

Hints Chapter 1

1. Histidine requires special attention.
2. It is not only the side chain that can carry a charge.
- 3–5. Re-read the relevant parts of this chapter.
6. You will find several sequences for each protein. Why, and does it matter? Look at the E value. What does this mean?
8. The main class of intracellular proteins relevant to this question is zinc finger proteins.
9. These proteins are not discussed in the text: you will need to go elsewhere to find this information.
- N1. This question requires you to use the Henderson–Hasselbalch equation. You will need to identify which are the “salt” and “acid” forms of histidine. Once you have obtained the ratio of salt to acid, you need to convert this to the fraction protonated. To do this you will need to use the additional fact that the histidine is either protonated or unprotonated; that is, [unprotonated] + [protonated] = 100%. How does it help to know the ratio between one and the other? Finally, look at your answer. Does this look reasonable? What does it mean in words?
- N2. Probabilities of two events happening together multiply. Thus the probability of *A* and *B* = [probability of *A*] × [probability of *B*].
- N3. This question requires you to use a spreadsheet program such as Excel®. In ch1N3_start.xls you will find a partly completed spreadsheet. Note that questions N3, N4, and N5 all use the same data to some extent.
- N4. See ch1N4_start.xls. You will need to look up the codons. The “amino acids with unusual or extreme behavior” are any that lie far from the line of best fit.
- N5. See ch1N5_start.xls. This question is considerably simpler than N3 and N4.