

Supplementary Information:

Unique Evolution of Antiviral Tetherin in Bats

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This PDF file includes:

SI Data 1

SI Data

Data SI 1. Multiple sequence alignment of 27 bat tetherin protein homologues of human I-tetherin.

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>Tetherin_(Cynopterus_sphinx)
MAPTWYHYFPVPMGDYSEKPALRDRKLP---GWLWIPLVLV---GLGLLV
A---LIIFIIKANSEACKDGLRAEQKCRNETHLLELQLTRAQESLVAAKA
QAASCNQTVETLKSSLEMEKAESQKQKLAQELQGEIRNLKQELEN----
-----TAA-----ELEQLRKEHEKN----
-GEKNGSTSF-----RDARSSLVVAVLLGLSFGALLA
>Tetherin_(Pteropus_alecto)_Isoform_A
MAPTLYHYFPVPMDDHSKVVLGNRNLP---RXLWILLVLV---ILGLTV
A---VIVLAVENSSEACKNGLQAEQKCRNETHLLKLQLTQTQESLGVAKA
QAASCNQTVGTLNSSLEMEKAESQKQRELAQKLQGEITNLTQQLKN----
-----TAA-----ELEQLRKEHAS-----
-GEKNGSTSS-----RNARSSLVVVLLSLSFRALLA
>Tetherin_(Pteropus_vampyrus)
MAPTLYHYFPVPMDDHSKVVLGDRKLP---GWLGILLVLV---ILGLIV
A---VIVLAVKANSEACKDGLQAEQKCRNTHLLELQLTQAQESLGVAKA
QAASCNQTVGTLKSSLEMEKAESQKQRELAQELQGEITNLTQQLKN----
-----TAA-----ELEQLRKEHAS-----
-GEKNGSTSS-----RNAGSSLVVVLLSLSFRALLA
>Tetherin_(Eidolon_helvum)
MAPTWYHYFPVPMDDHSEKLKLGNRKLP---GWLCILLVLV---ALGLLV
P---LIVFIIKANSEACKDGLRAEEKCRNKTDLLELQLTQAQESLVVAKD
QTALCNQTVGTLKLSLEMEKAESQKQRELAQELQGEIRNLKQKLEN----
-----TAA-----ELEQLRKEHAS-----
-GEKNGATSS-----RNARSSLVVAVLLSLSFIALLA
>Tetherin_(Eonycteris_spelaea)
MAPTLYHYFPVPMDDHPKRVLGNRKLP---KWLQILLVLA--ALLSLLV
P---LIFFAIKANSEACKDGLLAEQKCQNKTHLLELQLTQAQESLVVAED
QAVLCNRTVATLNSLEMEKAESQKQRELAQELQGEIWNLKQKLEN----
-----TMA-----ELEQLRKEHES-----
-DEKNGSTSS-----GNARSSLVVAVLLSLSFGALLA
>Tetherin_(Rousettus_aegyptiacus)
MAPALYHYFPVPMDDHSEKVVLRNRKML---KWLWILPVLA--LVLSLLV
A---LIVFAIEANSKACKDGLLAEQKCLNKTRLLELQLTQAQESLVVAEA
QAYLCNQTVGTLKSSLEMEKDESQKQRELAQKLQGENGNLQELEN----
-----MMA-----ELEQLRKEHAS-----
-DEKNGSTSS-----RNARSFLVVAVLLSLSFGALLA
>Tetherin_(Myotis_lucifugus)
MAPTFYCHPPVLMDEYPKK--MGDRKLPVREG---ILLGLL---VVGLFV
A---VGVLAAKANSPACKDGLRAEQECRNTHLLEQELTQAQEVLRGTEA
QAATCNQTVETLKISLKEEKAAGHKQQELVQKLQEEIKTLNQSLQN----
-----KSSELEKKSAELEQLRKENEAL----
-VSAKGPPDS-----GVSLHLSMAAVLLPLSLLVLLA
>Tetherin_(Myotis_brandtii)
MAPTFYCHPTVPMDEYPKK--LGDRKLPVREGIVGILLVVV---VGLSV
A---VGVLAAKANSPACKDGLPAEQECRNITHLLEQELTQAQEVLRTEA
QAATCNQTVETLKISLKEEKAAGHKQQELVQKLQEEIKTLNQSLQD----
-----KSAELEEKSSELEQLRKENEDL----
-VSAKGPPNS-----GITLRLSVAAVLLSLSLLTLLA
>Tetherin_(Myotis_davidii)
MAPTSYCHPPVPMDEYPKK--LGDRKLPVREGIVGILLGLL---VVGLSV
A---VGVLAAKANSPACNDGLRAEQECRNITHLLEQELTQAQEVLRGTEA
QSATCNQTVETLKISLKEEKAVGLRQQELVQKLQEEIKTLNQSLKD----
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-----KSAELEEKSTELGKLRKENEAL-----
-VSAKGPPNS-----GITLSFSVVAVLLPMSLLALLA
>Tetherin_(Myotis_myotis)
MAPTFYCHPPVPMDEYPKK--LGERKLPVREGIVGILLGLL---VVGLSV
A---VGVLAANKANSPACKDGLQAEQEQRNITHLLEQELTQAQEVLRGTEA
QAATCNQTVETLKISLKEEKAAGHKQQELVQKLQEEIKTLNQSLRD----
-----KSAADLEKKSAAEELQLRKENEAL-----
-VSAKGPPNS-----GITLSLSVAAVLLPLSLQALLA
>Tetherin_(Myotis_laniger)
MAPTFYCHPPVPMDEYPKK--LGDRKLPVREGIVWILLGLL---VVGLSV
A---VGVLAANKANSPACKDGLLAEQEQRNITHLLEQELTQAQEVLRGTEA
QAATCNQTVETLKISLKEEKAAGHRQQELVQKLQEEIKTLNQSLQE----
-----KSAELEEKKSAAEELQLRKENEAL-----
-VSAKGPPNS-----GITLSLSVVAVLLPMSLLALLA
>Tetherin_(Myotis_macropus)
MAPTFYCHPPVPMDEYPKK--LGDQKLPVREGIVWILLGLL---VVGLSV
A---VGVLAANKANSPACKDGLLAEQEQRNITHLLEQERTQAQEVLRGTEA
QAATCNQTVETLKISLKEEKAAGHRQQELVQKLQEEIKTLNQSLQE----
-----KSAELEEKKSAAEELQLRKENEAL-----
-VSAKGPPNS-----GITLSLSVVAVLLPMSLLALLA
>Tetherin_(Myotis_ricketti)
MAPTFYCHPPVPMDEYPKK--LGDQKLPVREGIVWILLGLL---VVGLSV
A---VGVLAANKANSPACKDGLLAEQEQRNITHLLEQERTQAQEVLRGTEA
QAATCNQTVETLKISLKEEKAAGHRQQELVQKLQEEIKTLNQSLQE----
-----KSAELEEKKSAAEELQLRKENEAL-----
-VSAKGPPNS-----GITLSLSVVAVLLPMSLLALLA
>Tetherin_(Murina_leucogaster)
MAPTFYCHPPVPMDEYPKK--LGDRKLPVREGIVGILLGLL---VVSLSV
A---VGVLAANKANSPACKDGLRAEQEQRNITHLLEQELTQAQEVLRGTEA
QAATCNQTVETLKISLKEEKAAGHRQQELVQKLQEEIKTLNQELQE----
-----KSA-----ELEQLRKENEAL-----
-VSAKGPPNS-----GITLSLSVVAVLLPMSLLALLA
>Tetherin_(Hipposideros_armiger)
MAPISYKYCPVSMDDNLSP--LQSRKLP---WWLWILLAVVLMVLVILIV
L---TIFFAVRANSKACKDGLQAEQEQRNIFTHLLEHQLTQANKVLLDAEI
WAATCNKTVETLTASLEMEKARGHKQQELVQKLQGEIAELKQKLQD----
-----TSK-----ELDRLRKETETS-----
-DTGNGSTTNGSTSTFGDTINLFVVSVLLTSLGALLA
>Tetherin_(Rhinolophus_ferrumequinum)
MAPISCHYRPVPMGDGLNS-VLGGRKAP---CWLVIIMLVVG---VGILLV
P---LSIFAVKANRESCDKGLLAEQKCNLTHLLEHQLTQAHNLLKMKMKN
QTATCNQTVVTLKASLEAEKAQGPKQQLLQELQGEIKKLKQKLQD----
-----TTT-----ELKQLRKKNEAS-----
-EEGKGSTSS-----GNTINPLVIHVLLTSLRALLA
>Tetherin_(Rhinolopus_macrotois)
MAPVSCHYRPVSMDDKLTST-VFGGHRPS---WWMVIVLVGVA---VVILFV
V---TSIFAAMANREACKDGLLAEQKCNLTHLLEHQLTQAQNVLLGMKI
QAATCNQTVVTLTASLETEKAHGHKQQELVQQQELQGEIEKLLKQKLQD----
-----TTT-----ELEQLRKKNDAS-----
-EGNGSTSS-----GNTINSLAIYVLLTSLGALLA
>Tetherin_(Taphozous_melanopogon)
-----MDDYLEKLLKLDCKLP---RWLGILLLLL---VVGEFV
L---LIIFGVRDSSNVCKDSLRAEQEQRNITHLLQHQLTQAQEVVLETEA
QAASCNKTVVTLMESLEKEKAQGHKQQELVQELQEEIEKLLKQELQD----
-----TGTEL-----ELERLRKKDESW-----
-GLKTNSNS-----GNILRPLAITVLLTCLRLLA
>Tetherin_(Carollia_brevicauda)
MTSTFYHYTLPLMGKNSRELMLGYYQLPRQLKILLALLGLL---VVGLSV

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A---TTIFAVQAFSPACKDGRRAEQECRNFTHLLQRQLTQAQDILLKTEA
QAATYNQTAETLMASLKVEQAQGQKLQEQVQELQEEIETLKQKLQDTTQK
LQDTTQKLQD-----TTQKLQGTAE LNQLRKDHESC-----
---GYDSTNS-----GNTLGLSVVAMLLTSLLDLLA
>Tetherin_(Carollia_perspicillata)
MTSTFYHYTLPLPMGKNSRELMLGYYQLPRQLKILLALLGLL---VVGLSV
A---TTIFAVQAFSPACKDGRRAEQECRNFTHLLQRQLTQAQDILLKTEA
QAATYNQTAETLMASLKVEQAQGQKLQEQVQELQEEIETLKQKLQDTTQK
LQDTTQKLQD-----TTQKLQGTAE LNQLRKDHESC-----
---SYDSTNS-----GNTLGLSVVAMLLTSLLDLLA
>Tetherin_(Desmodus_rotundus)
MTSTFYHYIPLPMSSENSRELMLEYHKLP---RWLGILLALLVLLVVGLLV
A---TIILAVQAHSACKDGRRAEQECRNFTHLLSQRTAQEILLKTKA
QAATYNQTVVTLMASLKVEQAQGQKLREQVQELQEEIKTLKQKLQDTTQK
LQVTTTELQNTTQKLQVTTAKLQVTTQKLQDTTTELNQLRKDHESF----
-GWNGSTSS-----GNTLSLSVVVLLLLTSLLDLLA
>Tetherin_(Macrotus_californicus)
MAPTFYHYVPLPMGDNSKMLMRGYKLP---KWLVI LLALLVLLVVGLLL
A---TITFAVQAHRPACKDGHRAEQECRNFTHLLSQQTQTQEILLKTKA
EAATYNQTVVTLMASLKVEQAQGQKLQEQVQELQEEIKTLKQKLQD----
-----TTQKLQDTTTELNQLREDQESF-----
-SRHHGSTSS-----GSTLSLSVVTMLLLTLRLLDLLA
>Tetherin_(Artibeus_jamaicensis)
MTSTFYHYTSLPSDENSREQMQGHYKIP---LWLSILLALL---GTGLVV
AMALAIIFYNQAHSACKDGFKMEQECQNVNTSLKSKLAQTQEILLKTEA
QAATYNQTAETLMASLKVEQAQGQMLQKQVQELQKEIKTLKQNLQD----
-----TTQKLQDTTQKLNQLRKDHES-----
-GPGKGPTDS-----GNTLSLSMISMLLLTSLLDLLA
>Tetherin_(Uroderma_bilobatum)
MTSTFYHYISLPLDENSREQMQGHYKMP---RWLLILLALL---VVGLVV
ASALAIYFAHQAHSPACKNGLKVEQECQNVTDLSKSKLAQTQEILLKTEA
QAATYNQTVAAQMASLKAERAQSQKLQEQVQELQKEIKTLKQKLQD----
-----TTQKLQDTTAE LNQLRKDHGSS-----
-SRGNPTSS-----ENTLSLSVVAMLLTSLLDLLA
>Tetherin_(Tadarida_basiliensis)
MAPTFY-YRPLSMDECSEYKQYWRP---RCLVITVFLM---LVSMSV
T---VIVLAVKLNSTACKNGLQAEQECRNRTHLLNQLTQTQ---LKTEV
QAATCNQTVATLMASLKKEKAQSDTQQLVQTLQEKIKELKQKLNT----
-----SPD-----QGLRKENEAS-----
-GGENSSTSF-----GNTLSRCVVTTLLAVSLQVLLA
>Tetherin_(Miniopterus_natalensis)
MAGTLYHHSVPVPMDDRSNNMLWCHRWL---KLLVIVPVMV-----VLIV
L---VIILANRLNSITCKDVLGAEQECQNITY-LEHQLNQAQRVLLLETN-
--ATCNQTVVTLMDSLKMEQAQGHKQQQLVQKLQEEIKELKQNVQN----
-----TSM-----ELERLRKWKETS-----
-GREEDSTSS-----GNTFSLCMVIVLLPLTLEVLLA
>Tetherin_(Miniopterus_schreibersii)
MAGTLYHHSVPVPMGDRSNNMLWCHRWL---KLLVIVPVMV-----VLIV
L---VIILANRPNGITCKDVLRAEQECQNITY-LEHQLNQAQRVLLLETN-
--ATCNQTVVTLMDSLKMEQAQGHKQQQLVQKLQEEIKELKQNLQN----
-----TSM-----ELERLRKWKETS-----
-GREEDSTSS-----GNTFSLCMVIVLLPLTLEVLLT