

Supplementary Table 1. Predicted linear B-cell epitopes

S/N	Start/Epitopes/End	ANGN	ANGN score	ALGN	Tox
1	5'GGSGGSTLDE'14	+	2.5037	-	-
2	597'CYEEKDIEKHGDVDDDDADGNPLN'620	+	1.1110	-	-
3	768'LENLDVDSVTENDKASH'787	+	2.1337	-	-
4	952'EENEETQEEETAGADNQQKN'968	+	1.2512	-	-
5	1029'MWNKDSGSTE'1038	+	1.1754	-	-
6	1565'NGICEQSEEEKKK'1577	+	1.689	-	-
7	1466'NRNNGPHKEGDKEKRKKFWE'1485	+	1.3019	-	-
8	2245'CTNDVNSCKQG'2255	+	1.2572	-	-
9	2670'TCDGTDEEKKKK'2681	+	2.3776	-	-
10	84'RTEHNYDKKYRDV'96	+	1.1405	-	-
11	320'RRKKKMKKKLQYIK'333	+	1.3550	-	-
12	158'QLSNRNFNENRT'169	+	1.5093	-	-

ANGN – antigenicity, ALGN – allergenicity, Tox – toxicity, + present, – absent

Supplementary Table 2. Predicted CTL epitopes

S/N	Epitopes	Alleles/Super Types	P.R	ANGN score	ALGN	Tox
1	EEYEQKIKKW	HLA-B*44:03, HLA-B*44:02,HLA-A*24:02,HLA-A*23:01,HLA-B*53:01, HLA-B*57:01,,HLA-B*40:01,HLA-B*08:01,HLA-A*32:01, HLA-A*23:01, HLA-A*02:06, HLA-B*51:01, HLA-B*07:02, HLA-A*11:01, HLA-A*68:02, HLA-B*58:01, HLA-A*03:01, HLA-A*31:01, HLA-A*11:01,HLA-A*02:01, HLA-A*68:01, HLA-B*57:01, HLA-A*02:03, HLA-A*30:01	0.01	0.5808	–	–
2	AAIETFVLW	HLA-B*57:01, HLA-B*58:01, HLA-B*53:01, HLA-A*32:01, HLA-A*23:01, HLA-A*24:02, HLA-B*44:02, HLA-B*44:03, HLA-A*26:01, HLA-B*51:01, HLA-B*35:01, HLA-A*30:02, HLA-A*01:01, HLA-B*15:01, HLA-A*02:06, HLA-A*68:02, HLA-A*11:01, HLA-A*33:01, HLA-B*40:01, HLA-A*31:01, HLA-A*68:01, HLA-A*02:01, HLA-A*30:01, HLA-B*08:01, HLA-A*03:01, HLA-B*07:02	0.01	1.3919	–	–
3	TTLEGTSKK	HLA-A*11:01, HLA-A*68:01, HLA-A*03:01, HLA-A*30:01, HLA-A*26:01, HLA-A*31:01, HLA-A*01:01, HLA-A*33:01, HLA-A*30:02, HLA-A*32:01, HLA-A*68:02, HLA-B*58:01, HLA-B*57:01, HLA-B*15:01, HLA-B*44:02, HLA-A*02:06, HLA-B*35:01, HLA-B*44:03, HLA-B*40:01, HLA-B*53:01, HLA-B*07:02, HLA-A*02:01, HLA-A*02:03, HLA-B*51:01, HLA-A*24:02, HLA-A*23:01,	0.01	1.4417	–	–
4	QEEEHKREY	HLA-A*01:01,HLA-A*02:01,HLA-A0*2:03,HLA-A*02:06,HLA-A*03:01,HLA-A*11:01,HLA-	0.01	1.8209	–	–

		A*23:01,HLA-A*24:02,HLA-A*26:01,HLA-A*30:01,HLA-A*30:02,HLA-A*31:01,HLA-A*32:01,HLA-A*33:01,HLA-A*68:01,HLA-A*68:02,HLA-B*07:02,HLA-B*08:01,HLA-B*15:01,HLA-B*35:01,HLA-B*40:01,HLA-B*44:02,HLA-B*44:03,HLA-B*51:01,HLA-B*53:01,HLA-B*57:01,HLA-B*58:01				
5	KVRAPAEGK	HLA-A*30:02,HLA-A*30:01, HLA-A*03:01, HLA-A*11:01, HLA-A*31:01, HLA-A*68:01, HLA-A*32:01, HLA-A*33:01, HLA-B*07:02, HLA-B*15:01, HLA-A*26:01, HLA-B*57:01, HLA-B*58:01, HLA-A*02:03, HLA-A*68:02, HLA-B*44:02, HLA-A*02:06, HLA-A*02:01, HLA-B*44:03, HLA-A*01:01, HLA-A*24:02, HLA-B*40:01, HLA-B*35:01, HLA-A*23:01, HLA-B*53:01, HLA-B*08:01	0.02	0.7847	-	-
6	ETKSQSYSV	HLA-A*68:02, HLA-A*26:01, HLA-B*08:01, HLA-B*51:01, HLA-A*30:01, HLA-A*33:01, HLA-A*68:01, HLA-A*01:01, HLA-A*02:03, HLA-A*02:06, HLA-B*07:02, HLA-A*32:01, HLA-B*35:01, HLA-B*53:01, HLA-B*57:01, HLA-A*30:02, HLA-B*44:02, HLA-B*58:01, HLA-A*02:01, HLA-B*44:03, HLA-A*31:01, HLA-A*24:02, HLA-A*23:01, HLA-B*15:01, HLA-B*40:01, HLA-A*11:01,	0.01	1.3592	-	-
7	YENSQNKHY	HLA-B*44:03, HLA-B*44:02, HLA-A*01:01, HLA-B*15:01, HLA-B*40:01, HLA-A*30:02, HLA-A*26:01, HLA-B*35:01, HLA-B*53:01, HLA-B*58:01, HLA-B*57:01, HLA-A*32:01, HLA-A*11:01, HLA-A*23:01, HLA-B*07:02, HLA-A*68:01, HLA-A*24:02, HLA-	0.01	0.8977	-	-

		B*08:01, HLA-A*03:01,HLA-B*51:01, HLA-A*02:06, HLA-A*33:01, HLA- A*30:01, HLA-A*31:01, HLA-A*02:01, HLA-A*02:03				
8	MYYLKMILF	HLA-A*23:01, HLA-A*24:02, HLA- A*32:01, HLA-B*08:01, HLA-A*30:02, HLA-A*33:01, HLA-B*53:01, HLA- B*57:01, HLA-B*58:01, HLA-A*26:01, HLA-B*35:01, HLA-B*15:01, HLA- A*31:01, HLA-A*30:01, HLA-B*51:01, HLA-B*44:02, HLA-B*44:03, HLA- A*01:01, HLA-A*03:01, HLA-A*68:01, HLA-B*40:01, HLA-B*07:02, HLA- A*11:01, HLA-A*68:02, HLA-A*02:06, HLA-A*02:01	0.01	1.0320	-	-
9	KTMGAVAPAW	HLA-B*57:01, HLA-A*32:01, HLA- B*58:01, HLA-A*30:01, HLA-B*53:01, HLA-A*02:03, HLA-A*68:02, HLA- A*24:02, HLA-A*23:01, HLA-A*02:01, HLA-A*30:02, HLA-B*15:01, HLA- B*44:02, HLA-A*26:01, HLA-B*44:03, HLA-A*11:01, HLA-B*35:01, HLA- B*07:02, HLA-A*26:01, HLA-A*31:01, HLA-A*01:01, HLA-B*51:01, HLA- A*68:01, HLA-A*11:01, HLA-A*02:03, HLA-A*03:01, HLA-A*02:06, HLA- B*08:01, HLA-B*40:01, HLA-A*33:01,	0.01	0.6754	-	-
10	EIVIGTTVNV	HLA-A*24:02,HLA-A*01:01,HLA- A*02:01,HLA-A*02:03,HLA- A*02:06,HLA-A*03:01,HLA- A*11:01,HLA-A*23:01, HLA-A*26:01, HLA-A*30:01,HLA-A*30:02,HLA- A*31:01,HLA-A*32:01,HLA- A*33:01,HLA-A*68:01,HLA- A*68:02,HLA-B*07:02,HLA- B*08:01,HLA-B*15:01,HLA- B*35:01,HLA-B*40:01,HLA- B*44:02,HLA-B*44:03,HLA-	0.01	0.8417	-	-

		B*51:01,HLA-B*53:01,HLA-B*57:01,HLA-B*58:01				
11	KIVEAGIKK	HLA-A*11:01, HLA-A*03:01, HLA-A*68:01, HLA-A*31:01, HLA-A*30:01, HLA-A*32:01, HLA-A*30:02, HLA-B*15:01, HLA-A*26:01, HLA-A*33:01, HLA-A*02:06, HLA-B*58:01, HLA-B*57:01, HLA-A*02:01, HLA-A*01:01, HLA-A*02:03, HLA-B*07:02, HLA-B*44:02, HLA-A*68:02, HLA-B*44:03, HLA-B*35:01, HLA-B*53:01, HLA-A*23:01, HLA-B*40:01, HLA-A*24:02, HLA-B*51:01	0.02	0.4251	-	-

ANGN – antigenicity, ALGN – allergenicity, P.R – percentile rank, Tox – toxicity, + present, – absent

Supplementary Table 3. Predicted HTL epitopes

S/ N	Epitope	Alleles/ Super Types	P.R	ANGN Score	ALGN	Tox	IL-4	IL-10	IFN
1	YLILRYRRK KKMKKK	HLA-DRB1*13:02, HLA-DRB1*11:01, HLA-DRB1*08:02, HLA-DRB5*01:01, HLA-DPA1*01:03/DPB1*02:01, HLA- DRB1*03:01, HLA-DRB1*12:01, HLA- DRB1*15:01, HLA- DPA1*02:01/DPB1*05:01, HLA- DRB3*02:02, HLA-DRB4*01:01, HLA- DRB1*04:01, HLA- DPA1*01:03/DPB1*04:01, HLA- DPA1*02:01/DPB1*01:01, HLA- DRB1*01:01, HLA- DPA1*02:01/DPB1*14:01, HLA- DPA1*03:01/DPB1*04:02, HLA- DRB1*04:05, HLA- DQA1*04:01/DQB1*04:02, HLA- DRB3*01:01, HLA-DRB1*07:01, HLA- DQA1*01:01/DQB1*05:01, HLA- DRB1*09:01, HLA- DQA1*03:01/DQB1*03:02, HLA- DQA1*05:01/DQB1*03:01, HLA- DQA1*05:01/DQB1*02:01, HLA- DQA1*01:02/DQB1*06:02	0.14	0.5885	-	-	+	-	+
2	IYLILRYRRK KKMKKA	HLA-DRB1*13:02, , HLA-DRB1*11:01, HLA-DRB1*08:02, HLA-DRB5*01:01, HLA-DRB1*15:01, HLA- HLA- DPA1*01:03/DPB1*02:01, HLA- DRB1*03:01, HLA-DRB1*12:01, HLA- DRB1*12:01, HLA-DRB1*15:01, , HLA- DPA1*02:01/DPB1*05:01, HLA-, HLA- DPA1*01:03/DPB1*04:01, HLA- DRB1*01:01, HLA-DRB1*04:01, HLA- DPA1*02:01/DPB1*14:01, HLA- DPA1*03:01/DPB1*04:02, HLA- DPA1*02:01/DPB1*01:01, HLA- DRB1*04:01, HLA- DPA1*02:01/DPB1*01:01, HLA-	0.21	0.3979	-	-	+	+	+

		DPA1*03:01/DPB1*04:02, HLA-DQA1*04:01/DQB1*04:02, HLA-DRB1*04:05, HLA-DRB3*01:01, HLA-DQA1*04:01/DQB1*04:02, HLA-, HLA-DPA1*02:01/DPB1*14:01, HLA-DRB3*01:01, HLA-DRB1*04:05, HLA-DQA1*01:01/DQB1*05:01, HLA-DRB1*07:01, HLA-DRB1*09:01, HLA-HLA-DQA1*03:01/DQB1*03:02, HLA-DQA1*05:01/DQB1*02:01, HLA-DQA1*05:01/DQB1*03:01, HLA-,								
3	DLELNSTT MPANSY	HLA-DQA1*01:02/DQB1*06:02, HLA-DRB1*04:01, HLA-DQA1*05:01/DQB1*03:01, HLA-DRB1*09:01, HLA-DRB3*02:02, HLA-DRB1*07:01, HLA-DRB1*04:05, HLA-DQA1*03:01/DQB1*03:02, HLA-DRB1*13:02, HLA-DRB1*08:02, HLA-DRB1*03:01, HLA-DRB4*01:01, HLA-DQA1*05:01/DQB1*02:01, HLA-DQA1*04:01/DQB1*04:02, HLA-DRB3*01:01, HLA-DRB1*11:01, HLA-DRB1*01:01 HLA-DRB1*12:01, HLA-DRB5*01:01, HLA-DQA1*01:01/DQB1*05:01, HLA-DPA1*02:01/DPB1*05:01, HLA-DPA1*03:01/DPB1*04:02, HLA-DPA1*01:03/DPB1*04:01,	0.79	0.7553	-	-	+	+	-	-
4	TGKYTSDGL NGFDHE	HLA-DRB3*01:01, HLA-DQA1*03:01/DQB1*03:02, HLA-DPA1*02:01/DPB1*01:01, HLA-DQA1*05:01/DQB1*03:01, HLA-DPA1*01:03/DPB1*04:01, HLA-DPA1*03:01/DPB1*04:02, HLA-DRB3*02:02, HLA-DRB1*04:01, HLA-HLA-DQA1*01:01/DQB1*05:01, HLA-DPA1*02:01/DPB1*05:01, HLA-DRB1*04:05, HLA-DPA1*01:03/DPB1*02:01, HLA-DRB1*09:01, HLA-	0.85	0.1936	-	-	+	-	-	-

		DPA1*02:01/DPB1*14:01, HLA-DRB1*13:02, HLA-DRB1*07:01, HLA-DRB4*01:01, HLA-DRB1*11:01, HLA-DRB1*08:02, HLA-DRB1*12:01, HLA-DQA1*01:02/DQB1*06:02							
5	ILFNFLINTLL LPHY	HLA-DRB1*12:01, HLA-DRB1*01:01, HLA-DPA1*03:01/DPB1*04:02, HLA-DPA1*02:01/DPB1*01:01, HLA-DPA1*01:03/DPB1*04:01, HLA-DRB3*02:02, HLA-DQA1*01:01/DQB1*05:01, HLA-DPA1*01:03/DPB1*02:01, HLA-DQA1*05:01/DQB1*02:01, HLA-, HLA-DQA1*03:01/DQB1*03:02, HLA-DRB3*01:01, HLA-DRB1*13:02, HLA-DRB4*01:01, HLA-DRB1*04:05, HLA-DRB1*15:01, HLA-DRB1*08:02, HLA-DPA1*02:01/DPB1*14:01, HLA-DRB5*01:01, HLA-DRB1*04:01, HLA-DRB1*03:01, HLA-DRB1*07:01, HLA-DQA1*05:01/DQB1*03:01, HLA-DQA1*01:02/DQB1*06:02,	0.11	1.4594	-	-	-	+	-
6	LVMLIYLIL RYRRK	HLA-DRB1*03:01, HLA-DRB1*13:02, HLA-DRB1*12:01, HLA-DQA1*01:01/DQB1*05:01, HLA-DRB1*15:01, HLA-DPA1*02:01/DPB1*05:01, HLA-DRB5*01:01, HLA-DRB1*11:01, HLA-DPA1*03:01/DPB1*04:02, HLA-DPA1*01:03/DPB1*04:01, HLA-DRB4*01:01, HLA-DRB1*08:02, HLA-DRB3*01:01, HLA-DRB1*01:01, HLA-DRB3*02:02, HLA-DRB1*04:05, HLA-DPA1*02:01/DPB1*14:01, HLA-DQA1*04:01/DQB1*04:02, HLA-DRB1*04:01, HLA-DQA1*05:01/DQB1*02:01, HLA-DRB1*07:01, HLA-DQA1*01:02/DQB1*06:02, HLA-DRB1*09:01, HLA-	0.09	0.8369	-	-	-	+	-

		DQA1*03:01/DQB1*03:02, HLA- DQA1*05:01/DQB1*03:01								
7	IILVMLIYLI LRYR	HLA-DRB1*12:01, HLA- DPA1*01:03/DPB1*04:01, HLA- DQA1*01:01/DQB1*05:01, HLA- DPA1*03:01/DPB1*04:02, HLA- DRB1*03:01, HLA-DRB4*01:01, HLA- DPA1*02:01/DPB1*05:01, HLA- DRB5*01:01, HLA-DRB3*01:01, HLA- DRB1*13:02, HLA-DRB1*11:01, HLA- DPA1*02:01/DPB1*14:01, HLA- DRB1*01:01, HLA-DRB1*04:05, HLA- DQA1*05:01/DQB1*02:01, HLA- DRB1*08:02, HLA-DRB1*07:01, HLA- DQA1*03:01/DQB1*03:02, HLA- DRB3*02:02, HLA-DRB1*09:01, HLA- DQA1*01:02/DQB1*06:02, HLA- DQA1*04:01/DQB1*04:02, HLA- DRB1*04:01,	0.10	1.5865	-	-	-	-	-	+

ANGN – antigenicity, ALGN – allergenicity, P.R – percentile rank, Tox – toxicity, IL-4 – interlekin-4, IL-10 – interlekin-10, IFN – interferon gamma, + present, – absent

Supplementary Table 4. Conformational B-cell scores

S/N	Residue	No	Score
1	A:Y537, A:D539, A:V540, A:G541, A:P542, A:G543, A:P544, A:G545, A:R546, A:R547, A:K549, A:K550, A:M551, A:K552, A:K553, A:K554, A:L555, A:Q556, A:Y557, A:I558, A:K559, A:G560, A:P561, A:G562 A:P563, A:G564, A:N565, A:I566, A:Y567, A:S568, A:N569, A:S570, A:C571, A:K572, A:A573, A:G574, A:A575, A:N576, A:S577, A:S578 A:K579, A:L580, A:G581, A:G582, A:G583, A:P584, A:G585	47	0.931
2	A:E1, A:A2, A:A3, A:K4, A:G5, A:I6, A:I7, A:N8, A:T9, A:L10, A:Q11, A:K12, A:Y13, A:Y14, A:C15, A:R16, :V17, :G19, :G20, :R21,A:C22, A:A23, A:V24, A:L25, A:S26, A:C27, A:L28, A:P29, :K30, :E31,A:E32, A:Q33, A:I34, A:G35, A:K36, A:C37, A:S38, A:T39, A:R40, :G41, :R42, A:K43, A:C44, A:C45, A:R46, :R47, A:K48, A:K49, :E50, :A51, :A52, A:K53, A:A54, :A55, :Y56, A:A57, A:A58, A:I59, A:E60, A:T61, :F62, A:W63, A:L64, :W65, A:A66, A:A67, A:Y68, A:T69, :T70, :L71, :E72, A:G73, :T74, A:S75, A:K76, A:K77, A:A78, A:A79, A:Y80, A:Q81, A:E82, :H85, :K86,A:E89, :A92, :Y93, :V95,A:R96, :A97, :P98,A:A99, A:Y105, A:E106, A:T107, A:K108, :S109, :Q110, :S111, :Y112, :S113, A:V114, A:A115, A:A116, :Y117, :Y118, :E119,A:N120, :S121, :Q122, A:N123, A:K124, A:H125, A:Y126, :A127, :A128, A:Y129, A:Y132, A:L133, A:I136	119	0.762
3	A:T333, A:K335, A:A336, A:A337, A:A338, A:G339, A:P340, A:D364, A:I365, A:E366, A:E391, A:E392, A:T393, A:Q394	14	0.651
4	A:D417, A:D419, A:S420, A:V421, A:T422, A:E423, A:N424, :D425, A:K426, A:A427, A:S428, A:H429, A:G430, A:P431, A:G432, :P433, A:G434, A:N435, A:G436, A:I437, A:C438, A:E439, A:E465, :G473, A:P474, A:G475, A:P476, A:G477, A:C478, A:T479, A:N480, :D481, A:N483, A:C485, A:Q487, A:P490, A:G491, A:P492, A:G493, :T494, A:C495, A:D496, A:G497, A:T498, A:D499, A:E500, A:E501, :K503, A:K504, A:G506, A:P507, A:G508, A:P509, A:G510, A:T511, :C512, A:D513, A:G514, A:T515, A:D516, A:E517, A:E530, A:H531, :N532, A:Y533, A:D534, A:K535, A:K536	68	0.606
5	A:Y190, A:K199, A:G200, A:P201, A:G202, A:P203, A:G204, A:I204, A:I207, A:I208, A:I209	11	0.580
6	A:A165, A:A166, A:K168, A:I169, A:V170, A:E171, A:A172, A:G173, A:I174, A:K175	10	0.552
7	A:E442, A:E443, A:E444, A:K445, A:K446, A:K447, A:G450, A:K468, A:K469	9	0.532
8	A:A140, A:K142, A:T143, A:M144, A:G145	5	0.528
9	A:G354, A:P355, A:G356, A:P357, A:G358, A:C359, A:Y360	7	0.521
10	A:D252, A:G253, A:L254, A:N255, A:N273, A:T274, A:L275, A:L276, A:L277, A:P278, A:P282	11	0.514
11	A:K214, A:M217, A:K218, A:K219, A:R299, A:K300, A:G30	7	0.508