

Protein sequencing problems  
Homework for video (1)  
Solutions in video (2)

4. (a) A peptide has sequence gly-ala-lys-pro-ser-pro-arg-thr-ser. The peptide is treated with trypsin; then, the resulting peptides are separated into separate flasks; then, the contents of each flask subjected to total hydrolysis. What would be the final products of this process? (b) After using trypsin, followed by hydrolysis, how can you figure out which peptide fragment came from the end of the peptide?

5. Based on the results below, figure out as much as you can about the amino sequence of a tetrapeptide.

- a. Complete acid hydrolysis of the tetrapeptide followed by amino acid analysis yielded gly, thr, lys<sub>2</sub>.
- b. Treatment of the intact tetrapeptide with dansyl chloride yielded dansyl-lys.

6. Based on the results below, figure out as much as you can about the amino acid sequence of a tripeptide.

- a. Complete acid hydrolysis of the tripeptide followed by amino acid analysis yielded lys, val, thr.
- b. Treatment of the intact tripeptide with trypsin yielded peptides with the compositions:  
free thr, and (lys, val)

7. Based on the results below, figure out as much as you can about the amino acid sequence of a tetrapeptide.

- a. Complete acid hydrolysis of the tetrapeptide followed by amino acid analysis yielded  
leu, arg, pro, met
- b. Treatment of the intact tetrapeptide with dansyl chloride yielded dansyl-pro.
- c. Treatment of the intact tetrapeptide with trypsin yielded peptides with the compositions:  
free met, and (leu, arg, pro)

8. Based on the results below, figure out as much as you can about the amino acid sequence of a hexapeptide.

- a. Complete acid hydrolysis of the hexapeptide followed by amino acid analysis yielded  
arg, ile, tyr, lys, trp, phe
- b. Treatment of the intact hexapeptide with dansyl chloride yielded dansyl-tyr.
- c. Treatment of the intact hexapeptide with trypsin yielded peptides with the compositions:  
free ile, (lys, tyr, trp), and (arg, phe)

9. Based on the results below, figure out as much as you can about the amino acid sequence of a heptapeptide.

a. Complete acid hydrolysis of the heptapeptide followed by amino acid analysis yielded

arg, ile, tyr, pro, lys, trp, phe

b. Treatment of the intact heptapeptide with dansyl chloride yielded dansyl-ile.

c. Treatment of the intact heptapeptide with trypsin yielded peptides with the compositions:

(tyr, arg, trp), (lys, ile), (phe, pro)

10. Chymotrypsin cleaves after tyr, phe, and trp.

A peptide has sequence gly-phe-lys-pro-trp-tyr-arg-thr-ser.

The peptide is treated with chymotrypsin; then, the resulting peptides are separated into separate flasks; then, the contents of each flask subjected to total hydrolysis.

(a) What would be the final products of this process?

(b) After using chymotrypsin, followed by hydrolysis, how can you figure out which peptide fragment came from the end of the peptide?

11. Based on the results below, figure out as much as you can about the amino acid sequence of an octapeptide.

a. Complete acid hydrolysis of the octapeptide followed by amino acid analysis yielded

pro, ile, lys<sub>2</sub>, val, trp<sub>2</sub>, ser

b. Treatment of the intact octapeptide with dansyl chloride yielded dansyl-val.

c. Treatment of the intact octapeptide with trypsin yielded peptides with the compositions:

(lys, pro), (ile, trp), and (val, trp, ser, lys)

d. Treatment of the intact octapeptide with chymotrypsin yielded peptides with the compositions:

free ile, (val, ser, trp), and (lys<sub>2</sub>, pro, trp)