

## BIOLOGY IN ENGLISH

# Proteins are the most versatile of life molecules

**P**roteins are of primary importance to the structure and function of cells. As much as 50% of the dry weight of cell consists of proteins. Presently, over 100,000 proteins have been identified. Here are some of their many functions in animals:

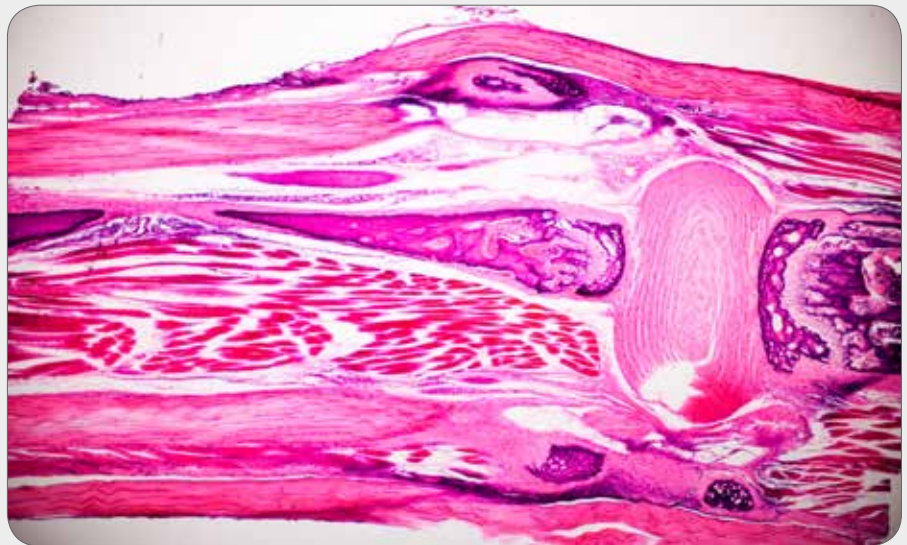
- **Support.** Some proteins are structural proteins. Examples include the silk protein in spider webs; *keratin*, the protein that makes up hair and fingernails; and *collagen*, the protein that lends support to skin, ligaments, and tendons (**figure 1**).
- **Metabolism.** Some proteins are *enzymes*. They bring reactants together and thereby speed chemical reactions in cells. They are specific for one particular type of reaction and can function at body temperature.
- **Transport.** Channel and carrier proteins in the plasma membrane allow substances to enter and exit cells. Other proteins transport molecules in the blood of animals, for example, *hemoglobin* is a complex protein that transports oxygen.
- **Defense.** Proteins called *antibodies* combine with disease-causing agents to prevent them from destroying cells and upsetting homeostasis, the relative constancy of the internal environment.
- **Regulation.** Some hormones are regulatory proteins. They serve as intercellular messengers that influence the metabolism of cells. For example, the hormone *insulin* regulates the content of glucose in the blood and in cells, while *growth hormone* determines the height of an individual.

- **Motion.** The contractile proteins *actin* and *myosin* allow parts of cells to move and cause muscles to contract. Muscle contraction enables animals to move from place to place.

Proteins are such a major part of living organisms that tissues and cells of the body can sometimes be characterized by the proteins they contain or produce. For example, red blood cells are filled with hemoglobin, that transports oxygen.

### ANSWER

In general do you expect a vegetal organism to have different enzymes from an animal?



**Figure 1** Tendon and bone cross section under optical microscope.