

capitolo 17 La regolazione dell'ambiente interno e la riproduzione

verifica la comprensione

Leggi il brano e rispondi alle domande.



Maintenance of homeostasis

For an organism to function normally and effectively, it is necessary that the biochemical processes of its tissues operate smoothly and conjointly in a stable setting. The endocrine system provides an essential mechanism called homeostasis that integrates body activities and at the same time ensures that the composition of the body fluids bathing the constituent cells remains constant.

Scientists have postulated that the concentrations of the various salts present in the fluids of the body closely resemble the concentrations of salts in the primordial seas, which nourished the simple organisms from which increasingly complex species have evolved. Any change in the salt composition of fluids that surround cells, such as the extracellular fluid and the fluid portion of the circulating blood (the serum), necessitates large compensating changes in the salt concentrations within cells. As a result, the constancy of these salts (electrolytes) inside and outside of cells is closely guarded. Even small changes in the serum concentrations of these electrolytes (sodium, potassium, chloride, calcium, magnesium, and phosphate) elicit prompt responses

from the endocrine system in order to restore normal concentrations. These responses are initiated through negative feedback regulatory mechanisms.

Not only is the concentration of each individual electrolyte maintained through homeostasis, but the total concentration of all of the electrolytes per unit of fluid (osmolality) is maintained as well. If this were not the case, an increase in extracellular osmolality (an increase in the concentrations of electrolytes outside of cells) would result in the movement of intracellular fluid across the cell membrane into the extracellular fluid. Because the kidneys would excrete much of the fluid from the expanded extracellular volume, dehydration would occur. Conversely, decreased serum osmolality (a decrease in the concentrations of electrolytes outside of cells) would lead to a buildup of fluid within the cells.

(www.britannica.com)

- What is homeostasis?
- What have scientists postulated about concentrations of the various salts present in body fluids?
- How is the total concentration level of salts (electrolytes) maintained unchanged?

