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The current tendency of physiological thought is clearly toward an increasing emphasis upon the unity of operation of the Human Body.

Ernest G. Martin, preface to The Human Body, 10th edition, 1917

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LO 1.1.1 Define physiology.

LO 1.1.2 List the levels of organization from atoms to the biosphere.

LO 1.1.3 Name the 10 physiological organ systems of the body and give their functions.

1.2 Function and Mechanism 40

LO 1.2.1 Distinguish between mechanistic explanations and teleological explanations.

1.3 Themes in Physiology 41

LO 1.3.1 List and give examples of the four major themes in physiology.

1.4 Homeostasis 45

LO 1.4.1 Define homeostasis. What happens when homeostasis fails?

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LO 1.4.3 Explain the law of mass balance and how it applies to the body's load of a substance.

LO 1.4.4 Define mass flow using mathematical units and explain how it relates to mass balance.

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1.5 Control Systems and Homeostasis 49

LO 1.5.1 List the three components of a control system and give an example.

LO 1.5.2 Explain the relationship between a regulated variable and its setpoint.

LO 1.5.3 Compare local control, long-distance control, and reflex control.

LO 1.5.4 Explain the relationship between a response loop and a feedback loop.

LO 1.5.5 Compare negative feedback, positive feedback, and feedforward control. Give an example of each.

LO 1.5.6 Explain what happens to setpoints in biological rhythms and give some examples.

1.6 The Science of Physiology 54

LO 1.6.1 Explain and give examples of the following components of scientific research: independent and dependent variables, experimental control, data, replication, variability.

LO 1.6.2 Compare and contrast the following types of experimental study designs: blind study, double-blind study, crossover study, prospective and retrospective studies, cross-sectional study, longitudinal study, meta-analysis.

LO 1.6.3 Define placebo and nocebo effects and explain how they may influence the outcome of experimental studies.