



# Moving From the '-OMICS' to Systems Biology

The term genome, coined in the 1920s, is now accepted as the term describing the entire complement of genes in an organism. Similarly, proteome, first used in the mid-1990s, describes the concept of the full complement of proteins contained in a cell, tissue, organ, or organism. Proteomics studies the properties of the proteome.

Other "-omes" include the metabolome, the full complement of metabolites (metabolomics and metabonomics refer to nearly complete sets of metabolites in cells and organisms, respectively).

By interacting with each other, proteins, also called macromolecules, form complex networks organized into systems with properties that extend beyond the function of each individual molecule. Systems biology attempts to predict the behavior of such molecular networks.

Sources: U.S. Department of Energy, *Nature Reviews: Genetics*, Photo Researchers Inc.

This diagram illustrates complex biological relationships and is not comprehensive.

## DNA

### Trillions of cells

#### Each cell:

- 46 human chromosomes
- 2 meters of DNA
- 3 billion DNA subunits (the bases: A, T, C, G)
- Approximately 30,000 genes code for proteins that perform most life functions

## The Molecule of Life

