**Data Analysis Problem**

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to accompany

*The Cell: A Molecular Approach,* Eighth Edition

Geoffrey M. Cooper

**13.2 Staining of Mitochondria with a Fluorescent Dye**

This Data Analysis Problem is also found on page 450 of the textbook.

**Source:** Johnson, L. V., M. L. Walsh, L. B. Chen. 1980. Localization of mitochondria in living cells with rhodamine 123. *Proc. Natl. Acad. Sci. USA* 77: 990–994.

**Level of difficulty:** Medium

**Corresponding chapter(s) in the textbook:** Chapter 13 (and 20)

**Review the following terms before working on the problem:** fibroblasts, Rous sarcoma virus, *src* gene, mitochondria, fluorescent dye, fluorescence microscope

**Experiment**

Rat fibroblasts were infected with a Rous sarcoma virus (RSV) strain carrying a temperature-sensitive mutation in the *src* gene. Cells were stained with a mitochondrion-specific fluorescent dye (rhodamine 123) at a nonpermissive temperature (39°C, which renders the *src* gene product inactive; A) and 30 minutes after shifting to a permissive temperature (34°C, at which the *src* gene product is active; B). The cells were imaged with a fluorescence microscope.

**Figure**



**Questions**

1. How does the RSV *srv* gene product affect the behavior or mitochondria?

2. How could you confirm that rhodamine 123 stains mitochondria specifically?