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Gisèle Gisela d'Angelo d'Angelo-Bernard, Mohieddine Moumni, Marian Jutisz, Raymond Counis. Cloning and sequence analysis of the cDNA for the precursor of the beta subunit of ovine luteinizing hormone. Nucleic Acids Research, 1990, 18 (8), pp.2175-2175. 10.1093/nar/18.8.2175 . hal-03034076

HAL Id: hal-03034076

<https://hal.science/hal-03034076>

Submitted on 16 Dec 2021

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Cloning and sequence analysis of the cDNA for the precursor of the beta subunit of ovine luteinizing hormone

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Submitted March 19, 1990

EMBL accession no. X52488

Clones containing cDNA for the beta-subunit of ovine luteinizing hormone (LH β) were isolated from an ovine pituitary pBR322 cDNA library using a rat LH β cDNA as a probe. The complete DNA sequence for the LH β subunit, presented in Figure 1, was obtained by sequencing three overlapping recombinant inserts using both the chemical cleavage (1) and chain terminator (2) methods. The 533 base-pair cDNA included the entire coding region for a 141 amino acid LH β subunit precursor preceded by a short 5' non coding region as for other mammals (3–5), and followed by a 103 nucleotide long 3' region. Comparison of the amino acid sequence deduced from the open reading frame of the cDNA with that previously established by direct polypeptide sequencing (7) implies a 20 amino acid leader peptide, and a 121 amino acid mature subunit in which we noted four conservative substitutions and a two amino acid extension to the carboxyl terminus giving the ovine LH β a size identical to that of the other mammals studied (3–6). In addition, residues 106 and 111 were identified as Gln and Asp, respectively.

Comparison of either the entire cDNA or the coding region of the ovine LH β with that of the corresponding bovine sequence (5) gave an overall homology of 98%. Interestingly, although it has long been thought that ovine and bovine LH β subunits share complete homology in their primary structures, DNA sequencing of the different clones has revealed two amino acid differences. In addition to the 98% homology with bovine LH β , the amino acid sequence of the ovine LH β determined in the present study displays an overall homology of 84% with

porcine (6), 81% with rat (4), 74% with equine (8), 69% with human (3) and 43% with the chicken (9) or eel (10) sequences.

ACKNOWLEDGEMENTS

This work was supported by a grant from the Institut National de la Santé et de la Recherche Médicale (CRE no. 864 005).

REFERENCES

- Maxam,A.M. and Gilbert,W. (1977) *Proc. Natl. Acad. Sci. USA* **74**, 560–564.
- Sanger,F., Nicklen,S. and Coulson,A.R. (1977) *Proc. Natl. Acad. Sci. USA* **74**, 5463–5467.
- Talmadge,K., Vamvakopoulos,N.C. and Fiddes,J.C. (1984) *Nature* **307**, 37–40.
- Jameson,L., Chin,W.W., Hollenberg,A.N., Chang,A.S. and Habener,J.F. (1984) *J. Biol. Chem.* **259**, 15474–15480.
- Virgin,J.B., Silver,B.J., Thomason,A.R. and Nilson,J.N. (1985) *J. Biol. Chem.* **260**, 7072–7077.
- Kato,Y. and Hirai,T. (1989) *Mol. Cell. Endocrinol.* **62**, 47–53.
- Liu,W.K., Nahm,H.S., Sweeney,C.M., Holcomb,G.N. and Ward,D.N. (1972) *J. Biol. Chem.* **247**, 4365–4381.
- Bousfield,G.R., Liu,W.K., Sugino,H. and Ward,D. (1987) *J. Biol. Chem.* **262**, 8610–8620.
- Noce,T., Ando,H., Ueda,T., Kubokawa,K., Higashinakagawa,T. and Ishii,S. (1989) *J. Mol. Endocrinol.* **3**, 129–137.
- Quérat,B., Moumni,M., Jutisz,M., Fontaine,Y.A. and Counis,R. (1990) *J. Mol. Endocrinol.* **4**, (in press).

M E M L Q G L L L W L L L G V A C V W A S R G P L R P L	90
ACCAAGGATGGAGATGCTCAGGGACTGCTGCTGTGGCTCTGGGGTGGCCGGGTCTGGGCTTCAGGGGCCACTCGCGCCGCT	
◊ C Q P I N A T L A A E K E A C P V C I T F T T S I C A G Y C	180
CTGCCACCCATCAACCCCCACCCCTGGGGCTGACAAGGAGGCCCTCCCTGCTGTATCACTTCACCAACCAAGCATCTGCCCGCGCTACTCG	
L ^T S M K Q ^T V L P V I L P P M P Q R V C T Y H E L R F A S V R	270
CCTCAGCATGAAGCAGCTGGCTGCTGTCATCCCTGCCGCCATCCCCACGGGCTGACCTACCAACCAAGCTGGCCTCCGCTCCGGTCC	
L P G C P P G V D P M V S F P V A L S C H C G P C R L S S T	360
GCTCCCCGGCTGCCAACCTGGCGTGGACCCAATGGCTCTTCCCCTGGCCCTCAGCTGTCACTGTGGCCCTGCCCTCACCAAC	
D C G G ^T P ^T R T Q ^T P L A C D ^T H P P L P D I L F ^T I ^T *	450
TGACTGGGGGCTCCACAACCCAAACCCCTGGCTGTGACCACCCCCCGCTCCAGATATCCTCTTCTTAAGGATGCCCACTTCAT	
CTCCCCATGCCAACCTAACCTCCAAAGCCAGCAGACGCCCTCCCTCCCTCCCAATAAA <u>ACTTCTCAAGCTGCAAAAAAA</u>	533

FIGURE 1. Nucleotide cDNA sequence and predicted amino acid sequence of the ovine LH β -subunit precursor. The amino acids differing from the published peptide sequence [7] are indicated by T . The asterisk indicates the stop codon and the losange, the position of the single N-linked carbohydrate chain. The polyadenylation signal is underlined.

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