

Supplementary Information

Table: List of selected LBL epitopes of vaccine target proteins predicted by ABCpred.

S. No	Accession id	Epitopes	Start position	ABCpred score	Antigenicity	Allergenicity	Toxicity
1	WP 005373930.1	CAGIDMTITLNQDGT	75	0.88	1.0009	-	-
		TSAVEVPQATETEVT	9	0.80	0.9017	-	-
		TFVDSEHNAQSALDWN	48	0.73	0.4906	-	-
		EVTTSADVTTETIDTL	21	0.58	1.3482	-	-
2	WP 005374784.1	GVEGIEAGPGKVSFAW	142	0.91	1.3140	-	-
		VVVRPMYKWDDNHKTI	311	0.90	0.5488	-	-
		YGTEGYSKTMAFYGDG	242	0.86	0.6940	-	-
		GSSFWARPEIRVYASY	355	0.82	0.4254	-	-
		YWNISGAGAGVEGIEA	133	0.82	1.8932	-	-
		GDSWEMGHQLVYGVGE	282	0.81	0.5175	-	-
		HGYMRAGVGVNADGGQ	4	0.80	1.5381	-	-
		TFYVDSMVAMTSNGSN	54	0.79	0.4404	-	-
		GVNADGGQQLTFEKNK	12	0.76	1.2034	-	-
		GSNDWESTSANCGLDN	67	0.75	0.9831	-	-
		GSLEMGLNYAILNETD	193	0.75	0.7357	-	-
		LNETDAAPNGTKDAKN	204	0.74	0.9404	-	-
		GATNVNTLDVRYAGLP	173	0.71	1.1881	-	-
		DPGNDGGATNVNTLDV	167	0.70	1.7140	-	-
		GEVKCVDDAQFALRQF	83	0.67	0.6657	-	-
3	WP 005379034.1	KDYQAASQTFAKTRND	231	0.92	0.6809	-	-
		SLDKRADSDSSVIAAP	35	0.82	1.0501	-	-
		AETAGFGGEISLNAGF	3	0.81	1.1173	-	-
		TENSNTIDSLDKRADS	27	0.79	1.1254	-	-
		DGKAESFDSYGFDISW	198	0.78	1.5730	-	-
		KDIEQEEVTDRLSLARD	151	0.75	0.8311	-	-
		GGEISLNAGFISSESN	9	0.72	0.6489	-	-
		TYTFGSRLNHQVYAGT	55	0.71	0.8832	-	-
		WSFISLAGYSQTDSNI	266	0.70	0.6116	-	-
		AFTYINQDADGKAESF	189	0.65	1.0100	-	-
4	WP 005379463.1	PFDIMTVKPSNNRANF	656	0.95	0.8272	-	-
		SLYWDWYNNYDKFIYV	453	0.94	0.6140	-	-
		PSFWRDTPTEVEDNQ	271	0.94	0.7432	-	-
		GMGWGYLGTRDTVNP	142	0.94	0.6140	-	-
		AGVGTEFLYRPQGANW	523	0.90	0.5279	-	-
		LGMADFRLSYERGDTL	242	0.89	0.9904	-	-
		SFTDLSADEFGESFT	633	0.85	0.5376	-	-
		INPKIEDATSRATTKP	384	0.85	1.5081	-	-
		AGIDMSPHTPWNFVGL	224	0.85	0.4389	-	-

		FVSGYYYPQWEFLQDL	583	0.84	0.6155	-	-
		GDTLVAGLTLNTNFND	254	0.84	0.8964	-	-
		DKFIYVTPPDGTTVPR	463	0.82	0.7043	-	-
		TGRMAHEGEFNFSVTG	27	0.81	0.8085	-	-
		NDYSTDYPVVQAGIDM	213	0.81	0.7517	-	-
		FGGIEYQTLHKPLRFK	192	0.80	0.4216	-	-
		PLTRDGGQKLGRKYSL	675	0.78	0.7897	-	-
		VGEQKKYRDRTEAHEK	323	0.77	1.2529	-	-
		RYSNSKLGTFDFTLGM	128	0.75	1.3197	-	-
		DMPFEAPSLQPSQSDF	2	0.74	0.6880	-	-
		LGNAEDFYLFVGLSG	423	0.72	0.6193	-	-
		KELSDVDWERVTEDDL	288	0.71	0.4259	-	-
		VGQFLAGDVGQTQINVS	604	0.61	0.5110	-	-
		FAQVNYINPKIEDATS	378	0.58	0.8186	-	-
		GTQINVSQKFKSGVIA	613	0.51	0.4599	-	-
5	WP 005379673.1	QCLVDTSGEEDALNTP	16	0.97	0.7853	-	-
		DQAIGSTGASPEYENN	702	0.91	1.0607	-	-
		QAGIVAAYEFNPNWSA	645	0.91	1.0524	-	-
		QGRGTAAYIARTGQSV	118	0.90	0.8362	-	-
		VKARSDRVTNDINQDT	89	0.88	1.1784	-	-
		PFYWNIAPQYDMTLTT	217	0.88	1.6243	-	-
		SGEEDALNTPVVVEAD	22	0.87	0.9581	-	-
		TNYSSWAIEADFNND	566	0.85	0.7187	-	-
		NSDRKYQDESRWGYQV	264	0.84	1.0406	-	-
		TDGWGNGEIKGEYLS	250	0.83	1.1282	-	-
		TLEPQLQYLYVPEEDQ	471	0.81	0.9147	-	-
		YSQDLTGLTDVNLQNQ	423	0.81	0.7639	-	-
		VSRFDTSDAARPNATR	379	0.81	0.5196	-	-
		MQLANSTLEYQFNGGF	598	0.79	0.7753	-	-
		QKKITADSVTLHQQDN	59	0.78	0.6762	-	-
		SDFWDASLTVRDFQIL	329	0.76	0.6792	-	-
		SWIKGYTQTLEPQLQY	463	0.74	0.4894	-	-
		DLDSDIGNREDGQLVQ	306	0.73	1.2170	-	-
		SGIDVDQDEETATLHH	156	0.73	1.0743	-	-
		LDTDFRYLTDGWNGE	242	0.71	0.9521	-	-
6	WP 005382055.1	SGDWDYESEYAVNATV	381	0.93	0.5736	-	-
		YGTGADSAASGASGDW	369	0.88	1.6425	-	-
		TVSDRTTLAFDFYGVD	261	0.87	1.2157	-	-
		NGTIGNVWSFVPGTYR	144	0.87	0.7496	-	-
		YAGAGDAETDLRLQV	422	0.86	1.9132	-	-
		SFVPGTYRGFELNAKL	152	0.84	0.5004	-	-
		PGGENGDRWSRLNYSS	41	0.83	0.8490	-	-
		HGTILERDEYAGAGDA	413	0.82	0.8454	-	-
		GNGWNYLGFYGTGA	358	0.80	1.2601	-	-
		DDVKYDGLGFHTGLSL	277	0.77	0.9265	-	-

		QFTAPWLLHEDDYAPA	179	0.77	0.5004	-	-
		SDTSWSYLHSLGLNGN	197	0.75	0.7343	-	-
		RLSYNQGNWNYLGF	352	0.73	0.8433	-	-
		HNETDNTSYKAYLKYT	246	0.69	0.8749	-	-
		FGMLQAGGNGTIGNVW	136	0.66	1.0289	-	-
		NAKLGD FNLSYFGADQ	164	0.59	0.6398	-	-
7	WP 005383742.1	GVFAGAGVGFKVTDNF	110	0.91	0.726	-	-
		GNKDDEGVFAGAGVGF	104	0.82	0.7129	-	-
		NVANGANTETDFNQAS	142	0.81	1.0351	-	-
		TDGYTAALKVTAPIAD	65	0.76	0.7857	-	-
		RVDLYAKGGQMWYSTD	81	0.75	0.4204	-	-
		VIQGLVG YRFNPYLAL	31	0.66	1.0247	-	-
8	WP 017634227.1	GFKVTDNFLVNAEYMW	118	0.53	0.8665	-	-
		EFQVYSDGAGNKTLTD	115	0.87	1.6462	-	-
		KTLTDGTSVSVAGKTV	126	0.85	1.1951	-	-
		DEKTTYKQVRVGYKS	87	0.84	1.2636	-	-
		LVAGDSEFDWGVRYQI	54	0.83	0.8507	-	-
		SYEINYNKNYDEVRLS	168	0.82	1.0941	-	-
		TSVSVAGKTVEQGKWT	132	0.81	0.8623	-	-
		SSKINDQTKLNFGEVQ	25	0.80	1.0130	-	-
		SFGLSTALRYRHEFQV	103	0.75	1.0287	-	-
		TLDYRAEYKHESETYA	2	0.73	1.2522	-	-
9	WP 017635354.1	VRYQINKQWFIQPGMP	65	0.61	0.4075	-	-
		DASITAKQVSLAPVFS	85	0.89	1.0300	-	-
		LGTTDHDLEPHFSSEN	10	0.81	1.0578	-	-
		LGYSQFDLDDGRSKNL	53	0.80	0.7680	-	-
		DVEISNTLFHSSEKSN	137	0.78	0.6098	-	-
		TIGANAKYQLDSYANT	171	0.76	0.9196	-	-
		LAPVFSYALSDKWTTK	95	0.75	1.1552	-	-
		DAKVAQHQEYELVAND	121	0.75	0.8751	-	-
		FHSSEKSNELGAMFSV	145	0.74	0.5749	-	-
		DNWAIELGYSQFDLDD	47	0.66	0.5460	-	-
10	WP 017819904.1	PHFSSENVTLNPELEG	19	0.57	1.3933	-	-
		LDDGRSKNLGIKTIDG	60	0.54	1.1523	-	-
		GTADEDGVGFVSALDP	298	0.92	0.9887	-	-
		IGDTGEKGTFGAGYFD	171	0.92	0.6745	-	-
		TEQFDDQNLFGVG VDA	600	0.90	0.7249	-	-
		GTYHGDGITFQGRKW	575	0.89	0.6308	-	-
		DRYIYGYDTTNKKIVR	52	0.88	0.6997	-	-
		FSIDLSPLDSDPNATL	108	0.88	1.1844	-	-
		NGSATAIGDTGEKGTF	165	0.86	1.0510	-	-
		PSSSQNDGARCANAPV	229	0.84	1.0562	-	-
		NRDGD FDFDEGEQVFTD	336	0.83	0.4030	-	-
		AIFIISED LSTHAASS	513	0.79	0.7687	-	-
		AYLFQSTPVQIYGVNL	10	0.79	0.8551	-	-

		PQFQTWAESGGERSTD	654	0.77	1.1788	-	-
		GVGFNFDRYIYG YDT	45	0.77	0.9652	-	-
		VSALDPGLSSIVNVTA	308	0.77	0.4280	-	-
		YKNGFAIRLPGVLRSS	471	0.74	0.8323	-	-
		TFGAGYFDVNGNYYVS	179	0.74	0.4442	-	-
		GKIYRVDLSEGNAANI	199	0.73	1.0507	-	-
		GKDFQAETLDVSG LPT	69	0.71	0.8361	-	-
		FTEGSDRSAIQAMPYD	552	0.68	0.7773	-	-
		ATLSIVKISSTATVNL	121	0.68	0.5833	-	-
		GSLYGIDNNSGVLYQF	146	0.67	0.4043	-	-
		SIENGLTTL SFNGVEQ	486	0.59	0.4394	-	-
		VYFKTANNLPWALLIV	622	0.52	0.8872	-	-
11	WP 017820116.1	KSETTDFTLGDSTTP	244	0.88	1.2156	-	-
		PPVVDGYYQAASGKTG	259	0.86	1.1679	-	-
		GDSTTTPPVVDGYYQA	253	0.84	0.6943	-	-
		CGSGAGSYTLTEGDKT	220	0.84	1.8243	-	-
		KVEPMNSDGHHLFATD	362	0.82	0.5333	-	-
		NKTINVGLRFYDEASF	113	0.81	0.4183	-	-
		QPPVESCS DHQVVLTL	147	0.80	0.4553	-	-
		GQGYESAITIEKSMCL	186	0.79	0.7922	-	-
		NVEQGKTYPFSVSVYH	60	0.78	0.8442	-	-
		RWHKNDPVSEKERNRN	476	0.78	0.8934	-	-
		AASGKTGYALKTALFN	268	0.78	1.1234	-	-
		EGNVKARLVVDGYHNY	77	0.77	0.7373	-	-
		WQELAHNYTASSNKTI	101	0.73	0.6306	-	-
		GSEVVYVDNFQPTETS	130	0.67	0.6391	-	-
		YVSSNGSKLGQASTSL	397	0.62	1.0280	-	-
12	WP 017820143.1	DGFPETGPRDGKIASA	47	0.92	0.9641	-	-
		IGYNIETPVPEYSLTV	284	0.92	1.2080	-	-
		KFDGDSPIPDWKQGG	177	0.90	0.6954	-	-
		AGTQTFEWTFTANHVT	85	0.87	1.3123	-	-
		HVTRDWKYIITKPDWN	98	0.86	0.6334	-	-
		PQSVEGPDGFPETGPR	40	0.78	0.6070	-	-
		PTTLDLTLTAEGDLNA	312	0.76	1.1970	-	-
		YLQANSGLERVEIGYN	272	0.76	0.6760	-	-
		YGTNPVYLQANSGLER	266	0.72	0.5363	-	-
		QQTLDFHLKEESVTPP	382	0.71	1.1275	-	-
		WTFTANHVT RDWKYYI	92	0.70	0.7562	-	-
		PDTNEKNNNCGAIQYE	24	0.69	1.1202	-	-
		TKLNQKQAKLQAGQYA	243	0.59	1.0891	-	-
		NWSYALATKLNQKQAK	236	0.58	1.1913	-	-
		DTAASFYNVIDVKFDG	165	0.55	1.1190	-	-
13	WP 017820170.1	LWDVISDN TSAKL VTK	189	0.92	0.8286	-	-
		AAAIQKAVGNDFTIYL	51	0.88	0.6816	-	-
		GVSVLDPKPDFSITRGN	93	0.85	0.5048	-	-

		SDRSNASNRHLQFNDT	67	0.78	1.1315	-	-
		QNSINLTWNIEWLSI	1	0.72	1.1657	-	-
		RGNSKLRFASYLVLP	106	0.69	0.9508	-	-
14	WP 017820457.1	IGAIAKATDDKTDNT	93	0.96	1.2013	-	-
		EKFGYEHILVDVGAGT	7	0.83	0.9469	-	-
		RSDIVDENNFKIGLNY	141	0.83	1.0918	-	-
		GESSDYVNEVGLSLKF	177	0.80	1.2486	-	-
		LLFGGGYRYGVTEQFD	71	0.71	0.4535	-	-
		DDKTDNTLSSDSELIQ	102	0.69	1.0783	-	-
		LFTENWLFNVDYSAQF	43	0.56	0.7307	-	-
		TVGVNYLLSEKLIATA	120	0.53	0.6118	-	-
15	WP 017821220.1	TELTGTVEVSNGMLTI	96	0.91	0.4230	-	-
		TDLRDAPSAPPPTETE	3	0.91	0.6146	-	-
		MSLAWDGDENVSING	501	0.90	1.1312	-	-
		TETGDTFELGENLAIE	240	0.90	1.1872	-	-
		AKSDDEHDLPNVYVFE	35	0.89	0.5184	-	-
		LRLGDNGNTTNFELNA	289	0.88	1.7341	-	-
		SLISDTDTTNKPYYT	412	0.86	0.5083	-	-
		EDKDTETLTFNLYDES	75	0.84	1.2463	-	-
		QLTIYVGDTSGASTKA	537	0.84	1.4316	-	-
		AEAGSDDVEIGTITTD	481	0.83	1.0082	-	-
		RISGSGKVEAEAGSDD	472	0.83	1.7530	-	-
		SVAVVSDDVSKSGANS	397	0.83	1.0599	-	-
		GTNISSANSSWKEYNT	372	0.82	0.5582	-	-
		GSSNPDKPSEDVSENF	351	0.82	0.6680	-	-
		VVQILDNTNKGTEEDT	146	0.80	1.1897	-	-
		EDVSENFDSYPVGTNI	360	0.74	0.4244	-	-
		TETSELSQGMWDIST	15	0.71	0.6791	-	-
		AAKTSNSNLHGEVAFE	211	0.64	1.2014	-	-
		PSQSETGLDATNTPSQ	522	0.63	0.9386	-	-
		SWVENFFSFSVNGKQI	257	0.61	0.5853	-	-
16	WP 017821221.1	NFELNADNLKIYSSDS	299	0.60	1.4371	-	-
		NDAGDNNVVQILDNTK	139	0.51	0.4086	-	-
		ASHIITDDVVNAEAAM	156	0.94	0.4096	-	-
		GGMVFKSYVKGARTSE	276	0.87	0.4989	-	-
		MPYPTLPKEPLATNAP	214	0.87	0.4612	-	-
		DGRADDIDEWDLANGF	249	0.84	0.8158	-	-
		DGTLEATLKIDHATTT	338	0.83	1.2159	-	-
		APGENFDLTRWKLTPP	228	0.83	1.1112	-	-
		PKEPLATNAPGENFDL	220	0.82	1.0351	-	-
		KSYSTKGVPNNWVFS	309	0.78	0.9176	-	-
		MTRWSANGDGEWAML	46	0.76	0.5512	-	-
		LFDQDIMTRWSANGDG	40	0.76	1.1493	-	-
		APVEDQKEAGGVDGTL	326	0.75	1.3845	-	-
		FDAIQASFSGKNERVS	68	0.74	0.8565	-	-

		TLKIDHATTTGQSHEV	344	0.74	1.6258	-	-
		QSSGRALGLERFQFEP	104	0.72	1.2235	-	-
		KFSYIIDVKGNTMTVT	425	0.71	1.4099	-	-
		SFSKGNERNVSKFDVQF	74	0.56	1.1598	-	-
		LERFQFEPVAVKARYVR	112	0.56	1.1125	-	-
17	WP 017821879.1	TLEVQYKLTPRSSIYT	279	0.92	0.9283	-	-
		PRSSIYTNYVDRNGSR	288	0.85	0.7011	-	-
		YILGNNTSELDYGNA	156	0.84	0.4119	-	-
		GAHADESYYHLGLRYE	315	0.82	1.0014	-	-
		ALYSEDELEGYYSQTS	224	0.82	0.4758	-	-
		NVTSKNNEHGDANGF	21	0.77	1.6128	-	-
		KVMELTAVYSVNDKWA	242	0.76	0.5002	-	-
		SSDVSMARQANKVDKT	115	0.75	0.8698	-	-
		ELEGYYQTSTDKVME	230	0.74	0.8371	-	-
		YSNGQEVSFQGAHADE	305	0.70	0.7938	-	-
		AQLYQAEDGSVLNIYS	1	0.68	0.7843	-	-
		SLENSDGDELELKDTT	264	0.67	1.7010	-	-
18	WP 021707746.1	YYTVNWPPTWRFGVAE	310	0.96	0.6753	-	-
		TEMEDKGYTPSKLLNY	339	0.95	0.5877	-	-
		YGHPLTDELFGFPLDI	267	0.91	0.5371	-	-
		AMYRTASIPFYTADND	10	0.88	0.4449	-	-
		YRLAANYVFGDWELEP	119	0.87	0.9719	-	-
		GERIGAGLDTNLGIKA	157	0.85	1.6676	-	-
		SSSVQSASTEYVMAIK	293	0.82	0.9079	-	-
		SFDVNVGDLFNQKSWN	358	0.76	0.7515	-	-
		TLSNKAYLRIAHGWAT	226	0.75	0.7361	-	-
		DELQFHSNYRLAANYV	111	0.75	0.6065	-	-
		GGQVRYSINDNWRAEV	90	0.73	0.9859	-	-
		PSKLLNYLDFSFDVNV	348	0.71	1.3461	-	-
		EVELMTDDELQFHSNY	104	0.69	0.4826	-	-
		SKVPKPTLSNKAYLRI	220	0.61	0.7880	-	-
		FYTADNDSTVSTFVPM	19	0.59	0.7817	-	-