also to look for other materials that will support this Solutions Manual and the broader course.

Three words of advice:

- Do, do the problems. This alone will help you learn the material and use it in your research and scientific life.
- Pay attention to dimensional analysis. This is the trick to understanding and to checking your own developing expertise. If you do nothing else, do the dimensional analysis on these problems. Biophysical studies are hard because you can get lost. Dimensional analysis is the map. Use it.
- Have fun. Really. We did when we wrote and solved these problems. And stick with it. It is worth the trouble to become more expert.

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