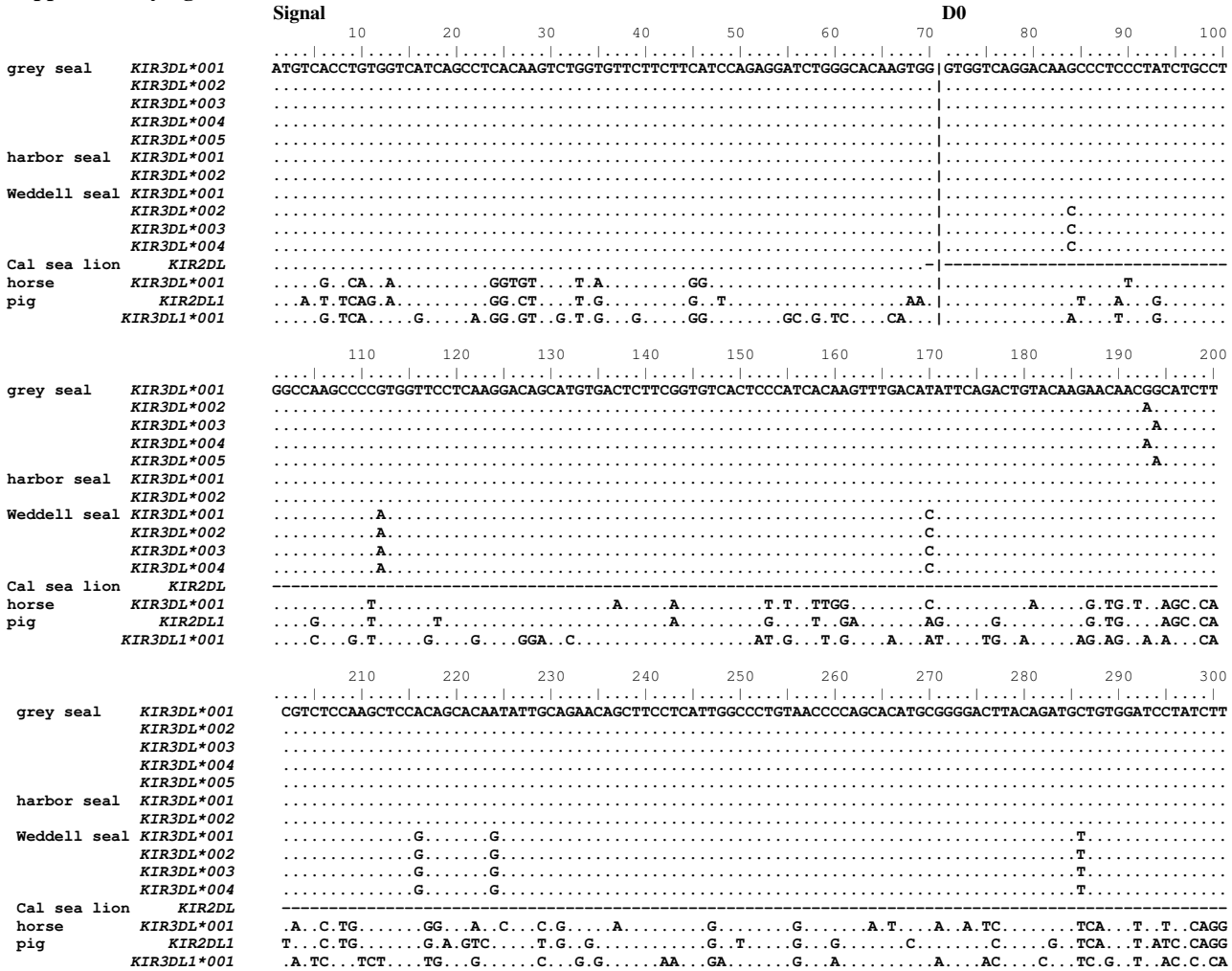


Supplementary figure 1.

(A). Full coding alignment of pinniped and selected species *KIR* cDNA sequences. Dots represent an identical residue to the first reference sequence. Domains are marked by vertical lines in the alignment and annotated above.

(B). Full coding alignment of pinniped and selected species *Ly49* cDNA sequences. Dots represent an identical residue to the first reference sequence. Domains are marked by vertical lines in the alignment and annotated above.

Supplementary figure 1A



D2

```

610      620      630      640      650      660      670      680      690      700
grey seal KIR3DL*001 CGCTCCTCCCAATAAGTGGTCTGCCCCAGTGGGCCCTGGACATCATGATCACAG|GTCTACACCAGAACCTTCTCTCTGGGCCAGCCGGGCACCGTGG
KIR3DL*002
KIR3DL*003
KIR3DL*004
harbor seal KIR3DL*005
KIR3DL*001
Weddell seal KIR3DL*002
KIR3DL*001 G A
KIR3DL*002 G A
KIR3DL*003 G
KIR3DL*004 G G
Cal sea lion KIR2DL A G A T A
horse KIR3DL*001 TA T G GA A AC A A A C CT A TA T A C
pig KIR2DL1 T T CA GG C TG
KIR3DL1*001 A A C T C T A T AT G G C T TG CA C AA

710      720      730      740      750      760      770      780      790      800
grey seal KIR3DL*001 TGAGGTCAGGAGAGAACGTGACCTTGCTCTGCTCGGAGATTCTTTGATGTGTACCATCTATCCAGGGATGGCAGCCCATGAGCTCTGGCTCGC
KIR3DL*002
KIR3DL*003
KIR3DL*004 A
KIR3DL*005
harbor seal KIR3DL*001
KIR3DL*002
Weddell seal KIR3DL*001
KIR3DL*002
KIR3DL*003
KIR3DL*004
Cal sea lion KIR2DL G T
horse KIR3DL*001 T T T A T GC A T A G G AT T
pig KIR2DL1 A C G C CA GCT AA AA AA T GATGG A
KIR3DL1*001 TCA G G TA CCG GC A CA G GGAG A GTA C

810      820      830      840      850      860      870      880      890      900
grey seal KIR3DL*001 TAAGGGGCAGAGGCATGGCGGTGCATCCAGGCTGACTTCACTTGGGCCCTGCACACCCAGCCCTGGGTGGGACCTACAGATGCTATGGCTCTTCAAC
KIR3DL*002
KIR3DL*003
KIR3DL*004
KIR3DL*005
harbor seal KIR3DL*001
KIR3DL*002
Weddell seal KIR3DL*001 C
KIR3DL*002 C
KIR3DL*003
KIR3DL*004
Cal sea lion KIR2DL C T TG C C T
horse KIR3DL*001 GGA C AAT T CAT C TGAC T ACAAC T C T
pig KIR2DL1 GGA CA C CA TGG A TA T GGAC ATA C T G C T
KIR3DL1*001 GCA T GC A GTCAA A AA T A T C CAC ----- AC A TC CGT
```

Stem

		910	920	930	940	950	960	970	980	990	1000
grey seal	KIR3DL*001	CCCTCTCCCTGTGAGTGGTCAGGCCCGAGTGACCCACTGTACCTTTCTGTACAG	GAAACTCTTCAAATAGTTGCCTCCTATCCACAAAACCAACCCCA								
	KIR3DL*002	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	KIR3DL*003	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	KIR3DL*004	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
harbor seal	KIR3DL*005	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Weddell seal	KIR3DL*001	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	KIR3DL*002	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	KIR3DL*003	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	KIR3DL*004	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cal sea lion	KIR2DL	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
horse	KIR3DL*001	AA.....	C.T.....	A.A.....	TG.....	T.....	G.....	G.T.....	C.....	TG.....	A.G.T.....
pig	KIR2DL1	A.....	ACAG.....	A.GT.....	C.....	T.....	A.....	G.....	G.T.....	C.....	TG.....
	KIR3DL1*001	A.....	AC.....	A.....	CTTG.....	.....	C.....	G.....	G.CTTC.....	C.....	G.....

Transmembrane

		1010	1020	1030	1040	1050	1060	1070	1080	1090	1100
grey seal	KIR3DL*001	AAACTG	GTAACCCAGACACCTGCATGTTCTGGCTGGGCCCTTAGTGCCATCATCTCCCTCGTGTCTCTTTCTTCCTCACTCGTCAGTGGTGCCC								
	KIR3DL*002	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	KIR3DL*003	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	KIR3DL*004	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	KIR3DL*005	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
harbor seal	KIR3DL*001	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	KIR3DL*002	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Weddell seal	KIR3DL*001	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	KIR3DL*002	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	KIR3DL*003	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	KIR3DL*004	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cal sea lion	KIR2DL	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
horse	KIR3DL*001	T.....	T.A.....	T.C.....	AT.....	T.T.G.....	T.A.C.....	A.....	T.A.....	C.....	.....
pig	KIR2DL1	T.....	C.....	G.....	T.T.CG.G.....	A.G.T.T.TCA.C.....	A.....	TC.A.TGC.....	CA.A.....	.....	.....
	KIR3DL1*001	T.....	CA.....	AT.....	A.C.....	T.....	C.T.....	ATCC.C.....	C.C.....	T.....	CT.A.TC.....

Cytoplasmic Tail

		1110	1120	1130	1140	1150	1160	1170	1180	1190	1200
grey seal	KIR3DL*001	TGCCAAGAGA	ATGCTGCTATAATGAACAGAGAGCCTGAGGTGGACAGAATGGTGAGCAGGGAGGACCCCTCAAGCAGAAGACCCACAGGAAGTGATATAC								
	KIR3DL*002	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	KIR3DL*003	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	KIR3DL*004	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	KIR3DL*005	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
harbor seal	KIR3DL*001	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	KIR3DL*002	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Weddell seal	KIR3DL*001	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	KIR3DL*002	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	KIR3DL*003	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	KIR3DL*004	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cal sea lion	KIR2DL	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
horse	KIR3DL*001	T.....	A.....	G.....	A.....	AT.....	G.G.A.....	G.....	C.....	.....	.....
pig	KIR2DL1	A.....	G.....	C.A.....	G.....	G.....	C.....	AT.C.....	G.....	GG.....	G.CAG.....
	KIR3DL1*001	CAA.....	A.A.....	G.....	G.CA.....	CA.G.A.....	CA.CC.A.....	C.....	T.....	G.T.A.C.....	TG.....

		1210	1220	1230	1240	1250	1260	1270	1280	1290	1300
grey seal	KIR3DL*001	ACACAGTTGGATCATTCATTTTATGCAGAAAAAACCACCTCCCACTTCCCGGAGGCCCGAGGAACCCCTGCATGATGATGGTGTGTACATGGAATTCA									
	KIR3DL*002	.....								
	KIR3DL*003	.....								
	KIR3DL*004	.....								
	KIR3DL*005	.....								
harbor seal	KIR3DL*001	.....								
	KIR3DL*002	.....								
Weddell seal	KIR3DL*001	.....								
	KIR3DL*002	.....								
	KIR3DL*003	.....								
	KIR3DL*004	.....								
Cal sea lion	KIR2DL	.....G.....T.....A.....CA.....C..G									
horse	KIR3DL*001	G.....									
pig	KIR2DL1	..G..G.....C..G.....C..CA.....T.....G.....A..C..A.....C..AC..ACCA..C.....TC..G									
	KIR3DL1*001	G.....C..G.....C..CA.....G.....T.....G..C.....T..A.....A..AC.....CCTACA..ACCATCT.....C.....C..TC									
		1310	1320	1330							
grey seal	KIR3DL*001	CAACATGC-----									
	KIR3DL*002	-----									
	KIR3DL*003	-----									
	KIR3DL*004	-----									
	KIR3DL*005	-----									
harbor seal	KIR3DL*001	-----									
	KIR3DL*002	-----									
Weddell seal	KIR3DL*001	-----									
	KIR3DL*002	-----									
	KIR3DL*003	-----									
	KIR3DL*004	-----									
Cal sea lion	KIR2DL	-----									
horse	KIR3DL*001	-----									
pig	KIR2DL1	...C...-----									
	KIR3DL1*001	...ATGCTAAGCCAGATCCAAGTTGTCTCCTGCCCCA									

Supplementary figure 1B

Cytoplasmic Tail

10 20 30 40 50 60 70 80 90 100

grey_seal Ly49*001 ATGAGCGATCAGCAAGTGATTTATTCCTCCCTGAGATTTCTTCAGTCTCCTTCAGAGTCACCAAATAGATTAAGGCCAGGTGGGACTCAAAGGCCTGGGA
 Ly49*002T.....
 harbor seal Ly49*001T.....
 Ly49*002T.....
 Weddell seal Ly49A.....T.....
 Cal sea lion Ly49A.....T.....C.....
 dog Ly49A..G..A..A.....T.....A.....G..A.AC.....C.....
 cat Ly49A.....A.....AG..T.A.....A.....C.....
 pig Ly49AT...C...G.....C.....TAG.....C.....CA..A.....A..T.....T.....A.....C.....

Transmembrane

110 120 130 140 150 160 170 180 190 200

grey_seal Ly49*001 AAAATGATGGCAAAGGTTTTCAGTGACCTGGCAT|ACTCATAGCAGTGATTTGGGATCTTGTGTTTACTACTATTGGTGACAGTCGCACATATTGGGGAC
 Ly49*002T.....
 harbor seal Ly49*001T.....
 Ly49*002T.....C.....C..G.....
 Weddell seal Ly49T.....G.....A.C.....C.....
 Cal sea lion Ly49G.....C..AA..A.....T.T.....C.....C..A.C.TT..T..CG.G.....
 dog Ly49C.....AG..A.....C.A.....T.....C.C.....C.....T..G.G.....
 cat Ly49G.C.....AA..A.....CT.....G..T.....C.C.....C..T..G.....A.....TAT.G.G.....
 pig Ly49

Stalk

210 220 230 240 250 260 270 280 290 300

grey_seal Ly49*001 A|AAGATTTTTCAGTATATTTCAAGAAAACCATCAGCTGGGGAAATGATAGGAAACCTGACTCGAGAACACCACATTTTGCAAAATGACAGCTACTTAAAG
 Ly49*002G.....
 harbor seal Ly49*001G.....
 Ly49*002G.....
 Weddell seal Ly49C.....G..T.....T.....G.....T.....
 Cal sea lion Ly49T.....C.....A..GT.....
 dog Ly49A.A.C..AT..A.....TT..G..A..GT...A..G.....C.....
 cat Ly49C.C.....G..A.....A.A.A.....TC..C.....C..A.A.A.GT...C..A.....G.A.....T.....
 pig Ly49

310 320 330 340 350 360 370 380 390 400

grey_seal Ly49*001 GAGCGACTTTTGACAAATATGACTTTAGAATATAACATTCTCAAAAATGAATCGCTTCAGCAGAAAAAGGAACAGGATTTACTGTTTCAGATAGGAGAT
 Ly49*002T.....
 harbor seal Ly49*001T.....
 Ly49*002T.....C.....
 Weddell seal Ly49A.....A.G.....AT.....C.....A..A.....CG.....
 Cal sea lion Ly49A.....A.T..G.....G.....GTG.....AGT.....T.A.G.....TA.AGAAAGGACAT..CCAGA
 dog Ly49A.....A..A.....G.....T.C..C..GAGAAAGGGATGTTGC.GAA..AT...G..T.T.CAAAGCC.T..C---
 cat Ly49
 pig Ly49

C-type lectin domain

```

          410      420      430      440      450      460      470      480      490      500
grey_seal Ly49*001 GTCAGAAAGAAAATGAA|GGCAAACCTCTATGAAAACCGCTGGTCTGTGTGGAAATAAAGTGTATTATTTTATTCCTGCAAGTAAAAACTGGAACGGATG
Ly49*002
harbor seal Ly49*001
Ly49*002
Weddell seal Ly49
Cal sea lion Ly49
dog Ly49
cat Ly49
pig Ly49

          510      520      530      540      550      560      570      580      590      600
grey_seal Ly49*001 TAAACAGACTTGCCAGAGTTATAATTCACTCTCTTTTGAAGATAAATGATGAAGATGAACTGGCCTTTATTCAACCCCAAACCTTAGGAATAACTACTGG
Ly49*002
harbor seal Ly49*001
Ly49*002
Weddell seal Ly49
Cal sea lion Ly49
dog Ly49
cat Ly49
pig Ly49

          610      620      630      640      650      660      670      680      690      700
grey_seal Ly49*001 ATTGGATTATCATATGATGATAGAGAACAATAATGGAAATGGATTGACACTGGTCCACCTTTTGGGATTAACATATGCATTCATGCGTTCTTCTGGAAGAG
Ly49*002
harbor seal Ly49*001
Ly49*002
Weddell seal Ly49
Cal sea lion Ly49
dog Ly49
cat Ly49
pig Ly49

          710      720      730      740      750      760      770      780      790      800
grey_seal Ly49*001 GA---CAATGTGCATTTTAAACCCCAACAAGAAATAGCAACTATTGAGTGCCTTAAGACCTACAATTGTATCTGTGAGGAGAGAATTGATGATGTTTTCTC
Ly49*002
harbor seal Ly49*001
Ly49*002
Weddell seal Ly49
Cal sea lion Ly49
dog Ly49
cat Ly49
pig Ly49

```


		810	820	830	840	850	860	870	880	890	900	
grey_seal	Ly49*001	TGCCTGCTTCAATATATACAAAGAAAAGAGAGCAC---AAGAGAGCACAAGCAGGGGGAGCGGCAGAAGCAGGCTCCCCGCGAGCAGAGAGACCGA										
	Ly49*002	.....G.....AGAGTGC.....T..T.....										
harbor seal	Ly49*001	.....G.....AGAGTGC.....T..T.....										
	Ly49*002	.....G.....AGAGTGC.....T..T.....										
Weddell seal	Ly49	..T.....G.....A.AGCAC.....A.....G.....A.T.G.....T...										
Cal sea lion	Ly49	.....C.....C.A.G.....G.....										
dog	Ly49	.....C.....AT..T.....A.T.....										
cat	Ly49	C-----										
pig	Ly49	-----										

		910	920	930	940	950	960	
grey_seal	Ly49*001	CACAGGGCTTGATCCCAGGACCCCAGGACCCCAGGACCCCAGGACCCCAGGACCCCAGGACCCCAGGATCCTACC						
	Ly49*002	.....					
harbor seal	Ly49*001	.....					
	Ly49*002	.....					
Weddell seal	Ly49	.....					
Cal sea lion	Ly49	.G.....						
dog	Ly49	-----						
cat	Ly49	-----						
pig	Ly49	-----						