

S1 Table: List of genes used for analysis

Phylum/class	Species	Protein	Uniprot / NCBI code	PDB
Arthropoda/insecta	<i>Acyrtosiphon pisum</i>	NC (comp)	J9JTU7	
	<i>Aedes aegypti</i>	GABAr1 (comp) Ho	Q16896	
	<i>Anopheles gambiae</i>	nAChR α 9 (comp)	Q7PSA8	
	<i>Apis mellifera</i>	pHCl (comp)	A0A088AFF8	
		GABAlcch3 (comp)	A0A088A2R0	
		GABAgrd (comp)	A0A087ZPX8	
	<i>Bombyx mori</i>	GluCl3b (comp)	V9P9S1	
		GABAgrd (comp)	E0X9H5	
	<i>Culex quinquefasciatus</i>	nAChR α 4 (comp)	B0W5Q9	
	<i>Drosophila melanogaster</i>	nACh α 1 (comp) He	P09478	
		nACh β 1 (comp) He	P04755	
		GluCl α (comp) Ho	Q94900	
		pHClA (frag) Ho	Q5D6W1	
		HisCl1 (comp) Ho	Q9VGI0	
		HisCl2 (comp) (ort)	A1KYB3	
		Ho		
		GABAr1 (comp)	P25123	
		Ho/He		
		GABAlcch3 (comp)	Q08832	
		He		
	GABAgrd (comp) He	Q24352		
	<i>Locusta migratoria</i>	nACh α 8 (comp)	W6EAG0	
	<i>Microplitis demolitor</i>	nACh α 1 (comp)	XP_008553229	
		nACh α 2 (comp)	XP_008549166	
		nACh α 7 (comp)	XP_008560787	
	<i>Musca domestica</i>	GABAr1 (comp) Ho	Q75NA5	
	<i>Nasonia vitripennis</i>	nACh α 11 (comp)	D3UA23	
		GluCl (comp)	D3UAF9	
		pHCl (comp)	D3UAF2	
		HisCl1 (comp)	D3UAF0	
		GABAlcch3 (comp)	D3UAF7	
	<i>Tribolium castaneum</i>	nACh α 10 (comp)	A8DIV1	
		pHCl (comp)	A8DMU9	
HisCl1 (comp)		A8DMU7		
HisCl2 (comp)		A8DMU8		
GABAlcch3 (comp)		A8DMU3		
GABAgrd (comp)		A8DMU2		
Arthropoda/arachnida	<i>Dermacentor variabilis</i>	GluCl10-2 Ho	US patent 7267964	
		GluCl1-GluCl11 Ho	US patent EP2009021	
	<i>Ixodes ricinus</i>	nACh1 (comp)	V5H4U2	
		nACh2 (frag)	V5HYY9	
	<i>Ixodes scapularis</i>	nACh α 1 (frag)	A0A088BD75	
		GluCl1 (frag)	R9S2C9	
		GluCl2 (frag)	R9S0M9	
		GluCl3 (frag)	B7Q8K2	
		Gly α 1 (frag)	B7P8W0	
		HisCl (frag)	R9S1B2	
	GABA α (comp)	B7PLP1		

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		GABA _A 1 (comp)	B7Q4M3	
		GABA _A 2 (frag)	R9S1A7	
		GABA _A 3 (frag)	B7Q4M8	
	<i>Metaseiulus occidentalis</i>	nACh α 1A (comp)	XP_003745665	
		nACh α 1B (comp)	XP_003738108	
		nACh α 1C (comp)	XP_003738107	
		Gly α 2 (comp)	XP_003748161	
		GABA _A α (comp)	XP_003747426	
		GABA _A β (comp)	XP_003747411	
	<i>Pardosa pseudoannulata</i>	nACh α 1 (comp) He	D6QYZ4	
		nACh α 8 (comp) He	D6QYZ5	
		nACh β 1 (comp) He	C7EA46	
	<i>Rhipicephalus microplus</i>	GABA _A (comp)	C8CGT5	
	<i>Rhipicephalus pulchellus</i>	nACh (frag)	L7MKP0	
		GABA _A (comp)	L7LVP4	
		Gly α 3 (comp)	L7M4K6	
	<i>Rhipicephalus sanguineus</i>	nACh α 1 (comp) He	V9Z9T0	
	<i>Sarcoptes scabiei</i>	pHCl (frag) Ho	A8SDR1	
	<i>Stegodyphus mimosarum</i>	nACh α 2 (frag)	A0A087UEE3	
		nACh α 7 (frag)	A0A087U1S9	
		nACh α 10 (frag)	A0A087U0W4	
		nACh β 3 (frag)	A0A087TJD1	
		GABA _A α (frag)	A0A087TN57	
		GABA _A β 1 (frag)	A0A087TN58	
		GABA _A β 2 (frag)	A0A087TN61	
		GluCl1 (frag)	A0A087TG26	
		GluCl2 (frag)	A0A087UMK3	
		GluCl3 (frag)	A0A087UMK5	
		GluCl4 (frag)	A0A087UMK6	
		Gly α Z1 (frag)	A0A087UNJ7	
		Gly α Z2 (frag)	A0A087UNJ8	
	<i>Tetranychus urticae</i>	nACh α 3 (comp)	T1JSJ8	
		nACh α 7 (comp)	T1KYX4	
		nACh β 1 (comp)	T1KCW6	
		GluCl1 (frag)	H9U2V4	
		HisCl1 (comp)	T1KWX0	
		pHCl (comp)	T1K9D2	
		GABAr12 (comp)	T1L3N8	
Arthropoda/Chilopoda	<i>Strigamia maritima</i>	NC2 (comp)	T1JOD0	
Arthropoda/crustacea	<i>Daphnia pulex</i>	NC1 (comp)	E9HDH4	
		NC2 (comp)	E9H343	
Nematoda/Chromadorea	<i>Caenorhabditis elegans</i>	nACh β 3 (comp) He	Q93149	
		GluCl α (comp)	G5EBR3	3rhw
		Ho/He/B		4tnw
Annelida	<i>Capitella teleta</i>	AChBP (comp) B	I6L8L2	
Mollusca/gastropoda	<i>Lymnaea stagnalis</i>	GABA _A β (comp) He	P26714	
		AChBP (com) B	P58154	1i9B
	<i>Sepia officinalis</i>	GABA _A β (comp)	Q9GYU4	
Chordata/elasmobranchii	<i>Torpedo marmorata</i>	nACh α (comp) B	P02711	2bg9

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Chordata/mammalia	<i>Homo sapiens</i>	nACh α 7 (comp) Ho	P36544	
		nACh α 9 (comp) He	Q9UGM1	4do1
		nACh β 3 (comp) No	Q05901	
		GABA $_A$ α 2 (comp)	P47869	
		GABA $_A$ β 3 (comp) Ho	P28472	4cof
		Gly α 1 (comp) Ho	P23415	
		Gly α 2 (comp) Ho	P23416	
	<i>Mus Musculus</i>	5HT $_3$ A Ho	P23979	4Pir

NC = uncharacterized, “comp” indicates complete genes and “frag” gene fragments. NCBI codes are shown in italics for sequences where Uniprot codes are not available. PDB; protein data bank code.

Ho = formed homomultimeric channels in expression systems, He= heteromultimeric channels in expression system, B= ligand binding tested. lcch3 = ligand gated chloride ion channel homolog 3. rdl = resistance to dieldrin. grd = GABA and glycine-like receptor.