

Additional file 4: Details of recombinant antigens featured in the systematic review

Author, year [reference]	Allele/Strain (region)	Expression System	Tag	Seroprevalence (%)
PvCSP				
Oliveira-Ferreira, 2004 [1]	VK210	synthetic	NA	34.26
Oliveira-Ferreira, 2004 [1]	VK247	synthetic	NA	24.07
Oliveira-Ferreira, 2004 [1]	<i>P. vivax</i> -like	synthetic	NA	31.48
Wongsrichanalai, 1991 [2]	VK210 (NS1/81-V20) ¹	DNS	DNS	Controls: 44.8, Cases: 66.7
Yildiz Zeyrek, 2011 [3]	PvCSP-c chimeric protein containing VK210 and VK247 amino acid repeat sequences	Wheat germ cell-free translational system, <i>E. coli</i>	His	IgG: 33.8, IgM: 36.9, IgG1: 25.6, IgG2: 2.05, IgG3: 28.7, IgG4: 5.64 ²
PvDBPII				
Cole-Tobian, 2009 [4]	PNG-AH (251-566)	<i>E. coli</i>	His	98
Cole-Tobian, 2009 [4]	PNG-O (251-566)	<i>E. coli</i>	His	90
Cole-Tobian, 2009 [4]	PNG-P (251-566)	<i>E. coli</i>	His	90
Cole-Tobian, 2009 [4]	Sal 1 (251-566)	<i>E. coli</i>	His	72
Tran, 2005 [5]	DNS (194-521)	<i>E. coli</i>	His	Ribeirinha: 69, Colina: 70
PvDBPII-IV				
Kano, 2012 [6]	Sal 1 (132-771)	<i>E. coli</i>	GST	49.5
Souza-Silva, 2010 [7]	132-771	<i>E. coli</i>	GST	18.6
PvMSP-1₁₉				
Ak, 1998 [8]	DNS (1639-1729)	<i>S. cerevisiae</i>	His	IgG + IgM: 70

¹ NS1/81-V20 consists of 81 amino acids from the non-structural protein 1 of influenza A virus fused N-terminally to the entire repeat region of the CS protein of *P. vivax*

² Frequencies calculated from 2 x 2 provided by authors

Kano, 2012 [6]	Belem (1616-1704)	<i>E. coli</i>	His	60
Lima-Junior, 2012 [9]	Belem (1616-1704)	<i>E. coli</i>	His	86.7
Cole-Tobian, 2009 [4]	DNS	<i>E. coli</i>	DNS	83.4
Fernandez-Becerra, 2010 [10]	Belem (1615-1726)	<i>E. coli</i>	GST	80
Nogueira, 2006 [11]	Belem (1615-1726)	<i>E. coli</i>	GST	IgG: 42.8, (IgG1: 25, IgG2: 0, IgG3: 0, IgG4: 0) ³
Yildiz Zeyrek, 2011 [3]	Sal 1 (1590-1699)	Wheat germ cell-free translational system	His	IgG: 50.3, IgM: 28.2, IgG1: 45.6, IgG2: 5.6, IgG3: 35.4, IgG4: 2.56 ⁴
PvMSP-1_{NT}				
Versiani, 2013 [12]	Belem (170-675)	<i>E. coli</i>	GST	IgG: 35.4, (IgG1: 8.7, IgG2: 29.6, IgG3: 51.6, IgG4: 8.7%) ⁵
Nogueira, 2006 [11]	Belem (170-675)	<i>E. coli</i>	GST	IgG: 36.4, (IgG1: 17, IgG2: 0, IgG3: 56, IgG4: 0) ⁶
Fernandez-Becerra, 2010 [10]	DNS	<i>E. coli</i>	GST	89
PvMSP-3α_{FL}				
Lima-Junior, 2011 [13]	Belem (73-2520)	<i>E. coli</i>	His	78
PvMSP-3α_{NT}				
Lima-Junior, 2011 [13]	Belem (73-309)	<i>E. coli</i>	His	39
Stanisic, 2013 [14]	Belem (73-309)	<i>E. coli</i>	His	38.3
PvMSP-3α_{RI}				
Lima-Junior, 2011 [13]	Belem (316-1242)	<i>E. coli</i>	His	64
Stanisic, 2013 [14]	Belem (316-1242)	<i>E. coli</i>	His	36.1

³ Frequencies of subclass responses were reported for IgG responders only and were estimated from a graph presented in the original paper.

⁴ Frequencies calculated from 2 x 2 provided by authors

⁵ Frequencies of subclass responses were reported (in text) for IgG responders only.

⁶ Frequencies of subclass responses were reported for IgG responders only and were estimated from a graph presented in the original paper.

PvMSP-3α_{RII}				
Lima-Junior, 2011 [13]	Belem (1246-2058)	<i>E. coli</i>	His	53
Stanisic, 2013 [14]	Belem (1246-2058)	<i>E. coli</i>	His	38.3
PvMSP-3α_{CT}				
Lima-Junior, 2011 [13]	Belem (2059-2523)	<i>E. coli</i>	His	54
Stanisic, 2013 [14]	Belem (2059-2523)	<i>E. coli</i>	His	65
PvMSP-5				
Woodberry, 2008 [15]	Sal 1	<i>E. coli</i>	His	IgG: 47, 42; IgM: 46, 49; IgG1: 24, 50; IgG2: 5, 6; IgG3: 85, 69; IgG4: 0, 0 (controls, cases) ⁷
PvMSP-9_{RIRII}				
Lima-Junior, 2012 [9]	Belem (729-972)	<i>E. coli</i>	His	63.7
Lima-Junior, 2008 [16]	Belem (729-972)	<i>E. coli</i>	His	50
Stanisic, 2013 [14]	Belem (729-972)	<i>E. coli</i>	GST	8.7
PvMSP-9_{RII}				
Lima-Junior, 2012 [9]	Belem (874-972)	<i>E. coli</i>	His	40.2
Lima-Junior, 2008 [16]	Belem (874-972)	<i>E. coli</i>	His	40
PvMSP-9_{NT}				
Lima-Junior, 2012 [9]	Belem (34-367)	<i>E. coli</i>	His	33.7
Lima-Junior, 2008 [16]	Belem (34-367)	<i>E. coli</i>	His	16
Stanisic, 2013 [14]	Belem (34-193)	<i>E. coli</i>	GST	45.9
PvAMA1 ectodomain				
Fowkes, 2012 [17]	Sal 1 (77-484)	Wheat germ cell-free translational	His	Controls: 9, Cases: 38)

⁷ Frequencies of subclass responses were reported for IgG responders only.

		system		
Yildiz-Zeyrek, 2011 [3]	Sal 1 (77-484)	Wheat germ cell-free translational system	His	IgG: 21.0, IgM: 18, IgG1: 20, IgG2: 1.54, IgG3: 15.9, IgG4: 1.54 ⁸
PvRBP1 extracellular domain				
Tran, 2005 [5]	Belem	<i>E. coli</i>	His	Ribeirinha: 73, Colina: 57
PvSERA4				
Yildiz-Zeyrek, 2011 [3]	Sal 1 (19-352)	<i>E. coli</i>	His	IgG: 16.4, IgM: 49.2, IgG1: 14.9, IgG2: 7.69, IgG3: 9.7, IgG4: 2.05 ⁹

Region shows amino acid positions. If no position is given then BLAST searches were performed with amino acid sequence. Seroprevalence for IgG is shown unless otherwise indicated. Abbreviations: CT, C-terminal; DNS, data not shown in original manuscript; GST, Glutathione S-Transferase; His, histidine; MSP, Merozoite Surface Protein; NA, Not Applicable; NT, N-terminal; RI, Block I repeats; RII, Block II repeats; RIRII, Block I and Block II repeats.

⁸ Frequencies calculated from 2 x 2 provided by authors

⁹ Frequencies calculated from 2 x 2 provided by authors

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