

# Pioneers of Exercise Science: Milestones and Innovations

Exercise Science · Practice Test · 18 Questions

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**1. Who is widely credited with performing the first systematic study of muscle physiology in the late 18th century, laying groundwork for understanding muscle contraction?**

- A) August Krogh
- B) Archibald Vivian Hill
- C) Hermann von Helmholtz
- D) Luigi Galvani

**2. What groundbreaking invention in the early 20th century allowed for the non-invasive measurement of oxygen consumption during exercise, revolutionizing exercise physiology research?**

- A) The treadmill ergometer
- B) The electromyograph (EMG)
- C) The Douglas bag apparatus
- D) The spirometer

**3. Which scientist is often referred to as the 'father of exercise physiology' for his extensive research on metabolism and the physiological responses to physical exertion in the early 20th century?**

- A) Walter Cannon
- B) August Krogh
- C) A.V. Hill
- D) Carl von Voit

**4. The development of the concept of 'VO<sub>2</sub> max' as a measure of cardiorespiratory fitness is largely attributed to the work of which Nobel laureate?**

- A) Olof Hetland
- B) Per-Olof Åstrand
- C) Lars-Eric Saltin
- D) J.R. Pappenheimer

**5. What physiological discovery in the mid-19th century by Carl Ludwig demonstrated that muscles utilize oxygen for energy production, challenging previous theories?**

- A) The sliding filament theory
- B) The concept of anaerobic glycolysis
- C) The role of ATP in muscle contraction
- D) The discovery of lactic acid as a metabolic byproduct

**6. The first standardized method for testing muscular strength and endurance, developed in the early 20th century, was significantly influenced by the work of:**

- A) Frederick Taylor
- B) Hans Selye
- C) Charles D. Mayhew
- D) Thomas Cureton

**7. Who is recognized for the groundbreaking discovery of the 'all-or-none law' of nerve impulses in the late 19th century, which has implications for understanding neuromuscular activation?**

- A) Santiago Ramón y Cajal
- B) Edgar Douglas Adrian
- C) Ivan Pavlov
- D) Sherrington

**8. The invention of the first reliable cycle ergometer for laboratory use is often attributed to:**

- A) James H. McArdle
- B) John B. Peterson
- C) Ernst Jakob Mathys
- D) P.O. Åstrand

**9. Which early 20th-century physiologist's meticulous studies on the energetic efficiency of muscle work, including the discovery of the 'efficiency of muscle,' earned him a Nobel Prize?**

- A) Archibald Vivian Hill
- B) August Krogh
- C) Otto Loewi
- D) Walter B. Cannon

**10. The significant discovery that muscle fatigue is not solely due to lactic acid accumulation, but also involves central fatigue mechanisms, was a major advancement in the mid-20th century research led by:**

- A) Robert F. Fitts
- B) Elsworth R. Buskirk
- C) George Brooks
- D) David Costill

**11. What revolutionary technique, developed in the late 1960s, allowed for the direct visualization and study of muscle fiber types and their metabolic characteristics?**

- A) Magnetic Resonance Imaging (MRI)
- B) Positron Emission Tomography (PET)
- C) Histochemistry and Electron Microscopy
- D) Computerized Tomography (CT)

**12. The foundational work on the hormonal regulation of metabolism during exercise, including the role of insulin and glucagon, was significantly advanced by research in the early to mid-20th century by figures like:**

- A) Frederick Sanger
- B) Emil Fischer
- C) Banting and Best
- D) Hans Krebs

**13. The concept of 'training adaptation' and its physiological basis began to be systematically studied with the advent of which type of measurement in the early 20th century?**

- A) Blood lactate threshold
- B) Ventilatory threshold
- C) Maximal oxygen uptake (VO<sub>2</sub> max)
- D) Heart rate variability

**14. Who is credited with developing the first detailed biomechanical models of human locomotion in the early 20th century, influencing the study of gait and movement efficiency?**

- A) Étienne-Jules Marey
- B) John J. Zatsiorsky
- C) J.J. van Ingen Schenau
- D) Berton D. Thomas

**15. The discovery of the 'sliding filament theory' of muscle contraction, a pivotal moment in understanding how muscles shorten, was proposed by which pair of researchers in the 1950s?**

- A) Huxley and Hanson
- B) Hodgkin and Huxley
- C) Katz and Liley
- D) Bernstein and Manin

**16. The establishment of dedicated exercise physiology laboratories, often associated with universities, began to proliferate in the mid-20th century, with significant contributions from institutions like:**

- A) Harvard Fatigue Laboratory
- B) Kaiser Wilhelm Institute
- C) Max Planck Institute
- D) CERN

**17. Which scientist in the early 20th century laid crucial groundwork for understanding the nervous control of movement by studying reflex actions and reciprocal innervation?**

- A) Charles Sherrington
- B) Edgar Adrian
- C) Ivan Pavlov
- D) Santiago Ramón y Cajal

**18. The measurement of power output during cycling became a standard practice with the widespread adoption of which device, first developed for scientific purposes in the early 20th century?**

- A) Wattbike
- B) Monark cycle ergometer
- C) Peloton bike
- D) Stryd power meter