

muscle physiology lecture 22

neuroendocrine system

hypothalamic-pituitary-whatever axes - HP-adrenal: corticotropin releasing hormone, adrenocorticotrophic hormone; HP-thyroid: thyrotropin releasing hormone, thyroid stimulating hormone; HP-gonadal: gonadotropin releasing hormone, luteinizing hormone and follicle stimulating hormone; HP-liver: growth hormone releasing hormone or somatostatin, growth hormone. hormone classes - amine hormone: amino acids with modified groups; peptide hormone: short chains of linked amino acids; protein hormone: long chains of linked amino acids; steroid hormones: derived from the lipid cholesterol - interact directly with the regulatory elements of DNA. polypeptide hormones - target receptors that are integrated into cell membranes which initiates a signal transduction pathway. all cases, cell's behavior changes. peptide - made in cells from amino acids, water soluble (can't diffuse across sarcolemma), usually act through second messenger on cell surface, fast initiation, temporary action. steroid - made from cholesterol, fat soluble (can diffuse across sarcolemma), adrenal cortex, testes, ovaries, nuclear or cytosolic receptors, slow initiation, long action, different types based on the receptors they bind to. most hormones come from glands, get shuttled around in circulation, and exert some physiological effect on a distant bunch of cells, like a tissue or an organ. signals from a hormone only affects the cells that express a specific receptor, one that is specific to that exact hormone. otherwise, they would affect any cell in the body.

different types of secretion or transportation

autocrine secretion: cell releases a hormone by itself for itself and the hormone never exits the tissue that produced it. example - IGF-1

paracrine secretion: hormone gets released, acts with adjacent cells, and does not need to enter circulation to get there. example - fibroblast growth factor

binding proteins - carry hormones through circulation, prolonging the (otherwise brief) half-life of the hormone. major role in endocrine function