

The Nomenclature of Peptide Hormones*

IUPAC-IUB Commission on Biochemical Nomenclature‡

Recommendations (1974)

In the last two decades, the structures of many peptide hormones have been elucidated and other peptide hormones have been obtained in pure form. However, there are presently no accepted guidelines for nomenclature in this field. Therefore, the IUPAC-IUB Commission on Biochemical Nomenclature (CBN) appointed a subcommittee consisting of R. A. Acher, R. A. Boissonnas, H. B. F. Dixon, R. Guillemin, P. Karlson (Convenor), H. Rasmussen, J. Rudinger, and N. A. Yudayev to discuss the question of the nomenclature of peptide hormones and to report to CBN. The International Union of Physiological Sciences nominated, as consultants to the subcommittee, A. Brodish, S. M. McCann, and F. Ulrich. The present Recommendations are based on the report of this subcommittee.

1. General Principles

Naturally occurring oligo- and polypeptides are generally referred to by trivial names; their systematic names are so cumbersome that they are of little use. Most of the peptide hormones already have well established trivial names indicating either natural source (*e.g.* insulin) or physiological action (*e.g.* relaxin, prolactin). However, some of the trivial names are so long that these hormones are known mainly by abbreviations (*e.g.* FSH for follicle-stimulating hormone). This is unfortunate, and it was therefore considered advisable to create suitable names for those peptide hormones not already having well established short trivial names. Three principles have been observed:

- (a) new names for hormones of the adenohypophysis bear the ending “-tropin”;
- (b) hypothalamic releasing factors (hormones) bear the ending “-liberin”;
- (c) hypothalamic release-inhibiting factors (hormones) bear the ending “-statin” (see below).

2. Trivial Names

The trivial names proposed for peptide hormones are given in the “Appendix.” Abbreviations of the new names are not proposed, and the use of currently fashionable abbreviations is discouraged.

* Document of the Commission on Biochemical Nomenclature (CBN) of the International Union of Pure and Applied Chemistry (IUPAC) and the International Union of Biochemistry (IUB), approved by CBN, IUPAC, and IUB in 1974 and published by permission of IUPAC and IUB. Comments on and suggestions for future revisions of these Recommendations may be sent to any member of CBN.‡. Reprints of this publication may be obtained from W. E. Cohn, Director, NRC Office of Biochemical Nomenclature, Biology Division, Oak Ridge National Laboratory, Box Y, Oak Ridge, Tenn., U.S.A. 37830.

‡ Members of the Commission are: O. Hoffmann-Ostenhof (Chairman), W. E. Cohn (Secretary), A. E. Braunstein, B. L. Horecker, W. B. Jakoby, P. Karlson, B. Keil, W. Klyne, C. Liébecq, and E. C. Webb.

3. Species Designation

Since peptide hormones show species variation in their amino-acid sequence, their names are essentially “generic names”, and are insufficient to specify a single chemical compound. It is therefore recommended that authors add to the name of each hormone the species from which the hormone was isolated, or at least indicate the biological source(s) where appropriate in each paper.

4. Special Groups of Hormones

(a) *Hypothalamic Factors (Hormones)*—The hypothalamic “releasing factors” or “releasing hormones” have no well established trivial names. It is recommended that the trivial names given in the “Appendix” be used for the releasing factors (hormones). They are based on the ending “-liberin” added to the prefix of the pituitary hormone released by the factor. Thus, “thyroliberin” indicates the hypothalamic peptide stimulating the release (and perhaps also the biosynthesis) of thyrotropin, the corresponding tropic hormone, from the pituitary gland. (Note that the ending “-tropin” is no longer retained in the name; it is implied in the definition of “-liberin”.)

The names of those factors inhibiting the release (and perhaps the synthesis) of pituitary hormones are formed in a similar way with the suffix “-statin.”

(b) *Pituitary Hormones*—Most of the hormones of the adenohypophysis have acceptable trivial names ending in -tropin.¹ The committee has created the missing names for follicle-stimulating hormone, “follitropin,” and for luteinizing hormone, “lutropin.” It is recommended that pituitary hormones discovered in the future also be named with the ending -tropin. This suffix should be restricted to pituitary and similar hormones and should not be used for, *e.g.* crustacean hormones acting on pigment cells.

Some placental hormones are physiologically very similar to pituitary hormones. They are named accordingly with the prefix “chorio-”, *e.g.* choriogonadotropin for chorionic gonadotropin.

(c) *Invertebrate Peptide Hormones*—Though some of the invertebrate peptide hormones have been isolated in pure form and their amino-acid compositions have been determined, the field has not yet developed to a stage where a list of names seems warranted.

It is, however, recommended that the suffixes defined above for hypothalamic and pituitary hormones not be used in a different sense in invertebrates. Thus, a crustacean color change hormone acting on, *e.g.* erythrophores, should *not* be named “erythrotropin,” a hormone causing release of eggs and/or sperm in sea urchins should *not* be called “gametoliberin.”

¹ The committee has re-evaluated the arguments for and against the suffix “-trophin,” still used by many anatomists and physiologists. Since the bioassay systems are based mostly on effects other than the trophic one, it was decided to recommend “-tropin” for general usage in biochemistry.

Appendix. List of Peptide Hormones^a

Trivial name	Other names	Current abbreviation ^b	Trivial name	Other names	Current abbreviation ^b
<i>1. Hypothalamic Factors</i>					
Corticoliberin	Corticotropin-releasing factor	CRF	Melanotropin ^a	Melanocyte-stimulating hormone	MSH
Folliberin	Follicle-stimulating-hormone-releasing factor	FSH-RF	Mesotocin ^c	[Ile ⁸]Ocytocin ^d	
Gonadoliberin ^e	Gonadotropin-releasing factor	(LH/FSH-RF)	Ocytocin ^d (Oxytocin)		OXT
Luliberin	Luteinizing hormone-releasing factor	LH-RF (LRF)	Prolactin	Mammatropic hormone; mammatropin; lactotropic hormone; lactotropin	PRL
Melanoliberin	Melanotropin-releasing factor	MFR	Somatotropin	Somatotropic hormone; growth hormone	STH
Melanostatin	Melanotropin release-inhibiting factor	MIF	Thyrotropin	Thyrotropic hormone	GH
Proactoliberin	Prolactin-releasing factor	PRF	Urogonadotropin ^a	(Human) Menopausal gonadotropin	TSH
Proactostatin	Prolactin release-inhibiting factor	PIF	Vasopressin	Adiuretin; antidiuretic hormone	HMG
Somatoliberin	Somatotropin-releasing factor; growth hormone-releasing factor	SRF GH-RF	Vasotocin	[Arg ⁸]Ocytocin ^d	VP, ADH
Somatostatin	Somatotropin release-inhibiting factor		<i>3. Other Peptide Hormones</i>		
Thyroliberin	Thyrotropin-releasing factor	TRF	Angiotensin	Angiotensin II	
<i>2. Pituitary and Related Hormones</i>			Bradykinin	Kinin-9	
Choriogonadotropin ^f	Chorionic gonadotropin	CG	Calcitonin	Thyrocalcitonin	
Choriomammotropin	Chorionic somatomammotropin	CS	Erythropoietin		
Corticotropin	Adrenocorticotrophic hormone	ACTH	Gastrin		
Follitropin	Follicle-stimulating hormone	FSH	Gastrin sulphate	Gastrin II	
Gonadotropin ^e	Gonadotropin hormone		Glucagon	Hyperglycemic factor	(HGF)
Glumitocin ^d	[Ser ⁴ ,Gln ⁸]Ocytocin ^d		Insulin		
Isotocin ^g	[Ser ⁴ ,Ile ⁸]Ocytocin ^d		Kallidin	Kinin-10	
Lipotropin	Lipotropic hormone	LPH	Pancreozymin	Cholecystokinin	
Lutropin	Luteinizing hormone; (Interstitial cell-stimulating hormone)	LH (ICSH)	Parathyrin ⁱ	Parathyroid hormone; Parathormone	
			Proangiotsin	Angiotensin I	
			Relaxin		
			Secretin		
			Somatomedin ^m	Sulfation factor	
			Thymopoietin ⁿ	Thymin	

^a For convenience, some biologically active peptides that may not fulfill all criteria of a hormone are included.

^b Abbreviations, old or new, are not recommended; they are given here for identification purposes only.

^c This name indicates a hypothalamic substance releasing gonadotropin. It may also be used for the decapeptide isolated from pig hypothalamus and known as luteinizing hormone/follicle-stimulating-hormone releasing factor, abbreviated LH/FSH-RF,^h since the peptide induces the release of both lutropin and follitropin in constant proportions and thus carries the activity of both luliberin and folliberin (see also Footnote e).

^d The chorionic gonadotropins have in most species (including man) the action of both follitropin and lutropin and are therefore termed "gonadotropins."

^e Gonadotropin is to be used for hormones having the activity of both follitropin and lutropin, like the gonadotropins of cold-blooded vertebrates. It may also be used for impure preparations containing lutropin and follitropin.

^f In elasmobranch fishes.

^g In bony fishes.

^a Two peptides have been sequenced and designated α -melanotropin and β -melanotropin.

^c In birds and reptiles.

^d The name of this hormone is derived from Greek $\omega\kappa\upsilon\tau\omicron\kappa\omicron\varsigma$ (OKYTOKOS = fast birth, prompt delivery), not from the Greek $\omicron\acute{\xi}\nu\sigma$ (oxys = acid; fast). The spelling oxytocin should therefore be preferred; moreover, it avoids confusion with oxy, meaning "related to oxygen." However, oxytocin is in wide use, especially in the English language. Therefore, both spellings are listed as optional.

^a Most work has been done on the human hormone, known as Human Menopausal Gonadotropin (HMG); it is a pituitary hormone, chemically changed during passage through the kidney. Due to its occurrence in urine, it has been termed "urogonadotropin."

ⁱ Parathyrin is a new name suggested here. The synonym Parathormone is a proprietary name.

^m The name "somatomedin" was suggested by a group working in the field (*Nature* **235**, 107 (1972)).

ⁿ A polypeptide from the thymus. The name proposed was suggested in a letter to *Nature* (**249**, 863 (1974)) to avoid confusion with the earlier "thymine" from nucleic acids. "Thymin" should be abandoned.

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