



The Living
BODY

FILMS FOR THE
HUMANITIES &
SCIENCES®



Messengers

Summary

This program looks at how hormones work and illustrates their varied effects on the body. The camera follows the activities of firefighters and the changes in their bodies produced by hormones, as they move from the calm of the firehouse to the tension and danger of battling a fire.



Hormones control many of the most important activities in the body. These chemical messengers are carried in the blood circulation to every cell in the body. Hormones are produced and stored in glands and released when needed. The pituitary gland is the source of many different hormones, some of them needed to control the secretions of the other glands. The other main hormone-producing glands are the thyroid, adrenals, pancreas, ovaries, and testes. Hormones help control the metabolic rate, the timing and rate of digestion, growth, and the maintenance tasks in the body; they coordinate the activities of organs and systems whenever one event needs to produce a number of different effects inside the body.

The adrenal glands are located on top of each kidney, and are really two glands, one wrapped around the other. The core of the gland produces adrenaline, which aids the body with the immediate needs for hard, sustained physical activity, or the “fight or flight” reaction. The outer covering produces cortisol which helps the body cope with some of the longer-term consequences of the fight for survival.

When hormones are released into the bloodstream, they travel toward their target cells where they make contact and influence the cell in various ways. Adrenaline molecules fit into a receptor on the outside membrane of their target cell and trigger chemical activity inside the cell. Cortisol molecules actually enter their target cells where they combine with other molecules and find the nucleus. Hormones are broken down by the body and eliminated a short time after being secreted.

Objectives

1. To explain the critical role played by hormones in coordinating and regulating many of the body's activities.
2. To illustrate the hormone-producing glands and to discuss the effects of several of their secretions.
3. To show how molecules of hormones produce effects in their target cells.
4. To show how the adrenal glands are triggered to secrete adrenaline and cortisol, and the particular effects each hormone has on its target cell.
5. To explain the breakdown and elimination of hormones in the bloodstream.

Recall Questions

1. In what sense can it be said that hormones are responsible for the "seasons" of human life?
2. Name the main hormone-producing glands in the body and give their locations.
3. How is breastfeeding dependent on the release of hormones?
4. Describe the two, very different states created in the body by an underactive and an overactive thyroid.
5. How are the adrenal glands actually two glands combined within one?
6. Trace the effects of adrenaline and cortisol on their many different target cells throughout the body.

Interpretive Questions

1. Recall a recent incident when you felt the effects of adrenaline. What event triggered the response, and what exactly did you feel?
2. Why do you think it is important that hormones be broken down and eliminated within a short time of secretion?

Vocabulary Required for Effective Viewing

- adrenal glands
- adrenaline
- cells
- cortisol
- hormones
- hypothalamus
- insulin
- metabolism
- molecules
- ovaries
- pancreas
- pituitary
- testes
- thyroid



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