

S. japonica -----
S. lycidas -----ACATGGGC-----
S. pharaonis -----
S. lessoniana ATAGGGCAAGCAGTGGTATCAACGCAGAGTACATGGGGAGTGATCTCCCTATTTAAGCG
U. edulis -----

S. japonica -----ACTTACTTTTCTCTCATCCCTCGAAGAAGAC-AAAGAA
S. lycidas -----ACTTCCTTTACACTCGTCCCTCGAAGAAGACAAAAGAA
S. pharaonis -----ACTTCCTTTACACTCGTCCCTCGAAGAAGACAAAAGAA
S. lessoniana AAGATCTCATAGAAATTCCTTCACTTTCCCTTCTCTCATCTCTTGAAG-----ACAAA
U. edulis -----CATCTTTTGAAG-----ACAAA
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S. japonica CAGTTGAAATCTCCATCATCAGG--TAAACATCTACCAGCCAGTATAATCATGTCAACCA
S. lycidas CACTTCAAATCTCCATCATCAGC--TAAACATCTACCAGACAGTATTATCATGTCAACCT
S. pharaonis CACTTCAAATCTCCATCATCAGC--TAAACATCTACCAGACAGTATTATCATGTCAACCT
S. lessoniana CTCTCCAAG-CTTAATCGT[CAGAGTCAGACAACCTGCCAACCAAGA]GTATCATGTCAACCT
U. edulis CACCGCAAGCTTAATCGTCAGA--CAACTATTT-CCAGCCAG--CATCATGTCAACCT
 *

S. japonica CTGCACTCTCGTCCAACCTTGAGAAAAATGGCCTTTCTCACCTGTGCCATTCTCTCTCTGT
S. lycidas CCACAGCCTCGTCCAGCCTGAGAAGAATGGCCTTTTTCACCTGTGCTATTCTTCTCTCT
S. pharaonis CCACAGCCTCGTCCAGCCTGAGAAGAATGGCCTTTTTCACCTGTGCTATTCTTCCCTCT
S. lessoniana [GCCCAGTCTCTTCCACTCTAAGGAAAAATGGTTTTCTGACCTGC]ACTATCCTCTCTGT
U. edulis CCCCAGTCACTTCCACTCTCAGAAGAATGGTCTTCTGACCTGCGCCATCTTCTCTCTGT
 *

S. japonica CTTTCTGCATGCAATACAAGCACAGAATTACCATTTTAGCAATGGATGGCACCCCTGGTG
S. lycidas CTTTCTGCATGCATATCCAGGCACAGAATTACCATTTTAGCAATGGATGGCACCCCTGGTG
S. pharaonis CTTTCTGCATGCATATCCAGGCACAGAATTACCATTTTAGCAATGGATGGCACCCCGGTG
S. lessoniana [CTTTGTGCATGCAGACACAGGCACAGAATTACCATTTTAGCAATGGATGGCACCCCTGGCG
U. edulis CTTTGTGCATGCAGACACAGGCACAGAATTACCATTTAGCAACGGATGGCACCCCTGGCG
 **** *

S. japonica GTAAACGAAGTGGACTTCCAGACATGCAGTGTCAATTTAGACCCCAACAAAAGCTTTGA
S. lycidas GTAAACGAAGTGGACTTCCAGACATGCAGTGTCAATTTAGACCCCAACAAAAGCTTTGA
S. pharaonis GTAAACGAAGTGGACTTCCAGACATGCAGTGTCAATTTAGACCCCAACAAAAGCTTTGA
S. lessoniana [GTAAACGAAGTGGAAATTCAGACATGCAGTGTCTGTT]CAGACCCAGACGAAAGCTTTGA
U. edulis GCAAAACGTAGTGGAAATTCAGACATGCAGTGTCAATTTAGACCCCAACAAAAGCTTTGA
 *

S. japonica TCGAGAACTCTTAGACGAGGAAATCACTCGTATAATTACTACATGTACCAATACAGTCA
S. lycidas TCGAGAACTCTTAGACGAGGAAATCACTCGTATAATTACTACATGTACCAATACAGTCA
S. pharaonis TCGAGAACTCTTAGACGAGGAAATCACTCGTATAATTACTACATGTACCAATACAGTCA
S. lessoniana [TAGAGAACTCTTAGACGAGGAAATAACTCGTA]TACTCACCACCTGCACCAAGACTGTCA
U. edulis TAGAGAACTCTTAGATGAGGAAATTAATCGTATACTAACCACCTGCACCAACACCGTCA
 *

S. japonica ATGACATTGCAGACTTGCAGTGATACTTCA---CAGGTCAAGCAAATTCAGTGGATATGC
S. lycidas ATGACATCGCAGACTTGCAGTAATTTTCA---CAGGTCAAGCAAATTCAGTGGATATAC
S. pharaonis ATGACATCGCAGACTTGCAGTAATTTTCA---CAGGTCAAGCAAATTCAGTGGATATAC
S. lessoniana ATGACATCACAGACTTGCATAAA-ACTTCA---CAAGTTGAATAAATTCACCGAATGTGG
U. edulis ATGACATTGCAGACTTGCATAAA-AAATCACAGCAGGTCAAATAAATTCGCCAAATGAGG
 *

S. japonica AACCACCAAATA--AACTGACCAAAGCTGGAAGGCTAACATTTACAGAAAAAGATCAA
S. lycidas AACTACCAAAAAATAAACTGACCAAAGCTGGAATGCTAAAATTTACAGAAAAAGACGAA
S. pharaonis AACTACCAAAA-----
S. lessoniana AACCAACAAA-----AACTGACC-AAGTTGAAATGCTAAAATTAATAAATTTGAA
U. edulis AACCAACAAA-----AACTGATC-AAGCTAAAATGCTAAAATTTAA-----
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S. japonica CTTTATGATTTTTAATTATTGATAAAACCAAGACAATTTCT-----TATATATA
S. lycidas CTTTATGATTTTGAATTATTGATAAAACCAAGACACTTTATAACATTATATATATGTG
S. pharaonis -----
S. lessoniana ACTTATGATCTTCAATTATTGATAAACCAAAAGACTCC-----
U. edulis -----

S. japonica TATATATATATATATATATATATATATATAA-----TACACACACCTGCTGAACAG
S. lycidas TATATATATATATATATATATATATATATATACACACTCACACTTACCTGCTGAAGAG
S. pharaonis -----
S. lessoniana -----CATATATATATATATATATATAC-----TCAAAACA
U. edulis -----

S. japonica AACTGTCAAAACACTGTA-----ATATACAGAGCTATATATGTAGATCATAGGACTT--
S. lycidas AACTGTCAAAACACTGTAT-----TATAAACAGAGCTATATATGTAGATCATAGGATTA--
S. pharaonis -----
S. lessoniana GACTGTGAGAACATTATGTATTATATATAGAGAGCTATATATGTAGATCATTGGACTATA
U. edulis -----

S. japonica -----TATATGATATTACTTATATATTCATTATAATATCATGAAATAAA
S. lycidas -----TATATGATATTACTTATATATTATTATAATATCATGAAATAAA
S. pharaonis -----
S. lessoniana TTCTAAATAGCTACTGTATATGATATTGCTTATACATTGATGCTGATATCATGAAATAAA
U. edulis -----

S. japonica AAGTTAAACTAAAAAAAATGGTGATTTCTGTACAAATATAAAAAAAA
S. lycidas AAGTTAAAAATCTCAAAA-----AAAAAAA
S. pharaonis -----AAAAA-----AAAAAAA
S. lessoniana ATGTTAAAAATCCCAAAAA-----AAAAAAA
U. edulis -----AAAAA-----AAAAAAA
 *

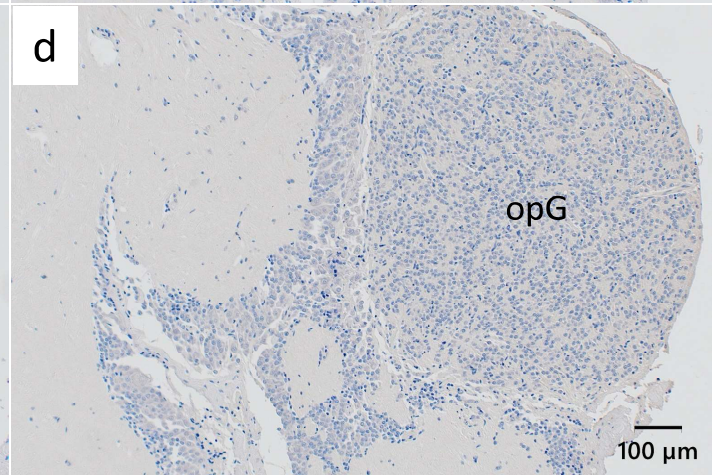
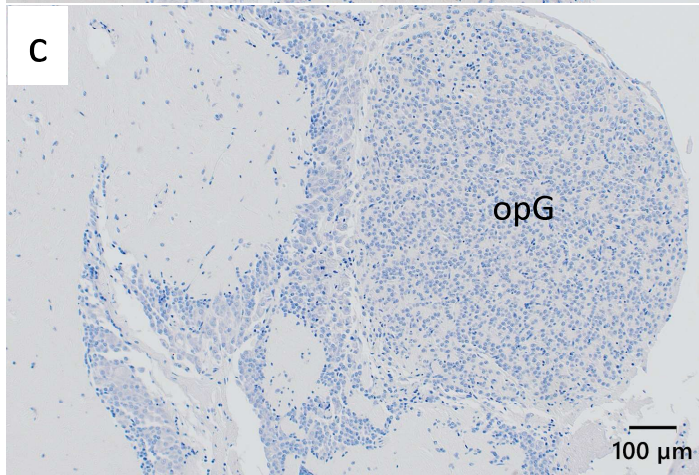
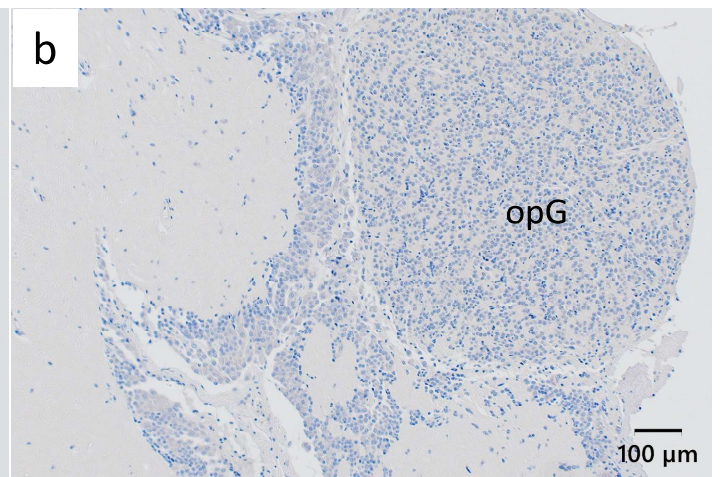
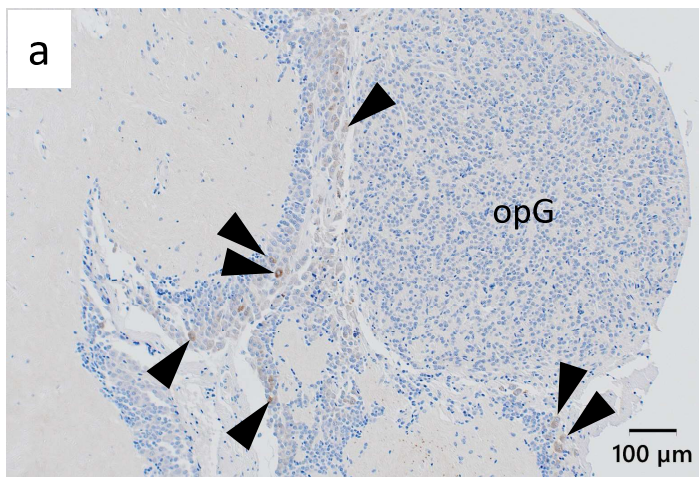
(A)

	Nucleotide sequence identity	Amino acid sequence identity	similarity
<i>U. edulis</i>	87%	92%	94%
<i>S. japonica</i>	82%	87%	90%
<i>S. lycidas</i>	81%	83%	87%
<i>S. pharaonis</i>	82%	82%	86%
<i>O. vulgaris</i>	-	69%	80%

(B)

<i>S. lessoniana</i>	Q	N	Y	H	F	S	N	G	W	H	P	G	G	K	R
	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<i>U. edulis</i>	Q	N	Y	H	F	S	N	G	W	H	P	G	G	K	R
	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<i>S. japonica</i>	Q	N	Y	H	F	S	N	G	W	H	P	G	G	K	R
	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<i>S. lycidas</i>	Q	N	Y	H	F	S	N	G	W	H	P	G	G	K	R
	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<i>S. pharaonis</i>	Q	N	Y	H	F	S	N	G	W	H	P	G	G	K	R
	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<i>O. vulgaris</i>	Q	N	Y	H	F	S	N	G	W	H	P	G	G	K	R
	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<i>M. yessoensis</i>	Q	N	F	H	Y	S	N	G	W	Q	O	G	K	R	-
	*	*		*		*	*	*	*			*			
<i>A. californica</i>	Q	N	Y	H	F	S	N	G	W	Y	A	G	K	K	R
	*	*	*	*	*	*	*	*	*			*		*	*

Additional file 2



Additional file 3