

Nucleotide sequence of the rat low density lipoprotein receptor cDNA

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A 4.7 kb cDNA clone (lrLDL2-1a) coding for the rat low density lipoprotein (LDL) receptor was isolated from a λgt-11 rat liver cDNA library (1,2). The DNA sequence of the entire coding region and portions of the 5' and 3' untranslated region is shown in Figure 1. The open reading frame coded for an 879 amino acid polypeptide with a theoretical molecular weight of 96,632, which is larger than the size of the human (3) and rabbit (4) LDL receptors. A signal sequence of 21 amino acids was also present in both the rat (Fig. 1) and human (3) receptors.

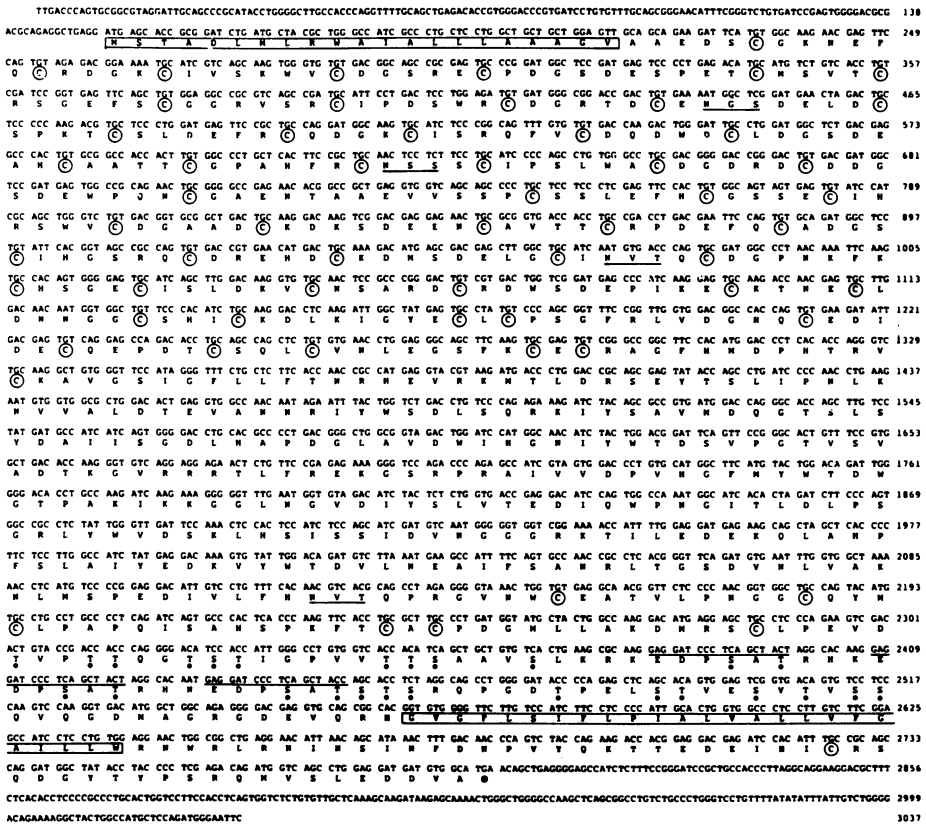


Figure 1. Nucleotide sequence and predicted amino acid sequence of the rat LDL receptor. The signal sequence (nucleotide 154-216), and the transmembrane region (nucleotide 2566-2640) are boxed. Potential sites for N-linked glycosylation are underlined and potential sites for O-linked glycosylation are marked with dots. The amino acid sequence of the 3 repeated sequences in the O-linked sugar domain are overlined.

The 5 structural domains of the rat LDL receptor shared sequence homology with the human, rabbit and bovine receptors (3,4,5, Table 1). Position of cysteine residues was conserved in the ligand-binding and EGF-precursor domains (Fig.1). The ligand-binding domain had 7 cysteine-rich repeated sequences similar to the rabbit and human receptors, however, the rat receptor contained one additional amino acid in the gap between the 4th and 5th repeat.

There were 4 potential sites for N-linked glycosylation and 26 potential sites for O-linked glycosylation (Fig.1). One feature unique to the rat LDL receptor was the presence of 3 repeated sequences of 6 amino acids in the O-linked sugar domain. The significance of these 3 repeated sequences is unknown.

**Table 1. Comparison of the Amino Acid Sequence of the Rat LDL Receptor with the Sequences of the Human, Rabbit and Bovine Receptors**

Receptor	Percent Sequence Homology to the Rat LDL Receptor				
	Ligand Binding Domain (293*)	EGF Precursor Homology Domain (400)	O-Linked Sugar Domain (77)	Transmembrane Domain (25)	Cytoplasmic Domain (50)
Human	78	84	41	55	88
Rabbit	73	84	35	60	90
Bovine	ND	ND	36	59	92

\* Number of amino acids

ND Not determined because the DNA sequence is unknown

† The order of the authors may not reflect their relative contribution

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