Table 1. Antimalarial activities and host toxicity (where known) of cationic 'host defence' and related peptides

Name of peptide or class	Source of original peptide(s)	IC_{50}/activity on erythrocytic stages, μM[a]	Activity on insect stages[b]	Haemolytic activity	Host cytotoxicity, μM[c]	Refer-ences
Cecropins, SB-37	*Hyalophora cecropia*	~40 –>300	0.05–1 μg/ml cecropin (0.5-μl injection, >5 days after blood meal) reduced *Plasmodium cynomolgi* oocyst development in *Anopheles gambiae*.	None at concentrations tested		(26, 40, 41)
Shiva-1–3 (cecropin derivatives)	"	~20	≥50 μM Shiva-3 (added at time 0) inhibited ookinete development in culture by 100%; 100 μM (added at 24 h) inhibited up to 54%. 75 μM inhibitory in blood meal (*Anopheles albimanus*) at 0 or 6 but not 12 h. 100 μM Shiva-1 blocked ookinete development in culture.	None at concentrations tested		(39, 40, 89)
Cecropin–melittin hybrids	*Hyalophora cecropia*/*Apis melifera*	~10–50		None at 200 μM		(26, 36)
Magainins	*Xenopus laevis*	~80–100	0.04–0.4 μg/ml magainin (0.5-μl injection, >5 days after blood meal) reduced *P. cynomolgi* oocyst development in *A. gambiae*.			(26, 36, 41)
Dermaseptin S3	*Phyllomedusa* spp.	0.26–1.5		None at 34 μM[d]		(27)
Dermaseptin S4	"	0.27–2.2		At >8.5 μM[d]		(27)
Dermaseptin	"	≥0.2; up to 100%		0–19% at 10		(28, 29)

S4 derivatives		inhibition at 10 μM		μM		
Lauryl-lysine oligomers	(Synthetic)	0.08–68		≤26% at 100 μM	37–>800 (MDCK)	(30)
Defensins	*Aeschna cyanea, Phormia terranovae*		>2.5 μM (1-μl injection, 4–7 days after blood meal) caused oocyst abnormality in *Aedes aegypti*. Sporozoites damaged by ≥1 μM, 30 min.			(42)
Drosomy-cins	*Drosophila melanogaster*		Cultured ookinetes inhibited by drosomycin (15% at 10 μM, 76% at 20 μM), drosomycin 2 (29% at 20 μM)			(33)
AdDLP	*Anaeromy-xobacter dehalogenans*	Killed by 10 μM	Cultured ookinetes inhibited ~50% by 20 μM.			(90)
Scorpine	*Pandinus imperator*	Trophozoites inhibited >50% by ≥0.1 μM, 100% by ≥5 μM (40 h), 100% by ≥0.1 μM (88 h).	IC_{50} cultured ookinetes ~0.7 μM (development), ~10 μM (rosette formation); 15 μM inhibited cultured ookinetes 98% (time 0), ≤50% (≥15 min.)	None at concentrations tested		(44, 91)
Gambicin	*A. gambiae*		Cultured ookinetes inhibited by ≥10 μM.			(21)
Vida 1–3, P2WN, ILF	(Synthetic)		Cultured ookinetes inhibited by 50 μM at certain times (time-dependence different for different peptides). 50 μM in blood			(43)

			meal reduced no. oocysts/midgut (Vida 3, ILF most potent). 50 μM Vida 3 or ILF (1-μl injection, 4 days after blood meal) reduced no. oocysts/midgut.			
Psalmopeo-toxins I, II	*Psalmopoeus cambridgei*	1.12–1.56		None at 10 μM	No effect up to 50 μM (HeLa)	(31)
Psalmopeo-toxin I & II derivatives	"	≤62% inhibition at 20 μg/ml				(32)
Gomesin	*Acantho-scurria gomesiana*	76–87	IC_{50} microgametocyte exflagellation 47 μM. Ookinete formation in culture inhibited by ≥12.5 μM. Oocysts/midgut reduced ~53% at (estimated) 50 μM, ~86% at (estimated) 100 μM (*Anopeles stephensi* fed on injected mice). *P. falciparum* oocysts reduced ~56% at 50 μM, 100% at 100 μM (*A. stephensi* fed on stage V gametocytes).	40% at 100 μM		(92, 93)
NK-2	*Sus scrofa*	6.2		None up to 10 μM		(38)
TP10, PVEC	(Synthetic)	TP10 inhibitory at 30 μM	*P. falciparum* oocysts reduced by 30 μM TP10 or PVEC (*A. gambiae* fed on gametocytes)	5% at 30 μM (TP10)		(94)
Histidine-rich peptides	"	0.1–17		HC_{50}[e] <5.6–716 μM	Toxic in mid-μM	(34)
Meucins	*Mesobuthus eupeus*	10 μM inhibited trophozoites >90%	Cultured ookinetes inhibited 40% (meucin-24), 50% (meucin-25) by 20 μM, 20% by 10 μM (either).	None at 100 μM	Little or no effect at 50 μM	(95)

		at 48 h, 100% at 72 h but ineffective at 24 h			(GC-2)	
Catestatin & derivatives	*Homo sapiens*, *Bos taurus*	≥14; 1–88% inhibition at 20 μM				(35)

Blanks indicate not determined.

[a] 50% inhibitory concentration (IC_{50}) on cultured, asexual *P. falciparum* unless otherwise stated. No more than two significant figures are shown. Care should be taken when comparing activities of peptides in different studies because of the different strains and assay methods used.

[b] *P. berghei* unless otherwise stated.

[c] IC_{50} or equivalent on cultured mammalian cells (name of cell line if provided) unless otherwise stated.

[d] In the presence of serum.

[e] HC_{50}, 50% haemolytic concentration.