**Data Analysis Problem**

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to accompany

*The Cell: A Molecular Approach,* Eighth Edition

Geoffrey M. Cooper

**15.1 The Effect of Antidiuretic Hormone on the Localization of Aquaporin in Kidney Cells**

This Data Analysis Problem is also found on pages 535–536 of the textbook.

**Source:** Katsura, T., J.-M. Verbavatz, J. Farinas, T. Ma, D. A. Ausiello, A. S. Verkman, D. Brown. 1995. Constitutive and regulated membrane expression of aquaporin 1 and aquaporin 2 water channels in stably transfected LLC-PK1 epithelial cells. *Proc. Natl. Acad. Sci. USA* 92: 7212–7216.

**Level of difficulty:** Medium

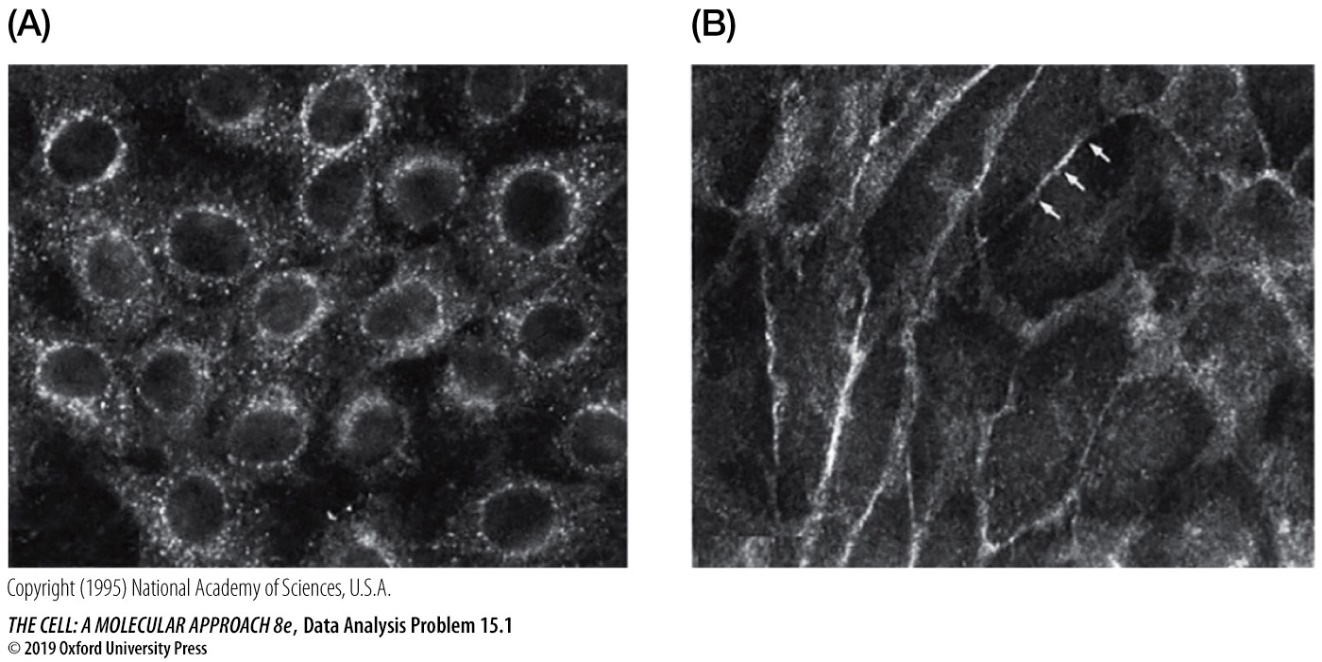
**Corresponding chapter(s) in the textbook:** Chapter 15 (and 17)

**Review the following terms before working on the problem:** epithelial cells, transfection, expression vector, cDNA, aquaporins, c-Myc protein, cell culture, antidiuretic hormone, adenylate cyclase, immunofluorescent staining, fluorescence microscopy

**Experiment**

Kidney cells were transfected with an expression plasmid containing a cDNA coding for aquaporin fused to a short peptide called a Myc tag. Stable transfectants were isolated, and cell cultures of the transfectants were either left untreated (A) or treated with antidiuretic hormone (ADH; B) for 10 minutes. Immunofluorescent staining was performed using an antibody specific for the Myc tag. The samples were analyzed in a fluorescence microscope.

**Figure**



**Questions**

1. What was the purpose of Myc tag?

2. Describe the cellular distribution of aquaporin in untreated cells.

3. How did ADH affect the localization of aquaporin in kidney cells?