

(a)

Amino acid position	1	2	2	2	2	4	5	5	6	6	6	9	0	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	3	3	3	
	6	7	3	4	5	8	0	1	4	0	4	7	6	3	4	9	4	4	9	4	7	9	0	1	6	4	8	3	4	5	7	4	5	7
<i>S. j.boettgeri</i>	N	N	K	E	T	A	E	V	L	V	V	V	L	V	F	I	M	A	A	D	I	S	C	A	H	I	A	V	T	F	A	S	I	A
<i>O. hannah</i>	.	D	R	.	.	.	.	I	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
<i>L. semifasciata</i>	.	D	.	Q	.	V	.	.	I	I	.	.	.	.	F	L	.	.	.	.	A	.	S	.	.	.	.	I	.	.	.	L	S	
<i>L. laticaudata</i>	.	D	.	Q	S	V	A	.	I	I	A	.	L	.	F	L	.	.	.	.	A	.	S	.	.	.	.	I	A	.	.	L	S	
<i>L. frontalis</i>	.	D	.	Q	S	V	.	.	I	I	.	.	.	.	F	L	.	.	.	.	A	.	S	.	.	.	V	I	.	.	P	.	P	
<i>L. colubrina</i>	.	D	.	Q	S	V	.	.	I	I	.	.	.	.	F	L	.	.	.	.	A	.	S	.	.	.	.	I	.	.	P	.	P	
<i>N. scutatus</i>	.	D	.	.	.	.	.	I	.	I	I	.	I	.	V	.	.	.	.	.	.	.	T	.	.	.	.	.	.	.	A	L	.	
<i>E. ijimae</i>	.	D	.	.	.	.	.	.	I	.	.	I	.	I	.	L	V	.	G	.	.	A	I	.	.	.	.	.	.	.	A	L	.	
<i>H. platyrus</i>	.	D	.	.	.	T	.	.	I	.	.	I	.	I	.	.	V	.	G	M	A	S	F	H/N	.	A/V	.	A	S	.	A	L	S	
<i>H. melanocephalus</i>	.	D	.	.	.	.	.	.	I	.	.	I	.	V	.	.	V	G	G	.	.	S	I	.	T	.	.	.	.	.	A	L	.	
<i>H. peronii</i>	D	D	.	.	.	.	.	.	I	.	.	I	.	V	.	.	V	G	G	.	.	S	I	.	.	.	.	.	.	.	A	L	.	
<i>H. ornatus</i>	.	D	.	.	.	.	.	.	I	.	.	I	.	V	.	.	V	G	G	.	.	S	I	.	.	.	.	.	.	.	A	L	.	
Amino acid position in bovine RH1																							1	1				2			2			
																							6	8				6			9			
																							4	1				9			2			

(b)

Amino acid position	1	1	3	3	6	8	8	0	3	4	5	5	5	6	7	8	9	1	1	1	2	2	2	2	2	2	2	3	3	3
	1	9	5	6	0	1	5	4	3	6	0	4	5	0	3	9	8	3	7	8	5	9	3	2	0	4	1			
<i>S. j.boettgeri</i>	I	I	W	K	Y	I	F	V	V	F	E	I	M	T	I	V	V	V	T	V	R	E	M	S	I	V	K			
<i>O. hannah</i>	V	.	.	.	.	V	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
<i>L. semifasciata</i>	V	.	.	.	.	V	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
<i>L. laticaudata</i>	V	.	.	.	.	V	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
<i>L. frontalis</i>	.	.	.	.	.	V	.	.	I	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
<i>L. colubrina</i>	.	.	.	.	.	V	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
<i>N. scutatus</i>	V	.	C/W	Q	F	.	F/L	.	.	F/L	Q	V	I	S/T	.	.	.	.	I	I	.	.	I/M	A	V	.	R			
<i>E. ijimae</i>	V	V	.	.	F	.	.	.	.	.	Q	V	.	.	V	I	.	I	I	I	.	.	.	A	V	.	.			
<i>H. platyrus</i>	V	V	.	Q	F	.	.	.	.	.	Q	.	.	.	V	.	I	I	I	I	.	.	.	A	V	.	.			
<i>H. melanocephalus</i>	V	V	.	Q	F	.	.	.	.	.	Q	.	.	.	V	.	I	I	I	I	.	.	.	A	V	.	.			
<i>H. peronii</i>	V	V	.	Q	F	.	.	I	.	.	Q	.	.	.	V	I	I	I	I	I	S	G	.	A	V	M	.			
<i>H. ornatus</i>	V	V	.	Q	F	.	.	.	.	.	Q	.	.	.	V	.	I	I	I	I	.	.	.	A	V	.	.			
Amino acid position in bovine RH1																								2	9	2				

(C)

Amino acid position	1	1	1	1	1	3	4	5	5	7	8	8	8	8	0	0	0	0	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
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Fig. S1 Alignments of (a) LWS, (b) RH1, and (c) SWS1 amino acid sequences