



wwPDB EM Validation Summary Report ⓘ

Jan 2, 2025 – 01:20 AM EST

PDB ID : 9GDY
EMDB ID : EMD-51280
Title : SARS-CoV-2 Spike protein Beta Variant at 37C structural flexibility / heterogeneity analyses
Authors : Herreros, D.; Mata, C.P.; Noddings, C.; Irene, D.; Agard, D.A.; Tsai, M.-D.; Sorzano, C.O.S.; Carazo, J.M.
Deposited on : 2024-08-06
Resolution : 2.80 Å(reported)
Based on initial models : 7VX1, 7WEV

This is a wwPDB EM Validation Summary Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

EMDB validation analysis : 0.0.1.dev113
MolProbity : 4.02b-467
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.40

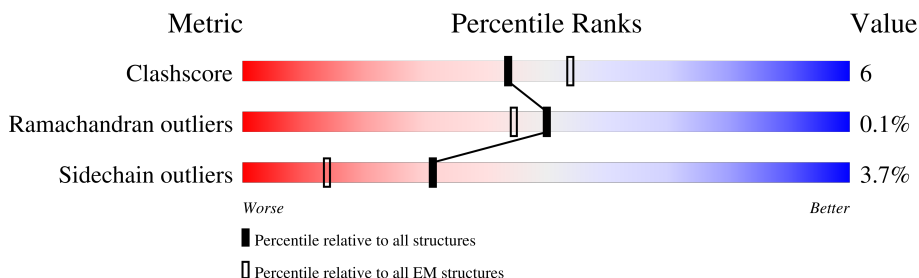
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 2.80 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.




























Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion $< 40\%$). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	1-A	1230	
1	1-B	1230	
1	1-C	1230	
1	10-A	1230	
1	10-B	1230	
1	10-C	1230	
1	11-A	1230	
1	11-B	1230	

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
1	11-C	1230	 70% 16% • 12%
1	12-A	1230	 70% 16% • 12%
1	12-B	1230	 68% 18% • 12%
1	12-C	1230	 69% 17% • 12%
1	13-A	1230	 68% 17% • 12%
1	13-B	1230	 70% 16% • 12%
1	13-C	1230	 69% 17% • 12%
1	14-A	1230	 69% 17% • 12%
1	14-B	1230	 71% 15% • 12%
1	14-C	1230	 68% 18% • 12%
1	15-A	1230	 69% 17% • 12%
1	15-B	1230	 69% 17% • 12%
1	15-C	1230	 68% 18% • 12%
1	16-A	1230	 68% 17% • 12%
1	16-B	1230	 70% 16% • 12%
1	16-C	1230	 70% 16% • 12%
1	17-A	1230	 68% 18% • 12%
1	17-B	1230	 70% 16% • 12%
1	17-C	1230	 67% 19% • 12%
1	18-A	1230	 71% 16% • 12%
1	18-B	1230	 71% 15% • 12%
1	18-C	1230	 70% 17% • 12%
1	19-A	1230	 69% 17% • 12%
1	19-B	1230	 70% 17% • 12%
1	19-C	1230	 68% 18% • 12%



Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain		
1	2-A	1230	72%	15%	12%
1	2-B	1230	70%	16%	12%
1	2-C	1230	70%	15%	12%
1	20-A	1230	71%	16%	12%
1	20-B	1230	70%	16%	12%
1	20-C	1230	71%	15%	12%
1	3-A	1230	69%	17%	12%
1	3-B	1230	71%	15%	12%
1	3-C	1230	70%	16%	12%
1	4-A	1230	66%	20%	12%
1	4-B	1230	66%	19%	12%
1	4-C	1230	68%	18%	12%
1	5-A	1230	67%	18%	12%
1	5-B	1230	70%	16%	12%
1	5-C	1230	69%	18%	12%
1	6-A	1230	69%	17%	12%
1	6-B	1230	72%	14%	12%
1	6-C	1230	70%	15%	12%
1	7-A	1230	69%	17%	12%
1	7-B	1230	70%	16%	12%
1	7-C	1230	69%	17%	12%
1	8-A	1230	70%	16%	12%
1	8-B	1230	69%	16%	12%
1	8-C	1230	69%	17%	12%
1	9-A	1230	71%	16%	12%

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
1	9-B	1230	 68% 17% 12%
1	9-C	1230	 69% 17% 12%

2 Entry composition [i](#)

There is only 1 type of molecule in this entry. The entry contains 509160 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called Spike glycoprotein,Fibritin.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	1-A	1079	8454	5399	1410	1606	39	0	0
1	2-A	1079	8454	5399	1410	1606	39	0	0
1	3-A	1085	8494	5425	1416	1615	38	0	0
1	4-A	1085	8494	5425	1416	1615	38	0	0
1	5-A	1085	8494	5425	1416	1615	38	0	0
1	6-A	1085	8494	5425	1416	1615	38	0	0
1	7-A	1085	8494	5425	1416	1615	38	0	0
1	8-A	1085	8494	5425	1416	1615	38	0	0
1	9-A	1079	8454	5399	1410	1606	39	0	0
1	10-A	1085	8494	5425	1416	1615	38	0	0
1	11-A	1079	8454	5399	1410	1606	39	0	0
1	12-A	1085	8494	5425	1416	1615	38	0	0
1	13-A	1085	8494	5425	1416	1615	38	0	0
1	14-A	1085	8494	5425	1416	1615	38	0	0
1	15-A	1085	8494	5425	1416	1615	38	0	0
1	16-A	1085	8494	5425	1416	1615	38	0	0
1	17-A	1085	8494	5425	1416	1615	38	0	0

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	18-A	1085	Total 8494	C 5425	N 1416	O 1615	S 38	0	0
1	19-A	1085	Total 8494	C 5425	N 1416	O 1615	S 38	0	0
1	20-A	1085	Total 8494	C 5425	N 1416	O 1615	S 38	0	0
1	1-B	1079	Total 8454	C 5399	N 1410	O 1606	S 39	0	0
1	2-B	1079	Total 8454	C 5399	N 1410	O 1606	S 39	0	0
1	3-B	1085	Total 8494	C 5425	N 1416	O 1615	S 38	0	0
1	4-B	1085	Total 8494	C 5425	N 1416	O 1615	S 38	0	0
1	5-B	1085	Total 8494	C 5425	N 1416	O 1615	S 38	0	0
1	6-B	1085	Total 8494	C 5425	N 1416	O 1615	S 38	0	0
1	7-B	1085	Total 8494	C 5425	N 1416	O 1615	S 38	0	0
1	8-B	1085	Total 8494	C 5425	N 1416	O 1615	S 38	0	0
1	9-B	1079	Total 8454	C 5399	N 1410	O 1606	S 39	0	0
1	10-B	1085	Total 8494	C 5425	N 1416	O 1615	S 38	0	0
1	11-B	1079	Total 8454	C 5399	N 1410	O 1606	S 39	0	0
1	12-B	1085	Total 8494	C 5425	N 1416	O 1615	S 38	0	0
1	13-B	1085	Total 8494	C 5425	N 1416	O 1615	S 38	0	0
1	14-B	1085	Total 8494	C 5425	N 1416	O 1615	S 38	0	0
1	15-B	1085	Total 8494	C 5425	N 1416	O 1615	S 38	0	0
1	16-B	1085	Total 8494	C 5425	N 1416	O 1615	S 38	0	0
1	17-B	1085	Total 8494	C 5425	N 1416	O 1615	S 38	0	0
1	18-B	1085	Total 8494	C 5425	N 1416	O 1615	S 38	0	0

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	19-B	1085	Total 8494	C 5425	N 1416	O 1615	S 38	0	0
1	20-B	1085	Total 8494	C 5425	N 1416	O 1615	S 38	0	0
1	1-C	1079	Total 8454	C 5399	N 1410	O 1606	S 39	0	0
1	2-C	1079	Total 8454	C 5399	N 1410	O 1606	S 39	0	0
1	3-C	1085	Total 8494	C 5425	N 1416	O 1615	S 38	0	0
1	4-C	1085	Total 8494	C 5425	N 1416	O 1615	S 38	0	0
1	5-C	1085	Total 8494	C 5425	N 1416	O 1615	S 38	0	0
1	6-C	1085	Total 8494	C 5425	N 1416	O 1615	S 38	0	0
1	7-C	1085	Total 8494	C 5425	N 1416	O 1615	S 38	0	0
1	8-C	1085	Total 8494	C 5425	N 1416	O 1615	S 38	0	0
1	9-C	1079	Total 8454	C 5399	N 1410	O 1606	S 39	0	0
1	10-C	1085	Total 8494	C 5425	N 1416	O 1615	S 38	0	0
1	11-C	1079	Total 8454	C 5399	N 1410	O 1606	S 39	0	0
1	12-C	1085	Total 8494	C 5425	N 1416	O 1615	S 38	0	0
1	13-C	1085	Total 8494	C 5425	N 1416	O 1615	S 38	0	0
1	14-C	1085	Total 8494	C 5425	N 1416	O 1615	S 38	0	0
1	15-C	1085	Total 8494	C 5425	N 1416	O 1615	S 38	0	0
1	16-C	1085	Total 8494	C 5425	N 1416	O 1615	S 38	0	0
1	17-C	1085	Total 8494	C 5425	N 1416	O 1615	S 38	0	0
1	18-C	1085	Total 8494	C 5425	N 1416	O 1615	S 38	0	0
1	19-C	1085	Total 8494	C 5425	N 1416	O 1615	S 38	0	0

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	20-C	1085	8494	5425	1416	1615	38	0	0

There are 87 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	18	PHE	LEU	variant	UNP P0DTC2
A	80	ALA	ASP	variant	UNP P0DTC2
A	215	GLY	ASP	variant	UNP P0DTC2
A	?	-	LEU	deletion	UNP P0DTC2
A	?	-	ALA	deletion	UNP P0DTC2
A	?	-	LEU	deletion	UNP P0DTC2
A	246	ILE	ARG	conflict	UNP P0DTC2
A	417	ASN	LYS	variant	UNP P0DTC2
A	484	LYS	GLU	variant	UNP P0DTC2
A	501	TYR	ASN	variant	UNP P0DTC2
A	614	GLY	ASP	variant	UNP P0DTC2
A	682	GLY	ARG	engineered mutation	UNP P0DTC2
A	683	SER	ARG	engineered mutation	UNP P0DTC2
A	685	SER	ARG	engineered mutation	UNP P0DTC2
A	701	VAL	ALA	variant	UNP P0DTC2
A	986	PRO	LYS	engineered mutation	UNP P0DTC2
A	987	PRO	VAL	engineered mutation	UNP P0DTC2
A	1209	GLY	-	linker	UNP P0DTC2
A	1210	SER	-	linker	UNP P0DTC2
A	1232	LEU	PHE	engineered mutation	UNP P10104
A	1238	GLY	-	expression tag	UNP P10104
A	1239	ARG	-	expression tag	UNP P10104
A	1240	SER	-	expression tag	UNP P10104
A	1241	LEU	-	expression tag	UNP P10104
A	1242	GLU	-	expression tag	UNP P10104
A	1243	VAL	-	expression tag	UNP P10104
A	1244	LEU	-	expression tag	UNP P10104
A	1245	PHE	-	expression tag	UNP P10104
A	1246	GLN	-	expression tag	UNP P10104
B	18	PHE	LEU	variant	UNP P0DTC2
B	80	ALA	ASP	variant	UNP P0DTC2
B	215	GLY	ASP	variant	UNP P0DTC2
B	?	-	LEU	deletion	UNP P0DTC2
B	?	-	ALA	deletion	UNP P0DTC2
B	?	-	LEU	deletion	UNP P0DTC2
B	246	ILE	ARG	conflict	UNP P0DTC2

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
B	417	ASN	LYS	variant	UNP P0DTC2
B	484	LYS	GLU	variant	UNP P0DTC2
B	501	TYR	ASN	variant	UNP P0DTC2
B	614	GLY	ASP	variant	UNP P0DTC2
B	682	GLY	ARG	engineered mutation	UNP P0DTC2
B	683	SER	ARG	engineered mutation	UNP P0DTC2
B	685	SER	ARG	engineered mutation	UNP P0DTC2
B	701	VAL	ALA	variant	UNP P0DTC2
B	986	PRO	LYS	engineered mutation	UNP P0DTC2
B	987	PRO	VAL	engineered mutation	UNP P0DTC2
B	1209	GLY	-	linker	UNP P0DTC2
B	1210	SER	-	linker	UNP P0DTC2
B	1232	LEU	PHE	engineered mutation	UNP P10104
B	1238	GLY	-	expression tag	UNP P10104
B	1239	ARG	-	expression tag	UNP P10104
B	1240	SER	-	expression tag	UNP P10104
B	1241	LEU	-	expression tag	UNP P10104
B	1242	GLU	-	expression tag	UNP P10104
B	1243	VAL	-	expression tag	UNP P10104
B	1244	LEU	-	expression tag	UNP P10104
B	1245	PHE	-	expression tag	UNP P10104
B	1246	GLN	-	expression tag	UNP P10104
C	18	PHE	LEU	variant	UNP P0DTC2
C	80	ALA	ASP	variant	UNP P0DTC2
C	215	GLY	ASP	variant	UNP P0DTC2
C	?	-	LEU	deletion	UNP P0DTC2
C	?	-	ALA	deletion	UNP P0DTC2
C	?	-	LEU	deletion	UNP P0DTC2
C	246	ILE	ARG	conflict	UNP P0DTC2
C	417	ASN	LYS	variant	UNP P0DTC2
C	484	LYS	GLU	variant	UNP P0DTC2
C	501	TYR	ASN	variant	UNP P0DTC2
C	614	GLY	ASP	variant	UNP P0DTC2
C	682	GLY	ARG	engineered mutation	UNP P0DTC2
C	683	SER	ARG	engineered mutation	UNP P0DTC2
C	685	SER	ARG	engineered mutation	UNP P0DTC2
C	701	VAL	ALA	variant	UNP P0DTC2
C	986	PRO	LYS	engineered mutation	UNP P0DTC2
C	987	PRO	VAL	engineered mutation	UNP P0DTC2
C	1209	GLY	-	linker	UNP P0DTC2
C	1210	SER	-	linker	UNP P0DTC2
C	1232	LEU	PHE	engineered mutation	UNP P10104

Continued on next page...

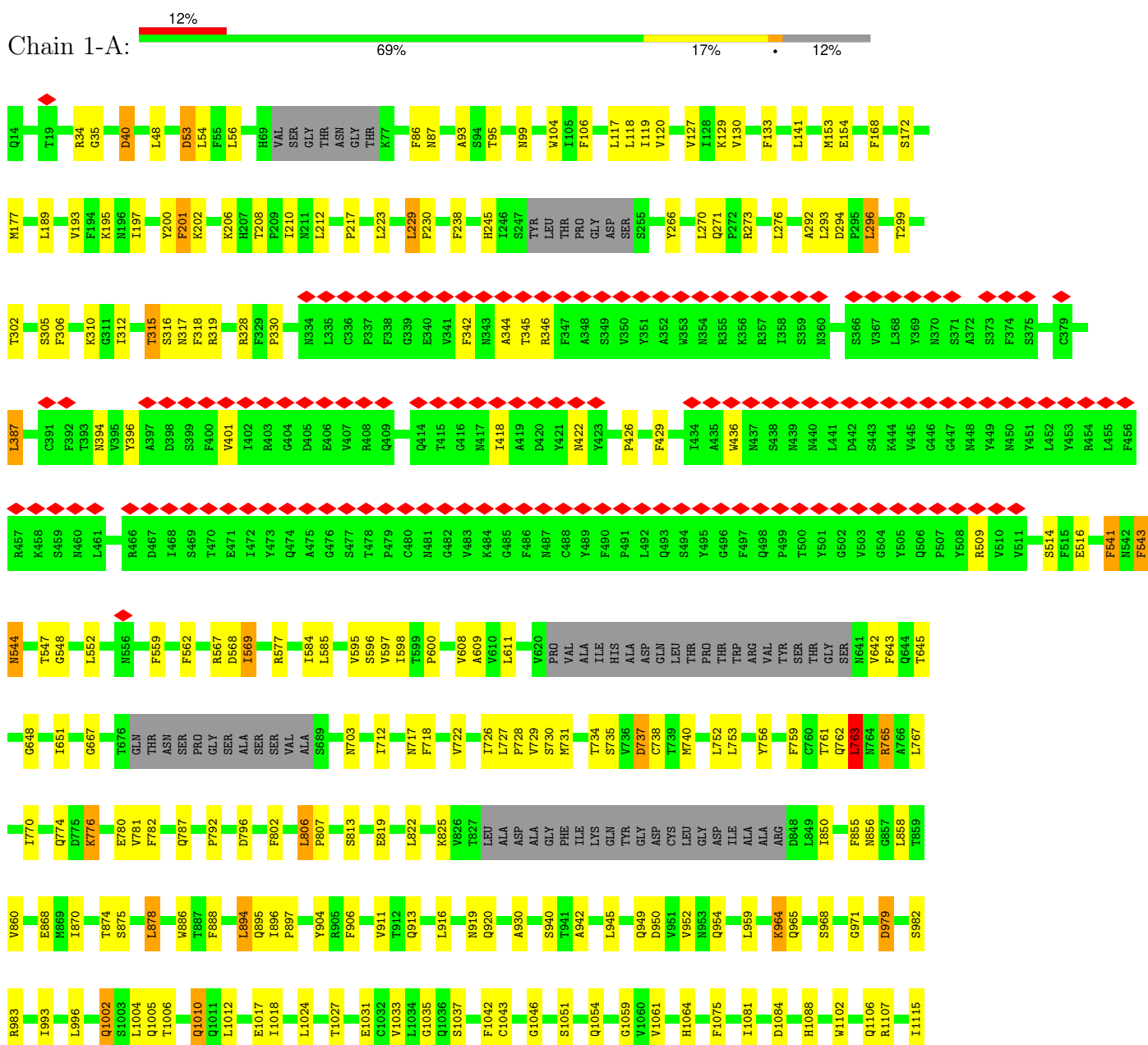
Continued from previous page...

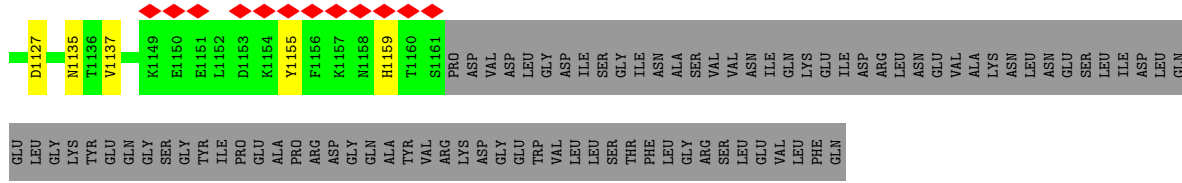
Chain	Residue	Modelled	Actual	Comment	Reference
C	1238	GLY	-	expression tag	UNP P10104
C	1239	ARG	-	expression tag	UNP P10104
C	1240	SER	-	expression tag	UNP P10104
C	1241	LEU	-	expression tag	UNP P10104
C	1242	GLU	-	expression tag	UNP P10104
C	1243	VAL	-	expression tag	UNP P10104
C	1244	LEU	-	expression tag	UNP P10104
C	1245	PHE	-	expression tag	UNP P10104
C	1246	GLN	-	expression tag	UNP P10104

3 Residue-property plots [i](#)

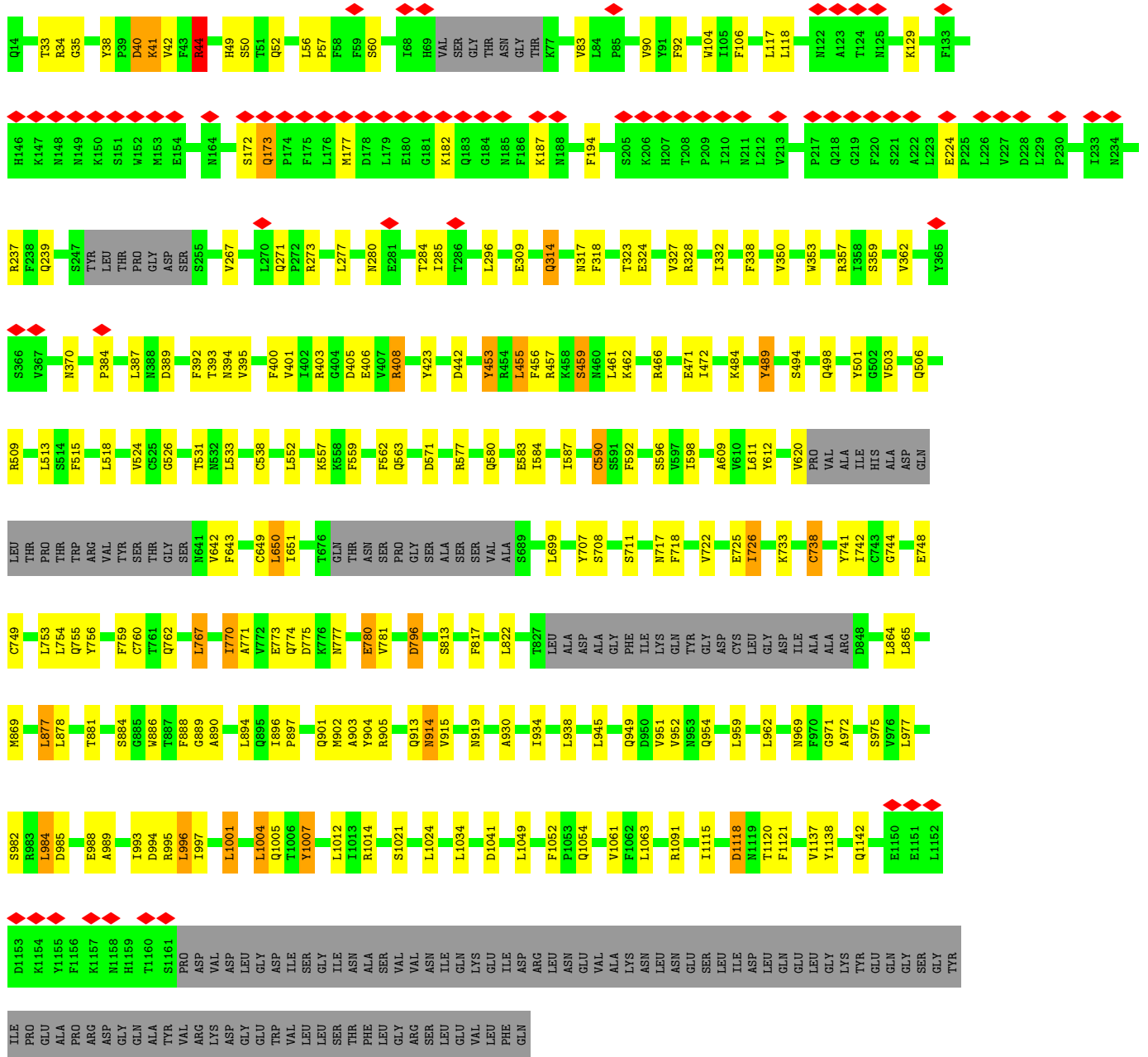
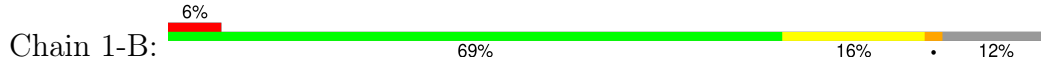
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion in map density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

- Molecule 1: Spike glycoprotein,Fibrin

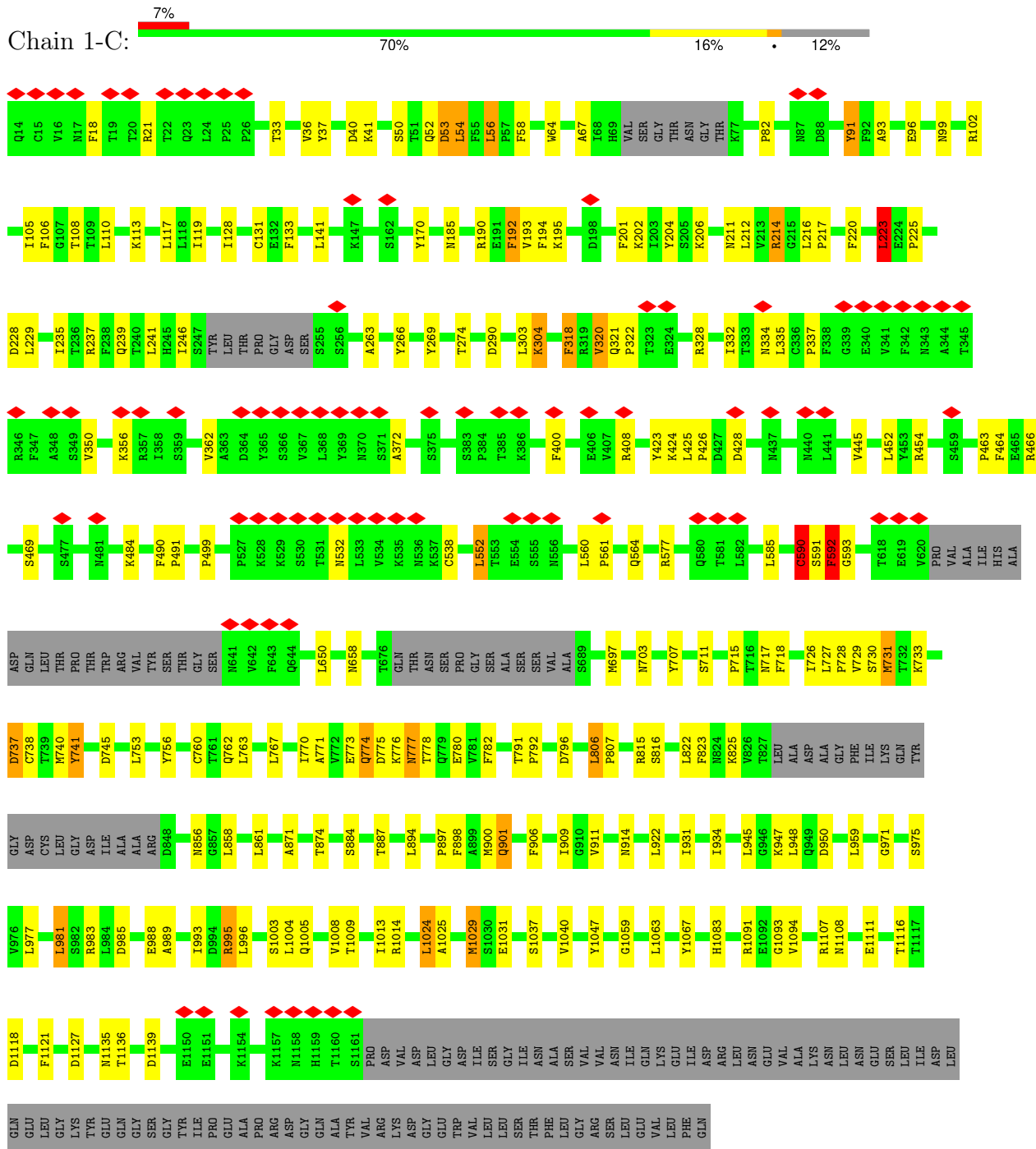




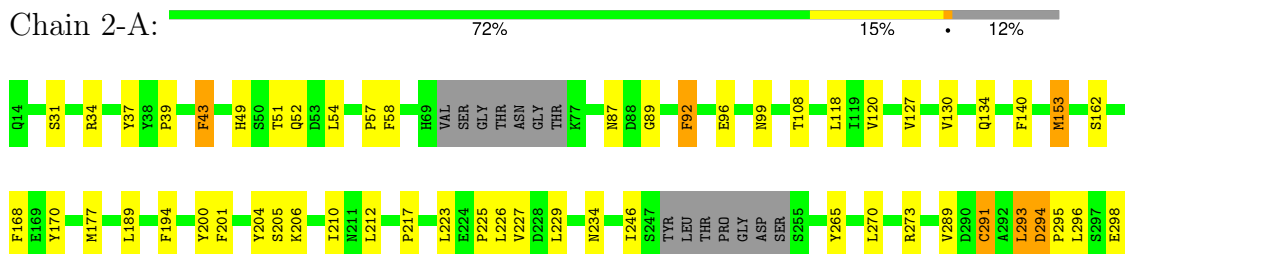
• Molecule 1: Spike glycoprotein, Fibrin



• Molecule 1: Spike glycoprotein, Fibrin



• Molecule 1: Spike glycoprotein, Fibrin



ASN	ALA	LEU
ALA	SER	THR
VAL	PHE	LEU
VAL	LEU	GLY
ASN	ARG	ARG
ILE	SER	SER
GLN	LEU	LEU
LYS	ASN	ASN
GLU	GLU	GLU
ILE	VAL	VAL
ASP	LEU	LEU
ARG	PHE	PHE
LEU	GLN	GLN
ASN	LEU	LEU
GLU	VAL	VAL
ALA	ALA	ALA
LYS	LYS	LYS
ASN	ASN	ASN
LEU	LEU	LEU
GLU	GLU	GLU
ILE	ILE	ILE
ASP	ASP	ASP
LEU	LEU	LEU
GLN	GLN	GLN
TYR	TYR	TYR
GLY	GLY	GLY
GLY	GLY	GLY
GLY	GLY	GLY
SER	SER	SER
GLY	GLY	GLY
TYR	TYR	TYR
ILE	ILE	ILE
PRO	PRO	PRO
GLU	GLU	GLU
ALA	ALA	ALA
PRO	PRO	PRO
ARG	ARG	ARG
ASP	ASP	ASP
GLY	GLY	GLY
GLN	GLN	GLN
ALA	ALA	ALA
TYR	TYR	TYR
VAL	VAL	VAL
ARG	ARG	ARG
LYS	LYS	LYS
ASP	ASP	ASP
GLY	GLY	GLY
GLU	GLU	GLU
THR	THR	THR
VAL	VAL	VAL
LEU	LEU	LEU

● Molecule 1: Spike glycoprotein,Fibrin

Chain 2-C:  70% 15% 12%

Q14	F18	R21	T33	D40	V47	Q52	D53	L54	H69	V69	H69	GLY	GLY	THR	K77	V83	F92	E96	N99	I100	V104	I105	F106	L117	L118	V126	V130	C131	F133	D138	M153	F168	S172	M185	R190									
K195	F201	K206	H207	N211	L212	V213	R214	G215	L216	P217	F220	L223	L229	I235	Q239	S247	T247	THR	THR	PRO	GLY	S255	A263	A264	Y265	Q271	P272	R273	T274	F276	L276	D290	L293	D294	P295	T299	F300	C301	K304	I312				
Y313	S316	V320	I326	N334	L335	A344	R345	R346	F347	A348	S349	R353	R355	D364	N370	S371	F374	S375	T376	F377	K378	P384	S399	F400	V401	Q409	N417	I418	Y421	D428	Y436	L452	R457	K458	T299	C301	L461	D467	Q474					
K484	Y489	L492	Y501	R509	L513	R534	N532	K537	A538	V539	L552	L560	P561	F562	Q563	L585	G593	S594	T595	V595	S596	P384	V608	A609	V620	PRO	VAL	ILE	ALA	ASP	GLN	THR	THR	THR	THR	VAL	VAL	THR	GLY	N641				
V642	F643	L650	I651	C662	D663	I664	P665	Y674	G675	T676	THR	ASN	PRO	GLY	S689	L885	I714	G593	N717	F718	V729	S735	V736	D737	C738	M740	Y741	C749	L754	Q755	Y756	F759	Q762	L763	E773	N777	I778	Q779	E780					
V783	F782	P792	D796	L806	P807	S816	E819	L822	T827	ALA	ASP	ALA	ALA	PHE	ILE	LYS	GLN	TYR	GLY	ASP	CYS	LEU	GLY	ASP	ILE	ALA	ARG	D848	L858	L861	T866	M869	I870	L894	Q895	I896	P897	M900	Q901	N902				
N914	E918	L922	I931	I934	L938	D950	L959	Q965	L966	F970	G971	A972	I973	V976	D979	I980	L981	S982	R983	L984	D985	E988	D984	R995	L996	I997	T998	Q1002	S1003	L1004	Q1005	T1006	Y1007	V1008	T1009	Q1010	Q1011	L1012	I1013	R1014	I1018	R1019		
L1024	K1028	E1031	L1034	S1037	D1041	G1059	F1075	I1081	H1088	Y1110	E1111	P1112	Q1113	D1118	D1127	N1135	T1136	S1161	PRO	ASP	VAL	ASP	LEU	GLY	ASP	ILE	ILE	ASN	ALA	SER	THR	PHE	VAL	ASN	ILE	GLN	LYS	GLU	VAL	ILE	ASP	ARG	ASN	GLU
VAL	ALA	LYS	ASN	ASN	GLU	SER	ILE	ASP	LEU	GLN	GLU	LEU	GLY	TYR	TYR	GLN	GLY	GLY	ILE	PRO	PRO	GLU	ALA	ALA	ALA	VAL	VAL	ASP	LEU	ASN	GLY	ARG	SER	GLN	LYS	GLU	GLU	VAL	VAL	ILE	ASP	ARG	ASN	GLU

● Molecule 1: Spike glycoprotein,Fibrin

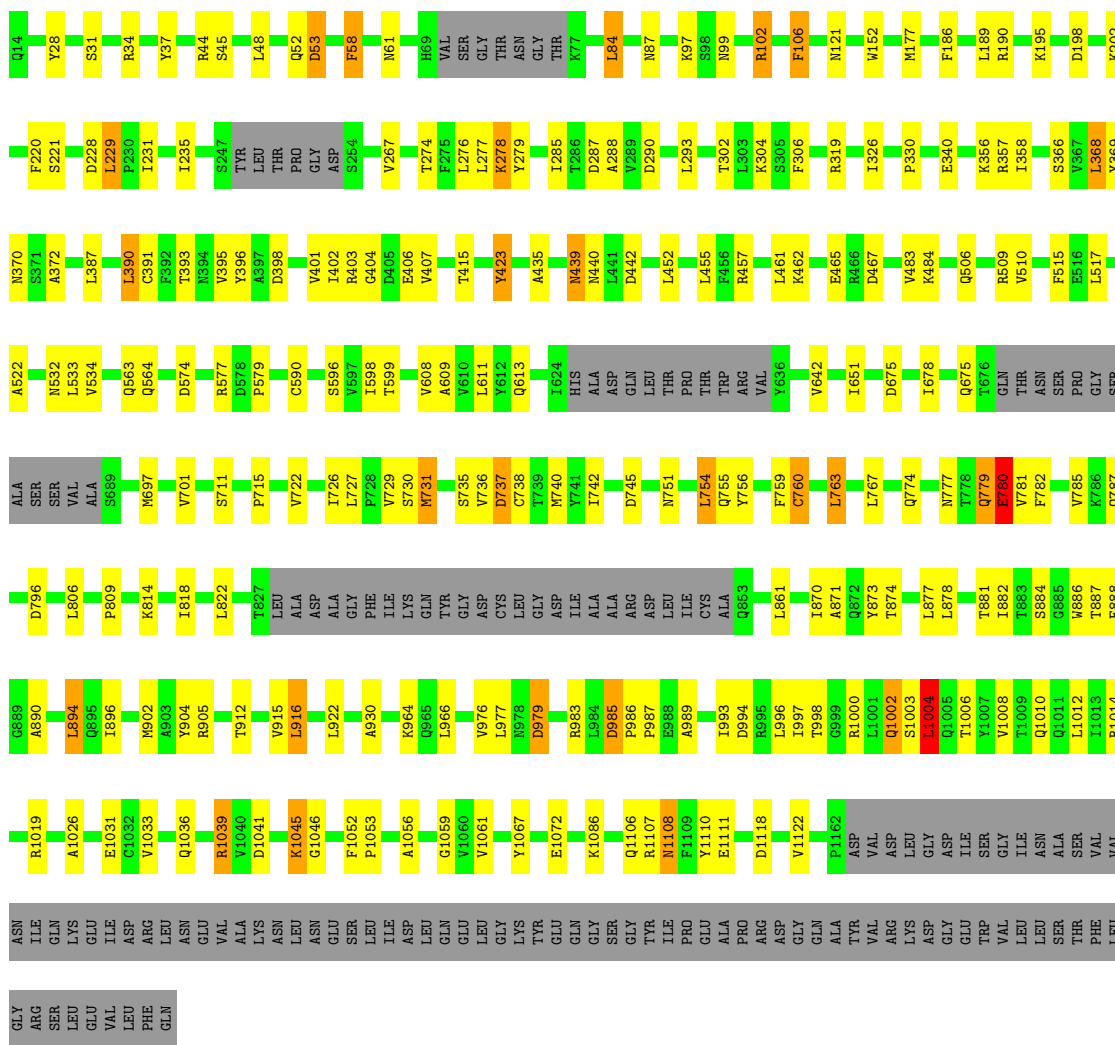
Chain 3-A:  69% 17% 12%

Q14	R34	D40	F43	H49	D53	L54	F58	F59	S60	N64	F65	T68	H69	VAL	SER	THR	GLY	THR	ASN	GLY	K77	K77	R78	R79	A80	L84	I100	I105	F106	G107	T108	D111	Q115	S116	L117	L118	V152	M153	F157	I197	G219	F220	S221		
A222	L226	V227	D228	L229	P230	I231	G232	L233	N234	I235	T236	R237	F238	Q239	H245	L246	S247	TYR	LEU	THR	THR	A264	L277	I285	T286	D287	A288	V289	D290	C291	P295	E298	T299	K300	C301	T302	L303	K304	T312	T315	P330	N331	I332	T333	N334
R353	R354	R355	K356	R357	N360	C361	R362	A363	D364	L368	Y369	A372	P384	L387	N388	D389	L390	C391	F392	T393	N394	Y395	Y396	A397	D398	V401	I402	R403	G404	D405	E406	Q409	Q414	N417	Y421	N440	L455	R466	Y473	V483	K484	Y505			

LEU	ASN	GLU	SER	SER	ILE	ASP	LEU	GLN	LEU	GLY	LYS	TYR	GLU	GLN	GLY	SER	SER	GLY	TYR	PRO	GLU	ALA	PRO	ARG	ARG	ASP	GLY	GLN	ALA	TYR	VAL	ARG	LYS	ASP	GLY	GLU	TRP	VAL	LEU	SER	SER	THR	PHE	LEU	GLY	ARG	ARG	SER	SER	LEU	GLU	VAL	LEU	PHE	GLN
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

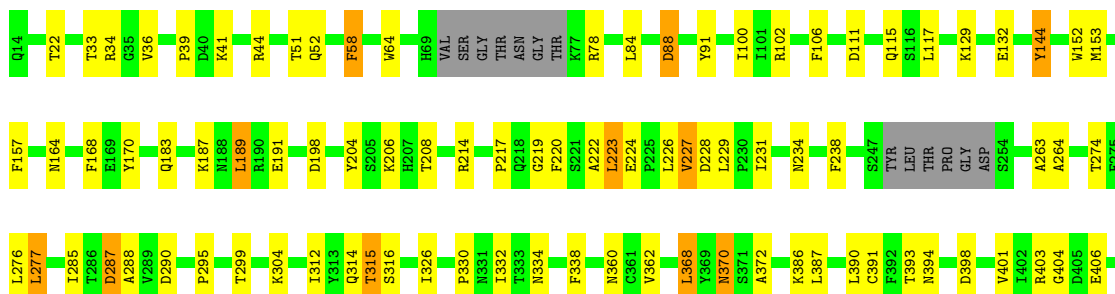
• Molecule 1: Spike glycoprotein,Fibrin

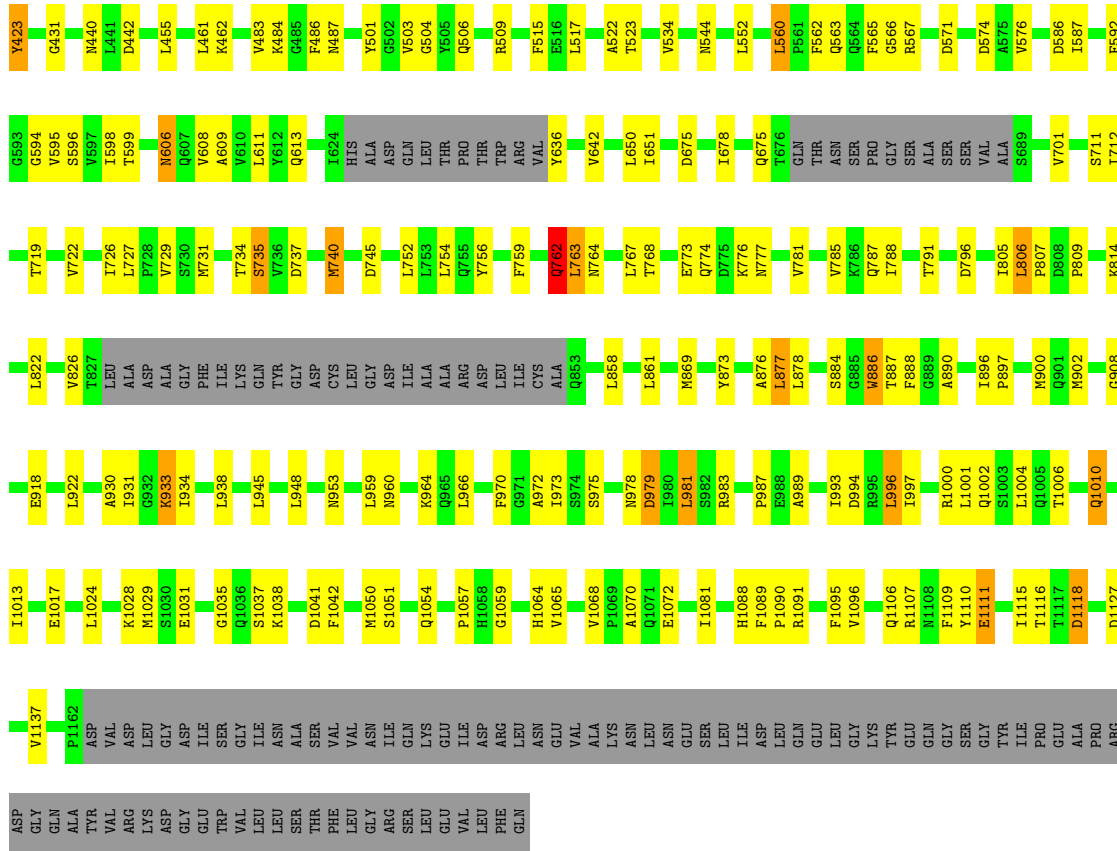
Chain 3-C: 70% 16% 12%



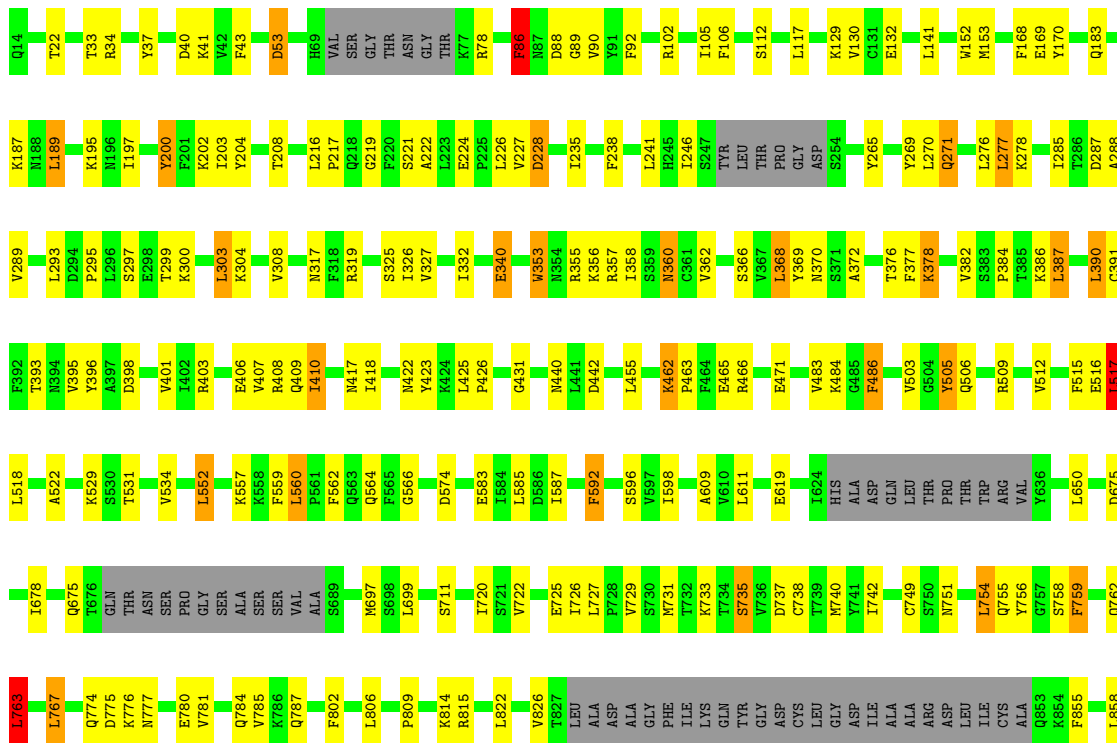
• Molecule 1: Spike glycoprotein,Fibrin

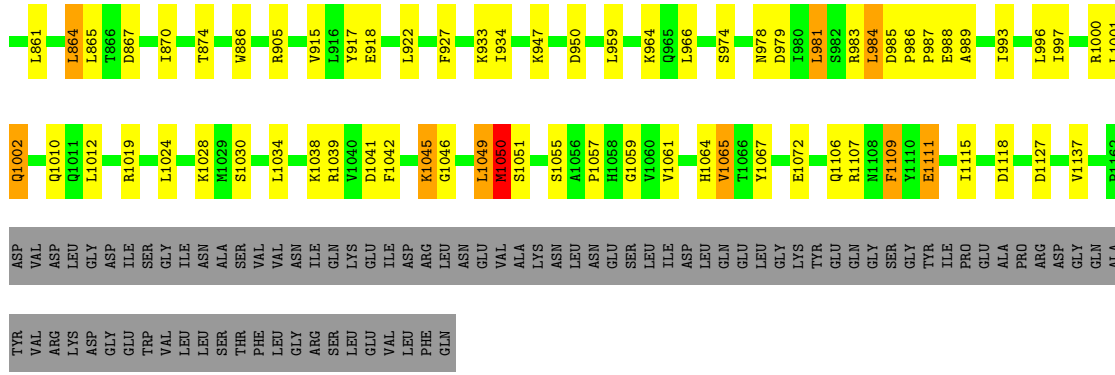
Chain 4-A: 66% 20% 12%



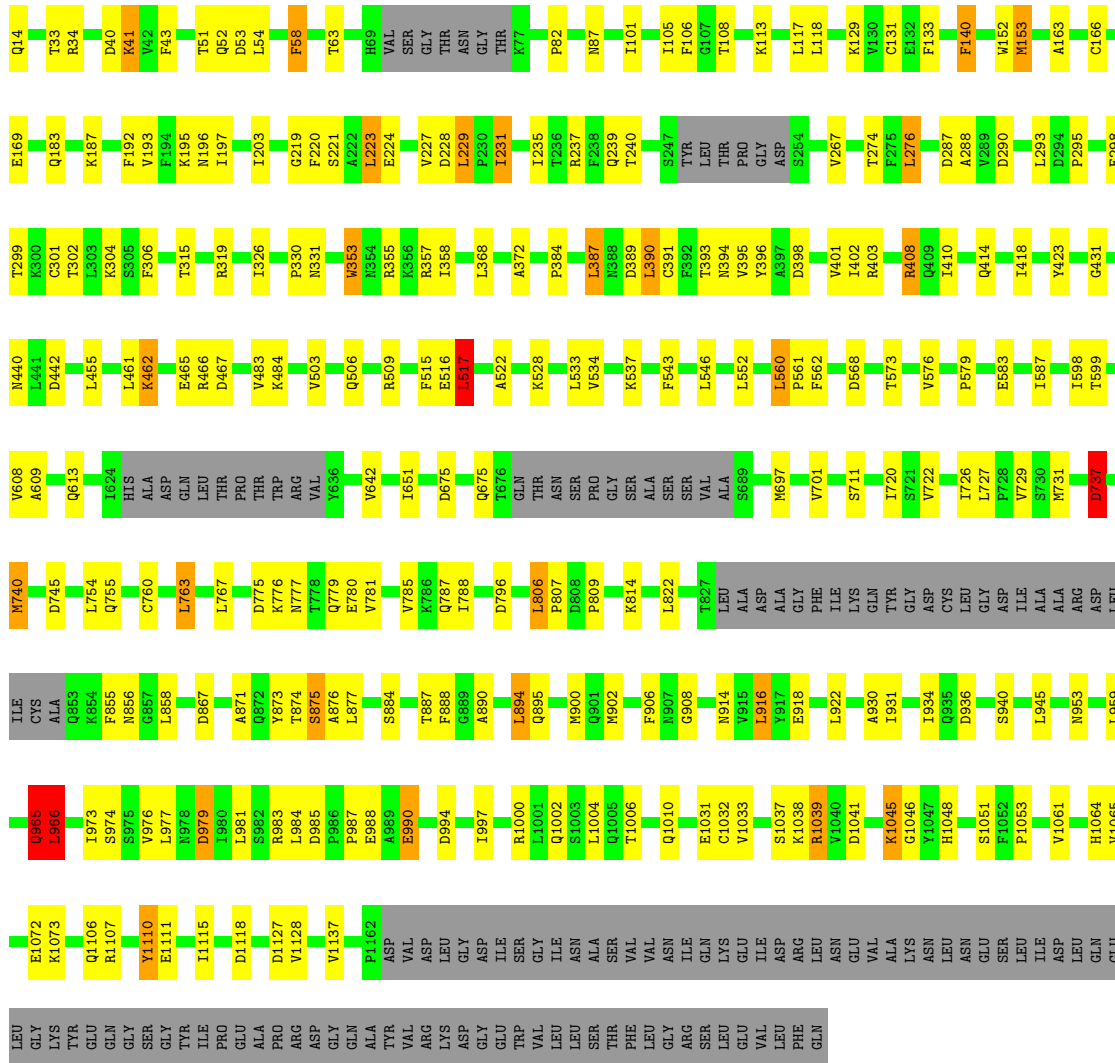


• Molecule 1: Spike glycoprotein, Fibritin



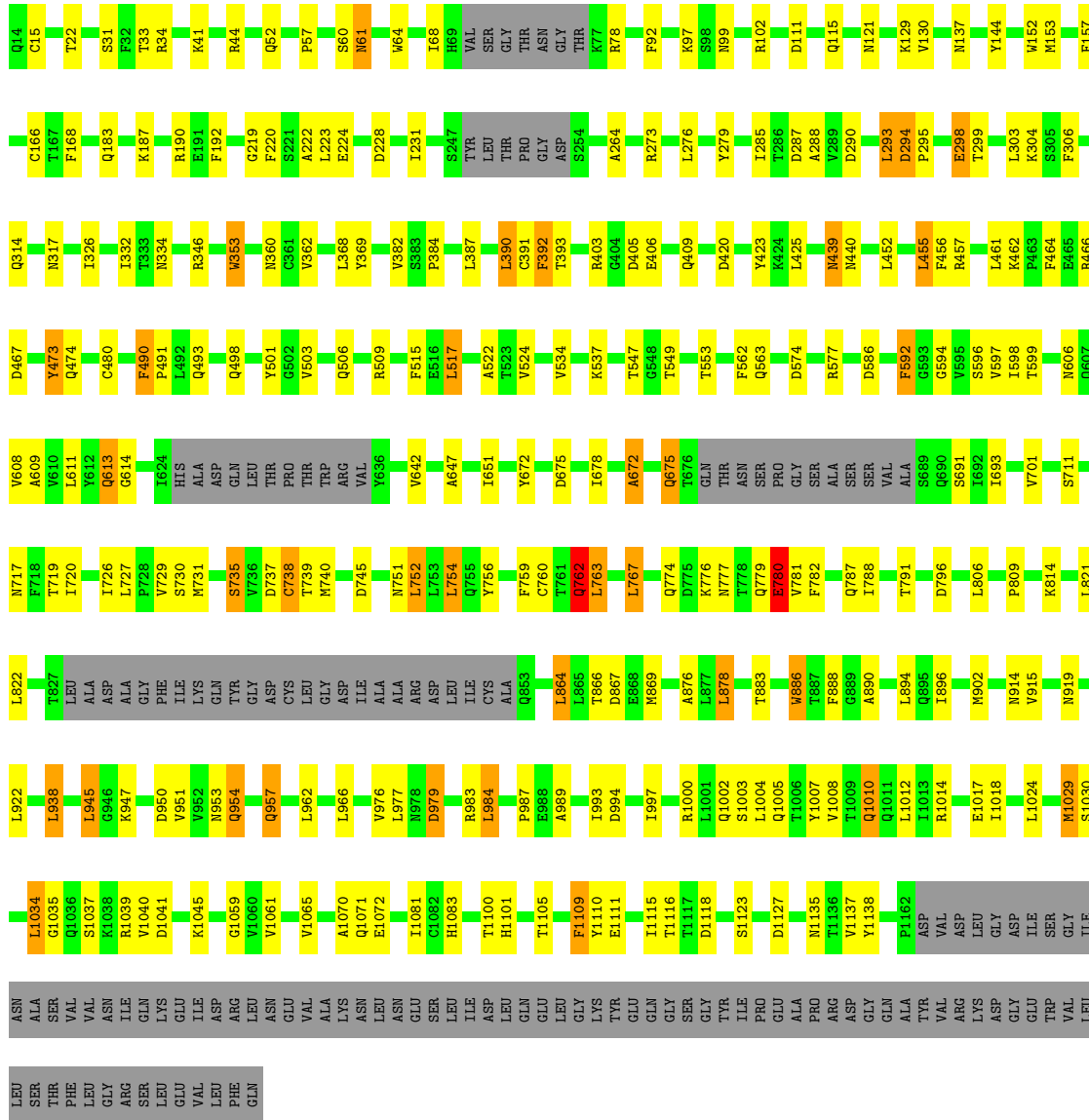


• Molecule 1: Spike glycoprotein, Fibrin

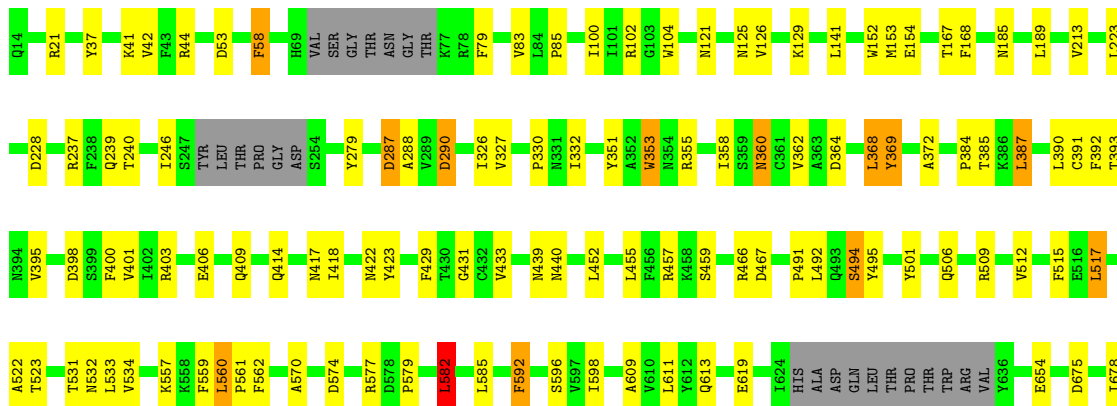


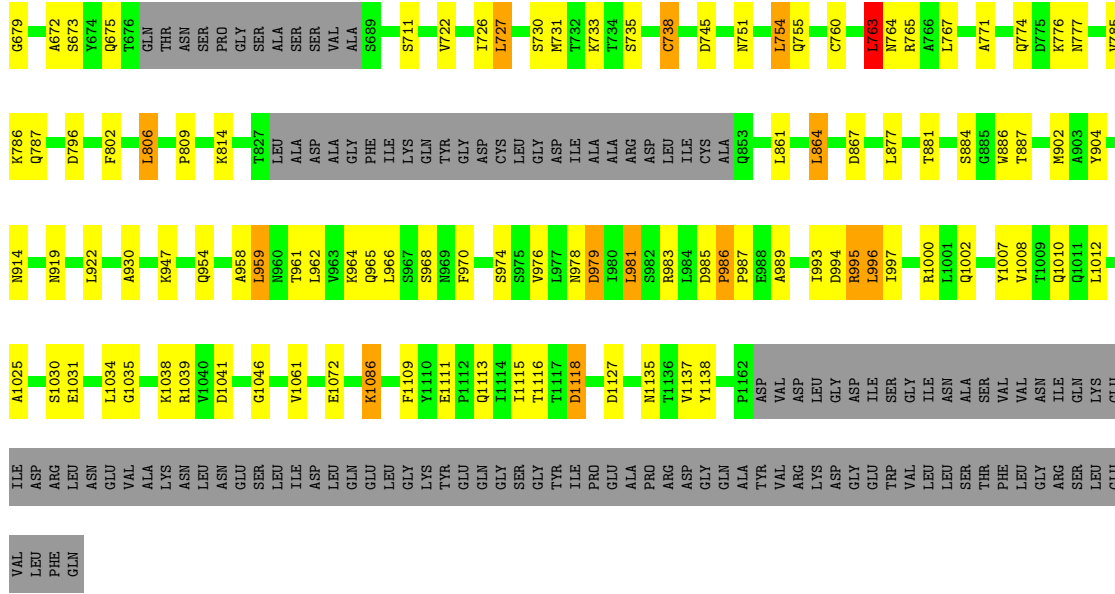
• Molecule 1: Spike glycoprotein, Fibrin



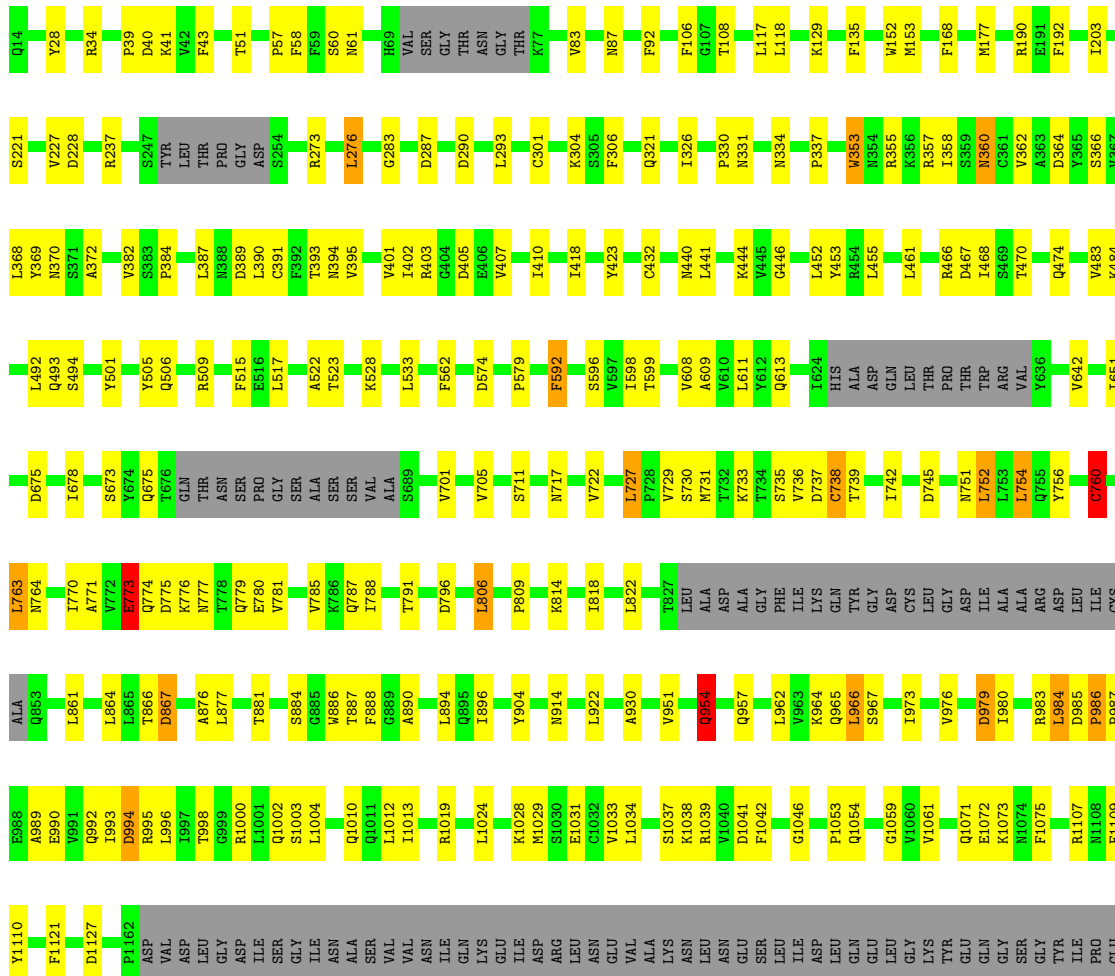


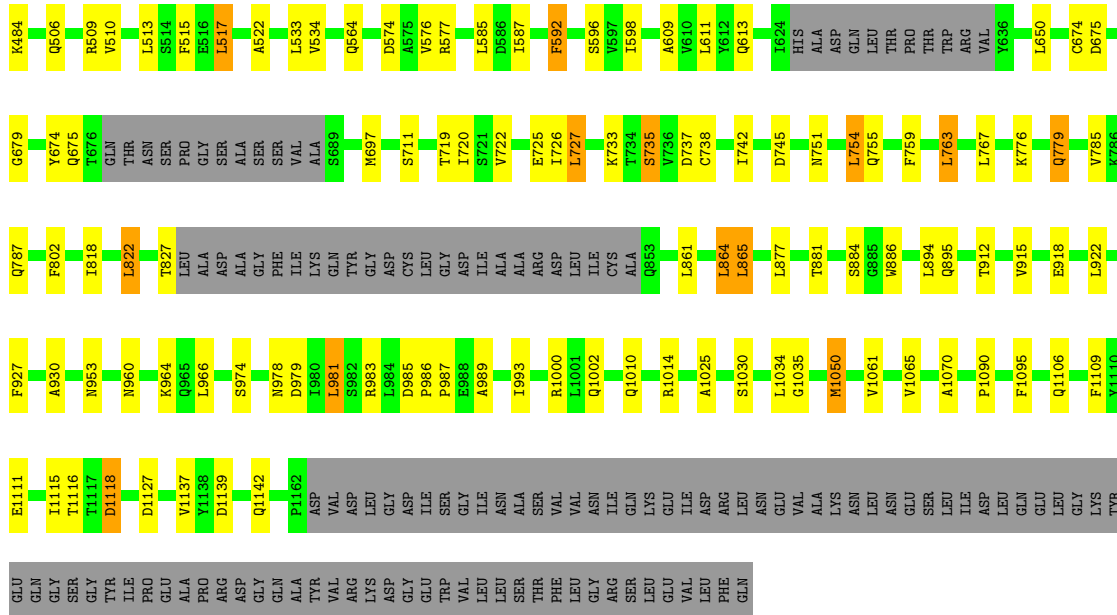
● Molecule 1: Spike glycoprotein, Fibrin



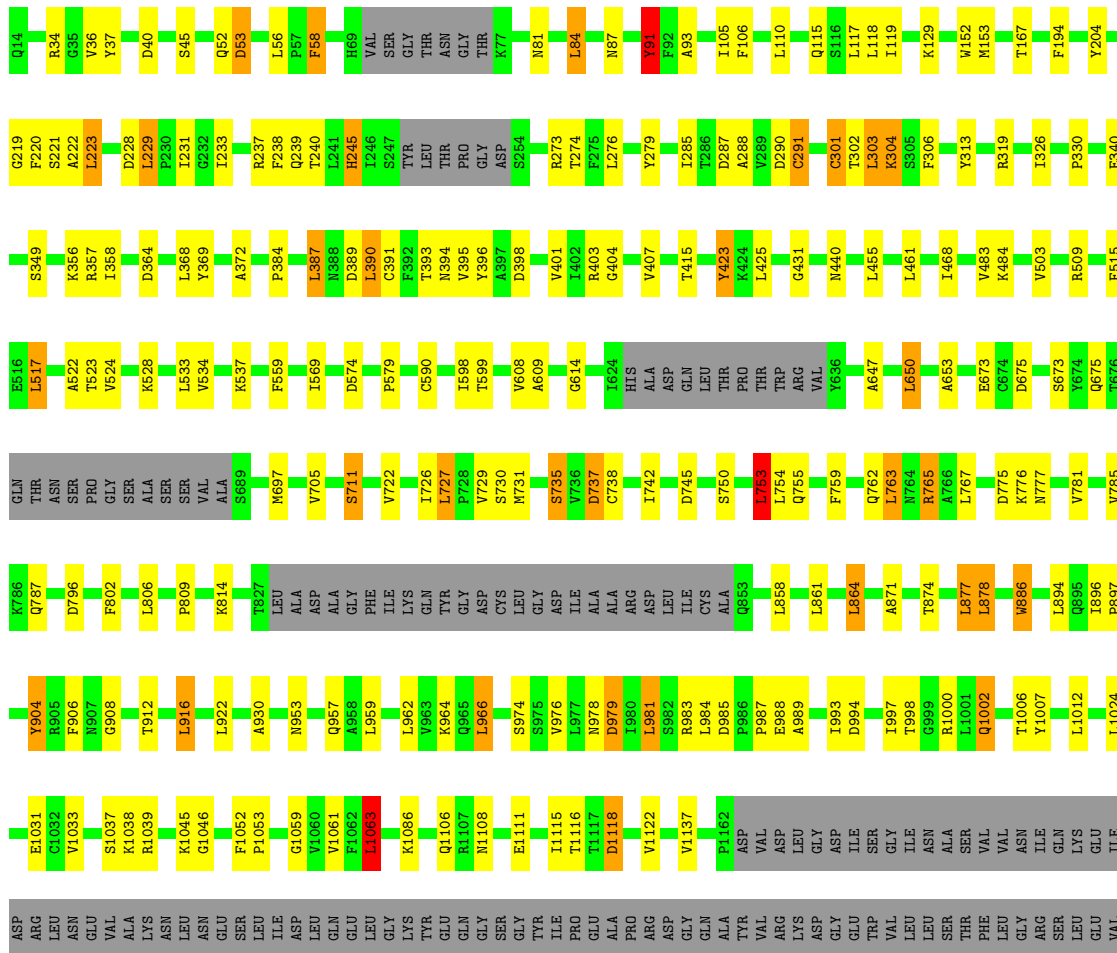


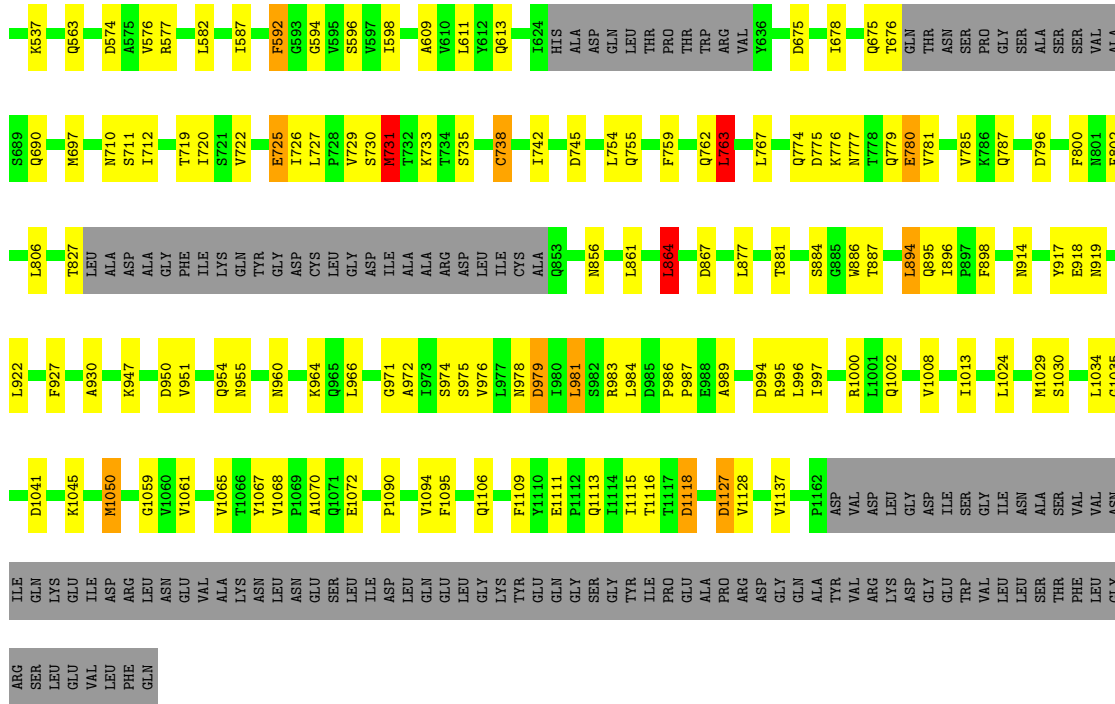
• Molecule 1: Spike glycoprotein, Fibrin



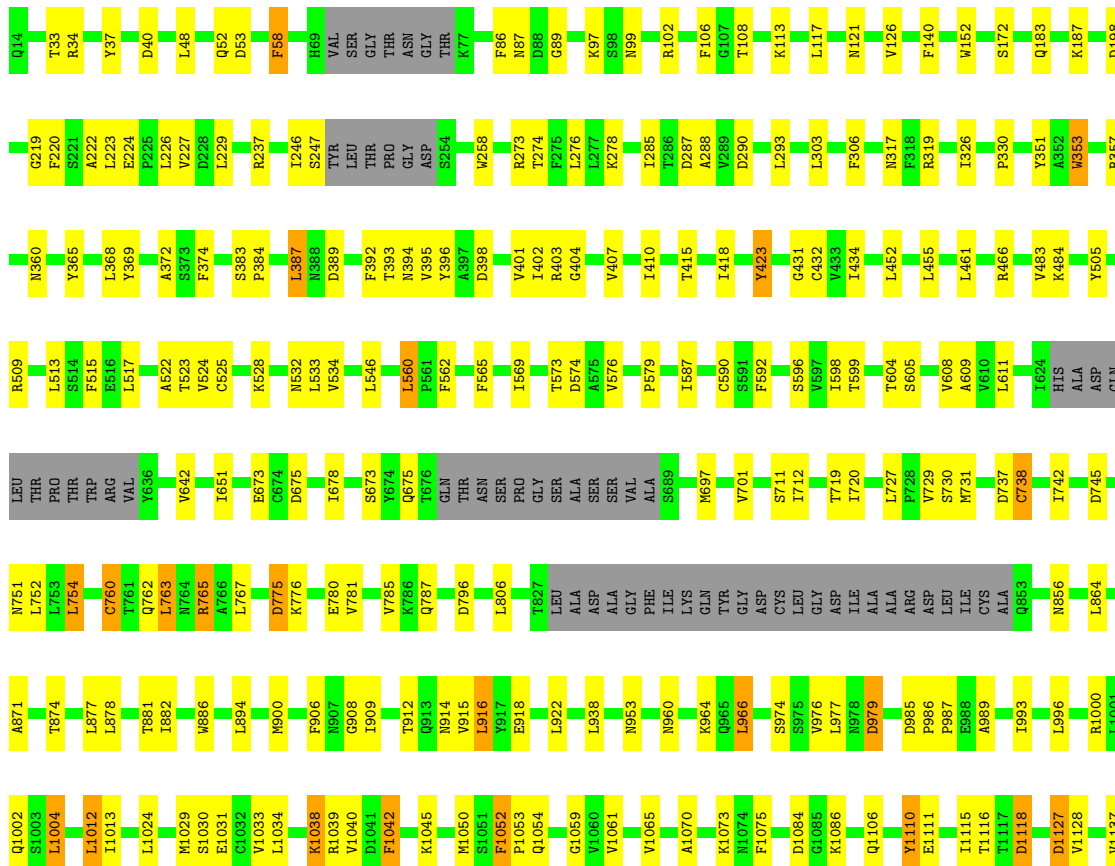


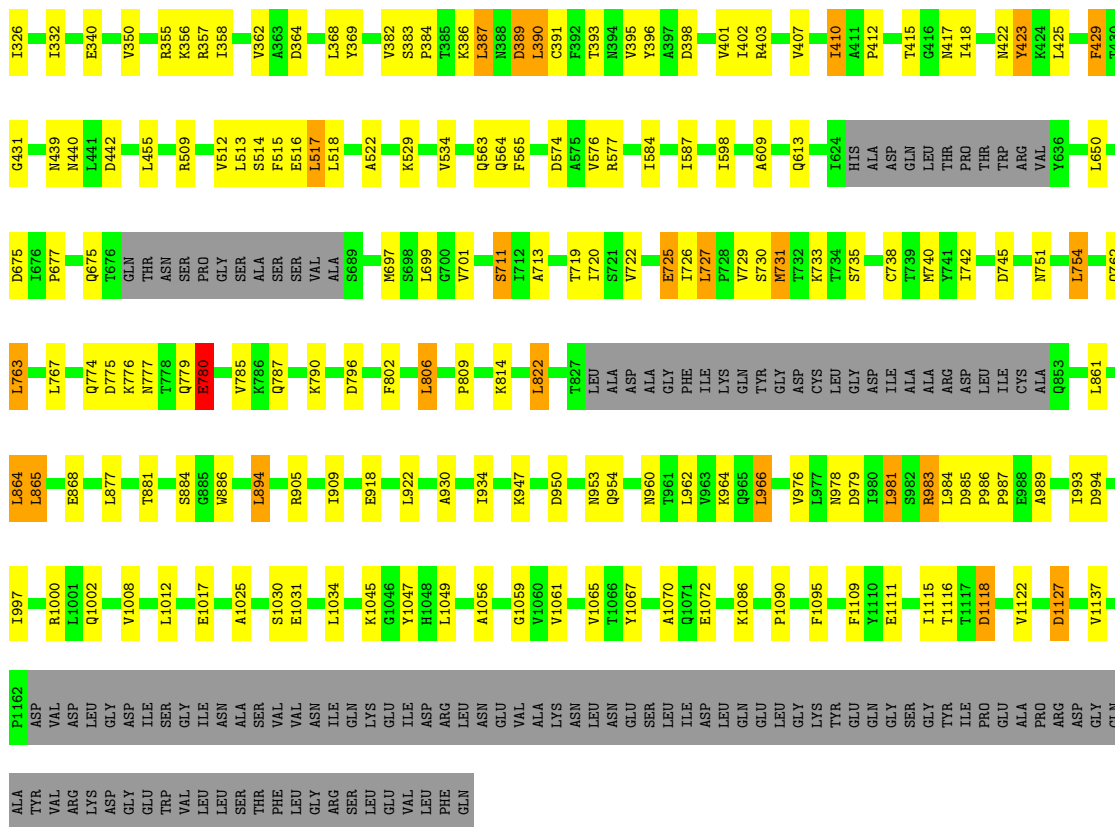
• Molecule 1: Spike glycoprotein, Fibritin



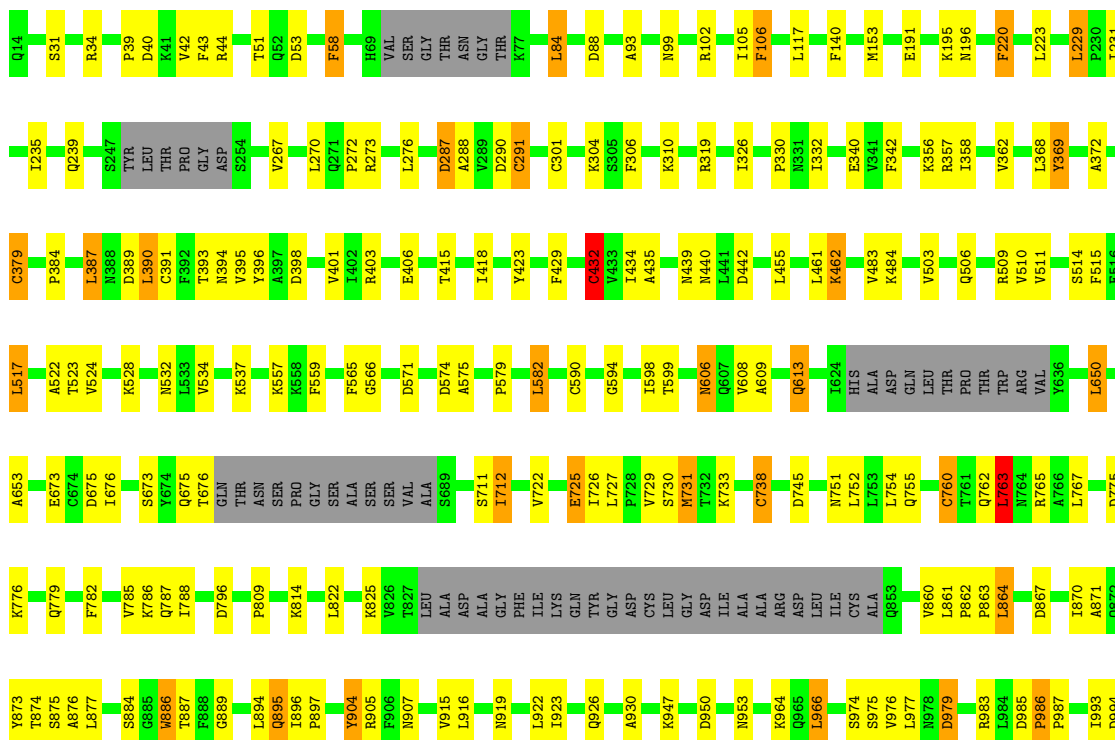


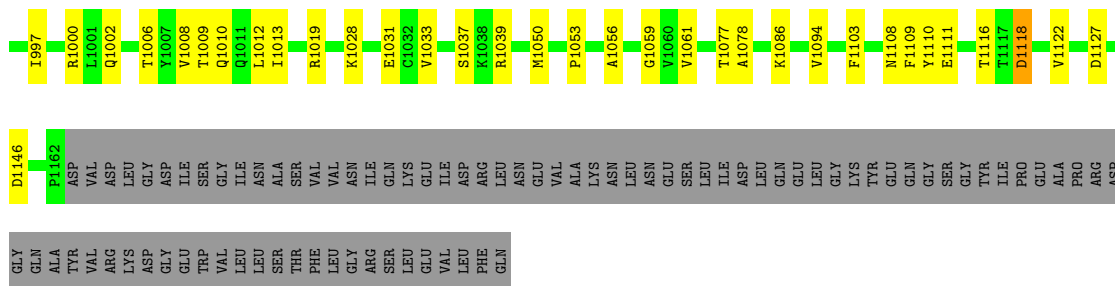
● Molecule 1: Spike glycoprotein, Fibrin



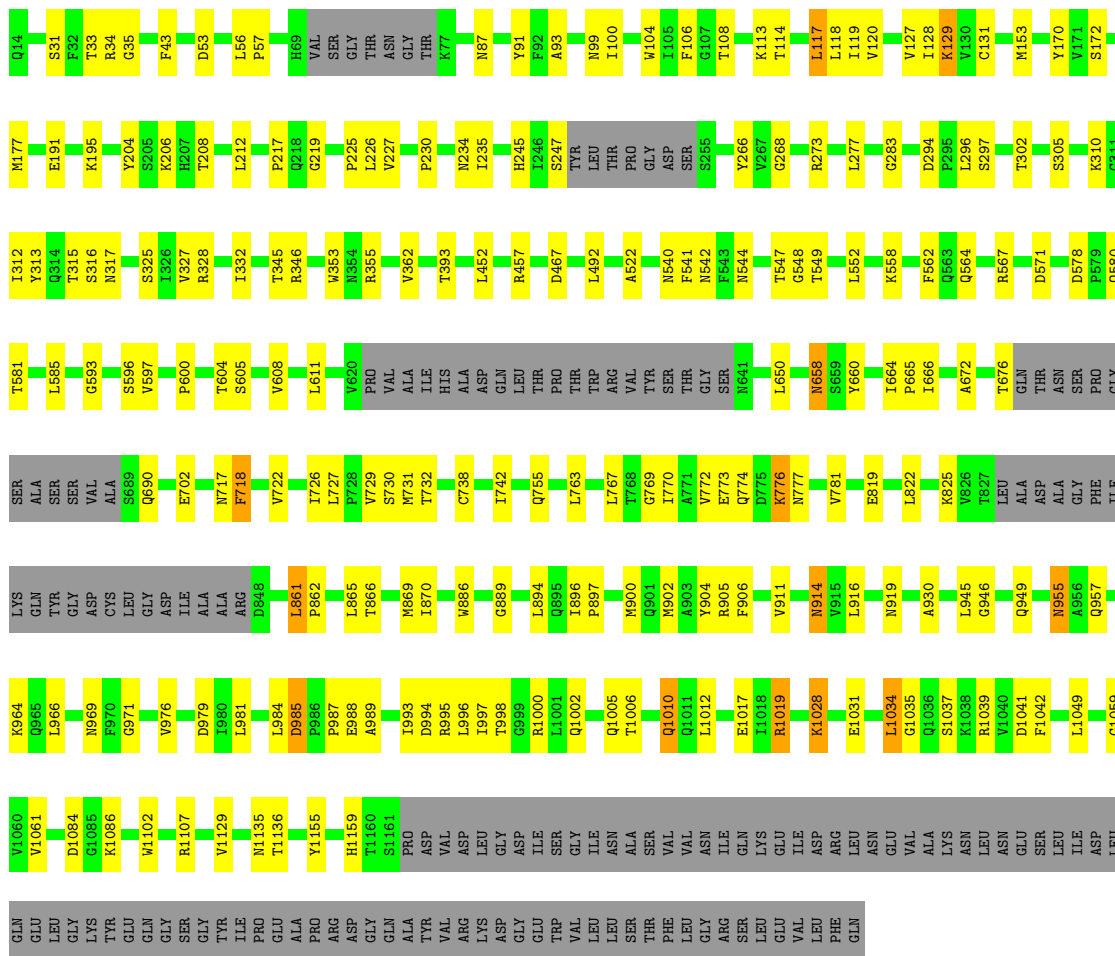


• Molecule 1: Spike glycoprotein, Fibrin

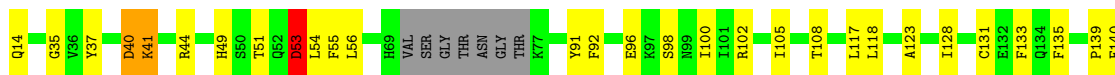


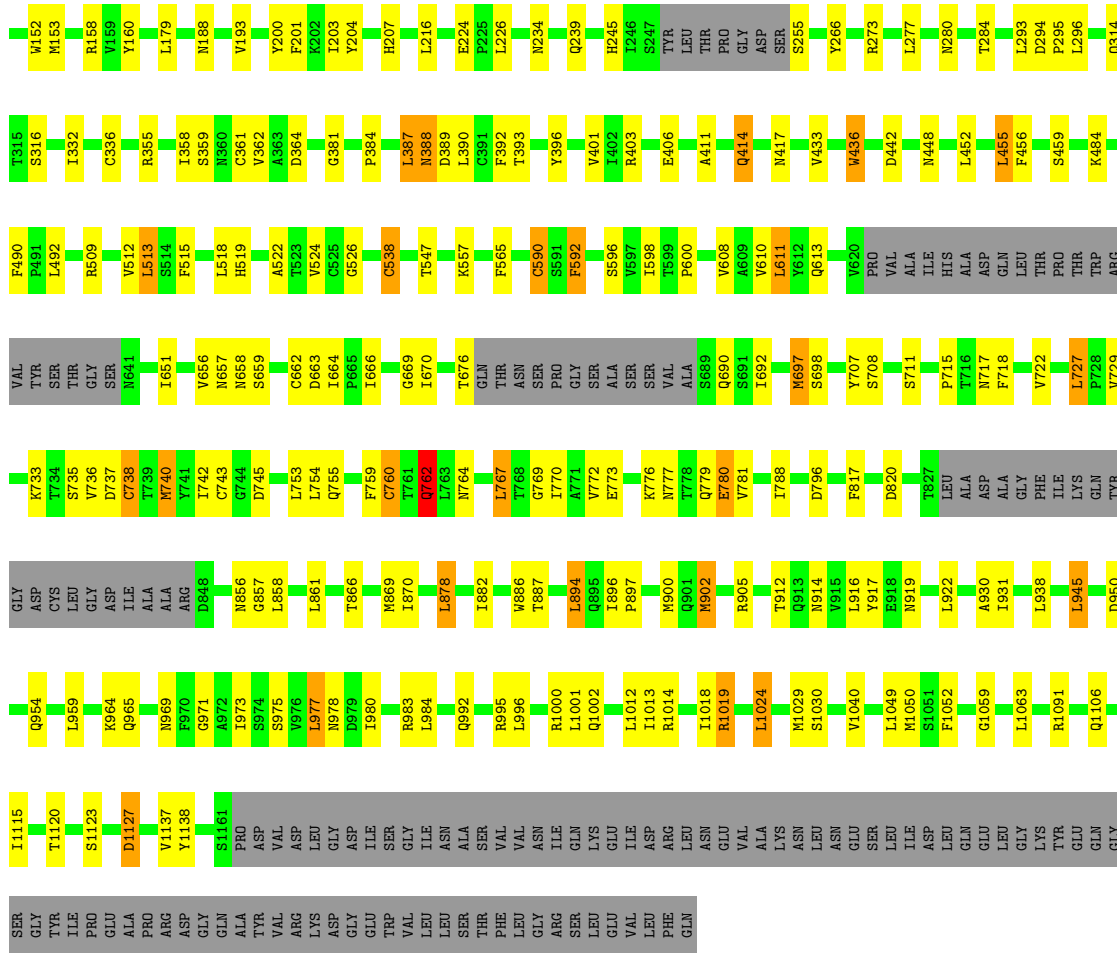


• Molecule 1: Spike glycoprotein,Fibrinin

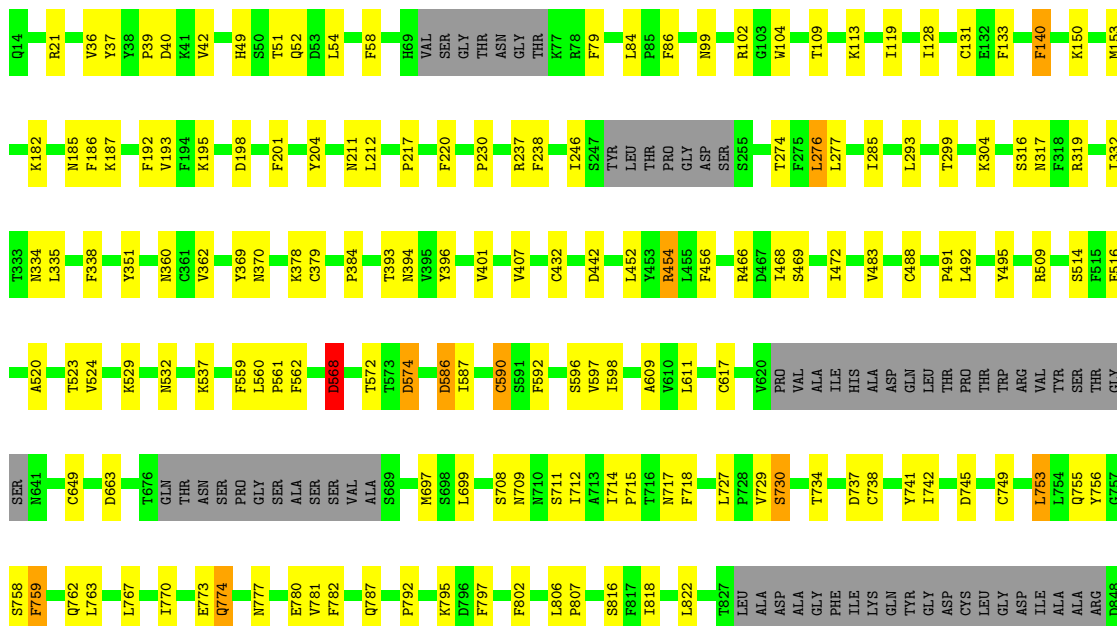


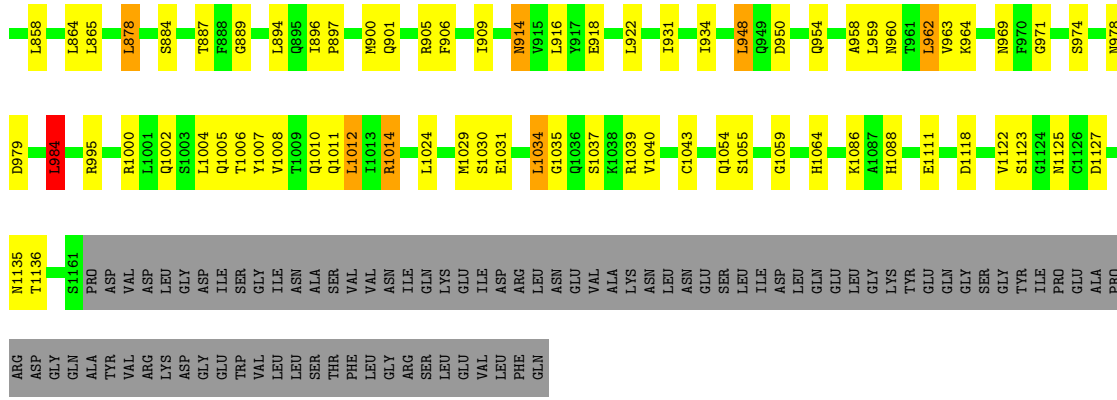
• Molecule 1: Spike glycoprotein,Fibrinin





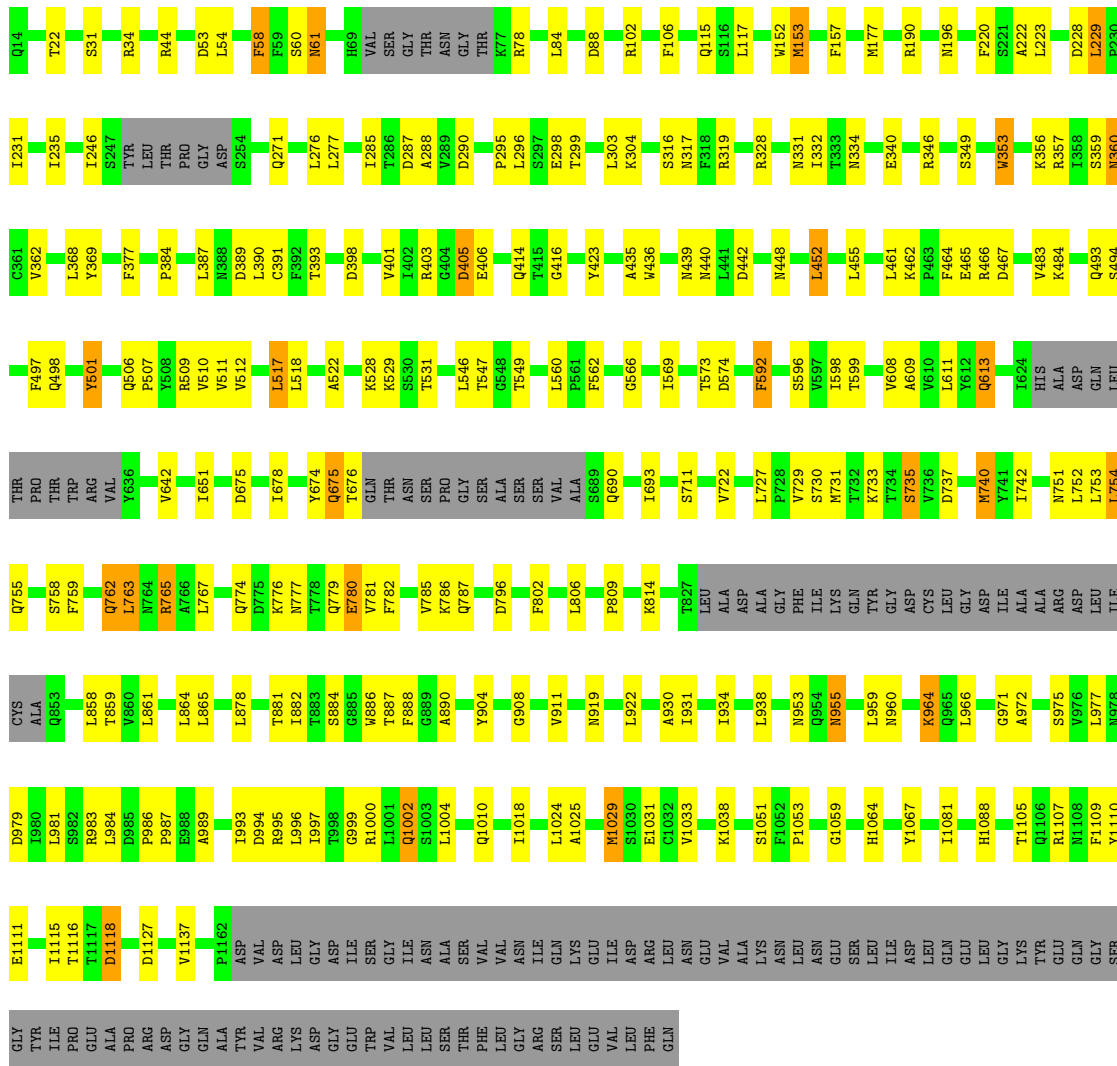
• Molecule 1: Spike glycoprotein,Fibrinin





• Molecule 1: Spike glycoprotein, Fibrin

Chain 10-A:



• Molecule 1: Spike glycoprotein, Fibrin

Chain 10-B:



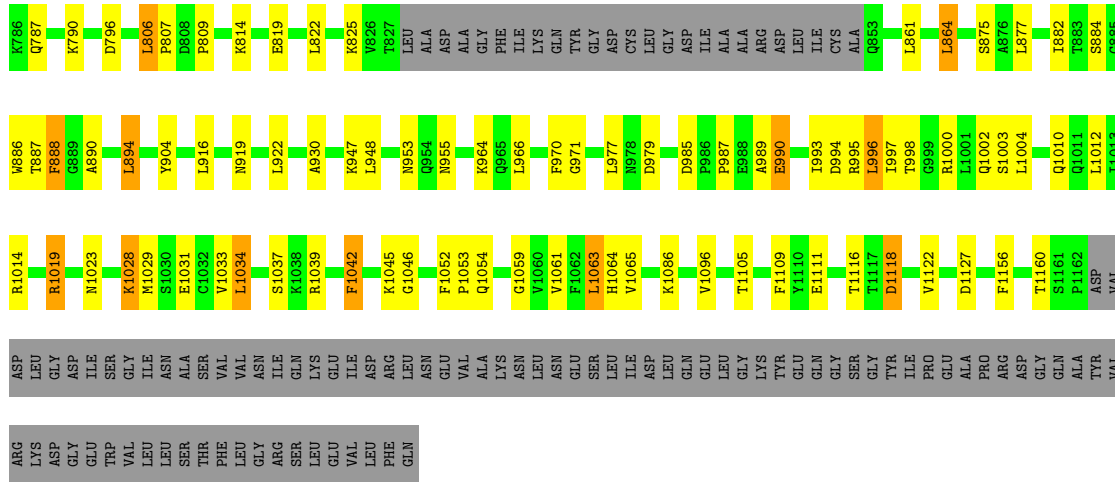
G14	T22	Y28	R34	Y37	F43	V47	Q52	D53	F58	M61	W64	H69	SER	GLY	THR	ASN	GLY	THR	K77	R78	F79	P85	R102	S112	E132	W152	L189	F201	Y204	S221	A222	P225	D228	T235	T236														
R237	I246	T247	LEU	THR	PRO	GLY	ASP	S254	A264	T274	F275	L276	L277	F58	M61	T285	T286	D287	A288	T299	F306	I326	P330	H331	I332	F347	Y351	R355	K356	R357	I358	Y362	A363	D364	Y365	S366	V367	L368	Y369	H370	V382	S383	F384	L387	H388	D389			
L390	C391	F392	T393	N394	Y395	Y396	A397	D398	S399	F400	V401	I402	R403	E406	V407	R408	O409	I410	Y423	K424	L425	F429	A435	N440	L441	D442	L452	L455	F456	R457	L461	D467	Q483	R509	V510	V511	V512	F515	E516	L517	L518	V519	S533	A522	L533	V534	L535		
Q564	D574	R577	N578	P579	L582	E583	V597	I598	A609	V610	L611	Y612	V620	HIS	K624	ALA	ASP	GLN	LEU	THR	A435	N440	L441	D442	L452	L455	F456	R457	L461	D467	Q483	R509	V510	V511	V512	F515	E516	L517	L518	V519	S533	A522	L533	V534	L535				
H697	E702	S711	I712	V722	L582	E583	V597	I598	A609	V610	L611	Y612	V620	HIS	K624	ALA	ASP	GLN	LEU	THR	A435	N440	L441	D442	L452	L455	F456	R457	L461	D467	Q483	R509	V510	V511	V512	F515	E516	L517	L518	V519	S533	A522	L533	V534	L535				
ILE	LYS	GLN	TYR	GLY	ASP	GLY	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP
A972	L977	N978	D979	I980	L981	D985	P986	S987	E988	A989	I993	L996	I997	R1000	L1001	Q1002	Q1005	Q1011	L1012	T881	I1018	R1019	L1024	G1046	S1051	V1061	H1064	Y1067	E1072	V1094	F1109	Y1110	E1111	I1115	T1116	D1117	D1118	D1127	V1137										
F1162	ASP	VAL	ASP	GLY	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	ASP	
GLN	ALA	TYR	VAL	ARG	LYS	ASP	GLY	GLU	TRP	ASP	VAL	VAL	ASP	LEU	PHE	VAL	VAL	ASP	ASN	LEU	ARG	PHE	GLN	LEU	ASP	ASN	GLU	GLY	LYS	TYR	GLU	GLN	GLY	GLY	GLY	GLY	ILE	PRO	GLU	ALA	PRO	ARG	ASP	GLY					

- Molecule 1: Spike glycoprotein,Fibrin

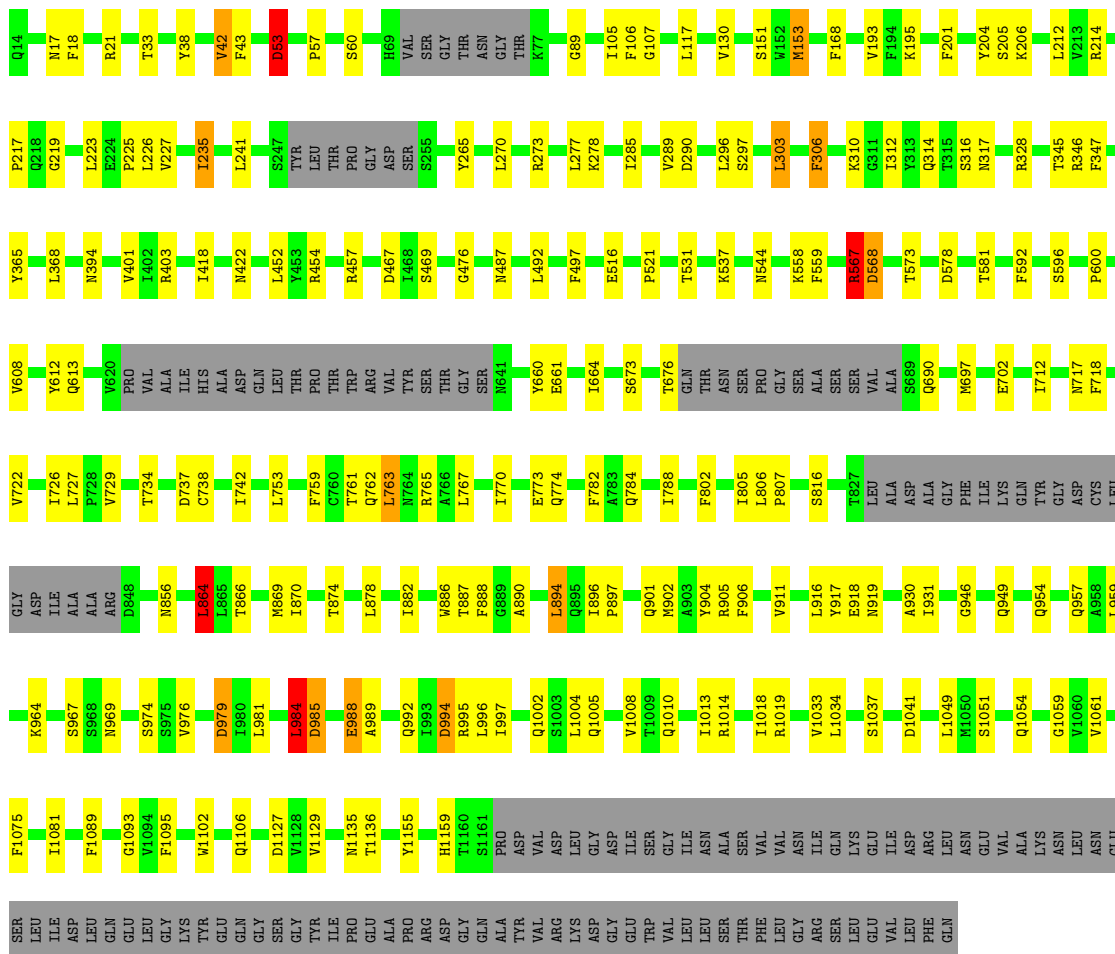
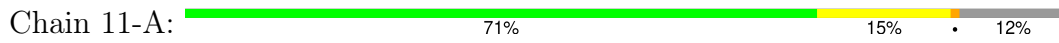
Chain 10-C:



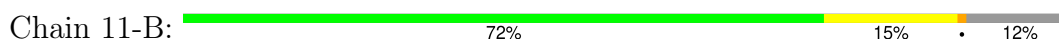
G14	T22	R34	Y37	D40	R44	V47	L54	F58	H69	VAL	SER	GLY	THR	K77	R78	I101	S112	Q134	W152	M153	R158	L189	R190	E191	F192	G219	F220	S221	A222	D228	T240	I246												
S247	TYR	THR	PRO	GLY	ASP	S254	Q271	L285	D287	D290	C291	L296	C301	T302	L303	F306	F307	V308	N317	P318	L64	R319	I326	P330	R357	I358	L368	Y369	A372	S383	P384	T385	K386	L387	L390	C391	F392	T393	N394	Y396	D398			
V401	I402	R403	R408	Q409	Q414	F415	C416	Y423	G431	C432	N439	N440	L441	D442	L452	Y453	R454	L455	K462	D467	L468	S469	V483	K484	S494	P499	Y505	O506	R509	Y512	F515	E516	L517	A522	T523	V524	L533	V534	K537	L552				
F559	P579	L585	D586	C590	S591	F592	I598	T599	V608	A609	V610	L611	Q613	L624	HIS	ALA	ASP	GLN	LEU	THR	R78	L84	Y91	I100	I101	S112	Q134	W152	M153	R158	L189	R190	E191	F192	G219	F220	S221	A222	D228	T240	I246			
SER	ALA	SER	VAL	ALA	SER	ASP	LYS	ASP	LEU	THR	PHE	VAL	VAL	ASP	LEU	PHE	VAL	VAL	ASP	ASN	LEU	ARG	PHE	GLN	LEU	ASP	ASN	GLU	GLY	LYS	TYR	GLU	GLN	GLY	GLY	ILE	PRO	GLU	ALA	PRO	ARG	ASP	GLY	
S735	V736	D737	C738	T739	H740	I741	I742	N751	L752	L753	L754	Q755	S758	F759	C760	T761	Q762	L763	N764	R765	A766	L767	G774	Q775	F776	K777	V781	F782	V785	N751	L752	L753	L754	Q755	S758	F759	C760	T761	Q762	L763	N764	R765	A766	L767

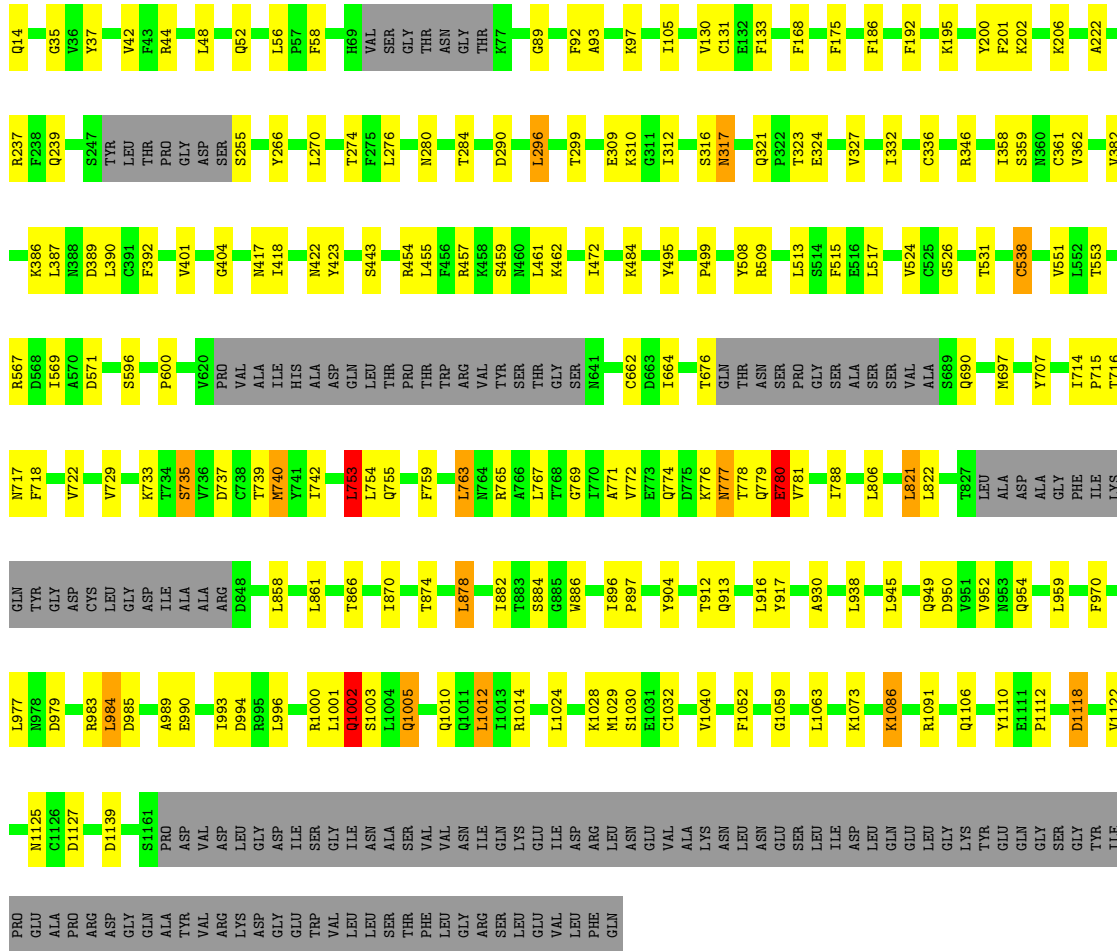


- Molecule 1: Spike glycoprotein, Fibrin

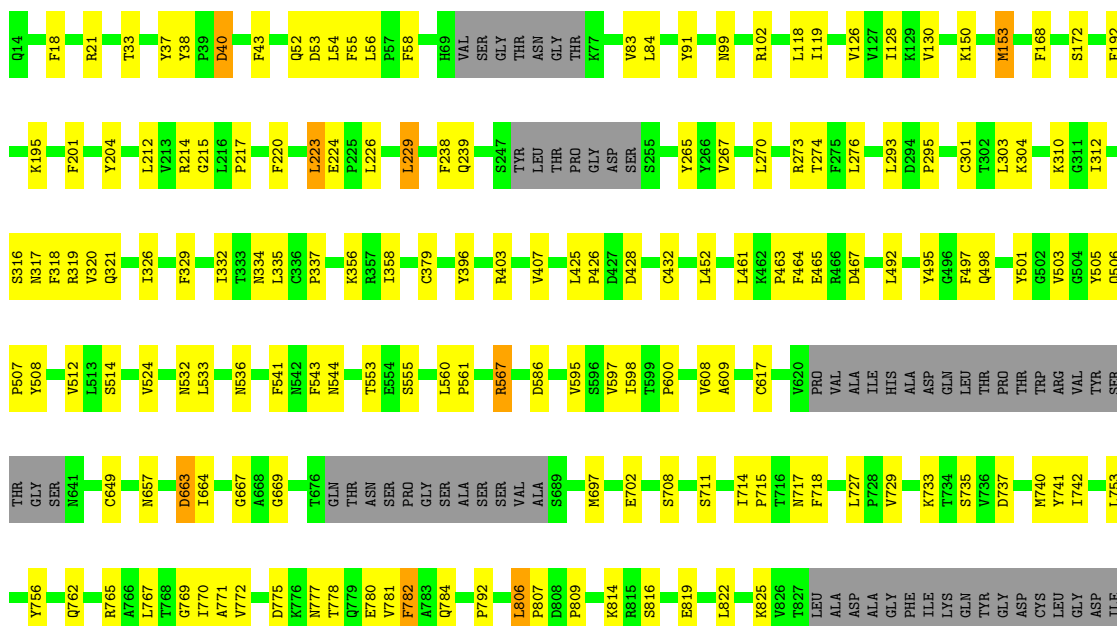
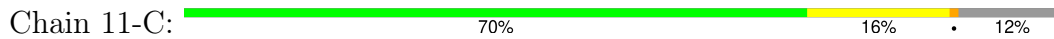


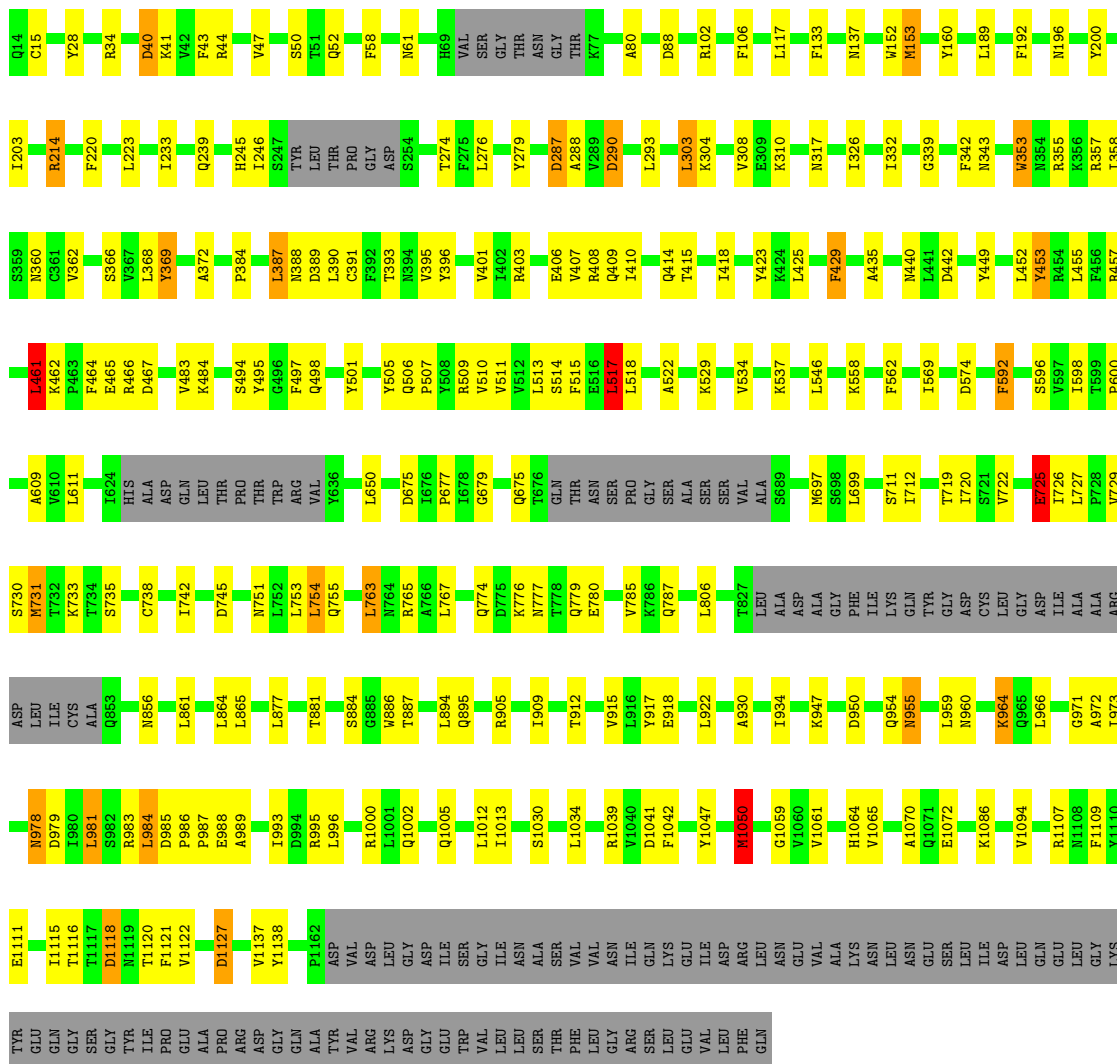
- Molecule 1: Spike glycoprotein, Fibrin





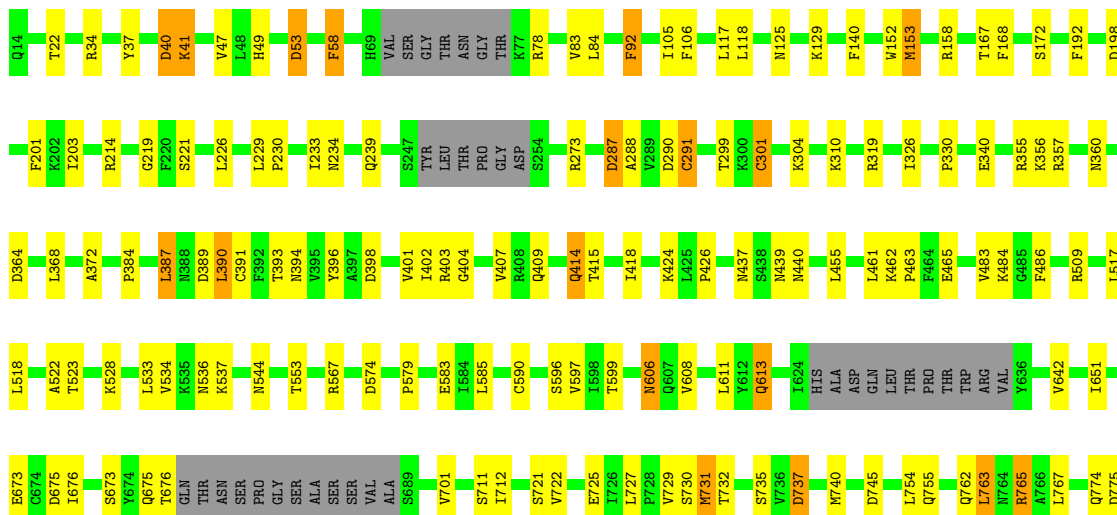
● Molecule 1: Spike glycoprotein,Fibrin

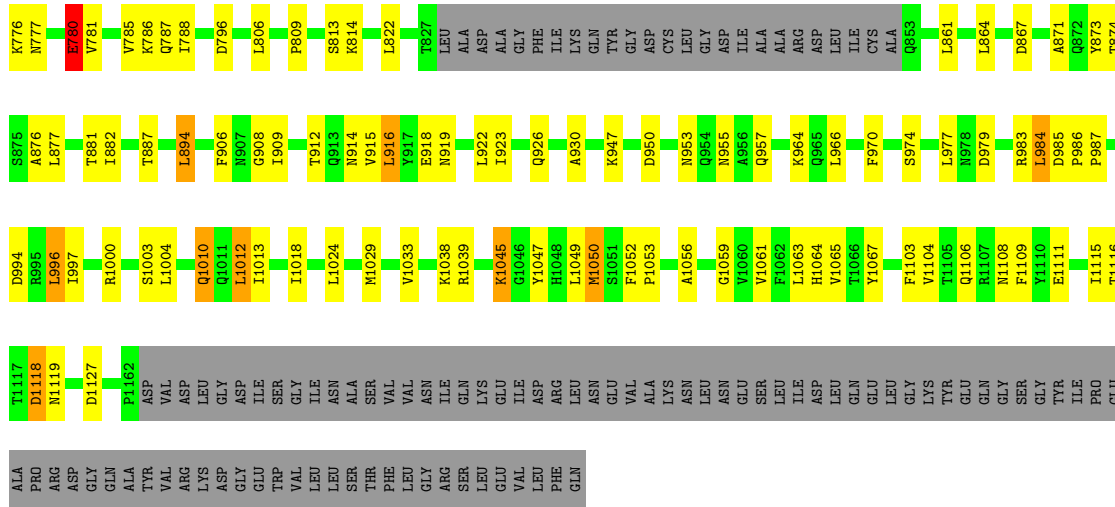




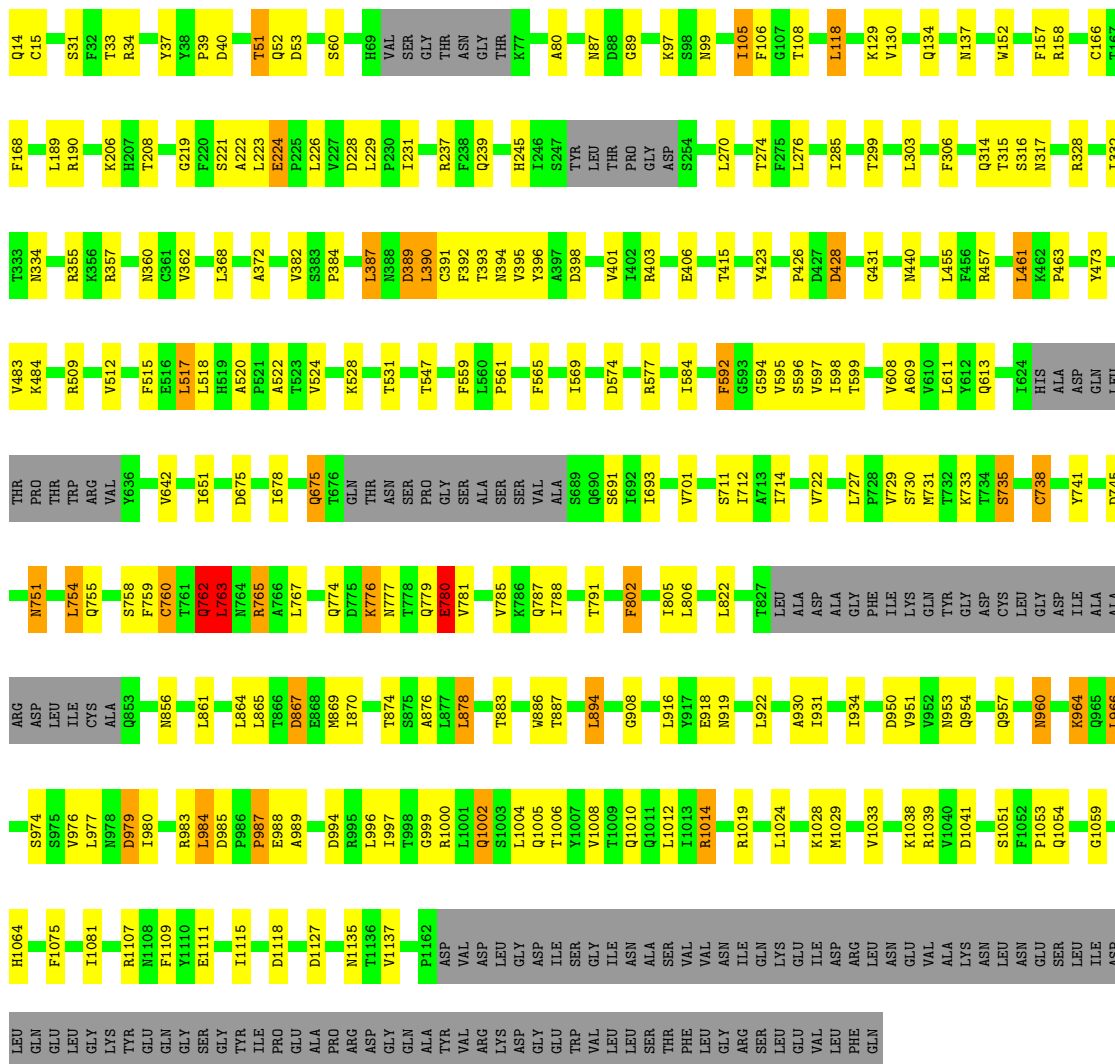
● Molecule 1: Spike glycoprotein, Fibritin

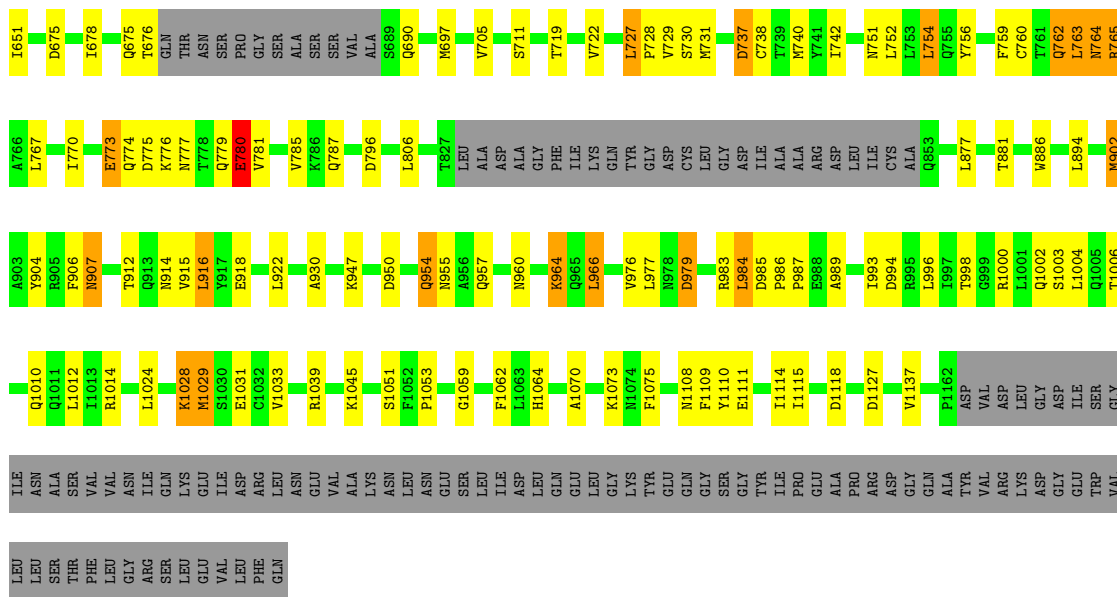
Chain 12-C: 69% 17% 12%



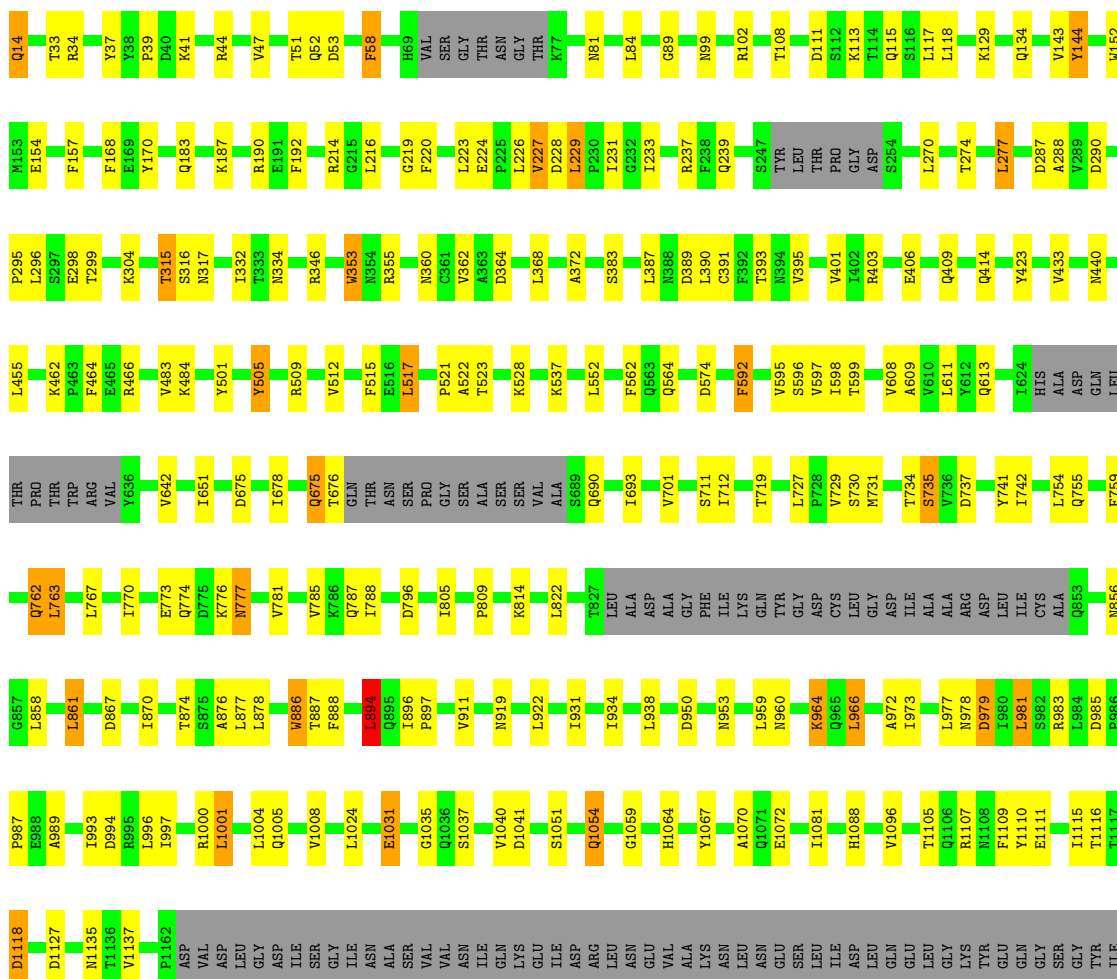


● Molecule 1: Spike glycoprotein, Fibrin





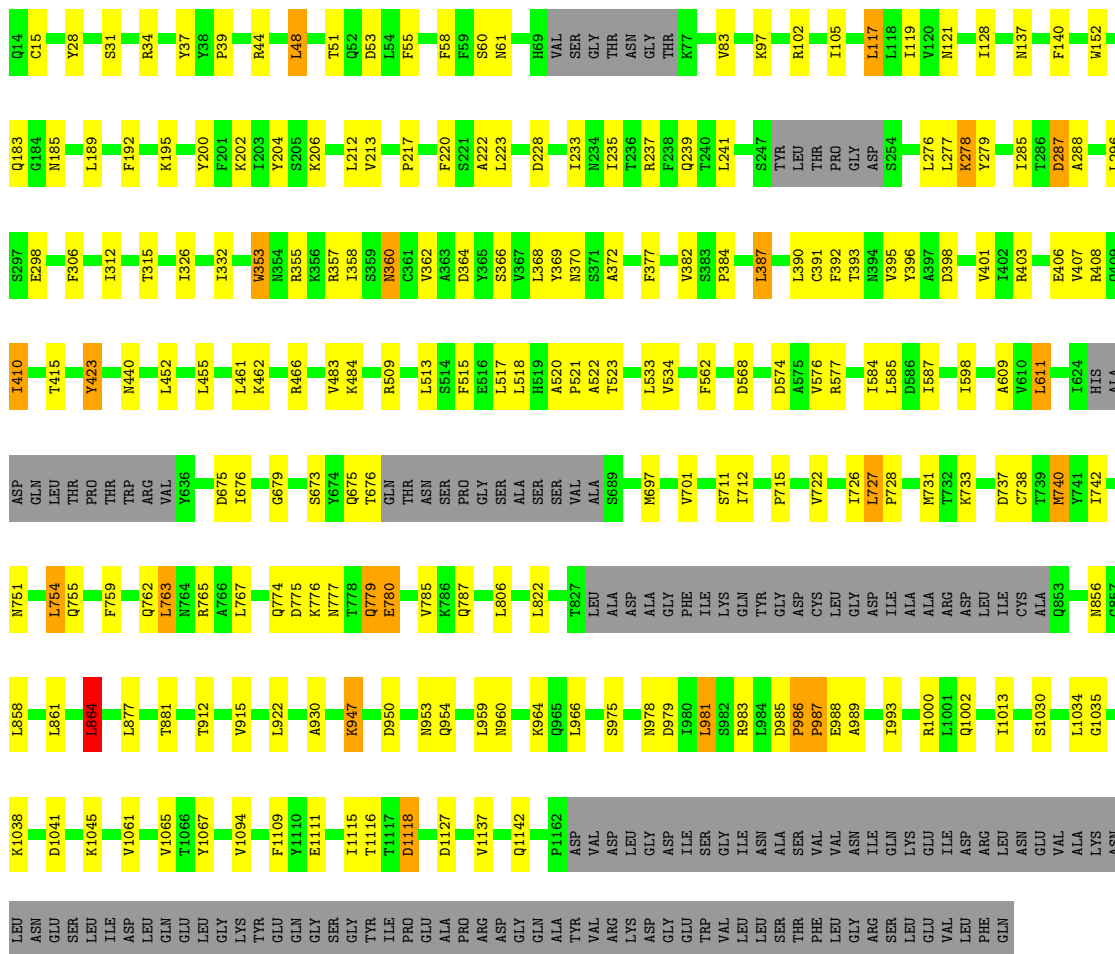
• Molecule 1: Spike glycoprotein, Fibrin



PRO GLU ALA ALA PRO PRO ARG ASP GLY GLN ALA VAL TVR Y37 VAL ARG LYS ASP GLY SER PHE LEU LEU ARG ARG SER LEU VAL VAL LEU PHE LEU GLN

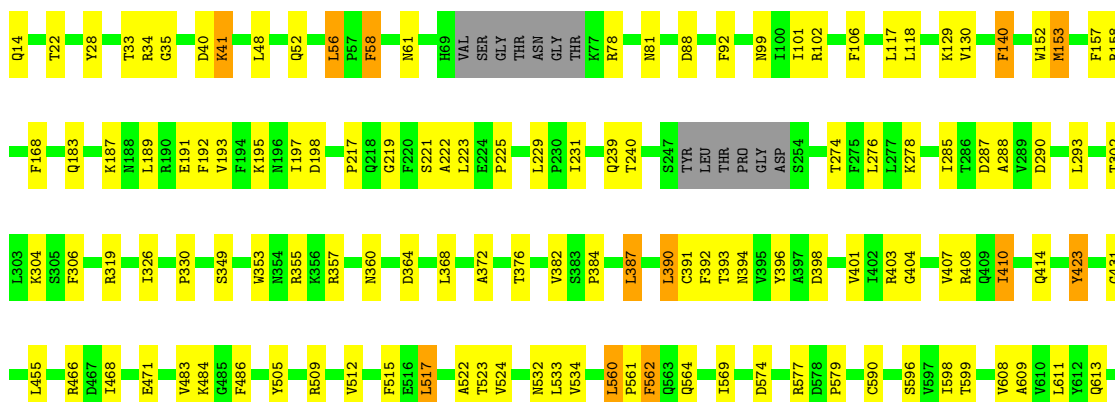
• Molecule 1: Spike glycoprotein,Fibrin

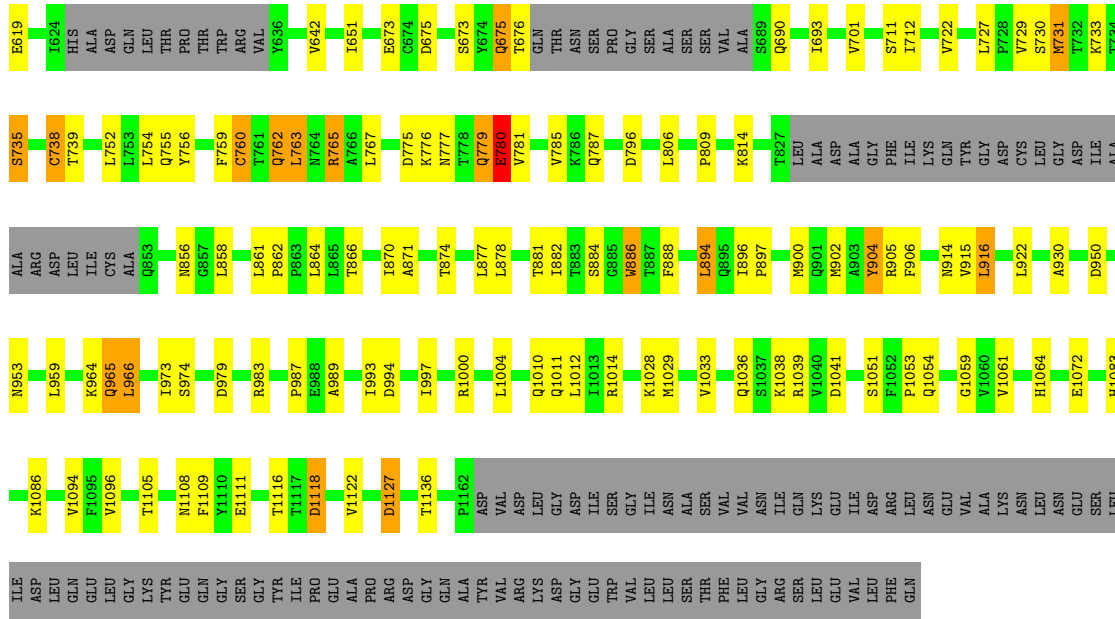
Chain 14-B: 71% 15% 12%



• Molecule 1: Spike glycoprotein,Fibrin

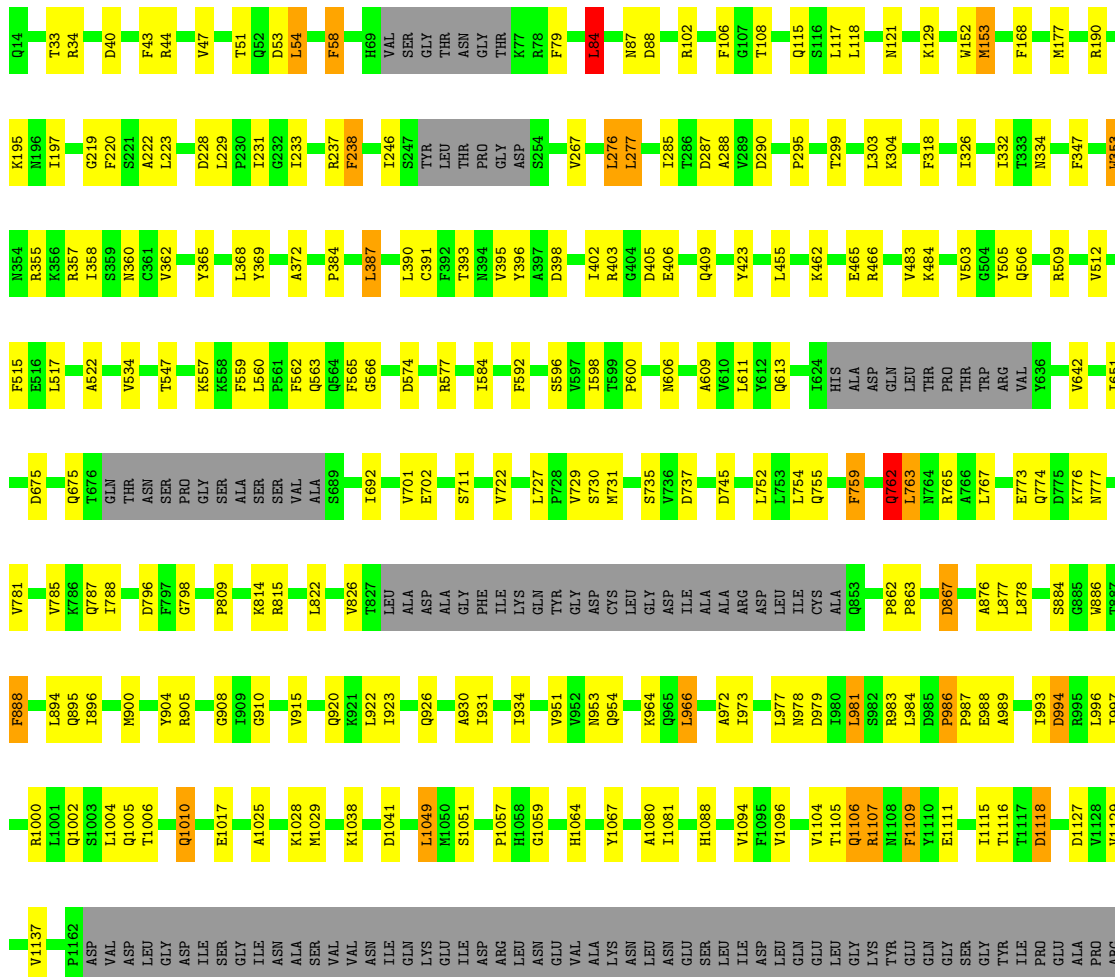
Chain 14-C: 68% 18% 12%

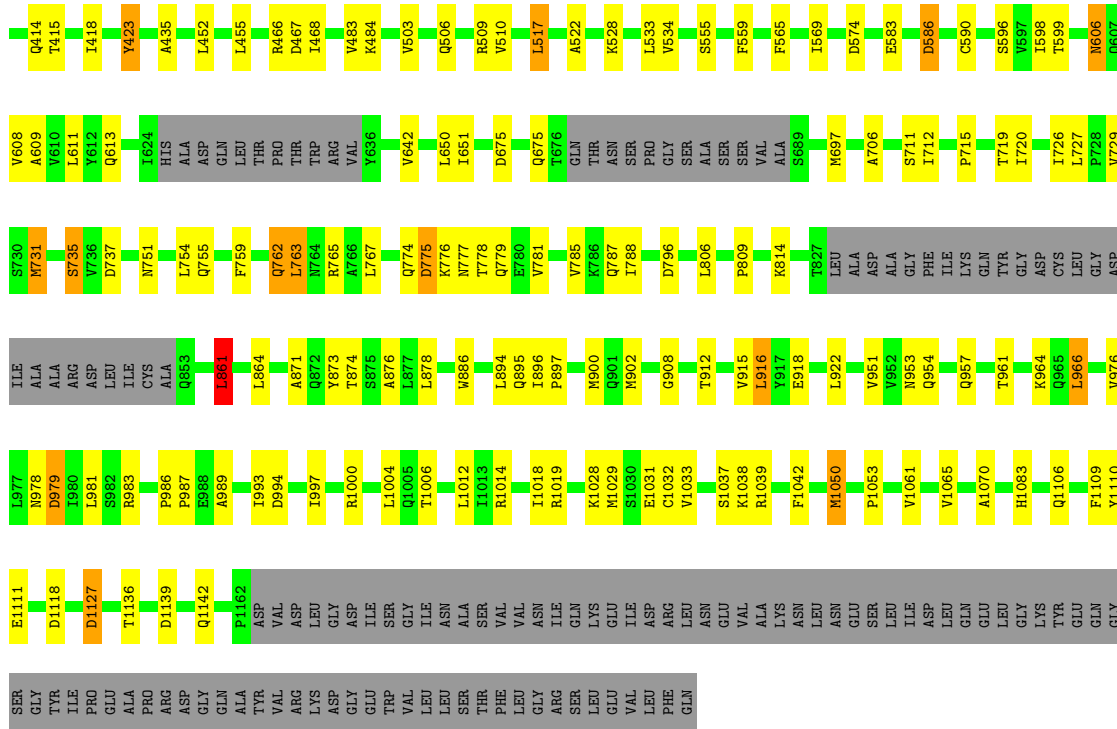




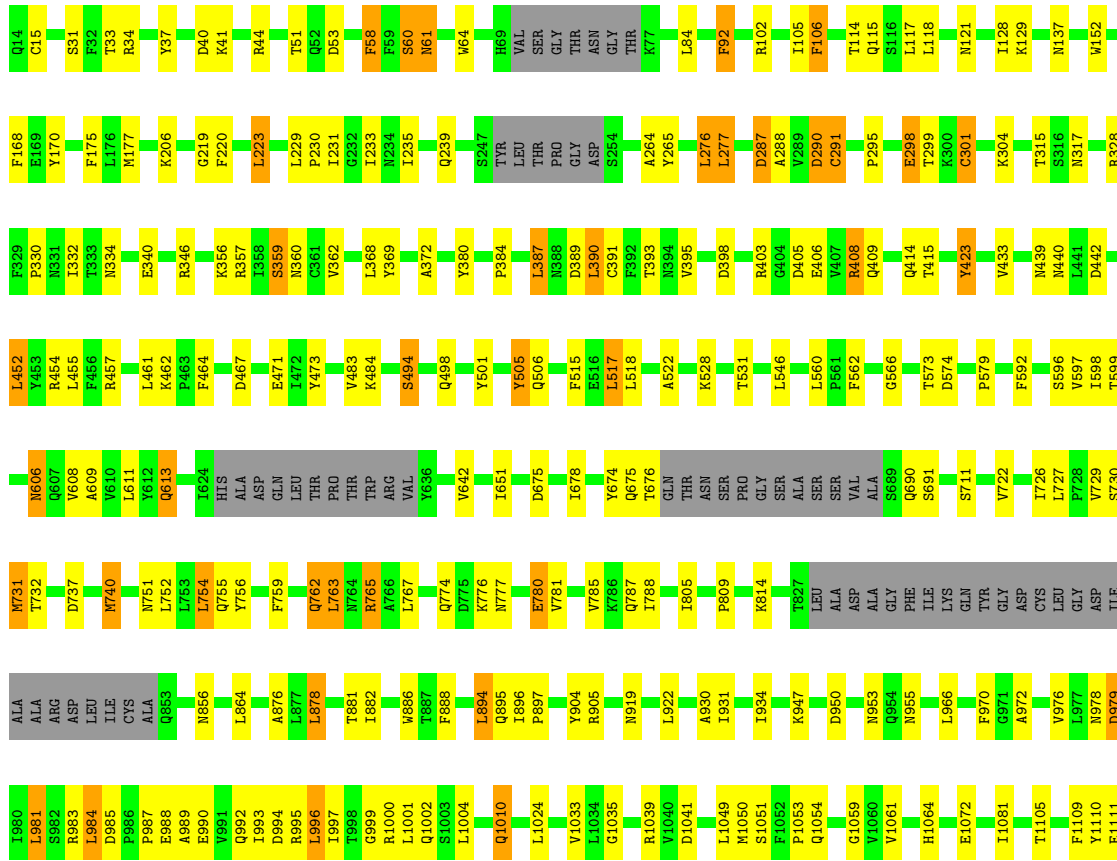
• Molecule 1: Spike glycoprotein, Fibritin

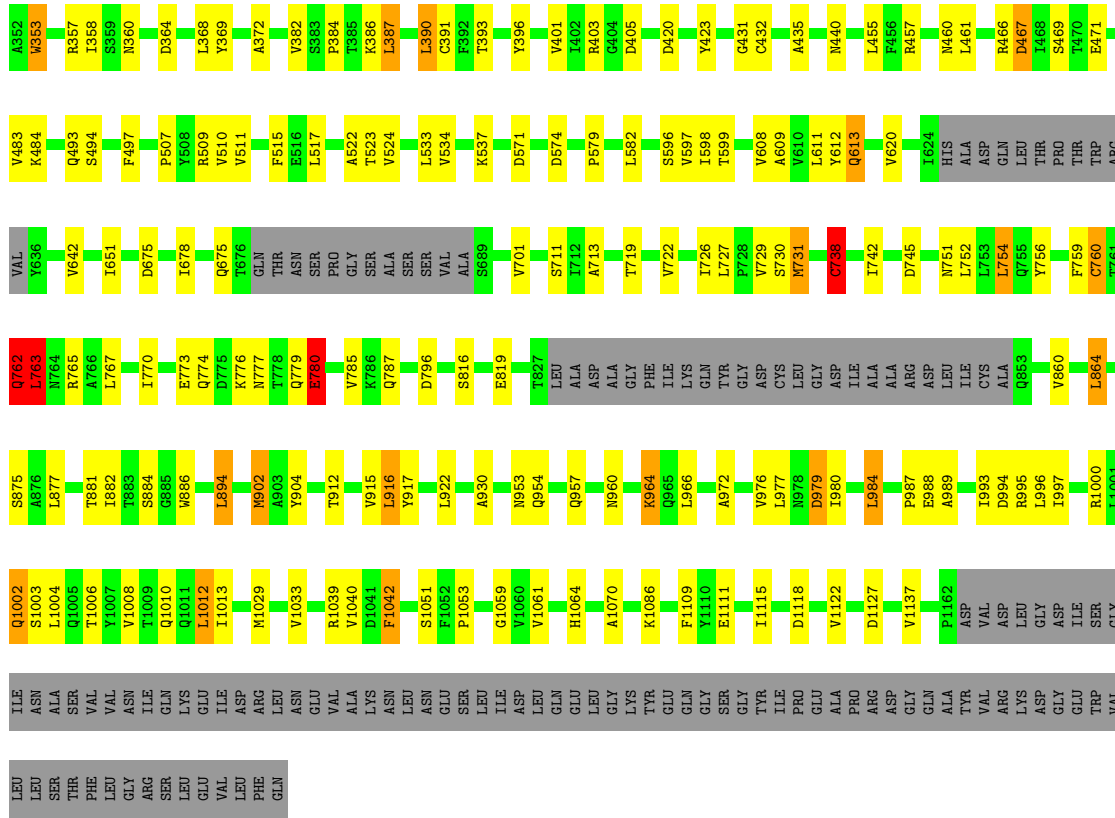
Chain 15-A: 69% 17% 12%



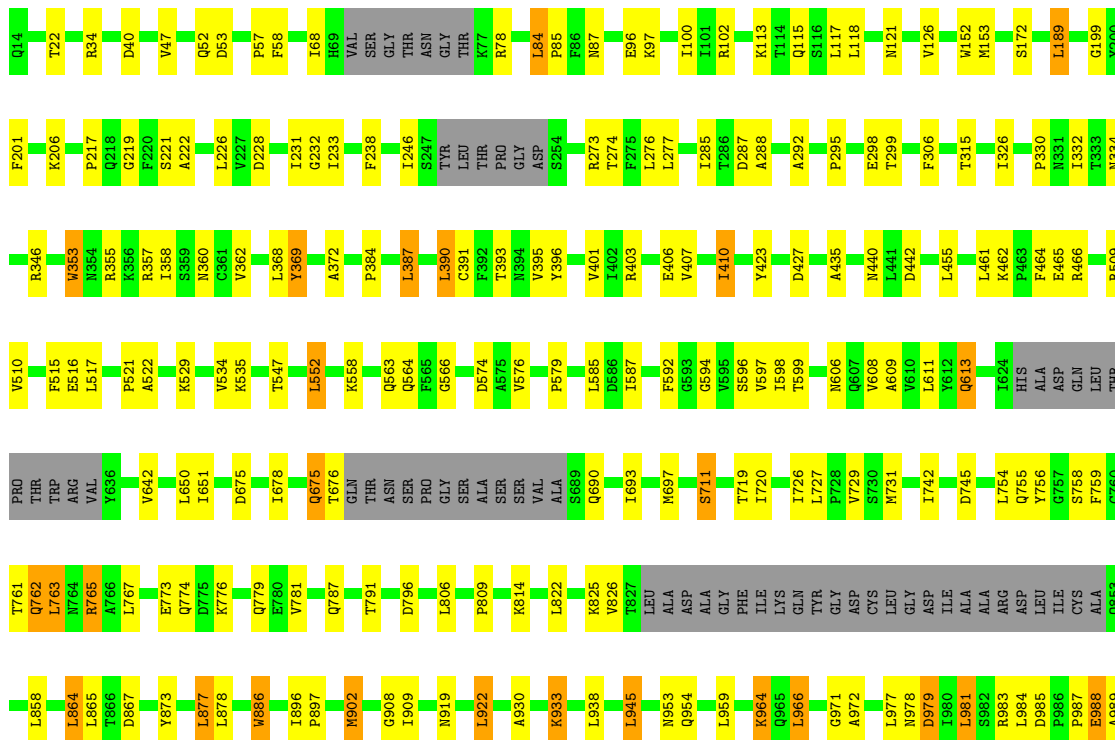


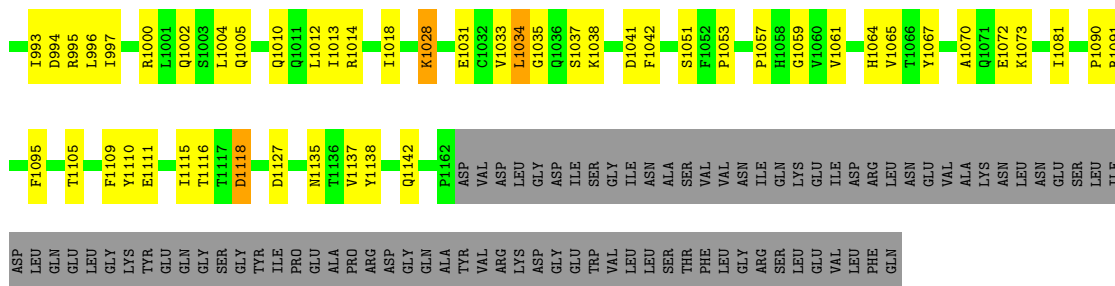
• Molecule 1: Spike glycoprotein,Fibrinin





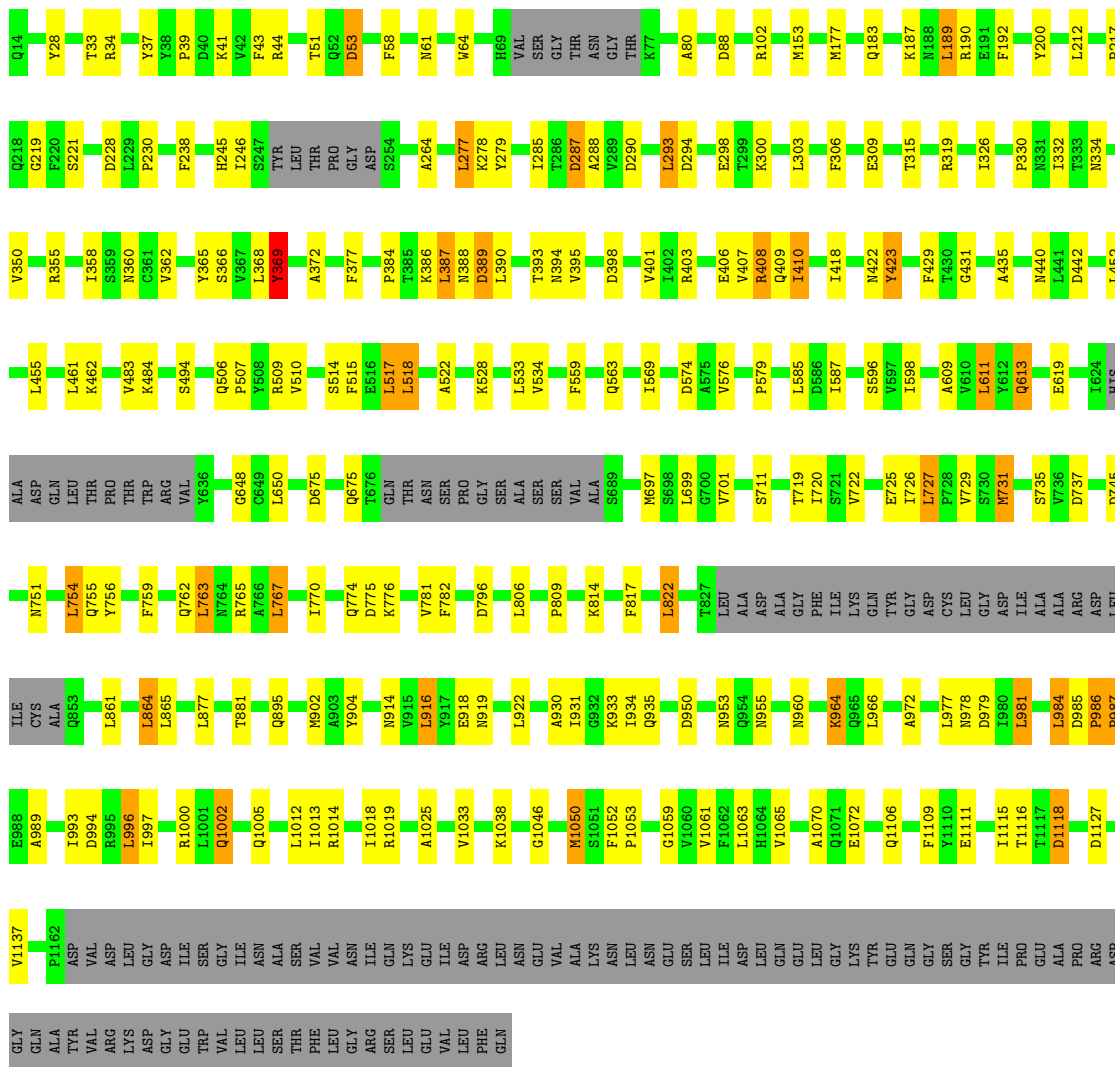
• Molecule 1: Spike glycoprotein, Fibritin





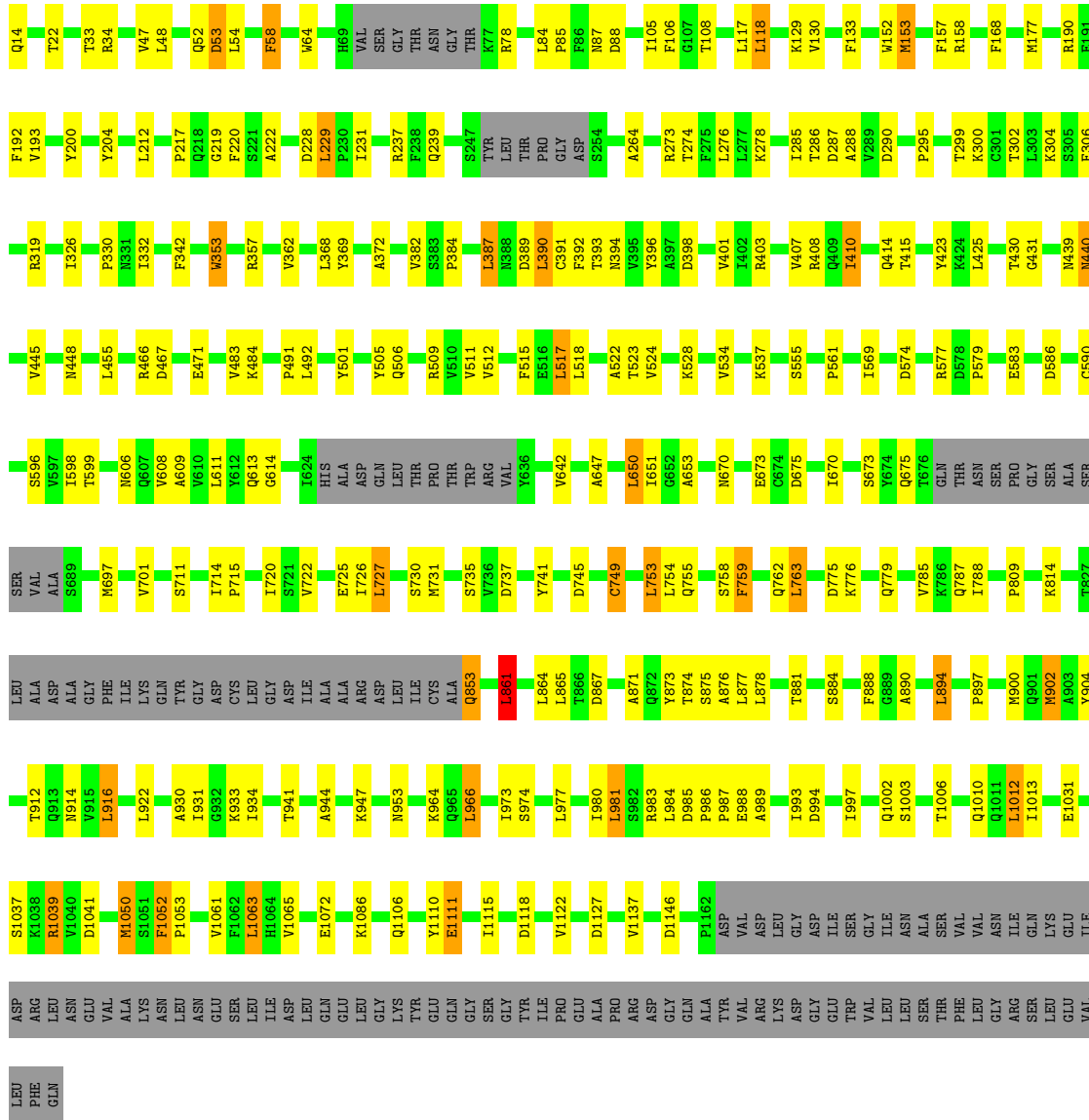
• Molecule 1: Spike glycoprotein,Fibrinin

Chain 17-B: 70% 16% 12%



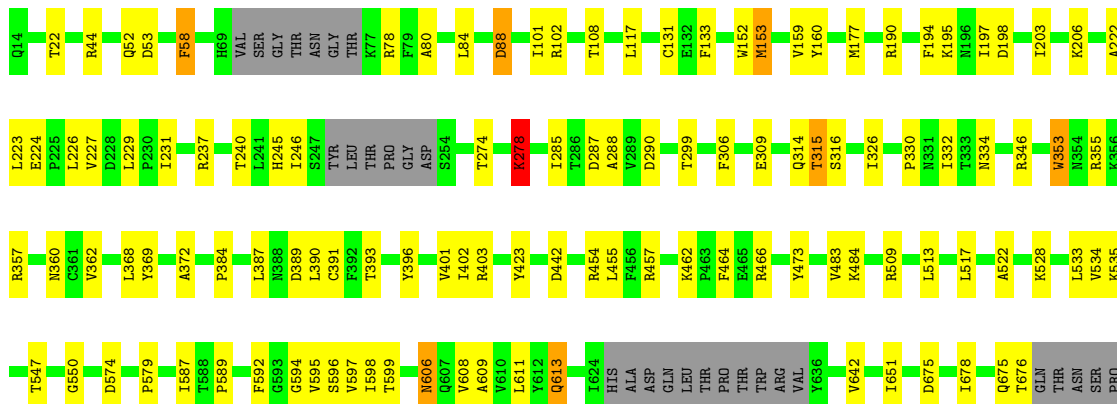
• Molecule 1: Spike glycoprotein,Fibrinin

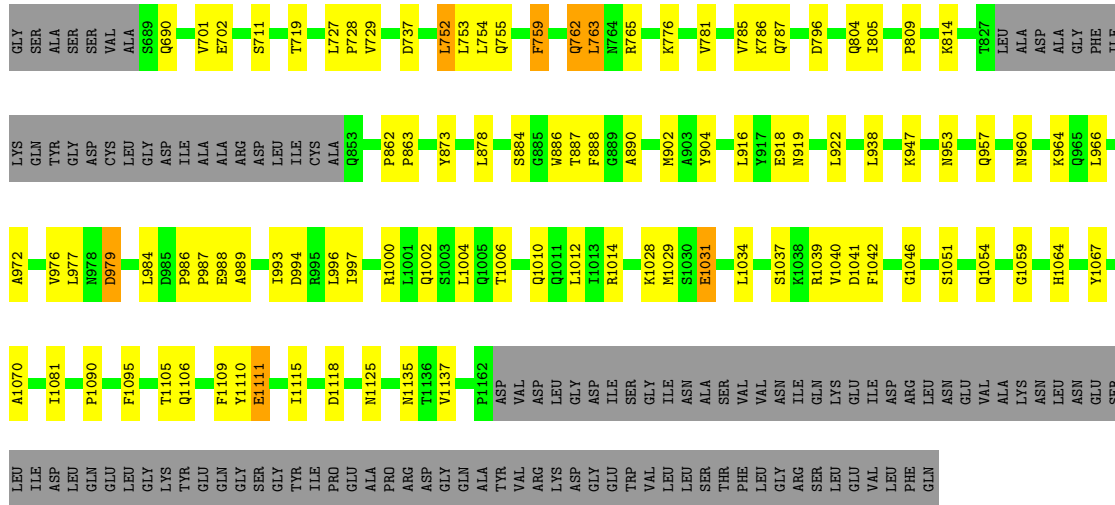
Chain 17-C: 67% 19% 12%



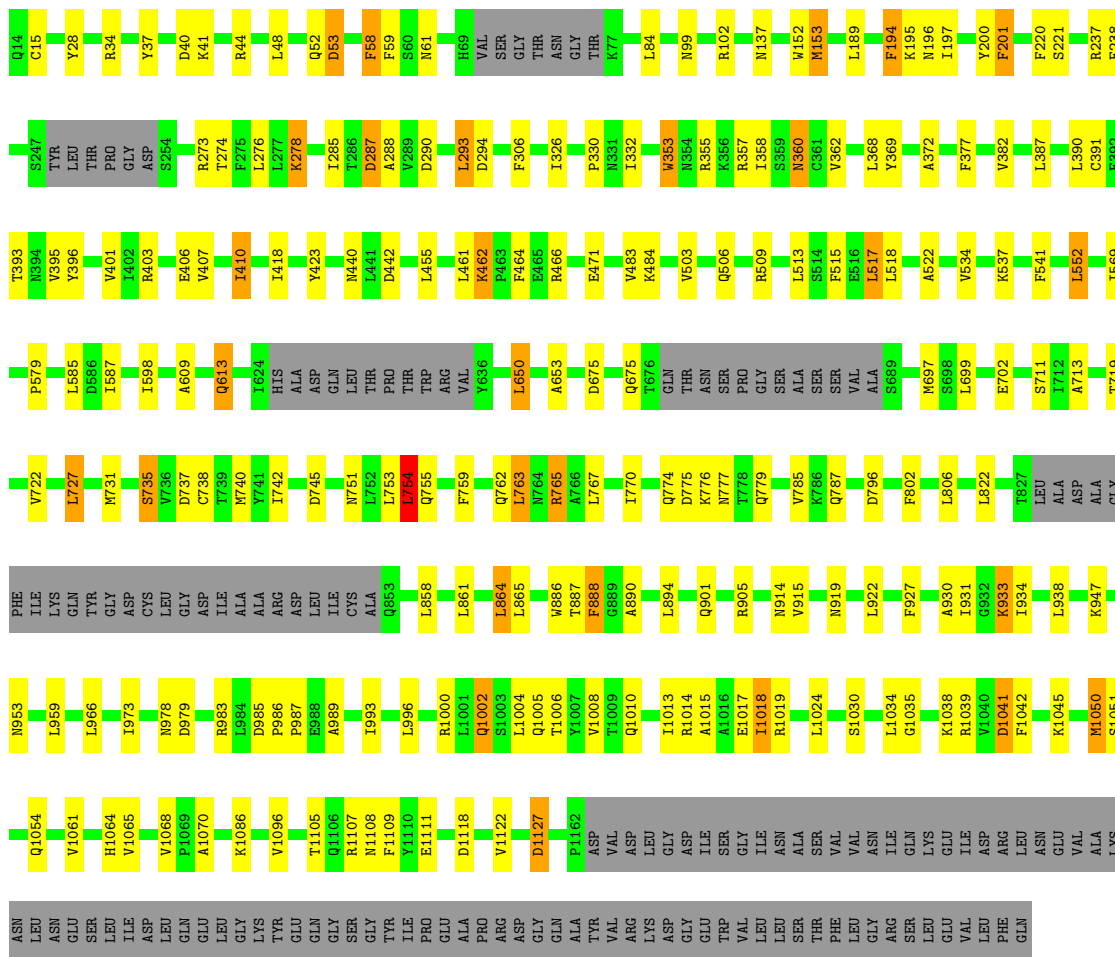
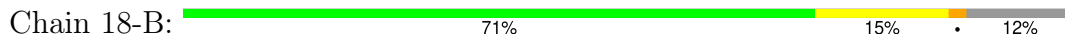
● Molecule 1: Spike glycoprotein,Fibritin

Chain 18-A: 71% 16% 12%



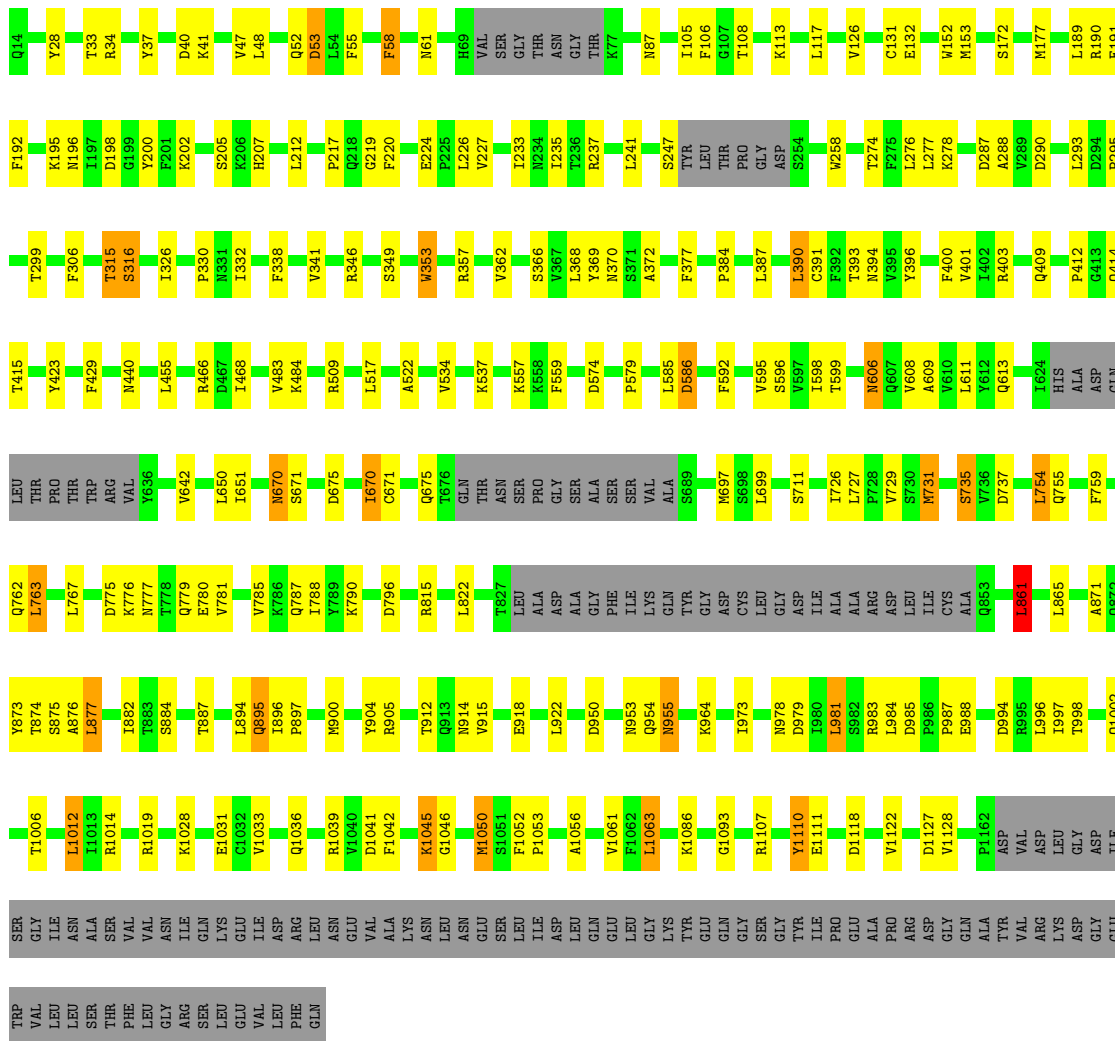


• Molecule 1: Spike glycoprotein,Fibrin



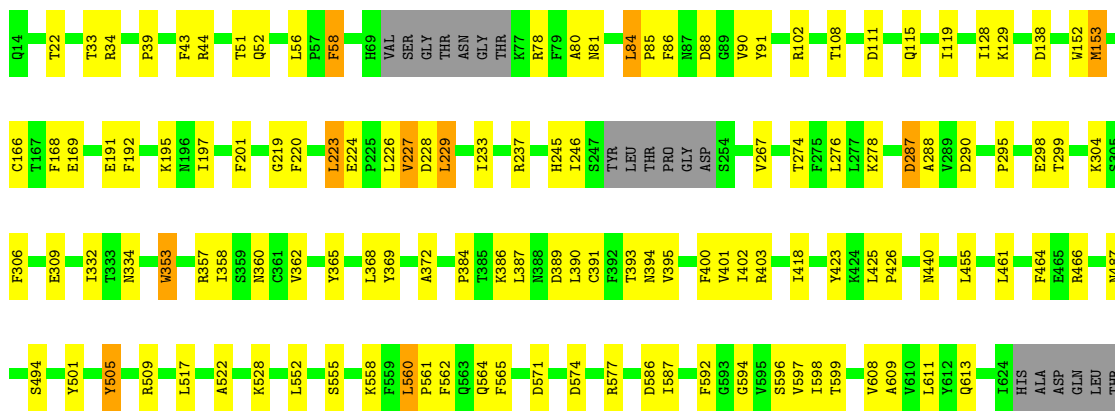
• Molecule 1: Spike glycoprotein,Fibrin

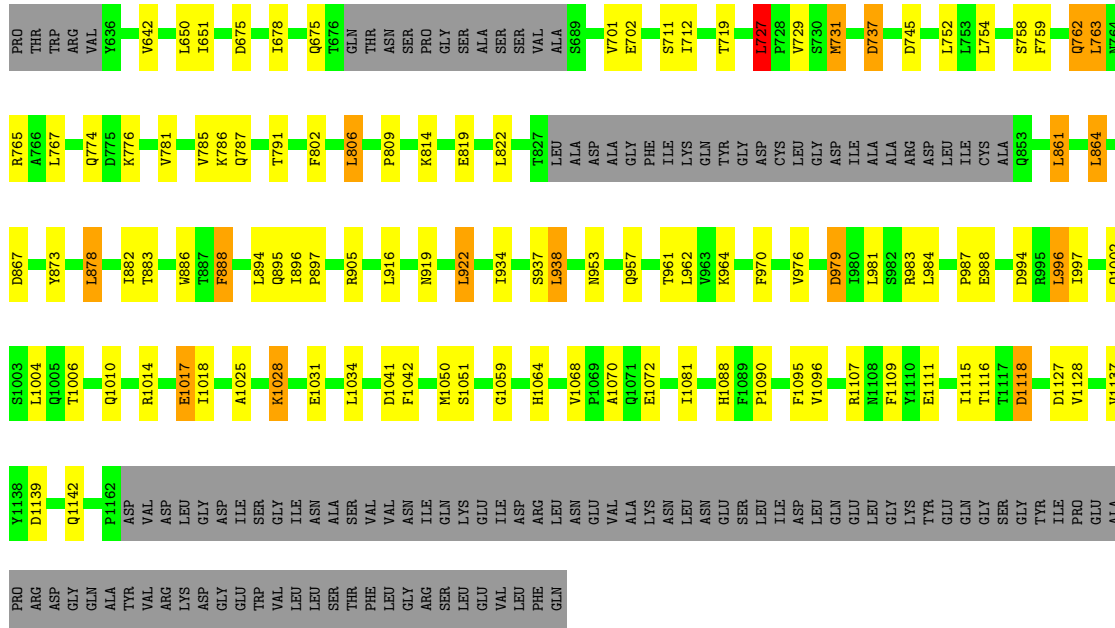
Chain 18-C: 70% 17% 12%



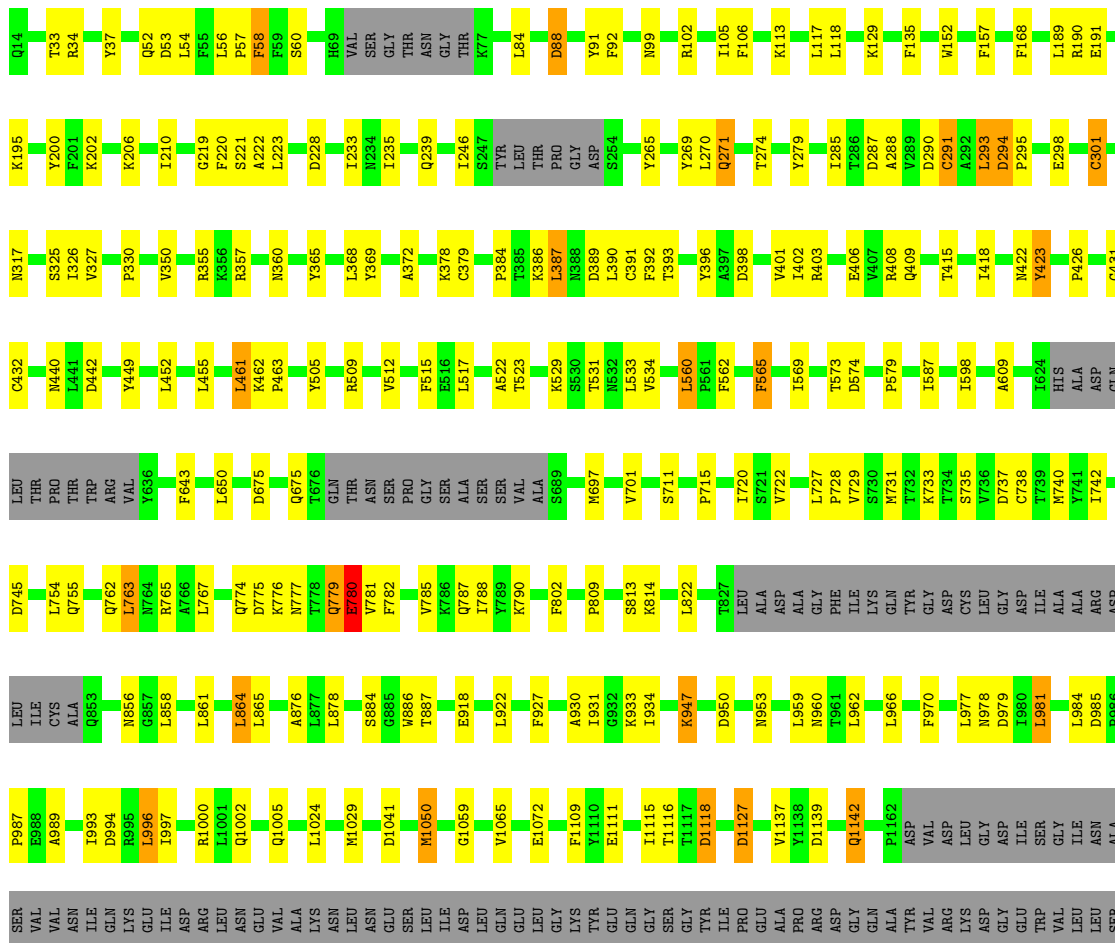
• Molecule 1: Spike glycoprotein,Fibrin

Chain 19-A: 69% 17% 12%





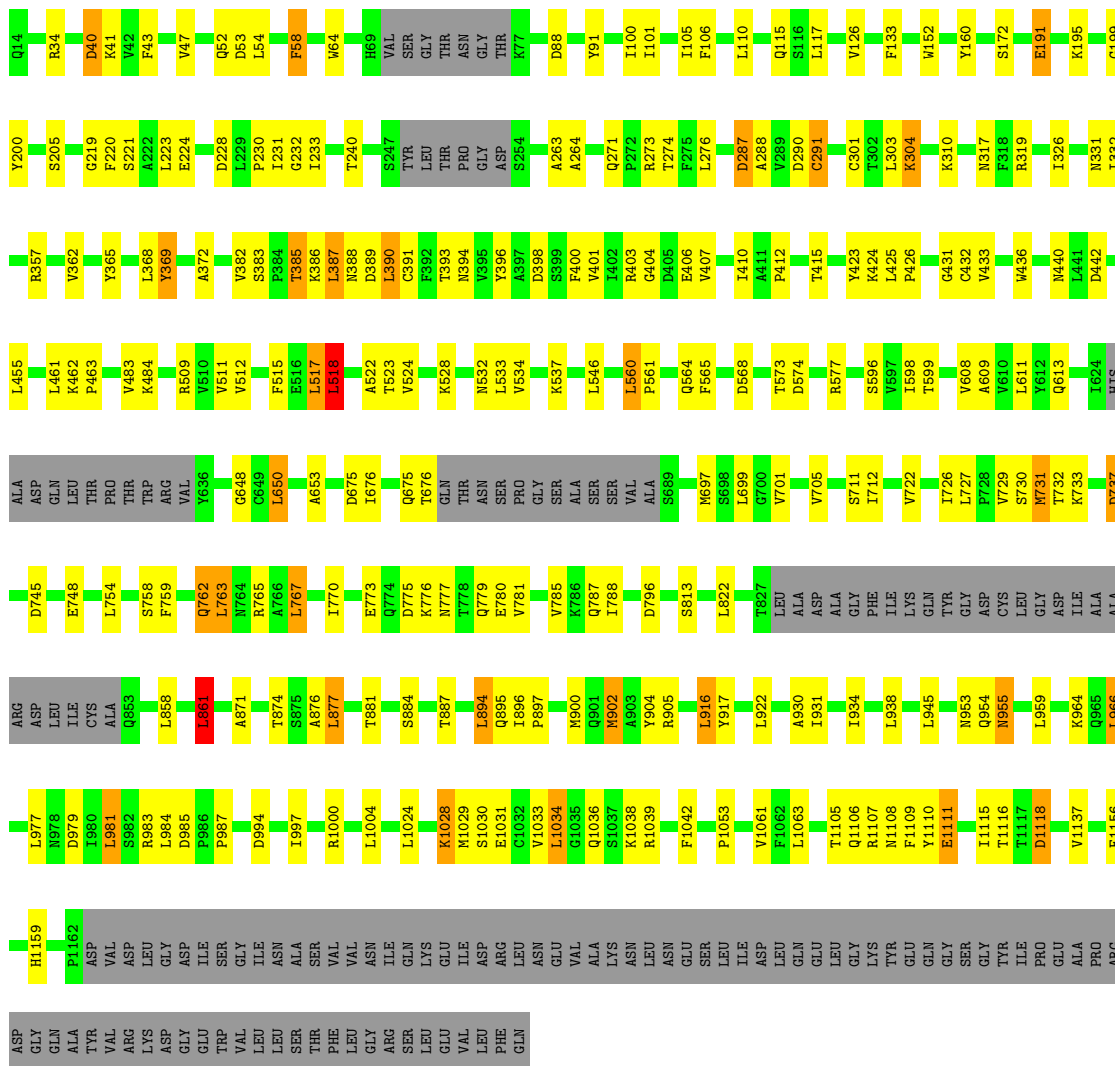
● Molecule 1: Spike glycoprotein, Fibrin



THR
PHE
LEU
GLY
SER
ARG
LEU
LEU
VAL
PHE
GLN

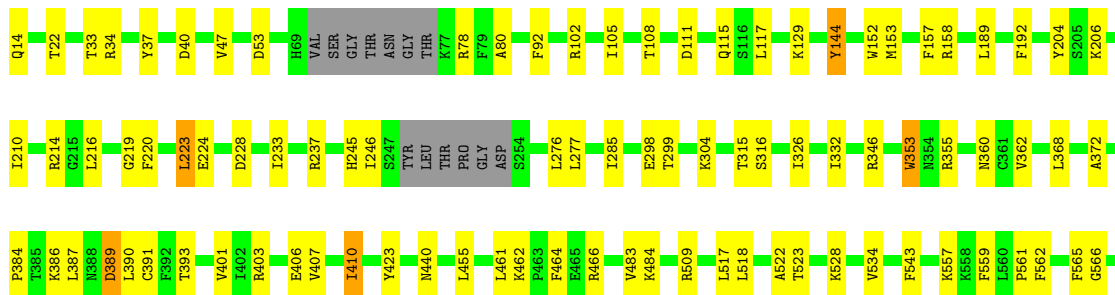
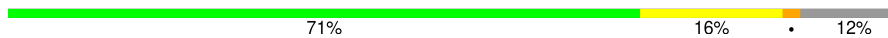
● Molecule 1: Spike glycoprotein, Fibrin

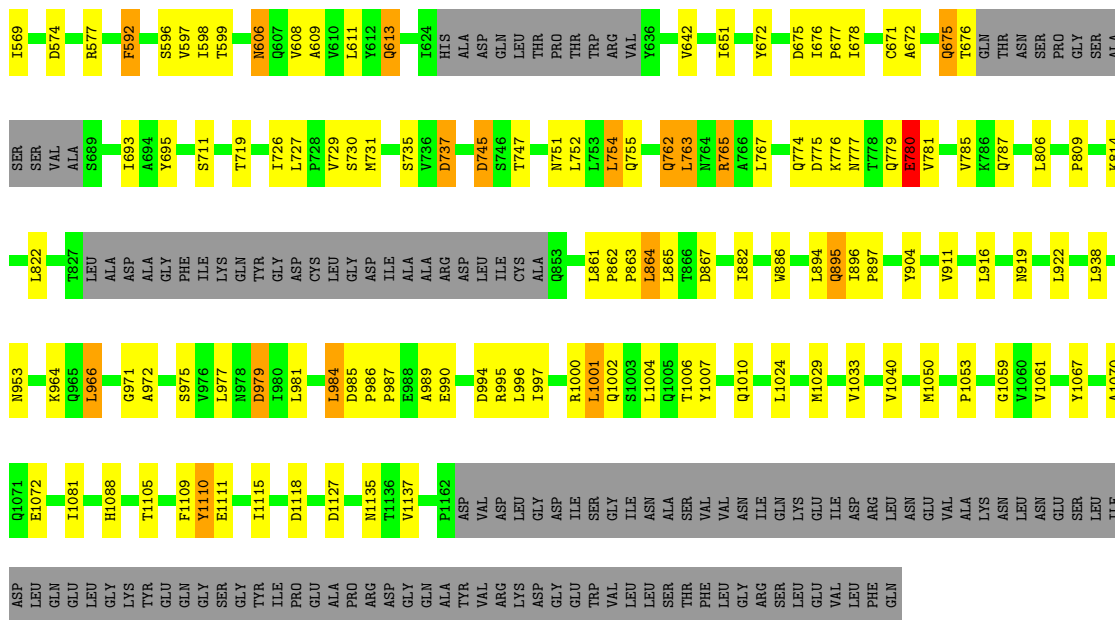
Chain 19-C:



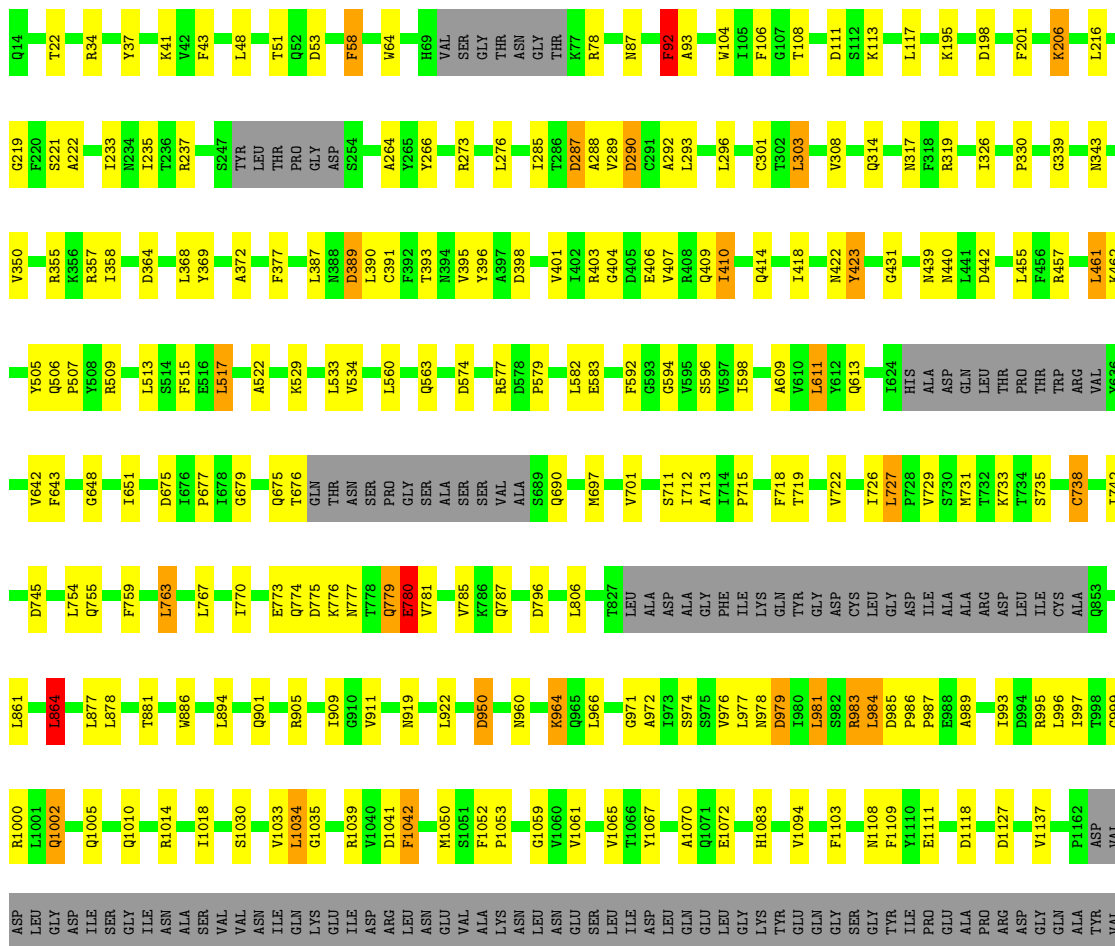
● Molecule 1: Spike glycoprotein, Fibrin

Chain 20-A:





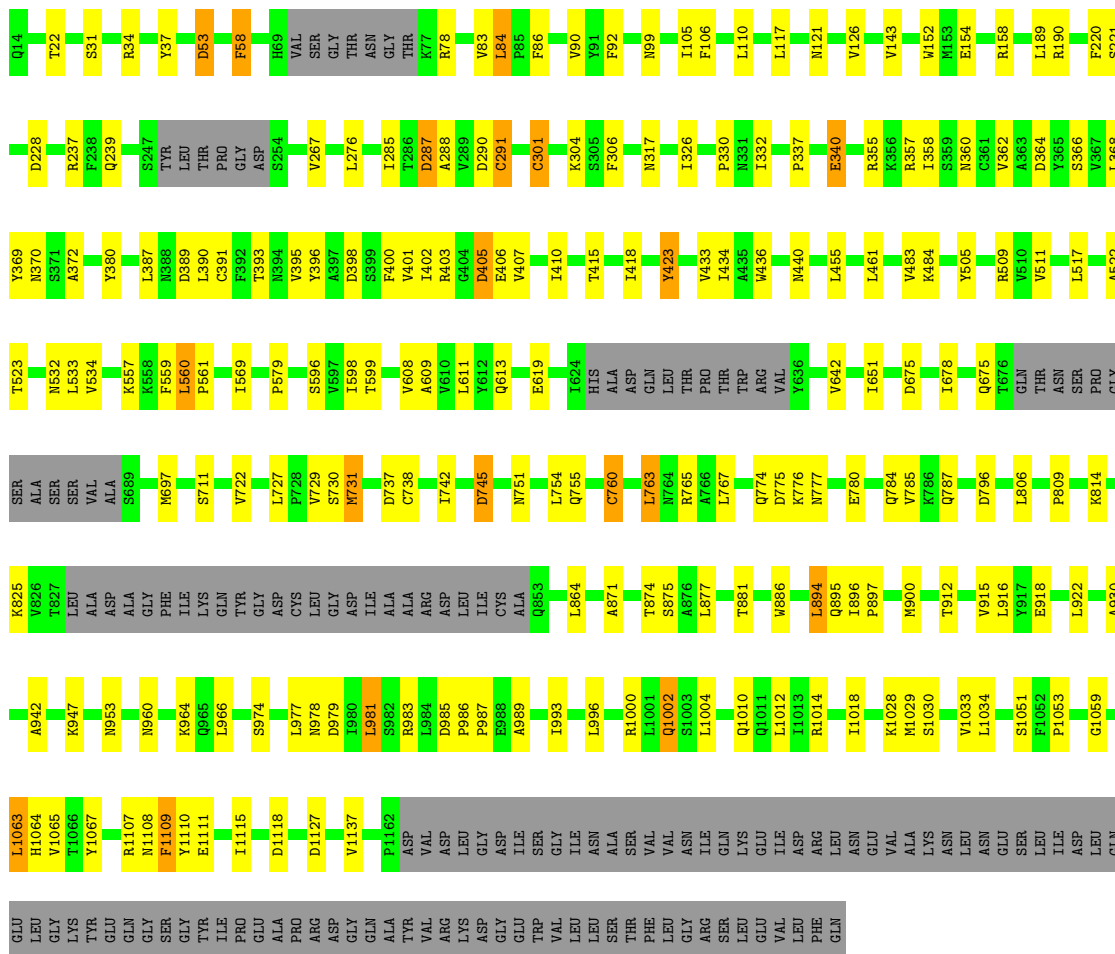
• Molecule 1: Spike glycoprotein, Fibrin



ARG
LYS
ASP
GLY
GLU
TRP
VAL
LEU
LEU
SER
THR
THR
PHE
LEU
GLY
ARG

● Molecule 1: Spike glycoprotein, Fibrin

Chain 20-C: 71% 15% 12%



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	309062	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	1500	Depositor
Maximum defocus (nm)	2200	Depositor
Magnification	81000	Depositor
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	1.384	Depositor
Minimum map value	-0.335	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.057	Depositor
Recommended contour level	0.15	Depositor
Map size (\AA)	313.6, 313.6, 313.6	wwPDB
Map dimensions	224, 224, 224	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	1.4, 1.4, 1.4	Depositor

5 Model quality

5.1 Standard geometry

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	1-A	0.39	0/8652	0.86	28/11768 (0.2%)
1	1-B	0.43	2/8652 (0.0%)	0.93	48/11768 (0.4%)
1	1-C	0.43	2/8652 (0.0%)	0.90	36/11768 (0.3%)
1	2-A	0.38	1/8652 (0.0%)	0.87	38/11768 (0.3%)
1	2-B	0.41	1/8652 (0.0%)	0.92	41/11768 (0.3%)
1	2-C	0.42	3/8652 (0.0%)	0.94	43/11768 (0.4%)
1	3-A	0.41	0/8695	0.97	54/11829 (0.5%)
1	3-B	0.41	0/8695	0.93	46/11829 (0.4%)
1	3-C	0.42	0/8695	0.95	40/11829 (0.3%)
1	4-A	0.43	0/8695	0.99	50/11829 (0.4%)
1	4-B	0.45	0/8695	1.00	62/11829 (0.5%)
1	4-C	0.45	0/8695	1.05	64/11829 (0.5%)
1	5-A	0.45	1/8695 (0.0%)	1.03	63/11829 (0.5%)
1	5-B	0.44	0/8695	0.98	51/11829 (0.4%)
1	5-C	0.45	0/8695	0.99	47/11829 (0.4%)
1	6-A	0.43	0/8695	0.98	55/11829 (0.5%)
1	6-B	0.42	0/8695	0.94	37/11829 (0.3%)
1	6-C	0.43	1/8695 (0.0%)	0.99	49/11829 (0.4%)
1	7-A	0.46	0/8695	1.01	57/11829 (0.5%)
1	7-B	0.46	0/8695	0.95	45/11829 (0.4%)
1	7-C	0.46	2/8695 (0.0%)	0.99	48/11829 (0.4%)
1	8-A	0.43	0/8695	1.02	63/11829 (0.5%)
1	8-B	0.42	0/8695	0.97	47/11829 (0.4%)
1	8-C	0.46	2/8695 (0.0%)	1.01	56/11829 (0.5%)
1	9-A	0.38	0/8652	0.85	28/11768 (0.2%)
1	9-B	0.41	2/8652 (0.0%)	0.91	45/11768 (0.4%)
1	9-C	0.40	0/8652	0.90	34/11768 (0.3%)
1	10-A	0.41	0/8695	0.96	48/11829 (0.4%)
1	10-B	0.41	0/8695	0.93	45/11829 (0.4%)
1	10-C	0.43	1/8695 (0.0%)	1.00	56/11829 (0.5%)
1	11-A	0.37	0/8652	0.83	26/11768 (0.2%)
1	11-B	0.38	0/8652	0.90	41/11768 (0.3%)
1	11-C	0.40	1/8652 (0.0%)	0.89	34/11768 (0.3%)
1	12-A	0.44	0/8695	0.99	58/11829 (0.5%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	12-B	0.44	0/8695	0.99	53/11829 (0.4%)
1	12-C	0.45	1/8695 (0.0%)	1.01	60/11829 (0.5%)
1	13-A	0.42	0/8695	0.98	60/11829 (0.5%)
1	13-B	0.43	0/8695	0.97	56/11829 (0.5%)
1	13-C	0.43	2/8695 (0.0%)	0.96	51/11829 (0.4%)
1	14-A	0.43	0/8695	0.99	58/11829 (0.5%)
1	14-B	0.41	0/8695	0.93	45/11829 (0.4%)
1	14-C	0.43	0/8695	0.99	49/11829 (0.4%)
1	15-A	0.42	0/8695	0.97	47/11829 (0.4%)
1	15-B	0.42	0/8695	0.95	51/11829 (0.4%)
1	15-C	0.43	0/8695	0.97	42/11829 (0.4%)
1	16-A	0.42	0/8695	1.02	65/11829 (0.5%)
1	16-B	0.43	0/8695	0.95	49/11829 (0.4%)
1	16-C	0.44	2/8695 (0.0%)	1.01	54/11829 (0.5%)
1	17-A	0.42	0/8695	0.99	57/11829 (0.5%)
1	17-B	0.41	0/8695	0.97	55/11829 (0.5%)
1	17-C	0.43	0/8695	1.01	54/11829 (0.5%)
1	18-A	0.42	0/8695	0.96	44/11829 (0.4%)
1	18-B	0.42	0/8695	0.95	43/11829 (0.4%)
1	18-C	0.41	0/8695	0.96	50/11829 (0.4%)
1	19-A	0.43	0/8695	1.00	50/11829 (0.4%)
1	19-B	0.42	1/8695 (0.0%)	0.99	53/11829 (0.4%)
1	19-C	0.43	1/8695 (0.0%)	1.01	63/11829 (0.5%)
1	20-A	0.42	0/8695	0.98	58/11829 (0.5%)
1	20-B	0.41	1/8695 (0.0%)	0.94	47/11829 (0.4%)
1	20-C	0.41	1/8695 (0.0%)	0.98	41/11829 (0.3%)
All	All	0.42	28/521184 (0.0%)	0.96	2938/709008 (0.4%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	1-B	0	1
1	1-C	0	2
1	2-C	0	1
1	8-B	0	1
1	10-B	0	1
1	11-C	0	1
1	17-C	0	1
1	20-B	0	1
All	All	0	9

The worst 5 of 28 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	1-C	320	VAL	C-N	15.62	1.70	1.34
1	8-C	379	CYS	CB-SG	7.88	1.95	1.82
1	6-C	291	CYS	CB-SG	-7.63	1.69	1.82
1	19-C	291	CYS	CB-SG	-7.59	1.69	1.82
1	13-C	432	CYS	CB-SG	-7.09	1.70	1.82

The worst 5 of 2938 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	12-C	745	ASP	CB-CG-OD2	15.96	132.66	118.30
1	3-A	1034	LEU	CA-CB-CG	15.12	150.08	115.30
1	16-C	745	ASP	CB-CG-OD1	14.75	131.57	118.30
1	8-B	745	ASP	CB-CG-OD1	14.48	131.33	118.30
1	17-A	1034	LEU	CA-CB-CG	14.18	147.91	115.30

There are no chirality outliers.

5 of 9 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	1-B	338	PHE	Sidechain
1	1-C	590	CYS	Peptide
1	1-C	592	PHE	Peptide
1	2-C	595	VAL	Peptide
1	8-B	87	ASN	Mainchain

5.2 Too-close contacts [\(i\)](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	1-A	8454	0	8245	121	0
1	1-B	8454	0	8246	111	0
1	1-C	8454	0	8248	120	0
1	2-A	8454	0	8246	100	0
1	2-B	8454	0	8246	114	0
1	2-C	8454	0	8248	109	0
1	3-A	8494	0	8289	110	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	3-B	8494	0	8289	98	0
1	3-C	8494	0	8289	116	0
1	4-A	8494	0	8289	142	0
1	4-B	8494	0	8289	140	0
1	4-C	8494	0	8289	125	0
1	5-A	8494	0	8289	135	0
1	5-B	8494	0	8289	112	0
1	5-C	8494	0	8289	124	0
1	6-A	8494	0	8289	115	0
1	6-B	8494	0	8289	102	0
1	6-C	8494	0	8289	114	0
1	7-A	8494	0	8289	119	0
1	7-B	8494	0	8289	110	0
1	7-C	8494	0	8289	112	0
1	8-A	8494	0	8289	99	0
1	8-B	8494	0	8289	123	0
1	8-C	8494	0	8289	121	0
1	9-A	8454	0	8245	116	0
1	9-B	8454	0	8246	130	0
1	9-C	8454	0	8248	126	0
1	10-A	8494	0	8289	113	0
1	10-B	8494	0	8289	90	0
1	10-C	8494	0	8289	105	0
1	11-A	8454	0	8246	103	0
1	11-B	8454	0	8246	97	0
1	11-C	8454	0	8248	111	0
1	12-A	8494	0	8289	117	0
1	12-B	8494	0	8289	116	0
1	12-C	8494	0	8289	112	0
1	13-A	8494	0	8289	123	0
1	13-B	8494	0	8289	109	0
1	13-C	8494	0	8289	118	0
1	14-A	8494	0	8289	112	0
1	14-B	8494	0	8289	93	0
1	14-C	8494	0	8289	122	0
1	15-A	8494	0	8289	112	0
1	15-B	8494	0	8289	110	0
1	15-C	8494	0	8289	123	0
1	16-A	8494	0	8289	120	0
1	16-B	8494	0	8289	99	0
1	16-C	8494	0	8289	110	0
1	17-A	8494	0	8289	128	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	17-B	8494	0	8289	115	0
1	17-C	8494	0	8289	130	0
1	18-A	8494	0	8289	103	0
1	18-B	8494	0	8289	100	0
1	18-C	8494	0	8289	115	0
1	19-A	8494	0	8289	120	0
1	19-B	8494	0	8289	105	0
1	19-C	8494	0	8289	126	0
1	20-A	8494	0	8289	89	0
1	20-B	8494	0	8289	110	0
1	20-C	8494	0	8289	94	0
All	All	509160	0	496830	6304	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 6.

The worst 5 of 6304 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:320:VAL:C	1:C:321:GLN:N	1.70	1.45
1:A:14:GLN:HE21	1:A:14:GLN:N	1.41	1.18
1:C:853:GLN:N	1:C:853:GLN:HE21	1.62	0.97
1:B:1051:SER:HG	1:B:1064:HIS:HD1	1.23	0.86
1:C:353:TRP:HE1	1:C:466:ARG:HB2	1.41	0.84

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	1-A	1067/1230 (87%)	1024 (96%)	42 (4%)	1 (0%)	48 77

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	1-B	1067/1230 (87%)	1020 (96%)	47 (4%)	0	100	100
1	1-C	1067/1230 (87%)	1011 (95%)	54 (5%)	2 (0%)	44	73
1	2-A	1067/1230 (87%)	1025 (96%)	41 (4%)	1 (0%)	48	77
1	2-B	1067/1230 (87%)	1019 (96%)	47 (4%)	1 (0%)	48	77
1	2-C	1067/1230 (87%)	1013 (95%)	53 (5%)	1 (0%)	48	77
1	3-A	1073/1230 (87%)	1038 (97%)	34 (3%)	1 (0%)	48	77
1	3-B	1073/1230 (87%)	1033 (96%)	39 (4%)	1 (0%)	48	77
1	3-C	1073/1230 (87%)	1035 (96%)	37 (3%)	1 (0%)	48	77
1	4-A	1073/1230 (87%)	1038 (97%)	34 (3%)	1 (0%)	48	77
1	4-B	1073/1230 (87%)	1037 (97%)	35 (3%)	1 (0%)	48	77
1	4-C	1073/1230 (87%)	1038 (97%)	34 (3%)	1 (0%)	48	77
1	5-A	1073/1230 (87%)	1038 (97%)	34 (3%)	1 (0%)	48	77
1	5-B	1073/1230 (87%)	1033 (96%)	39 (4%)	1 (0%)	48	77
1	5-C	1073/1230 (87%)	1036 (97%)	36 (3%)	1 (0%)	48	77
1	6-A	1073/1230 (87%)	1036 (97%)	36 (3%)	1 (0%)	48	77
1	6-B	1073/1230 (87%)	1035 (96%)	37 (3%)	1 (0%)	48	77
1	6-C	1073/1230 (87%)	1039 (97%)	33 (3%)	1 (0%)	48	77
1	7-A	1073/1230 (87%)	1037 (97%)	35 (3%)	1 (0%)	48	77
1	7-B	1073/1230 (87%)	1036 (97%)	36 (3%)	1 (0%)	48	77
1	7-C	1073/1230 (87%)	1034 (96%)	38 (4%)	1 (0%)	48	77
1	8-A	1073/1230 (87%)	1037 (97%)	35 (3%)	1 (0%)	48	77
1	8-B	1073/1230 (87%)	1035 (96%)	37 (3%)	1 (0%)	48	77
1	8-C	1073/1230 (87%)	1037 (97%)	35 (3%)	1 (0%)	48	77
1	9-A	1067/1230 (87%)	1023 (96%)	43 (4%)	1 (0%)	48	77
1	9-B	1067/1230 (87%)	1022 (96%)	45 (4%)	0	100	100
1	9-C	1067/1230 (87%)	1016 (95%)	49 (5%)	2 (0%)	44	73
1	10-A	1073/1230 (87%)	1037 (97%)	35 (3%)	1 (0%)	48	77
1	10-B	1073/1230 (87%)	1037 (97%)	35 (3%)	1 (0%)	48	77
1	10-C	1073/1230 (87%)	1038 (97%)	34 (3%)	1 (0%)	48	77
1	11-A	1067/1230 (87%)	1026 (96%)	40 (4%)	1 (0%)	48	77
1	11-B	1067/1230 (87%)	1019 (96%)	48 (4%)	0	100	100

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	11-C	1067/1230 (87%)	1013 (95%)	51 (5%)	3 (0%)	37	67
1	12-A	1073/1230 (87%)	1039 (97%)	33 (3%)	1 (0%)	48	77
1	12-B	1073/1230 (87%)	1037 (97%)	35 (3%)	1 (0%)	48	77
1	12-C	1073/1230 (87%)	1037 (97%)	35 (3%)	1 (0%)	48	77
1	13-A	1073/1230 (87%)	1040 (97%)	32 (3%)	1 (0%)	48	77
1	13-B	1073/1230 (87%)	1036 (97%)	36 (3%)	1 (0%)	48	77
1	13-C	1073/1230 (87%)	1036 (97%)	36 (3%)	1 (0%)	48	77
1	14-A	1073/1230 (87%)	1038 (97%)	34 (3%)	1 (0%)	48	77
1	14-B	1073/1230 (87%)	1036 (97%)	36 (3%)	1 (0%)	48	77
1	14-C	1073/1230 (87%)	1038 (97%)	34 (3%)	1 (0%)	48	77
1	15-A	1073/1230 (87%)	1037 (97%)	35 (3%)	1 (0%)	48	77
1	15-B	1073/1230 (87%)	1039 (97%)	33 (3%)	1 (0%)	48	77
1	15-C	1073/1230 (87%)	1036 (97%)	36 (3%)	1 (0%)	48	77
1	16-A	1073/1230 (87%)	1036 (97%)	36 (3%)	1 (0%)	48	77
1	16-B	1073/1230 (87%)	1037 (97%)	35 (3%)	1 (0%)	48	77
1	16-C	1073/1230 (87%)	1037 (97%)	35 (3%)	1 (0%)	48	77
1	17-A	1073/1230 (87%)	1038 (97%)	34 (3%)	1 (0%)	48	77
1	17-B	1073/1230 (87%)	1037 (97%)	35 (3%)	1 (0%)	48	77
1	17-C	1073/1230 (87%)	1032 (96%)	38 (4%)	3 (0%)	37	67
1	18-A	1073/1230 (87%)	1035 (96%)	37 (3%)	1 (0%)	48	77
1	18-B	1073/1230 (87%)	1037 (97%)	35 (3%)	1 (0%)	48	77
1	18-C	1073/1230 (87%)	1040 (97%)	32 (3%)	1 (0%)	48	77
1	19-A	1073/1230 (87%)	1040 (97%)	32 (3%)	1 (0%)	48	77
1	19-B	1073/1230 (87%)	1037 (97%)	35 (3%)	1 (0%)	48	77
1	19-C	1073/1230 (87%)	1038 (97%)	33 (3%)	2 (0%)	44	73
1	20-A	1073/1230 (87%)	1038 (97%)	34 (3%)	1 (0%)	48	77
1	20-B	1073/1230 (87%)	1035 (96%)	37 (3%)	1 (0%)	48	77
1	20-C	1073/1230 (87%)	1040 (97%)	32 (3%)	1 (0%)	48	77
All	All	64308/73800 (87%)	62001 (96%)	2243 (4%)	64 (0%)	50	77

5 of 64 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	11-C	319	ARG
1	1-C	590	CYS
1	17-C	445	VAL
1	19-C	385	THR
1	2-A	544	ASN

5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	1-A	944/1067 (88%)	907 (96%)	37 (4%)	27 61
1	1-B	944/1067 (88%)	907 (96%)	37 (4%)	27 61
1	1-C	944/1067 (88%)	917 (97%)	27 (3%)	37 71
1	2-A	944/1067 (88%)	916 (97%)	28 (3%)	36 70
1	2-B	944/1067 (88%)	910 (96%)	34 (4%)	30 64
1	2-C	944/1067 (88%)	911 (96%)	33 (4%)	31 65
1	3-A	949/1067 (89%)	910 (96%)	39 (4%)	26 59
1	3-B	949/1067 (89%)	910 (96%)	39 (4%)	26 59
1	3-C	949/1067 (89%)	917 (97%)	32 (3%)	32 66
1	4-A	949/1067 (89%)	914 (96%)	35 (4%)	29 63
1	4-B	949/1067 (89%)	904 (95%)	45 (5%)	22 54
1	4-C	949/1067 (89%)	913 (96%)	36 (4%)	28 62
1	5-A	949/1067 (89%)	915 (96%)	34 (4%)	30 64
1	5-B	949/1067 (89%)	912 (96%)	37 (4%)	27 61
1	5-C	949/1067 (89%)	916 (96%)	33 (4%)	31 65
1	6-A	949/1067 (89%)	912 (96%)	37 (4%)	27 61
1	6-B	949/1067 (89%)	913 (96%)	36 (4%)	28 62
1	6-C	949/1067 (89%)	915 (96%)	34 (4%)	30 64
1	7-A	949/1067 (89%)	919 (97%)	30 (3%)	34 68
1	7-B	949/1067 (89%)	911 (96%)	38 (4%)	27 60

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	7-C	949/1067 (89%)	918 (97%)	31 (3%)	33	67
1	8-A	949/1067 (89%)	915 (96%)	34 (4%)	30	64
1	8-B	949/1067 (89%)	917 (97%)	32 (3%)	32	66
1	8-C	949/1067 (89%)	915 (96%)	34 (4%)	30	64
1	9-A	944/1067 (88%)	924 (98%)	20 (2%)	48	80
1	9-B	944/1067 (88%)	908 (96%)	36 (4%)	28	62
1	9-C	944/1067 (88%)	916 (97%)	28 (3%)	36	70
1	10-A	949/1067 (89%)	912 (96%)	37 (4%)	27	61
1	10-B	949/1067 (89%)	922 (97%)	27 (3%)	38	72
1	10-C	949/1067 (89%)	906 (96%)	43 (4%)	23	55
1	11-A	944/1067 (88%)	909 (96%)	35 (4%)	29	63
1	11-B	944/1067 (88%)	914 (97%)	30 (3%)	34	68
1	11-C	944/1067 (88%)	921 (98%)	23 (2%)	44	77
1	12-A	949/1067 (89%)	916 (96%)	33 (4%)	31	65
1	12-B	949/1067 (89%)	909 (96%)	40 (4%)	25	58
1	12-C	949/1067 (89%)	910 (96%)	39 (4%)	26	59
1	13-A	949/1067 (89%)	914 (96%)	35 (4%)	29	63
1	13-B	949/1067 (89%)	907 (96%)	42 (4%)	24	56
1	13-C	949/1067 (89%)	918 (97%)	31 (3%)	33	67
1	14-A	949/1067 (89%)	918 (97%)	31 (3%)	33	67
1	14-B	949/1067 (89%)	914 (96%)	35 (4%)	29	63
1	14-C	949/1067 (89%)	912 (96%)	37 (4%)	27	61
1	15-A	949/1067 (89%)	911 (96%)	38 (4%)	27	60
1	15-B	949/1067 (89%)	905 (95%)	44 (5%)	23	55
1	15-C	949/1067 (89%)	916 (96%)	33 (4%)	31	65
1	16-A	949/1067 (89%)	911 (96%)	38 (4%)	27	60
1	16-B	949/1067 (89%)	903 (95%)	46 (5%)	21	53
1	16-C	949/1067 (89%)	910 (96%)	39 (4%)	26	59
1	17-A	949/1067 (89%)	916 (96%)	33 (4%)	31	65
1	17-B	949/1067 (89%)	917 (97%)	32 (3%)	32	66
1	17-C	949/1067 (89%)	906 (96%)	43 (4%)	23	55

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	18-A	949/1067 (89%)	919 (97%)	30 (3%)	34	68
1	18-B	949/1067 (89%)	904 (95%)	45 (5%)	22	54
1	18-C	949/1067 (89%)	909 (96%)	40 (4%)	25	58
1	19-A	949/1067 (89%)	916 (96%)	33 (4%)	31	65
1	19-B	949/1067 (89%)	914 (96%)	35 (4%)	29	63
1	19-C	949/1067 (89%)	915 (96%)	34 (4%)	30	64
1	20-A	949/1067 (89%)	911 (96%)	38 (4%)	27	60
1	20-B	949/1067 (89%)	913 (96%)	36 (4%)	28	62
1	20-C	949/1067 (89%)	910 (96%)	39 (4%)	26	59
All	All	56880/64020 (89%)	54770 (96%)	2110 (4%)	31	63

5 of 2110 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	18-B	1050	MET
1	19-A	517	LEU
1	18-B	1042	PHE
1	20-C	400	PHE
1	8-B	429	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 120 such sidechains are listed below:

Mol	Chain	Res	Type
1	9-C	969	ASN
1	19-A	115	GLN
1	12-A	957	GLN
1	18-C	762	GLN
1	20-C	777	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
1	1-C	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	C	320:VAL	C	321:GLN	N	1.70

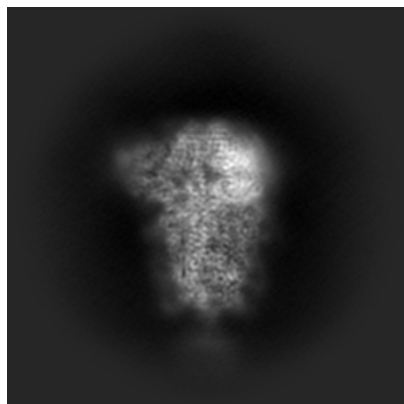
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-51280. These allow visual inspection of the internal detail of the map and identification of artifacts.

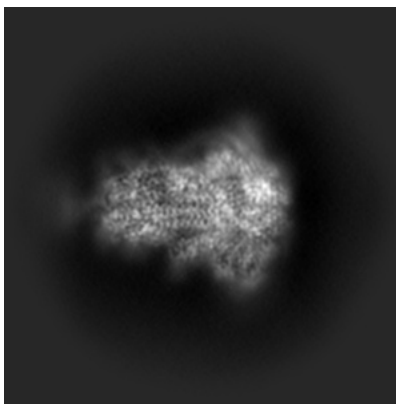
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

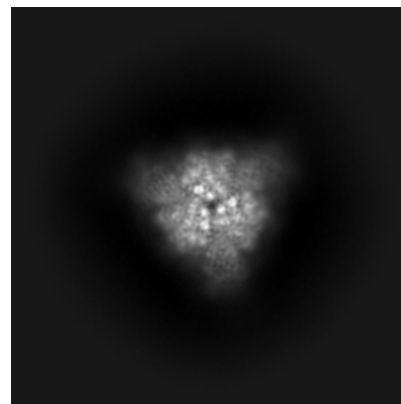
6.1.1 Primary map



X

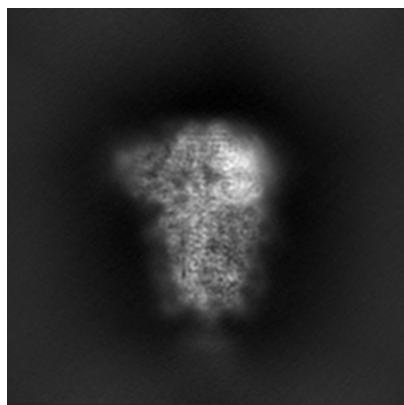


Y

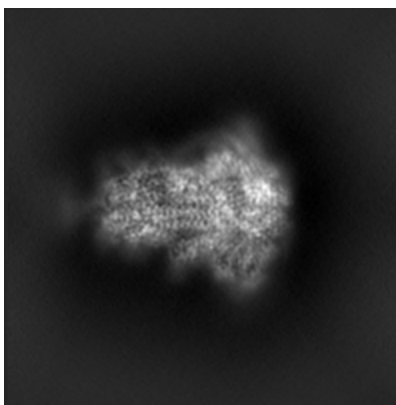


Z

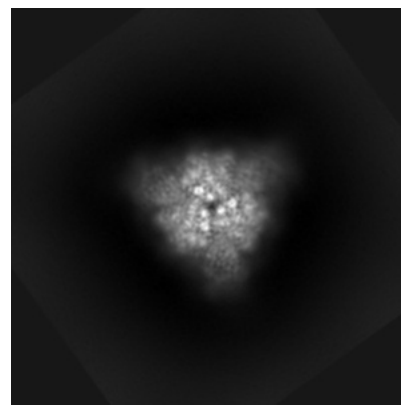
6.1.2 Raw map



X



Y

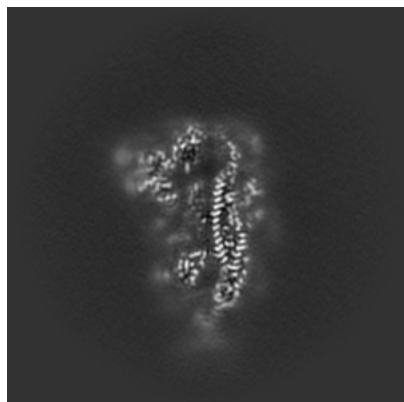


Z

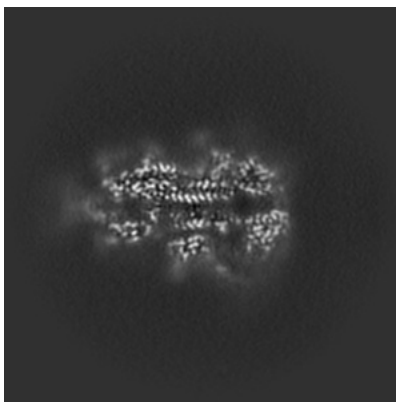
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

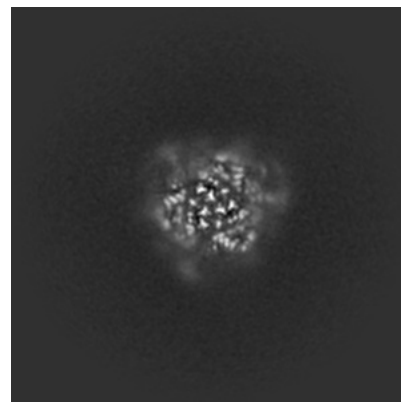
6.2.1 Primary map



X Index: 112

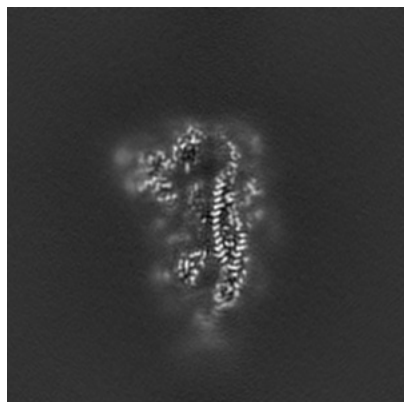


Y Index: 112

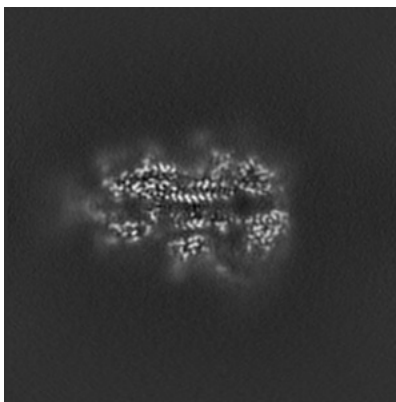


Z Index: 112

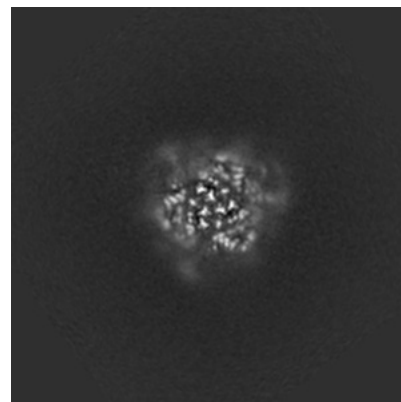
6.2.2 Raw map



X Index: 112



Y Index: 112

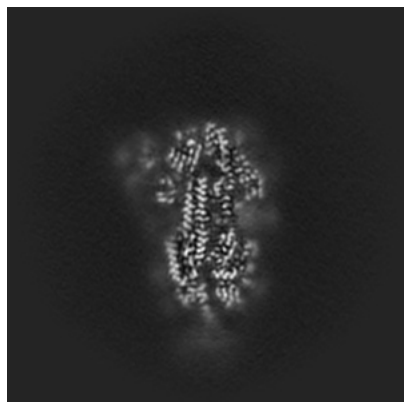


Z Index: 112

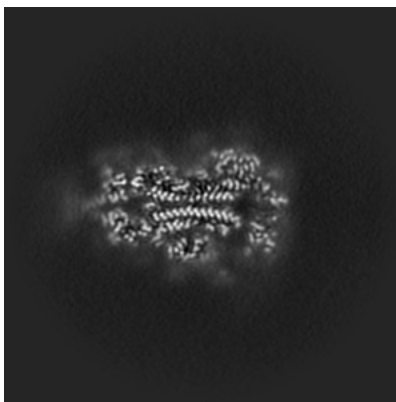
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

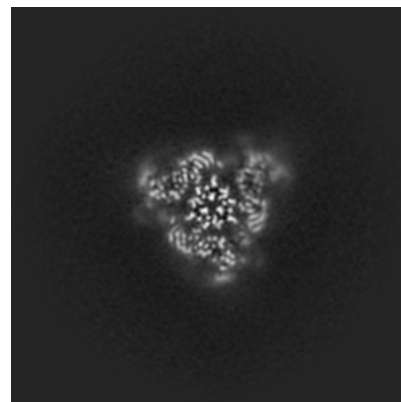
6.3.1 Primary map



X Index: 107

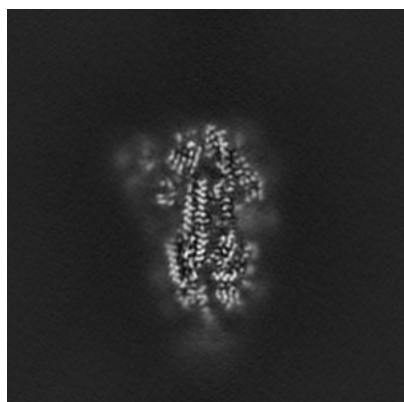


Y Index: 109

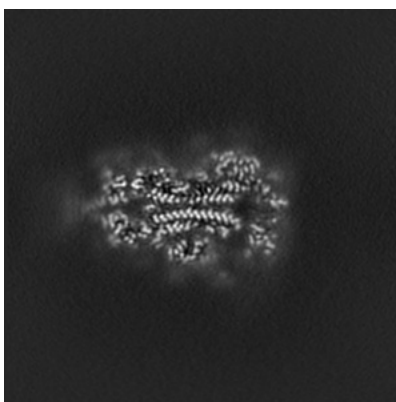


Z Index: 119

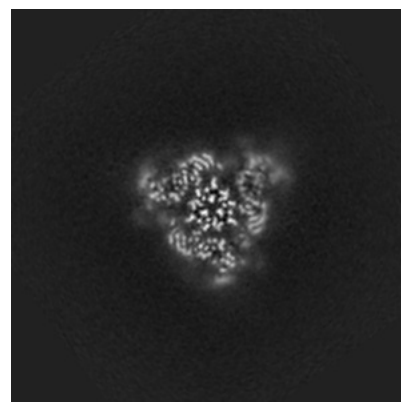
6.3.2 Raw map



X Index: 107



Y Index: 109

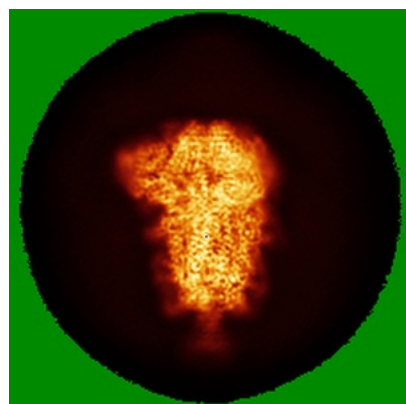


Z Index: 119

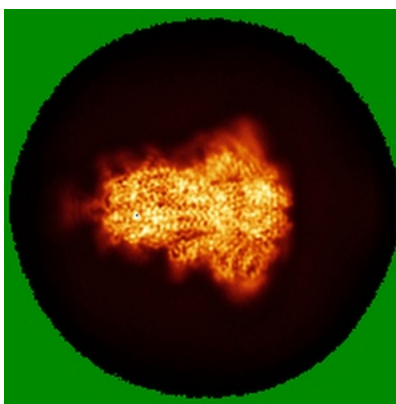
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) [i](#)

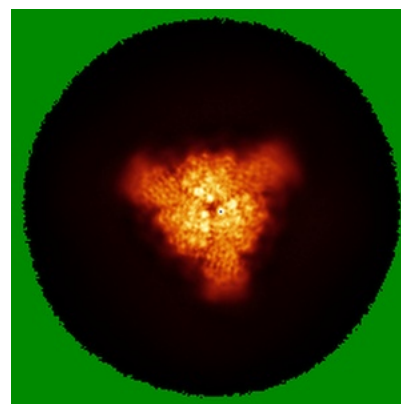
6.4.1 Primary map



X

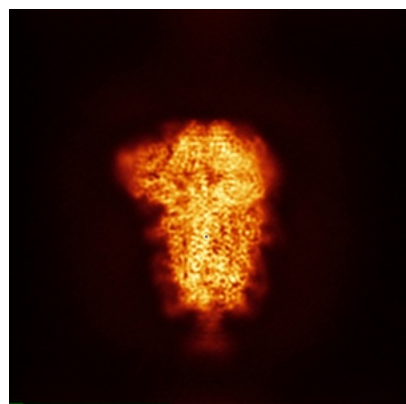


Y

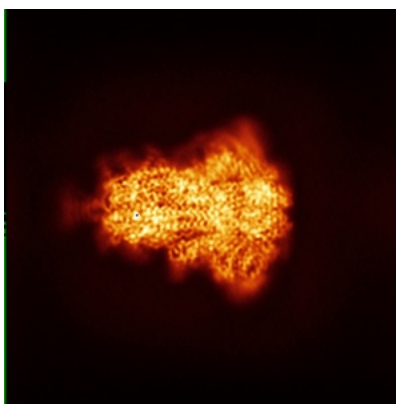


Z

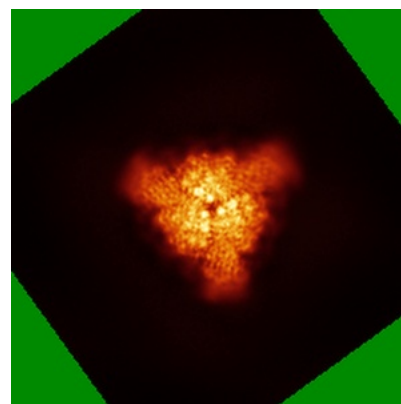
6.4.2 Raw map



X



Y

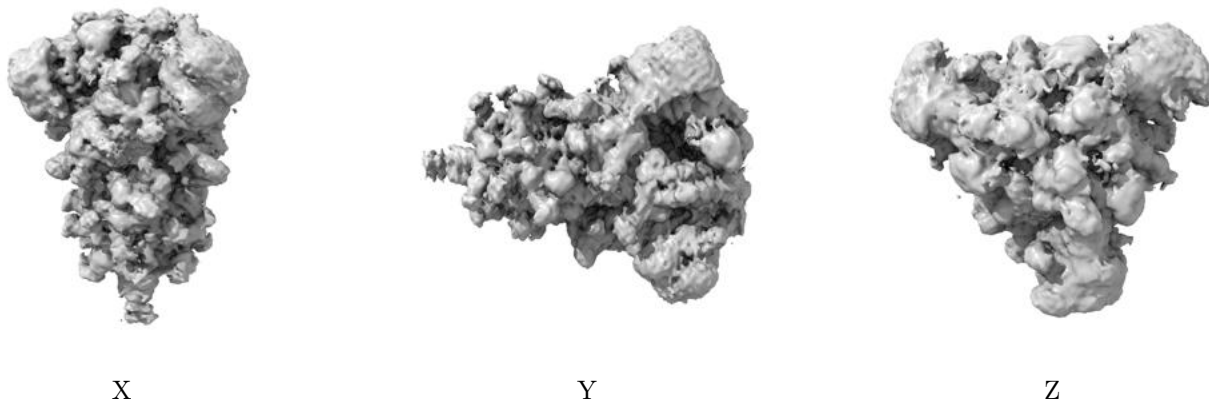


Z

The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

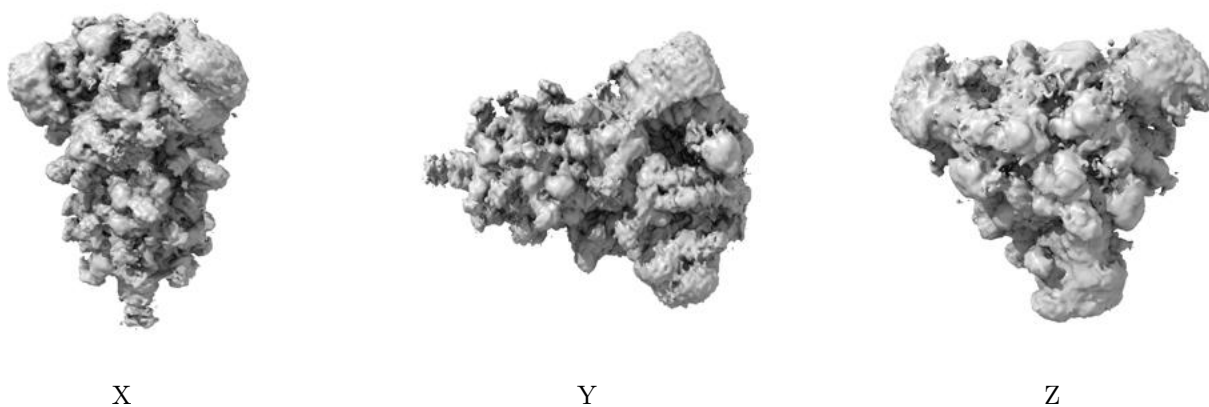
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.15. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

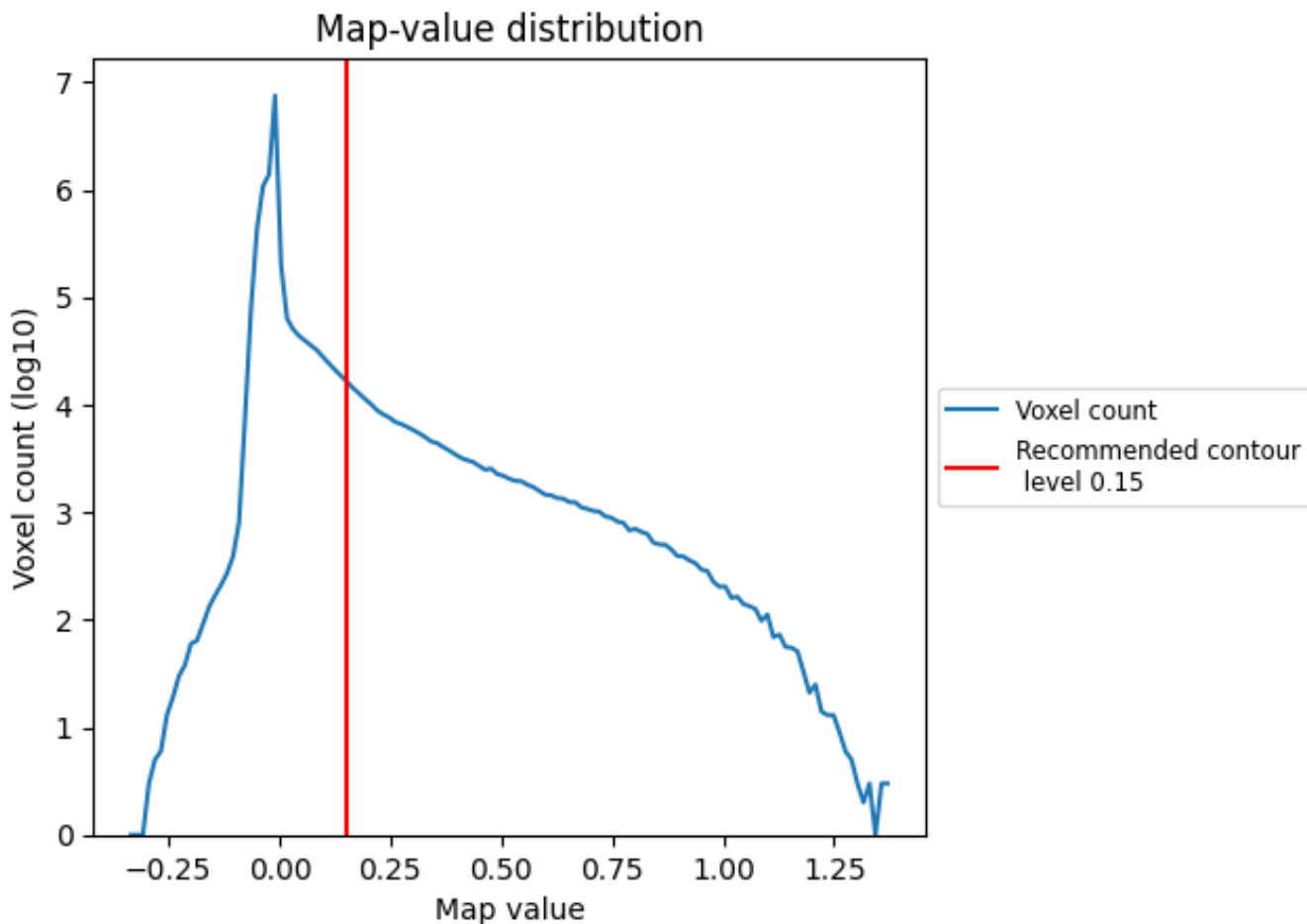
6.6 Mask visualisation [i](#)

This section was not generated. No masks/segmentation were deposited.

7 Map analysis [i](#)

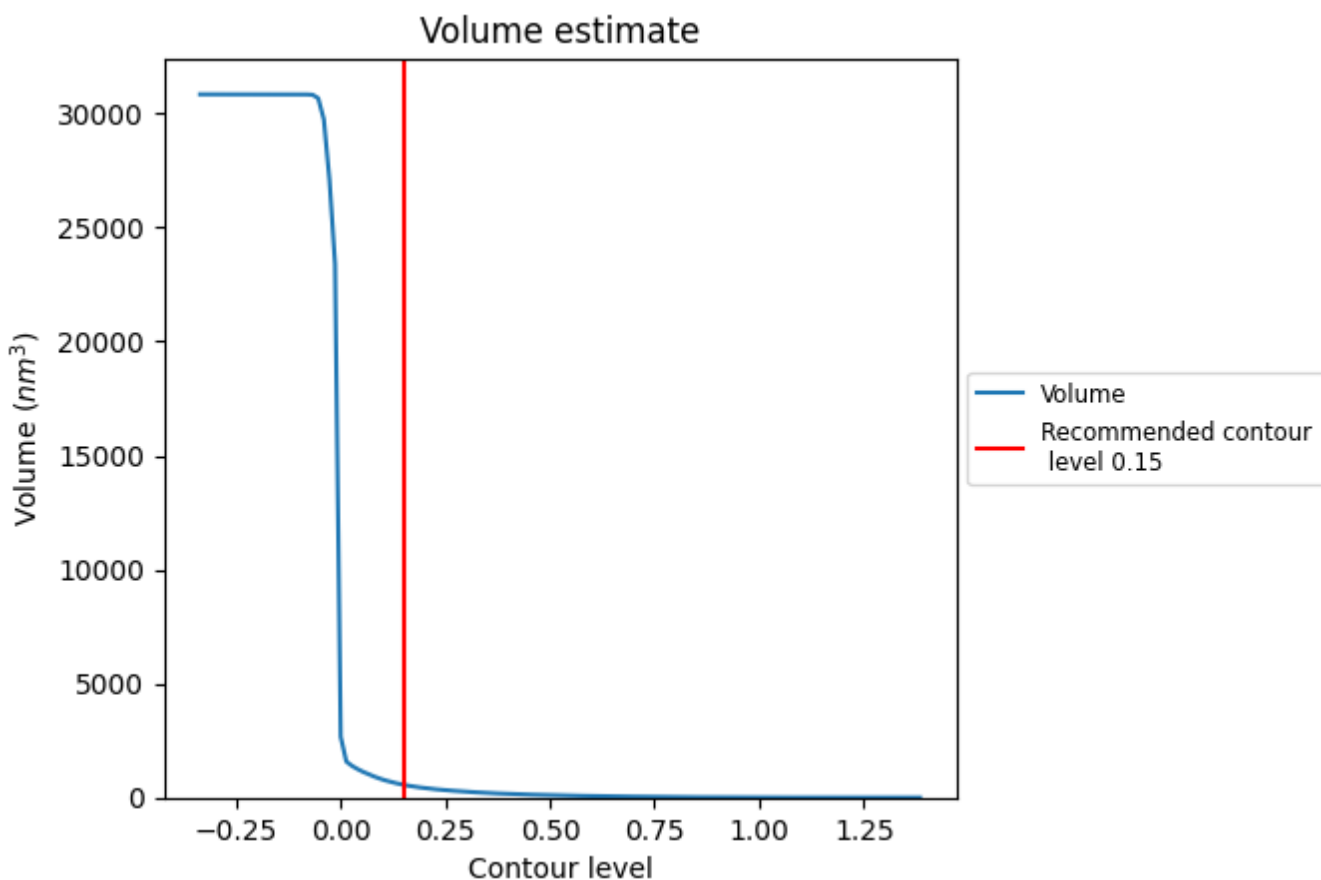
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

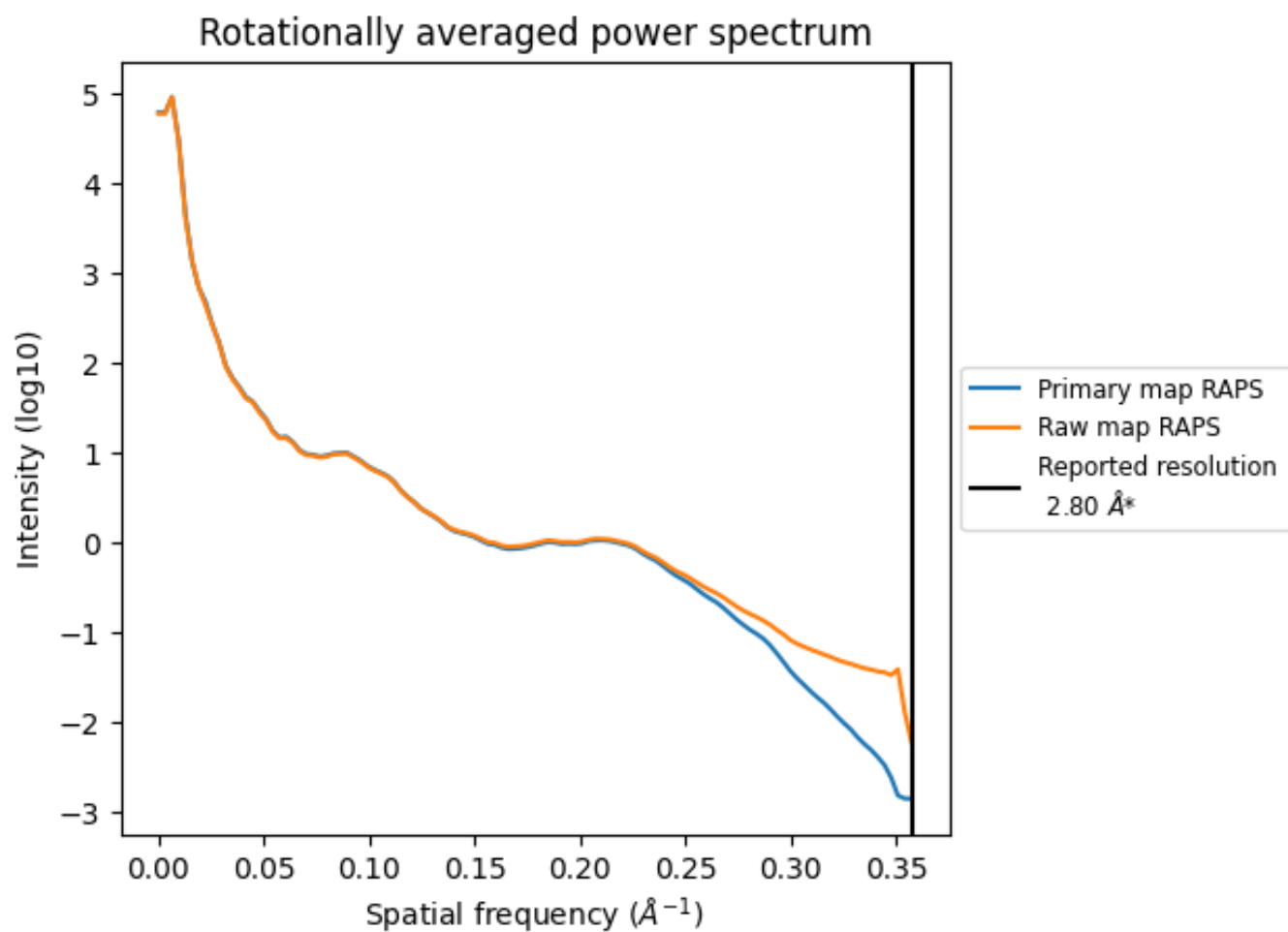
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 564 nm³; this corresponds to an approximate mass of 510 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

7.3 Rotationally averaged power spectrum [i](#)

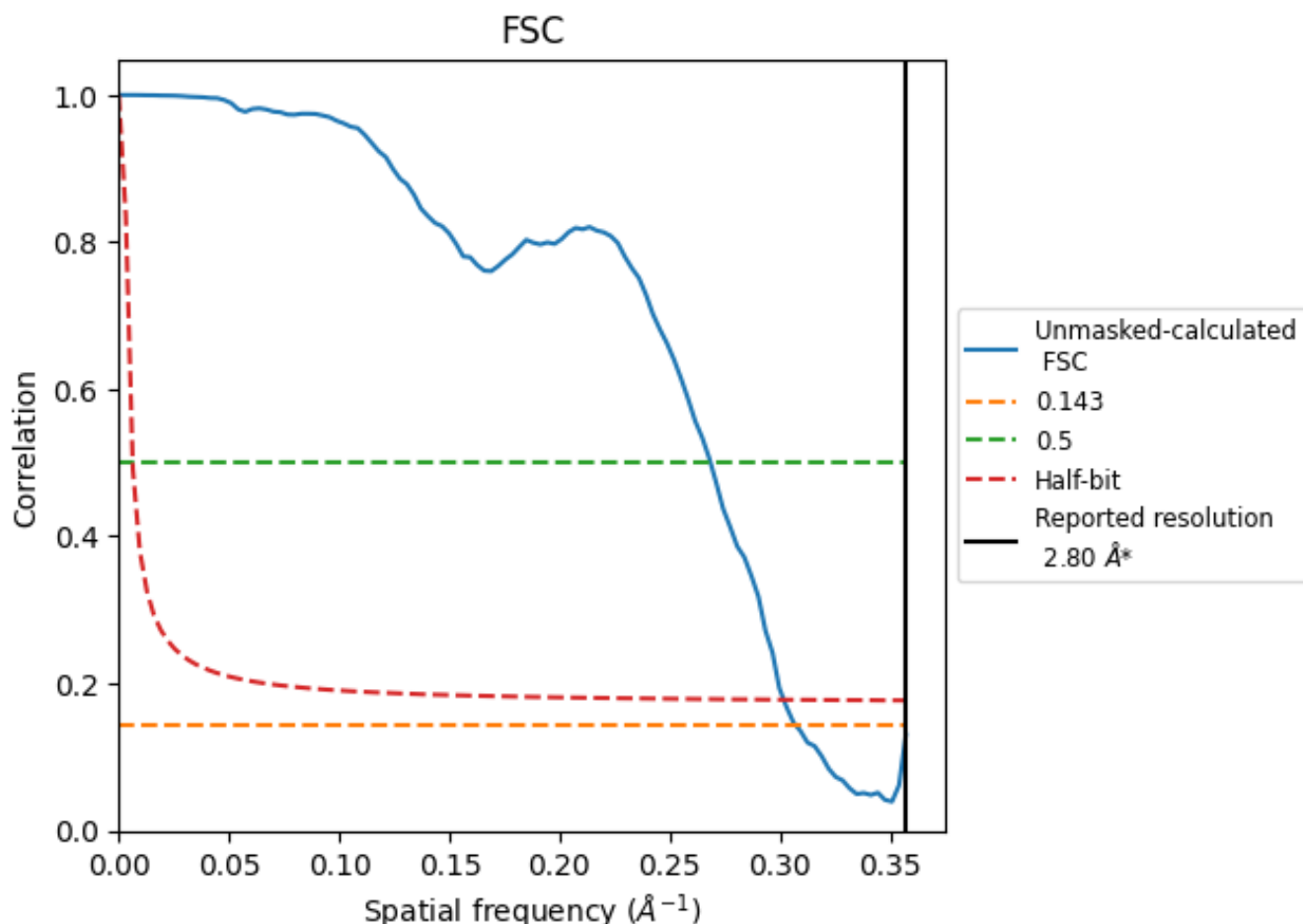


*Reported resolution corresponds to spatial frequency of 0.357 \AA^{-1}

8 Fourier-Shell correlation [i](#)

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.357 Å⁻¹

8.2 Resolution estimates [i](#)

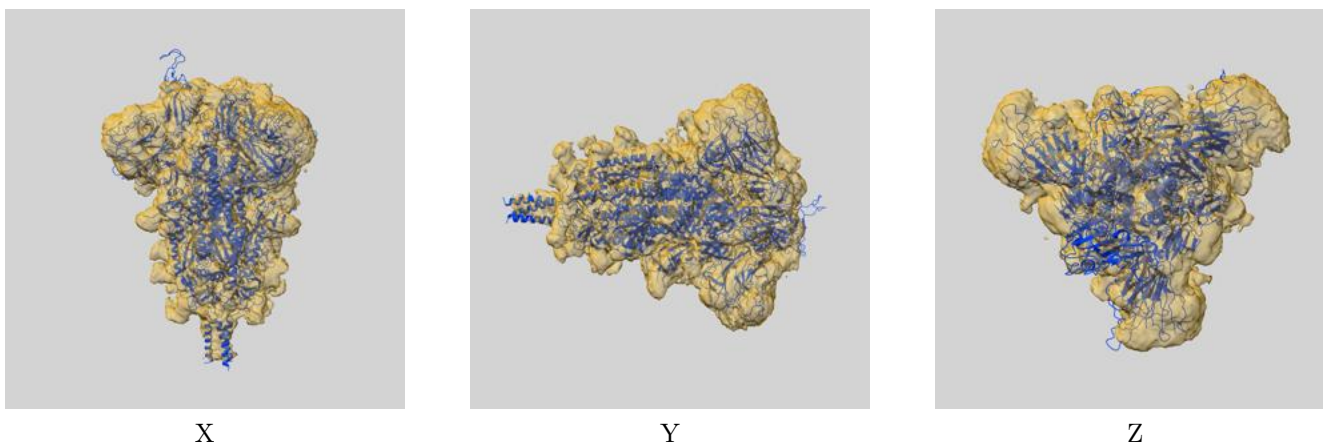
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.80	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	3.26	3.73	3.31

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 3.26 differs from the reported value 2.8 by more than 10 %

9 Map-model fit [i](#)

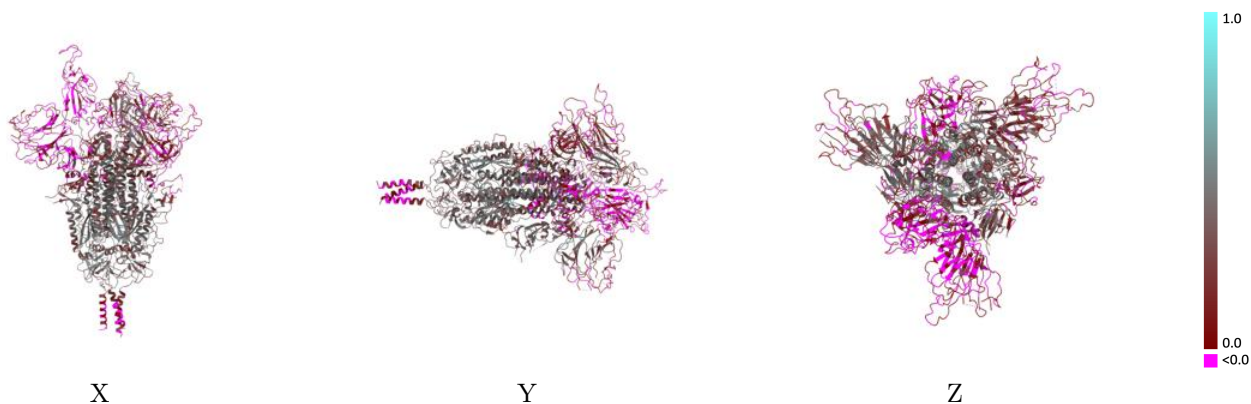
This section contains information regarding the fit between EMDB map EMD-51280 and PDB model 9GDY. Per-residue inclusion information can be found in section [3](#) on page [12](#).

9.1 Map-model overlay [i](#)



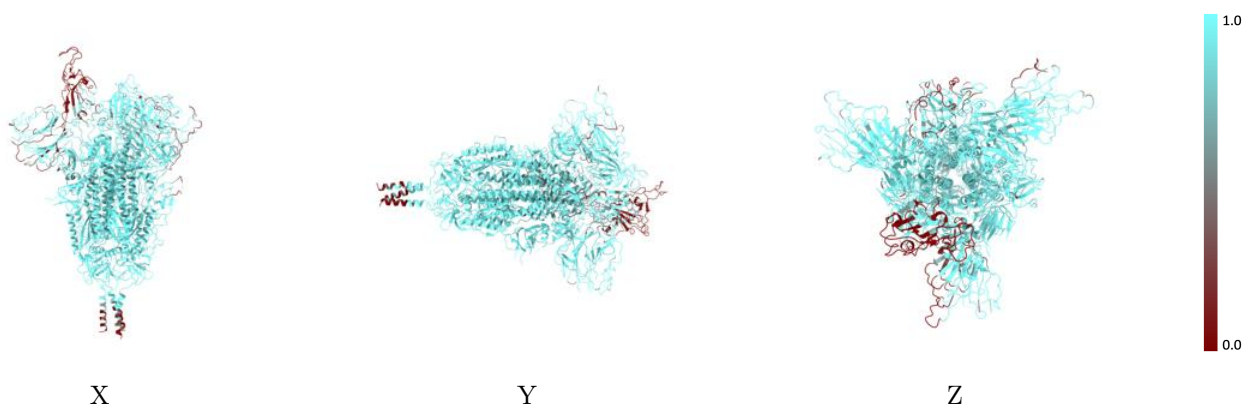
The images above show the 3D surface view of the map at the recommended contour level 0.15 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model [i](#)



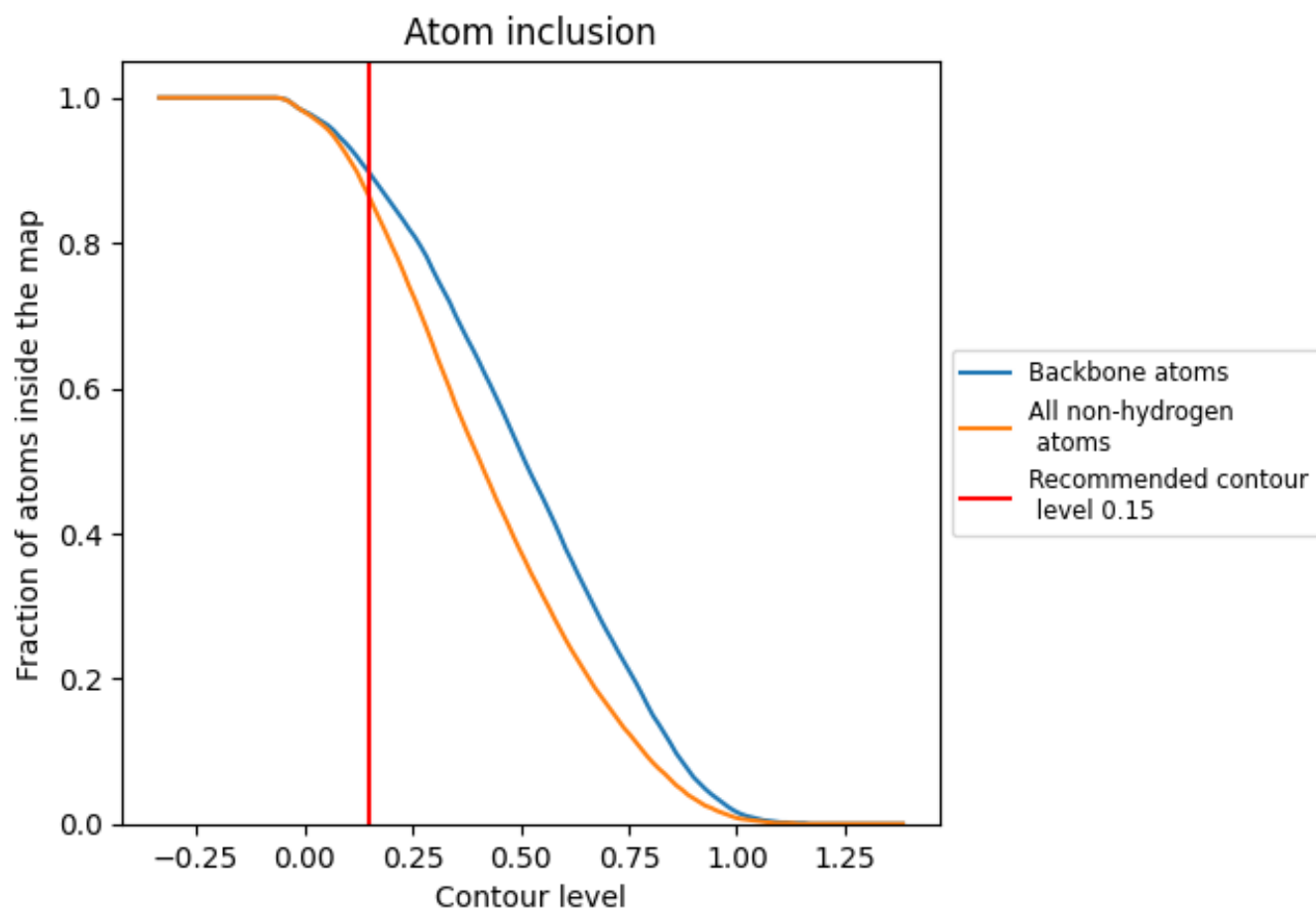
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

9.3 Atom inclusion mapped to coordinate model [i](#)



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.15).






9.4 Atom inclusion [i](#)



At the recommended contour level, 90% of all backbone atoms, 86% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (0.15) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8640	 0.2390
A	 0.8260	 0.2590
B	 0.8900	 0.2410
C	 0.8750	 0.2170

