**Data Analysis Problem**

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to accompany

*The Cell: A Molecular Approach,* Eighth Edition

Geoffrey M. Cooper

**4.4 The Fate of a Gene in Fruit Fly Ovary during Egg Development**

This Data Analysis Problem does not appear in the textbook.

**Source:** Spradling A. C., A. P. Mahowald. 1980. [Amplification of genes for chorion proteins during oogenesis in Drosophila melanogaster.](http://www.ncbi.nlm.nih.gov/pubmed/6767241) *Proc Natl Acad Sci USA* 77: 1096–1100.

# Corresponding chapter(s) in the textbook: Chapter 4 and 6

# Review the following terms before working on the problem: *Drosophila*, Southern blotting, cDNA, probe, radioactive labeling, autoradiography

# Experiment

Developing eggs of *Drosophila* are coated by a protein produced by ovarian follicle cells. The figure shows the results of Southern blot analysis, in which radioactive cDNA synthesized from the mRNA of this protein was used as a probe. Cellular DNA samples were prepared from the “egg shells” of larvae at different stages of development (designated S1–14 in the figure) and subjected to Southern blot analysis. DNA isolated from adult males was used as a control (♂). The samples used in the experiments contained equal amounts of DNA.

**Figure**

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*Autoradiograph of fruit fly samples analysed*

*by Southern blotting (kb, kilobase).*

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**Questions**

1. What conclusions can be drawn from comparing the 7.4 kb band in samples 1 and 2?

2. What conclusions can be drawn from comparing the 7.4 kb band in samples 2 and 5?

3. What phenomenon is demonstrated by this experiment?