

Figure S7

G51	147	VHLI	H-NI-QF	N	G	Q-VEIFF	EDTIKREG	TNLHVR	SKSDIAYI	VYSGTIG	NKGTMI	EHKGIS	LKVEFENS	LV	220
fruitfly	145	DAGR	P-QGPR	STELVA	KSLQAGS	NL	LSEMLG	GNDDHAI	VYSGI	QKVR	PHESTL	NRQWATIE	PF	221	
S.mansoni	211	YDFI	Y-DDHND	NKMSDLS	DNNS	SLRKL	SNDFFI	IGNLQ	KLTFQ	LFQ	VYVY	IKMLK	SKYVS	353	
S.haematobium	219	YDFI	Y-DDHND	NKMSDLS	DNNS	SLRKL	SNDFFI	IGNLQ	KLTFQ	LFQ	VYVY	IKMLK	SKYVS	353	
S.japonicum	243	YDFH	Y-DDHND	NKMSDLS	DNNS	SLRKL	SNDFFI	IGNLQ	KLTFQ	LFQ	VYVY	IKMLK	SKYVS	305	
planarian	142	DILL	3-DNLS	Q	NENEI	TLKRF	SNDFFI	IGNLQ	NEKTFQ	SDIK	VYVY	IKMLK	SKYVS	272	
tapeworm	142	DILL	3-DNLS	Q	NENEI	TLKRF	SNDFFI	IGNLQ	NEKTFQ	SDIK	VYVY	IKMLK	SKYVS	272	
ameioid	161	AEV	5-DNLS	T	WDL	LD	Y	WDL	LD	Y	WDL	LD	Y	207	
ameioid	131	AEV	5-DNLS	T	WDL	LD	Y	WDL	LD	Y	WDL	LD	Y	207	
rotifer	176	PDSR	K-TN-AM	G	DA	AKES	ADIFAE	EL	CGS	BP	WPH	SCGL	NR	197	
cnidarian	131	AAQR	K-OT-DL	T	SYOL	LN	SCG	AV	PHAL	NRL	YOMSR	PE	F	209	
hemichordate	147	CVEMGR	VQO-IQ-SE	KRPD	F	PS	DDVED	DI	YQSF	H	DT	YQSF	H	209	
G51	221	TE	K-DR	LCQEA	LS	EDAS	MEMA	LT	EAS	YL	IL	KDT	IN	FE	221
fruitfly	221	TE	NEA	SVF	ALS	EDAS	MEMA	LT	EAS	YL	IL	KDT	IN	FE	221
S.mansoni	354	NSNT	SVR-R	GLAK	TAWG	ADAT	EL	ESCL	AG	VV	PGCS	AC	SEK	SV	491
S.haematobium	354	NSNT	SVR-R	GLAK	TAWG	ADAT	EL	ESCL	AG	VV	PGCS	AC	SEK	SV	491
S.japonicum	393	SSNI	SVK-R	GLAK	TAWG	ADAT	EL	ESCL	AG	VV	PGCS	AC	SEK	SV	501
planarian	293	SSNI	SVK-R	GLAK	TAWG	ADAT	EL	ESCL	AG	VV	PGCS	AC	SEK	SV	448
tapeworm	208	AGT	E	DRCC	MSSP	LVDS	LT	EL	TP	FR	PI	IL	LT	324	
ameioid	208	AGT	E	DRCC	MSSP	LVDS	LT	EL	TP	FR	PI	IL	LT	324	
rotifer	198	QE	K-D	ICL	TSLS	EDAS	MEMA	LT	EAS	YL	IL	KDT	IN	FE	370
cnidarian	210	EQ	N-EMCS	SNV	EDAS	MEMA	LT	EAS	YL	IL	KDT	IN	FE	370	
hemichordate	238	TS	E-DVCG	SSLS	EDAS	MEMA	LT	EAS	YL	IL	KDT	IN	FE	370	
G51	331	TWAT	P--	KE	T	GH	SV	PI	GA	P	QNT	LY	V	DE	306
fruitfly	331	TWAT	P--	KE	T	GH	SV	PI	GA	P	QNT	LY	V	DE	306
S.mansoni	492	TLVFR	SE	LDV	K	HT	KV	Y	CG	L	ER	NE	K	S	415
S.haematobium	502	TLVFR	SE	LDV	K	HT	KV	Y	CG	L	ER	NE	K	S	415
S.japonicum	531	TCVFR	NEL	DV	K	HT	KV	Y	CG	L	ER	NE	K	S	638
planarian	349	COTLY	S	INDV	R	MNS	Q	ST	Y	CG	L	ER	NE	401	
tapeworm	368	TA	S	FD	S	KEE	S	KAA	I	Q	ST	Y	CG	449	
ameioid	325	AS	INF	S	LED	E	KRS	V	GD	H	L	A	K	382	
rotifer	323	CE	IF	D	S	H	GL	Y	DR	L	S	3	MY	387	
cnidarian	331	MY	SKN	P	LAV	D	Y	DR	L	S	3	MY	SKN	399	
hemichordate	380	TS	EY	K	K	D	D	V	D	V	D	V	D	469	
G51	397	FVDP	FV--	P	CE	K	LV	K	T	G	QAR	W	--	497	
fruitfly	416	FLEP	LA	VE	K	Y	A	R	V	R	T	G	D	521	
S.mansoni	639	V	ES	CEN	N	S	S	K	E	I	F	M	P	772	
S.haematobium	639	V	ES	CEN	N	S	S	K	E	I	F	M	P	772	
S.japonicum	674	K	E	F	C	R	N	E	N	L	T	S	I	816	
planarian	402	CL	A	F	Q	T	G	D	V	F	I	4	DR	497	
tapeworm	450	L	S	R	N	L	M	K	S	P	C	R	L	563	
ameioid	383	E	L	E	R	M	G	D	L	F	I	4	DR	473	
rotifer	388	N	L	K	N	K	F	I	P	T	D	N	Q	486	
cnidarian	400	F	N	P	F	N	G	L	K	K	F	E	T	502	
hemichordate	470	F	L	P	N	T	F	Y	H	P	Q	H	T	580	
G51	498	Y	M	P	S	V	I	Q	L	B	K	M	P	528	
fruitfly	522	Y	M	P	S	V	I	Q	L	B	K	M	P	528	
S.mansoni	773	Y	L	S	P	T	F	I	N	D	H	I	P	809	
S.haematobium	773	Y	L	S	P	T	F	I	N	D	H	I	P	809	
S.japonicum	817	Y	L	S	P	T	F	I	N	D	H	I	P	853	
planarian	498	V	C	L	B	R	L	E	Y	K	S	I	Q	548	
tapeworm	564	F	L	H	V	I	F	E	V	P	T	F	L	600	
ameioid	474	Y	M	P	S	V	I	Q	L	B	K	M	P	510	
rotifer	487	Y	A	I	P	T	R	E	I	T	T	E	Y	576	
cnidarian	503	F	M	P	K	I	L	F	L	D	T	M	P	540	
hemichordate	581	F	T	I	P	T	I	P	V	B	E	F	L	736	