**Data Analysis Problem**

by Marianna Pap and József Szeberényi

to accompany

*The Cell: A Molecular Approach,* Eighth Edition

Geoffrey M. Cooper

**1.5 Electron Microscopic Analysis of a Subcellular Fraction**

This Data Analysis Problem does not appear in the textbook.

**Source:** Wolstenholme, D.R., N. J. Gross. 1968. The form and size of mitochondrial DNA of the red bean, *Phaseolus vulgaris*. *Proc. Natl. Acad. Sci. USA* 61: 245–252.

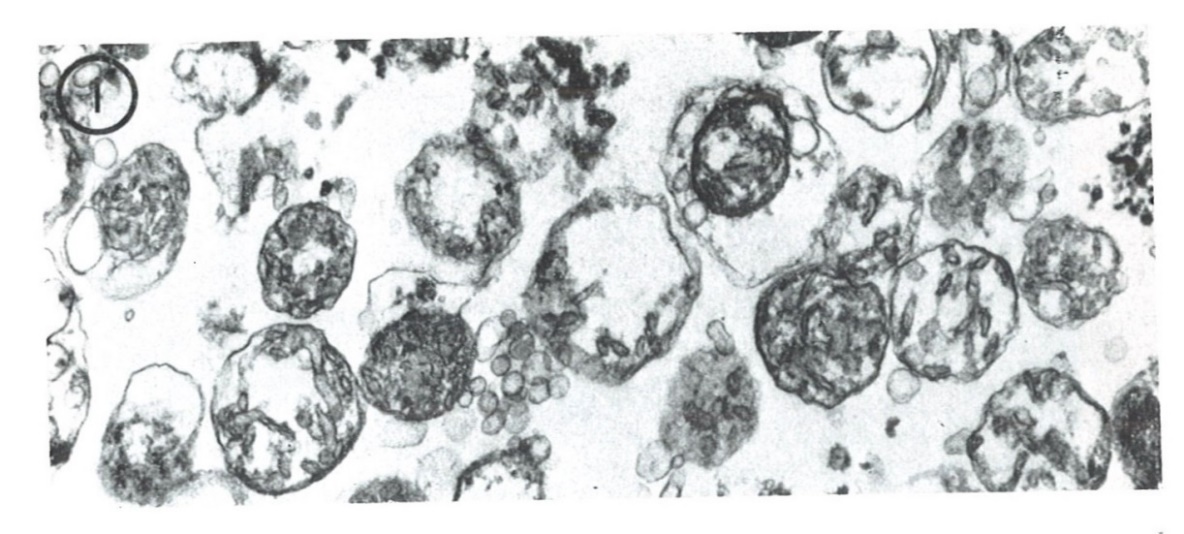
**Corresponding chapter(s) in the textbook:** Chapter 1 (and 12)

**Review the following terms before working on the problem:** differential centrifugation, homogenization, transmission electron microscopy

**Experiment**

The electron micrograph shows a section prepared from a cellular fraction obtained by differential centrifugation from plant cells. Homogenates of the cells were first centrifuged at 480 × *g* for 10 minutes, the pellet was discarded and the supernatant was centrifuged at 100,000 × *g* for 10 minutes. The pellet was processed for transmission electron microscopy (magnification: 27,000×).

**Figure**



Source: Wolstenholme, D.R., N. J. Gross. 1968. The form and size of mitochondrial DNA of the red bean, *Phaseolus vulgaris*. *Proc. Natl. Acad. Sci. USA* 61: 245–252.

**Questions**

1. What organelles are shown in the electron micrograph?

2. What is the diameter of the organelle in the middle of the micrograph?

3. What technique could be used to detect contamination by other organelles in the sample?