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Four Hormones Essential to Life

1. Insulin
2. Parathyroid Hormone (PTH)
3. Glucocorticosteroids (Cortisol)
4. Mineralcorticosteroids **(Aldosterone)**

1. **Insulin** is the only hormone that in its totality is **anabolic** in its actions. That is to say, purely growth, healing and repair occurs by way of glycogenesis, lipogenesis, and protein synthesis. While there are some hormones that provide catabolic and some that do a mixture, this is exclusively anabolic and animals can't live without it. The hormone that has the exact reverse action and is totally catabolic in nature is glucagon. It exclusively promotes glycogenolysis, lipolysis, protein catabolism, and gluconeogenesis.

Very Relevant to this: How Glucose Levels are regulated in the Blood Stream. Insulin and glucagon are important in shifting metabolic pathways between absorptive and post absorptive states, which maintains the appropriate plasma levels of nutrient molecules.

2. **Parathyroid Hormone (PTH)** from the parathyroid glands regulates calcium level and it's needed for muscle contraction and blood clotting. It's critical to maintaining plasma concentration of Ca+2. PTH is essential for life because of calcium's effect on neuromuscular capability. In the absence of PTH, death rapidly occurs from asphyxiation caused by pronounced spasms of the respiratory muscles.

Parathyroid Hormone activates osteoclasts which break down bone tissue and release the minerals, resulting in a transfer of calcium from bone to the blood. This is known as bone resorption.

Calcitonin (thyrocalcitonin) is the reverse of PTH. Calcitonin activates osteoblasts to form bone tissue by transferring calcium from the bloodstream to the bone tissue. This is known as ossification (or osteogenesis, synonymous with bone tissue formation).

3. **Cortisol**, the primary glucocorticosteroid secreted by your adrenal cortex, increases catabolism of proteins and thus, the plasma concentrations of glucose, fatty acids, and amino acids above normal.

4. **Aldosterone: is the life saving hormone**, it is the primary mineralcorticosteroid secreted by adrenal cortex, is absolutely essential to life. **Without it, animals will die within a week**. It's essential for Na+ and K+ balance. Because of sodium's osmotic effect, sodium balance is critical to maintaining the proper ECF volume and arterial blood pressure. This action is essential for life. Without aldosterone's sodium and water-conserving effect, so much plasma volume would be lost in the urine that death would quickly occur. Maintaining potassium ion balance is also essential for homeostasis because changes in ECF K+ profoundly impact neuromuscular excitability, most importantly of the heart.

The absolutely unbelievable, fantastic, incredible, homeostatic reflex involved with this is called the renin angiotensin system or renin-angiotensin-aldosterone reflex (or RAA pathway) which we'll dive into next.