Manipal Alumni Science and Health Journal 2022; 7(1): 11

A Synopsis on the Kinds and Functions of Human Hormones

Ashraful Kabir[1]

Corresponding Author Email id: ashraful.mission@gmail.com

Key words: Classification, Functions, Hormones, Amine, Peptide, Steroid, Eicosanoid, Deficiency, Organ systems

ABSTRACT

Based on the classification of human hormones, there is no solid idea in most books. In this view, this article could exemplify a concrete solution, especially for medical and university students. Hormones have many life-saving roles in the human body. With the deficiency of hormones, our body might fall into lots of severe problems. Data analyses of much information from books, articles, as well as online supplements provided different ideas on the total hormones. The result suggested that some hormones were secreted from the same glands. Out of 110 hormones (when the same hormone produced from different sources), different types of hormones were 88. Analyzed hormones consisted of four major groups-amine (4 hormones), eicosanoid (4), steroid (15), and peptide (65) out of 88 endocrine chemicals. The endocrine and reproductive system (56) jointly secreted most of the hormones, and secondly gastrointestinal tract (26 hormones). Besides the organ system or glands, some were secreted from the cell, tissue, tissue system, and placenta. This paper also mentioned that many sex hormones were found both in males and females. In future, it is needed to enhance more research on the classification of the hormones in human body.

MOTIVATION

Secretin, gastrin, and cholecystokinin were the first gastrointestinal hormones [1, 2, 3] and also the first structurally identified and are the largest endocrine organ in the body. Knowledge about the physiology and anatomy of the gut endocrine system is most helpful for the clinician to understand the pathophysiology of certain diseases (excess hormone production from gut endocrine tumours) [4]. Neuronal sensitivity may be involved in common gastrointestinal diseases like irritable bowel syndrome [5]. The latest research will relate to gut peptides associated with deficiency diseases as potential growth factors in malignancies [6]. The posterior pituitary gland is not a true gland [7], but a collection of

[1] Department of Biology, Cantonment Public College, Saidpur Cantonment-5311, Nilphamari, Bangladesh.

axons extending from the hypothalamus supraoptic and paraventricular nuclei terminating behind the anterior pituitary gland [8, 9]. The phylogenetic story of the gastrin family reveals that gastrointestinal hormones indeed are very old, and has evolved from a single ancestor [10]. Secretin was believed to exist only as a carboxyamidated peptide of 27 amino acid residues for many years [11, 12]. The gut or digestive system is the largest hormone-producing organ in the body (number of endocrine cells and number of hormones) [13, 14]. A study of the 1960s showed that gastrointestinal hormones could be peptides of 20-30 amino acid residues [10]. Hair follicles and sebaceous glands are the targets for androgens secreted by the gonads and adrenal cortex [15, 16] and melanocytes are directly influenced by polypeptide hormones of the pituitary gland [17]. Glucocorticoid receptor expressed in basal keratinocytes, Langerhans cells, and dermal fibroblasts [18, 19]; androgen receptor [16, 20, 21, 22], and progesterone receptor is expressed in basal epidermal keratinocytes only [23]; thyroid hormone receptor [24, 25], and estrogen receptor [22, 26, 27, 28, 29]. It has been recognized that estrogens are important in the maintenance of human skin [26] because the skin is also a source of corticosteroids [30]. Circulatory testosterone is a co-produced chemical in the skin and other peripheral organs [31]. There is no doubt that human skin is the largest peripheral endocrine organ [32]. More than 30 peptide hormone genes express more than 100 bioactive peptides, and monoamines and eicosanoids hormonal messenger [33]. Hormonal differences between males and females, their body muscles differ [34].

HYPOTHESES

The total number of hormones depends on the chemical composition, same hormones from the different organs/glands, as well as organ systems of the human body.

METHODS

In the higher secondary course of Bangladesh, there are some ideas on human hormones in the Zoology textbook, but those are not adequate. A Biology teacher undergoes lack of clarification about the hormones for the students. A Textbook of Medical Physiology [34], most of the hormones were elaborated with proper classification and functions. On the internet, a list of human hormones exhibited eighty plus hormones. Research articles and books were helpful for the qualitative analyses of chemicals and quantitative method was applicable for ensuring the maximum number of such hormones (Appendix 1).

RESULTS

Out of 88 hormones, 65 were in the peptide group, steroid 15 and others (amine and eicosanoid) 4 each (Table 1; Figure 1). Androstenedione is a steroid hormone available in the kidney, testis, and ovary. Dehydroepiandrosterone was second in their position secreted from the same organs (Table 2). Since the 'endocrine system' and 'reproductive system' are different in the human body but based on secreted hormones, these two systems secrete hormones jointly. Total 56 types of hormones were secreted from here that were the highest. From the digestive system 26 hormones (Table 3; Figure 2) were secreted that covered many biological activities through supplying the nutrients within the cell.

Table 1. Chemical composition of the hormones with their numbers

Chemical composition	Name of hormones	Number
Peptide	Brain natriuretic peptide, endothelin, thrombopoietin, adiponectin, lepsin, galanin, cortistatin, orexin, pituitary adenylate cyclase-activating peptide, prolactin-releasing hormone, vasoactive intestinal peptide, somatostatin, thyrotropin-releasing hormone, gastrin, ghrelin, oxyntomodulin, cholecystokinin, enterocrinin, gastric inhibitory polypeptide, glucagon-like peptide I, enteroglucagon, secretin, motilin, guanylin, angiotensinogen, angiotensin I, hepcidin, insulin-like growth factor I, lipasin, amylin, pancreatic polypeptide, glucagon, insulin, incretin, somatotropin, thyroid stimulating hormone, adrenocorticotropic hormone, follicle stimulating hormone, prolactin, luteinizing hormone, lipotropic, endorphin, melanocyte stimulating hormone, oxytocin, vasopressin, melatonin, triiodothyronine, calcitonin, parathormone, atrial natriuretic peptide (ANP), thymosin, thymulin, thymopoietin, thymic humoral factor, enkephalin, erythropoietin, uroguanylin, renin, anti-mullerian hormone, inhibin, relaxin, human placental lactogen, human chorionic gonadotropin hormone, angiotensinogen II, osteocalcin	65
Steroid	calcidiol, calcitriol, dehydroepiandrosterone, dihydrocholecalciferol, androstenedione, cortisol, aldosterone, testosterone, dihydrotestosterone, estrogen, estradiol, gonadocorticoid, estrone, estriol, progesterone	15
Amine	dopamine, thyroxine, adrenaline, nonadranaline	4
Eisosanoid	thromboxane, leukotrienes, prostaglandin, prostacyclin	4

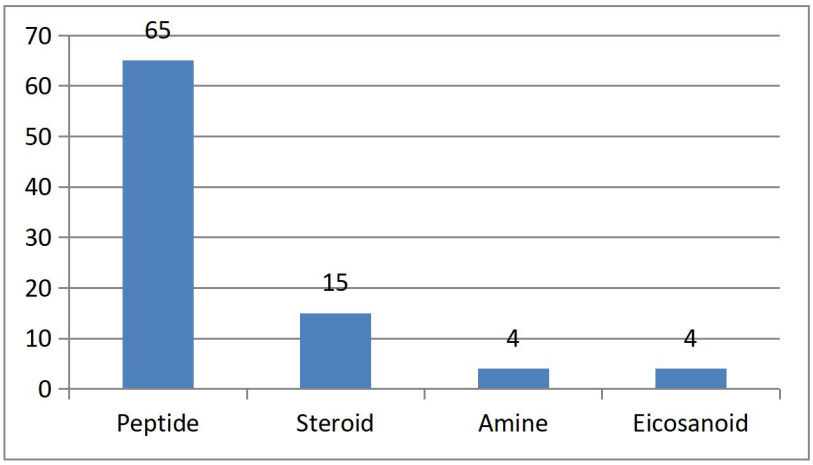

Figure 1. Number of hormones corresponding with their chemical composition

Table 2. Same hormones from the different portions

Hormones	Glands/Organs	Found in places
Androstenedione	kidney, adrenal cortex, adrenal medulla, testis, ovary	5
Dehydroepiandrosterone	testis, ovary, kidney	3
Estradiol	testis, ovary	2
Estriol	ovary, placenta	2
Estrogen	testis, ovary, placenta	3
Gastrin	stomach, pancreas	2
Gonadocorticoid	testis, ovary	2
Inhibin	testis, ovary, fetus	3
Progesterone	ovary, placenta	2
Ralaxin	decidual cell, prostate gland	2

Somatostatin	hypothalamus, pancreas	2
Thrombopoietin	striated muscle, liver, kidney	3
Vasoactive intestinal peptide	hypothalamus, from duodenum to rectum (gut), pancreas	3

Table 3. Organ system-wise secreted hormones

Organ system/Others	Secreted hormones
Integumentary system	1
Circulatory system	4
Muscular system	2
Nervous system	9
Digestive system	26
Endocrine system + Reproductive system	56
Respiratory system	1
Skeletal system	1
Others (nucleated cells, adipocytes, decidual cells, placenta, fetus)	10

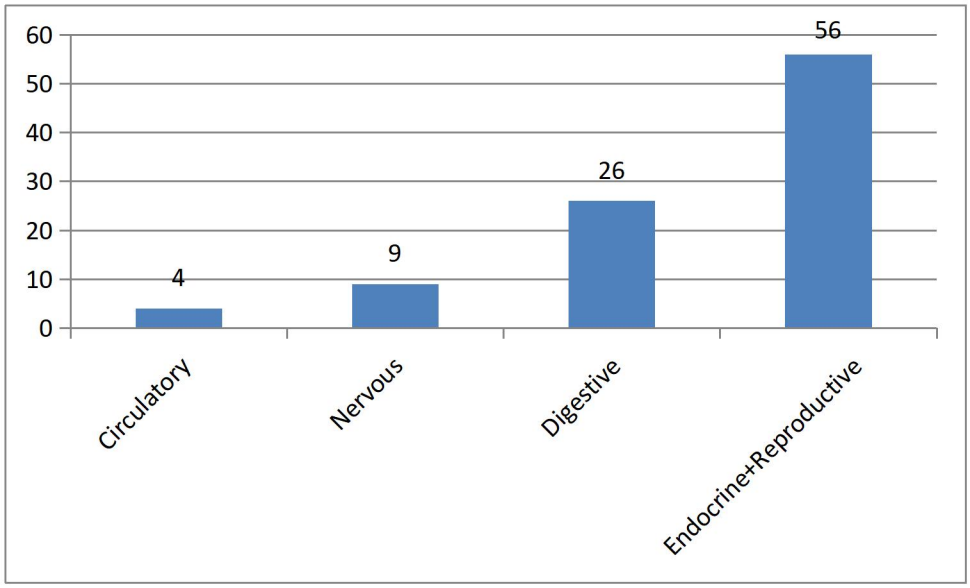

Figure 2. Number of hormones depending on the organ systems

CONCLUSION

Our body is composed of many chemicals, and all have a remarkable impact on the body. Identified 88 hormones are not an easy task to know their all functions shortly. Studied hormones have unbelievable acts in our 12 organ systems. Moreover, all nucleated cells, tissue, and tissue system play a significant role as a whole. Hormonal deficiencies have a very negative role in our life. Through the proper classification of these hormones make us more curious to discover their unseen functions. In the future, it needs to enhance more research on the division of hormones in the human body.

REFERENCES

1. Bayliss, W. M. & Starling, E. H. 1902. The mechanism of pancreatic secretion. Journal of Physiology London 28: 325-353.
2. Edkins, J. S. 1905. On the chemical mechanism of gastric secretion. Proceedings of the Royal Society B: Biological Sciences 76: 376.
3. Ivy, A. C. & Oldberg, E. 1928. A hormone mechanism for gall bladder contraction and evacuation. American Journal of Physiology 86: 599-613.
4. Rindi, G., Capella, C., Solcia, E. 1999. Pathobiology and classification of digestive endocrine tumours. In: Mignon, M. Colombel, J. F. (eds): Recent advances in the pathophysiology of inflammatory bowel disease and digestive endocrine tumours. Montrouge: John Libbey Eurotext 177-191.
5. Furness, J. B., Kunze, W. A. A., Clerc, N. 1999. Nutrient tasting and signaling mechanisms in the gut II. The intestine as a sensory organ: neural, endocrine and immune responses. American Journal of Physiology 277: 922-928.
6. Ahlman, H. & Nilsson, O. 2001. The gut as the largest endocrine organ in the body. Annals of Oncology 12(suppl. 2): 63-68.
7. Anatomy, Head and Neck, Pituitary Gland [internet]. Statpearls. July 2020 [cited 1 September 2020]. Available from: http://www.ncbi.nlm.nih.gov/books/NBK551529/.
8. Pasternak, J. 2010. The pituitary gland. In: James, M. F. M., editor. Anaesthesia for patients with endocrine disease. New York: Oxford University Press Inc., p. 15-22.
9. Kohler, P. O. 1983. Diseases of the hypothalamus and the anterior pituitary. In: Petersdorf, R. G. A. R., Braunwald, E., et al. editors. Harrison's Principles of Internal Medicine (10th edn.). Japan: McGraw-Hill, p. 587-1.
10. Rehfeld, J. F. 1998b. The new Biology of gastrointestinal hormones. The American Physiological Society 78(4): 1087-1108.
11. Mutt, V., Jorpes, J. E., Magnusson, S. 1970. Structure of porcine secretion. The amino acid sequence. European Journal of Biochemistry 15: 513-519.

12. Mutt, V., Magnusson, S., Jorpes, J. E., Dahl, E. 1965. Structure of porcine secretion. I. Degradation with trypsin and thrombin. Sequence of the tryptic peptides. The C-terminal residue. Biochemistry 4: 2358-2362.
13. Schultz, S. G., Makhlouf, G. M., Rauner, B. B. (Editors). 1989. Handbook of Physiology. The Gastrointestinal System. Neural and Endocrine Biology. Bethesda, MD: American Physiological Society, sect. 6, vol. II, p. 1-722.
14. Walsh, J. H. & Dockray, G. J. 1994. Gut Peptides. New York: Raven, p. 1-884.
15. Ebling, F. J. G. 1990. The hormonal control of hair growth In: Orfanos C. E., Happle, R. (eds). Hair and Hair Growth, Berlin, Heidelberg, New York: Springer; pp. 267-299.
16. Fritsch, M., Orfanos, C. E., Zouboilis, ChC. 2001. Sebocytes are the key regulators of androgen homeostasis in human skin. Journal of Investigative Dermatology 116: 793-800.
17. Suzuki, I., Cone, C. D., Im, S., Nordlund, J., Abdel-Malek, Z. A. 1996. Binding of melanocortin hormones to the melanocortin receptor MC1R on human melanocytes stimulates proliferation and melanogenesis. Endocrinology 137: 1627-1633.
18. Serres, M., Viac, J., Schmitt, D. 1996. Glucocorticoid receptor localization in human epidermal cells. Archives of Dermatological Research 288: 140-146.
19. Leiferman, K. M., Schroeter, A., Kirschner, M. K., Spelsberg, T. C. 1983. Characterization of the glucocorticoid receptor in human skin. Journal of Investigative Dermatology 81: 355-361.
20. Liang, T., Hoyer, S., Yu, R., et al. 1993. Immunocytochemical localization of androgen receptors in human skin using monoclonal antibodies against the androgen receptor. Journal of Investigative Dermatology 100: 663-666.
21. Tadokoro, T., Itami, S., Hosokawa, K., Terashi, H., Takayasu, S. 1997. Human genital melanocytes as androgen target cells. Journal of Investigative Dermatology 109: 513-517.
Thornton, M. J. 2002. The biological actions of estrogens on skin. Experimental Dermatology 11: 487-502.
22. Lachgar, S., Charveron, M., Serraute, J., Mourard, M., Gall, Y., Bonafe, J. L. 1999. In vitro main pathways of steroid action in cultured hair follicle cells: vascular approach. Journal of Investigative Dermatology Symposium Proceedings 4: 290-295.
23. Im, S., Lee, E. S., Kim, W., et al. 2000. Expression of progesterone receptor in human keratinocytes. Journal of Korean Medical Science 15: 647-654.
24. Torma, H., Rollman, D., Vahlquist, A. 1993. Detection of mRNA transcripts for retinoic acid, vitamin D3, and thyroid hormone (c-erb-A) nuclear receptors in human skin using reverse transcription and polymerase chain reaction. Acta Dermato-Venereologica 73: 102-107.

25. Zonefrati, R., Rotella, C. M., Toccafondi, R. S., Arcangeli, P. 1983. Thyroid hormone receptors in human cultured fibroblasts: evidence for cellular T4 transport and nuclear T3 binding. Hormone and Metabolic Research 15: 151-154.
26. Thornton, M. J., Taylor, A. H., Mulligan, K., et al. 2003. Oestrogen receptor-b is the predominant oestrogen receptor in human scalp skin. Experimental Dermatology 12: 181-190.
27. Crandall, D. L., Busler, D. E., Novak, T. J., Weber, R. V., Kral, J. G. 1998. Identification of estrogen receptor beta RNA in human breast and abdominal subcutaneous adipose tissue. Biochemical and Biophysical Research Communications 248: 523-526.
28. Jee, S. H., Lee, S. Y., Chiu, H. C., Chang, C. C., Chen, T. J. 1994. Effects of estrogen and estrogen receptor in normal human melanocytes. Biochemical and Biophysical Research Communications 199: 1407-1412.
29. Haczynski, J., Tarkowski, R., Jarzabek, K., et al. 2002. Human cultured skin fibroblasts express estrogen receptor alpha and beta. International Journal of Molecular Medicine 10: 149-153.
30. Gysler, A., Lange, K., Korting, H. C., Schafer-Korting, M. 1997. Prednicarbate biotransformation in human foreskin keratinocytes and fibroblasts. Pharmaceutical Research 14: 793-797.
31. Orfanos, C. E., Adler, Y. D., Zouboilis, ChC. 2000. The SAHA syndrome. Hormone Research 54: 251-258.
32. Zouboilis, C. C. 2004. The human skin as a hormone target and an endocrine gland. Hormones 3(1): 9-26.
33. Rehfeld, J. F. 1998a. The new biology of gastrointestinal hormones. Physiological Reviews 78: 1087-108.
34. Guyton, A. C. & Hall, J. E. 2015. Textbook of Medical Physiology. Elsevier India Private Limited. 907 pp.
35. Wikipedia. 2022. List of human hormones. (https://en.wikipedia.org/wiki/List_of_human_hormones). (Accessed 12 March 2022).

Appendix 1. Total hormones and their functions

Name	Status	Secreted hormone(s)	Chemical composition	Functions
Skin	Organ system	Calcidiol	Steroid	Inactive form of vitamin D_3
Heart	Organ	Brain Natriuretic Peptide (BNP)	Peptide	Reducing bile production
Blood	Tissue	Thromboxane	Eicosanoid	Vasoconstriction, platelet aggregation
	Tissue	Leukotrienes	Eicosanoid	Increase vascular permeability
Endothelial cell	Cell	Endothelin	Peptide	Smooth muscle contraction
All nucleated cells	Cell	Prostaglandin	Eicosanoid	Vasodilation
Striated muscle	Organ	Thrombopoietin	Peptide	Produce platelets
Vascular muscle cells	Cell	Prostacyclin	Eicosanoid	Vasodilation; Platelet activation inhibitor
Adipocytes	Cell	Adiponectin	Peptide	Regulating glucose levels
	Cell	Leptin	Peptide	Inhibits appetite, stimulates thermogenesis
Central Nervous System (CNS)	Organ system	Galanin	Peptide	Action potentials in neurone
Cerebral cortex	Tissue system	Cortistatin	Peptide	Neural activity (slow wave sleep)
	Organ	Orexin	Peptide	Increased appetite
	Organ	Pituitary adenylate cyclase-activating peptide	Peptide	Stimulates enterochromaffin-like cells
	Organ	Prolactin-releasing hormone	Peptide	Release prolactin
	Organ	Prolactin-inhibitory factor/Dopamine	Amine	Inhibits release of prolactin

Hypothalamus	Organ	Vasoactive intestinal peptide	Peptide	Blood pressure; Relax smooth muscle of trachea; Stomach; Gall bladder
	Organ	Somatostatin (growth hormone-inhibiting hormone/growth hormone release-inhibiting hormone/somatotropin release-inhibiting factor/somatotropin release-inhibiting hormone)	Peptide	Prevent the production of other hormones (may occur in tumours); Act as neurotransmitter; Role in gastrointestinal tract
	Organ	Thyrotropin-releasing hormone	Peptide	Release thyroid stimulating hormone; Stimulates prolactin release
Stomach	Organ	Gastrin	Peptide	Stimulates HCl secretion by parietal cells
	Organ	Ghrelin	Peptide	Stimulate appetite
	Organ	Oxyntomodulin	Peptide	Suppress appetite
Duodenum	Organ	Cholecystokinin	Peptide	Release digestive enzyme and bile juice
	Organ	Enterocrinin	Peptide	Increase the secretion of alkaline mucous
Duodenum and jejunum	Organ	Gastric inhibitory polypeptide	Peptide	Induce insulin secretion
Ileum	Organ	Glucagon-like peptide I	Peptide	Release of insulin
	Organ	Enteroglucagon	Peptide	Intestinal growth and dilation; Reduce the chance of apoptosis
	Organ	Secretin	Peptide	Stimulates

Small intestine				pancreatic acinar cells to release bicarbonate and water
	Organ	Motilin	Peptide	Stimulates gastric activity
Intestine (from duodenum to rectum (gut))	Organ	Vasoactive intestinal peptide	Peptide	Blood pressure; Relax smooth muscle of trachea; Stomach; Gall bladder
	Organ	Guanylin	Peptide	Regulates electrolytes
Liver	Organ	Angiotensinogen	Peptide	Vasoconstriction
	Organ	Angiotensin I	Peptide	Vasoconstriction
	Organ	Hepcidin	Peptide	Inhibits iron export from cells
	Organ	Insulin-like growth factor I	Peptide	Insulin-like effects
	Organ	Thrombopoietin	Peptide	Produce platelets
	Organ	Lipasin/Betatrophin	Peptide	Stimulates the insulin-secreting beta cells
Pancreas	Organ	Amylin (Islet amyloid polypeptide)	Peptide	Inhibits digestive secretion
	Organ	Pancreatic polypeptide	Peptide	Pancreatic secretions
	Organ	Vasoactive intestinal peptide	Peptide	Blood pressure; Relax smooth muscle of trachea; Stomach; Gall bladder
	Organ	Somatostatin (growth hormone-inhibiting hormone/growth hormone release-inhibiting hormone/somatotropin release-inhibiting factor/somatotropin release-inhibiting hormone)	Peptide	Prevent the production of other hormones (may occur in tumours); Act as neurotransmitter; Role in gastrointestinal tract

	Organ	Glucagon	Peptide	Increase glucose
	Organ	Insulin	Peptide	Decrease glucose
	Organ	Incretin	Peptide	Stimulates pancreas including insulin release
	Organ	Gastrin	Peptide	Stimulates HCl secretion by parietal cells
Anterior pituitary	Gland	Growth hormone/Somatotropin	Peptide	Maintain growth
	Gland	Thyroid stimulating hormone	Peptide	Stimulates thyroid gland
	Gland	Adrenocorticotropic hormone	Peptide	Stimulates adrenal glands
	Gland	Follicle stimulating hormone	Peptide	Stimulates follicle cells
	Gland	Luteotrophic/Lactogenic/ Prolactin	Peptide	
	Gland	Luteinizing hormone/Lutropin/Gonadotrophic hormone/Interstitial cell-stimulating hormone in male	Peptide	Stimulates gonads
	Gland	Lipotropin	Peptide	Lipolysis; Stimulates melanocytes
	Gland	Endorphin	Peptide	Act as analgesics (diminish the perception of pain)
Mid pituitary	Gland	Melanocyte stimulating hormone/Melanotropin/ Intermedin	Peptide	Stimulates melanocytes
Posterior pituitary	Gland	Oxytocin	Peptide	Uterine contraction in birth
	Gland	Vasopressin/Anti-diuretic hormone	Peptide	Water absorption
Pineal gland	Gland	Melatonin	Peptide	Sleep patterns (circadian rhythms)
Thyroid	Gland	Thyroxine	Amine	Maintains metabolic rate

	Gland	Triiodothyronine	Peptide	Maintains metabolic rate
	Gland	Calcitonin	Peptide	Regulate levels of calcium and phosphate
Parathyroid	Gland	Parathyroid hormone/Parathormone/ Parathyrin	Peptide	Absorption of calcium
	Gland	Atrial Natriuretic Peptide (ANP)	Peptide	Powerful vasodilator
Thymus	Gland	Thymosin	Peptide	Stimulate the production of T cell, which are important for immune system
	Gland	Thymulin/Thymic factor	Peptide	Circadian rhythm
	Gland	Thymopoietin	Peptide	Process of T cells differentiation
	Gland	Thymic humoral factor	Peptide	It increases immune response to particular virus
Kidney	Gland	Calcitriol	Steroid	Increase absorption of vitamin D3 and calcium
	Gland	Enkephalin	Peptide	Regulate pain
	Gland	Thrombopoietin	Peptide	Produce platelets
	Gland	Erythropoietin	Peptide	Erythrocyte production
	Gland	Uroguanylin	Peptide	Regulate electrolytes
	Gland	Dehydroepiandrosterone	Steroid	Virilization, anabolic
	Gland	Renin	Peptide	Conversion of angiotensinogen to angiotensin I
	Gland	Dihydroxycholecalciferol	Steroid	Bone mineralization
	Gland	Androstenedione	Steroid	Substrate for estrogen
	Gland	Androstenedione	Steroid	Substrate for

				estrogen
Adrenal cortex	Gland	Cortisol/Hydrocortisone/ Glucocorticoid	Steroid	Immune response
	Gland	Aldosterone/Mineralocorticoid	Steroid	Control blood pressure
Adrenal medulla	Gland	Androstenedione	Steroid	Substrate for estrogen
	Gland	Epinephrine/Adrenaline	Amine	Solve any unwanted situation
	Gland	Nor-epinephrine/Nor-adrenaline	Amine	Make people calm
Testis	Gland	Anti-Mullerian hormone	Peptide	Inhibit release of prolactin and TRH (thyrotropin-releasing hormone) from anterior pituitary
	Gland	Inhibin	Peptide	Inhibit production of FSH
	Gland	Testosterone	Steroid	Male sexual characteristics
	Gland	Dehydroepiandrosterone	Steroid	Virilization; Anabolic
	Gland	Dihydrotestosterone	Steroid	Male puberty and adult characteristics
	Gland	Androstenedione	Steroid	Substrate for estrogen
	Gland	Estrogen	Steroid	Male physical feature and reproduction; Need to produce testosterone
	Gland	Estradiol	Steroid	Essential for the production of sperm
	Gland	Sex steroid/Gonadocorticoid	Steroid	Stimulates sexual organs
Prostate gland	Gland	Relaxin	Peptide	It relaxes pelvic

				ligaments
Ovary	Gland	Estrogen	Steroid	Female physical feature and reproduction; Need to produce testosterone
	Gland	Estrone	Steroid	Female sexual development
	Gland	Estradiol	Steroid	Ovulation; Thickening of the uterine wall; Implantation
	Gland	Estriol	Steroid	Female physical feature and reproduction; Need to produce testosterone
	Gland	Progesterone	Steroid	Menstrual cycle; Menopause; Pregnancy; Need to produce testosterone
	Gland	Inhibin	Peptide	Inhibit production of FSH
	Gland	Testosterone	Steroid	Male-like sexual characteristics in female
	Gland	Dehydroepiandrosterone	Steroid	Virilization; Anabolic
	Gland	Androstenedione	Steroid	Substrate for estrogen
	Gland	Sex steroid/Gonadocorticoid	Steroid	Stimulates sexual organs
Decidual cells	Cell	Relaxin	Peptide	Relaxes pelvic ligaments
	Organ	Human placental lactogen/Human somatomammotropin hormone	Peptide	Increase production of insulin; Metabolism of pregnant woman;

Placenta				Probably development of fetal tissue and mother's breast
	Organ	Human chorionic gonadotropin hormone	Peptide	Growth of corpus luteum
	Organ	Estrogen	Steroid	Female physical feature and reproduction; Need to produce testosterone
	Organ	Estriol	Steroid	Uterine growth
	Organ	Progesterone	Steroid	Menstrual cycle; Menopause; Pregnancy; Need to produce testosterone
Fetus	Organ	Inhibin	Peptide	Inhibit production of FSH
Lung	Organ	Angiotensin II	Peptide	Regulates haemodynamic profile
Skeleton	Organ system	Osteocalcin	Peptide	Muscle function; Testosterone synthesis and energy expenditure

Source: [34, 35]

N. B. Total secreted hormones (same hormones from the different organs/glands) 110; but the different kinds are 88.