Q24 Compare and contrast peptide and steroid hormones. Give four examples of each (Sept 2012)

Hormone - a chemical substance produced by a specialized organ or gland, which enters the bloodstream and regulates the actions of other cells or organs.

	Peptide hormone	Steroid hormone
Examples	Anterior pituitary hormones (LH, FSH, ACTH, TSH, GH), parathyroid hormone, insulin	Cortisol, aldosterone, oestrogen, progesterone, testosterone
Structure	Range from small peptides (3-200 amino acids). Generally referred to as peptides if <100 amino acids, and proteins if >100.	Highly lipid soluble; consist of three cyclohexal ring and one cyclopental ring in a single structure
Synthesis	Via transcription and specific messenger RNA in the rough endoplasmic reticulum	Synthesised from pregnenolone, a steroid precursor (this is the rate limiting step)
Precursor	Synthesised as larger proteins (prehormones) then cleaved in the endoplasmic reticulum to form prohormones, and then cleaved in storage vesicles to form active fragments (hormones)	Cholesterol
Storage	In secretory vesicles	Minimal storage of the hormone itself, however large stores of cholesterol esters in the cytoplasm can be rapidly mobilized in response to a stimulus. Steroid hormones bound to plasma proteins also act as a reservoir.
Transport	Transported dissolved in plasma and then diffuse into interstitial tissues at the target site	Circulate bound to plasma proteins
Kinetics	Mainly act on specific cell membrane receptors and then via second messenger systems (cAMP, G proteins, PIP system, calmodulin, tyrosine kinase) to induce a cellular response	Readily enter cells to act on receptors in the cell cytoplasm or nucleus, initiating transcription of specific genes to promote ribosomal translation and protein synthesis.