**Subset of vision genes used in the analysis of selection divergence and their comparative sequence metrics among some ruminant species**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Gene name** | **Functional class in vision process** | **Species** | **Percentage nucleotide identity to giraffe** | **Percentage amino acid identity to giraffe** | **RefSeq/GenBank Accession No.** |
| *Cyclic Nucleotide Gated Channel Alpha 2(CNGA2)* | Phototransduction | Okapi | 99 | 98 | NA |
| Cattle | 97 | 97 | NM\_001001139.2 |
| Water buffalo | 97 | 98 | XM\_006059664.1 |
| Tibetan antelope | 97 | 97 | XM\_005972031.1 |
| Yak | 97 | 98 | XM\_005889859.1 |
| Sheep | 97 | 94 | XM\_015104729.1 |
| Goat | 97 | 97 | XM\_005700487.1 |
| *Cyclic Nucleotide Gated Channel Alpha 4 (CNGA4)* | Phototransduction | Okapi | 98 | 99 | NA |
| Cattle | 97 | 97 | XM\_594125.8 |
| Water buffalo | 97 | 97 | XM\_006042097.1 |
| Tibetan antelope | 96 | 96 | XM\_005960395.1 |
| Yak | 97 | 97 | XM\_005907126.1 |
| Sheep | 97 | 96 | XM\_015090403.1 |
| Goat | 97 | 93 | XM\_005689771.1 |
| *Crystallin Alpha A* (*CRYAA*) | Structural property of the lens | Okapi | 98 | 100 | NA |
| Cattle | 97 | 99 | NM\_174289.2 |
| Water buffalo | 97 | 99 | XM\_006063827.1 |
| Tibetan antelope | 97 | 99 | XM\_005956793.1 |
| Yak | 97 | 99 | XM\_005907575.2 |
| Sheep | 97 | 99 | NM\_001012458.1 |
| Goat | 97 | 99 | XM\_005675651.2 |
| *Guanine nucleotide-binding protein G(t) subunit alpha-1* (*GNAT1*) | Phototransduction | Okapi | 99 | 100 | NA |
| Cattle | 98 | 99 | XM\_010817664.2 |
| Water buffalo | 98 | 99 | XM\_006053291.1 |
| Tibetan antelope | 98 | 100 | XM\_005969293.1 |
| Yak | 98 | 99 | XM\_005892112.1 |
| Sheep | 98 | 100 | XM\_015102410.1 |
| Goat | 98 | 100 | XM\_013973538.1 |
| *Guanine nucleotide-binding protein G(t) subunit alpha-2* (*GNAT2*) | Phototransduction | Okapi | 99 | 100 | NA |
| Cattle | 99 | 99 | NM\_174326.2 |
| Water buffalo | 99 | 99 | XM\_006052192.1 |
| Tibetan antelope | 99 | 100 | XM\_005973578.1 |
| Yak | 99 | 99 | XM\_005891307.1 |
| Sheep | 99 | 100 | XM\_004002288.3 |
| Goat | 98 | 99 | XM\_013962560.1 |
| *Guanine nucleotide-binding protein subunit beta-1* (*GNB1*) | Phototransduction | Okapi | 99 | 100 | NA |
| Cattle | 97 | 100 | XM\_010813308.2 |
| Water buffalo | 98 | 100 | XM\_006066888.1 |
| Tibetan antelope | 97 | 97 | XM\_005969878.1 |
| Yak | 98 | 100 | XM\_005888848.1 |
| Sheep | 98 | 100 | XM\_004013774.3 |
| Goat | 98 | 100 | XM\_005690770.2 |
| *Guanine nucleotide-binding protein* *G(t) subunit gamma-T1* (*GNGT1*) | Phototransduction | Okapi | 99 | 100 | NA |
| Cattle | 97 | 96 | NM\_174327.3 |
| Water buffalo | 96 | 96 | XM\_006078316.1 |
| Tibetan antelope | 97 | 97 | XM\_005954515.1 |
| Yak | 97 | 96 | XM\_005909692.1 |
| Sheep | 97 | 97 | XM\_012146569.2 |
| Goat | 97 | 97 | XM\_005678931.2 |
| *Guanylate Cyclase Activator 1A* (*GUCA1A*) | Phototransduction | Okapi | 99 | 99 | NA |
| Cattle | 98 | 99 | NM\_174546.2 |
| Water buffalo | 98 | 99 | XM\_006069193.1 |
| Tibetan antelope | 98 | 99 | XM\_005969656.1 |
| Yak | 98 | 99 | XM\_014479547.1 |
| Sheep | 99 | 99 | XM\_015089980.1 |
| Goat | 98 | 99 | XM\_013973784.1 |
| *Guanylate Cyclase Activator 1B* (*GUCA1B*) | Phototransduction | Okapi | 99 | 100 | NA |
| Cattle | 96 | 92 | U32856.1 |
| Water buffalo | 96 | 92 | XM\_006069194.1 |
| Tibetan antelope | 96 | 93 | XM\_005969657.1 |
| Yak | 96 | 92 | XM\_005900138.1 |
| Sheep | 96 | 93 | XM\_004018819.3 |
| Goat | 97 | 93 | XM\_005696310.2 |
| *Lumican* (*LUM*) | Structural property of the cornea | Okapi | 99 | 99 | NA |
| Cattle | 97 | 97 | NM\_173934.1 |
| Water buffalo | 98 | 98 | XM\_006062953.1 |
| Tibetan antelope | 97 | 98 | XM\_005959547.1 |
| Yak | 98 | 97 | XM\_014483083.1 |
| Sheep | 97 | 98 | XM\_012174076.2 |
| Goat | 97 | 98 | XM\_005679812.2 |
| *Long-wave-sensitive opsin-1* (*OPN1LW*) | Phototransduction | Okapi | 99 | 99 | NA |
| Cattle | 97 | 98 | NM\_174566.1 |
| Water buffalo | 97 | 98 | XM\_006043645.1 |
| Tibetan antelope | 96 | 98 | XM\_005957735.1 |
| Yak | 97 | 98 | XM\_005909080.1 |
| Sheep | 96 | 99 | XM\_004022260.3 |
| Goat | 96 | 98 | XM\_005701738.1 |
| *Short-wave-sensitive opsin-1* (*OPN1SW*) | Phototransduction | Okapi | 99 | 99 | NA |
| Cattle | 98 | 96 | NM\_174567.1 |
| Water buffalo | 98 | 96 | XM\_006074392.1 |
| Tibetan antelope | 98 | 97 | XM\_005981411.1 |
| Yak | 98 | 96 | XM\_005905247.1 |
| Sheep | 98 | 97 | XM\_004008047.3 |
| Goat | 98 | 97 | XM\_005679445.2 |
| *Phosphodiesterase subunit delta* (*PDE6D*) | Phototransduction | Okapi | 99 | 100 | NA |
| Cattle | 99 | 100 | NM\_174420.2 |
| Tibetan antelope | 99 | 100 | XM\_005978626.1 |
| Sheep | 99 | 100 | XM\_004005001.3 |
| Goat | 99 | 100 | XM\_005676672.2 |
| *Phospholipase C beta 4* (*PLCB4)* | Phototransduction | Okapi | 99 | 99 | NA |
| Cattle | 97 | 97 | NM\_001166510.1 |
| Water buffalo | 98 | 99 | XM\_006049745.1 |
| Tibetan antelope | 98 | 99 | XM\_005956022.1 |
| Sheep | 98 | 99 | XM\_004014147.3 |
| Goat | 98 | 99 | XM\_013968411.1 |
| *Retinol dehydrogenase 11* (*RDH11*) | Phototransduction | Okapi | 99 | 99 | NA |
| Cattle | 97 | 97 | XM\_005193708.3 |
| Water buffalo | 97 | 98 | XM\_006056173.1 |
| Tibetan antelope | 97 | 99 | XM\_005961538.1 |
| Yak | 97 | 97 | XM\_014481441.1 |
| Sheep | 97 | 99 | XM\_012181884.2 |
| Goat | 97 | 98 | XM\_005686002.2 |
| *Retinol dehydrogenase 12* (*RDH12*) | Phototransduction | Okapi | 99 | 99 | NA |
| Cattle | 95 | 95 | BC142243.1 |
| Water buffalo | 95 | 95 | XM\_006056172.1 |
| Tibetan antelope | 96 | 96 | XM\_005961535.1 |
| Yak | 95 | 95 | XM\_014481447.1 |
| Sheep | 96 | 97 | XM\_004010741.3 |
| Goat | 96 | 96 | XM\_005686006.1 |
| *RPE-retinal G protein-coupled receptor* (*RGR*) | Phototransduction | Okapi | 98 | 99 | NA |
| Cattle | 96 | 97 | NM\_175775.2 |
| Water buffalo | 95 | 96 | XM\_006072363.1 |
| Tibetan antelope | 95 | 96 | XM\_005972722.1 |
| Yak | 96 | 97 | XM\_005902591.2 |
| Sheep | 96 | 96 | XM\_004021531.3 |
| Goat | 96 | 96 | XM\_013975680.1 |
| *Rhodopsin* (*RHO*) | Phototranduction | Okapi | 99 | 99 | NA |
| Cattle | 95 | 96 | NM\_001014890.2 |
| Water buffalo | 96 | 97 | XM\_006078900.1 |
| Tibetan antelope | 95 | 97 | XM\_005955745.1 |
| Yak | 95 | 96 | XM\_005902834.1 |
| Sheep | 97 | 99 | XM\_012114315.2 |
| *Retinal Pigment Epithelium-Specific Protein 65kDa* (*RPE65*) |  | Okapi | 99 | 99 | NA |
| Cattle | 99 | 99 | NM\_174453.2 |
| Water buffalo | 99 | 100 | XM\_006052721.1 |
| Tibetan antelope | 99 | 100 | XM\_005978384.1 |
| Yak | 99 | 100 | XM\_005906391.1 |
| Sheep | 99 | 100 | XM\_004002070.3 |
| Goat | 99 | 100 | XM\_005678276.1 |
| *S-antigen* (*SAG*) | Phototransduction | Okapi | 98 | 99 | NA |
| Cattle | 96 | 96 | XM\_010803842.2 |
| Water buffalo | 96 | 97 | XM\_006041760.1 |
| Tibetan antelope | 97 | 97 | XM\_005962253.1 |
| Yak | 96 | 97 | XM\_005895006.1 |
| Sheep | 96 | 97 | XM\_015091843.1 |
| Goat | 96 | 97 | XM\_005678742.1 |