Supporting Information

**Table S1. Proposed nomenclature for the 65 members grouped in 14 subfamilies of long-chain NaTxs from *Tityus* genus scorpions.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Subfamily** | | | **Sequence** | **Charact.** | **NaTx - name** | **% Id.** | **Refs** |
|  |  | |  |  |  |  |  |
| **1** | Tz2 | | -KEGYLLDKS NGCKRSCFFG STSWCNTECK SKSAEKGYCA WPSCYCYGFS DDSKMWDLKT NKC-- | P\*T β | NaTx1.1 | 100 | [1] |
|  | TdNa6 | | -KEGYLLDRS NGCKRSCFFG STSWCNTECK SKSADKGYCA WPSCYCYGFT DDSKMWHLKT NKC-- | PT Arthr β | NaTx1.2 | 93 | [2] |
|  | **Tpa7** | | -KEGYPLDTL NGCKVGCFFG TNSWCNDKCK SKTAAKGYCA WPSCYCYGFT DDSKIWDLKK NKC-- | T β | NaTx1.3 | 77 | – |
|  | **To15** | | GKEGYPLDS- SGCKAGCFFG TNSWCNTECK RKSAAKGYCA WPSCYCYEFT DDSKIWNAKT NKCYK | T β | NaTx1.4 | 77 | – |
|  |  | |  |  |  |  |  |
| **2** | Ardiscretin | | -KNGYIIEPK GCKYSCFWGS STWCNRECKF KKGSSGYCAW PACWCYGLPD NVKIFDYYNN KC | PT Arthr β | NaTx2.1 | 100 | [3] |
|  | TdNa1 | | -RDAYPADWR GCKFSCFWGS SSWCNEECTS LGGSSGYCAW PACWCYGLPD SVRYYNNKCH K- | PT Arthr β | NaTx2.2 | 68 | [2] |
|  | TdNa2 | | -RDAYPADWR GCKPSCPWGS SSWCNEECTS LGGSSGYCAW PACWCYGLPD SVRYYNNKCH K- | T Arthr β | NaTx2.3 | 66 | [2] |
|  | TdNa3 | | -KNGYIIEPK GCKYSCSWGS STWCNRECKF KKGSSGYCAW PACWCYGLPD NVKIFDYYNN KC | PT Arthr β | NaTx2.4 | 98 | [2] |
|  | TdNa5 | | -KDGYIIEHR GCKYSCFFGT NSWCNTECTL KKGSSGYCAW PACWCYGLPD NVKIFDSNNN KC | T Arthr β | NaTx2.5 | 80 | [2] |
|  | Bactridin-1 | | -KDGYIIEHR GCKYSCFFGT NSWCNTECTL KKGSSGYCAW PACWCYGLPD NVKIFDSNNL KC | P Arthr Antm β | NaTx2.6 | 78 | [4] |
|  | **To5** | | SRSGYPVTQK GCVYSCFWGS NWWCNAECTA LGGSSGYCAW PSCWCYSLPD NRNIWGSYPN NC | PT Arthr β | NaTx2.7 | 62 | – |
|  | |  |  |  |  |  |  |
| **3** | | Ts3 | KKDGYPVE-- YDNCAYICWN YDNA-YCDKL CKDKKADSGY CYWVHILCYC YGLPD---SE PTKTNGKCKS --- | PT Mice **α** | NaTx3.1 | 100 | [5 - 9] |
|  | | Ts5 | KKDGYPVE-- GDNCAFACFG YDNA-YCDKL CKDKKADDGY CVWS-PDCYC YGLPEHILKE PTKTSGRC-- --- | P α | NaTx3.2 | 73 | [10] |
|  | | Tb3 | KKDGYPVE-- ADNCAFVCFG YDNA-YCDKL CGDKKADSGY CYWVHILCYC YGLPD---NE PTKTNGKC-- --- | P Mice α | NaTx3.3 | 88 | [11] |
|  | | TbTx5 | KKDGYPVE-- GDNCAFVCFG YDNA-YCDKL CKDKKADSGY CYWVHILCYC YGLPD---KE PTKTNGRCKP --- | T α | NaTx3.4 | 87 | [12] |
|  | | Tst3 | KKDGYPVE-- YDNCAYICWN YDNA-YCDKL CKDKKADSGY CYWAHITCYC YGLPD---SE PTKTNGKCKS --- | P α | NaTx3.5 | 96 | [13] |
|  | | TdNa8 | KKDGYPVK-- EGDCAFPC-G YDNA-YCDKL CKERKADSGY CYWGNILCYC YGLPD---KA AIKGYGRCRP --- | P\*T α | NaTx3.6 | 68 | [2] |
|  | | **Tpa4** | KKDGYPLE-- YDNCAYDCLG YDNK-KCDKL CKDKKADSGY CYWAHILCYC YGLPD---NE PIKTSGRCRP --- | T α | NaTx3.7 | 79 | – |
|  | | **To9** | KKDGYPVK-- EGDCAFPC-G YDNE-YCDKL CKERKADSGY CYWGNILCYC YGLPD---KA AIKGYGRCRP --- | T α | NaTx3.8 | 66 | – |
|  | | **To10** | KKDGYPV--- EGSCAFPC-G YDNA-YCDKL CKERKADSGY CYWVNILCYC YGLPD---NA AIKGYGRCKP --- | T α | NaTx3.9 | 74 | – |
|  | | **To14** | KKDDYPVDTA KRNCMLDCNV WDDEGYCDKF CKGRKADSGY CYKLKAACYC YGLPD---DS PTKTSGRCNP NVR | T α | NaTx3.10 | 59 | – |
|  | |  |  |  |  |  |  |
| **4** | | Ts6 | GREGYPADSK GCKITCFLTA AGYCNTECTL KKGSSGYCAW PACYCYGLPE SVKIWTSETN KC- | P Allerg α | NaTx4.1 | 100 | [14] |
|  | | TsNTxP | GREGYPADSK GCKITCFLTA AGYCNTECTL KKGSSGYCAW PACYCYGLPD SVKIWTSETN KC- | PT Immun α | NaTx4.2 | 98 | [15,16] |
|  | | TbIT-1 | GKEGYPVDSR GCKVTCFFTG AGYCDKECKL KKASSGYCAW PACYCYGLPD SVPVYDNASN KCB | P Ins β | NaTx4.3 | 70 | [17] |
|  | | Tf4 | GKEGYPADSK GCKVTCFFTG VGYCDTECKL KKASSGYCAW PACYCYGLPD SASVWDSATN KC- | P Frog **α** | NaTx4.4 | 77 | [18] |
|  | | TcoNTxP1 | GKEGYPADSK GCKVTCFLTA AGYCNTECKL QKASSGYCAW PACYCYGLPD SASVWDSATN KC- | PT α | NaTx4.5 | 82 | [19] |
|  | |  |  |  |  |  |  |
| **5** | | Ts2 | KEGYAMDHEG CKFSCFIRPA GFCDGYCKTH LKASSGYCAW PACYCYGVPD HIKVWDYATN KC | P Mice β | NaTx5.1 | 100 | [6,20,21] |
|  | | Tst2 | KEGYAMDHEG CKFSCFIRPA GFCDGYCKTH LKASSGYCAW PACYCYGVPD HIKVWDYATN KC | P Mice β | NaTx5.2 | 100 | [11] |
|  | | Tb2 | KEGYAMDHEG CKFSCFPRPA GFCDGYCKTH LKASSGYCAW PACYCYGVPS NIKVWDYATN KC | P β | NaTx5.3 | 95 | [11] |
|  | | Tb2-II | KEGYAMDHEG CKFSCFIRPS GFCDGYCKTH LKASSGYCAW PACYCYGVPS NIKVWDYATN KC | P Mice Ins β | NaTx5.4 | 95 | [17] |
|  | | **To12** | KEGYPMDHEG CKFSCFIRPS GFCERYCKTH LSASTGYCAW PACYCYGVPA NQKVWDYYNN KC | T β | NaTx5.5 | 82 | – |
| Table 2 (*continued*) | | |  |  |  |  |  |
| **Subfamily** | | | **Sequence** | **Charact.** | **NaTx - name** | **% Id.** | **Refs** |
|  | |  |  |  |  |  |  |
| **6** | | Ts1 | -KEGYLMDHE GCKLSCFIRP SGYCGRECGI KKGSSGYCAW PACYCYGLPN WVKVWDRATN KC | P Mice Ins. **β** | NaTx6.1 | 100 | [22 - 25] |
|  | | Tb1/Tb-gamma | -KEGYLMDHE GCKLSCFIRP SGYCGSECKI KKGSSGYCAW PACYCYGLPN WVKVWDRATN KC | PT Mice β | NaTx6.2 | 96 | [11] |
|  | | Tst1/Tst-gamma | GKEGYLMDHE GCKLSCFIRP SGYCGRECTL KKGSSGYCAW PACYCYGLPN WVKVWDRATN KC | PT Mice β | NaTx6.3 | 96 | [11] |
|  | | Tco-gamma | -KEGYAMDHE GCKLSCFIRP SGYCGRECGY KKGSSGYCAW PACYCYGLPN WVKVWERATN RC | T β | NaTx6.4 | 93 | [19] |
|  | |  |  |  |  |  |  |
| **7** | | TdNa9 | -RDGYPQSKV NYCKIYCPNT TVCQWTCKNR AGATDG--DC RWSSCYCFNV APDTVLYGDP GTKPCMA- | PT α | NaTx7.1 | 100 | [2] |
|  | | TdNa10 | -LDGYPLSKN NYCKIYCPNT EVCKDTCKRR AGATDG--EC RWDGCYCFNV APDTKMY--P GELPCH-- | T α | NaTx7.2 | 75 | [2] |
|  | | **Tpa5** | ARDGYPISKN NYCKIYCPNT KVCKETCKNR ASAPDGECDG -WNLCYCFKV PDNIPVWGDP GTPPCMT- | T α | NaTx7.3 | 67 | – |
|  | | **Tpa6** | ARDGYPLSKN NNCKIYCPDT DVCKDTCKNR ASAPDGKCDG -WNSCYCFKV PDHIPVWGDP GTKPCMT- | T α | NaTx7.4 | 67 | – |
|  | | **To6** | -LDGYPLSKN NYCKIYCPDE KVCKWSCKHR AGATNGKGDC INKGCYCYDV APGTEMY--P GRLPCNPY | PT α | NaTx7.5 | 60 | [26] – |
|  | | **To7** | -LDGYPLSKI NNCKIYCPDD DVCKWTCKHR AGATNGKGDC IWYGCYCYDV APGTKMY--P GSSPCYA- | PT α | NaTx7.6 | 64 | [26] – |
|  | |  |  |  |  |  |  |
| **8** | | **To13** | IKNGYPRDSK GCTFECGQDA KHGDDYCDKM CKTTLKGEGG DCDFEYAECW CDNIPDTVVT WKNKEPKCKQ I | T | NaTx8.1 | 100 | – |
|  | |  |  |  |  |  |  |
| **9** | | **Tpa8** | LKNGYPVIEG GGSPDYGESA ECGSEDSNSA DNFCNDICTN VGGKSGDCCL GSCFCFDLPD EQKTVEVMDR TKEYCEFVE | T | NaTx9.1 | 100 | – |
|  | |  |  |  |  |  |  |
| **10** | | **To8** | KEGYLLGSRG CKMNCLTRPE KFCELECSLV GGENGYCAYW LACYCYNVPE SVKLWESDTN EC | PT β | NaTx10.1 | 100 | [26] – |
|  | |  |  |  |  |  |  |
| **11** | | **Tc48a** | NKDGYLMEGD GCKMGCLTRK ASYCVDQCKE VGGKDGYCYA WLSCYCYNMP DSVEIWDSKN NKCGK | PT **α’** | NaTx11.1 | 100 | [26] |
|  | |  |  |  |  |  |  |
| **12** | | **Tc49b** | KKEGYLVGND GCKYGCITRP HQYCVHECEL KKGTDGYCAY WLACYCYNMP DWVKTWSSAT NKCK- | PT not **α** | NaTx12.1 | 100 | [27] |
|  | | **Tpa2** | KKEGYLVGND GCKYSCFTRP AQYCVHECEL RKGTDGYCYA WLACYCYNMP DHVRTWSRAT NRCGS | P **β** | NaTx12.2 | 82 | [28] |
|  | |  |  |  |  |  |  |
| **13** | | Td1 | KDGYLMEPNG CKRGCLTRPA RYCPNECSRL KGKDGYCYLW LACYCYNMPE SAPVWERATN RCGK | PT β | NaTx13.1 | 100 | [1] |
|  | | Td2 | KEGYLMGADG CKRSCLTRPG HYCANECSRV KGTDGYCYAW LACYCYNMPN WVKTWDRATN TCGR | P\*T β | NaTx13.2 | 70 | [1] |
|  | | Td3 | KDGYLMGPDG CKLDCLMRKG TFCAETCSLR KGKDGYCYAW LACYCYNMPD SVKVWERATN RCGK | P\*T β | NaTx13.3 | 71 | [1] |
|  | | Td6 | KEGYLMEANG CKRSCTLRPG HYCANECSYV KGKNGYCYAW VACYCYNMPD SVKIWDSATN TCGR | T β | NaTx13.4 | 67 | [1] |
|  | | Td10 | KDGYLMGPDG CKRGCLTRPA RYCPNECSRL KGKDGYCYLW LACYCYNMPE SAPVWERATN RCGK | T β | NaTx13.5 | 96 | [1] |
|  | | Td11 | KDGYLMGSDG CKLDCLMKKG TYCADECSRV KGKDGYCYLW LACYCYNMPD SVKVWERATN RCGK | T β | NaTx13.6 | 75 | [1] |
|  | | Td12 | KDGYLMEPNG CKRGCLTRPA RYCANECSRV KGTDGYCYAW LACYCYNMPN WVKTWDRATN TCGR | T β | NaTx13.7 | 81 | [1] |
|  | | TdNa7 | KDGYLMGPDG CKLDCLMRKG TFCAETCSLR KGKDGYCYAW LACYCYNMPD WVKTWERATN TCGK | PT β | NaTx13.8 | 67 | [2] |
|  | | **To4** | KDGYLMEYGG CKMSCLMKKG TFCAEECTRM KGKDGYCYAW LACYCYNMPD WVKIWNRATN KC-- | PT β | NaTx13.9 | 64 | [27] – |
|  | |  |  |  |  |  |  |
| **14** | | Tz1 | KDGYLVGNDG CKYSCFTRPG TYCANECSRV KGKDGYCYAW MACYCYSMPN WVKTWDRATN RCGR | PT **β** | NaTx14.1 | 100 | [29] |
|  | | **Tc48b/Tc49a** | KDGYLVGNDG CKYNCLTRPG HYCANECSRV KGKDGYCYAW MACYCYSMPD WVKTWSRSTN RCGR | PT **α’** | NaTx14.2 | 90 | [30] |
|  | | Td4 | KDGYLVGNDG CKYSCFTRPG TYCANECSRV KGKDGYCYAW MACYCYSMPN WVKTWDRATN RCGR | P\*T β | NaTx14.3 | 100 | [1] |
|  | | Td5 | KDGYLVGNDG CKYSCSTRPG HYCASECSRV KGKDGYCYAW LACYCYNMPN WAPIWNSATN RCR- | P\*T β | NaTx14.4 | 82 | [1] |
|  | | Td7 | KDGYLVGADG CKYGCFTRPG HFCASECSLL KGKDGYCYAW LACYCYNLPD SVPVWDSATN RCGK | T β | NaTx14.5 | 75 | [1] |
|  | | Td8 | KDGYLVGDDG CKMHCFTRPG HYCASECSRV KGKDGYCYAW LACYCYNMPN WAPIWNSATN RCR- | PT β | NaTx14.6 | 79 | [1] |
|  | | Td9 | KDGYLVGDDG CKMHCFTRPG HYCASECSRV KGKDGYCYAW LACYCYNMPN WAPIWNSATN SCGK | T β | NaTx14.7 | 78 | [1] |
|  | | Bactridin-2 | KDGYLVGNDG CKYSCFTRPG TYCANECSRV KGKDGYCYAW MACYCYSMPN WVKTWNRATN RCGR | P Mice Antm β | NaTx14.8 | 98 | [4] |
|  | | **To11** | KDGYLVGNDG CKYNCLTRPG HYCANECSRV KGKDGYCYAW MACYCYNMPN WVKTWSRATN KC-- | T | NaTx14.9 | 90 | – |

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