**National Center for Biotechnology Information (NCBI)**

1. Download the gene sequence and mRNA sequence of Leptin and Leptin Receptor gene of Human, Mouse and Rat, Cattle and Pig. Save it in a separate folder and name it properly.

i. What is the chromosomal location of (i) Leptin and (ii) Leptin Receptor in these organisms?

ii. Compare the length of the gene sequences of (i) Leptin and (ii) Leptin Receptor in these organisms?

iii. Write the accession number of (i) Leptin and (ii) Leptin Receptor in these organisms?

iv. How many exons do you find in the gene sequence of (i) Leptin and (ii) Leptin Receptor in these organisms?

v. Write the start and end position of the exons in the gene sequence of (i) Leptin and (ii) Leptin Receptor in these organisms?

vi. Is there any publication related to these sequences? If so, quote it.

Answer:

Organism: Human

|  |  |  |
| --- | --- | --- |
|  | Leptin | Leptin Receptor |
| Chromosomal Location | Chromosome 7  NC\_000007.14 (128241278..128257629) | Chromosome 1  NC\_000001.11 (65420652..65641559) |
| Length of Gene Sequence | 16352 bp | 220908 bp |
| Accession Number | NC\_000007  NM\_000230 | NC\_000001 |
| Number of Exons | 3 | 24 |
| Start and End positions of Exons |  |  |
| Publications | REFERENCE - 2 (bases 1 to 16352)  AUTHORS - Hillier,L.W., Fulton,R.S., Fulton,L.A., Graves,T.A., Pepin,K.H., Wagner-McPherson,C., Layman,D., Maas,J., Jaeger,S., Walker,R.  TITLE - The DNA sequence of human chromosome 7  JOURNAL - Nature 424 (6945), 157-164 (2003)  PUBMED - 12853948 | REFERENCE - 1 (bases 1 to 220908)  AUTHORS - Gregory,S.G., Barlow,K.F.,McLay,K.E., Kaul,R., Swarbreck,D.,Dunham,A., Scott,C.E., Howe,K.L.,Woodfine,K.,Spencer,C.C.,  Jones,M.C., Gillson,C., Searle,S., Zhou,Y., Kokocinski,F.,  TITLE - The DNA sequence and biological annotation of human chromosome 1  JOURNAL - Nature 441 (7091), 315-321 (2006)  PUBMED - 16710414 |

Organism: Mouse

|  |  |  |
| --- | --- | --- |
|  | Leptin | Leptin Receptor |
| Chromosomal Location | Chromosome 6  NC\_000072.7 (29060220..29073875) | Chromosome 4  NC\_000070.7 (101574393..101676375) |
| Length of Gene Sequence | 13656 bp | 101983 bp |
| Accession Number | NC\_000072 | NC\_000070 |
| Number of Exons | 3 | 21 |
| Start and End positions of Exons |  |  |
| Publications | REFERENCE - 1 (bases 1 to 13656)  AUTHORS - Church,D.M., Schneider,V.A., Graves,T., Auger,K., Cunningham,F.,  Bouk,N., Chen,H.C., Agarwala,R., McLaren,W.M., Ritchie,G.R., Albracht,D., Kremitzki,M., Rock,S., Kotkiewicz,H., Kremitzki,C.  TITLE - Modernizing reference genome assemblies  JOURNAL - PLoS Biol. 9 (7), e1001091 (2011)  PUBMED - 21750661 | REFERENCE - 1 (bases 1 to 101983)  AUTHORS - Church,D.M., Schneider,V.A., Graves,T., Auger,K., Cunningham,F.,Bouk,N., Chen,H.C., Agarwala,R., McLaren,W.M., Ritchie,G.R.,Albracht,D., Kremitzki,M., Rock,S., Kotkiewicz,H., Kremitzki,C.  TITLE - Modernizing reference genome assemblies  JOURNAL - PLoS Biol. 9 (7), e1001091 (2011)  PUBMED - 21750661 |

Organism: Rat

|  |  |  |
| --- | --- | --- |
|  | Leptin | Leptin Receptor |
| Chromosomal Location | Chromosome 4  NC\_051339.1 (57661127..57675262) | Chromosome 5  NC\_051340.1 (116294409..116477904) |
| Length of Gene Sequence | 14136 bp | 183496 bp |
| Accession Number | NC\_051339 | NC\_051340 |
| Number of Exons | 3 | 23 |
| Start and End positions of Exons |  |  |
| Publications |  |  |

Organism: Cattle

|  |  |  |
| --- | --- | --- |
|  | Leptin | Leptin Receptor |
| Chromosomal Location | Chromosome 4  NC\_037331.1 (92436837..92453660) | Chromosome 3  NC\_037330.1 (79741204..79838014, complement) |
| Length of Gene Sequence | 16824 bp | 96811 bp |
| Accession Number | NC\_037331 | NC\_037330 |
| Number of Exons | 3 | 21 |
| Start and End positions of Exons |  |  |
| Publications |  |  |

Organism: Pig

|  |  |  |
| --- | --- | --- |
|  | Leptin | Leptin Receptor |
| Chromosomal Location | Chromosome 18  NC\_010460.4 (20106867..20124071, complement) | Chromosome 6  NC\_010448.4 (146802297..146896152, complement) |
| Length of Gene Sequence | 17205 bp | 93856 bp |
| Accession Number | NC\_010460 | NC\_010448 |
| Number of Exons | 5 | 22 |
| Start and End positions of Exons |  |  |
| Publications |  |  |