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Supplementary Materials for

Exploiting species specificity to understand the tropism of a human-specific toxin

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This PDF file includes:

SUPPLEMENTARY MATERIALS

Supplemental figures

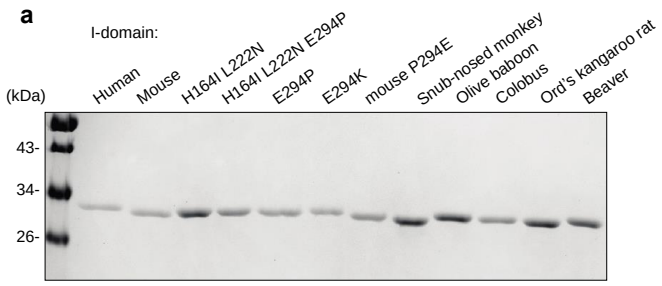

Fig. S1. Purification of CD11b I-domains. a) Coomassie staining of 1μg I-domains used in Fig. 2.

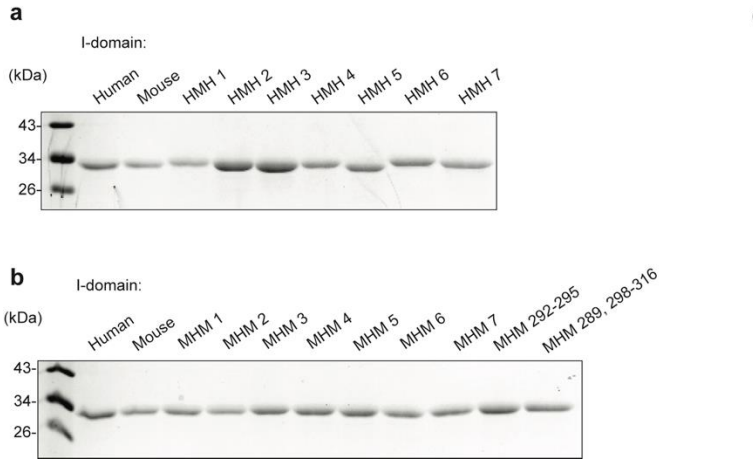

Fig. S2. Purification and transfection of CD11b I-domain chimeras. a-b) Coomassie staining of 1μg I-domains used in Fig. 3. **c**) Transfection levels of HEK293T cells transfected with CD11b and the corresponding CD18.

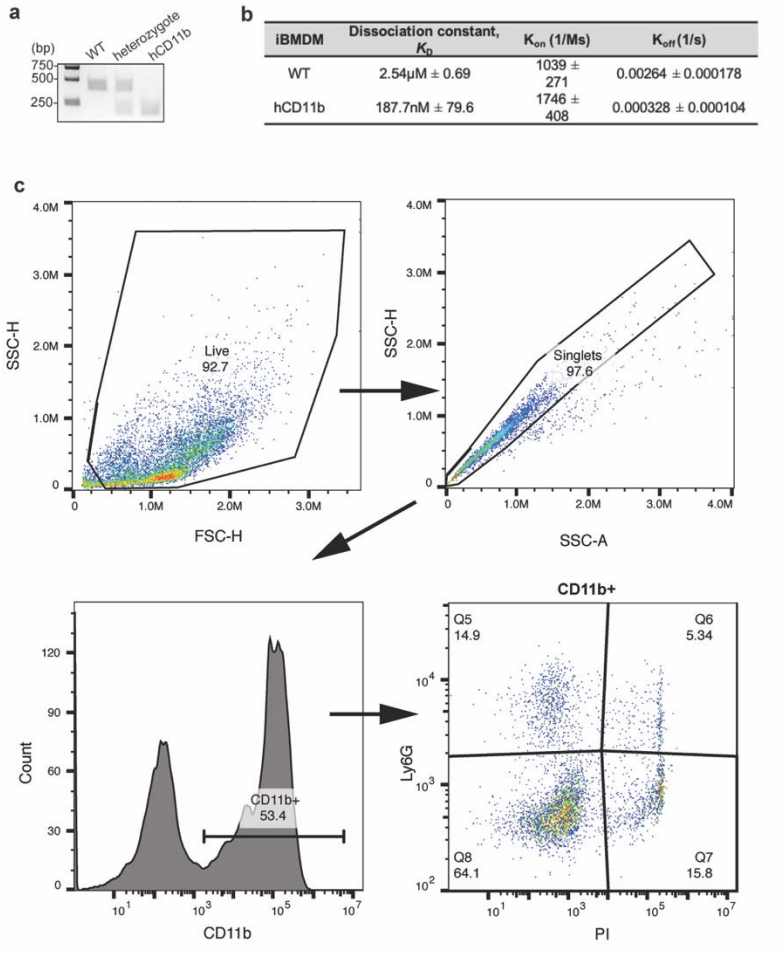

Fig. S3. Characterization of the hCD11b mouse. a) Representative gel of hCD11b mouse genotyping. DNA was isolated from tail samples, the region surrounding exon 9 was PCR amplified, and samples were digested with XhoI. **b**) SPR data of LukAB binding to WT or hCD11b iBMDMs. **c**) Representative gating strategy to determine the % propidium iodide (PI)+ PMNs (CD11b+ Ly6G+) as in Figure 4g.

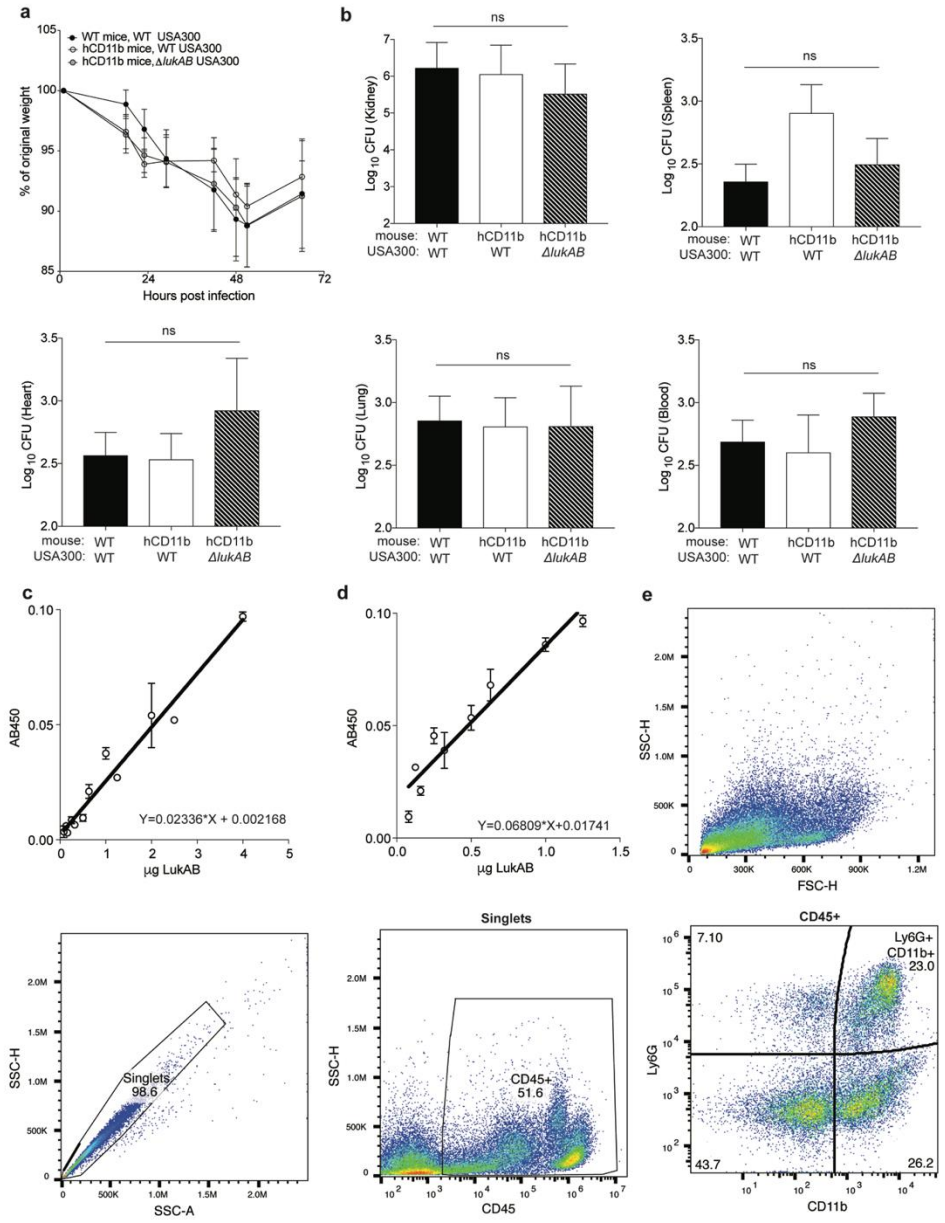

Fig. S4. LukAB exhibits liver-specific tropism in vivo. a-b) WT and hCD11b mice were infected IV with ~3x10^6 CFU of WT USA300 strain LAC or an isogenic *ΔlukAB* LAC strain and weight loss was monitored (a). 3 days post-infection, bacterial burdens in the organs were quantified (b). **c-d**) Standard curves of LukAB in infected livers (a) and kidneys (b). Known quantities of LukAB was added to homogenates from mice infected with LAC *ΔlukAB*, which were digested in RIPA buffer. The concentration of LukAB was measured by ELISA and linear regression was determined. Data are represented as the average of 3 independent experiments with 15 total mice per group. Statistical significance was determined by one-way ANOVA (ns=not significant). **e**) Representative gating strategy used to quantify PMNs (CD11b+ Ly6G+) in murine livers and kidneys as in figure 5f. The sample shown is from an infected liver.

Supplemental tables

Table S1. Signatures of positive selection on primate *ITGAM*.

MEME - sites subject to episodic positive selection (on at least one branch in the phylogeny); p<0.05

unedited site #	edited Site #	Partition	α (dS)	β- (dN)	p(β-) [dN dS]	β+ (dN)	p(β+) [dN dS]	LRT	p-value	# branches under selection	Total branch length	
54	53	1	0	0	0.91	14.44	0.09	4.64	0.05	1	0.59	
141	140	1	0	0	0.91	23.31	0.09	5.74	0.03	1	0.93	
164	161	1	0	0	0	8.79	1	7.69	0.01	0	3.96	
184	181	1	0	0	0.97	725.84	0.03	5.3	0.03	1	10.03	I DOMAIN
194	191	1	0	0	0.92	26.01	0.08	6.03	0.02	1	0.9	
222	219	1	0	0	0	11.53	1	8.49	0.01	2	5.2	
294	291	1	0.84	0.84	0.85	82.1	0.15	6.67	0.02	1	6.18	
343	340	1	0	0	0.74	31.01	0.26	5.73	0.03	2	3.62	
439	436	1	0	0	0.62	15.17	0.38	5.16	0.03	1	2.62	
628	625	1	0	0	0.94	50.15	0.06	6.97	0.01	1	1.24	
648	645	1	0	0	0.94	51.49	0.06	5.46	0.03	1	1.3	
687	684	1	0	0	0	8.3	1	6.96	0.01	0	3.74	
705	702	1	0	0	0.93	27.15	0.07	6.32	0.02	1	0.89	
959	955	1	0.53	0.53	0.95	70.35	0.05	4.59	0.05	1	1.8	
1079	1075	1	0	0	0.91	21.39	0.09	5.38	0.03	1	0.83	

FUBAR - sites evolving under pervasive positive selection (across entire phylogeny); PP>0.9

unedited site #	edited Site #	Partition	α	β	β - α	Prob[α>β] (posterior prob of negative selection)	Prob[α<β] (posterior prob of positive selection)	Bayes Factor [α<β]	PSRF	Neff	
24	23	1	0.764	4.869	4.105	0.051	0.907	19.678	1.012	153.547	
142	141	1	0.92	10.724	9.803	0.024	0.942	32.891	1.002	343.307	
164	161	1	0.635	18.504	17.869	0	0.997	628.953	1.005	250.309	
207	204	1	1.116	7.464	6.347	0.027	0.924	24.487	1.003	307.735	
222	219	1	0.647	25.029	24.382	0	0.998	1230.78	1.009	179.148	I DOMAIN
241	238	1	0.938	6.773	5.835	0.021	0.936	29.657	1.007	218.122	
267	264	1	0.972	8.404	7.432	0.012	0.95	38.646	1.002	382.524	
292	289	1	1.006	7.74	6.734	0.013	0.948	37.053	1.001	396.177	
294	291	1	1.031	14.511	13.48	0.007	0.97	66.381	1.002	336.297	
343	340	1	0.932	6.403	5.471	0.026	0.929	26.354	1.008	187.919	
439	436	1	0.704	7.175	6.471	0.01	0.967	59.455	1.013	144.846	
657	654	1	0.751	5.723	4.971	0.03	0.934	28.688	1.012	146.38	
687	684	1	0.652	17.545	16.893	0	0.996	451.193	1.004	267.888	
835	831	1	0.903	7.542	6.638	0.014	0.951	38.972	1.004	266.175	
839	835	1	0.977	6.246	5.269	0.027	0.924	24.787	1.007	203.682	
918	914	1	0.789	6.71	5.92	0.03	0.935	29.222	1.009	176.398	
1016	1012	1	1.098	10.014	8.916	0.014	0.949	37.772	0.999	570.596	
1127	1123	1	1.602	18.932	17.33	0.015	0.942	32.616	1.006	230.31	
1151	1147	1	0.798	5.325	4.527	0.049	0.909	20.169	1.01	164.846	

PAML - sites evolving under episodic positive selection; p<0.05 (M7 vs M8)

unedited site #	edited Site #	
164	161	I DOMAIN
222	219	
267	264	
294	291	
687	684	
1004	1000	
1127	1123	

Table S2. Signatures of positive selection on rodent *ITGAM*.

MEME - sites subject to episodic positive selection (on at least one branch in the phylogeny); p<0.05

unedited site #	edited Site #	Partition	α (dS)	β- (dN)	p(β-) [dN dS]	β+ (dN)	p(β+) [dN dS]	LRT	p-value	# branches under selection	Total branch length
62	57	1	0	0	0.72	7.49	0.28	4.34	0.05	0	3.52
68	63	1	0	0	0.8	11.22	0.2	9.23	0	3	3.73
71	66	1	0	0	0.53	4.28	0.47	5.68	0.03	2	3.31
77	72	1	0.57	0	0.74	14.41	0.26	5.59	0.03	2	6.45
98	93	1	0	0	0.76	5.63	0.24	4.58	0.05	0	2.25
163	158	1	0.56	0.56	0.89	217.47	0.11	6.89	0.01	1	42.11
222	217	1	0	0	0.43	5.59	0.57	7.09	0.01	1	5.32
277	272	1	0	0	0.94	8.61	0.06	7.03	0.01	1	0.9
294	289	1	1.74	0.56	0.87	10000	0.13	8.28	0.01	0	2124.18
298	293	1	0	0	0	1.97	1	4.86	0.04	0	3.26
340	335	1	0.45	0	0.82	13.55	0.18	6.07	0.02	3	4.28
387	382	1	0	0	0.1	1.84	0.9	4.9	0.04	0	2.75
503	497	1	0	0	0	1.35	1	4.55	0.05	0	2.24
573	567	1	0	0	0.34	1.81	0.66	5.16	0.03	0	1.97
641	635	1	0.56	0.19	0.95	5344.6	0.05	4.94	0.04	1	403.69
645	639	1	0	0	0	1.27	1	4.92	0.04	1	2.09
705	696	1	0	0	0.86	9.75	0.14	9.14	0	0	2.18
718	709	1	0.57	0.57	0.77	56.64	0.23	5.04	0.04	0	22.33
840	831	1	0.39	0	0.84	31.82	0.16	6.31	0.02	2	8.67
889	874	1	0	0	0	1.8	1	4.77	0.04	1	2.98
934	919	1	0	0	0.67	5.41	0.33	5.63	0.03	1	2.96
1103	1088	1	0	0	0.63	4.64	0.37	5.48	0.03	3	2.83

FUBAR - sites evolving under pervasive positive selection (across entire phylogeny); PP>0.9

unedited site #	edited Site #	Partition	α	β	Prob[α<β] (posterior prob of positive selection)
222	217	1	0.68	4.379	0.9306

Table S3. Primate and rodent sequences analyzed for selection on *ITGAM*.

Accession number	ID	Latin name	Common name
XM_017978882.1	calJac	Callithrix jacchus	Common marmoset
XM_008062063.2	carSyr	Carlito syrichta	Philippine tarsier
XM_017515568.1	cebCap	Cebus capucinus	White-headed capuchin
XM_012089958.1	cerAty	Cercocebus atys	Sooty mangabey
XM_007990737.1	chlSab	Chlorocebus sabaeus	Green monkey
XM_011933636.1	colAng	Colobus angolensis	Angolan colobus
XM_019012856.1	gorGor	Gorilla gorilla	gorilla
NM_001145808.1	homSap	Homo sapiens	human
XM_015126018.1	macMul	Macaca mulatta	Rhesus macaque
XM_011743478.2	macNem	Macaca nemestrina	Southern pig-tailed macaque
XM_011982524.1	manLeu	Mandrillus leucophaeus	drill
XM_003807498.3	panPan	Pan paniscus	Bonobo
NM_001194934.1	panTro	Pan troglodytes	Common chimpanzee
XM_021931902.1	papAnu	Papio anubis	Olive baboon
XM_023191072.1	pilTep	Piliocolobus tephrosceles	Ashy red colobus
XM_024233586.1	ponAbe	Pongo abelii	Sumatran orangutan
XM_017869819.1	rhiBie	Rhinopithecus bieti	Black snub-nosed monkey
XM_010362268.1	rhiRox	Rhinopithecus roxellana	Golden snub-nosed monkey
XM_003930035.2	saiBol	Saimiri bolivensis	Squirrel monkey
XM_015491355.1	marMar	Marmota marmota	Alpine marmot
XM_004856245.2	hetGla	Heterocephalus glaber	Naked mole-rat
XM_008823789.2	nanGal	Nannospalax galili	Blind mole-rat
XM_004671036.1	jacJac	Jaculus jaculus	Lesser Egyptian jerboa
XM_005064322.3	mesAur	Mesocricetus auratus	Golden hamster
XM_005351336.2	micOch	Microtus ochrogaster	Prairie vole
NM_001082960.1	musMus	Mus musculus	House mouse
XM_021167472.1	musCar	Mus caroli	Ryukyu mouse
XM_021206605.1	MusPah	Mus pahari	Gairdner’s shrewmouse
XM_006230214.3	ratNor	Rattus norvegicus	rat
XM_013011633.1	dipOrd	Dipodomys ordii	Ord’s kangaroo rat
XM_020179599.1	CasCan	Castor canadensis	North American beaver
XM_021662027.1	MerUng	Meriones unguiculatus	Mongolian gerbil

Table S4. *S. aureus* strains used in this study.

Strain name	Strain #	Description	Used for	Reference
Newman	VJT 2.97		Recruiting leukocytes to peritoneal cavity	(*38*)
Newman ΔΔΔΔ pOS1_P*lukAB*-LukAs.s.-6xHis-CC8 LukAB	VJT 46.28	Newman strain lacking all the leukocidins used to produce WT LukAB	purification of LukAB	(*35*)
AH-LAC USA300-Δ*lukAB hlg::tet lukED::kan lukSF::spec* pOS1sGFP	VJT 49.34	AH-LAC lacking all the leukocidins, transformed with pOS1 with super GFP driven by the *sarA* promoter and sod RBS	phagocytosis assay	(*39*)
USA300 LAC	VJT 12.61		mouse infections	(*40*)
USA300 LAC Δ*lukAB*	VJT 14.26	*lukAB* was deleted using pKOR1	mouse infections	(*34*)
USA300 LAC Δ*lukAB* pOS1	VJT 15.17	LAC transformed with pOS1	mouse infections	(*34*)
LAC Δ*lukAB* pOS1-*lukAB*	VJT 15.18	LAC transformed with pOS1-*lukAB* complementation plasmid	mouse infections	(*34*)

Table S5. Plasmids used in this study.

Plasmid	Used for	Reference/source
pET15b-6xHis- human CD11b I-domain-Flag	To generate recombinant human CD11b I-domain (NP_001139280.1) with a N-terminal 6xHis tag and 3xFLAG tag.	(*12*)
pET15b-6xHis- murine CD11b I-domain-Flag	To generate recombinant murine CD11b I-domain (NP_001076429.1) with a N-terminal 6xHis tag and 3xFLAG tag.	(*12*)
pCMV-XL5 human CD11b	HEK293T binding assay	OriGene (cat# SC32651)
pCMV-AC human CD18	HEK293T binding assay	OriGene (cat# SC320165)
pCMV-Entry mouse CD11b	HEK293T binding assay	OriGene (cat# MC223766)
pCMV-Entry mouse CD18	HEK293T binding assay	OriGene (cat# MC221481)
pCMV6-Entry mouse $CD11b^{H\text{-}I\text{-}domain}$	HEK293T binding assay	This study
pCMV6 Entry mouse $CD11b^{HMH\ 7\ I\text{-}domain}$	HEK293T binding assay	This study

Table S6. Oligonucleotides and gene sequences used in this study.

Label	Description	Sequence
CD11b$^{H\text{-}I\text{-}domain}$ Vector F	To clone pCMV6-Entry mouse CD11b$^{H\text{-}I\text{-}domain}$ for HEK293T binding assays	5'-CGGGAGAAGATCTTTGCGATTGAGGGCACGCAGACA-3’
CD11b$^{H\text{-}I\text{-}domain}$ Vector R	To clone pCMV6-Entry mouse CD11b$^{H\text{-}I\text{-}domain}$ for HEK293T binding assays	5'-CTGCCGTAGGTTGGATCCGAACAAATAGCACAATCCATTC-3’
CD11b$^{H\text{-}I\text{-}domain}$ Insert F	To clone pCMV6-Entry mouse CD11b$^{H\text{-}I\text{-}domain}$ for HEK293T binding assays	5'-GAATGGATTGTGCTATTTGTTCGGATCCAACCTACGGCAG-3’
CD11b$^{H\text{-}I\text{-}domain}$ Insert R	To clone pCMV6-Entry mouse CD11b$^{H\text{-}I\text{-}domain}$ for HEK293T binding assays	5'-TGTCTGCGTGCCCTCAATCGCAAAGATCTTCTCCCG-3’
CD11b$^{HMH\ 7\ I\text{-}domain}$ Vector F	To clone pCMV6 Entry mouse CD11b$^{HMH\ 7\ I\text{-}domain}$ for HEK293T binding assays	5’-ACCATTCAGAACCAGCTTCAGGA-3’
CD11b$^{HMH\ 7\ I\text{-}domain}$ Vector R	To clone pCMV6 Entry mouse CD11b$^{HMH\ 7\ I\text{-}domain}$ for HEK293T binding assays	5’-TCTCTGAGAGCCTCTGGGAACT-3’
CD11b$^{HMH\ 7\ I\text{-}domain}$ Insert F	To clone pCMV6 Entry mouse CD11b$^{HMH\ 7\ I\text{-}domain}$ for HEK293T binding assays	5’-AGTTCCCAGAGGCTCTCAGAGA-3’
CD11b$^{HMH\ 7\ I\text{-}domain}$ Insert R	To clone pCMV6 Entry mouse CD11b$^{HMH\ 7\ I\text{-}domain}$ for HEK293T binding assays	5’-TCCTGAAGCTGGTTCTGAATGGT-3’
Exon 9 F	Forward primer to amplify exon 9 of murine *Itgam*	5’-AAGCTGCCTTCTGCTGAACTCT-3’
Exon 9 R	Reverse primer to amplify exon 9 of murine *Itgam*	5’-GCTACATGGGGCTGCTACCATC-3’

Sheep I-domain	(Ovis aries, NP_001076062.1) To clone into pET15b; N-terminal NdeI site; C-terminal 6-glycine linker, 3xFLAG, XhoI site	ATTCGCATATGGGATCCAATCTACTCCAGAAACCC AGGAGGATCCCAGCGGCCCTCAGAGAGTGCCCTCA GCAAGACAGTGACATTGCCTTTTTGATTGATGGCTC TGGTAGCATCGACCCAGTAGACTTTGATCGGATGA AGAAGTTTGTCTCAACTGTGATGAGTCGATTCCAA AAGTCCAAAACCTTGTTCGCTCTGATGCAGTACTCG GATGACTTCCGGACTCACTTCACCTTCAATGGTTTC AAGAGAAACTCAGACCCGGAATTACTGGTGAGGCC AATAGGACAGCTGTTCGGGAGGACGCACACAGCCA CGGGGATCCGCAAAGTAGTGAGAGAACTGTTTCAC AGCAGCAATGGAGCCCGGAATCATGCCCTGAAGAT CATGATTGTCATCACAGATGGGGAAAAATATCTCG ATCCTTTGGAGTATAGGGATGTCATCCCTGAAGCT GATAGAAAAGGGATCATTCGCTACGTCATTGGGGT GGGAGATGCTTTTAACAGTAAGAAATCTCGAAAGG AGCTCGATACTATTGCATCTAAGCCGCCTGCTGATC ACGTGTTCCAGGTGAATAACTTCGAAGCTCTGAAG ACCATTCAGAACCAGCTTCAGGAAAAGATCTTTGC GGGAGGAGGCGGAGGAGGAGACTACAAAGACCAT GACGGTGATTATAAAGATCATGATATCGATTACAA GGATGACGATGACAAGTAACTCGAGTCGACG
Cow I-domain	(Bos Taurus, XP_005224900.1) To clone into pET15b; N-terminal NdeI site; C-terminal 6-glycine linker, 3xFLAG, XhoI site	ATTCGCATATGGGATCCAATCTACTCCAGCAACCC AGGAGGATCCCAAGGGCCCTCAGAGGGTGCCCTGA GCAAGACAGTGACATTGCCTTTTTGATTGATGGCTC TGGTAGCATCGACCCAGTAGACTTTGAGCGGATGA AGAGGTTTGTCTCAACTGTGATGAGTCAATTCCAA AAGTCCAAAACCTTGTTCTCTCTGATGCAGTACTCG GATGACTTCCAGACTCACTTCACCTTCAATGATTTC AAGAGAAACCCTGTCCCGGAATTCCTGGTGGGGCC AATAAGACAGCTGTTTGGGAGGACGCACACGGCCA CGGGGATCCGCAAAGTAGTGAGAGAACTGTTTCAC AGCAGCAGTGGAGCCCGGAATCATGCCATTAAGAT CATGATTGTCATCACAGATGGGGAAAAATATCTCG ATCCTTTGGAGTATAGTGATGTCATCCCTGAAGCTG ATAGAAAAAAGATCATTCGCTACGTCATTGGGGTG GGAGATGCTTTTAGGAGTAGGAAATCTCGACAGGA GCTCGATACTATTGCATCTAAGCCCCCTGCTGACCA CGTGTTCCAGGTGAATAACTTCGAAGCTCTGAAGA CCATTCAGAACCAGCTTCAGGAAAAGATCTTTGCG GGAGGAGGCGGAGGAGGAGACTACAAAGACCATG ACGGTGATTATAAAGATCATGATATCGATTACAAG GATGACGATGACAAGTAACTCGAGTCGACG

Chinese Hamster I-domain	(Cricetulus griseus, XP_003511044.1) To clone into pET15b; N-terminal NdeI site; C-terminal 6-glycine linker, 3xFLAG, XhoI site	ATTCGCATATGGACTCCAACCTGATGAGGCCACCC CAGCAGTTCCCAGAGGCTCTCAGAGAATGTCCTCA GCAGGAGAGTGACATTGTCTTCTTGATTGATGGCTC TGGTAGCATCCACCCCAGAGACTTTCAGAAGATGA AGGAGTTTGTCTCAACTGTGATGGAGCAGTTCACA AAGTCTAAAACCTTGTTCTCTTTGATGCAGTACTCT GATGAATTCCGGACTCACTTCACCTTCAATGATTTC AAGAAAAACCCTAACCCAAGATCACATGTGGATTC CATAAGGCAGCTGAATGGAATGACAAAAACGGCCT CAGGGATCCAAAAAGTAGTGAGAGAACTGTTTCAG AAAACTAGCGGGGCCCGGGAGAATGCTGTGAAGA TCCTAGTTGTCATCACAGATGGAGAAAAATATGGA GATCCCTTGGATTATGAGGATGTCATCCCTGAGGC AGACAGAGCAAGGGTCATCCGTTATGTCATTGGGG TAGGAAATGCCTTCGCCAGTAGACAATCCCGTCGA GAGCTTGATACCATTGCATCTAAGCCAGCTGATGA TCACGTGTTCCAAGTGGACAACTTTGAAGCTCTGA AGACCATTCAGAACCAGCTTCAGGAAAAAATCTTT GCCGGAGGAGGCGGAGGAGGAGACTACAAAGACC ATGACGGTGATTATAAAGATCATGATATCGATTAC AAGGATGACGATGACAAGTAACTCGAGTCGACG
Rabbit I-domain	(Oryctolagus cuniculus, XP_002721795.1) To clone into pET15b; N-terminal NdeI site; C-terminal 6-glycine linker, 3xFLAG, XhoI site	ATTCGCATATGGGATCCAACCTGCTGCAGTCACCC CAGAGGGTCCCAGAGACCCTCAGAGGATGTCCTCA GCAGGAGAGTGACATTGCCTTCCTGATTGATGGCT CCGGTAGCATTGACTCAACGGACTTCCAGAGGATG AAGGAGTTTGTCTCCACCGTGATGGAGCAATTCAC GAAGTCCAATTCCCTGTTCGCCTTGATGCAGTACTC CGAAGAGTTCCGGACTCACTTTACCTTCAGTGACTT CAAAAGAAACCCCAACCCTAGAGCGCTGGTGAAGC CGATCCGACAGCTGCTTGGGAGGACGCACACGGCC ACGGGGATCCTCAAAGTCGTGACAGAGCTGTTTCA TAGCAGTAGCGGGGCCAGGGCGAACGCCCGGAAG GTCCTCGTGGTGATCACGGATGGAGAGAAGTTCGG CGACACCTTGGAGTATGAGGATGTCATCCCGAGGG CAGAAAGGGAGGGCGTCATTCGCTACGTCGTTGGG GTGGGAGACGCCTTCAACAGTGAGCAAAGCCGCCA AGAGCTCAATACCATTGCGTCCAAGCCGTCTCGTG AGCACGTGTTCCGGGTGAACAACTTCGAAGCCCTG AACACCATTCGGAATCAGCTTCAGGAAAAGATCTT TGCAGGAGGAGGCGGAGGAGGAGACTACAAAGAC CATGACGGTGATTATAAAGATCATGATATCGATTA CAAGGATGACGATGACAAGTAACTCGAGTCGACG

Rat I-domain	(Rattus norvegicus, GenBank: EDM17198.1) To clone into pET15b; N-terminal NdeI site; C-terminal 6-glycine linker, 3xFLAG, XhoI site	ATTCGCATATGGGCTCCAACCTGCTGAGGAAGCCC CAGCAGTTCCCAGAGGCTCTCAGAGGATGTCCTCA GCAGGAGAGCGACATTGCCTTCTTGATTGACGGCT CCGGTAGCATCAACAGCATCGACTTTCAGAAGATG AAGGAATTTGTCTCAACTGTGATGGACCAGTTCCA AAAGTCTAAAACCTTGTTCTCTTTGATGCAGTACTC TGATGAATTCCGGACTCACTTCACCTTCAATGATTT CAAGAGAAACCCTGACCCAAAATCACATGTGAGAC CCATAAGGCAGCTGAATGGAAGGACAAAAACTGC CTCAGGGATCCGTAAAGTAGTGAGAGAACTGTTTC AGAAAATCAATGGGGCCCGGGACAATGCCGCGAA GATCCTAGTTGTCATCACAGACGGAGAAAAGTTTG GTGACCCCCTAAATTATGAGGATGTCATTCCTGAG GCAGAGGAAGCAGGGATCATTCGCTACGTTATTGG GGTGGGAAACGCCTTCCACAAACCACAGTCCCGCA GAGAGCTTGACACCATCGCGTCTAAGCCAGCTGGT GATCACGTGTTCCAAGTGGACAACTTTGAAGCTCT GAATACCATTCGGAACCAGCTCCAGGAAAAGATCT TTGCAGGAGGAGGCGGAGGAGGAGACTACAAAGA CCATGACGGTGATTATAAAGATCATGATATCGATT ACAAGGATGACGATGACAAGTAACTCGAGTCGACG
Pig I-domain	(Sus scrofa, XP_020942039.1) To clone into pET15b; N-terminal NdeI site; C-terminal 6-glycine linker, 3xFLAG, XhoI site	ATTCGCATATGGGATCCAACCTACATCAGCAGCCC CAGAGGGTCCCAGAGACCCTCAGAGGGTGTCCTCA GCAAGAGAGTGACATTGCCTTTTTGATTGATGGTTC CGGTAGCATCAACCGGTTAGACTTTCAGCGGATGA AGGAGTTTGTCTCCACTGTGATGGGTCAATTCCAA AAGTCCAAAACCCTGTTTGCTCTGATGCAGTACTCT GAAGACTTCTACACTCATTTCACCTTCAATGATTTC AAGAGAAACCCTTCCCCAGAATTGCTGGTGAGGCC AATAAGACAGCTGCTGGGGAGGACTCACACCGCCA CGGGAATCCGCAAAGTAGTAAGAGAACTGTTTCAC AGCAAGAGTGGAGCCCGGGAGAATGCCCTTAAGAT CCTAGTTGTCATCACGGACGGAGAAAAGTTCGGCG ATCCTTTGGGATATGAGGATGTCATCCCTGAAGCG GATAGAAAGGGCGTCATTCGCTATGTCATCGGGGT GGGAGATGCCTTCAACAGTTGGAAATCTCGTGAGG AGCTTAATACCATTGCATCCAAGCCGTCTGGAGAT CACGTGTTCCAGGTGACTAACTTTGAAGCTCTGAA GACCATTCAGAACCAGCTTCAGGAAAAGATCTTTG CGGGAGGAGGCGGAGGAGGAGACTACAAAGACCA TGACGGTGATTATAAAGATCATGATATCGATTACA AGGATGACGATGACAAGTAACTCGAGTCGACG

Horse I-domain	(Equus caballus, XP_005598796.2) To clone into pET15b; N-terminal NdeI site; C-terminal 6-glycine linker, 3xFLAG, XhoI site	ATTCGCATATGGGATCCAACTTACGGCAGCAGCCC CAGAGGTTCCCAGAAGCCCTCAGAGAGTGCCCTCA GCAGGAGAGTGACATCGCCTTCTTGATTGATGGCT CTGGTAGCATCTACGAGAATGACTTTCAGAAGATG AAGGAGTTTGTCACAATTGTGATGAATCAATTCAA AAAGTCTAAAACCTTGTTCTCTTTGATGCAGTACTC CGACACCTTCCAGACTCATTTCACCTTCAAAGAATT CGCTAACAACCCTAACCCAGGATCGCTGGTGAGAC CAATAAATCAGCTGGGTGGGAGGACACACACTGCC ACCGGAATCCGCAAAGTAGTGAGGGAACTGTTTCA CAGCAGGAATGGAGCCCGGAAGAATGCTCTTAAGA TCCTAGTTGTCATCACAGATGGAGAAAAGTTTGGT GATCGCTTGGAATACGAGGATGTCATCCCTGAGGC AGACCAAGAAGGAATCATTCGCTATGTCATTGGGG TGGGCATTGCCTTCAGCATTGAGAAATCTCGTGAA GAGCTTAACACCATTGCATCCAAGCCGGCTCGTGA CCATGTGTTCCGGGTGAATAACTTTGAAGCTCTGA AGACCATTCAGAATCAGCTTCAGGAAAAGATCTTT GCGGGAGGAGGCGGAGGAGGAGACTACAAAGACC ATGACGGTGATTATAAAGATCATGATATCGATTAC AAGGATGACGATGACAAGTAACTCGAGTCGACG
Rhesus monkey I-domain	(Macaca mulatta, XP_014981504.1) To clone into pET15b; N-terminal NdeI site; C-terminal 6-glycine linker, 3xFLAG, XhoI site	ATTCGCATATGGGATCCAACCTACGGCAGCAGCCC CAGAAGTTCCCAGGGACCCTCCGAGGGTGTCCTGA ACAGGACATCGCCTTCTTGATTGACGGCTCTGGTA GCATCAACCCACGTGAATTTCAGCAGATGAAGGAT TTTGTCTCGGTCATGATGGAGCAATTAAAAAAGTC CAAAACCTTGTTCTCTTTGATGCAGTACTCCGAAGA ATTCTGGACTCACTTTACCTTCGAAGAGTTCCAGCG CAAACCTAACCCGAGATCACTGGTGAACTCAATAA CGCAGCTGTATGGGCGGACACACACGGCCACGGCC ATCCGCAAAGTGGTGCGAGAACTGTTTAACGTCAA CCAGGGAGCCCGAAAGAATGCCCGTAAGATCCTAG TTGTCATCACAGATGGAGAAAAGTTTGGCGATCCA TTGGGATATGAGGACGTGATTCCTGAGGCAGACAG AGAGGGAGTCATTCGCTACGTCATTGGGGTGGGAG ATGCCTTCCGCAGTTCGAAATCCCGCCAAGAGCTT AATACCATCGCATCCAAGCCACCTCGTGATCACGT GTTCCAGGTGAATAACTTTGAGGCTCTGAAGACCA TTCAGAAGCAGCTTCAGGAGAAGATCTTTGCGGGA GGAGGCGGAGGAGGAGACTACAAAGACCATGACG GTGATTATAAAGATCATGATATCGATTACAAGGAT GACGATGACAAGTAACTCGAGTCGACG

Olive baboon I-domain	(Papio anubis, XM_021931902.1) To clone into pET15b; N-terminal NdeI site; C-terminal 6-glycine linker, 3xFLAG, XhoI site	ATTCGCATATGGGATCCAACCTACGGCAGCAGCCC CAGAAGTTCCCAGGGACCCTCCGAGGGTGTCCTGA ACAGGACATCGCCTTCTTGATTGACGGCTCTGGTA GCATCAACCCACGTGAATTTCAGCAGATGAAGGAT TTTGTCTCAATCATGATGGAGCAATTAAAAAAGTC CAAAACCTTGTTCTCTTTGATGCAGTACTCCGAAGA ATTCTGGACTCACTTTACCTTCAAAGAGTTCCAGCG CAACCCTAAGCCGAGATCACTGGTGAACTCAATAA CGCAGCTGTATGGGCGGACGCACACGGCCACGGCC ATCCGCAAAGTGGTACGAGAACTGTTTAACGTCAA CCAGGGAGCCCGAAAGTATGCCCGTAAGATCCTAG TTGTCATCACAGATGGAGAAAAGTTTGGCGATCCA TTGGGATATGAGGACGTCATTCCGGAGGCAGACAG AGAGGGAGTCATTCGCTACGTCATTGGGGTGGGAG ATGCCTTCCGCAGTTGGAAATCCCGCCAAGAGCTT AATACCATCGCATCCAAGCCAGCTCGTGATCACGT GTTCCAGGTGAATAACTTTGAGGCTCTGAAGACCA TTCAGAACCAGCTTCAGGAGAAGATCTTTGCGGGA GGAGGCGGAGGAGGAGACTACAAAGACCATGACG GTGATTATAAAGATCATGATATCGATTACAAGGAT GACGATGACAAGTAACTCGAGTCGACG
Angolan colobus I-domain	(Colobus angolensis, XM_011933636.1) To clone into pET15b; N-terminal NdeI site; C-terminal 6-glycine linker, 3xFLAG, XhoI site	ATTCGCATATGGGATCCAACCTACGGCAGCAGCCC CAGAAGTTCCCAGGGACCCTCCGAGGGTGTCCTGA ACAGGACATCGCCTTCTTGATTGACGGCTCTGGTA GCATCAACCCACGTGAATTTCAGCAGATGAAGGAG TTTGTCTCGATCATGATGGAGCAATTAAAAAAGTC CAAAACCTTGTTCTCTTTGATGCAGTACTCTGAAGA ATTCTGGACTCACTTTACCTTCAAAGAGTTCCAGGG CAACCCTAACCCGAGATCACTGGTGAAGTCAATAA CGCAGCTGTTTGGGCGGACACACACGGCCACGGCC ATCCGCAAAGTGGTACGAGAACTGTTTAACGTCAA CCAGGGAGCCCGAAAGAATGCCCTTAAGATCCTGG TTGTCATCACAGATGGAGAAAAGTTTGGCGATCCC TTGGGATATGAGGACGTCATCCCTGAGGCAGACAG AGAGGGAGTCATTCGCTACGTCATTGGGGTGGGAG ATGCCTTCCGCAGTTTGAAATCCCGGCAAGAGCTT AATACCATTGCATCCAAGCCACCTCGTGATCACGT GTTCCAGGTGAATAACTTTGAGGCTCTGAAGACCA TTCAGAACCAGCTTCAGGAGAAGATCTTTGCAGGA GGAGGCGGAGGAGGAGACTACAAAGACCATGACG GTGATTATAAAGATCATGATATCGATTACAAGGAT GACGATGACAAGTAACTCGAGTCGACG

Golden snub-nosed monkey I-domain	(Rhinopithecus roxellan, XM_010362268.1) To clone into pET15b; N-terminal NdeI site; C-terminal 6-glycine linker, 3xFLAG, XhoI site	ATTCGCATATGGGATCCAACCTACGGCAGCAGCCC CAGAAGTTCCCAGGGACCCTCCGAGGGTGTCCTGA ACAGGACATCGCCTTCTTGATTGACGGCTCTGGTA GCATCAACCCACATGAATTTCAGCAGATGAAGGAG TTTGTCTCGATCATGATGGAGCAATTAAAAAAGTC CAAAACCTTGTTCTCTTTGATGCAGTACTCCGAAGA ATTCTGGACTCATTTTACCTTCAAAGAGTTCCAGGG CAACCCTAACCCGAGATCACTGGTGAAGTCAATAA CGCAGCTGTTTGGGCGGACACACACGGCCACGGCC ATCCGCAAAGTGGTACGAGAACTGTTTAACGTCAA TCAGGGAGCCCGAAAGAATGCCCTTAAGATCCTGG TTGTCATCACAGATGGAGAAAAGTTTGGCGATCCC TTGGGATATGAGGACGTCATCCCTGAGGCAGACAG AGAGGGAGTCATTCGCTACGTCATTGGGGTGGGAG ACGCCTTCCGCAGTTTGAAATCCCGCCAAGAGCTT AATACCATTGCATCCAAGCCACCTCGTGATCACGT GTTCCAAGTGAATAACTTTGAGGCTCTGAAGACCA TTCAGAACCAGCTTCAGGAGAAGATCTTTGCAGGA GGAGGCGGAGGAGGAGACTACAAAGACCATGACG GTGATTATAAAGATCATGATATCGATTACAAGGAT GACGATGACAAGTAACTCGAGTCGACG
Ord's kangaroo rat I-domain	(Diipodomys ordii, XM_013011633.1) To clone into pET15b; N-terminal NdeI site; C-terminal 6-glycine linker, 3xFLAG, XhoI site	ATTCGCATATGGGACCCAACTTGCTACAGCAGCCT GAGCGGTTCCCAGAGACCCTTAGAGGATGTCCTCA GCAGGAGAGTGACATTGTCTTCTTGATCGATGGTTC AGGCAGCATCCGGACACATGAGTTTCAGGAGATGA AGGAGTTTGTATCAACTGTGATGAACCAATTCACA GAGTCCAAAACCTTGTTCTCCTTAATGCAGTACTCT GAAGAGTTCTGGACTCATTTCACCTTCAGCGATTTC AAGAGAAACCCGAACCCGAGGTCTCTGATAAACCC AATCAAACAGCTGAGTGGTAGGACGCACACCGCCA CAGCAATCCGCAAAGTAGTAACAGAACTCTTCCAG AGCTCCAATGGGGCCCGAGAGAATGCCGTGAAGAT CCTAGTTGTTATCACAGATGGAGAAAAGTTTGGTG ACCCCTTGGGCTATGAGCAAGTCATCCCTCAAGCT GACAGAGCGGGGATCATTCGCTATGTCATTGGGGT CGGGGATGCCTTCCGCAGTGAGCGGAACAGAGAA GAACTTAACACCATTGCGTCCAAGCCTTCTCAGGA TCATGTATTCCGGGTGAATAACTTTCAAGCTCTGAA GACCATTCAGAACCAACTGCAGGAAAAGATCTTTG CCGGAGGAGGCGGAGGAGGAGACTACAAAGACCA TGACGGTGATTATAAAGATCATGATATCGATTACA AGGATGACGATGACAAGTAACTCGAGTCGACG

N. American beaver I-domain	(Castor Canadensis, XM_020179599.1) To clone into pET15b; N-terminal NdeI site; C-terminal 6-glycine linker, 3xFLAG, XhoI site	ATTCGCATATGGGATCCAACCTGCTACAGCAGCCC CAGCGGTTCCCAGGGGCCCTCAGAGGATGCCCTCG GCAGGATAGTGACATTGCTTTTTTGATTGATGGCTC TGGTAGCATCAACGCAAATGACTTTCAGAAGATGA AGAACTTTGTCTCAACAGTGATGAACCAATTCAAA GAGTCCAAAACCTTGTTCTCCTTAATGCAGTACTCT GAAGACTTCCGGACTCATTTCACCTTCAGTGATTTC AAGAGAAACCCTAATCCAGAATCACTGGTCCGTCC AATAAGACAGCTGCTTGGGAGGACGCACACTGCCA CGGGCATCCGCAAAGTAGTAACAGAACTGTTCCAC CACGCCAGTGGAGCCCGAGAGAACGCTGTCAAGAT CCTAGTTGTTATCACAGATGGAGAAAAGTATGGTG ACCCCTTGGACTATGAGGATGTCATCCCGCAGGCA GACAGAGCAGGGGTCATTCGCTATGTCATTGGGGT GGGACATGCCTTCAGTAGTGTCGGATCTCGCCAAG AACTTAACACCATTGCATCCAAGCCACCTCGGGAC CACGTGTTCCAGGTGAATAACTTTGAAGCTCTAAA GACCATTCAGAATCAACTGCAGGAGAAGATCTTTG CCGGAGGAGGCGGAGGAGGAGACTACAAAGACCA TGACGGTGATTATAAAGATCATGATATCGATTACA AGGATGACGATGACAAGTAACTCGAGTCGACG
Human I-domain E294P	To clone into pET15b; N-terminal NdeI site; C-terminal 6-glycine linker, 3xFLAG, XhoI site	TTTCATATGGGATCCAACCTACGGCAGCAGCCCCA GAAGTTCCCAGAGGCCCTCCGAGGGTGTCCTCAAG AGGATAGTGACATTGCCTTCTTGATTGATGGCTCTG GTAGCATCATCCCACATGACTTTCGGCGGATGAAG GAGTTTGTCTCAACTGTGATGGAGCAATTAAAAAA GTCCAAAACCTTGTTCTCTTTGATGCAGTACTCTGA AGAATTCCGGATTCACTTTACCTTCAAAGAGTTCCA GAACAACCCTAACCCAAGATCACTGGTGAAGCCAA TAACGCAGCTGCTTGGGCGGACACACACGGCCACG GGCATCCGCAAAGTGGTACGAGAGCTGTTTAACAT CACCAACGGAGCCCGAAAGAATGCCTTTAAGATCC TAGTTGTCATCACGGATGGAGAAAAGTTTGGCGAT CCCTTGGGATATGAGGATGTCATCCCTGAGGCAGA CAGAGAGGGAGTCATTCGCTACGTCATTGGGGTGG GAGATGCCTTCCGCAGTCCAAAATCCCGCCAAGAG CTTAATACCATCGCATCCAAGCCGCCTCGTGATCAC GTGTTCCAGGTGAATAACTTTGAGGCTCTGAAGAC CATTCAGAACCAGCTTCGGGAGAAGATCTTTGCGG GAGGAGGCGGAGGAGGAGACTACAAAGACCATGA CGGTGATTATAAAGATCATGATATCGATTACAAGG ATGACGATGACAAGTAACTCGAGAAA

Human I-domain E294K	To clone into pET15b; N-terminal NdeI site; C-terminal 6-glycine linker, 3xFLAG, XhoI site	TTTCATATGGGATCCAACCTACGGCAGCAGCCCCA GAAGTTCCCAGAGGCCCTCCGAGGGTGTCCTCAAG AGGATAGTGACATTGCCTTCTTGATTGATGGCTCTG GTAGCATCATCCCACATGACTTTCGGCGGATGAAG GAGTTTGTCTCAACTGTGATGGAGCAATTAAAAAA GTCCAAAACCTTGTTCTCTTTGATGCAGTACTCTGA AGAATTCCGGATTCACTTTACCTTCAAAGAGTTCCA GAACAACCCTAACCCAAGATCACTGGTGAAGCCAA TAACGCAGCTGCTTGGGCGGACACACACGGCCACG GGCATCCGCAAAGTGGTACGAGAGCTGTTTAACAT CACCAACGGAGCCCGAAAGAATGCCTTTAAGATCC TAGTTGTCATCACGGATGGAGAAAAGTTTGGCGAT CCCTTGGGATATGAGGATGTCATCCCTGAGGCAGA CAGAGAGGGAGTCATTCGCTACGTCATTGGGGTGG GAGATGCCTTCCGCAGTAAAAAATCCCGCCAAGAG CTTAATACCATCGCATCCAAGCCGCCTCGTGATCAC GTGTTCCAGGTGAATAACTTTGAGGCTCTGAAGAC CATTCAGAACCAGCTTCGGGAGAAGATCTTTGCGG GAGGAGGCGGAGGAGGAGACTACAAAGACCATGA CGGTGATTATAAAGATCATGATATCGATTACAAGG ATGACGATGACAAGTAACTCGAGAAA
Human I-domain H164I L222N E294P	To clone into pET15b; N-terminal NdeI site; C-terminal 6-glycine linker, 3xFLAG, XhoI site	TTTCATATGGGATCCAACCTACGGCAGCAGCCCCA GAAGTTCCCAGAGGCCCTCCGAGGGTGTCCTCAAG AGGATAGTGACATTGCCTTCTTGATTGATGGCTCTG GTAGCATCATCCCAATTGACTTTCGGCGGATGAAG GAGTTTGTCTCAACTGTGATGGAGCAATTAAAAAA GTCCAAAACCTTGTTCTCTTTGATGCAGTACTCTGA AGAATTCCGGATTCACTTTACCTTCAAAGAGTTCCA GAACAACCCTAACCCAAGATCACTGGTGAAGCCAA TAACGCAGCTGAATGGGCGGACACACACGGCCACG GGCATCCGCAAAGTGGTACGAGAGCTGTTTAACAT CACCAACGGAGCCCGAAAGAATGCCTTTAAGATCC TAGTTGTCATCACGGATGGAGAAAAGTTTGGCGAT CCCTTGGGATATGAGGATGTCATCCCTGAGGCAGA CAGAGAGGGAGTCATTCGCTACGTCATTGGGGTGG GAGATGCCTTCCGCAGTCCAAAATCCCGCCAAGAG CTTAATACCATCGCATCCAAGCCGCCTCGTGATCAC GTGTTCCAGGTGAATAACTTTGAGGCTCTGAAGAC CATTCAGAACCAGCTTCGGGAGAAGATCTTTGCGG GAGGAGGAGGAGGCGGAGACTACAAAGACCATGA CGGTGATTATAAAGATCATGATATCGATTACAAGG ATGACGATGACAAGTAACTCGAGAAA

Human I-domain H164I L222N	To clone into pET15b; N-terminal NdeI site; C-terminal 6-glycine linker, 3xFLAG, XhoI site	TTTCATATGGGATCCAACCTACGGCAGCAGCCCCA GAAGTTCCCAGAGGCCCTCCGAGGGTGTCCTCAAG AGGATAGTGACATTGCCTTCTTGATTGATGGCTCTG GTAGCATCATCCCAATTGACTTTCGGCGGATGAAG GAGTTTGTCTCAACTGTGATGGAGCAATTAAAAAA GTCCAAAACCTTGTTCTCTTTGATGCAGTACTCTGA AGAATTCCGGATTCACTTTACCTTCAAAGAGTTCCA GAACAACCCTAACCCAAGATCACTGGTGAAGCCAA TAACGCAGCTGAATGGGCGGACACACACGGCCACG GGCATCCGCAAAGTGGTACGAGAGCTGTTTAACAT CACCAACGGAGCCCGAAAGAATGCCTTTAAGATCC TAGTTGTCATCACGGATGGAGAAAAGTTTGGCGAT CCCTTGGGATATGAGGATGTCATCCCTGAGGCAGA CAGAGAGGGAGTCATTCGCTACGTCATTGGGGTGG GAGATGCCTTCCGCAGTGAGAAATCCCGCCAAGAG CTTAATACCATCGCATCCAAGCCGCCTCGTGATCAC GTGTTCCAGGTGAATAACTTTGAGGCTCTGAAGAC CATTCAGAACCAGCTTCGGGAGAAGATCTTTGCGG GAGGAGGCGGAGGAGGAGACTACAAAGACCATGA CGGTGATTATAAAGATCATGATATCGATTACAAGG ATGACGATGACAAGTAACTCGAGAAA
HMH 1 chimeric I-domain	Murine residues swapped into human backbone; To clone into pET15b; N-terminal NdeI site; C-terminal 6-glycine linker, 3xFLAG, XhoI site	ATTCGCATATGGGATCCAACCTACTGAGGCCGCCC CAGCAGTTCCCAGAGGCCCTCCGAGAATGTCCTCA AGAGGATAGTGACATTGCCTTCTTGATTGATGGCTC TGGTAGCATCATCCCACATGACTTTCGGCGGATGA AGGAGTTTGTCTCAACTGTGATGGAGCAATTAAAA AAGTCCAAAACCTTGTTCTCTTTGATGCAGTACTCT GAAGAATTCCGGATTCACTTTACCTTCAAAGAGTTC CAGAACAACCCTAACCCAAGATCACTGGTGAAGCC AATAACGCAGCTGCTTGGGCGGACACACACGGCCA CGGGCATCCGCAAAGTGGTACGAGAGCTGTTTAAC ATCACCAACGGAGCCCGAAAGAATGCCTTTAAGAT CCTAGTTGTCATCACGGATGGAGAAAAGTTTGGCG ATCCCTTGGGATATGAGGATGTCATCCCTGAGGCA GACAGAGAGGGAGTCATTCGCTACGTCATTGGGGT GGGAGATGCCTTCCGCAGTGAGAAATCCCGCCAAG AGCTTAATACCATCGCATCCAAGCCGCCTCGTGAT CACGTGTTCCAGGTGAATAACTTTGAGGCTCTGAA GACCATTCAGAACCAGCTTCGGGAGAAGATCTTTG CGGGAGGAGGAGGCGGAGGAGACTACAAAGACCA TGACGGTGATTATAAAGATCATGATATCGATTACA AGGATGACGATGACAAGTAACTCGAGTCGACG

HMH 2 chimeric I-domain	Murine residues swapped into human backbone; To clone into pET15b; N-terminal NdeI site; C-terminal 6-glycine linker, 3xFLAG, XhoI site	ATTCGCATATGGGATCCAACCTACGGCAGCAGCCC CAGAAGTTCCCAGAGGCCCTCCGAGGGTGTCCTCA ACAGGAGAGTGACATTGTCTTCTTGATTGATGGCTC TGGTAGCATCATCCCACATGACTTTCGGCGGATGA AGGAGTTTGTCTCAACTGTGATGGAGCAATTAAAA AAGTCCAAAACCTTGTTCTCTTTGATGCAGTACTCT GAAGAATTCCGGATTCACTTTACCTTCAAAGAGTTC CAGAACAACCCTAACCCAAGATCACTGGTGAAGCC AATAACGCAGCTGCTTGGGCGGACACACACGGCCA CGGGCATCCGCAAAGTGGTACGAGAGCTGTTTCAC AAAACCAACGGAGCCCGAGAGAATGCCGCGAAGA TCCTAGTTGTCATCACGGATGGAGAAAAGTTTGGC GATCCCTTGGGATATGAGGATGTCATCCCTGAGGC AGACAGAGCAGGAGTCATTCGCTACGTCATTGGGG TGGGAGATGCCTTCCGCAGTGAGAAATCCCGCCAA GAGCTTAATACCATCGCATCCAAGCCGCCTCGTGA TCACGTGTTCCAGGTGAATAACTTTGAGGCTCTGA AGACCATTCAGAACCAGCTTCGGGAGAAGATCTTT GCGGGAGGAGGAGGCGGAGGAGACTACAAAGACC ATGACGGTGATTATAAAGATCATGATATCGATTAC AAGGATGACGATGACAAGTAACTCGAGTCGACG
HMH 3 chimeric I-domain	Murine residues swapped into human backbone; To clone into pET15b; N-terminal NdeI site; C-terminal 6-glycine linker, 3xFLAG, XhoI site	ATTCGCATATGGGATCCAACCTACGGCAGCAGCCC CAGAAGTTCCCAGAGGCCCTCCGAGGGTGTCCTCA AGAGGATAGTGACATTGCCTTCTTGATTGATGGCTC TGGTAGCATCAACAACATTGACTTTCAGAAGATGA AGGAGTTTGTCTCAACTGTGATGGAGCAATTAAAA AAGTCCAAAACCTTGTTCTCTTTGATGCAGTACTCT GAAGAATTCCGGATTCACTTTACCTTCAAAGAGTTC CAGAACAACCCTAACCCAAGATCACTGGTGAGCCC AATAAAGCAGCTGAATGGGCGGACACACACGGCC ACGGGCATCCGCAAAGTGGTACGAGAGCTGTTTAA CATCACCAACGGAGCCCGAAAGAATGCCTTTAAGA TCCTAGTTGTCATCACGGATGGAGAAAAGTTTGGC GATCCCTTGGGATATGAGGATGTCATCCCTGAGGC AGACAGAGAGGGAGTCATTCGCTACGTCATTGGGG TGGGAGATGCCTTCCGCAGTGAGAAATCCCGCCAA GAGCTTAATACCATCGCATCCAAGCCGCCTCGTGA TCACGTGTTCCAGGTGAATAACTTTGAGGCTCTGA AGACCATTCAGAACCAGCTTCGGGAGAAGATCTTT GCGGGAGGAGGAGGCGGAGGAGACTACAAAGACC ATGACGGTGATTATAAAGATCATGATATCGATTAC AAGGATGACGATGACAAGTAACTCGAGTCGACG

HMH 4 chimeric I-domain	Murine residues swapped into human backbone; To clone into pET15b; N-terminal NdeI site; C-terminal 6-glycine linker, 3xFLAG, XhoI site	ATTCGCATATGGGATCCAACCTACGGCAGCAGCCC CAGAAGTTCCCAGAGGCCCTCCGAGGGTGTCCTCA AGAGGATAGTGACATTGCCTTCTTGATTGATGGCTC TGGTAGCATCATCCCACATGACTTTCGGCGGATGA AGGAGTTTGTCTCAACTGTGATGGAGCAATTCAAA AAGTCCAAAACCTTGTTCTCTTTGATGCAGTACTCT GAAGAATTCCGGATTCACTTTACCTTCAAAGAGTTC CAGAACAACCCTAACCCAAGATCACTGGTGAAGCC AATAACGCAGCTGCTTGGGCGGACACACACGGCCA CGGGCATCCGCAAAGTGGTACGAGAGCTGTTTAAC ATCACCAACGGAGCCCGAAAGAATGCCTTTAAGAT CCTAGTTGTCATCACGGATGGAGAAAAGTTTGGCG ATCCCTTGGGATATGAGGATGTCATCCCTGAGGCA GACAGAGAGGGAGTCATTCGCTACGTCATTGGGGT GGGAGATGCCTTCCGCAGTGAGAAATCCCGCCAAG AGCTTAATACCATCGCATCCAAGCCGCCTCGTGAT CACGTGTTCCAGGTGAATAACTTTGAGGCTCTGAA GACCATTCAGAACCAGCTTCAGGAGAAGATCTTTG CGGGAGGAGGAGGCGGAGGAGACTACAAAGACCA TGACGGTGATTATAAAGATCATGATATCGATTACA AGGATGACGATGACAAGTAACTCGAGTCGACG
HMH 5 chimeric I-domain	Murine residues swapped into human backbone; To clone into pET15b; N-terminal NdeI site; C-terminal 6-glycine linker, 3xFLAG, XhoI site	ATTCGCATATGGGATCCAACCTACGGCAGCAGCCC CAGAAGTTCCCAGAGGCCCTCCGAGGGTGTCCTCA AGAGGATAGTGACATTGCCTTCTTGATTGATGGCTC TGGTAGCATCATCCCACATGACTTTCGGCGGATGA AGGAGTTTGTCTCAACTGTGATGGAGCAATTAAAA AAGTCCAAAACCTTGTTCTCTTTGATGCAGTACTCT GACGAATTCCGGATTCACTTTACCTTCAAAGAGTTC CAGAACAACCCTAACCCAAGATCACTGGTGAAGCC AATAACGCAGCTGCTTGGGCGGACAAAAACGGCCT CAGGCATCCGCAAAGTGGTACGAGAGCTGTTTAAC ATCACCAACGGAGCCCGAAAGAATGCCTTTAAGAT CCTAGTTGTCATCACGGATGGAGAAAAGTTTGGCG ATCCCTTGGATTATAAGGATGTCATCCCTGAGGCA GACAGAGAGGGAGTCATTCGCTACGTCATTGGGGT GGGAGATGCCTTCCGCAGTGAGAAATCCCGCCAAG AGCTTAATACCATCGCATCCAAGCCGCCTCGTGAT CACGTGTTCCAGGTGAATAACTTTGAGGCTCTGAA GACCATTCAGAACCAGCTTCGGGAGAAGATCTTTG CGGGAGGAGGAGGCGGAGGAGACTACAAAGACCA TGACGGTGATTATAAAGATCATGATATCGATTACA AGGATGACGATGACAAGTAACTCGAGTCGACG

HMH 6 chimeric I-domain	Murine residues swapped into human backbone; To clone into pET15b; N-terminal NdeI site; C-terminal 6-glycine linker, 3xFLAG, XhoI site	ATTCGCATATGGGATCCAACCTACGGCAGCAGCCC CAGAAGTTCCCAGAGGCCCTCCGAGGGTGTCCTCA AGAGGATAGTGACATTGCCTTCTTGATTGATGGCTC TGGTAGCATCATCCCACATGACTTTCGGCGGATGA AGGAGTTTGTCTCAACTGTGATGGAGCAATTAAAA AAGTCCAAAACCTTGTTCTCTTTGATGCAGTACTCT GAAGAATTCCGGATTCACTTTACCTTCAATGACTTC AAGAGAAACCCTAGCCCAAGATCACATGTGAAGCC AATAACGCAGCTGCTTGGGCGGACACACACGGCCA CGGGCATCCGCAAAGTGGTACGAGAGCTGTTTAAC ATCACCAACGGAGCCCGAAAGAATGCCTTTAAGAT CCTAGTTGTCATCACGGATGGAGAAAAGTTTGGCG ATCCCTTGGGATATGAGGATGTCATCCCTGAGGCA GACAGAGAGGGAGTCATTCGCTACGTCATTGGGGT GGGAGATGCCTTCCGCAGTGAGAAATCCCGCCAAG AGCTTAATACCATCGCATCCAAGCCGCCTCGTGAT CACGTGTTCCAGGTGAATAACTTTGAGGCTCTGAA GACCATTCAGAACCAGCTTCGGGAGAAGATCTTTG CGGGAGGAGGAGGCGGAGGAGACTACAAAGACCA TGACGGTGATTATAAAGATCATGATATCGATTACA AGGATGACGATGACAAGTAACTCGAGTCGACG
HMH 7 chimeric I-domain	Murine residues swapped into human backbone; To clone into pET15b; N-terminal NdeI site; C-terminal 6-glycine linker, 3xFLAG, XhoI site	ATTCGCATATGGGATCCAACCTACGGCAGCAGCCC CAGAAGTTCCCAGAGGCCCTCCGAGGGTGTCCTCA AGAGGATAGTGACATTGCCTTCTTGATTGATGGCTC TGGTAGCATCATCCCACATGACTTTCGGCGGATGA AGGAGTTTGTCTCAACTGTGATGGAGCAATTAAAA AAGTCCAAAACCTTGTTCTCTTTGATGCAGTACTCT GAAGAATTCCGGATTCACTTTACCTTCAAAGAGTTC CAGAACAACCCTAACCCAAGATCACTGGTGAAGCC AATAACGCAGCTGCTTGGGCGGACACACACGGCCA CGGGCATCCGCAAAGTGGTACGAGAGCTGTTTAAC ATCACCAACGGAGCCCGAAAGAATGCCTTTAAGAT CCTAGTTGTCATCACGGATGGAGAAAAGTTTGGCG ATCCCTTGGGATATGAGGATGTCATCCCTGAGGCA GACAGAGAGGGAGTCATTCGCTACGTCATTGGGGT GGGAAATGCCTTCAACAAACCACAGTCCCGCAGAG AGCTTGACACCATCGCATCCAAGCCGGCTGGTGAA CACGTGTTCCAGGTGGACAACTTTGAGGCTCTGAA GACCATTCAGAACCAGCTTCGGGAGAAGATCTTTG CGGGAGGAGGAGGCGGAGGAGACTACAAAGACCA TGACGGTGATTATAAAGATCATGATATCGATTACA AGGATGACGATGACAAGTAACTCGAGTCGACG

MHM 1 chimeric I-domain	Human residues swapped into murine backbone; To clone into pET15b; N-terminal NdeI site; C-terminal 6-glycine linker, 3xFLAG, XhoI site	ATTCGCATATGGGCTCCAACCTGCGGCAGCAGCCC CAGAAGTTCCCAGAGGCTCTCAGAGGGTGTCCTCA GCAGGAGAGTGACATTGTCTTCTTGATTGATGGCTC CGGTAGCATCAACAACATTGACTTTCAGAAGATGA AGGAGTTTGTCTCAACTGTGATGGAGCAGTTCAAA AAGTCTAAAACCTTGTTCTCTTTGATGCAGTACTCG GACGAGTTCCGGATTCACTTCACCTTCAATGACTTC AAGAGAAACCCTAGCCCAAGATCACATGTGAGCCC CATAAAGCAGCTGAATGGGAGGACAAAAACTGCCT CAGGGATCCGGAAAGTAGTGAGAGAACTGTTTCAC AAAACCAATGGGGCCCGGGAGAATGCTGCGAAGA TCCTAGTTGTCATCACAGATGGAGAAAAATTCGGT GATCCCTTGGATTATAAGGATGTCATCCCCGAGGC AGACAGAGCAGGGGTCATTCGCTACGTAATTGGGG TGGGAAATGCCTTCAACAAACCACAGTCCCGCAGA GAGCTCGACACCATCGCATCTAAGCCAGCTGGTGA ACACGTGTTCCAAGTGGACAACTTTGAAGCCCTGA ATACCATTCAGAACCAGCTTCAGGAAAAGATCTTT GCAGGAGGAGGCGGAGGAGGAGACTACAAAGACC ATGACGGTGATTATAAAGATCATGATATCGATTAC AAGGATGACGATGACAAGTAACTCGAGTCGACG
MHM 2 chimeric I-domain	Human residues swapped into murine backbone; To clone into pET15b; N-terminal NdeI site; C-terminal 6-glycine linker, 3xFLAG, XhoI site	ATTCGCATATGGGCTCCAACCTGCTGAGGCCGCCC CAGCAGTTCCCAGAGGCTCTCAGAGAATGTCCTCA GGAGGATAGTGACATTGCCTTCTTGATTGATGGCTC CGGTAGCATCAACAACATTGACTTTCAGAAGATGA AGGAGTTTGTCTCAACTGTGATGGAGCAGTTCAAA AAGTCTAAAACCTTGTTCTCTTTGATGCAGTACTCG GACGAGTTCCGGATTCACTTCACCTTCAATGACTTC AAGAGAAACCCTAGCCCAAGATCACATGTGAGCCC CATAAAGCAGCTGAATGGGAGGACAAAAACTGCCT CAGGGATCCGGAAAGTAGTGAGAGAACTGTTTAAC ATCACCAATGGGGCCCGGAAGAATGCTTTTAAGAT CCTAGTTGTCATCACAGATGGAGAAAAATTCGGTG ATCCCTTGGATTATAAGGATGTCATCCCCGAGGCA GACAGAGAGGGGGTCATTCGCTACGTAATTGGGGT GGGAAATGCCTTCAACAAACCACAGTCCCGCAGAG AGCTCGACACCATCGCATCTAAGCCAGCTGGTGAA CACGTGTTCCAAGTGGACAACTTTGAAGCCCTGAA TACCATTCAGAACCAGCTTCAGGAAAAGATCTTTG CAGGAGGAGGAGGCGGAGGAGACTACAAAGACCA TGACGGTGATTATAAAGATCATGATATCGATTACA AGGATGACGATGACAAGTAACTCGAGTCGACG

MHM 3 chimeric I-domain	Human residues swapped into murine backbone; To clone into pET15b; N-terminal NdeI site; C-terminal 6-glycine linker, 3xFLAG, XhoI site	ATTCGCATATGGGCTCCAACCTGCTGAGGCCGCCC CAGCAGTTCCCAGAGGCTCTCAGAGAATGTCCTCA GCAGGAGAGTGACATTGTCTTCTTGATTGATGGCTC CGGTAGCATCATCCCACATGACTTTCGGCGGATGA AGGAGTTTGTCTCAACTGTGATGGAGCAGTTCAAA AAGTCTAAAACCTTGTTCTCTTTGATGCAGTACTCG GACGAGTTCCGGATTCACTTCACCTTCAATGACTTC AAGAGAAACCCTAGCCCAAGATCACATGTGAAGCC CATAACGCAGCTGCTTGGGAGGACAAAAACTGCCT CAGGGATCCGGAAAGTAGTGAGAGAACTGTTTCAC AAAACCAATGGGGCCCGGGAGAATGCTGCGAAGA TCCTAGTTGTCATCACAGATGGAGAAAAATTCGGT GATCCCTTGGATTATAAGGATGTCATCCCCGAGGC AGACAGAGCAGGGGTCATTCGCTACGTAATTGGGG TGGGAAATGCCTTCAACAAACCACAGTCCCGCAGA GAGCTCGACACCATCGCATCTAAGCCAGCTGGTGA ACACGTGTTCCAAGTGGACAACTTTGAAGCCCTGA ATACCATTCAGAACCAGCTTCAGGAAAAGATCTTT GCAGGAGGAGGAGGCGGAGGAGACTACAAAGACC ATGACGGTGATTATAAAGATCATGATATCGATTAC AAGGATGACGATGACAAGTAACTCGAGTCGACG
MHM 4 chimeric I-domain	Human residues swapped into murine backbone; To clone into pET15b; N-terminal NdeI site; C-terminal 6-glycine linker, 3xFLAG, XhoI site	ATTCGCATATGGGCTCCAACCTGCTGAGGCCGCCC CAGCAGTTCCCAGAGGCTCTCAGAGAATGTCCTCA GCAGGAGAGTGACATTGTCTTCTTGATTGATGGCTC CGGTAGCATCAACAACATTGACTTTCAGAAGATGA AGGAGTTTGTCTCAACTGTGATGGAGCAGTTAAAA AAGTCTAAAACCTTGTTCTCTTTGATGCAGTACTCG GACGAGTTCCGGATTCACTTCACCTTCAATGACTTC AAGAGAAACCCTAGCCCAAGATCACATGTGAGCCC CATAAAGCAGCTGAATGGGAGGACAAAAACTGCCT CAGGGATCCGGAAAGTAGTGAGAGAACTGTTTCAC AAAACCAATGGGGCCCGGGAGAATGCTGCGAAGA TCCTAGTTGTCATCACAGATGGAGAAAAATTCGGT GATCCCTTGGATTATAAGGATGTCATCCCCGAGGC AGACAGAGCAGGGGTCATTCGCTACGTAATTGGGG TGGGAAATGCCTTCAACAAACCACAGTCCCGCAGA GAGCTCGACACCATCGCATCTAAGCCAGCTGGTGA ACACGTGTTCCAAGTGGACAACTTTGAAGCCCTGA ATACCATTCAGAACCAGCTTCGGGAAAAGATCTTT GCAGGAGGAGGAGGCGGAGGAGACTACAAAGACC ATGACGGTGATTATAAAGATCATGATATCGATTAC AAGGATGACGATGACAAGTAACTCGAGTCGACG

MHM 5 chimeric I-domain	Human residues swapped into murine backbone; To clone into pET15b; N-terminal NdeI site; C-terminal 6-glycine linker, 3xFLAG, XhoI site	ATTCGCATATGGGCTCCAACCTGCTGAGGCCGCCC CAGCAGTTCCCAGAGGCTCTCAGAGAATGTCCTCA GCAGGAGAGTGACATTGTCTTCTTGATTGATGGCTC CGGTAGCATCAACAACATTGACTTTCAGAAGATGA AGGAGTTTGTCTCAACTGTGATGGAGCAGTTCAAA AAGTCTAAAACCTTGTTCTCTTTGATGCAGTACTCG GAAGAGTTCCGGATTCACTTCACCTTCAATGACTTC AAGAGAAACCCTAGCCCAAGATCACATGTGAGCCC CATAAAGCAGCTGAATGGGAGGACACACACTGCCA CGGGGATCCGGAAAGTAGTGAGAGAACTGTTTCAC AAAACCAATGGGGCCCGGGAGAATGCTGCGAAGA TCCTAGTTGTCATCACAGATGGAGAAAAATTCGGT GATCCCTTGGGATATGAGGATGTCATCCCCGAGGC AGACAGAGCAGGGGTCATTCGCTACGTAATTGGGG TGGGAAATGCCTTCAACAAACCACAGTCCCGCAGA GAGCTCGACACCATCGCATCTAAGCCAGCTGGTGA ACACGTGTTCCAAGTGGACAACTTTGAAGCCCTGA ATACCATTCAGAACCAGCTTCAGGAAAAGATCTTT GCAGGAGGAGGAGGCGGAGGAGACTACAAAGACC ATGACGGTGATTATAAAGATCATGATATCGATTAC AAGGATGACGATGACAAGTAACTCGAGTCGACG
MHM 6 chimeric I-domain	Human residues swapped into murine backbone; To clone into pET15b; N-terminal NdeI site; C-terminal 6-glycine linker, 3xFLAG, XhoI site	ATTCGCATATGGGCTCCAACCTGCTGAGGCCGCCC CAGCAGTTCCCAGAGGCTCTCAGAGAATGTCCTCA GCAGGAGAGTGACATTGTCTTCTTGATTGATGGCTC CGGTAGCATCAACAACATTGACTTTCAGAAGATGA AGGAGTTTGTCTCAACTGTGATGGAGCAGTTCAAA AAGTCTAAAACCTTGTTCTCTTTGATGCAGTACTCG GACGAGTTCCGGATTCACTTCACCTTCAAAGAGTTC CAGAACAACCCTAACCCAAGATCACTGGTGAGCCC CATAAAGCAGCTGAATGGGAGGACAAAAACTGCCT CAGGGATCCGGAAAGTAGTGAGAGAACTGTTTCAC AAAACCAATGGGGCCCGGGAGAATGCTGCGAAGA TCCTAGTTGTCATCACAGATGGAGAAAAATTCGGT GATCCCTTGGATTATAAGGATGTCATCCCCGAGGC AGACAGAGCAGGGGTCATTCGCTACGTAATTGGGG TGGGAAATGCCTTCAACAAACCACAGTCCCGCAGA GAGCTCGACACCATCGCATCTAAGCCAGCTGGTGA ACACGTGTTCCAAGTGGACAACTTTGAAGCCCTGA ATACCATTCAGAACCAGCTTCAGGAAAAGATCTTT GCAGGAGGAGGAGGCGGAGGAGACTACAAAGACC ATGACGGTGATTATAAAGATCATGATATCGATTAC AAGGATGACGATGACAAGTAACTCGAGTCGACG

MHM 7 chimeric I-domain	Human residues swapped into murine backbone; To clone into pET15b; N-terminal NdeI site; C-terminal 6-glycine linker, 3xFLAG, XhoI site	ATTCGCATATGGGCTCCAACCTGCTGAGGCCGCCC CAGCAGTTCCCAGAGGCTCTCAGAGAATGTCCTCA GCAGGAGAGTGACATTGTCTTCTTGATTGATGGCTC CGGTAGCATCAACAACATTGACTTTCAGAAGATGA AGGAGTTTGTCTCAACTGTGATGGAGCAGTTCAAA AAGTCTAAAACCTTGTTCTCTTTGATGCAGTACTCG GACGAGTTCCGGATTCACTTCACCTTCAATGACTTC AAGAGAAACCCTAGCCCAAGATCACATGTGAGCCC CATAAAGCAGCTGAATGGGAGGACAAAAACTGCCT CAGGGATCCGGAAAGTAGTGAGAGAACTGTTTCAC AAAACCAATGGGGCCCGGGAGAATGCTGCGAAGA TCCTAGTTGTCATCACAGATGGAGAAAAATTCGGT GATCCCTTGGATTATAAGGATGTCATCCCCGAGGC AGACAGAGCAGGGGTCATTCGCTACGTAATTGGGG TGGGAGATGCCTTCCGCAGTGAGAAATCCCGCCAA GAGCTCAATACCATCGCATCTAAGCCACCTCGTGA TCACGTGTTCCAAGTGAATAACTTTGAAGCCCTGA ATACCATTCAGAACCAGCTTCAGGAAAAGATCTTT GCAGGAGGAGGAGGCGGAGGAGACTACAAAGACC ATGACGGTGATTATAAAGATCATGATATCGATTAC AAGGATGACGATGACAAGTAACTCGAGTCGACG
MHM$^{292\text{-}295}$ chimeric I-domain	Human residues swapped into murine backbone; To clone into pET15b; N-terminal NdeI site; C-terminal 6-glycine linker, 3xFLAG, XhoI site	ATTCGCATATGGGCTCCAACCTGCTGAGGCCGCCC CAGCAGTTCCCAGAGGCTCTCAGAGAATGTCCTCA GCAGGAGAGTGACATTGTCTTCTTGATTGATGGCTC CGGTAGCATCAACAACATTGACTTTCAGAAGATGA AGGAGTTTGTCTCAACTGTGATGGAGCAGTTCAAA AAGTCTAAAACCTTGTTCTCTTTGATGCAGTACTCG GACGAGTTCCGGATTCACTTCACCTTCAATGACTTC AAGAGAAACCCTAGCCCAAGATCACATGTGAGCCC CATAAAGCAGCTGAATGGGAGGACAAAAACTGCCT CAGGGATCCGGAAAGTAGTGAGAGAACTGTTTCAC AAAACCAATGGGGCCCGGGAGAATGCTGCGAAGA TCCTAGTTGTCATCACAGATGGAGAAAAATTCGGT GATCCCTTGGATTATAAGGATGTCATCCCCGAGGC AGACAGAGCAGGGGTCATTCGCTACGTAATTGGGG TGGGAAATGCCTTCCGCAGTGAGAAATCCCGCAGA GAGCTCGACACCATCGCATCTAAGCCAGCTGGTGA ACACGTGTTCCAAGTGGACAACTTTGAAGCCCTGA ATACCATTCAGAACCAGCTTCAGGAAAAGATCTTT GCAGGAGGAGGAGGCGGAGGAGACTACAAAGACC ATGACGGTGATTATAAAGATCATGATATCGATTAC AAGGATGACGATGACAAGTAACTCGAGTCGACG

MHM[289, 298-316] chimeric I-domain	Human residues swapped into murine backbone; To clone into pET15b; N-terminal NdeI site; C-terminal 6-glycine linker, 3xFLAG, XhoI site	ATTCGCATATGGGCTCCAACCTGCTGAGGCCGCCC CAGCAGTTCCCAGAGGCTCTCAGAGAATGTCCTCA GCAGGAGAGTGACATTGTCTTCTTGATTGATGGCTC CGGTAGCATCAACAACATTGACTTTCAGAAGATGA AGGAGTTTGTCTCAACTGTGATGGAGCAGTTCAAA AAGTCTAAAACCTTGTTCTCTTTGATGCAGTACTCG GACGAGTTCCGGATTCACTTCACCTTCAATGACTTC AAGAGAAACCCTAGCCCAAGATCACATGTGAGCCC CATAAAGCAGCTGAATGGGAGGACAAAAACTGCCT CAGGGATCCGGAAAGTAGTGAGAGAACTGTTTCAC AAAACCAATGGGGCCCGGGAGAATGCTGCGAAGA TCCTAGTTGTCATCACAGATGGAGAAAAATTCGGT GATCCCTTGGATTATAAGGATGTCATCCCCGAGGC AGACAGAGCAGGGGTCATTCGCTACGTAATTGGGG TGGGAGATGCCTTCAACAAACCACAGTCCCGCCAA GAGCTCAATACCATCGCATCTAAGCCACCTCGTGA TCACGTGTTCCAAGTGAATAACTTTGAAGCCCTGA ATACCATTCAGAACCAGCTTCAGGAAAAGATCTTT GCAGGAGGAGGAGGCGGAGGAGACTACAAAGACC ATGACGGTGATTATAAAGATCATGATATCGATTAC AAGGATGACGATGACAAGTAACTCGAGTCGACG
Humanized CD11b CRISPR/Cas 9 Repair Template		GGAATATCTTTTGCTGGAGAGATGTCAGCTTCCTAC CAGATGGATGATGGATGACATGACAGATGGATGGC CATCTGGAGATCAAATTGCTCCCTGTGCTATGTACA ACCTGCCTAACTGTCCCCAACAGCCCTGTTCTAAGC TGCCTTCTGCTGAACTCTCTATTGGACAGAAAAAGT TTCAGATTCTTTCATCAAGGCATTTTCTTTGCTACA TGGGGCTGCTACCATCAGAGAATATATAATTTAGC TTTGGCTCCTTGGCAACAGGTGGGAGATGCCTTCC GCAGTGAGAAATCCCGCCAAGAGCTCAATACCATC GCATCTAAGCCACCTCGAGATCACGTGTTCCAAGT GAATAACTTTGAAGCCCTGAATACCATTCAGAACC AGCTTCAGGAAAAGATCTTTGCAATTGAGGGTGAG ACAGCCCAGTCCGGACCAGCAGTTCCTACTTAGCA TCCGTACCCCAGCATCAGCTTATCTCCAGACATTTG GGTCTGACTTGCTCCATCCCTTTGAAATAAGCAAA GCTAGATTTTTGTCTCTAATTATCAGATCTAGACTA TAGGATGATTAAACTGTAGCACAGTGGATTTAAAT CCTACACAATATATACCAAAAAATTTATATGTGCT ATGAGCACTGGTTGACTTAGTCATGTCTCCTCTGCC TAGCATAGTGTGTTCTACAGAGAAATGTCCAAAAT TTT