**Data Analysis Problem**

by Marianna Pap and József Szeberényi

to accompany

*The Cell: A Molecular Approach,* Eighth Edition

Geoffrey M. Cooper

**8.1 *In vivo* Labeling of Nucleic Acids**

This Data Analysis Problem is also found on pages 282–283 of the textbook.

**Source:** Davidson, J. N. 1965. *The Biochemistry of the Nucleic Acids. Methnen & Co. Ltd., London,* Fifth edition, *Fig. 8.5*.

**Level of difficulty:** Low

**Corresponding chapter(s) in the textbook:** Chapter 8 (and 2, 7, and 17)

**Review the following terms before working on the problem:** radioisotopes, radioactive labeling, cell fractionation, isolation of DNA and RNA

**Experiment**

Rabbits were injected with [32P]phosphate intraperitoneally and sacrificed after 2, 5, 8, 12, 18, 24, 48, or 168 hours of radioisotope administration. DNA, nuclear RNA (nRNA), and cytoplasmic RNA (cRNA) were prepared from the kidneys, and their specific activities (radioactivity/mg of nucleic acid) were determined.

**Figure**

****

**Questions**

1. What processes were studied in this experiment?

2. What can you conclude about the division of kidney cells during the time of labeling?

3. What conclusions can be drawn from the nuclear (nRNA) and cytoplasmic RNA (cRNA) curves?

4. Why didn’t the specific activities of nRNAs and cRNAs decrease significantly after 2 days of labeling?