wwPDB EM Validation Summary Report (i)

Jul 7, 2021 – 03:33 pm BST

PDB ID	:	7NVG
EMDB ID	:	EMD-12603
Title	:	Salmonella flagellar basal body refined in C1 map
Authors	:	Johnson, S.; Furlong, E.; Lea, S.M.
Deposited on	:	2021-03-15
Resolution	:	3.70 Å(reported)

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 (i) symbol.

The following versions of software and data (see references (1)) were used in the production of this report:

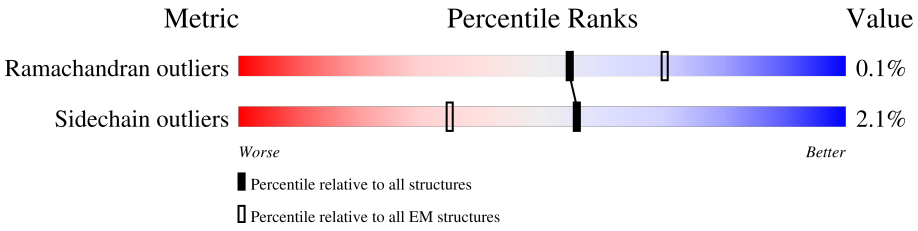
EMDB validation analysis	:	0.0.0.dev84
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.22

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 3.70 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)
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

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 <=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	A1	560	12% 27% 73%
1	B1	560	20% 44% 55%
1	C1	560	16% 44% 55%
1	D1	560	12% 27% 73%
1	E1	560	18% 44% 55%
1	F1	560	12% 27% 73%
1	G1	560	18% 44% 55%
1	H1	560	19% 44% 55%
1	I1	560	19% 44% 55%

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Mol	Chain	Length	Quality of chain
1	J1	560	13% 26% 73%
1	K1	560	22% 44% 55%
1	L1	560	23% 44% 55%
1	M1	560	13% 27% 73%
1	N1	560	22% 44% 55%
1	O1	560	22% 44% 55%
1	P1	560	13% 26% 73%
1	Q1	560	25% 44% 55%
1	R1	560	29% 44% 55%
1	S1	560	15% 27% 73%
1	T1	560	31% 44% 55%
1	U1	560	33% 44% 55%
1	V1	560	16% 27% 73%
1	W1	560	30% 44% 55%
1	X1	560	28% 44% 55%
1	Y1	560	25% 44% 55%
1	Z1	560	14% 27% 73%
1	a1	560	21% 44% 55%
1	b1	560	12% 27% 73%
1	c1	560	20% 44% 55%
1	d1	560	18% 44% 55%
1	e1	560	10% 27% 73%
1	f1	560	17% 44% 55%
1	g1	560	17% 44% 55%
1	h1	560	18% 44% 55%

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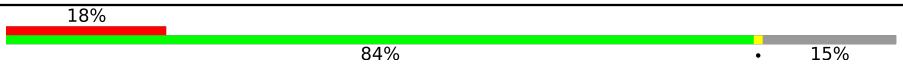
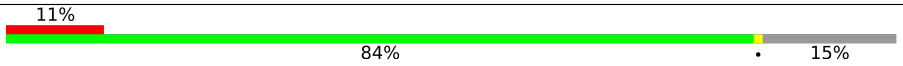
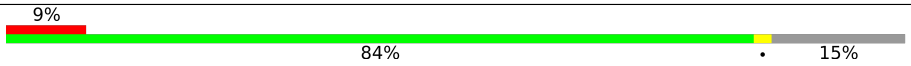
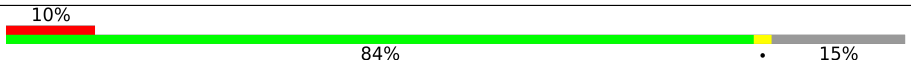
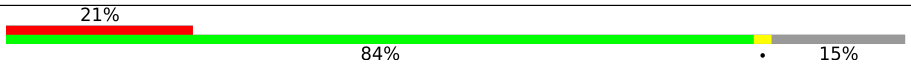
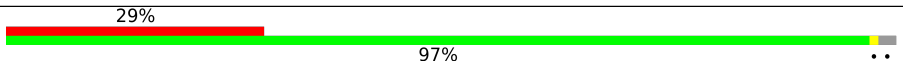
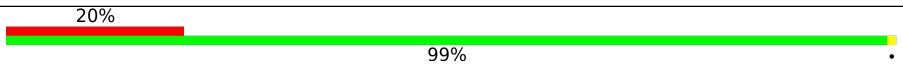
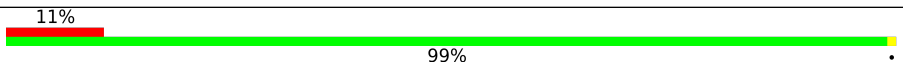
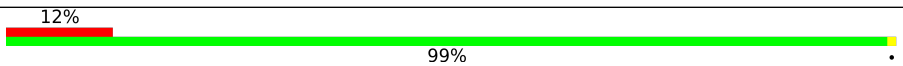
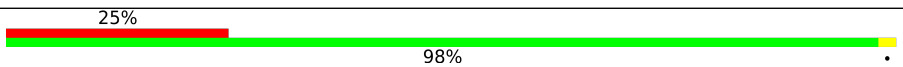
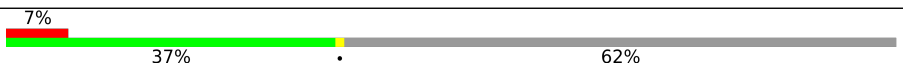
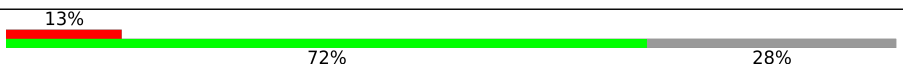
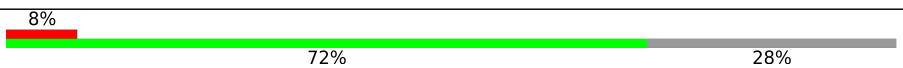
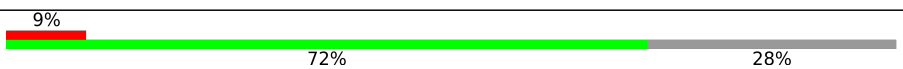
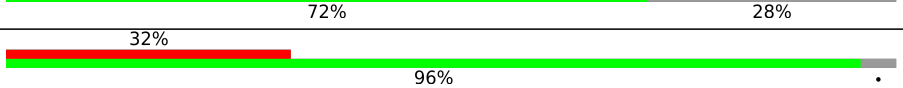
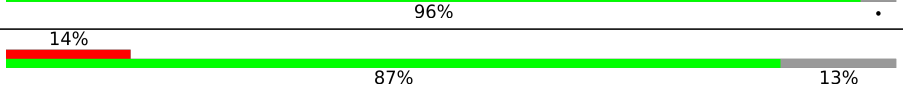
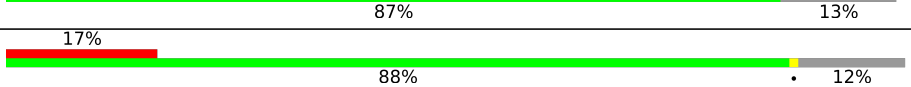
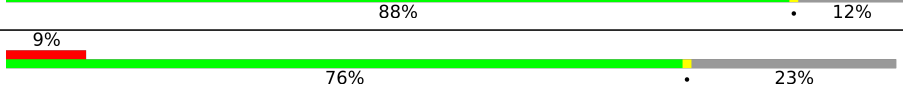
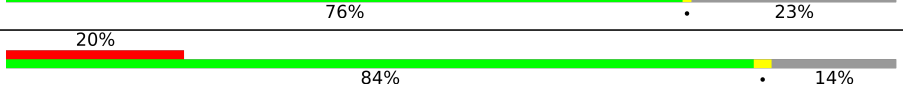
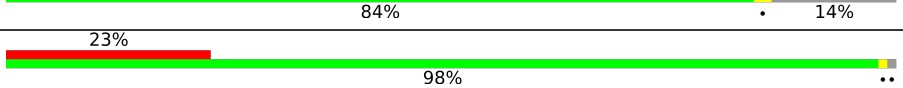
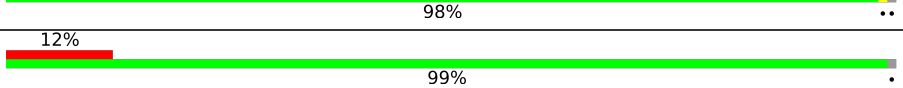
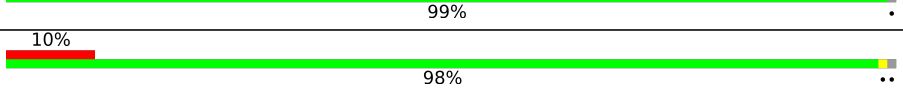
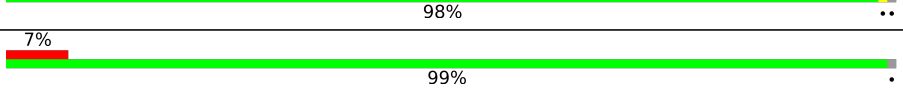
Mol	Chain	Length	Quality of chain
2	A2	245	
2	B2	245	
2	C2	245	
2	D2	245	
2	E2	245	
3	F2	264	
4	G2	89	
4	H2	89	
4	I2	89	
4	J2	89	
5	K2	104	
5	L2	104	
5	M2	104	
5	N2	104	
5	O2	104	
5	P2	104	
6	Q2	138	
6	R2	138	
6	S2	138	
6	T2	138	
6	U2	138	
7	V2	134	
7	W2	134	
7	X2	134	
7	Y2	134	

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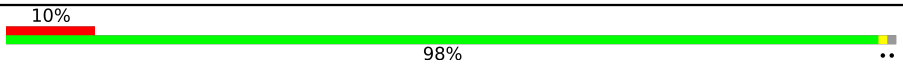
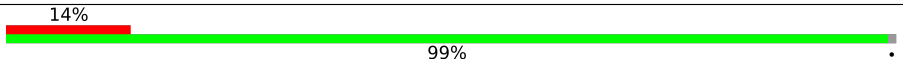
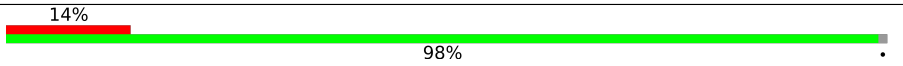
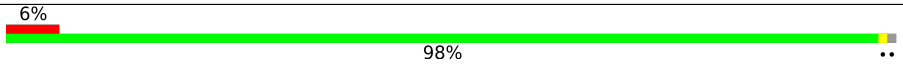
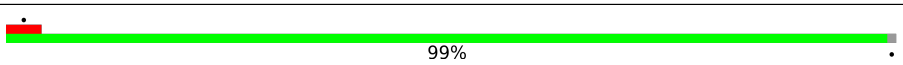
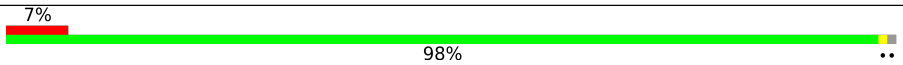
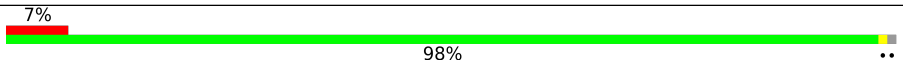
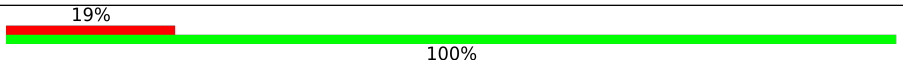
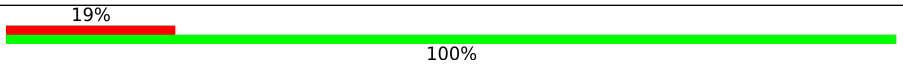
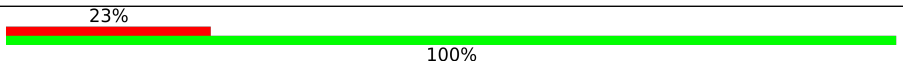
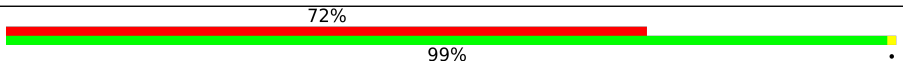
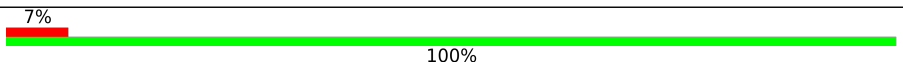
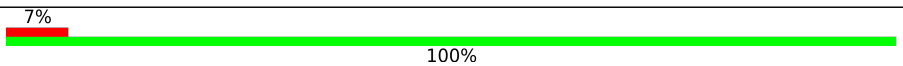
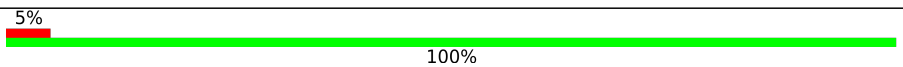
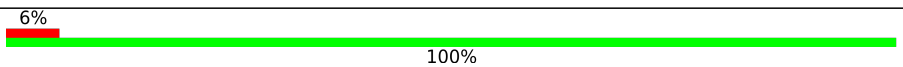
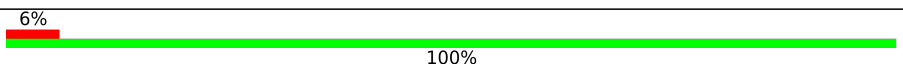
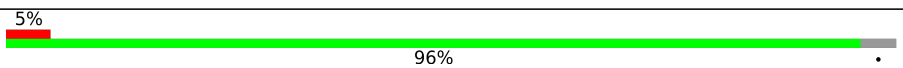
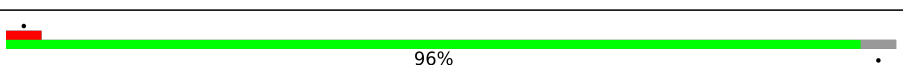
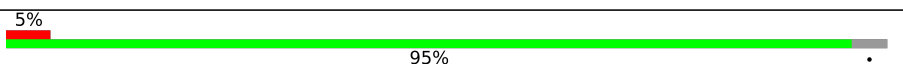
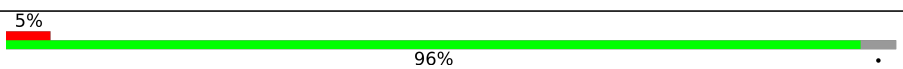
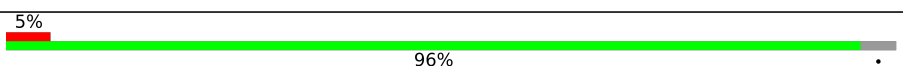
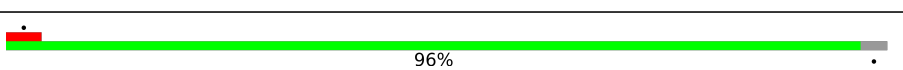
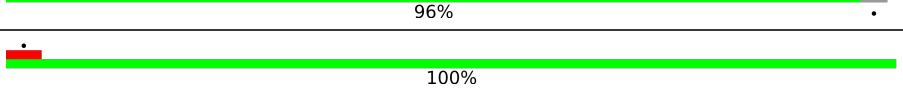
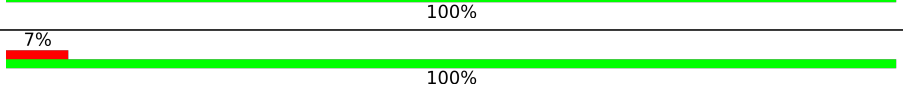
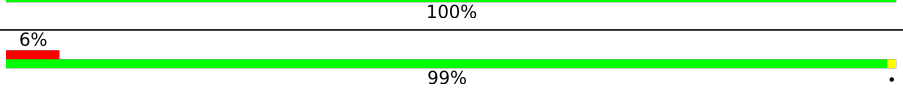
Mol	Chain	Length	Quality of chain
7	Z2	134	
7	a2	134	
8	b2	251	
8	c2	251	
8	d2	251	
8	e2	251	
8	f2	251	
9	12	260	
9	22	260	
9	32	260	
9	42	260	
9	g2	260	
9	h2	260	
9	i2	260	
9	j2	260	
9	k2	260	
9	l2	260	
9	m2	260	
9	n2	260	
9	o2	260	
9	p2	260	
9	q2	260	
9	r2	260	
9	s2	260	
9	t2	260	

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Mol	Chain	Length	Quality of chain
9	u2	260	7% 100%
9	v2	260	6% 100%
9	w2	260	5% 100%
9	x2	260	9% 100%
9	y2	260	19% 100%
9	z2	260	27% 99%
10	A3	232	85% 88% 9%
10	B3	232	85% 88% 9%
10	C3	232	85% 88% 9%
10	D3	232	86% 88% 9%
10	E3	232	85% 88% 9%
10	F3	232	84% 88% 9%
10	G3	232	86% 88% 9%
10	H3	232	86% 88% 9%
10	I3	232	87% 88% 9%
10	J3	232	85% 88% 9%
10	K3	232	85% 88% 9%
10	L3	232	85% 88% 9%
10	M3	232	86% 88% 9%
10	N3	232	85% 88% 9%
10	O3	232	86% 88% 9%
10	P3	232	87% 88% 9%
10	Q3	232	88% 88% 9%
10	R3	232	86% 88% 9%
10	S3	232	88% 88% 9%

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Mol	Chain	Length	Quality of chain
10	T3	232	87% 88% 9%
10	U3	232	87% 88% 9%
10	V3	232	87% 88% 9%
10	W3	232	86% 88% 9%
10	X3	232	88% 88% 9%
10	Y3	232	87% 88% 9%
10	Z3	232	84% 88% 9%
11	a3	365	83% 80% 16%
11	b3	365	83% 80% 16%
11	c3	365	84% 80% 16%
11	d3	365	83% 80% 16%
11	e3	365	83% 80% 16%
11	f3	365	84% 80% 16%
11	g3	365	83% 80% 16%
11	h3	365	84% 80% 16%
11	i3	365	83% 80% 16%
11	j3	365	84% 80% 16%
11	k3	365	84% 80% 16%
11	l3	365	84% 80% 16%
11	m3	365	84% 80% 16%
11	n3	365	83% 80% 16%
11	o3	365	84% 80% 16%
11	p3	365	84% 80% 16%
11	q3	365	84% 80% 16%
11	r3	365	84% 80% 16%

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Mol	Chain	Length	Quality of chain
11	s3	365	84% 80% 16%
11	t3	365	84% 80% 16%
11	u3	365	84% 80% 16%
11	v3	365	84% 80% 16%
11	w3	365	84% 80% 16%
11	x3	365	84% 80% 16%
11	y3	365	84% 80% 16%
11	z3	365	83% 80% 16%
12	A4	232	76% 86% 13%
12	B4	232	76% 88% 12%
12	C4	232	79% 86% 14%
12	D4	232	79% 87% 13%
12	E4	232	79% 88% 12%

2 Entry composition

There are 12 unique types of molecules in this entry. The entry contains 246311 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 Flagellar M-ring protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A1	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	B1	250	Total	C	N	O	S	0	0
			1931	1187	355	385	4		
1	C1	250	Total	C	N	O	S	0	0
			1931	1187	355	385	4		
1	D1	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	E1	250	Total	C	N	O	S	0	0
			1931	1187	355	385	4		
1	F1	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	G1	250	Total	C	N	O	S	0	0
			1931	1187	355	385	4		
1	H1	250	Total	C	N	O	S	0	0
			1931	1187	355	385	4		
1	I1	250	Total	C	N	O	S	0	0
			1931	1187	355	385	4		
1	J1	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	K1	250	Total	C	N	O	S	0	0
			1931	1187	355	385	4		
1	L1	250	Total	C	N	O	S	0	0
			1931	1187	355	385	4		
1	M1	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	N1	250	Total	C	N	O	S	0	0
			1931	1187	355	385	4		
1	O1	250	Total	C	N	O	S	0	0
			1931	1187	355	385	4		
1	P1	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	Q1	250	Total	C	N	O	S	0	0
			1931	1187	355	385	4		

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Mol	Chain	Residues	Atoms					AltConf	Trace
1	R1	250	Total	C	N	O	S	0	0
			1931	1187	355	385	4		
1	S1	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	T1	250	Total	C	N	O	S	0	0
			1931	1187	355	385	4		
1	U1	250	Total	C	N	O	S	0	0
			1931	1187	355	385	4		
1	V1	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	W1	250	Total	C	N	O	S	0	0
			1931	1187	355	385	4		
1	X1	250	Total	C	N	O	S	0	0
			1931	1187	355	385	4		
1	Y1	250	Total	C	N	O	S	0	0
			1931	1187	355	385	4		
1	Z1	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	a1	250	Total	C	N	O	S	0	0
			1931	1187	355	385	4		
1	b1	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	c1	250	Total	C	N	O	S	0	0
			1931	1187	355	385	4		
1	d1	250	Total	C	N	O	S	0	0
			1931	1187	355	385	4		
1	e1	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	f1	250	Total	C	N	O	S	0	0
			1931	1187	355	385	4		
1	g1	250	Total	C	N	O	S	0	0
			1931	1187	355	385	4		
1	h1	250	Total	C	N	O	S	0	0
			1931	1187	355	385	4		

- Molecule 2 is a protein called Flagellar biosynthetic protein FliP.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	A2	209	Total	C	N	O	S	0	0
			1623	1084	251	276	12		
2	B2	209	Total	C	N	O	S	0	0
			1623	1084	251	276	12		

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Mol	Chain	Residues	Atoms					AltConf	Trace
2	C2	209	Total	C	N	O	S	0	0
			1623	1084	251	276	12		
2	D2	209	Total	C	N	O	S	0	0
			1623	1084	251	276	12		
2	E2	209	Total	C	N	O	S	0	0
			1623	1084	251	276	12		

- Molecule 3 is a protein called Flagellar biosynthetic protein FliR.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	F2	258	Total	C	N	O	S	0	0
			1986	1329	314	327	16		

- Molecule 4 is a protein called Flagellar biosynthetic protein FliQ.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	G2	89	Total	C	N	O	S	0	0
			670	449	100	114	7		
4	H2	89	Total	C	N	O	S	0	0
			670	449	100	114	7		
4	I2	89	Total	C	N	O	S	0	0
			670	449	100	114	7		
4	J2	89	Total	C	N	O	S	0	0
			670	449	100	114	7		

- Molecule 5 is a protein called Flagellar hook-basal body complex protein FliE.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	K2	39	Total	C	N	O	S	0	0
			296	183	51	56	6		
5	L2	75	Total	C	N	O	S	0	0
			563	347	102	108	6		
5	M2	75	Total	C	N	O	S	0	0
			563	347	102	108	6		
5	N2	75	Total	C	N	O	S	0	0
			563	347	102	108	6		
5	O2	75	Total	C	N	O	S	0	0
			563	347	102	108	6		
5	P2	75	Total	C	N	O	S	0	0
			563	347	102	108	6		

- Molecule 6 is a protein called Flagellar basal body rod protein FlgB.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	Q2	133	Total	C	N	O	S	0	0
			1023	630	188	200	5		
6	R2	120	Total	C	N	O	S	0	0
			932	578	169	180	5		
6	S2	122	Total	C	N	O	S	0	0
			942	583	173	181	5		
6	T2	106	Total	C	N	O	S	0	0
			835	516	153	161	5		
6	U2	119	Total	C	N	O	S	0	0
			925	573	168	179	5		

- Molecule 7 is a protein called Flagellar basal-body rod protein FlgC.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	V2	133	Total	C	N	O	S	0	0
			969	604	167	193	5		
7	W2	132	Total	C	N	O	S	0	0
			964	601	166	192	5		
7	X2	132	Total	C	N	O	S	0	0
			964	601	166	192	5		
7	Y2	132	Total	C	N	O	S	0	0
			964	601	166	192	5		
7	Z2	132	Total	C	N	O	S	0	0
			964	601	166	192	5		
7	a2	132	Total	C	N	O	S	0	0
			964	601	166	192	5		

- Molecule 8 is a protein called Flagellar basal body protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	b2	249	Total	C	N	O	S	0	0
			1812	1111	325	368	8		
8	c2	249	Total	C	N	O	S	0	0
			1812	1111	325	368	8		
8	d2	249	Total	C	N	O	S	0	0
			1812	1111	325	368	8		
8	e2	249	Total	C	N	O	S	0	0
			1812	1111	325	368	8		
8	f2	249	Total	C	N	O	S	0	0
			1812	1111	325	368	8		

- Molecule 9 is a protein called Flagellar basal-body rod protein FlgG.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	g2	260	Total	C	N	O	S	0	0
			1949	1202	341	400	6		
9	h2	260	Total	C	N	O	S	0	0
			1949	1202	341	400	6		
9	i2	260	Total	C	N	O	S	0	0
			1949	1202	341	400	6		
9	j2	260	Total	C	N	O	S	0	0
			1949	1202	341	400	6		
9	k2	260	Total	C	N	O	S	0	0
			1949	1202	341	400	6		
9	l2	249	Total	C	N	O	S	0	0
			1871	1157	328	381	5		
9	m2	249	Total	C	N	O	S	0	0
			1871	1157	328	381	5		
9	n2	249	Total	C	N	O	S	0	0
			1871	1157	328	381	5		
9	o2	249	Total	C	N	O	S	0	0
			1871	1157	328	381	5		
9	p2	249	Total	C	N	O	S	0	0
			1871	1157	328	381	5		
9	q2	251	Total	C	N	O	S	0	0
			1885	1166	330	384	5		
9	r2	260	Total	C	N	O	S	0	0
			1949	1202	341	400	6		
9	s2	260	Total	C	N	O	S	0	0
			1949	1202	341	400	6		
9	t2	260	Total	C	N	O	S	0	0
			1949	1202	341	400	6		
9	u2	260	Total	C	N	O	S	0	0
			1949	1202	341	400	6		
9	v2	260	Total	C	N	O	S	0	0
			1949	1202	341	400	6		
9	w2	260	Total	C	N	O	S	0	0
			1949	1202	341	400	6		
9	x2	260	Total	C	N	O	S	0	0
			1949	1202	341	400	6		
9	y2	260	Total	C	N	O	S	0	0
			1949	1202	341	400	6		
9	z2	260	Total	C	N	O	S	0	0
			1949	1202	341	400	6		
9	12	260	Total	C	N	O	S	0	0
			1949	1202	341	400	6		
9	22	260	Total	C	N	O	S	0	0
			1949	1202	341	400	6		

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Mol	Chain	Residues	Atoms					AltConf	Trace
9	32	260	Total	C	N	O	S	0	0
			1948	1202	340	400	6		
9	42	260	Total	C	N	O	S	0	0
			1949	1202	341	400	6		

- Molecule 10 is a protein called Flagellar L-ring protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	A3	211	Total	C	N	O	S	0	0
			1581	985	282	310	4		
10	B3	211	Total	C	N	O	S	0	0
			1581	985	282	310	4		
10	C3	211	Total	C	N	O	S	0	0
			1581	985	282	310	4		
10	D3	211	Total	C	N	O	S	0	0
			1581	985	282	310	4		
10	E3	211	Total	C	N	O	S	0	0
			1581	985	282	310	4		
10	F3	211	Total	C	N	O	S	0	0
			1581	985	282	310	4		
10	G3	211	Total	C	N	O	S	0	0
			1581	985	282	310	4		
10	H3	211	Total	C	N	O	S	0	0
			1581	985	282	310	4		
10	I3	211	Total	C	N	O	S	0	0
			1581	985	282	310	4		
10	J3	211	Total	C	N	O	S	0	0
			1581	985	282	310	4		
10	K3	211	Total	C	N	O	S	0	0
			1581	985	282	310	4		
10	L3	211	Total	C	N	O	S	0	0
			1581	985	282	310	4		
10	M3	211	Total	C	N	O	S	0	0
			1581	985	282	310	4		
10	N3	211	Total	C	N	O	S	0	0
			1581	985	282	310	4		
10	O3	211	Total	C	N	O	S	0	0
			1581	985	282	310	4		
10	P3	211	Total	C	N	O	S	0	0
			1581	985	282	310	4		
10	Q3	211	Total	C	N	O	S	0	0
			1581	985	282	310	4		

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Mol	Chain	Residues	Atoms					AltConf	Trace
10	R3	211	Total	C	N	O	S	0	0
			1581	985	282	310	4		
10	S3	211	Total	C	N	O	S	0	0
			1581	985	282	310	4		
10	T3	211	Total	C	N	O	S	0	0
			1581	985	282	310	4		
10	U3	211	Total	C	N	O	S	0	0
			1581	985	282	310	4		
10	V3	211	Total	C	N	O	S	0	0
			1581	985	282	310	4		
10	W3	211	Total	C	N	O	S	0	0
			1580	984	282	310	4		
10	X3	211	Total	C	N	O	S	0	0
			1581	985	282	310	4		
10	Y3	211	Total	C	N	O	S	0	0
			1581	985	282	310	4		
10	Z3	211	Total	C	N	O	S	0	0
			1581	985	282	310	4		

- Molecule 11 is a protein called Flagellar P-ring protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	a3	306	Total	C	N	O	S	0	0
			2252	1379	409	451	13		
11	b3	306	Total	C	N	O	S	0	0
			2252	1379	409	451	13		
11	c3	306	Total	C	N	O	S	0	0
			2252	1379	409	451	13		
11	d3	306	Total	C	N	O	S	0	0
			2252	1379	409	451	13		
11	e3	306	Total	C	N	O	S	0	0
			2252	1379	409	451	13		
11	f3	306	Total	C	N	O	S	0	0
			2252	1379	409	451	13		
11	g3	306	Total	C	N	O	S	0	0
			2252	1379	409	451	13		
11	h3	306	Total	C	N	O	S	0	0
			2251	1379	408	451	13		
11	i3	306	Total	C	N	O	S	0	0
			2252	1379	409	451	13		
11	j3	306	Total	C	N	O	S	0	0
			2252	1379	409	451	13		

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Mol	Chain	Residues	Atoms					AltConf	Trace
11	k3	306	Total	C	N	O	S	0	0
			2252	1379	409	451	13		
11	l3	306	Total	C	N	O	S	0	0
			2252	1379	409	451	13		
11	m3	306	Total	C	N	O	S	0	0
			2252	1379	409	451	13		
11	n3	306	Total	C	N	O	S	0	0
			2252	1379	409	451	13		
11	o3	306	Total	C	N	O	S	0	0
			2252	1379	409	451	13		
11	p3	306	Total	C	N	O	S	0	0
			2252	1379	409	451	13		
11	q3	306	Total	C	N	O	S	0	0
			2252	1379	409	451	13		
11	r3	306	Total	C	N	O	S	0	0
			2251	1378	409	451	13		
11	s3	306	Total	C	N	O	S	0	0
			2252	1379	409	451	13		
11	t3	306	Total	C	N	O	S	0	0
			2252	1379	409	451	13		
11	u3	306	Total	C	N	O	S	0	0
			2252	1379	409	451	13		
11	v3	306	Total	C	N	O	S	0	0
			2252	1379	409	451	13		
11	w3	306	Total	C	N	O	S	0	0
			2252	1379	409	451	13		
11	x3	306	Total	C	N	O	S	0	0
			2252	1379	409	451	13		
11	y3	306	Total	C	N	O	S	0	0
			2252	1379	409	451	13		
11	z3	306	Total	C	N	O	S	0	0
			2252	1379	409	451	13		

- Molecule 12 is a protein called Basal-body rod modification protein FlgD.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	A4	201	Total	C	N	O	S	0	0
			1475	914	253	307	1		
12	B4	204	Total	C	N	O	S	0	0
			1493	924	256	312	1		
12	C4	199	Total	C	N	O	S	0	0
			1458	903	250	304	1		

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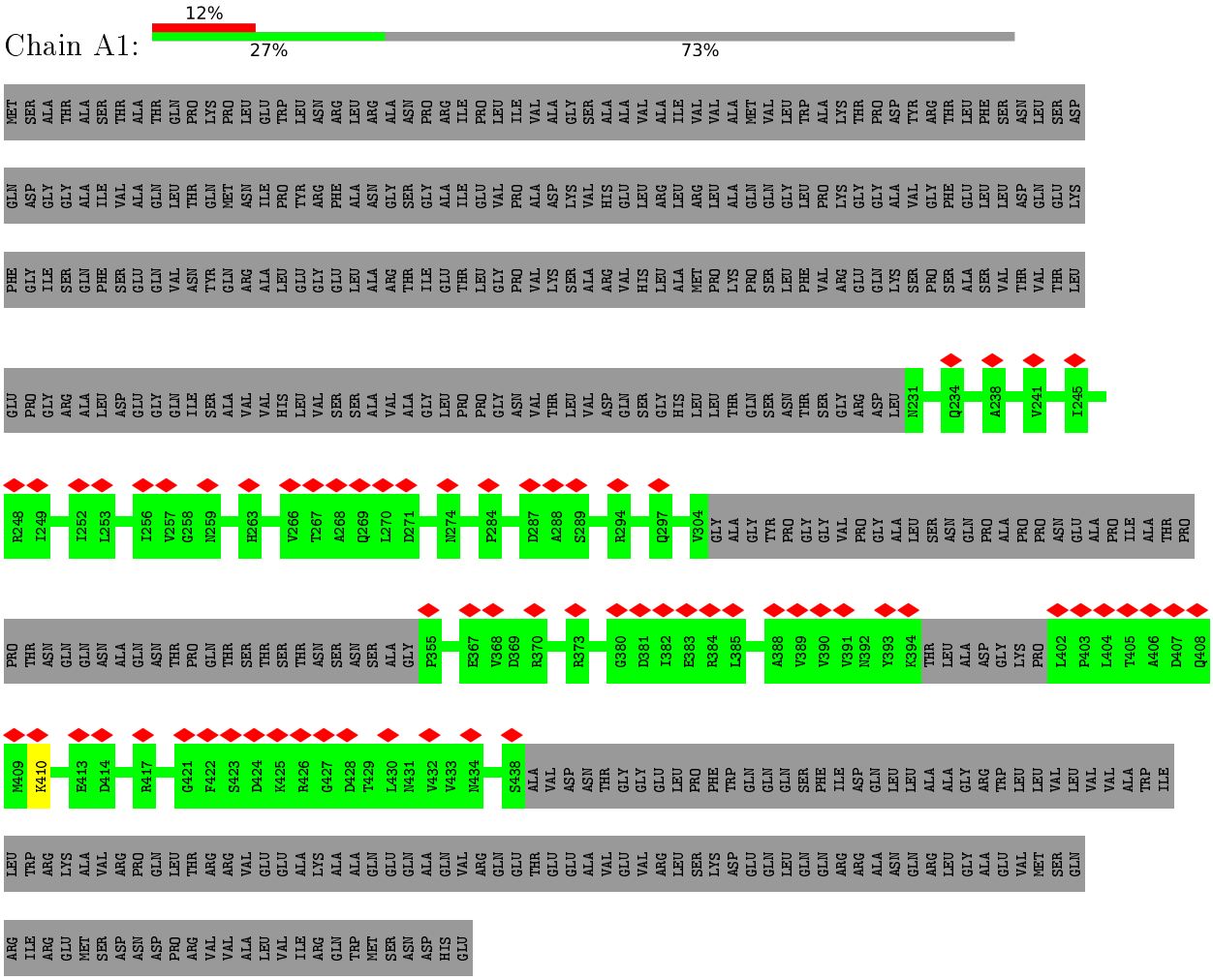
Mol	Chain	Residues	Atoms					AltConf	Trace
12	D4	202	Total	C	N	O	S	0	0
			1482	917	254	310	1		
12	E4	204	Total	C	N	O	S	0	0
			1493	924	256	312	1		

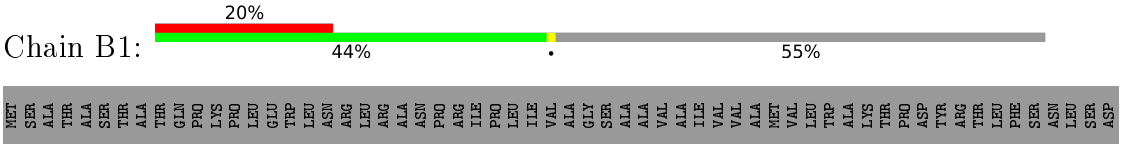
3 Residue-property plots (i)

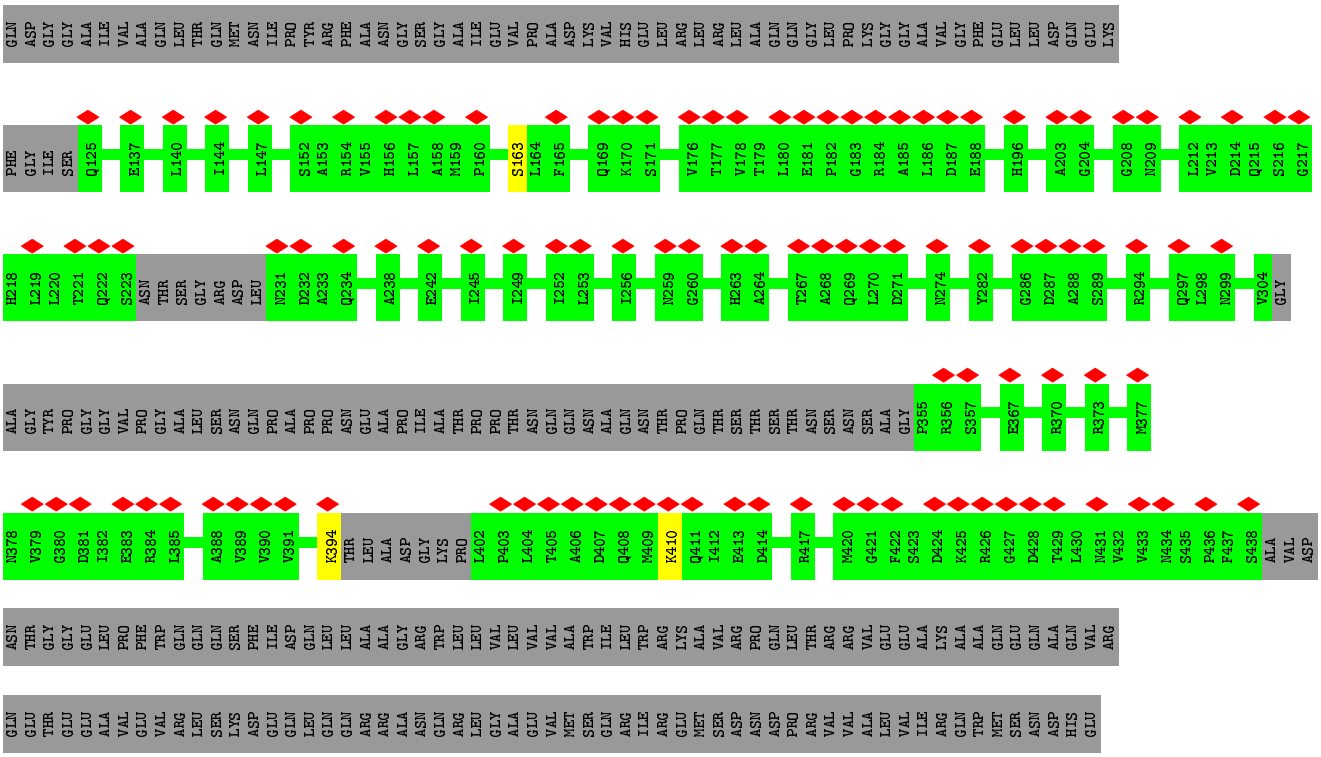
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion 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: Flagellar M-ring protein



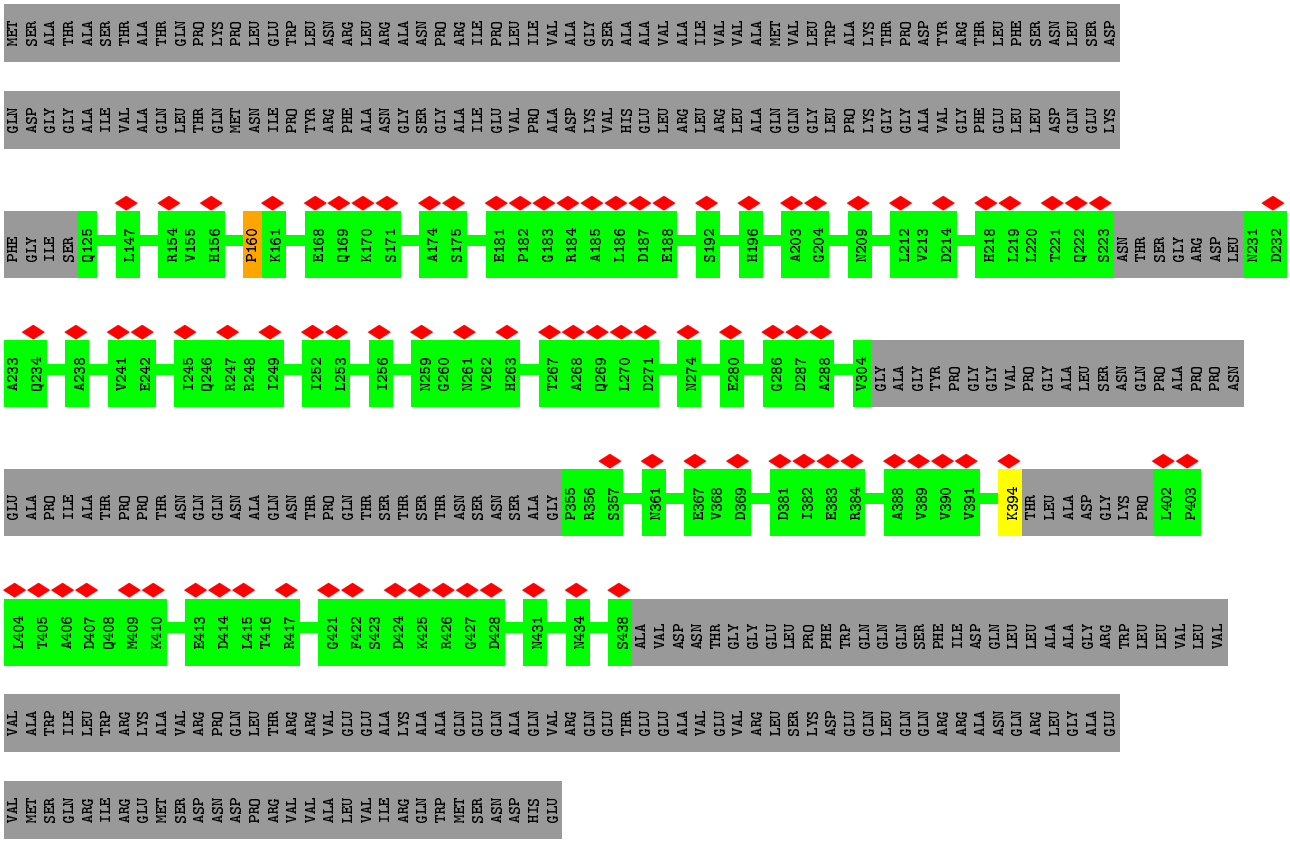
- Molecule 1: Flagellar M-ring protein





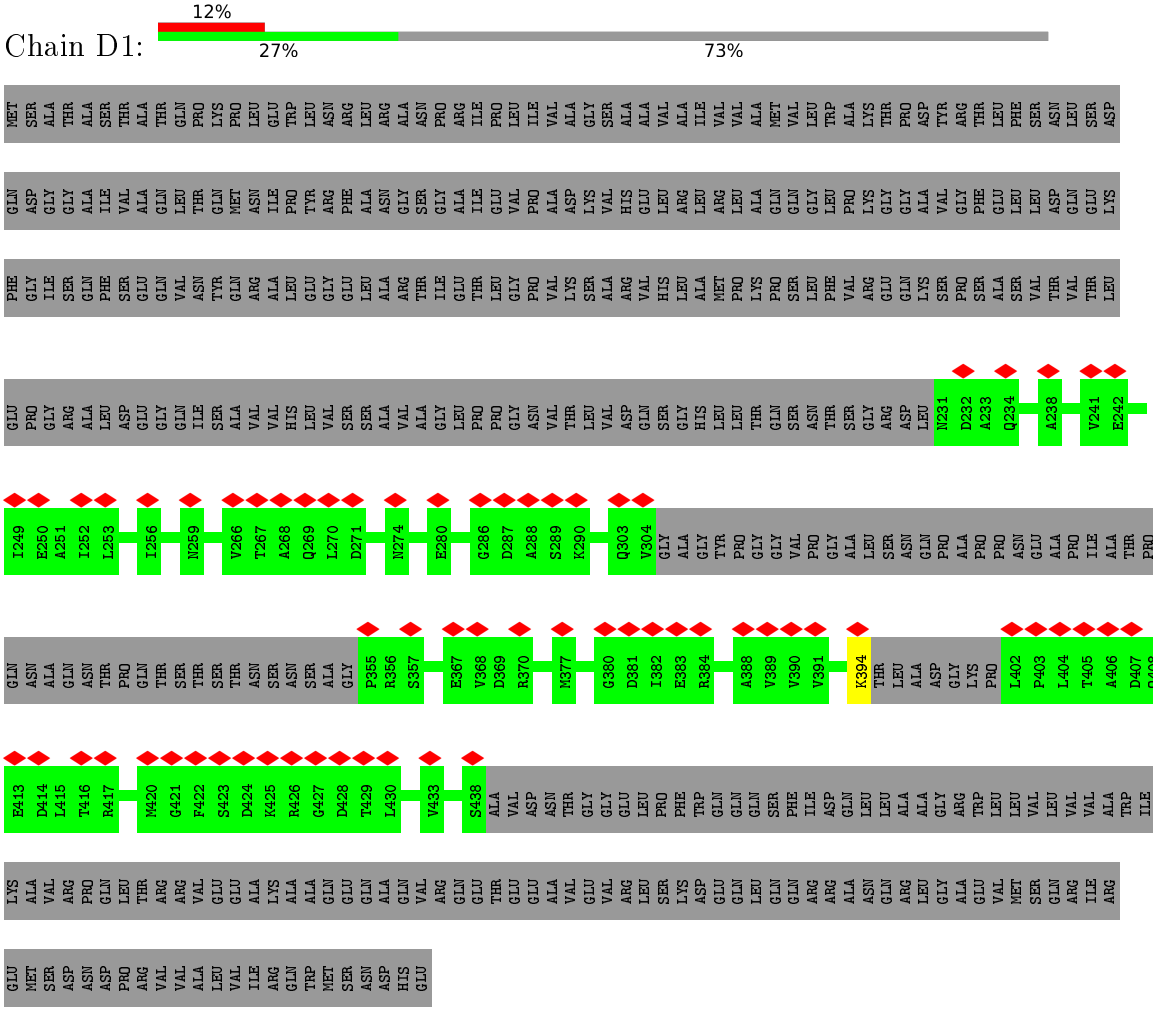
• Molecule 1: Flagellar M-ring protein

Chain C1:



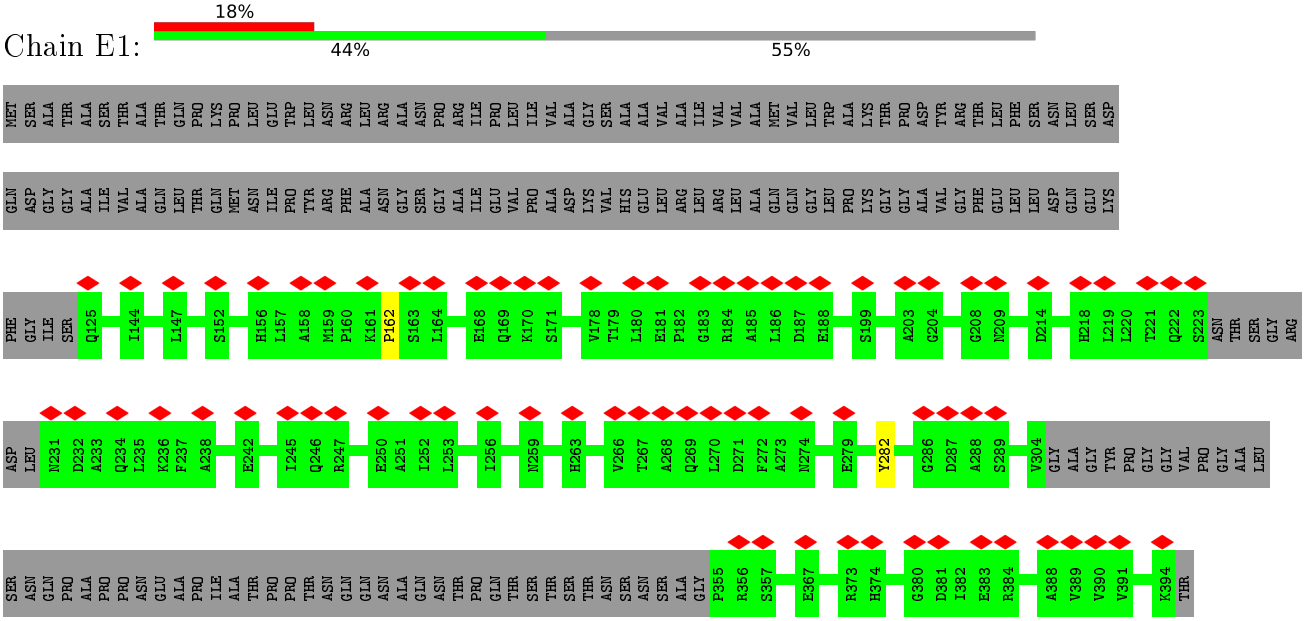
- Molecule 1: Flagellar M-ring protein

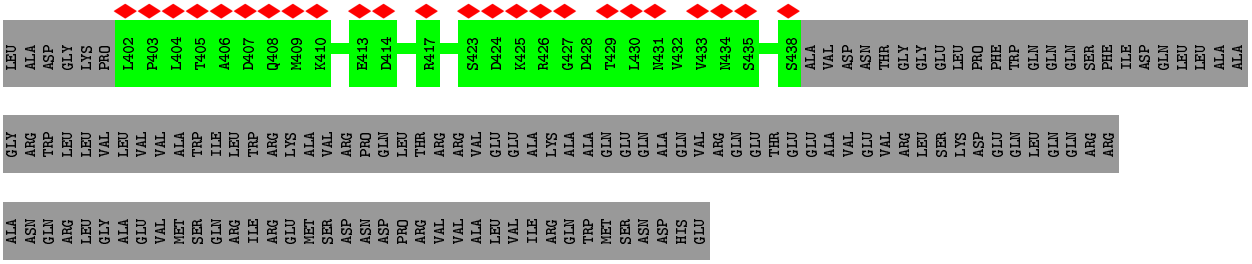
Chain D1:



- Molecule 1: Flagellar M-ring protein

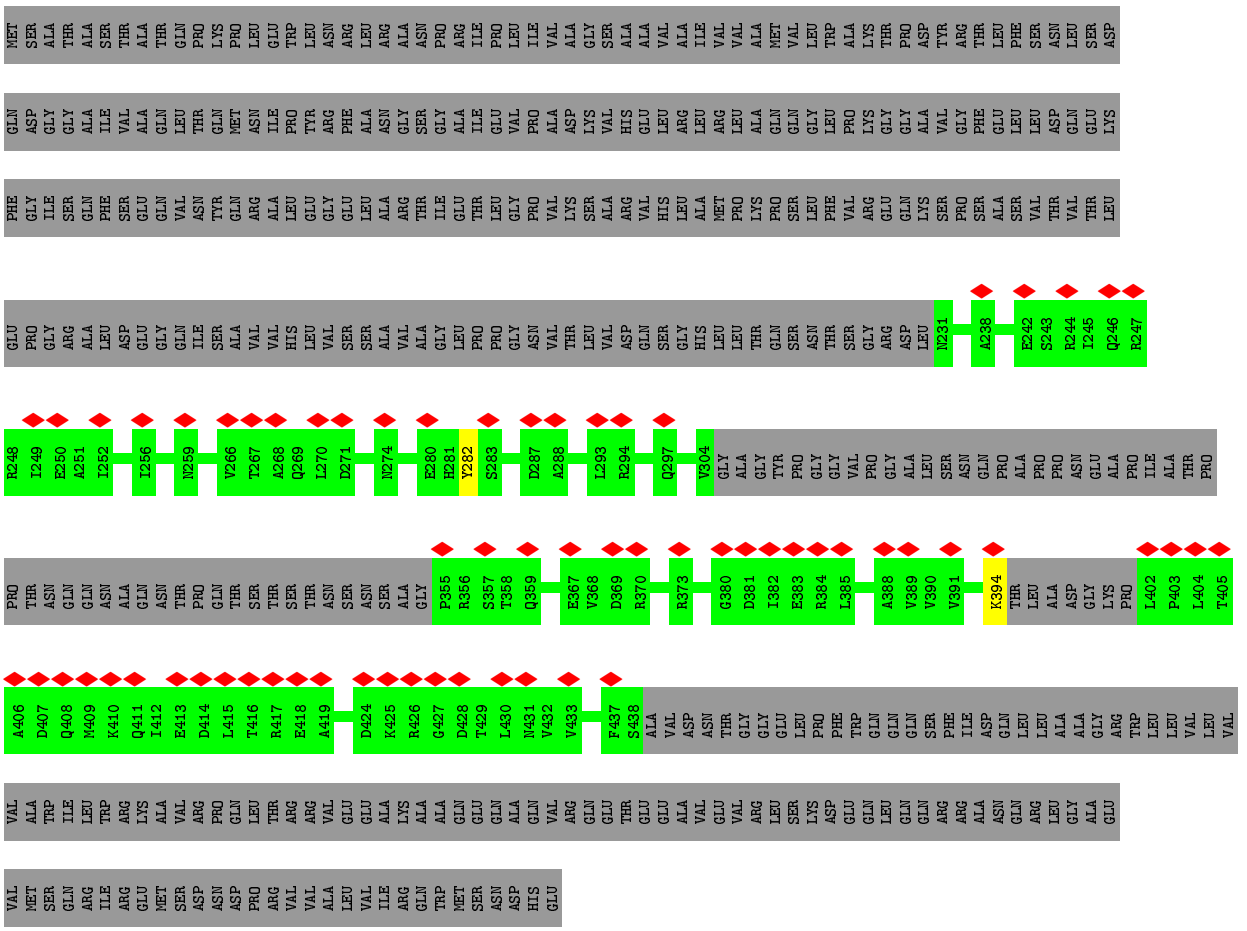
Chain E1:





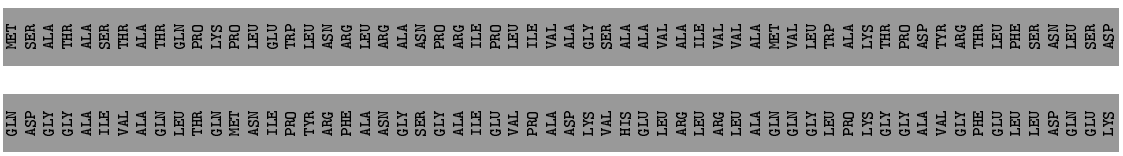
• Molecule 1: Flagellar M-ring protein

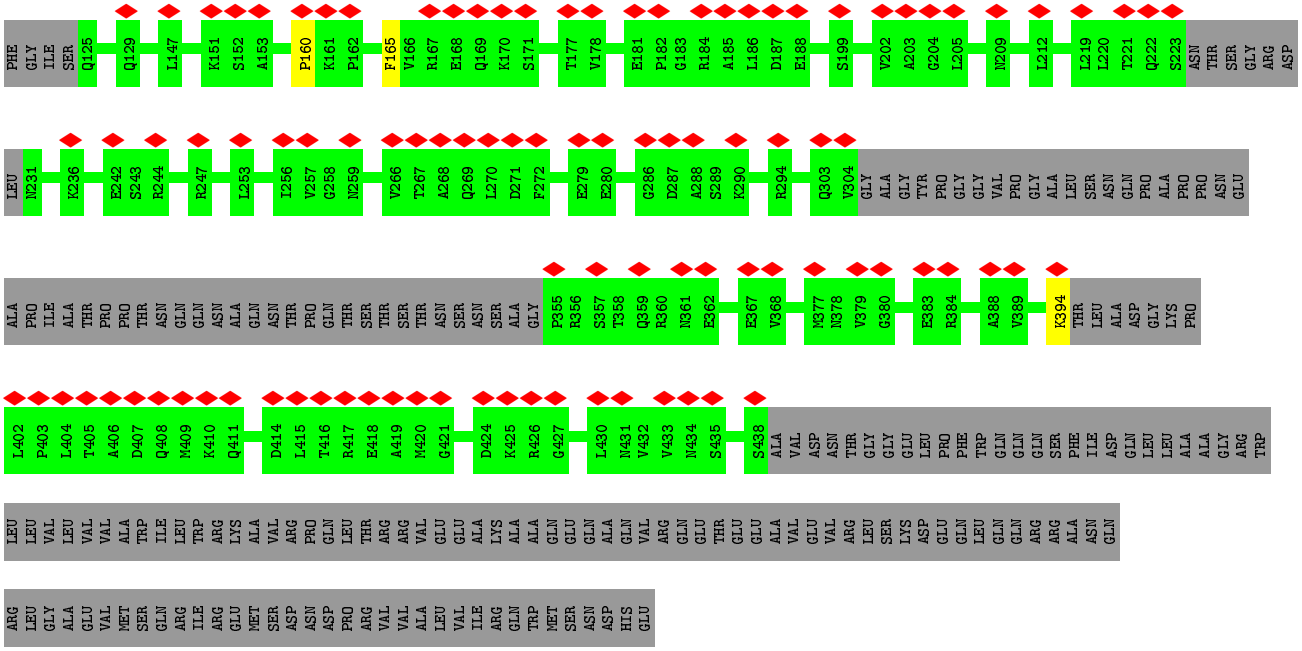
Chain F1:



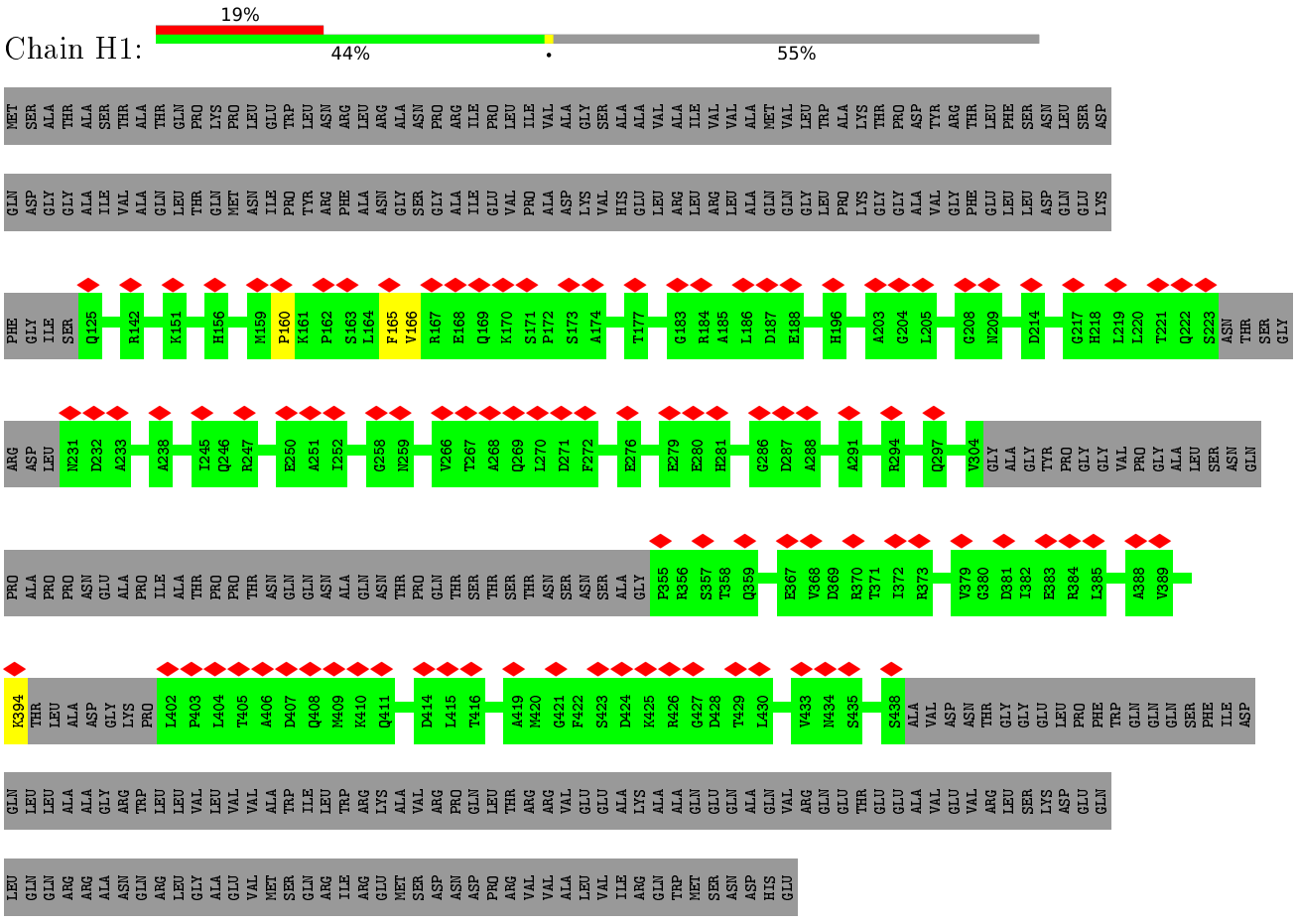
• Molecule 1: Flagellar M-ring protein

Chain G1:



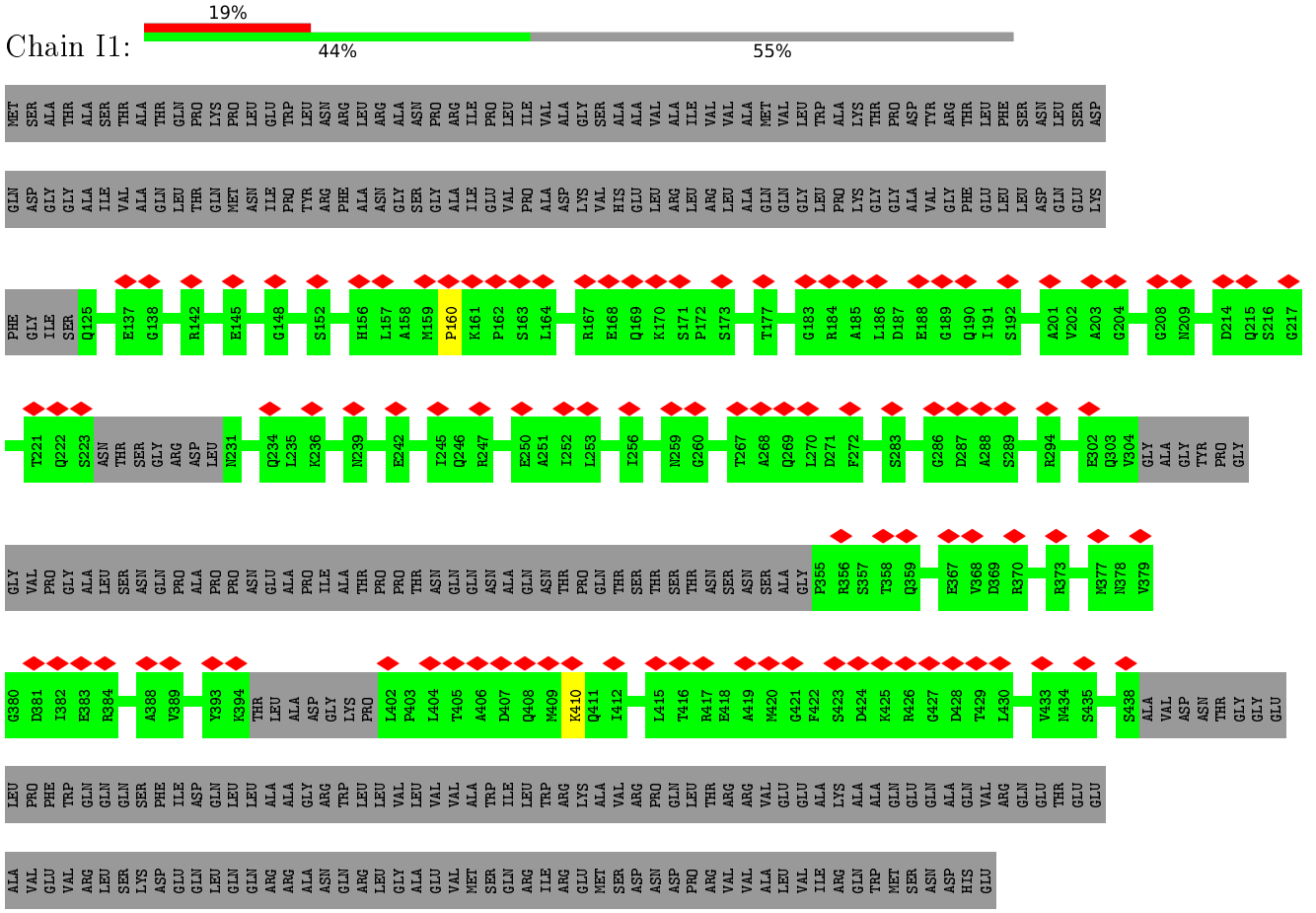


• Molecule 1: Flagellar M-ring protein



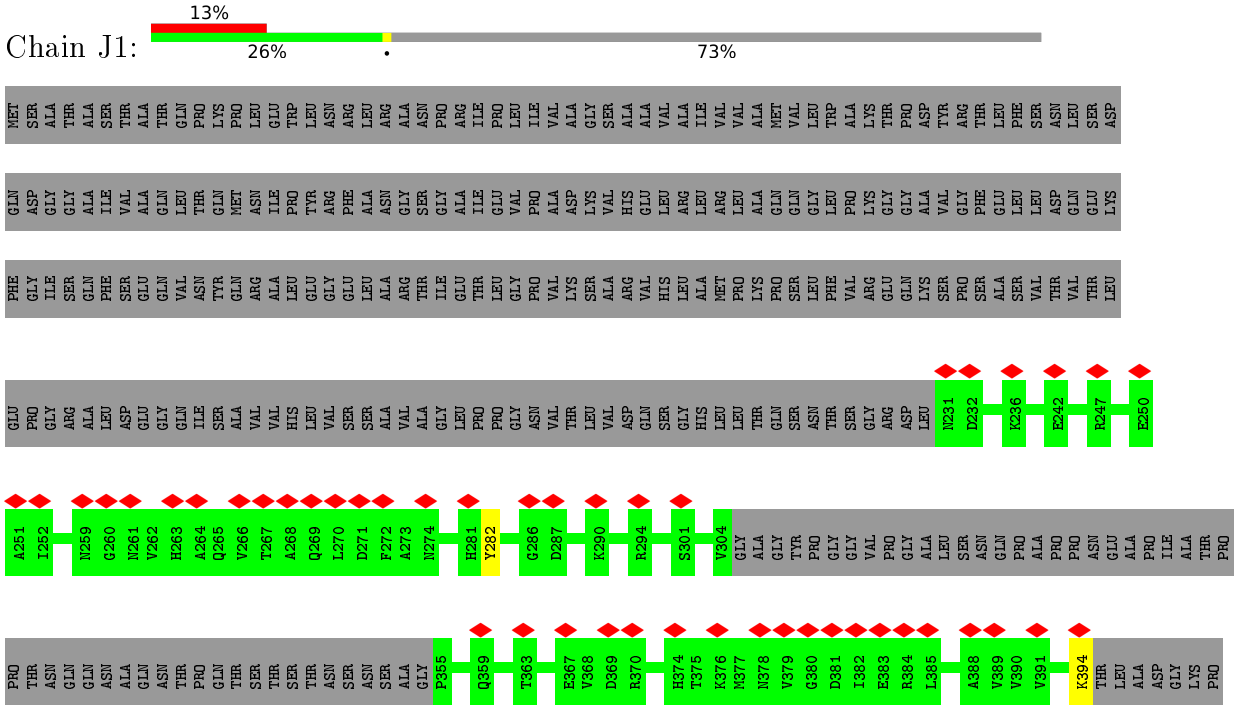
• Molecule 1: Flagellar M-ring protein

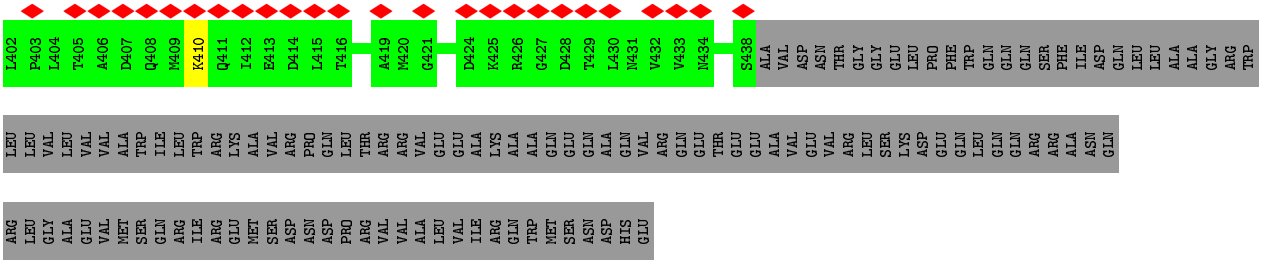
Chain I1:



• Molecule 1: Flagellar M-ring protein

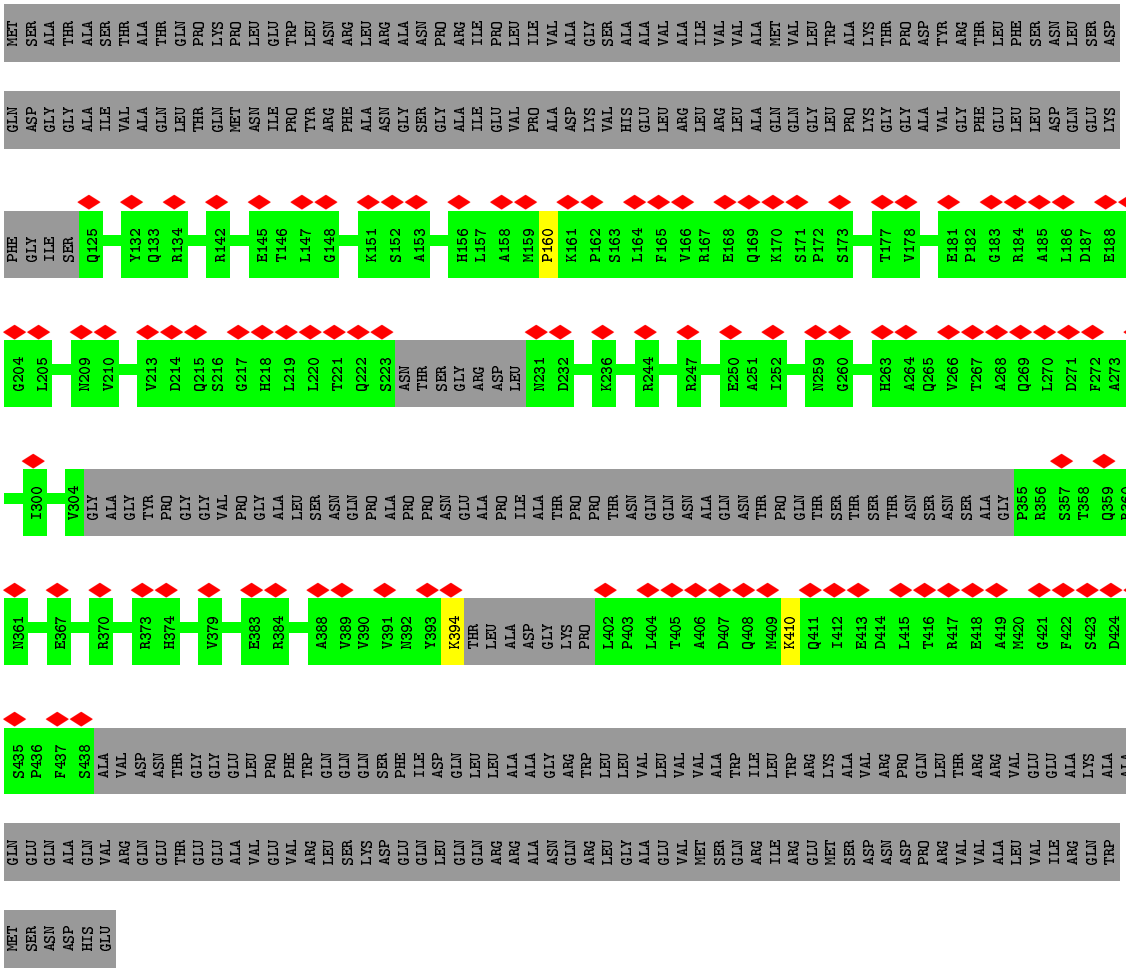
Chain J1:





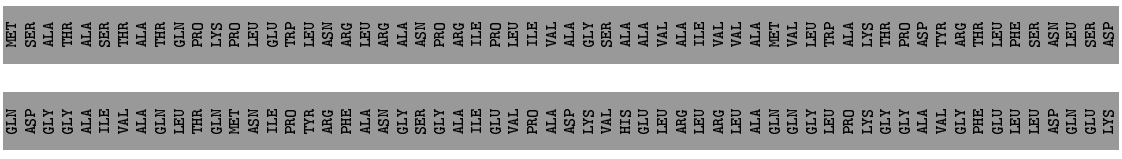
• Molecule 1: Flagellar M-ring protein

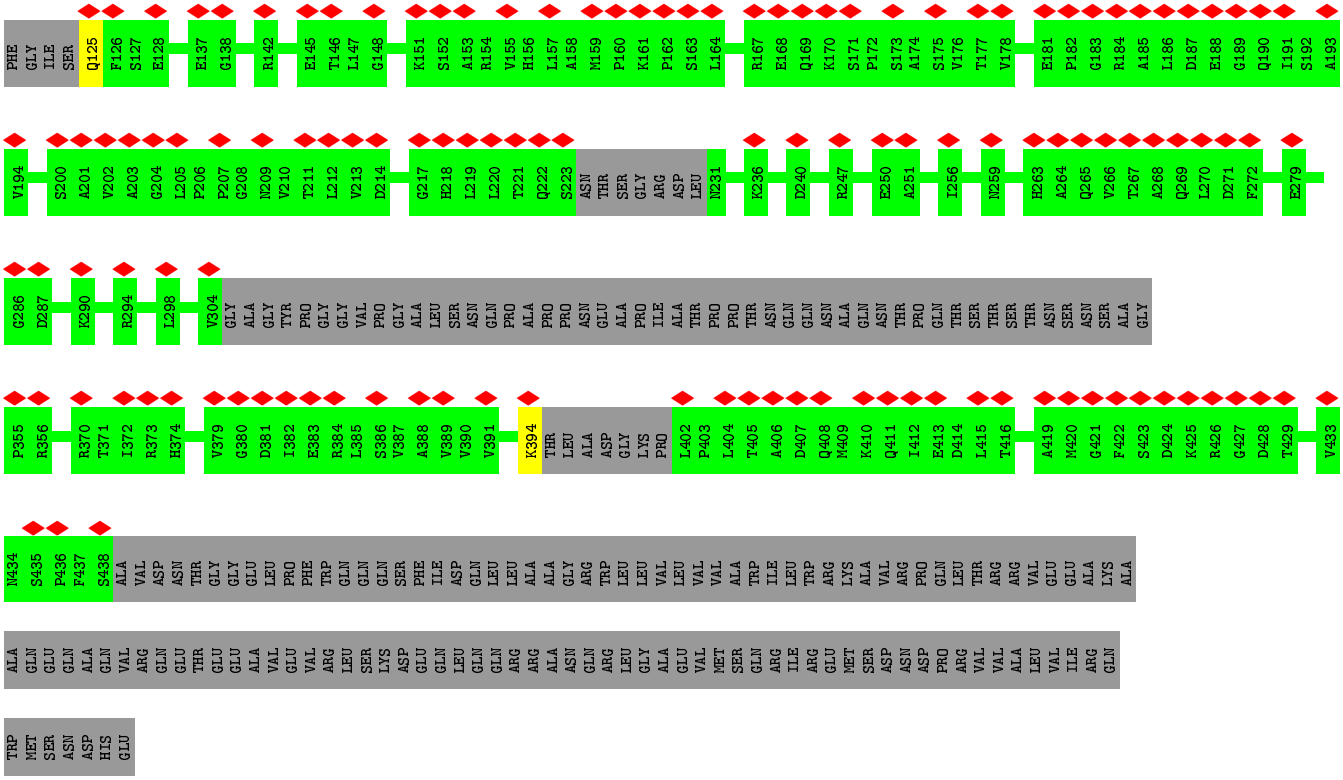
Chain K1:



• Molecule 1: Flagellar M-ring protein

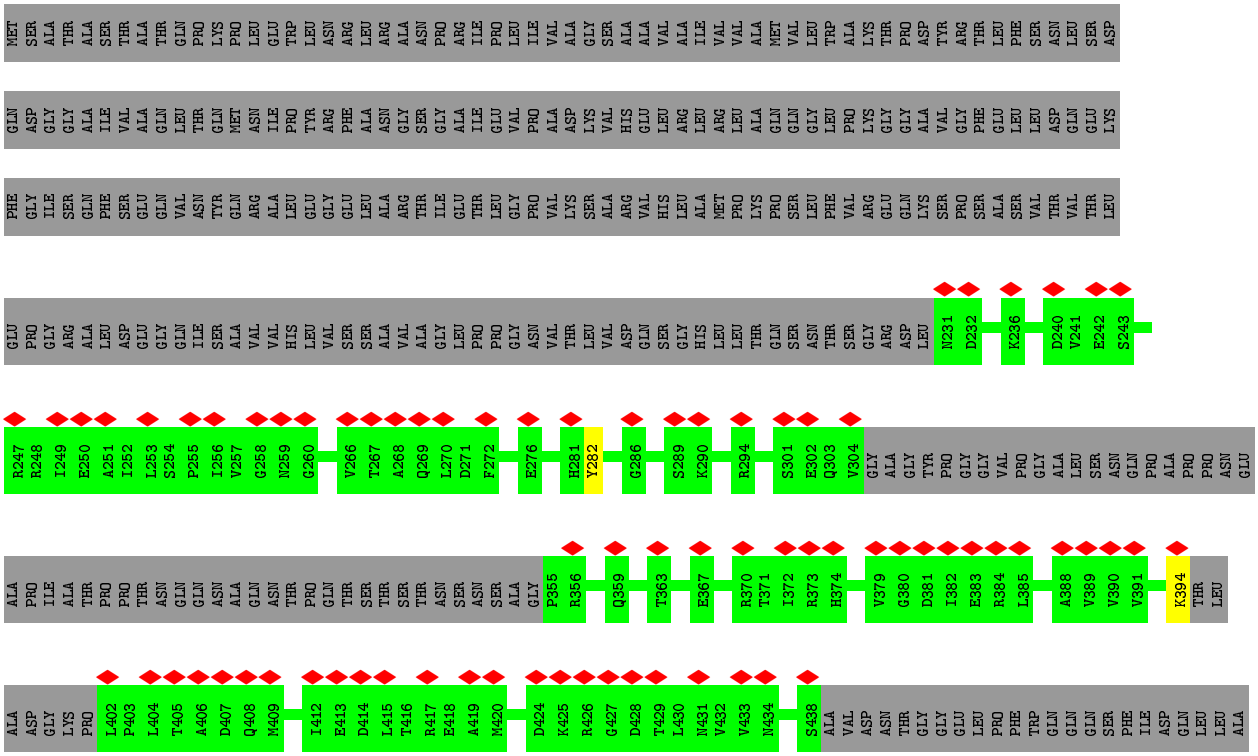
Chain L1:

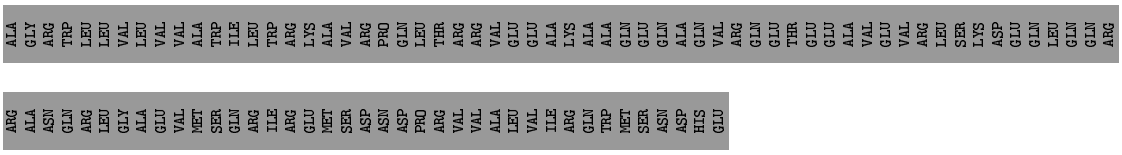




• Molecule 1: Flagellar M-ring protein

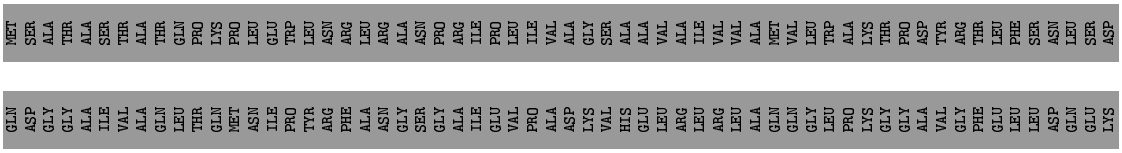
Chain M1:

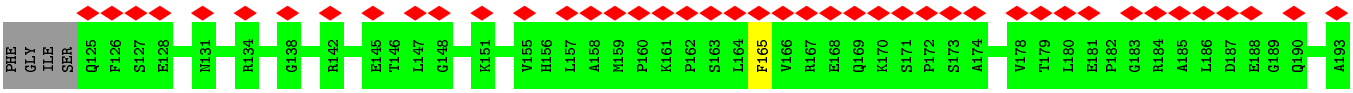


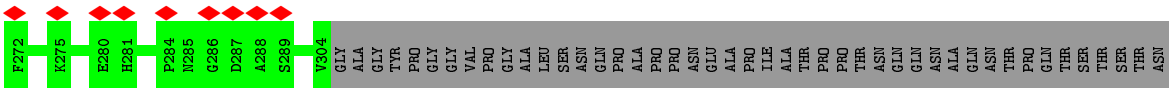


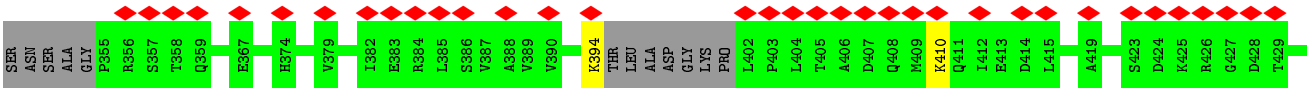
• Molecule 1: Flagellar M-ring protein

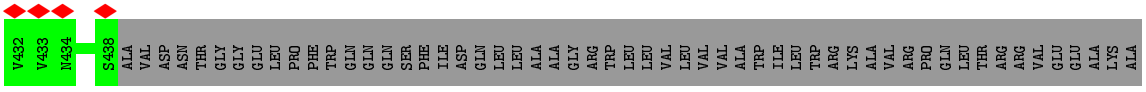
Chain N1:





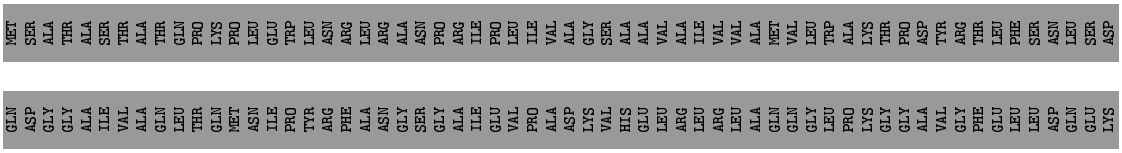


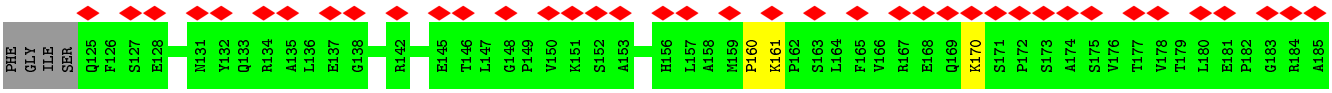


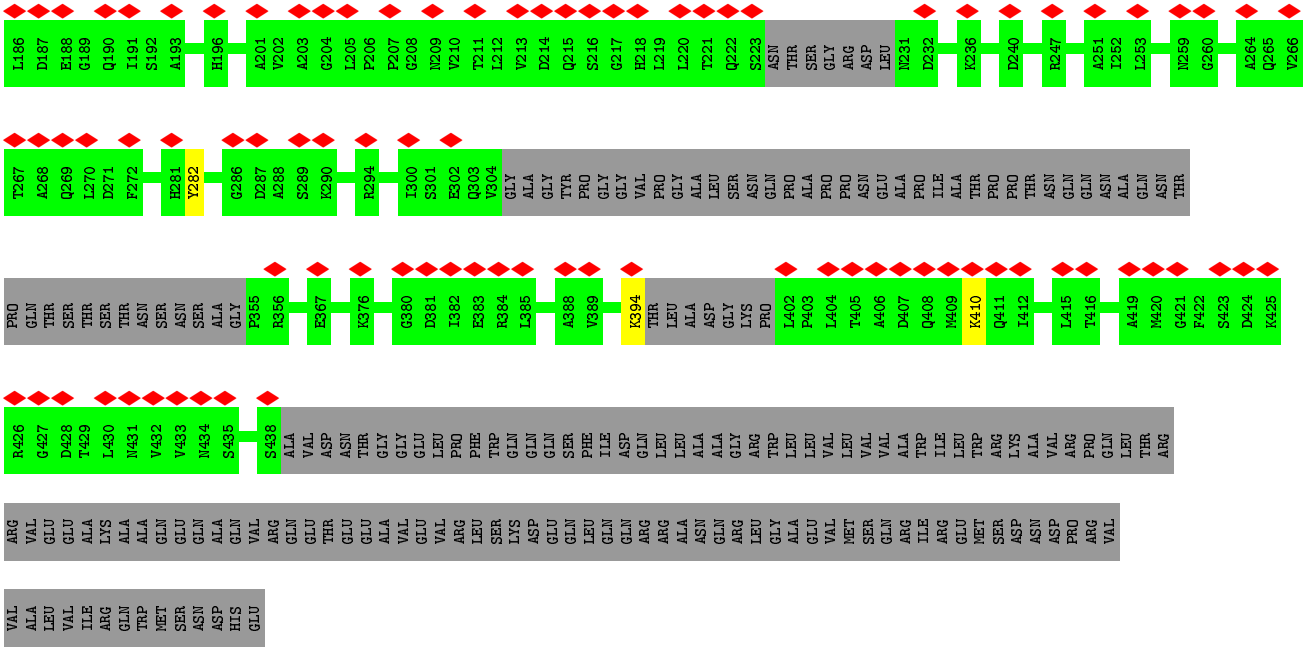


• Molecule 1: Flagellar M-ring protein

Chain O1:

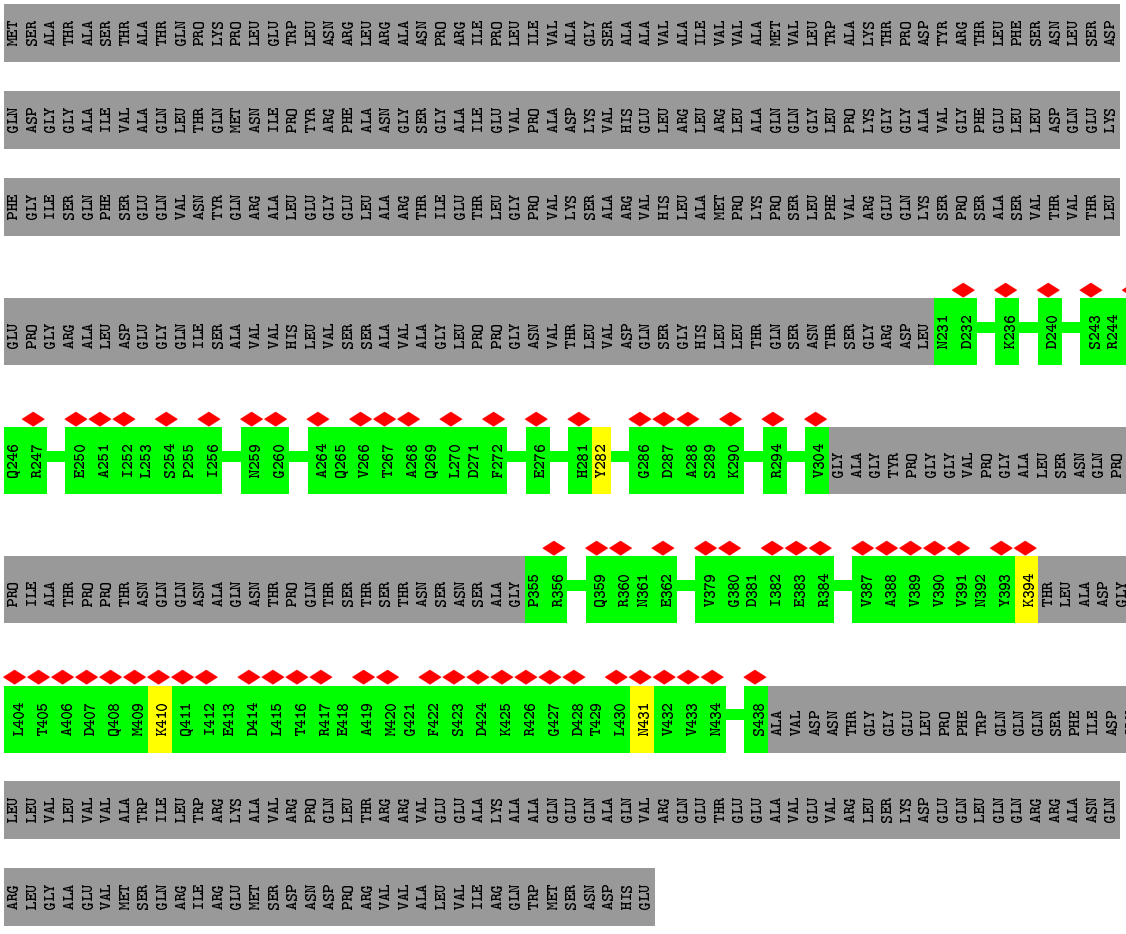






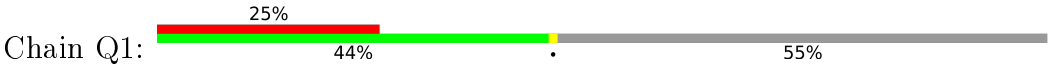
• Molecule 1: Flagellar M-ring protein

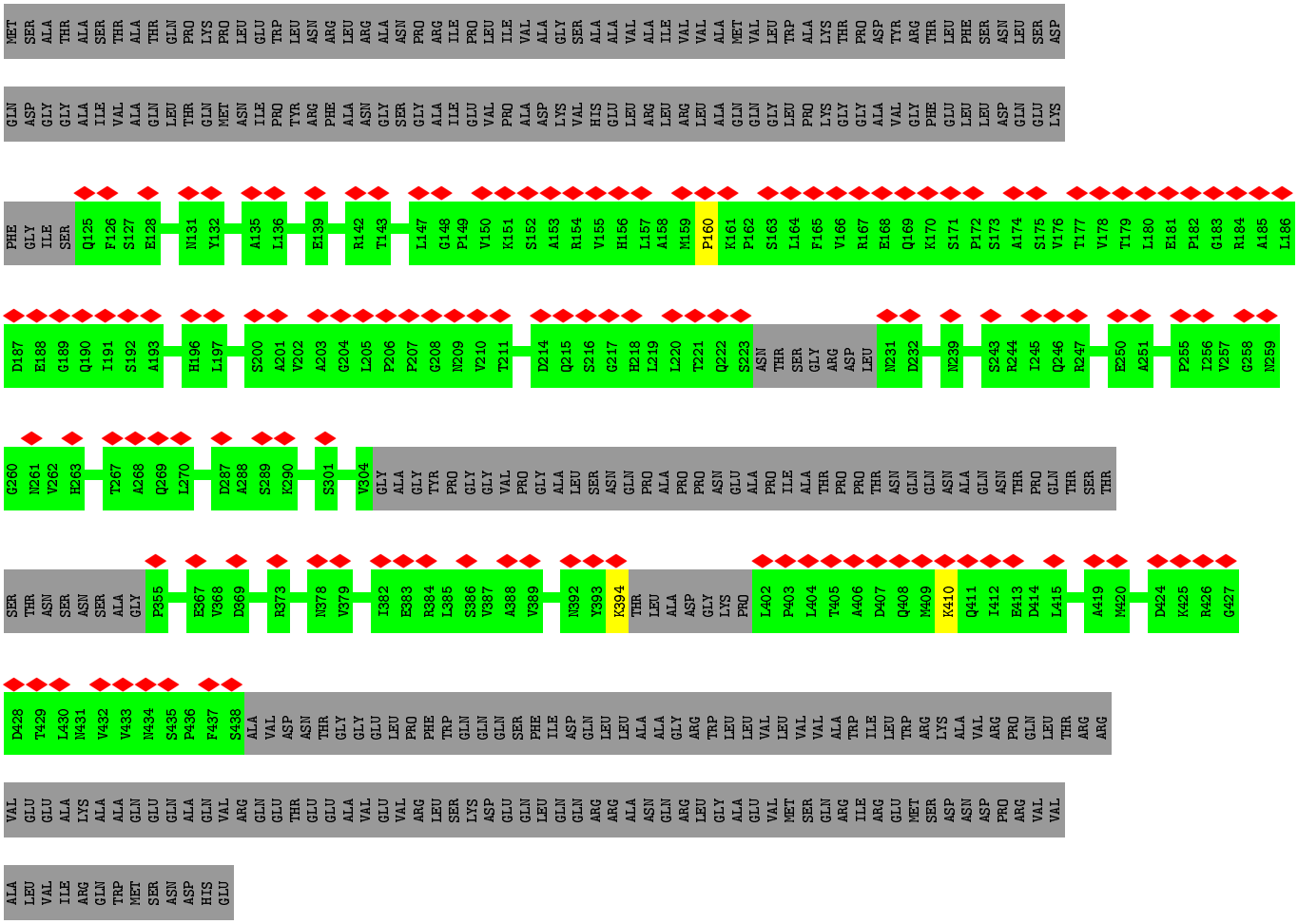
Chain P1:



- Molecule 1: Flagellar M-ring protein

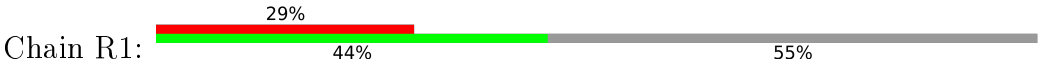
Chain Q1:

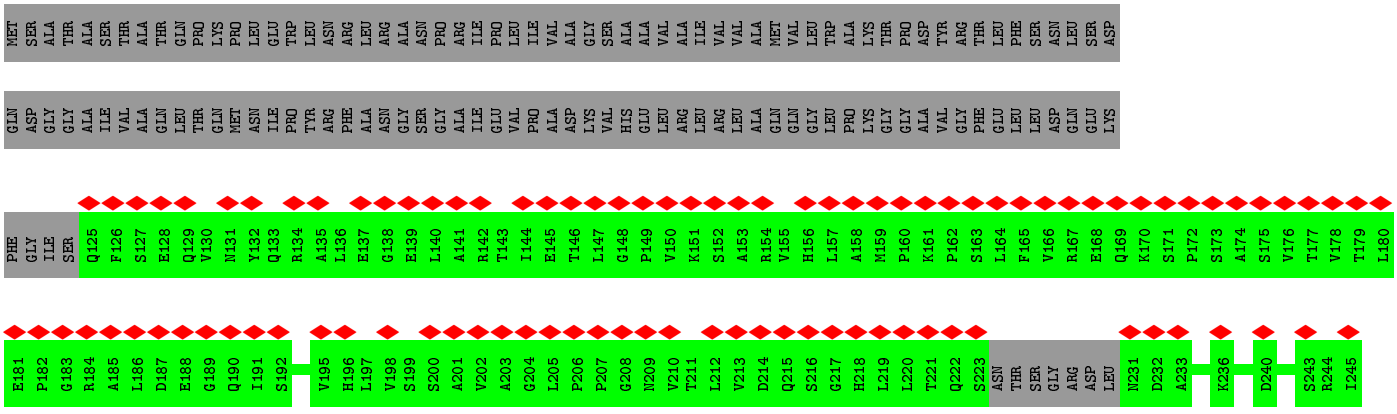


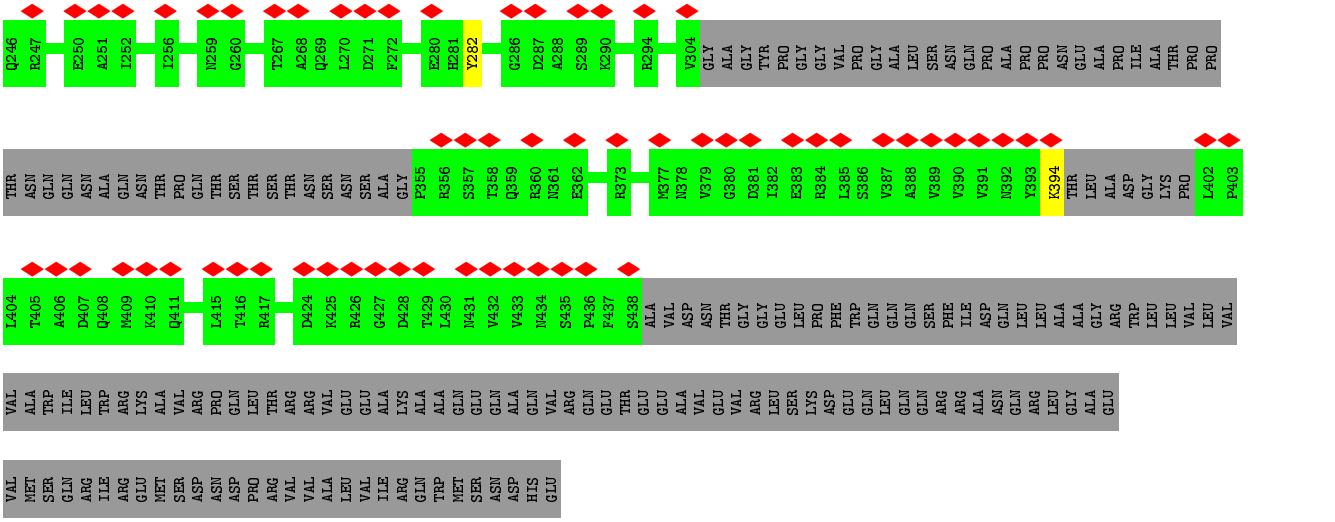


- Molecule 1: Flagellar M-ring protein

Chain R1:

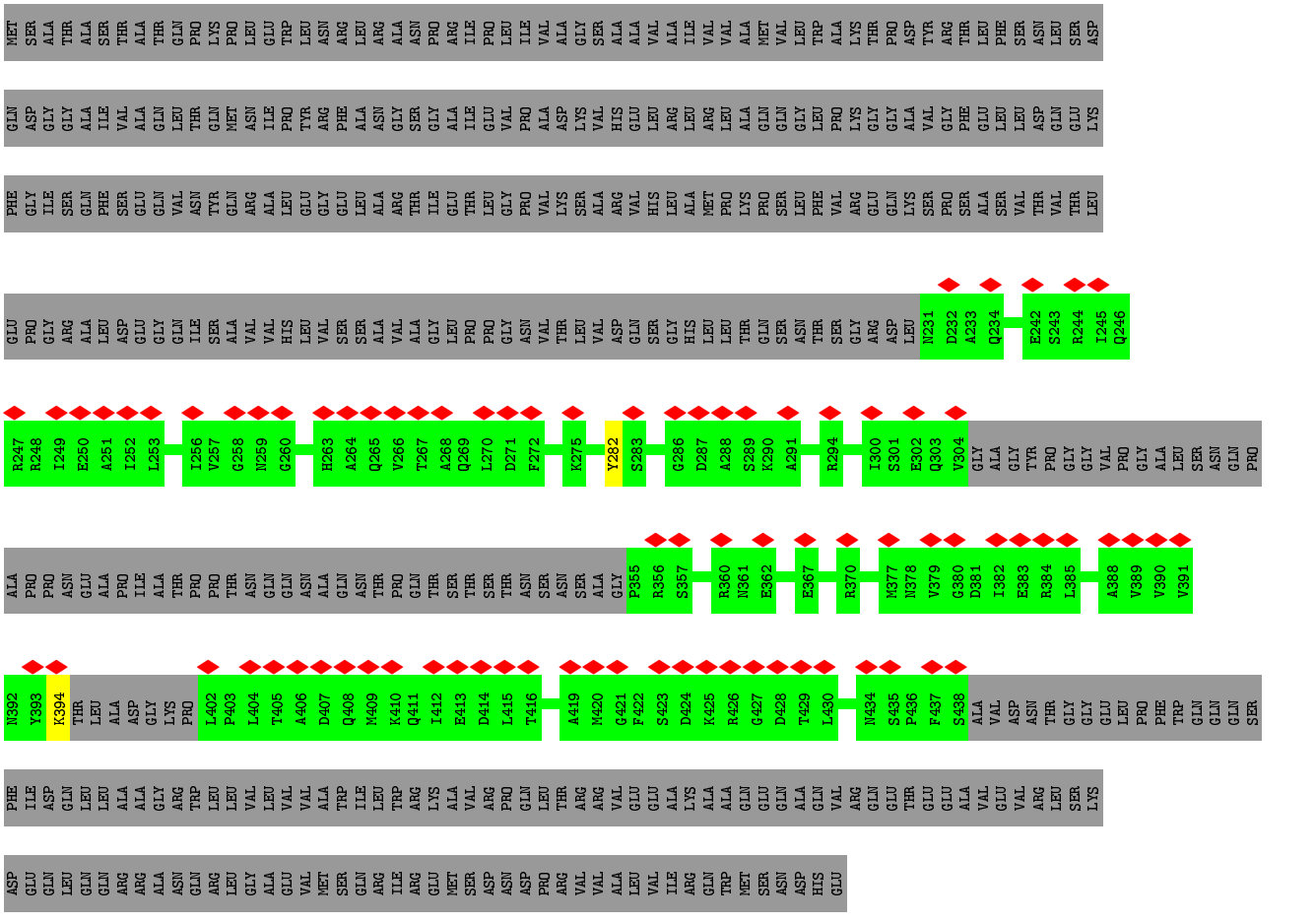






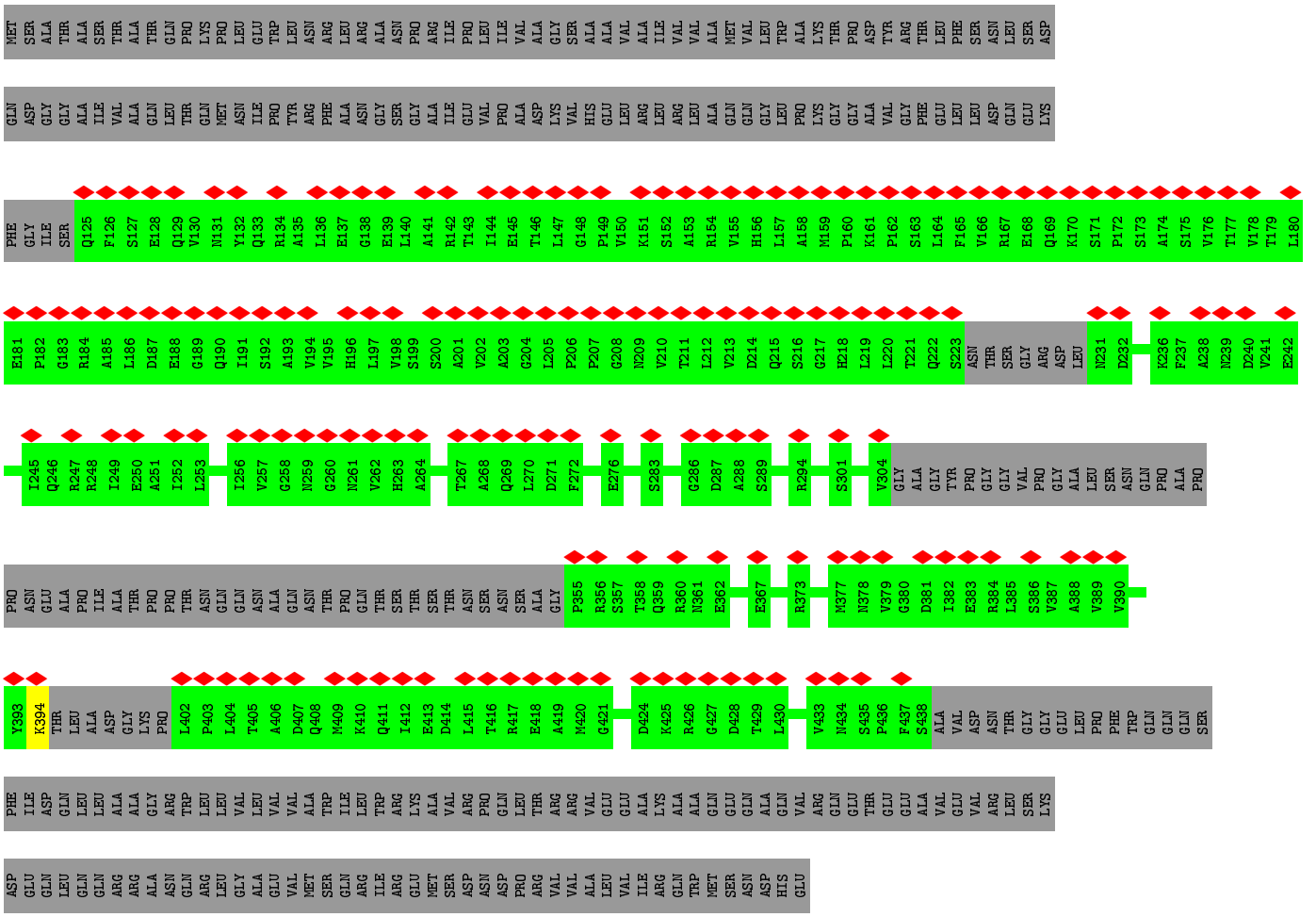
• Molecule 1: Flagellar M-ring protein

Chain S1:



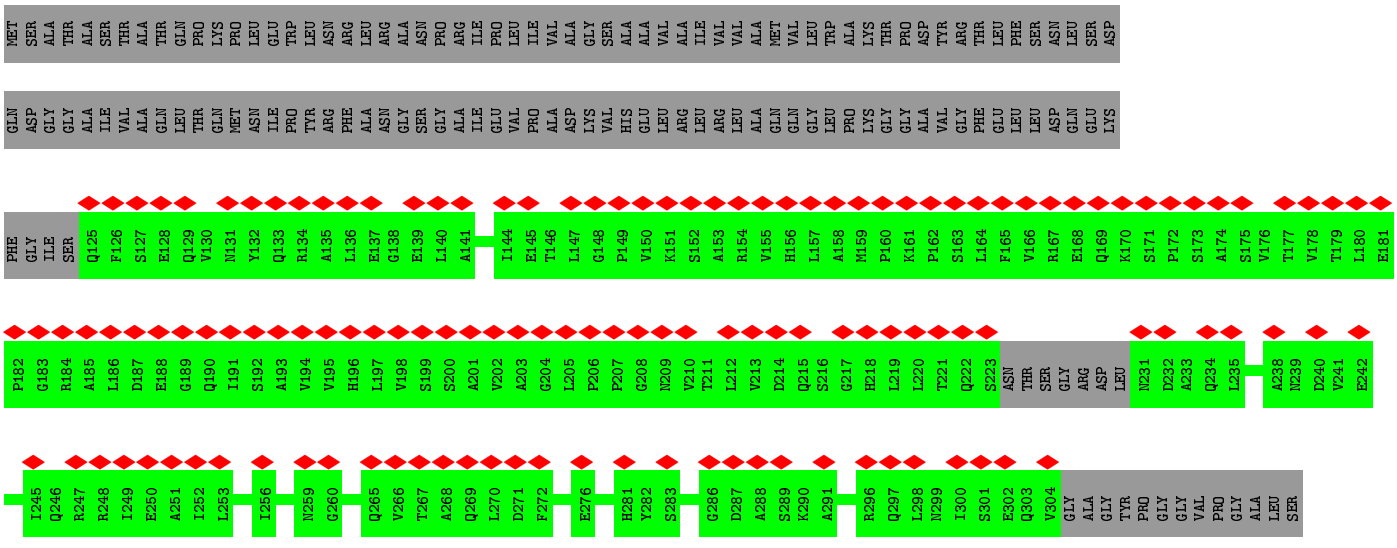
• Molecule 1: Flagellar M-ring protein

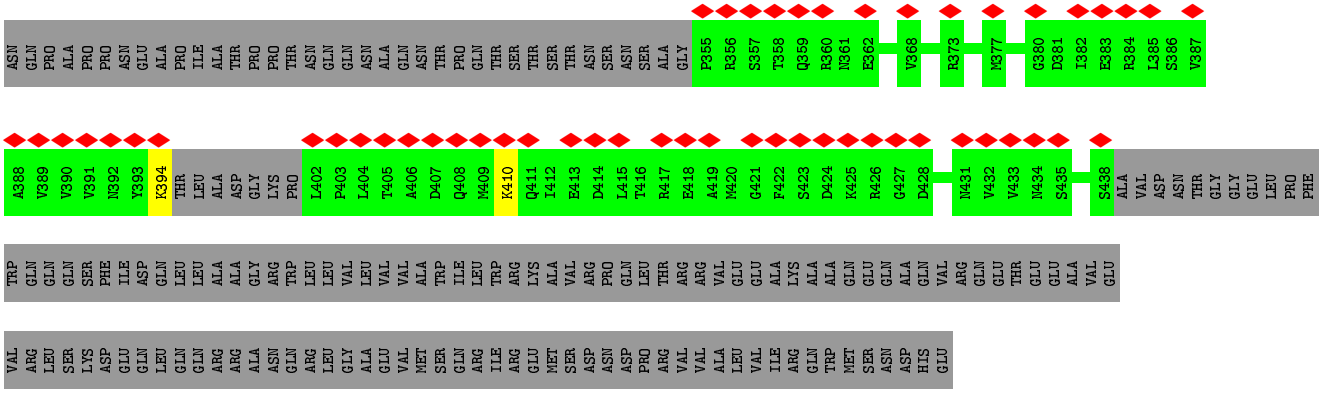
Chain T1:



• Molecule 1: Flagellar M-ring protein

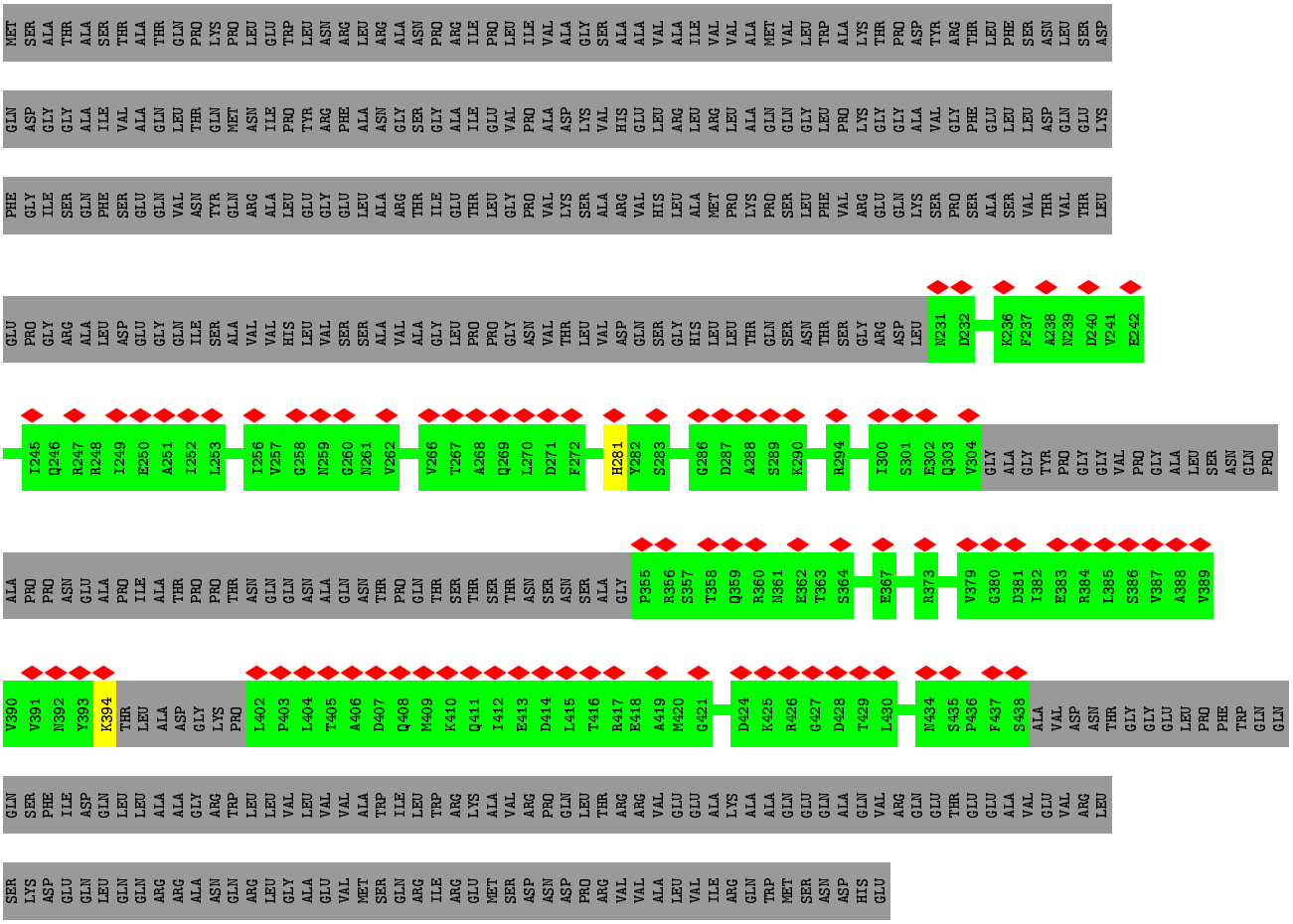
Chain U1:





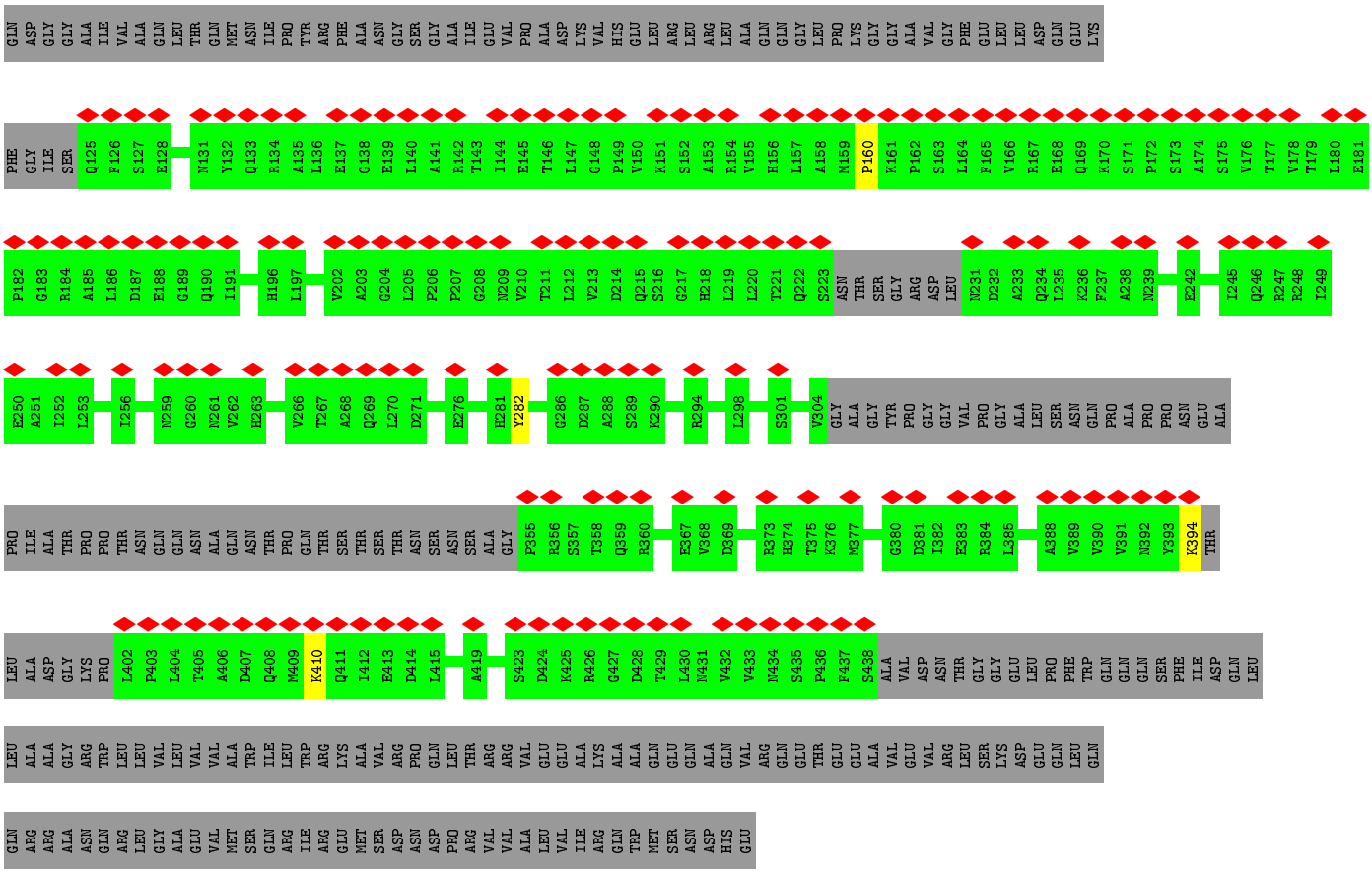
• Molecule 1: Flagellar M-ring protein

Chain V1:



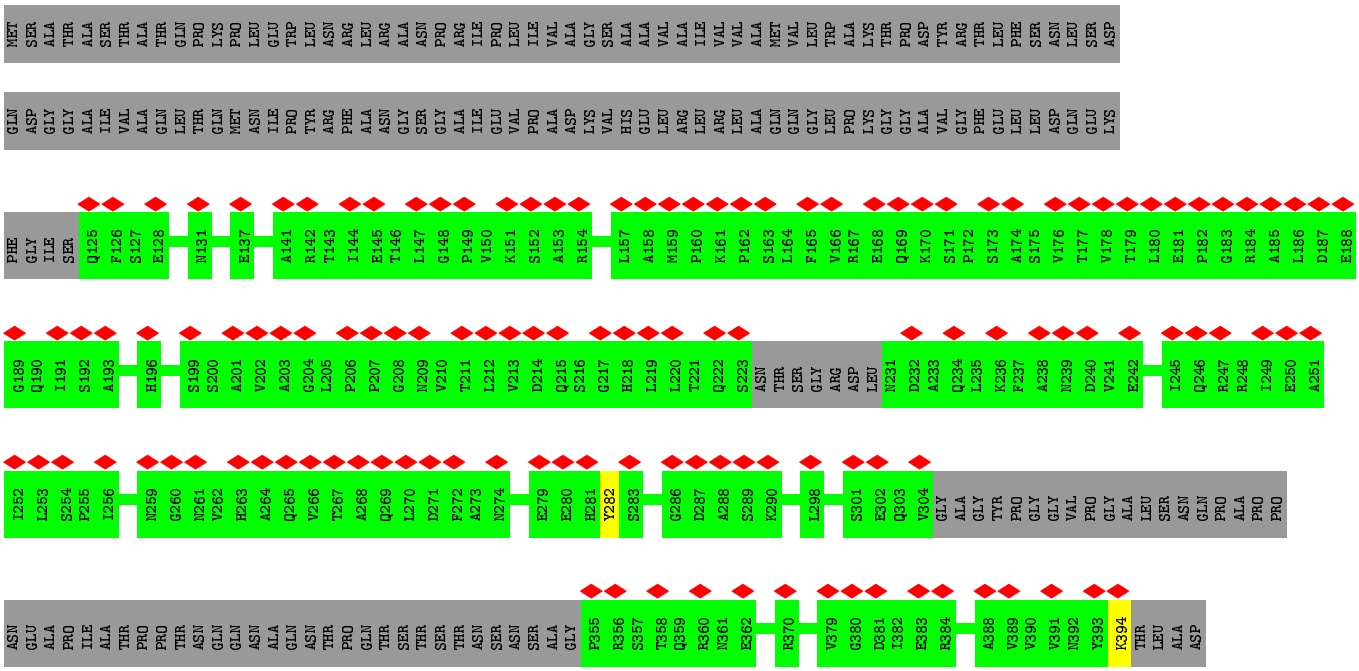
• Molecule 1: Flagellar M-ring protein

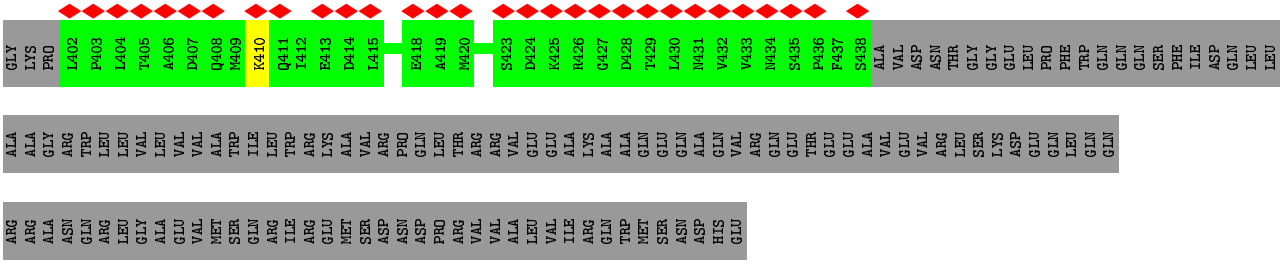
Chain W1:



• Molecule 1: Flagellar M-ring protein

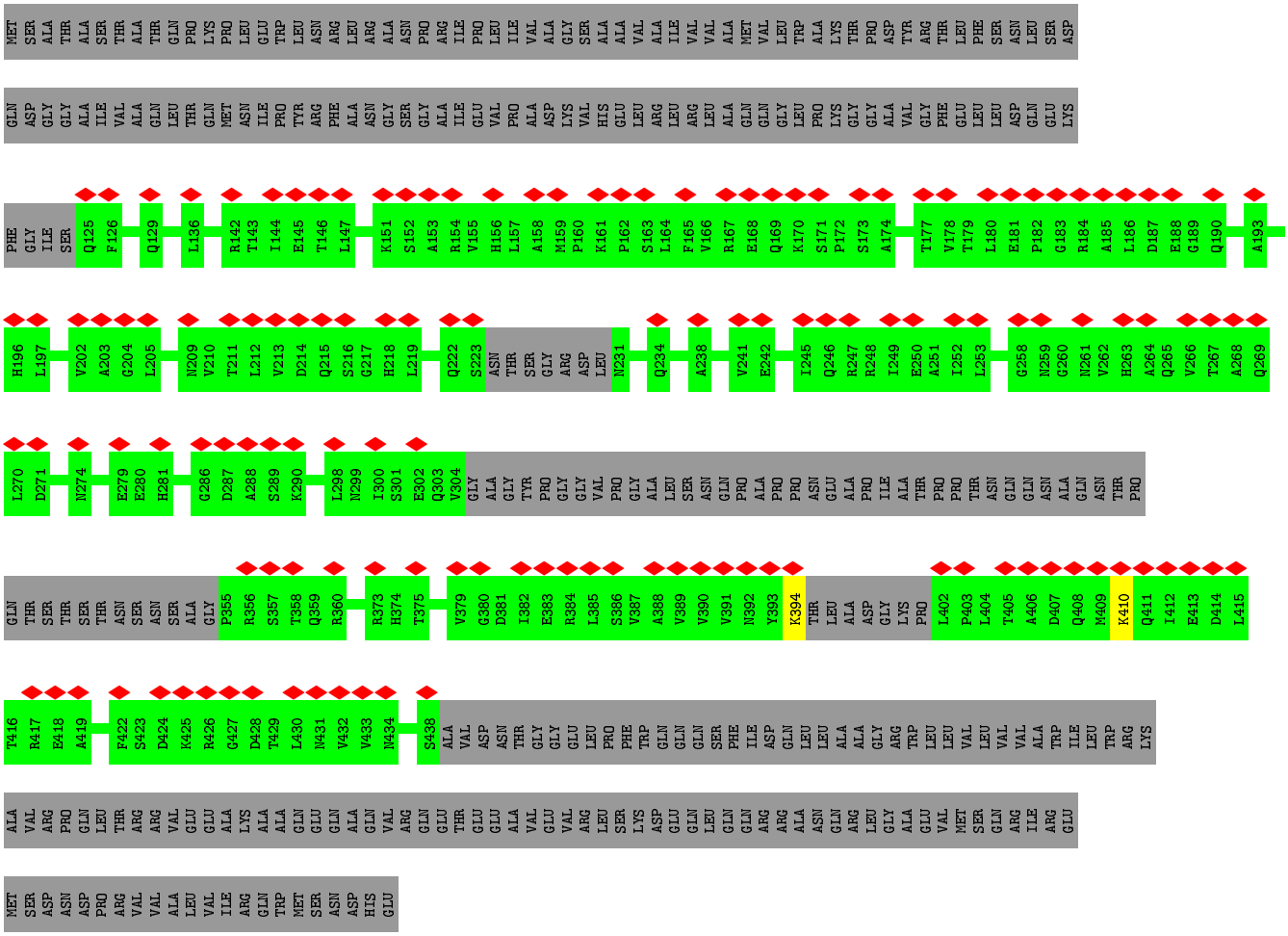
Chain X1:





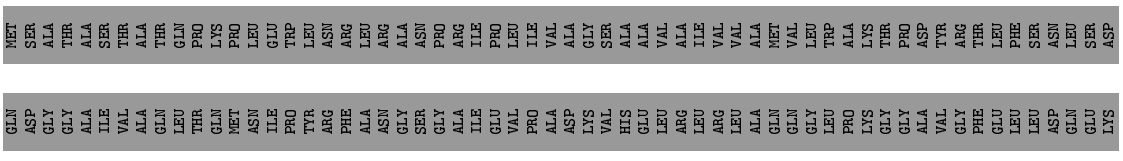
• Molecule 1: Flagellar M-ring protein

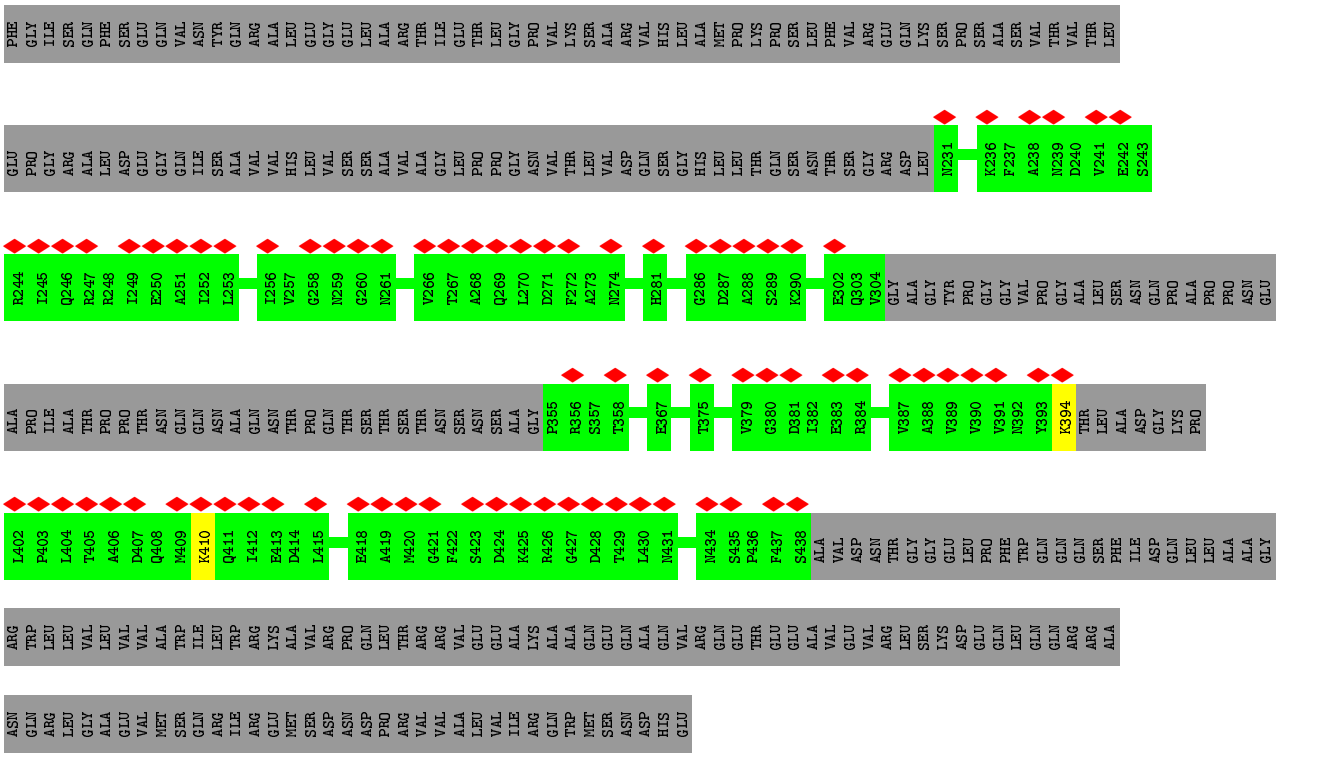
Chain Y1:



• Molecule 1: Flagellar M-ring protein

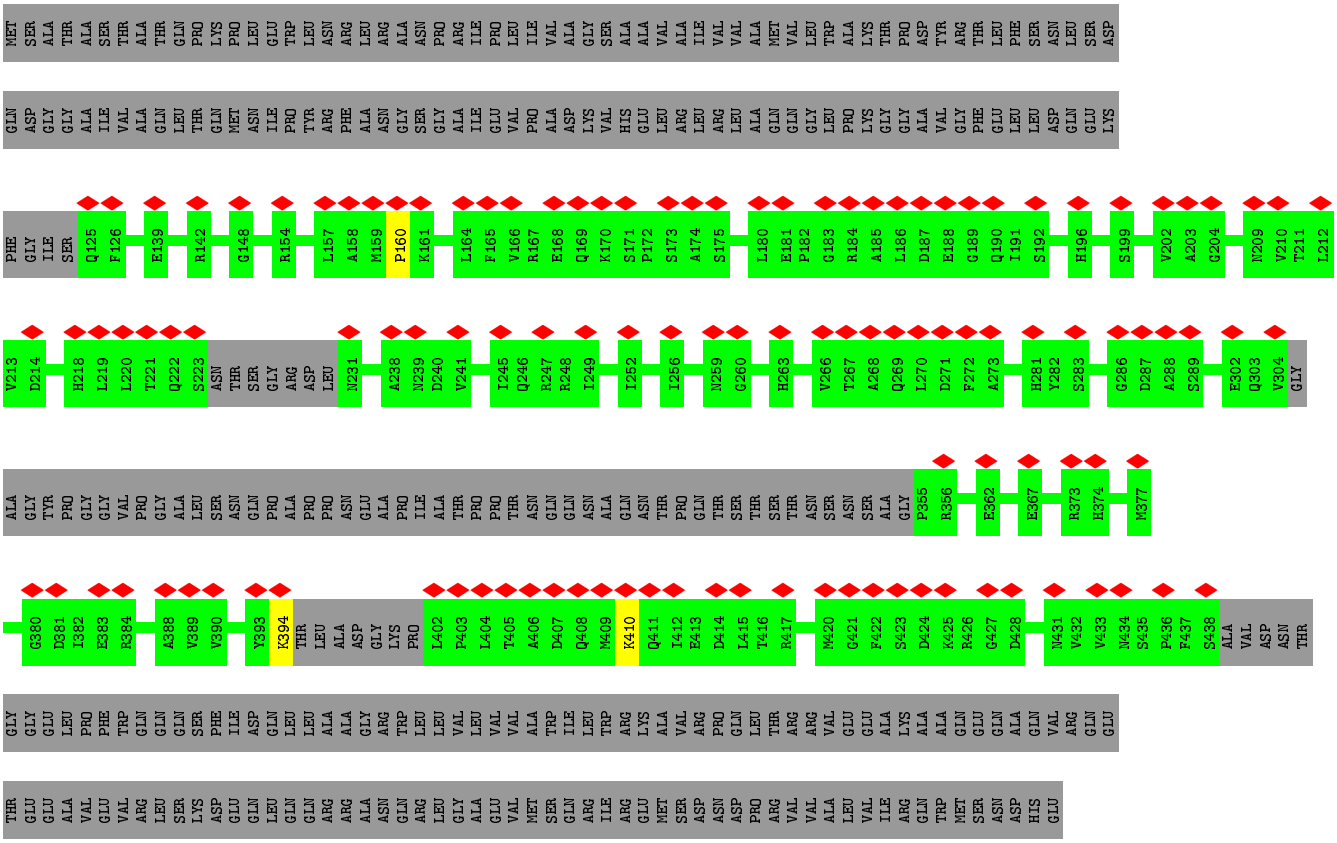
Chain Z1:





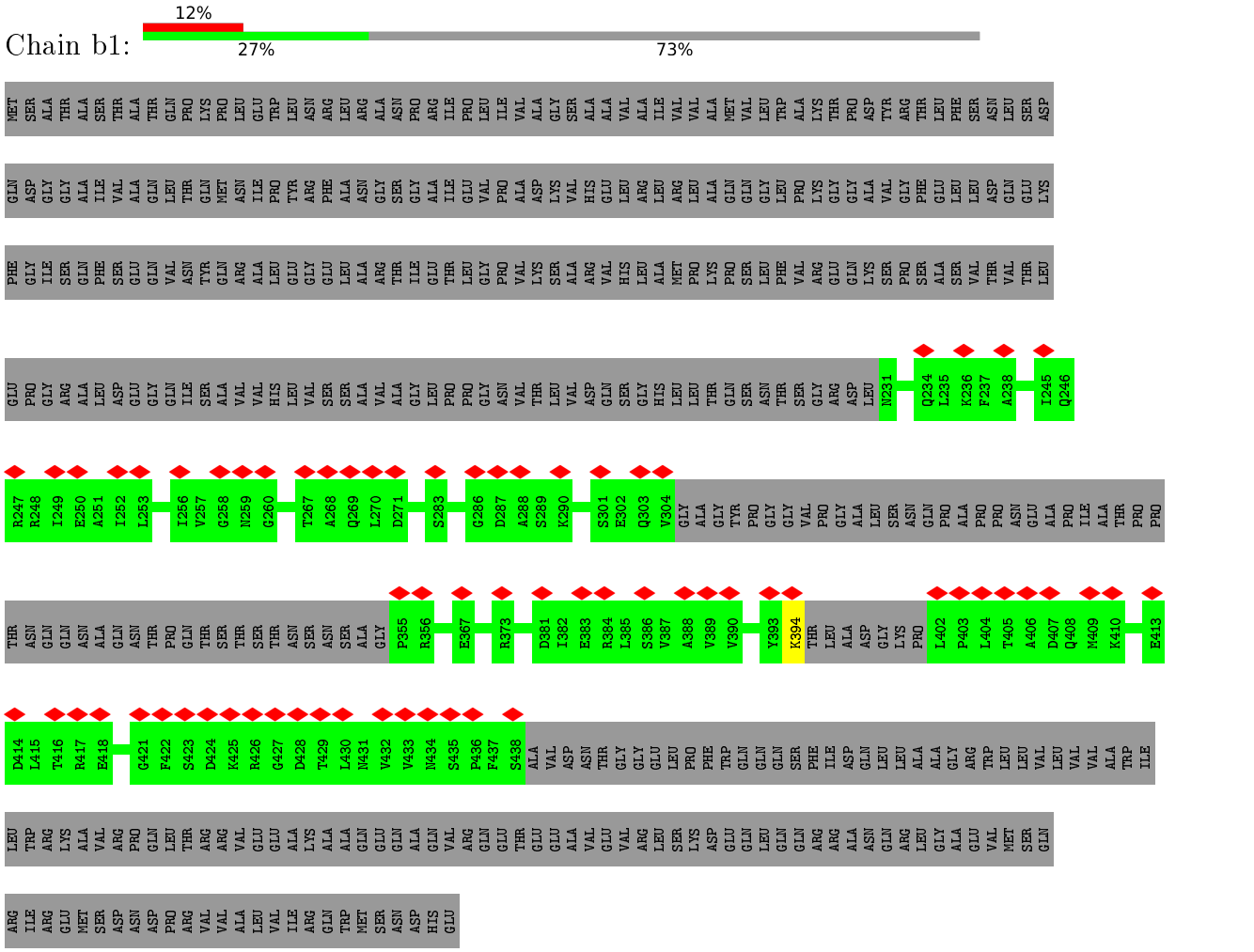
• Molecule 1: Flagellar M-ring protein

Chain a1:



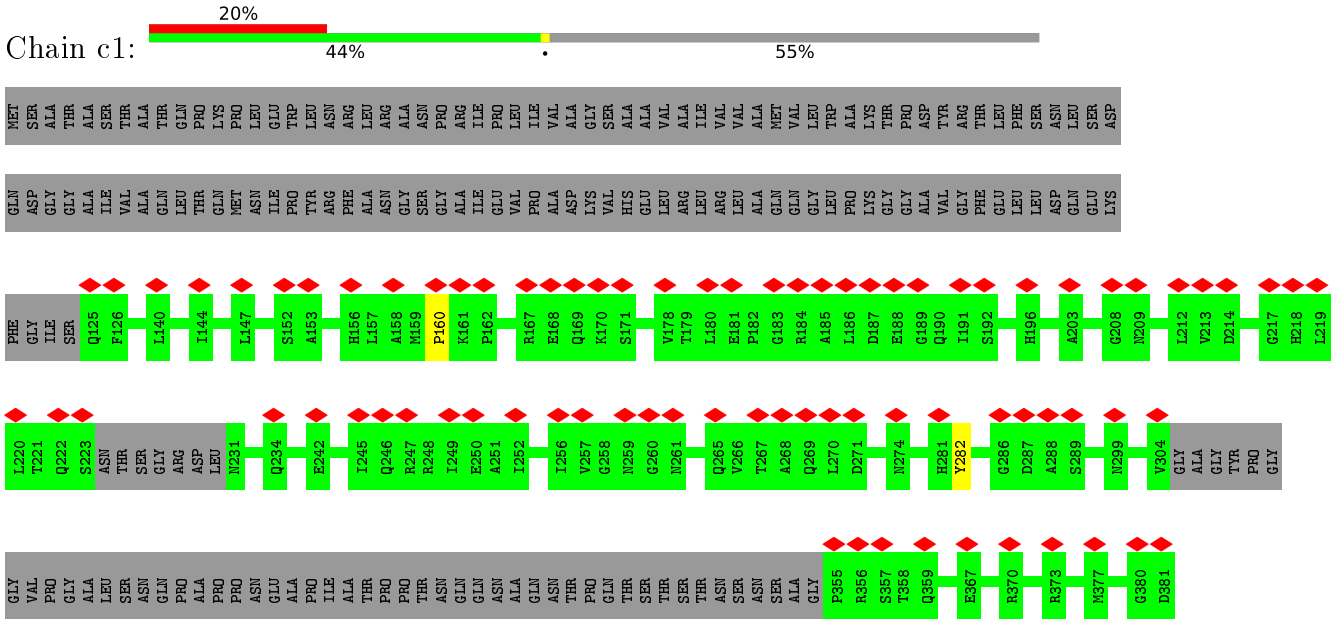
• Molecule 1: Flagellar M-ring protein

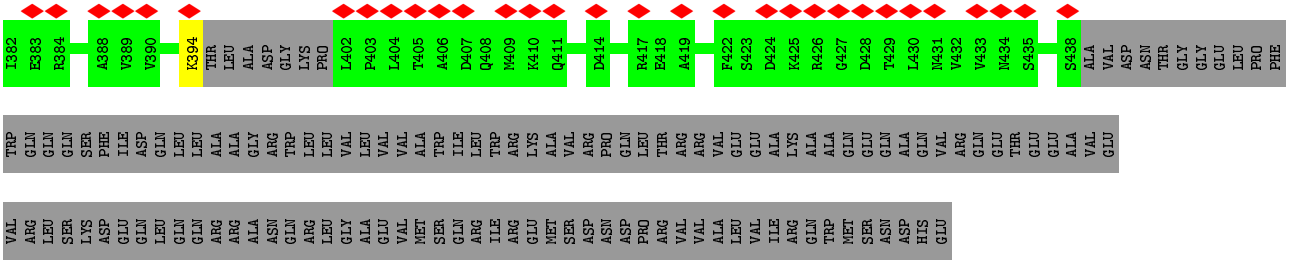
Chain b1:



• Molecule 1: Flagellar M-ring protein

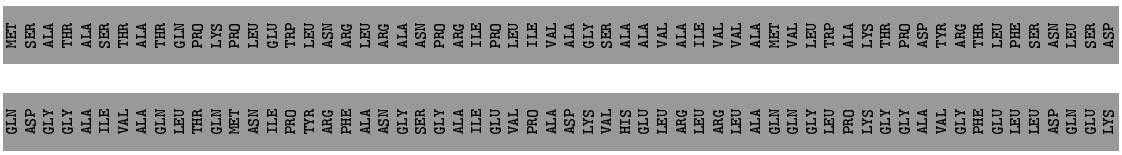
Chain c1:

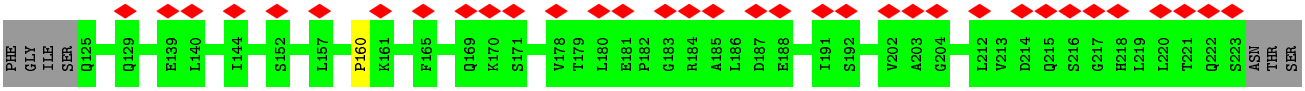


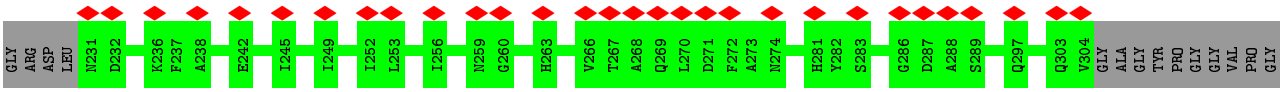


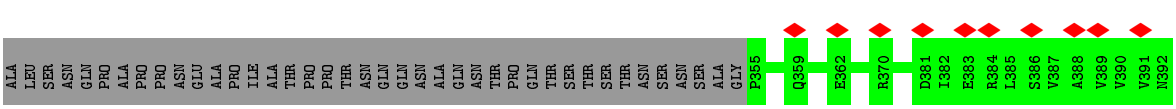
• Molecule 1: Flagellar M-ring protein

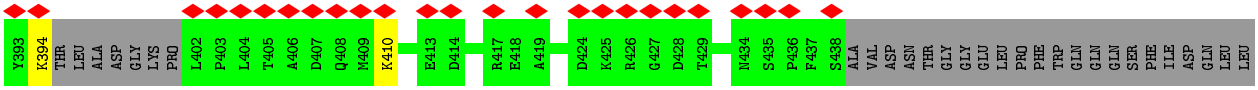
Chain d1:

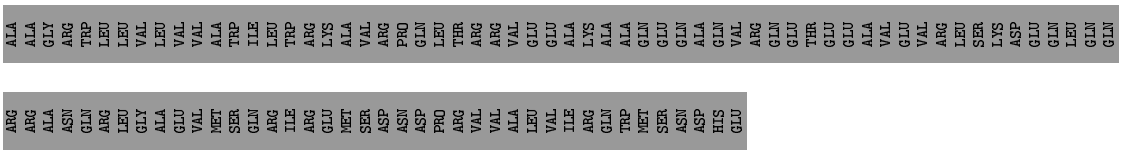






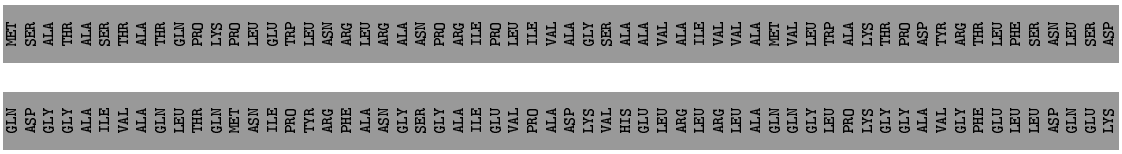


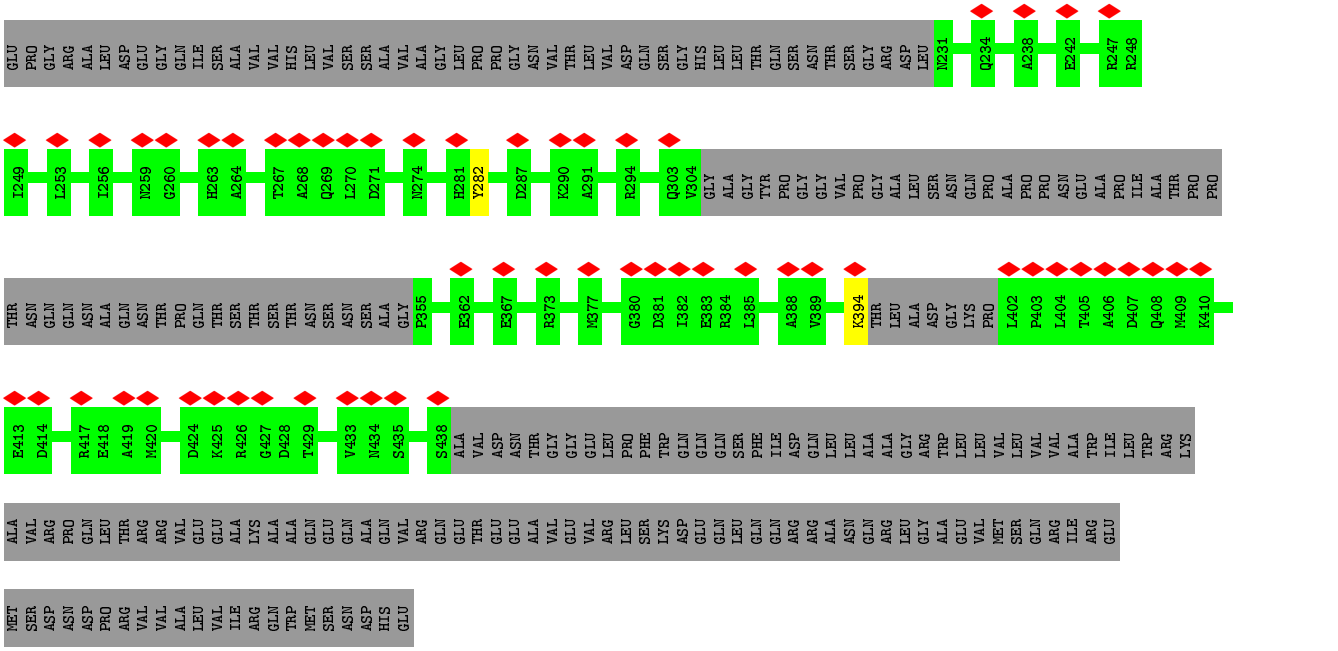




• Molecule 1: Flagellar M-ring protein

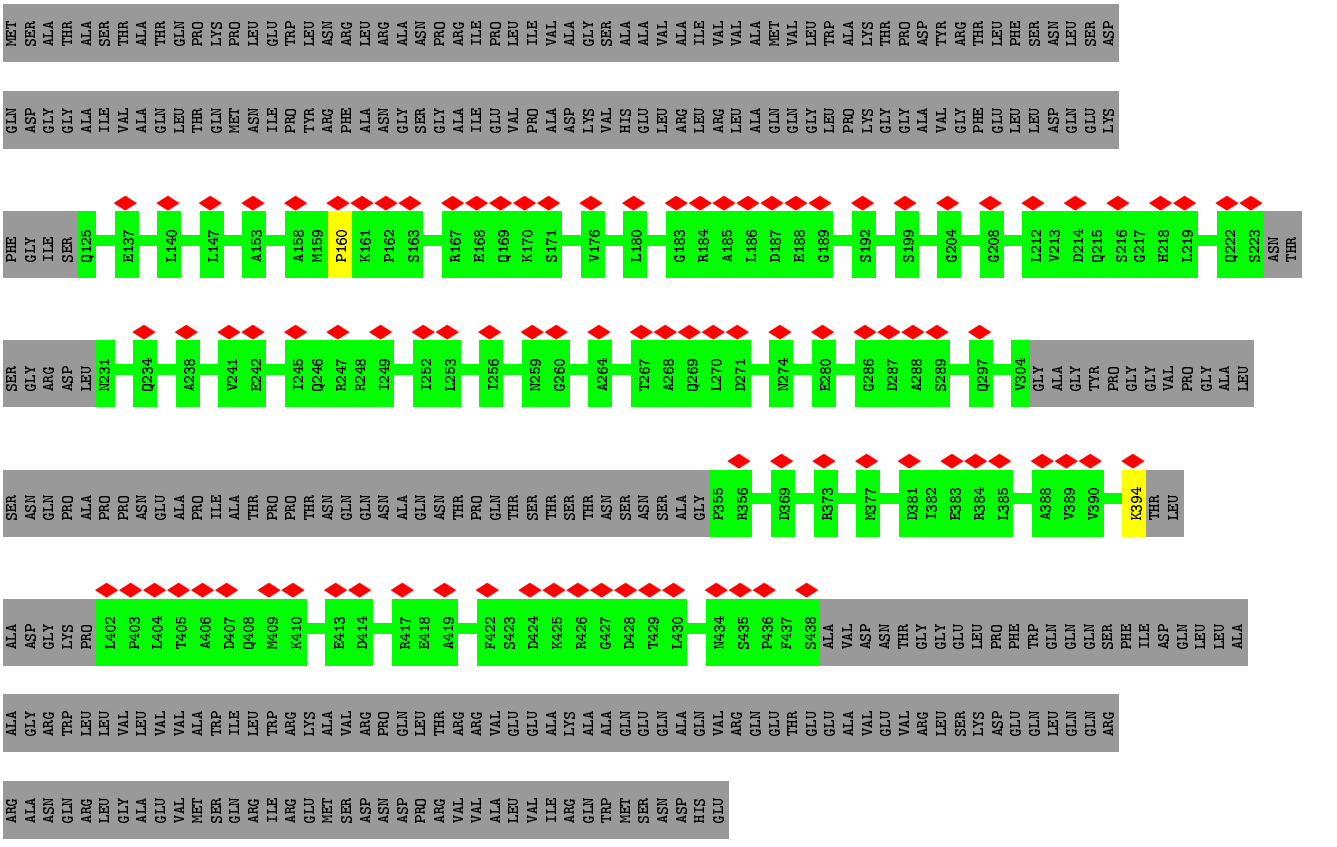
Chain e1:





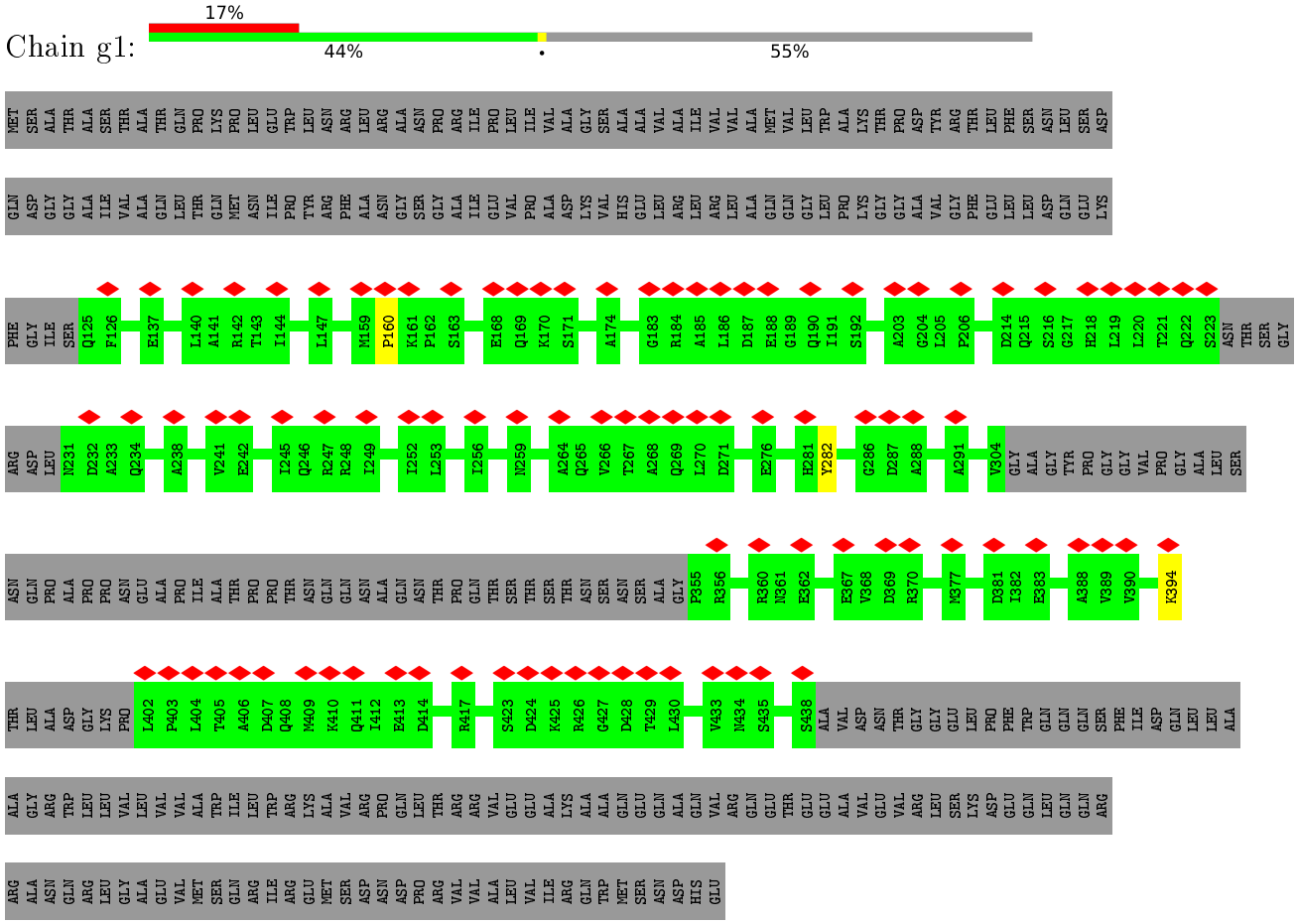
• Molecule 1: Flagellar M-ring protein

Chain f1:



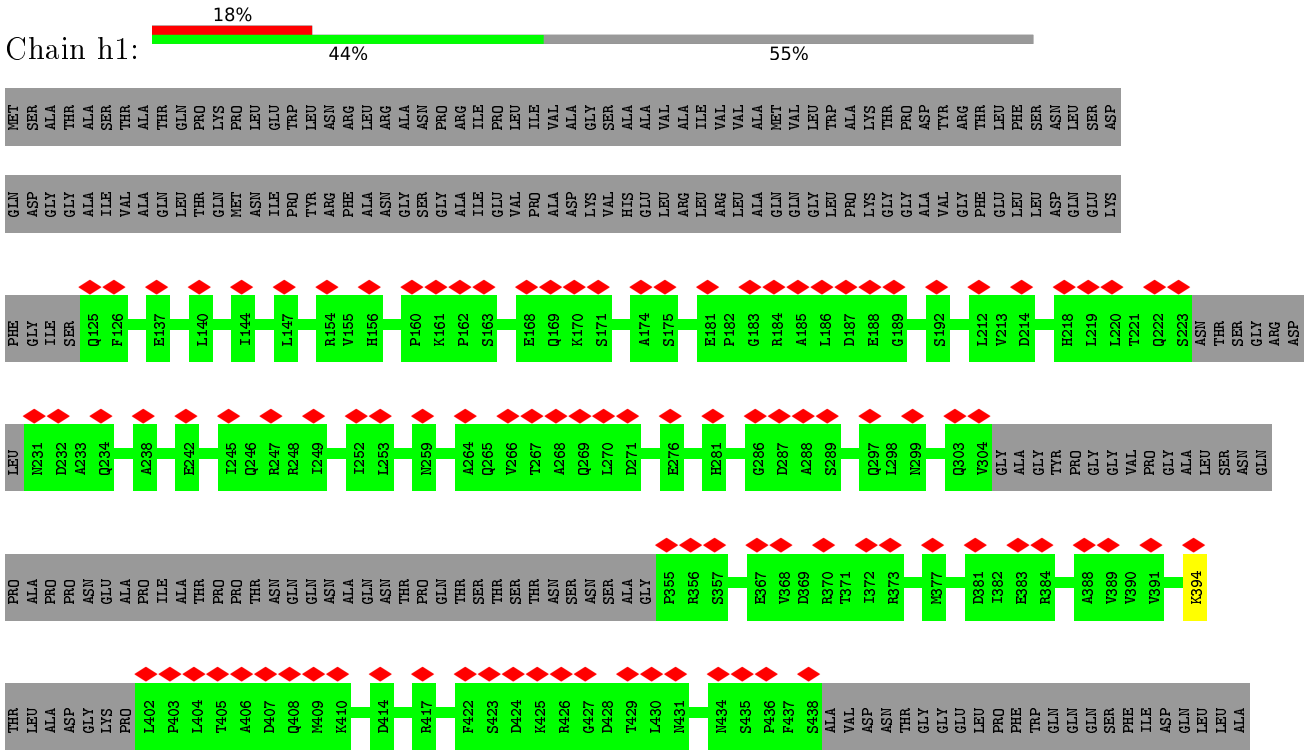
• Molecule 1: Flagellar M-ring protein

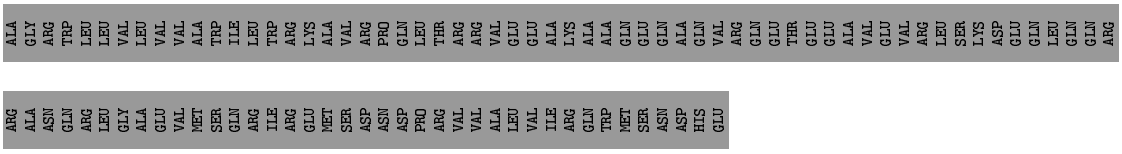
Chain g1:



• Molecule 1: Flagellar M-ring protein

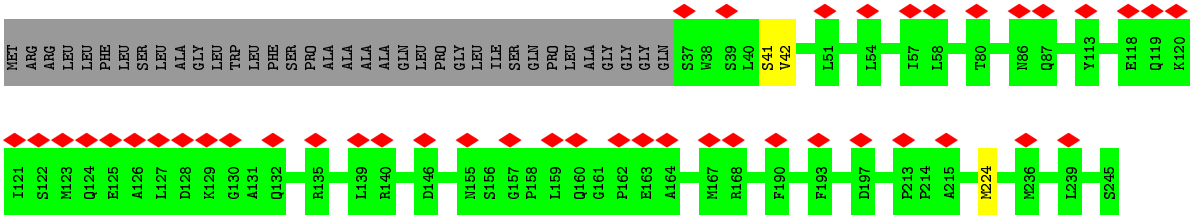
Chain h1:





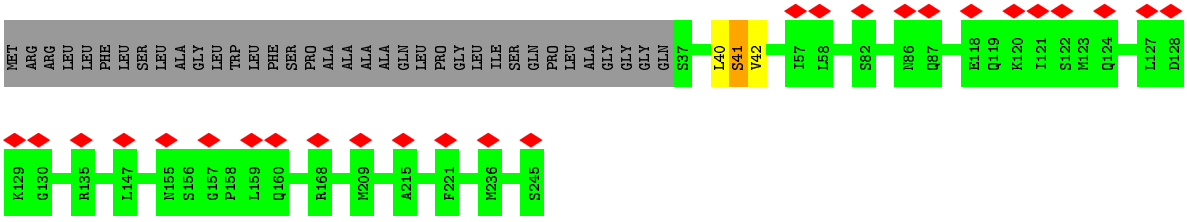
• Molecule 2: Flagellar biosynthetic protein FliP

Chain A2:



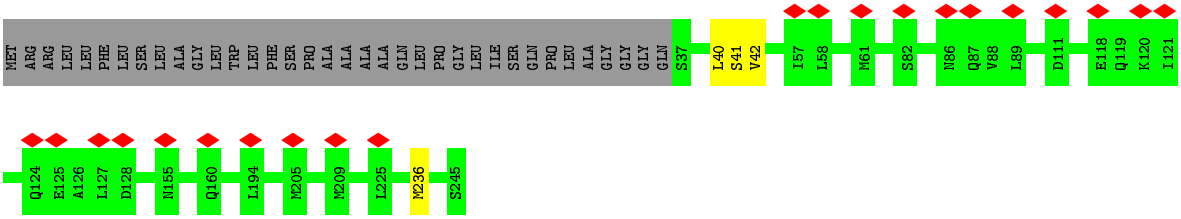
• Molecule 2: Flagellar biosynthetic protein FliP

Chain B2:



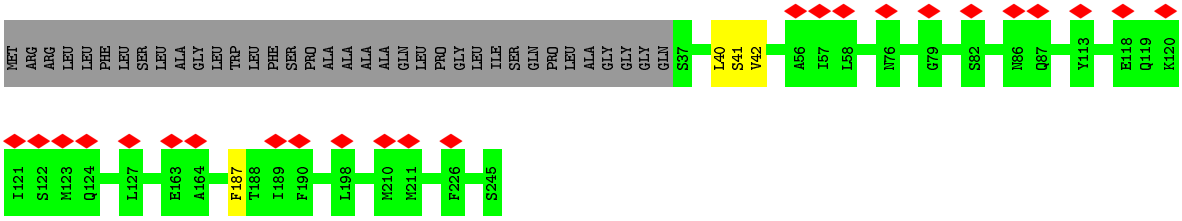
• Molecule 2: Flagellar biosynthetic protein FliP

Chain C2:



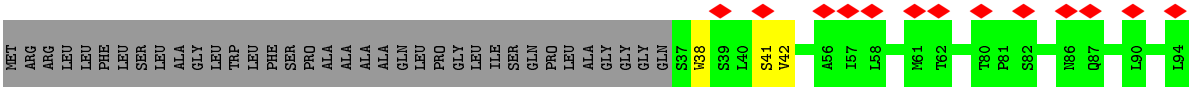
• Molecule 2: Flagellar biosynthetic protein FliP

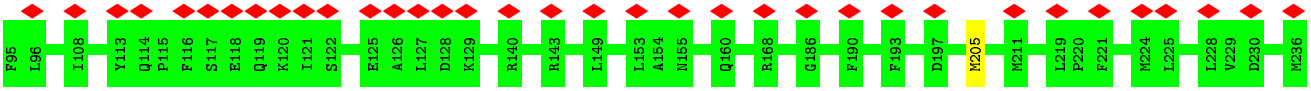
Chain D2:

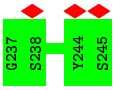


• Molecule 2: Flagellar biosynthetic protein FliP

Chain E2:

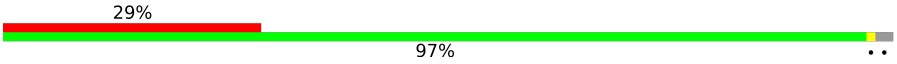


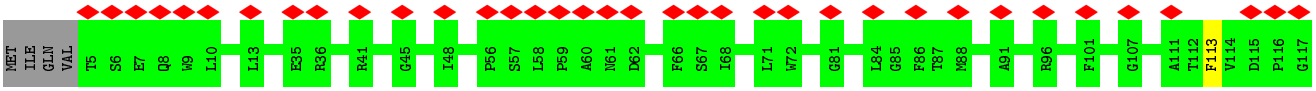


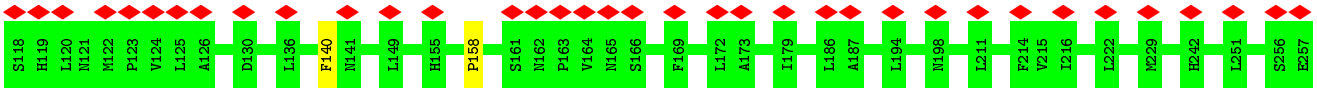


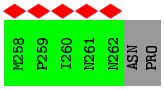
• Molecule 3: Flagellar biosynthetic protein FliR

Chain F2:



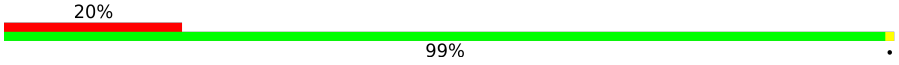


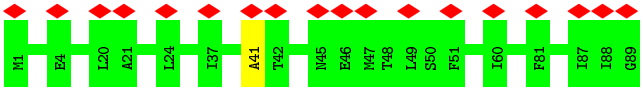




• Molecule 4: Flagellar biosynthetic protein FliQ

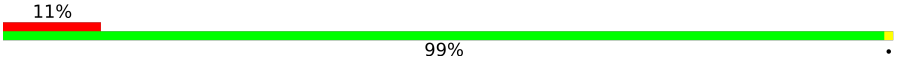
Chain G2:

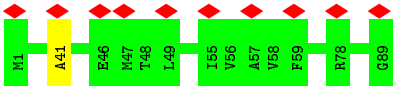




• Molecule 4: Flagellar biosynthetic protein FliQ

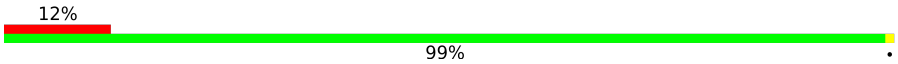
Chain H2:

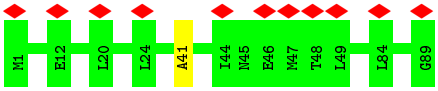




• Molecule 4: Flagellar biosynthetic protein FliQ

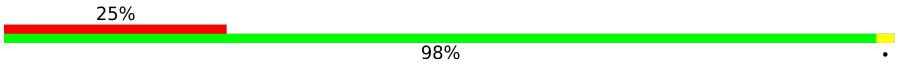
Chain I2:

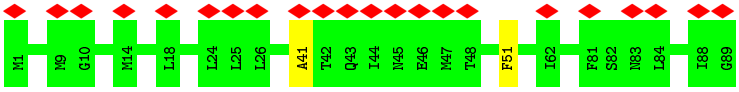




• Molecule 4: Flagellar biosynthetic protein FliQ

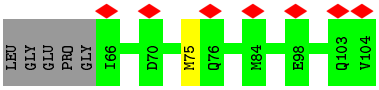
Chain J2:





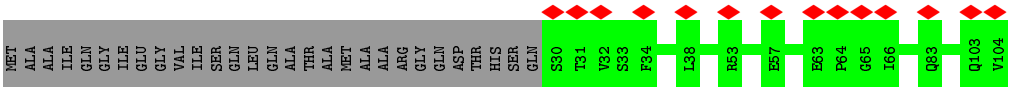
• Molecule 5: Flagellar hook-basal body complex protein FliE

Chain K2:



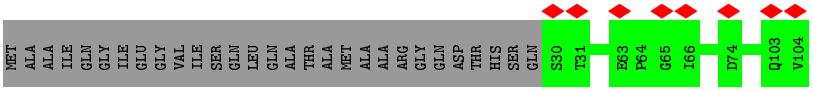
• Molecule 5: Flagellar hook-basal body complex protein FliE

Chain L2:



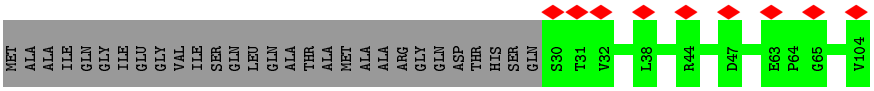
• Molecule 5: Flagellar hook-basal body complex protein FliE

Chain M2:



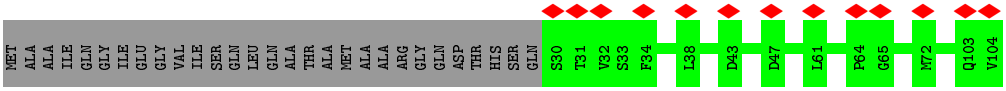
• Molecule 5: Flagellar hook-basal body complex protein FliE

Chain N2:

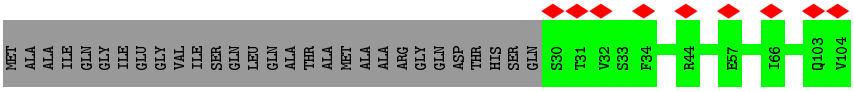


• Molecule 5: Flagellar hook-basal body complex protein FliE

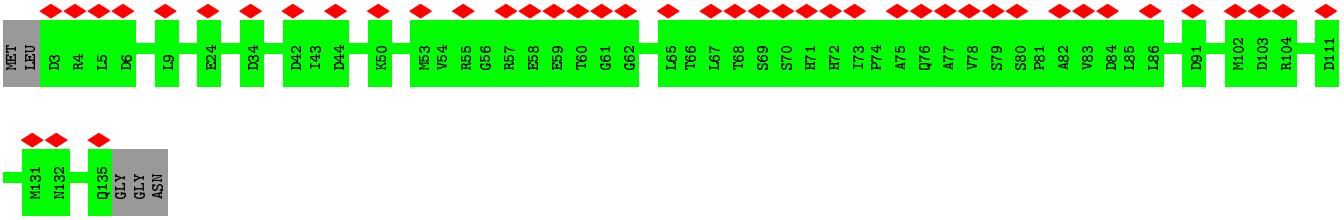
Chain O2:



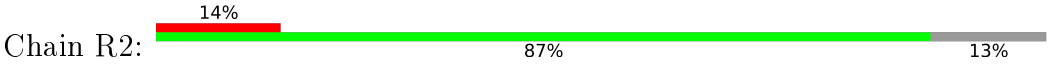
• Molecule 5: Flagellar hook-basal body complex protein FliE

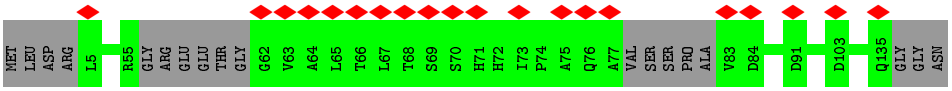


• Molecule 6: Flagellar basal body rod protein FlgB

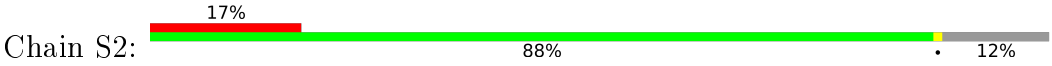


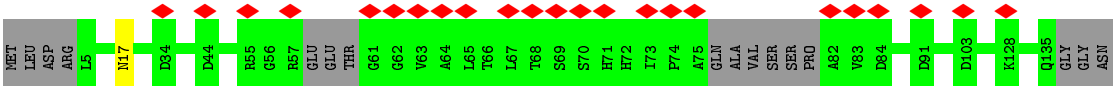
• Molecule 6: Flagellar basal body rod protein FlgB



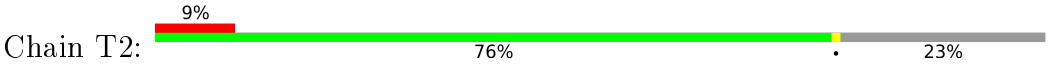


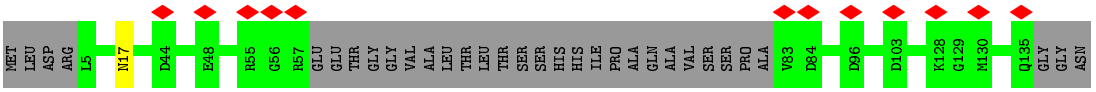
• Molecule 6: Flagellar basal body rod protein FlgB



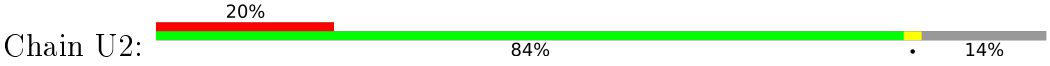


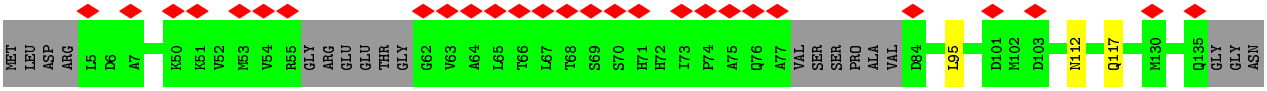
• Molecule 6: Flagellar basal body rod protein FlgB



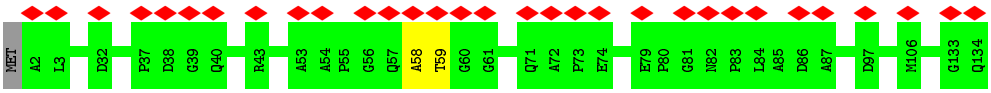


• Molecule 6: Flagellar basal body rod protein FlgB

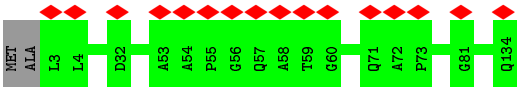




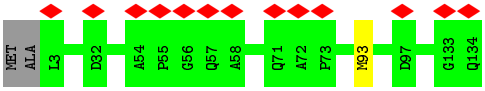
• Molecule 7: Flagellar basal-body rod protein FlgC



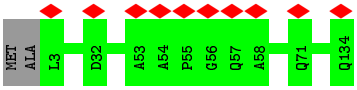
• Molecule 7: Flagellar basal-body rod protein FlgC



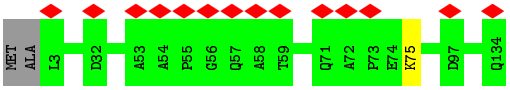
• Molecule 7: Flagellar basal-body rod protein FlgC



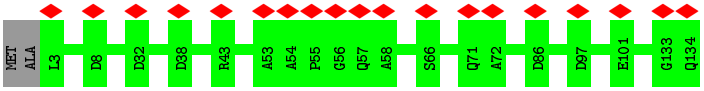
• Molecule 7: Flagellar basal-body rod protein FlgC



• Molecule 7: Flagellar basal-body rod protein FlgC

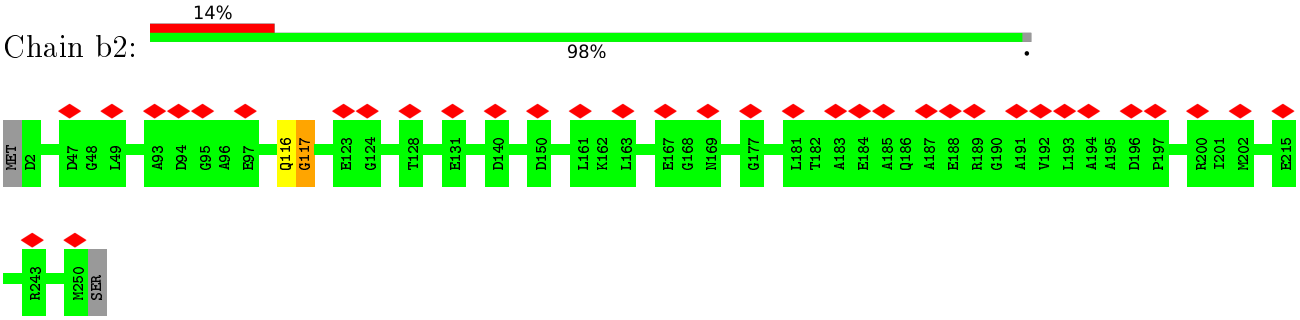


• Molecule 7: Flagellar basal-body rod protein FlgC



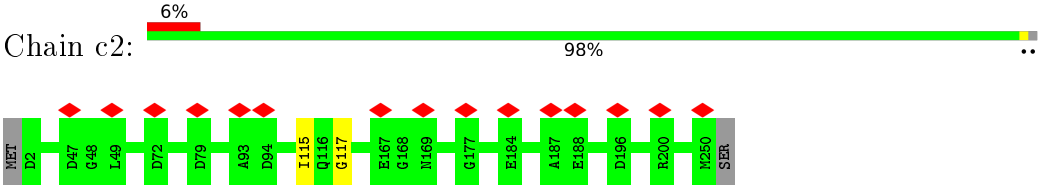
• Molecule 8: Flagellar basal body protein

Chain b2:



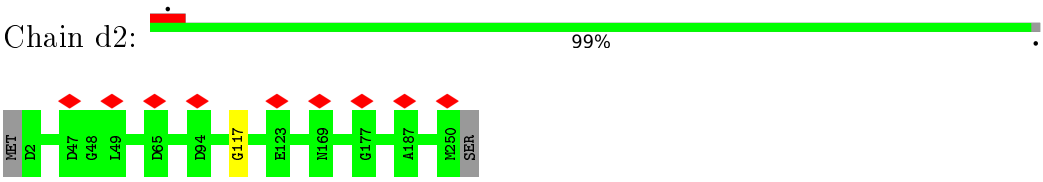
• Molecule 8: Flagellar basal body protein

Chain c2:



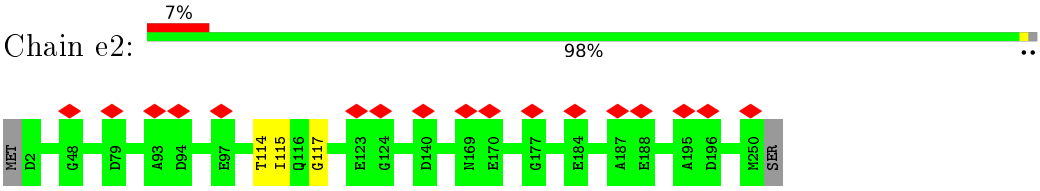
• Molecule 8: Flagellar basal body protein

Chain d2:



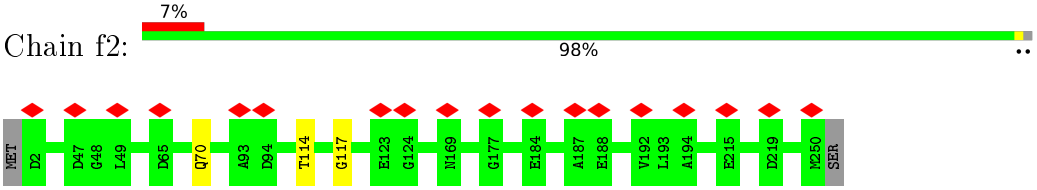
• Molecule 8: Flagellar basal body protein

Chain e2:



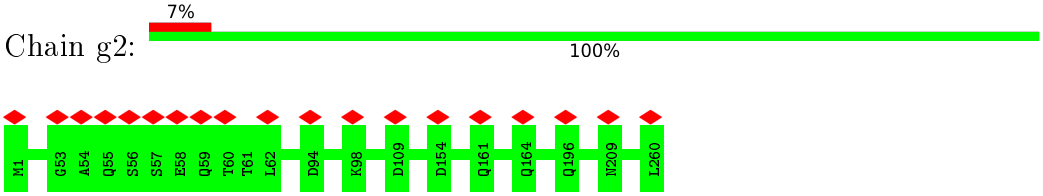
• Molecule 8: Flagellar basal body protein

Chain f2:



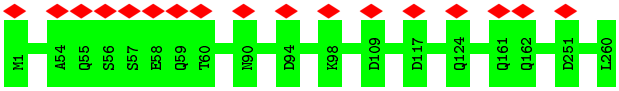
• Molecule 9: Flagellar basal-body rod protein FlgG

Chain g2:



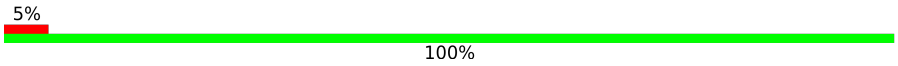
• Molecule 9: Flagellar basal-body rod protein FlgG

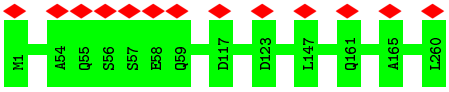
Chain h2:



• Molecule 9: Flagellar basal-body rod protein FlgG

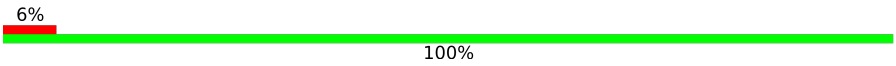
Chain i2:

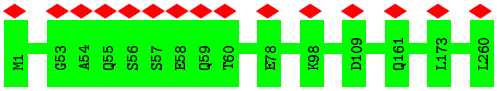




• Molecule 9: Flagellar basal-body rod protein FlgG

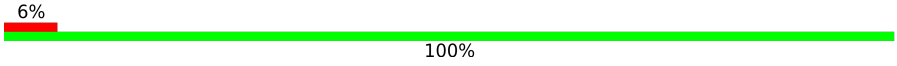
Chain j2:

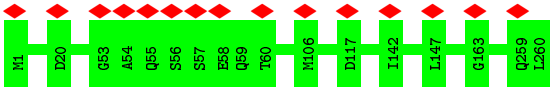




• Molecule 9: Flagellar basal-body rod protein FlgG

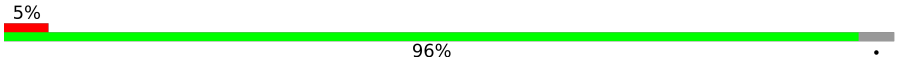
Chain k2:

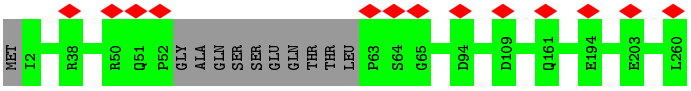




• Molecule 9: Flagellar basal-body rod protein FlgG

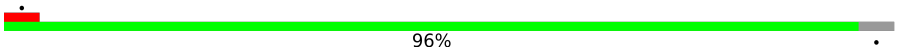
Chain l2:

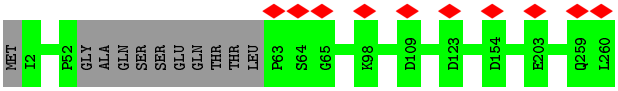




• Molecule 9: Flagellar basal-body rod protein FlgG

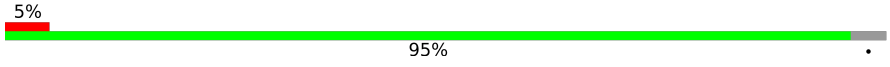
Chain m2:

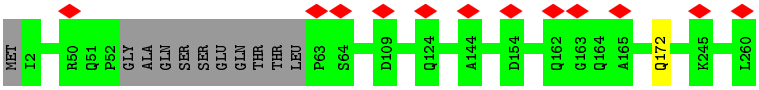




• Molecule 9: Flagellar basal-body rod protein FlgG

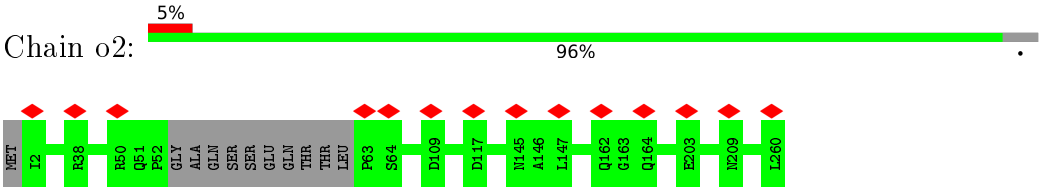
Chain n2:





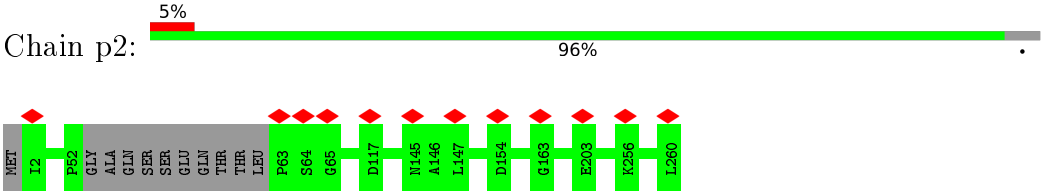
• Molecule 9: Flagellar basal-body rod protein FlgG

Chain o2:



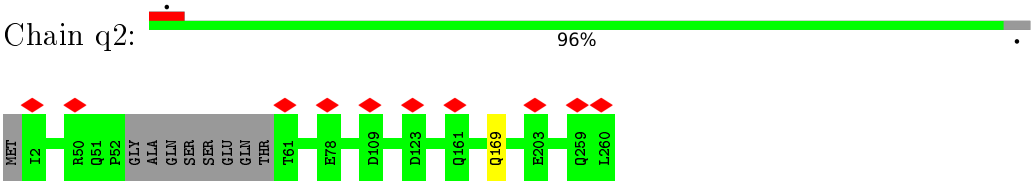
• Molecule 9: Flagellar basal-body rod protein FlgG

Chain p2:



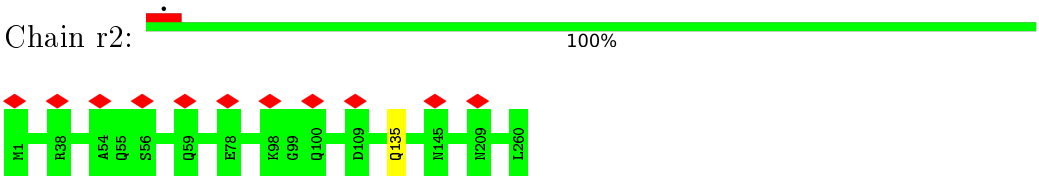
• Molecule 9: Flagellar basal-body rod protein FlgG

Chain q2:



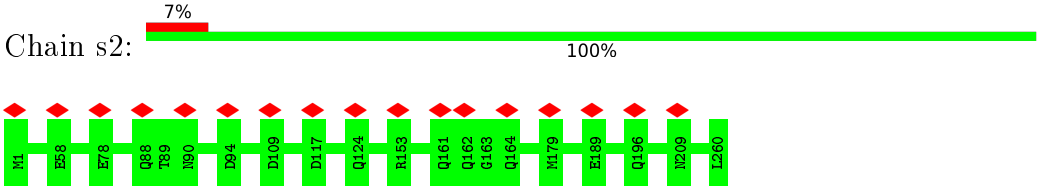
• Molecule 9: Flagellar basal-body rod protein FlgG

Chain r2:



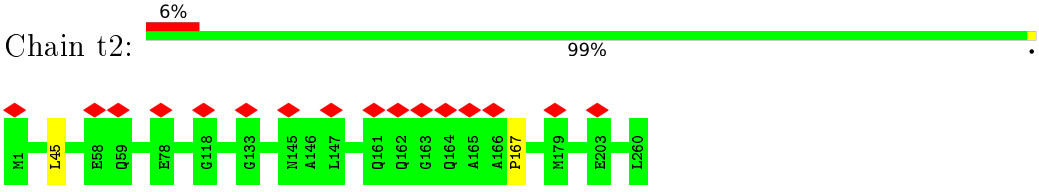
• Molecule 9: Flagellar basal-body rod protein FlgG

Chain s2:



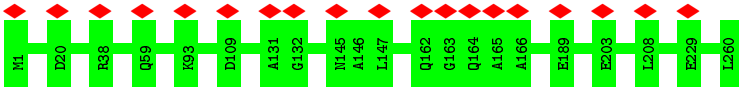
• Molecule 9: Flagellar basal-body rod protein FlgG

Chain t2:

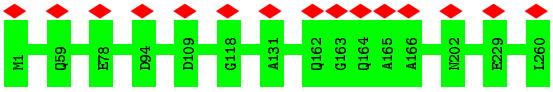


• Molecule 9: Flagellar basal-body rod protein FlgG

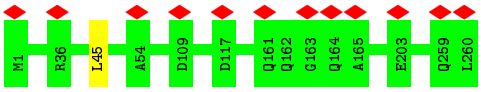
Chain u2:



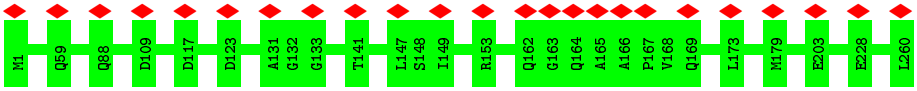
• Molecule 9: Flagellar basal-body rod protein FlgG



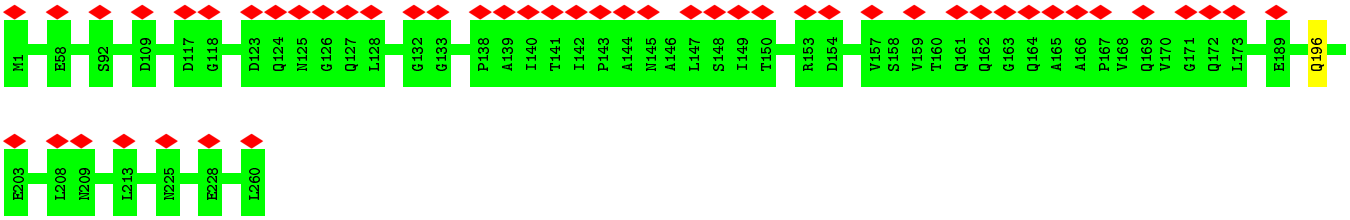
• Molecule 9: Flagellar basal-body rod protein FlgG



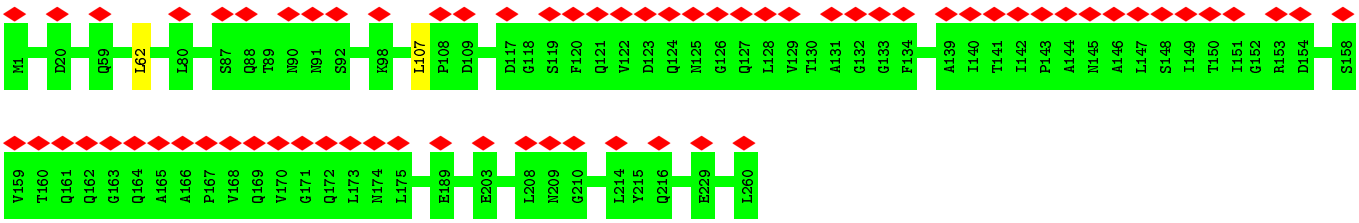
• Molecule 9: Flagellar basal-body rod protein FlgG



• Molecule 9: Flagellar basal-body rod protein FlgG

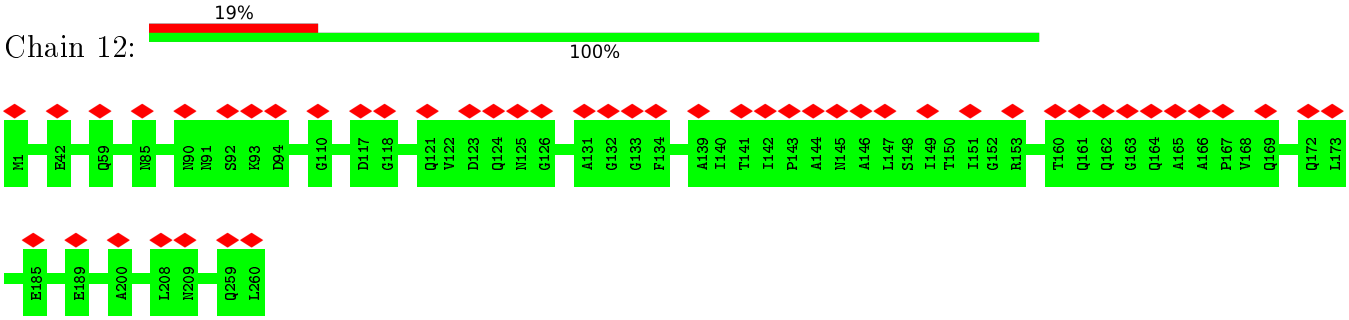


• Molecule 9: Flagellar basal-body rod protein FlgG



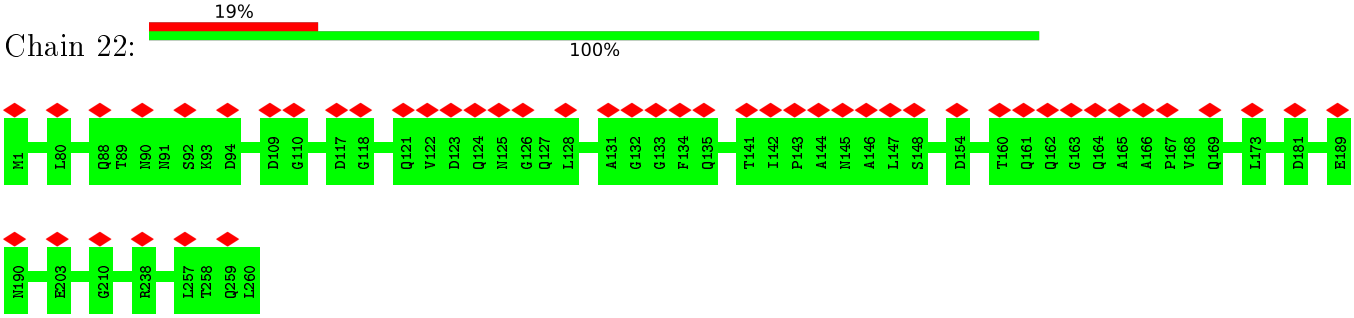
• Molecule 9: Flagellar basal-body rod protein FlgG

Chain 12:



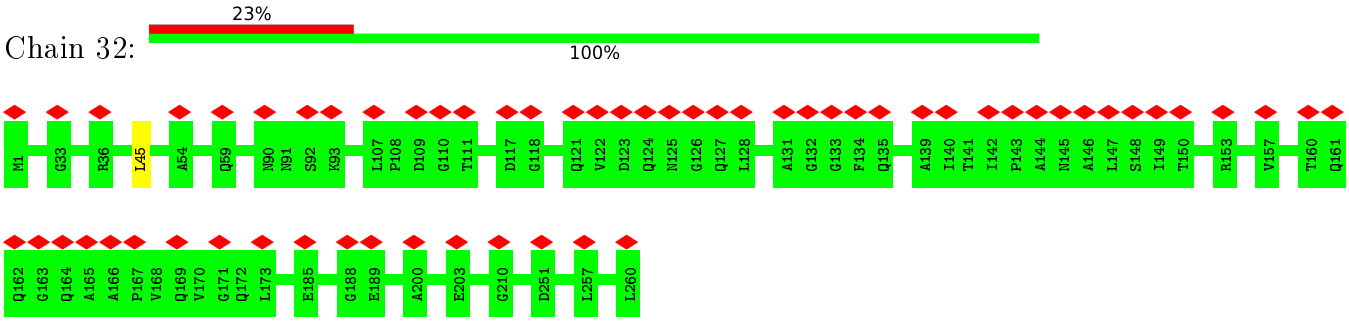
• Molecule 9: Flagellar basal-body rod protein FlgG

Chain 22:



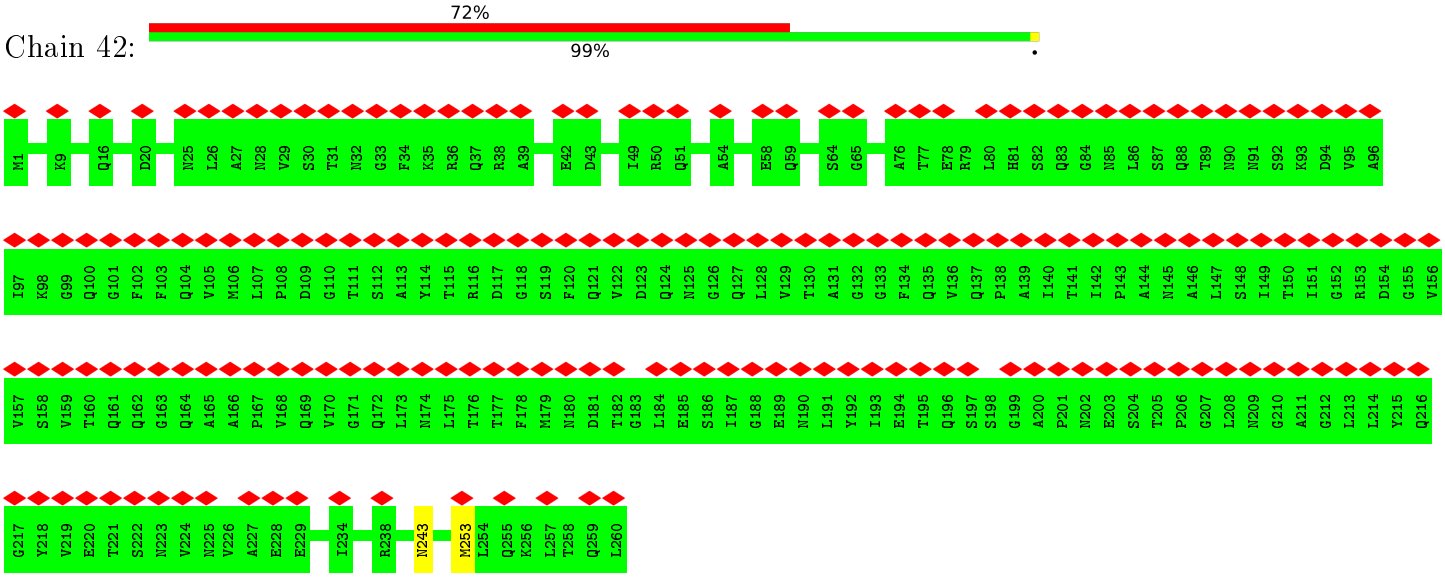
• Molecule 9: Flagellar basal-body rod protein FlgG

Chain 32:



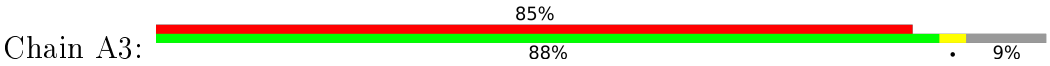
• Molecule 9: Flagellar basal-body rod protein FlgG

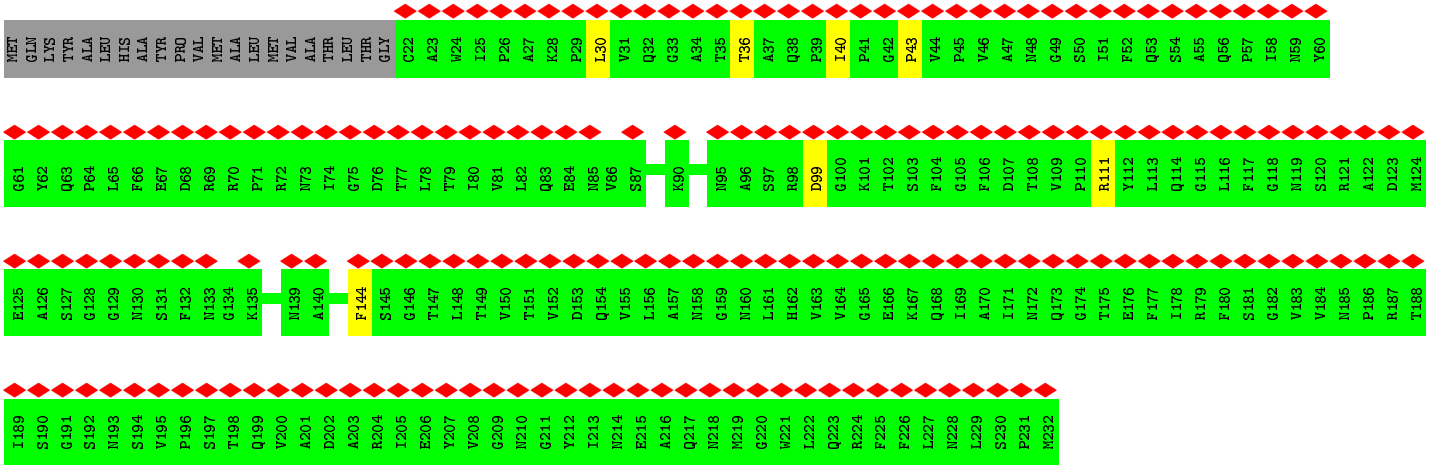
Chain 42:



- Molecule 10: Flagellar L-ring protein

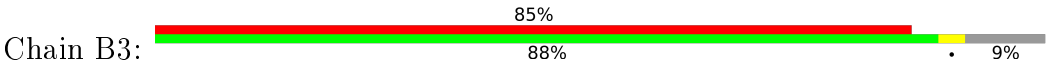
Chain A3:

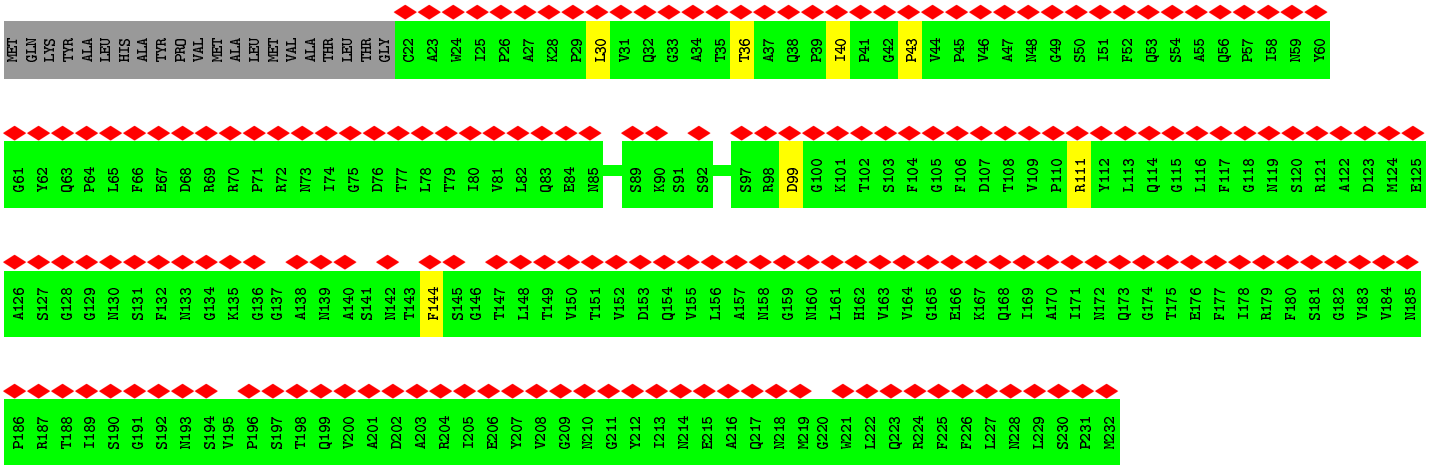




- Molecule 10: Flagellar L-ring protein

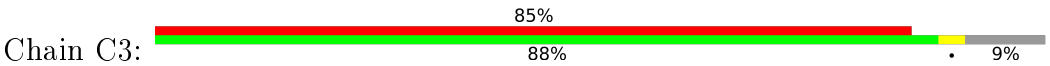
Chain B3:

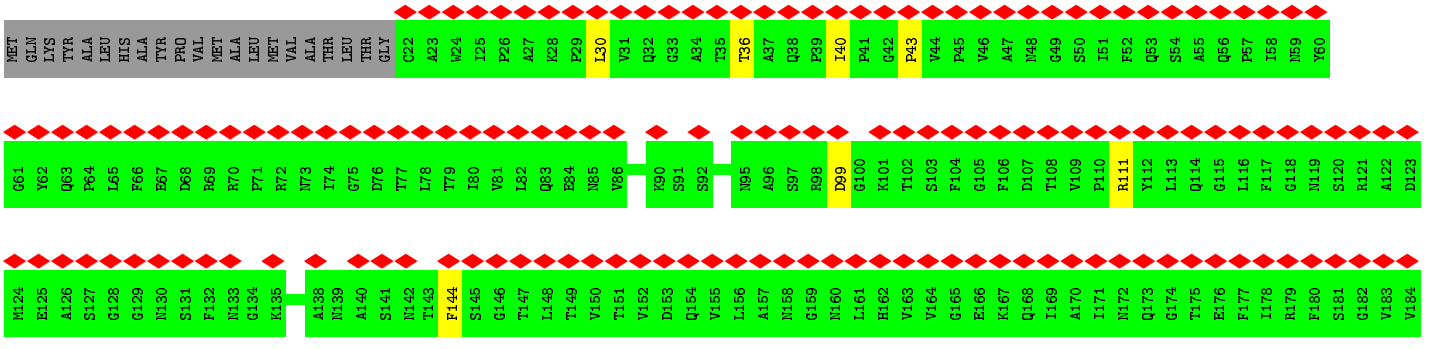


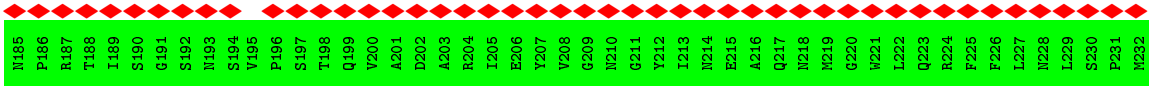


- Molecule 10: Flagellar L-ring protein

Chain C3:

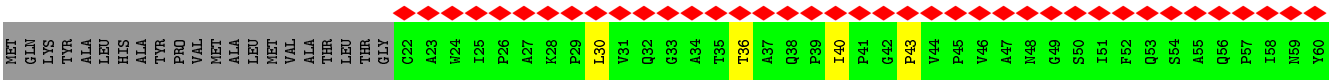


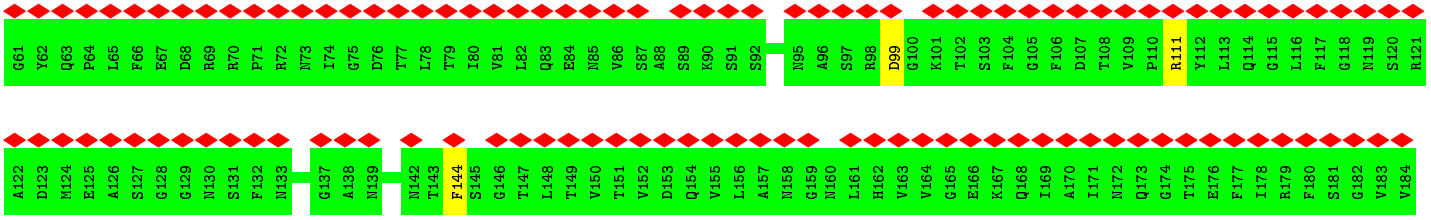


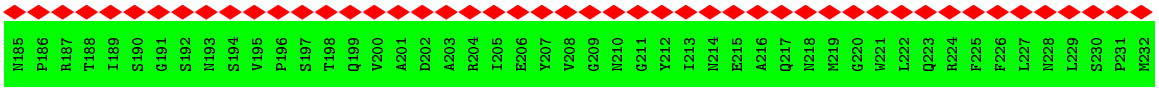


• Molecule 10: Flagellar L-ring protein

Chain D3:

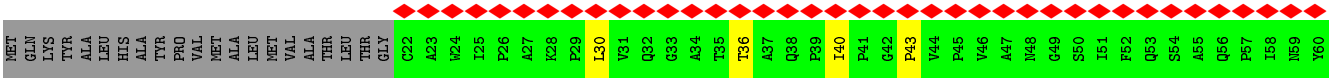


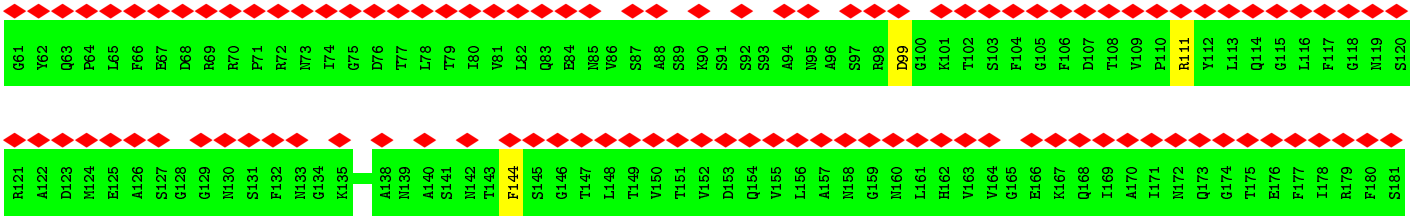




• Molecule 10: Flagellar L-ring protein

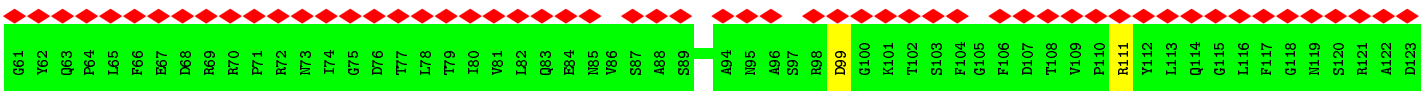
Chain E3:

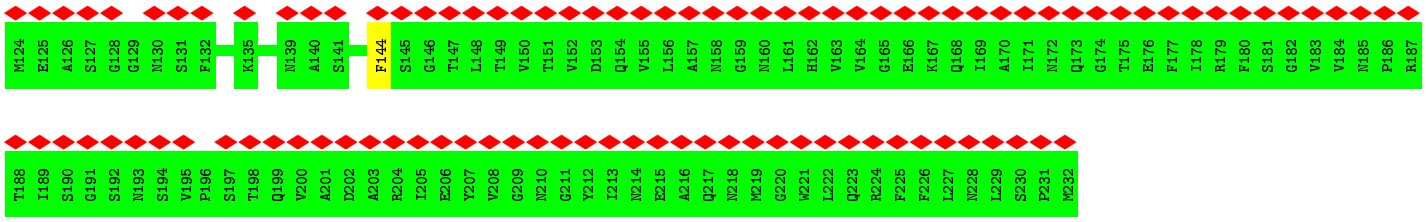




• Molecule 10: Flagellar L-ring protein

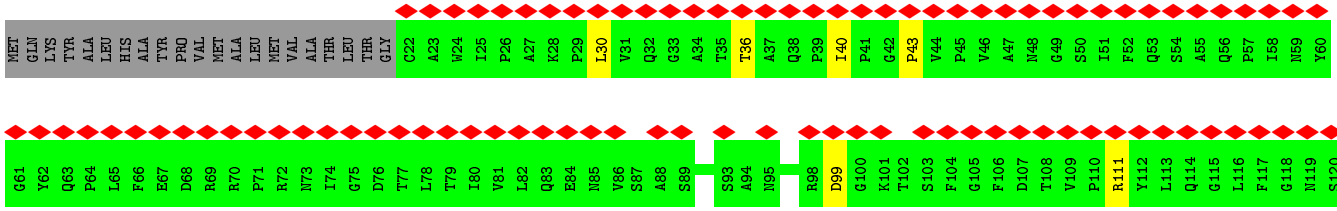
Chain F3:





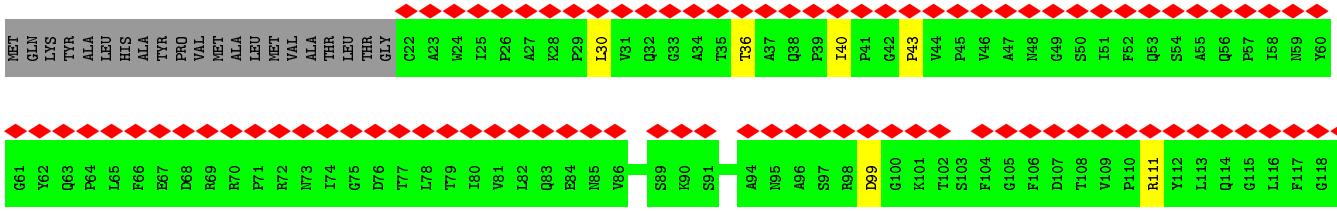
- Molecule 10: Flagellar L-ring protein

Chain G3:



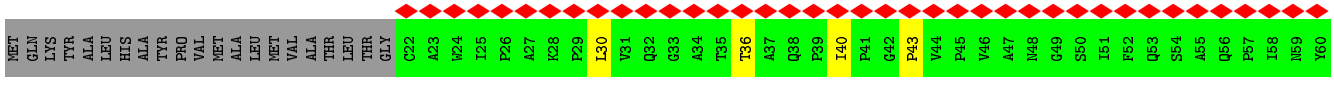
- Molecule 10: Flagellar L-ring protein

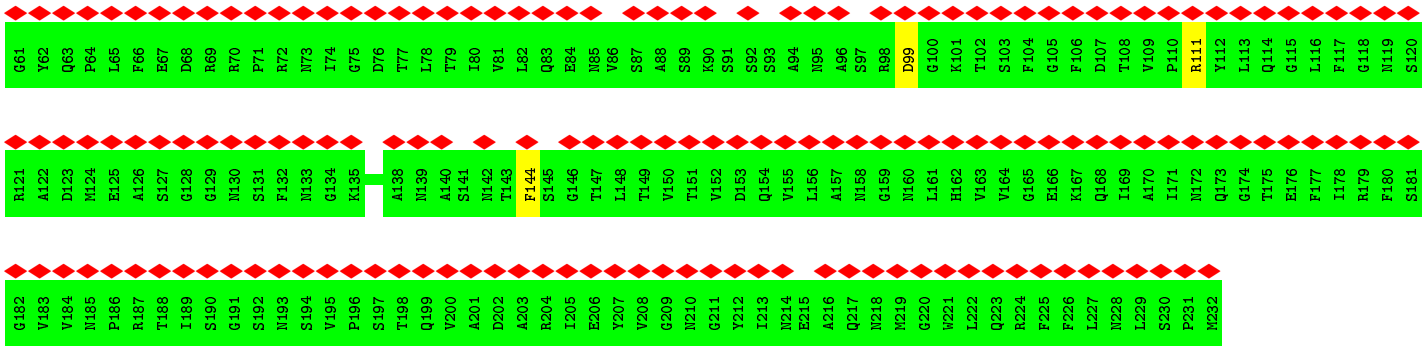
Chain H3:



- Molecule 10: Flagellar L-ring protein

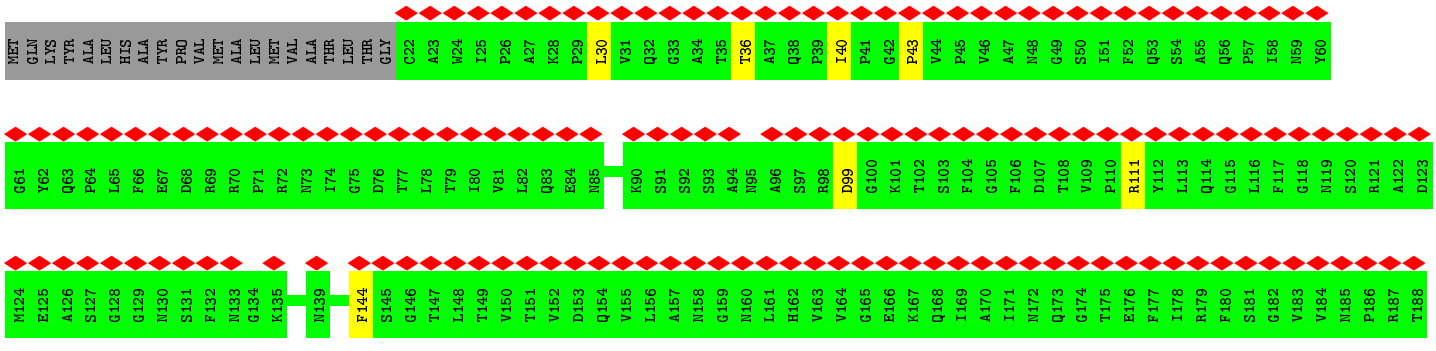
Chain I3:





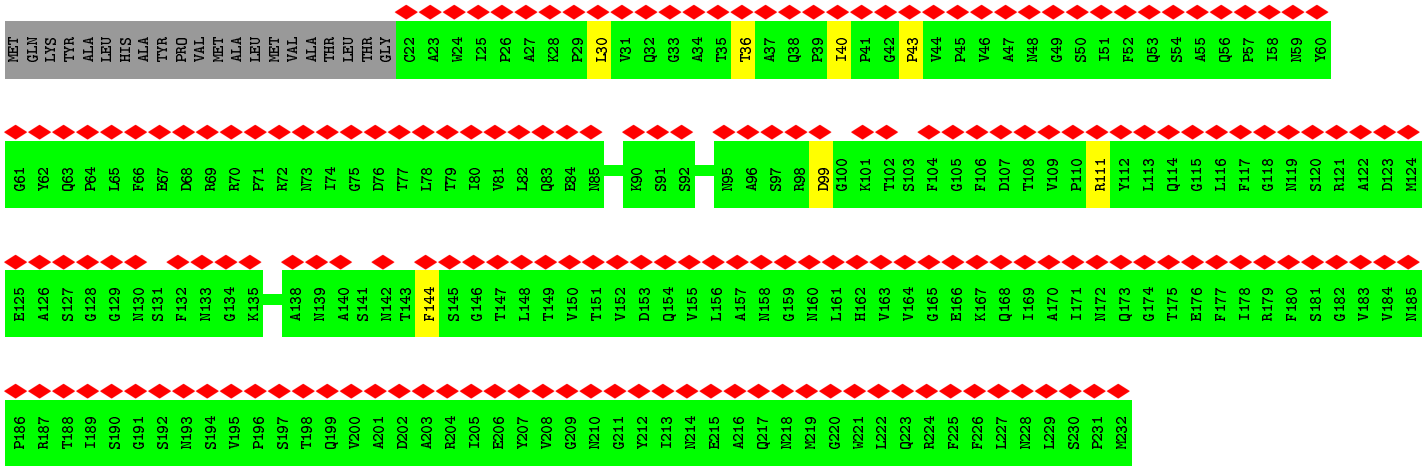
• Molecule 10: Flagellar L-ring protein

Chain J3:



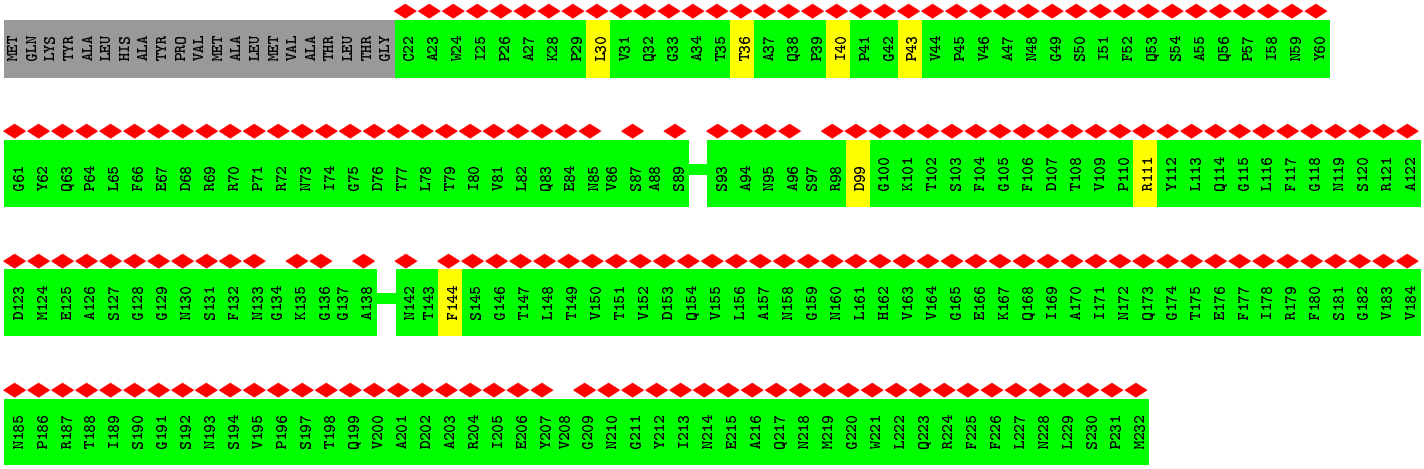
• Molecule 10: Flagellar L-ring protein

Chain K3:



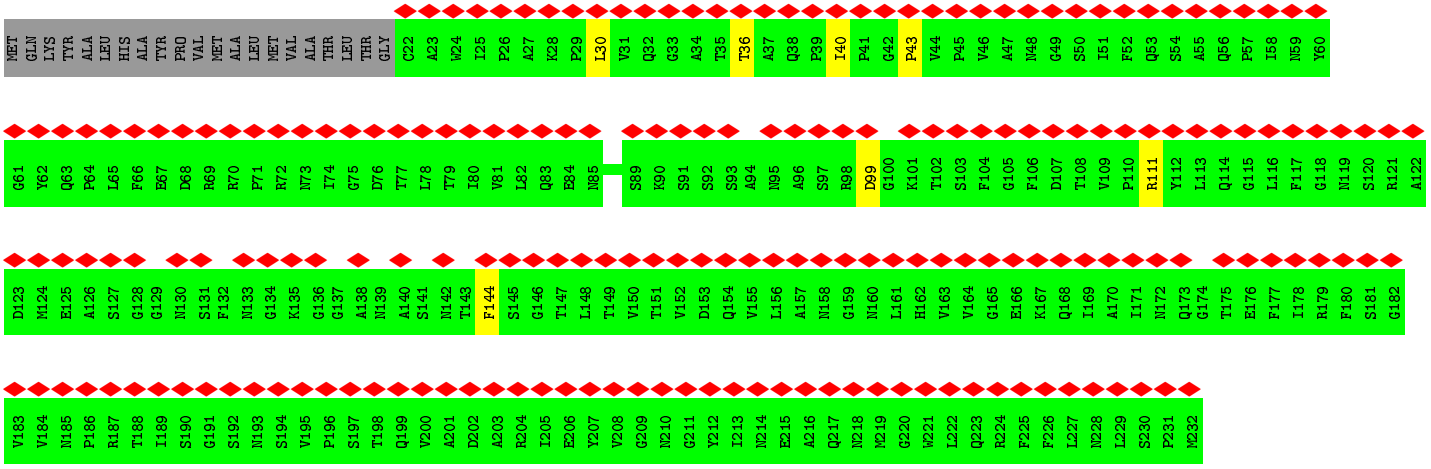
• Molecule 10: Flagellar L-ring protein

Chain L3:



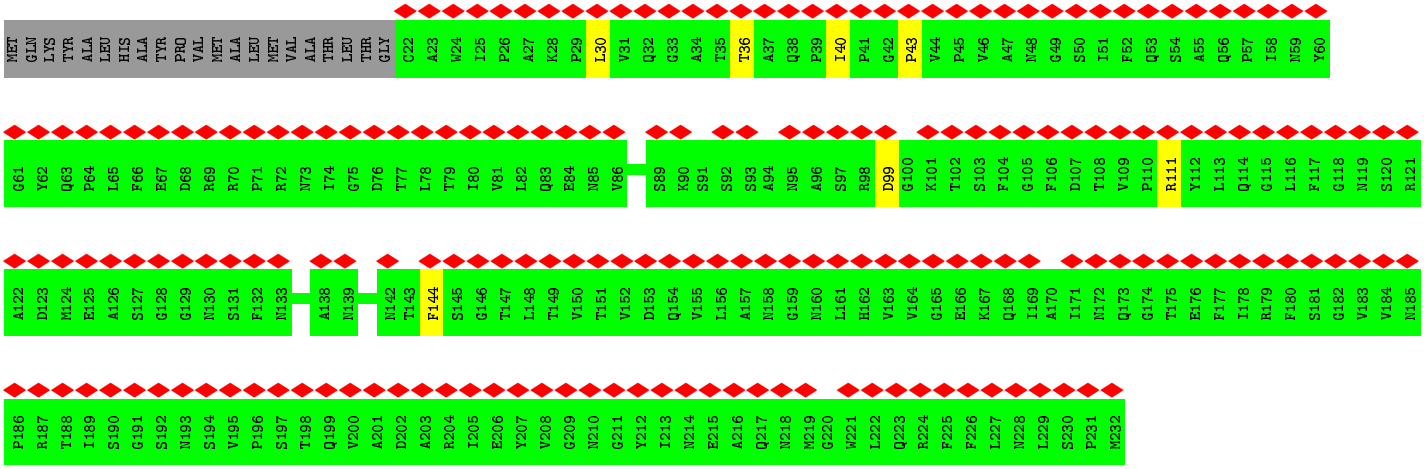
- Molecule 10: Flagellar L-ring protein

Chain M3:



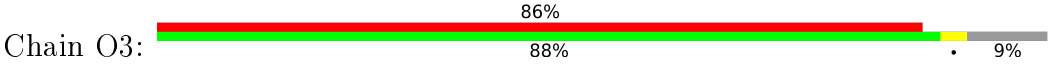
- Molecule 10: Flagellar L-ring protein

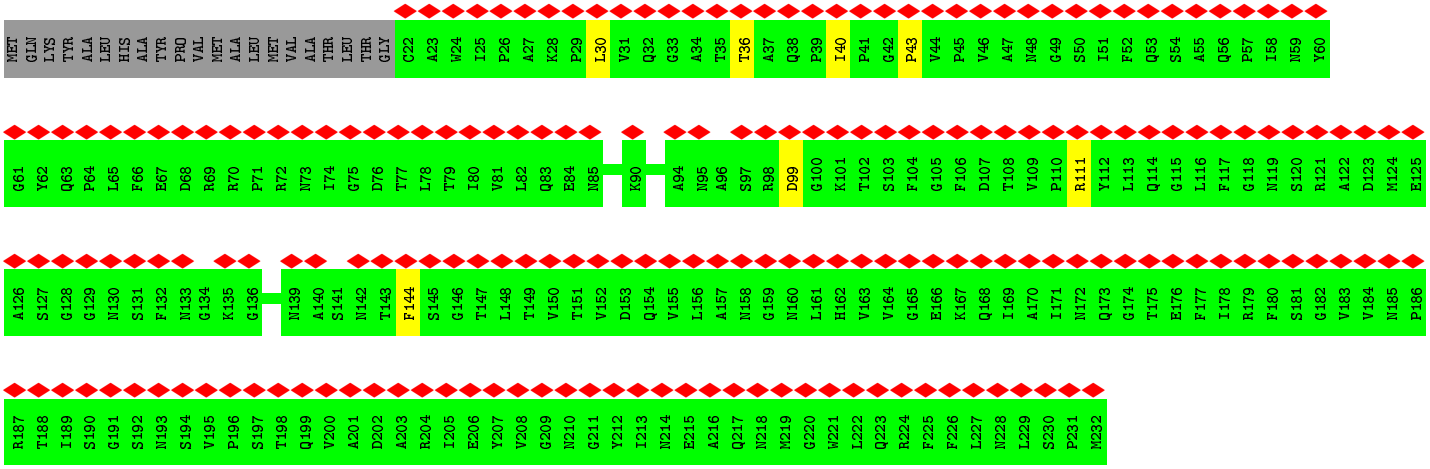
Chain N3:



- Molecule 10: Flagellar L-ring protein

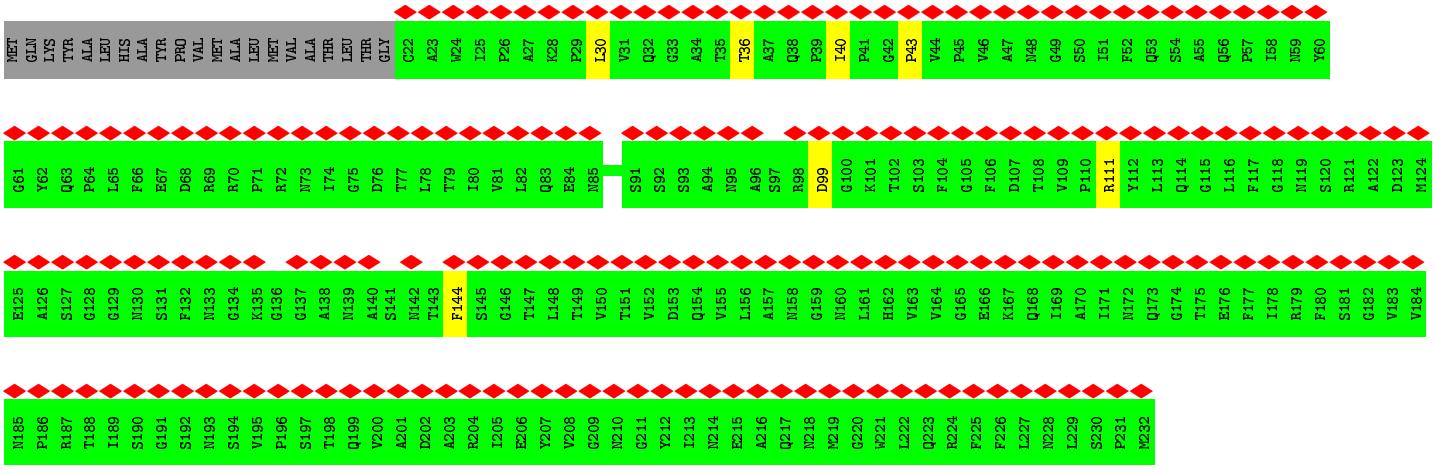
Chain O3:





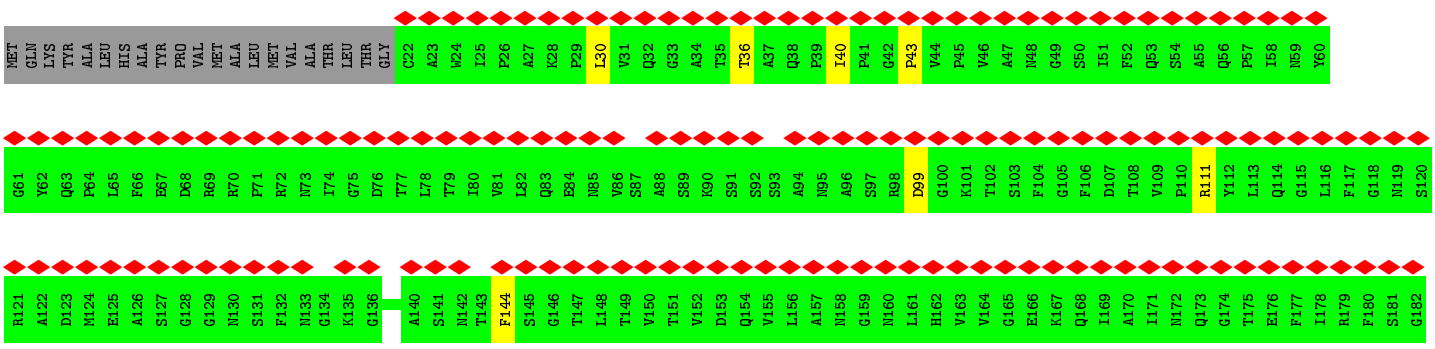
- Molecule 10: Flagellar L-ring protein

Chain P3:



- Molecule 10: Flagellar L-ring protein

Chain Q3:



V183 V184 N185 P186 R187 T188 I189 S190 G191 S192 N193 S194 V195 P196 S197 T198 Q199 V200 A201 D202 A203 R204 I205 E206 Y207 V208 G209 N210 G211 Y212 I213 N214 E215 A216 Q217 N218 M219 G220 W221 L222 Q223 R224 F225 F226 L227 N228 L229 S230 P231 M232

- Molecule 10: Flagellar L-ring protein

Chain R3:

MET GLN LYS TYR ALA LEU HIS ALA TYR PRO VAL MET ALA LEU MET VAL ALA THR LEU THR GLY C22 A23 W24 I25 P26 A27 K28 P29 L30 V31 Q32 G33 A34 T35 T36 A37 Q38 P39 I40 P41 G42 P43 V44 P45 V46 A47 N48 G49 S50 I51 F52 Q53 S54 A55 Q56 P57 I58 N59 Y60

G61 Y62 Q63 P64 L65 F66 E67 D68 R69 R70 P71 R72 N73 I74 G75 D76 T77 L78 T79 I80 V81 L82 Q83 E84 N85 V86 S93 A94 N95 A96 S97 R98 D99 G100 K101 T102 S103 F104 G105 F106 D107 T108 V109 P110 R111 Y112 L113 Q114 G115 L116 F117 G118 N119 S120 R121 A122 D123 M124 E125

A126 S127 G128 G129 N130 S131 F132 N133 G134 K135 G136 G137 A138 N139 A140 S141 N142 T143 F144 S145 G146 T147 L148 T149 V150 T151 V152 D153 Q154 V155 L156 A157 N158 G159 N160 L161 H162 V163 V164 G165 E166 K167 Q168 I169 A170 I171 N172 Q173 G174 T175 E176 F177 I178 R179 F180 S181 G182 V183 V184 N185

P186 R187 T188 I189 S190 G191 S192 N193 S194 V195 P196 S197 T198 Q199 V200 A201 D202 A203 R204 I205 E206 Y207 V208 G209 N210 G211 Y212 I213 N214 E215 A216 Q217 N218 M219 G220 W221 L222 Q223 R224 F225 F226 L227 N228 L229 S230 P231 M232

- Molecule 10: Flagellar L-ring protein

Chain S3:

MET GLN LYS TYR ALA LEU HIS ALA TYR PRO VAL MET ALA LEU MET VAL ALA THR LEU THR GLY C22 A23 W24 I25 P26 A27 K28 P29 L30 V31 Q32 G33 A34 T35 T36 A37 Q38 P39 I40 P41 G42 P43 V44 P45 V46 A47 N48 G49 S50 I51 F52 Q53 S54 A55 Q56 P57 I58 N59 Y60

G61 Y62 Q63 P64 L65 F66 E67 D68 R69 R70 P71 R72 N73 I74 G75 D76 T77 L78 T79 I80 V81 L82 Q83 E84 N85 V86 S87 K90 S91 S92 S93 A94 N95 A96 S97 R98 D99 G100 K101 T102 S103 F104 G105 F106 D107 T108 V109 P110 R111 Y112 L113 Q114 G115 L116 F117 G118 N119 S120 R121

A122 D123 M124 E125 A126 S127 G128 G129 N130 S131 F132 N133 G134 K135 G136 G137 A138 N139 A140 S141 N142 T143 F144 S145 G146 T147 L148 T149 V150 T151 V152 D153 Q154 V155 L156 A157 N158 G159 N160 L161 H162 V163 V164 G165 E166 K167 Q168 I169 A170 I171 N172 Q173 G174 T175 E176 F177 I178 R179 F180 S181

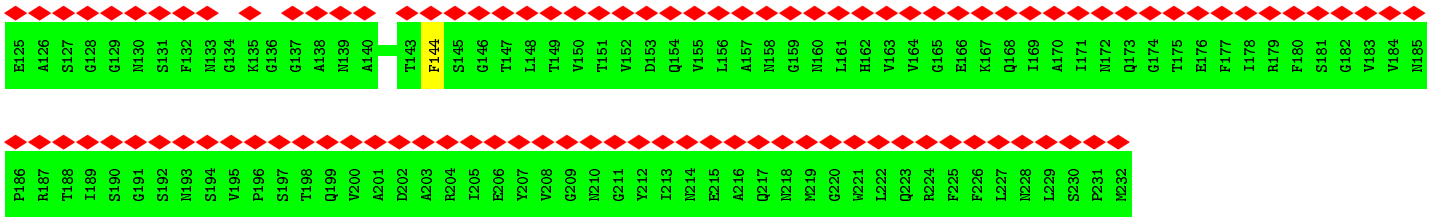
G182 V183 V184 N185 P186 R187 T188 I189 S190 G191 S192 N193 S194 V195 P196 S197 T198 Q199 V200 A201 D202 A203 R204 I205 E206 Y207 V208 G209 N210 G211 Y212 I213 N214 E215 A216 Q217 N218 M219 G220 W221 L222 Q223 R224 F225 F226 L227 N228 L229 S230 P231 M232

- Molecule 10: Flagellar L-ring protein

Chain T3:

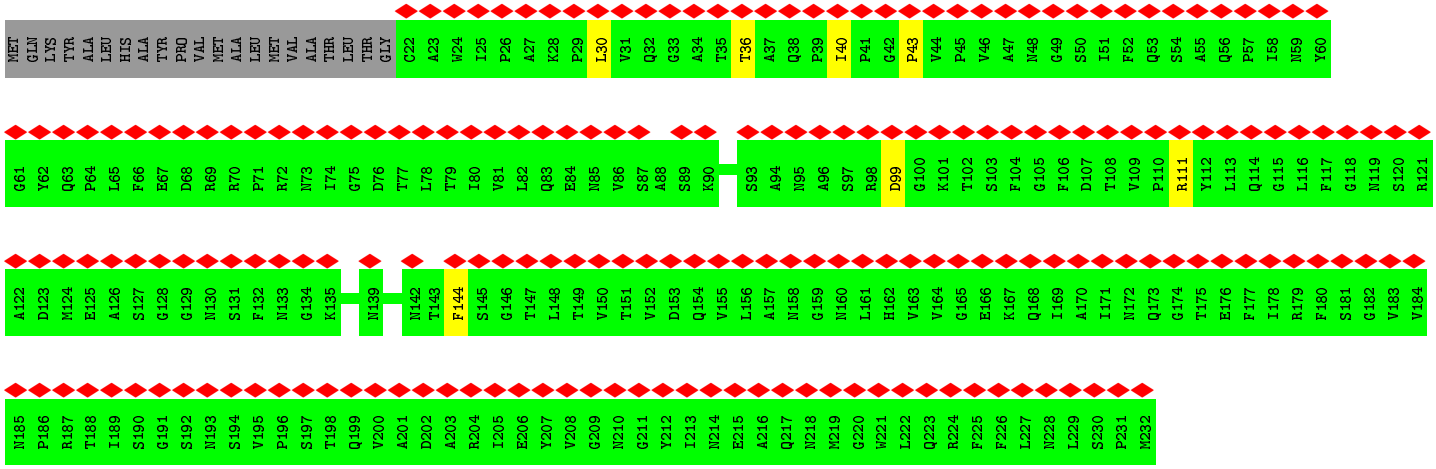
MET GLN LYS TYR ALA LEU HIS ALA TYR PRO VAL MET ALA LEU MET VAL ALA THR LEU THR GLY C22 A23 W24 I25 P26 A27 K28 P29 L30 V31 Q32 G33 A34 T35 T36 A37 Q38 P39 I40 P41 G42 P43 V44 P45 V46 A47 N48 G49 S50 I51 F52 Q53 S54 A55 Q56 P57 I58 N59 Y60

G61 Y62 Q63 P64 L65 F66 E67 D68 R69 R70 P71 R72 N73 I74 G75 D76 T77 L78 T79 I80 V81 L82 Q83 E84 N85 V86 S91 A94 N95 A96 S97 R98 D99 G100 K101 T102 S103 F104 G105 F106 D107 T108 V109 P110 R111 Y112 L113 Q114 G115 L116 F117 G118 N119 S120 R121 A122 D123 M124



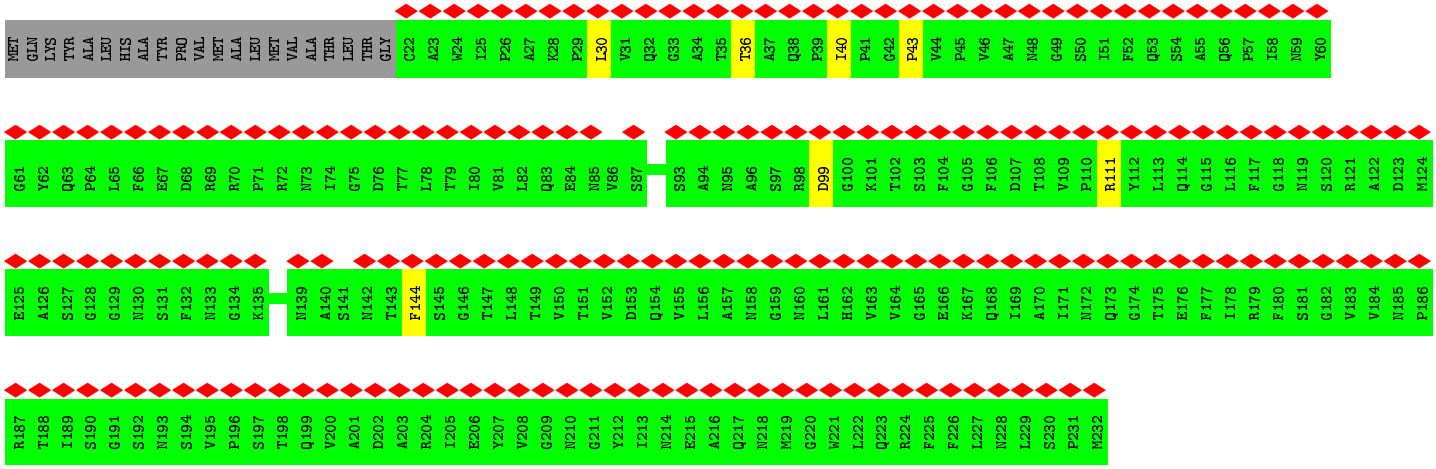
- Molecule 10: Flagellar L-ring protein

Chain U3:



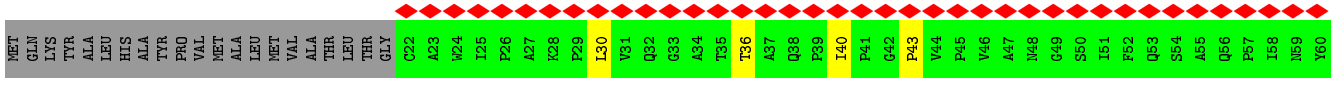
- Molecule 10: Flagellar L-ring protein

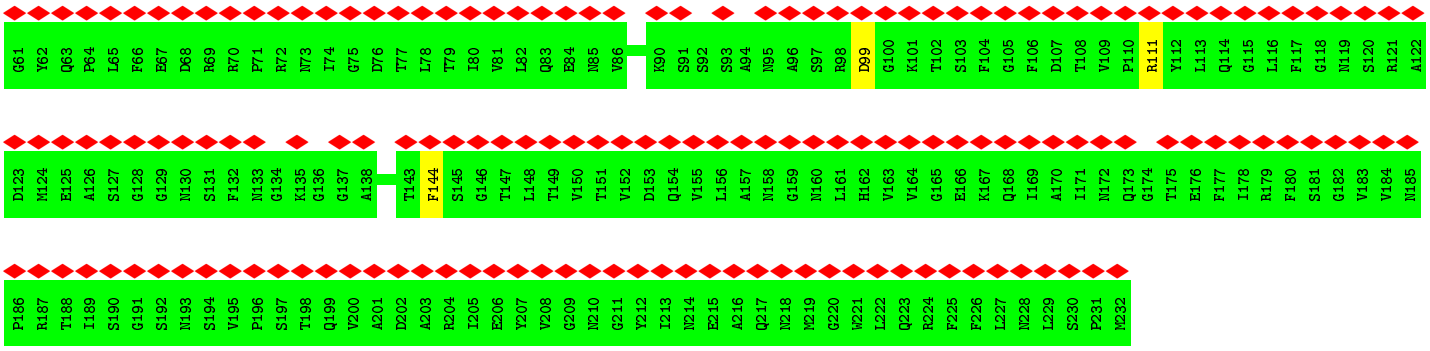
Chain V3:



- Molecule 10: Flagellar L-ring protein

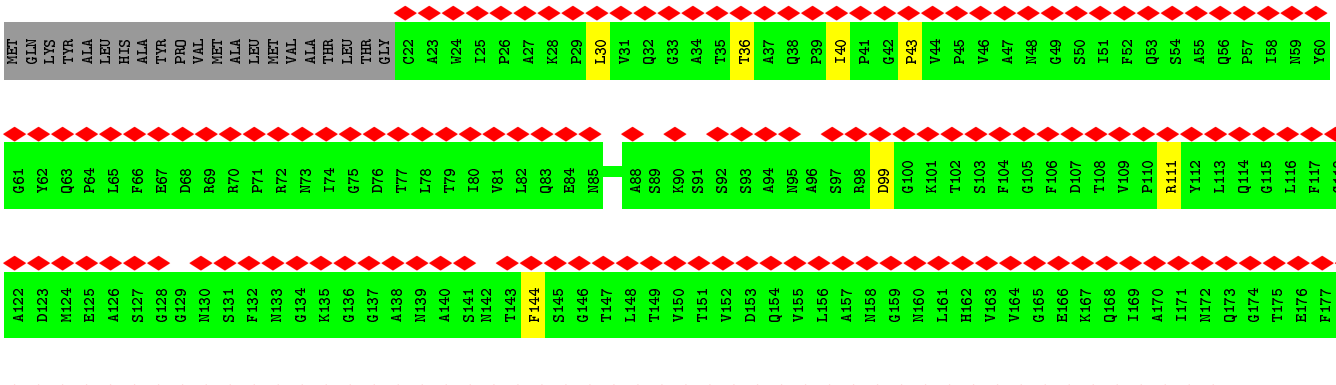
Chain W3:





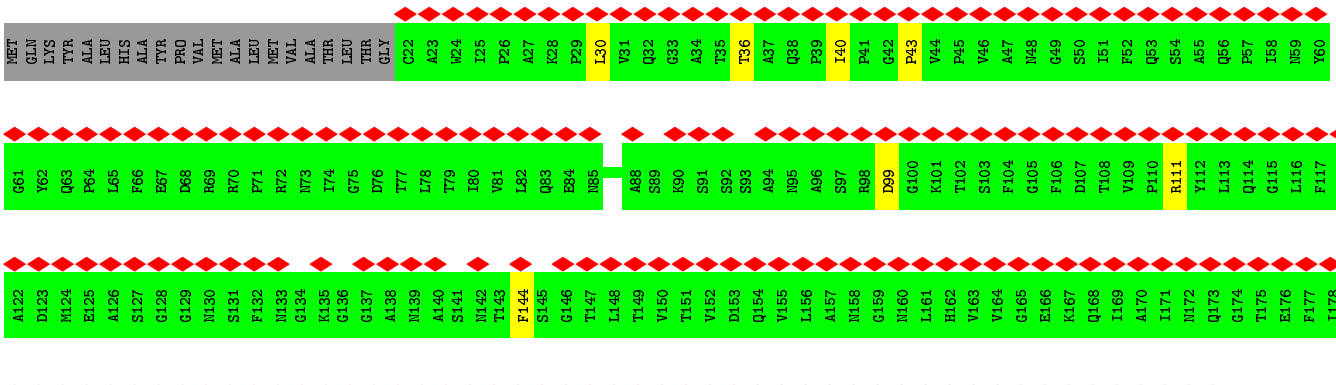
• Molecule 10: Flagellar L-ring protein

Chain X3:



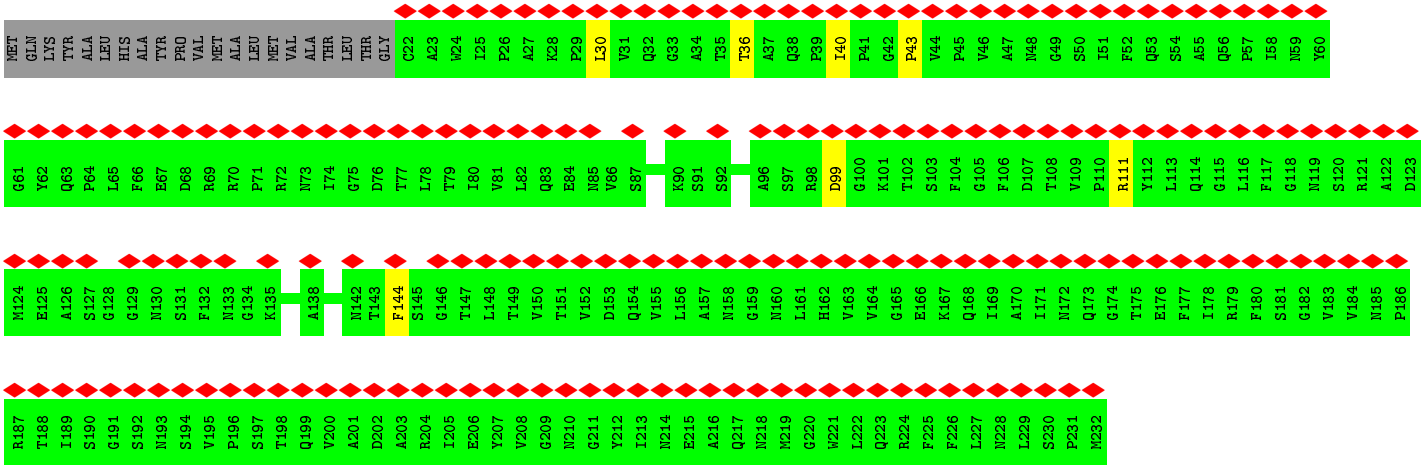
• Molecule 10: Flagellar L-ring protein

Chain Y3:



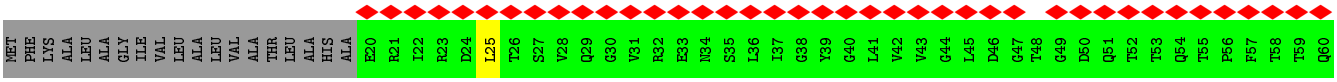
• Molecule 10: Flagellar L-ring protein

Chain Z3:



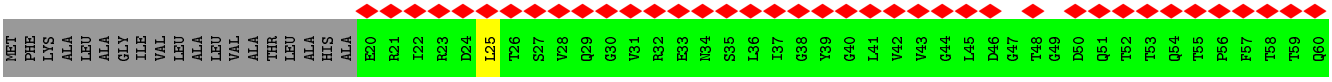
- Molecule 11: Flagellar P-ring protein

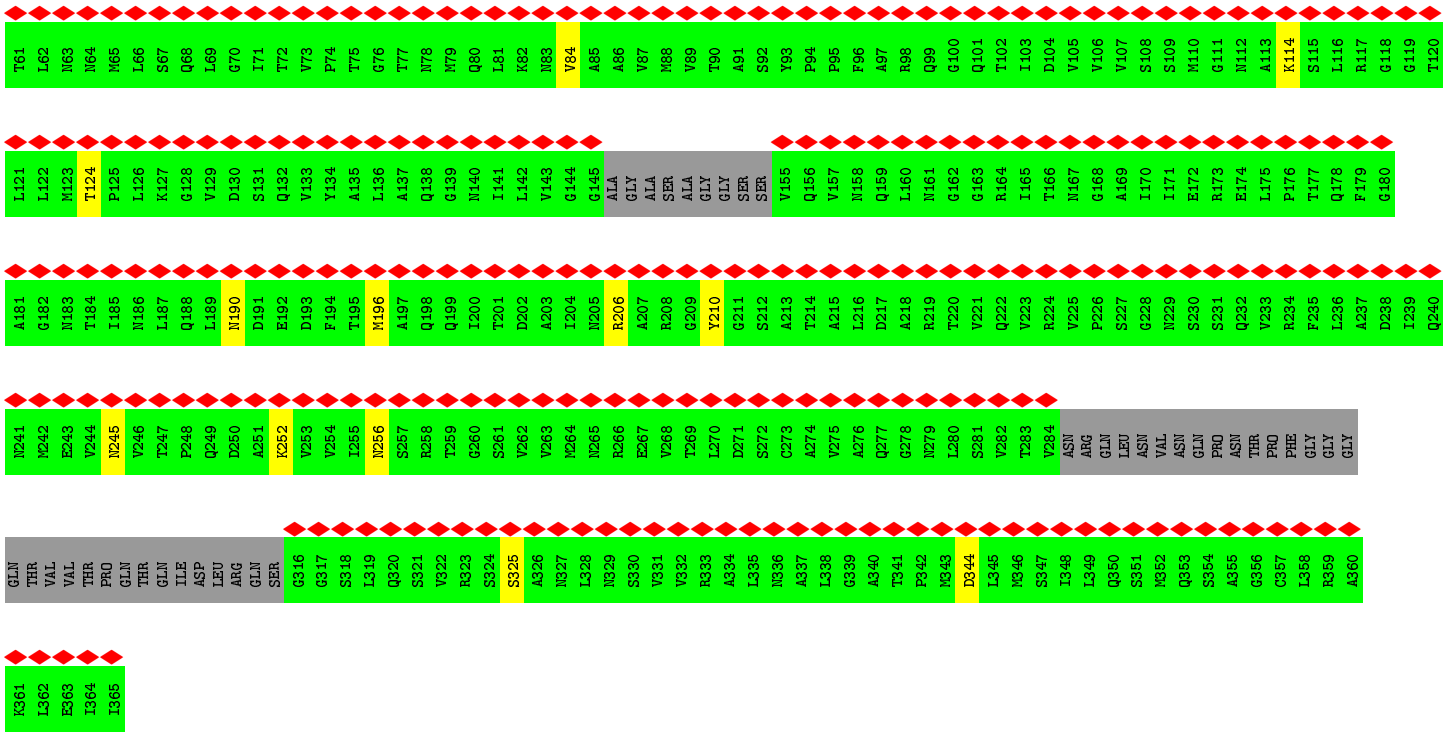
Chain a3:



- Molecule 11: Flagellar P-ring protein

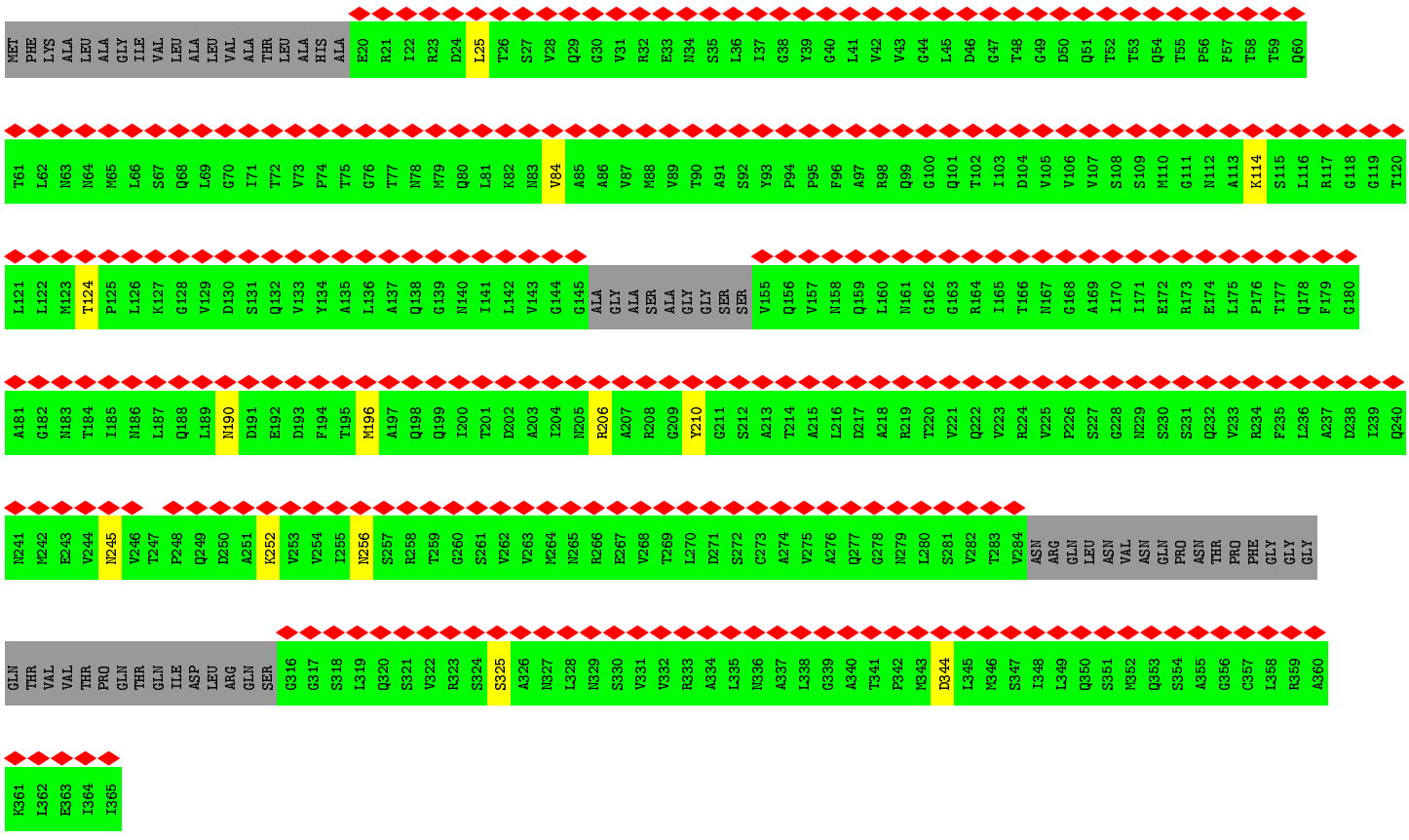
Chain b3:





- Molecule 11: Flagellar P-ring protein

Chain c3:

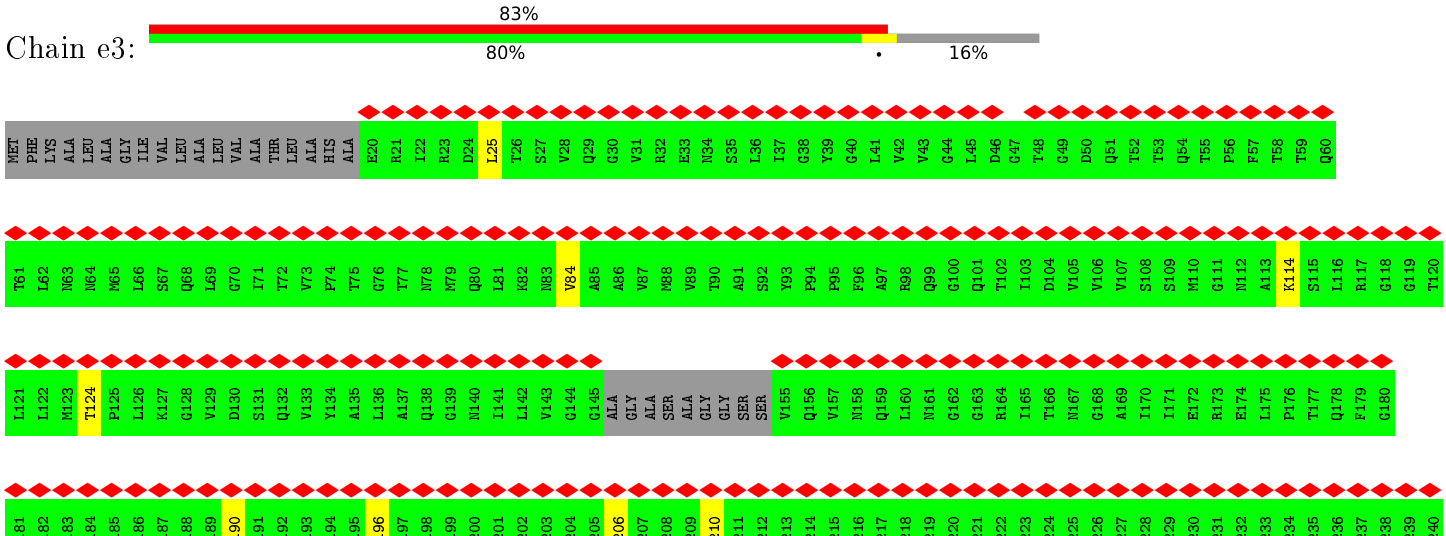


• Molecule 11: Flagellar P-ring protein

Chain d3:

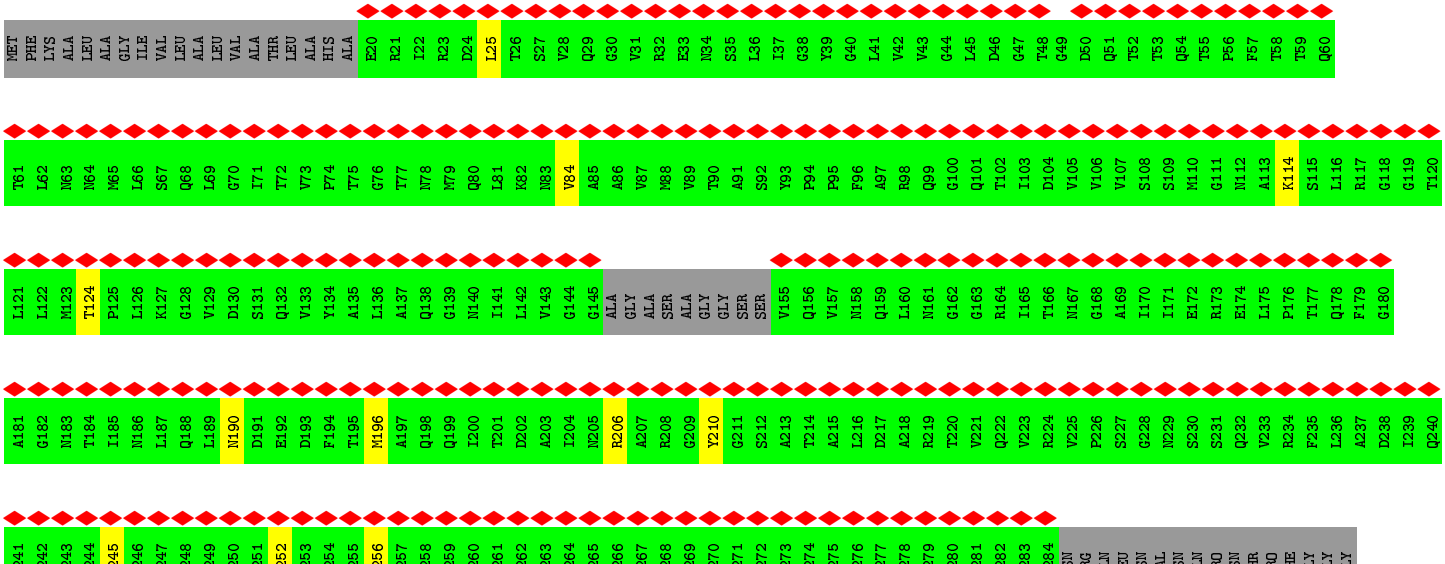
• Molecule 11: Flagellar P-ring protein

Chain e3:



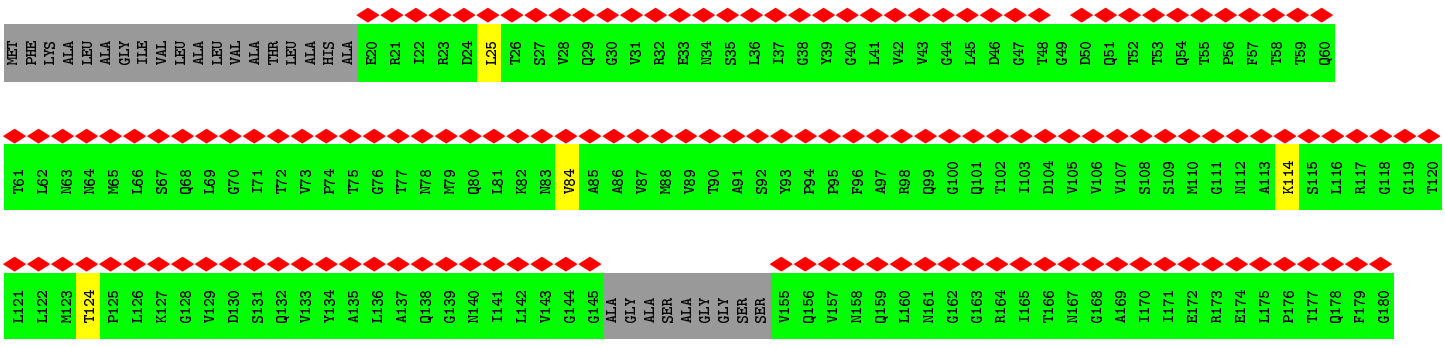
• Molecule 11: Flagellar P-ring protein

Chain f3:



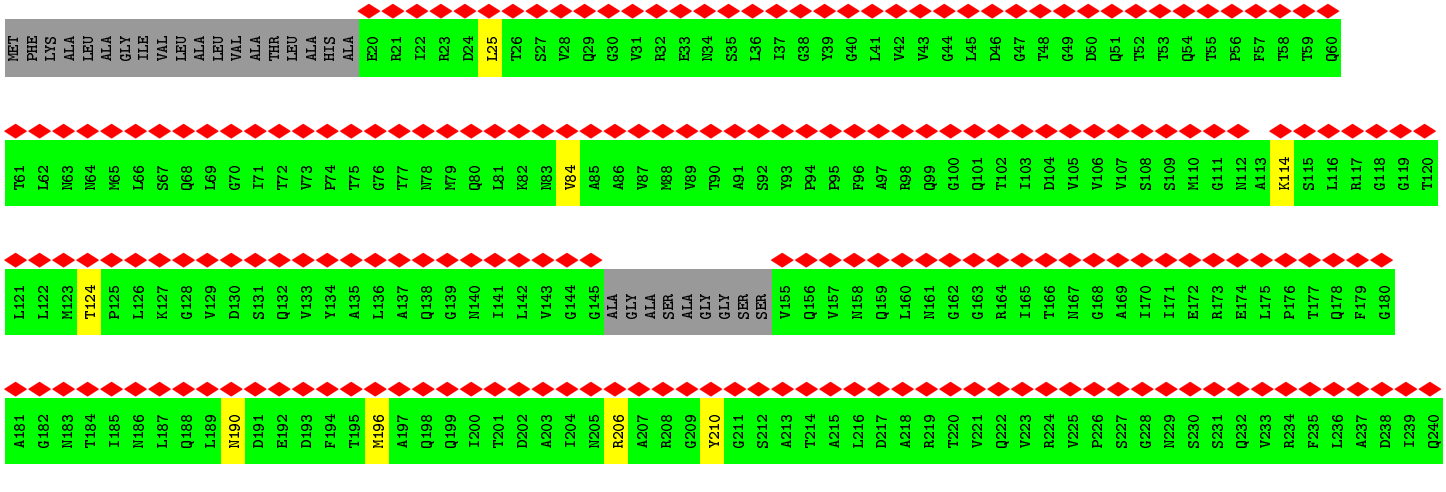
• Molecule 11: Flagellar P-ring protein

Chain g3:



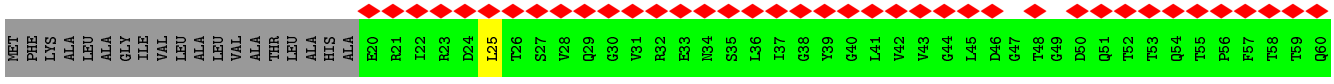
- Molecule 11: Flagellar P-ring protein

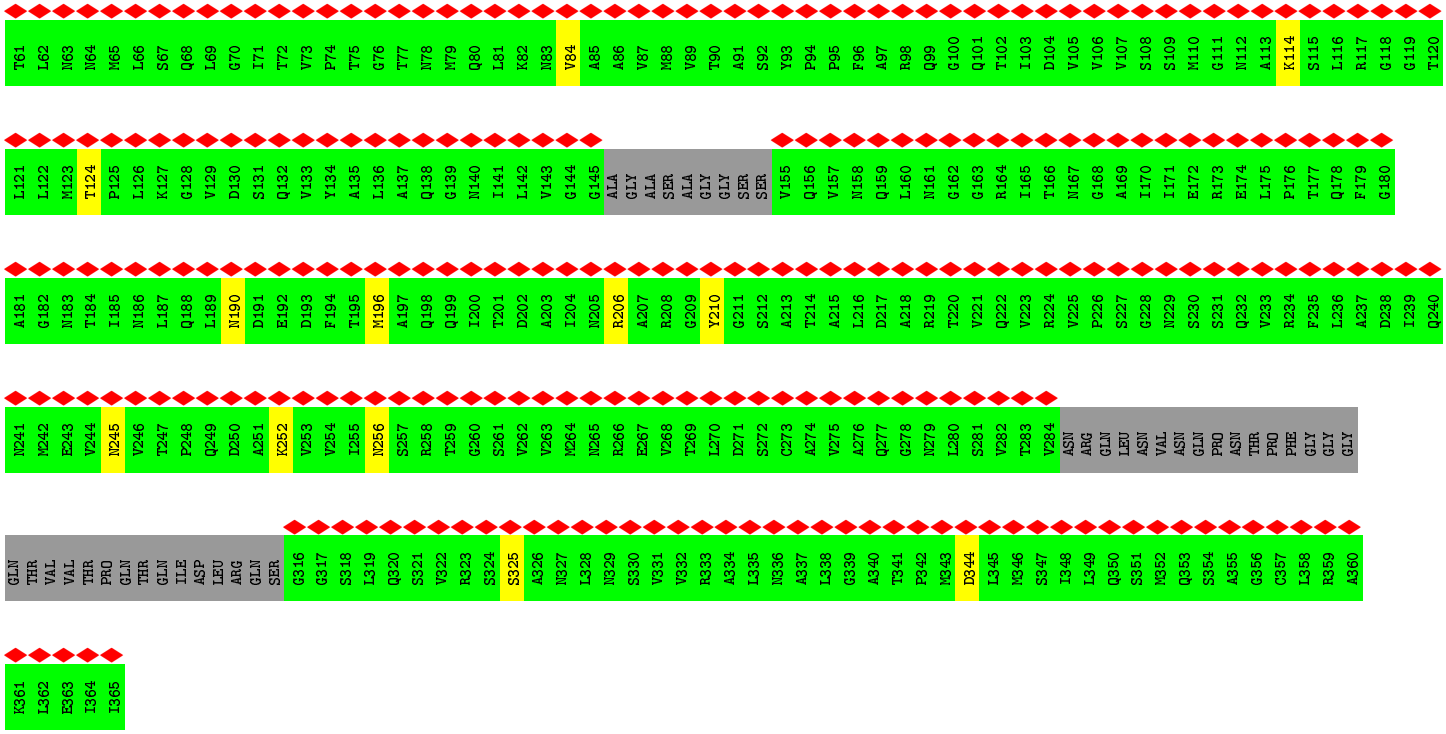
Chain h3:



- Molecule 11: Flagellar P-ring protein

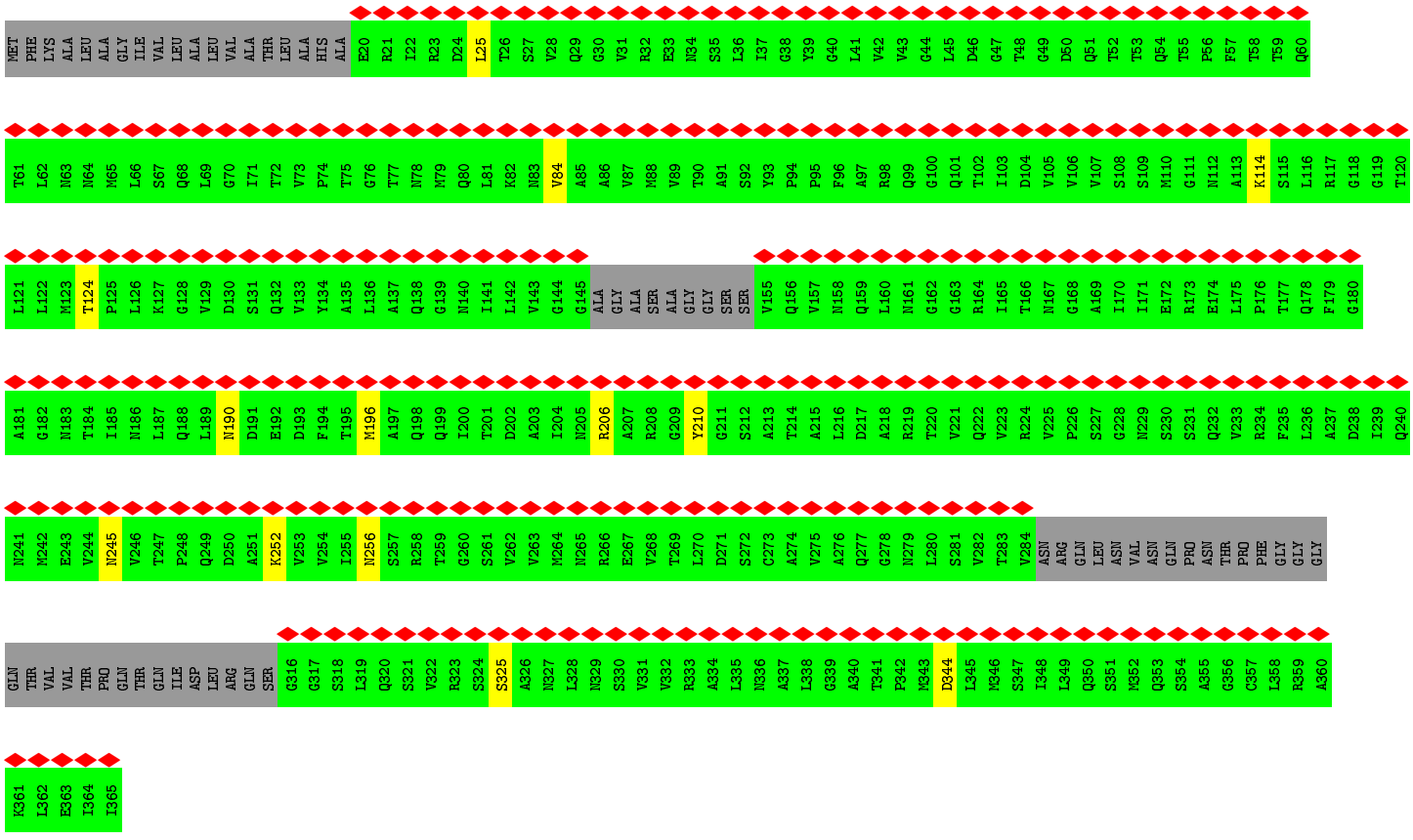
Chain i3:





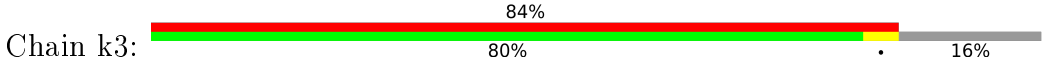
- Molecule 11: Flagellar P-ring protein

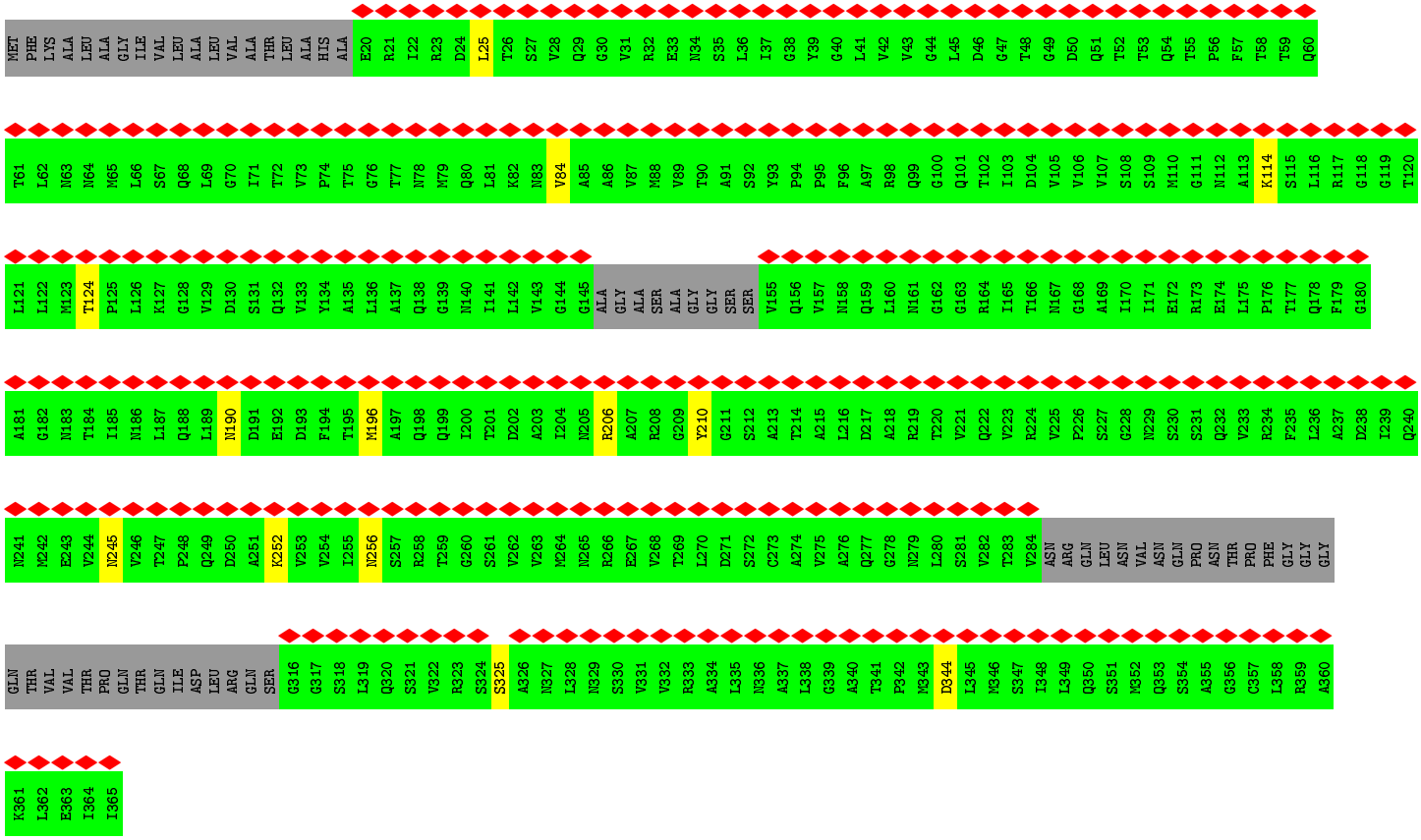
Chain j3:



• Molecule 11: Flagellar P-ring protein

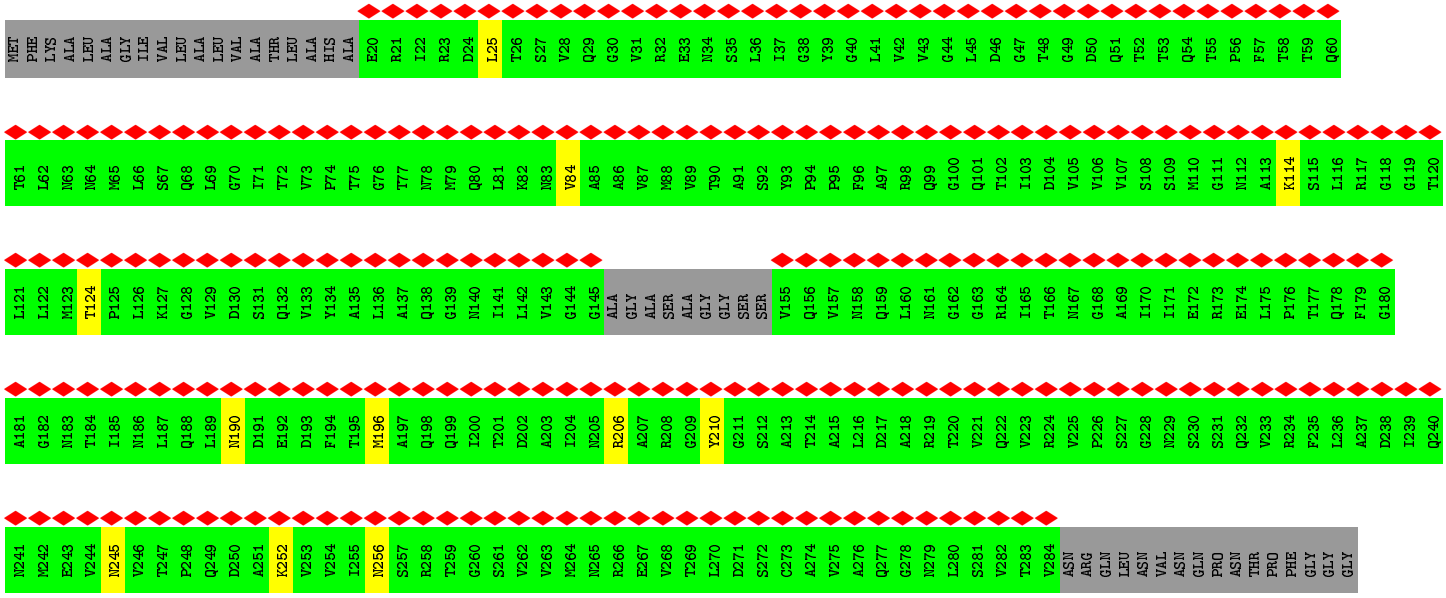
Chain k3:





• Molecule 11: Flagellar P-ring protein

Chain l3:

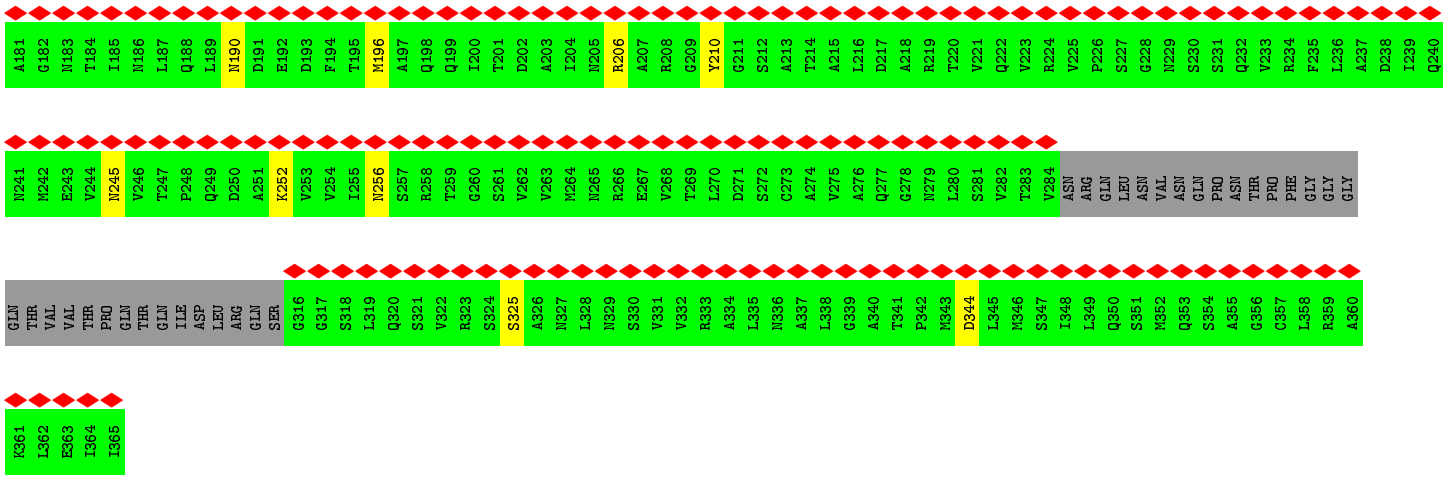


• Molecule 11: Flagellar P-ring protein

Chain m3:

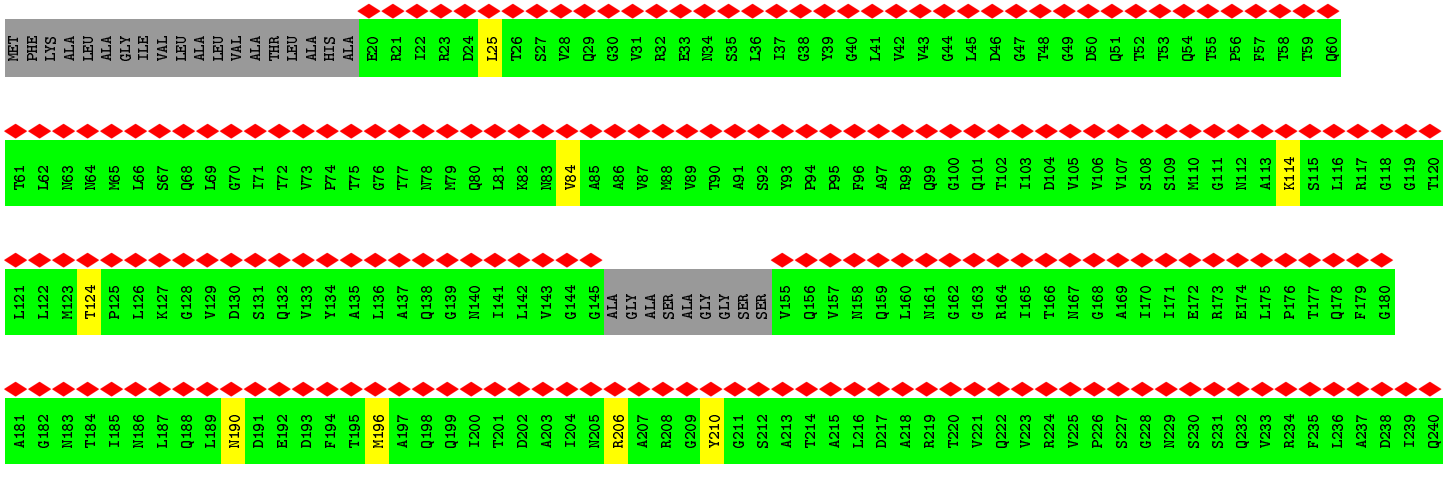
• Molecule 11: Flagellar P-ring protein

Chain n3:



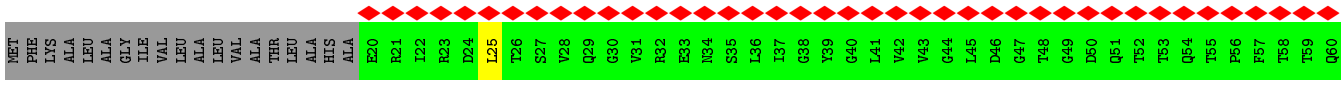
- Molecule 11: Flagellar P-ring protein

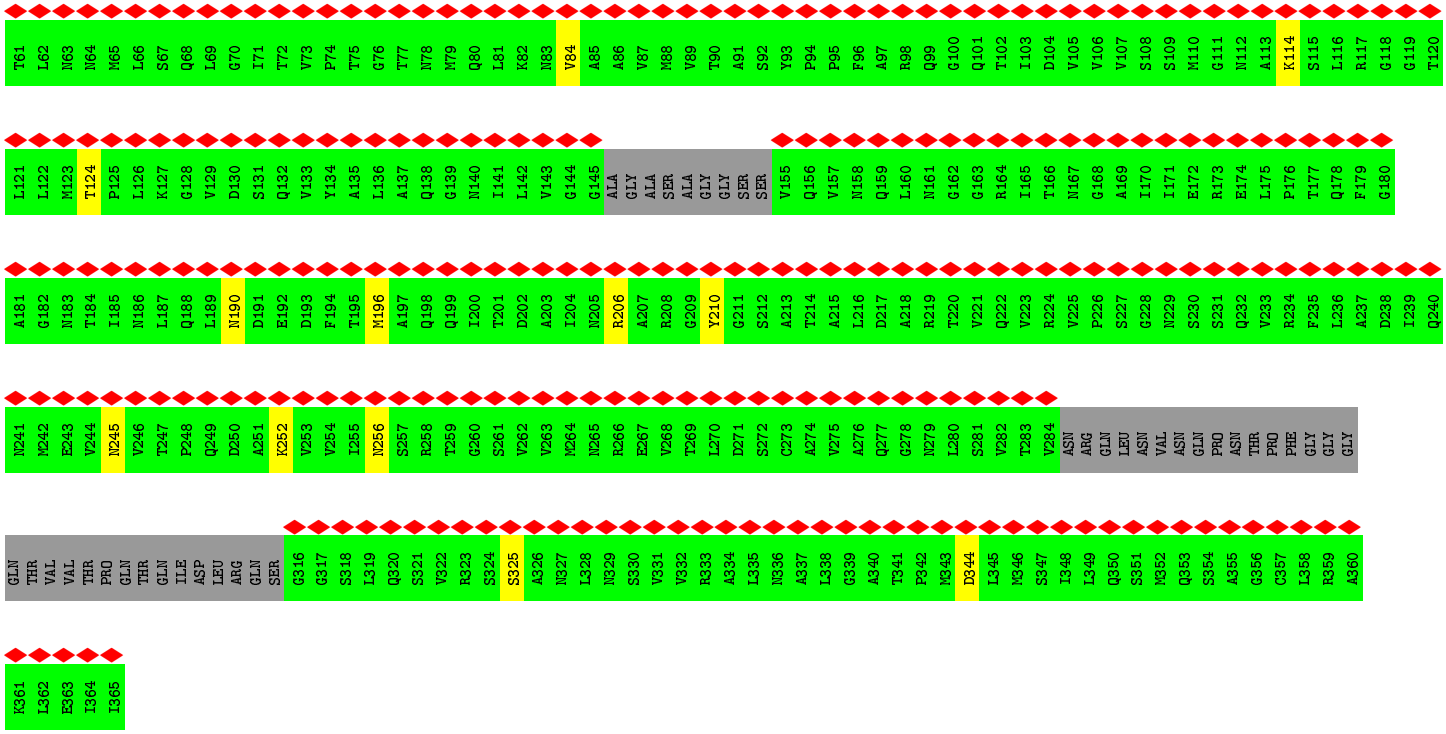
Chain o3:



- Molecule 11: Flagellar P-ring protein

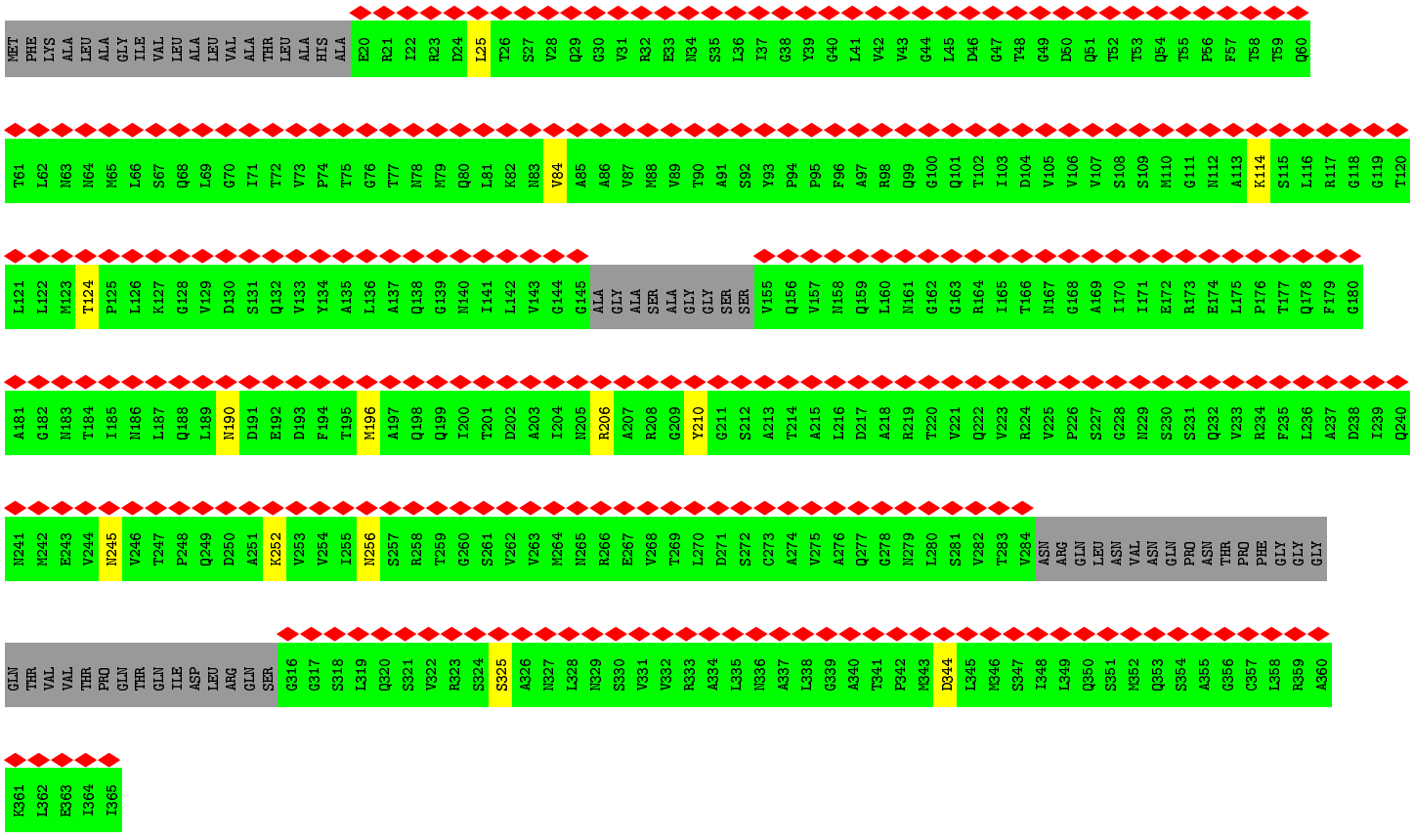
Chain p3:





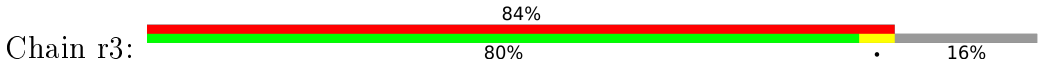
- Molecule 11: Flagellar P-ring protein

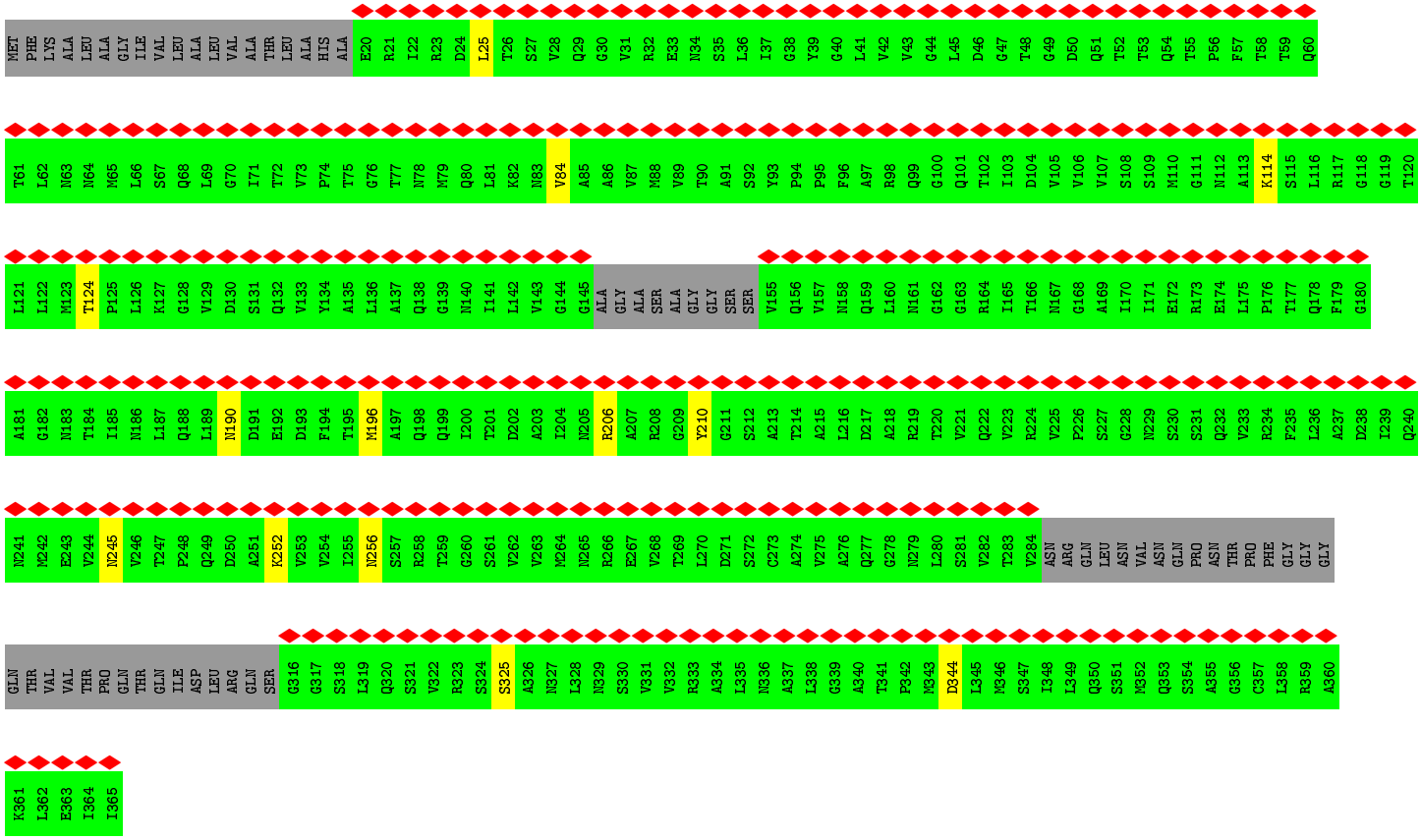
Chain q3:



• Molecule 11: Flagellar P-ring protein

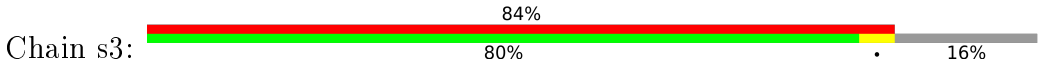
Chain r3:

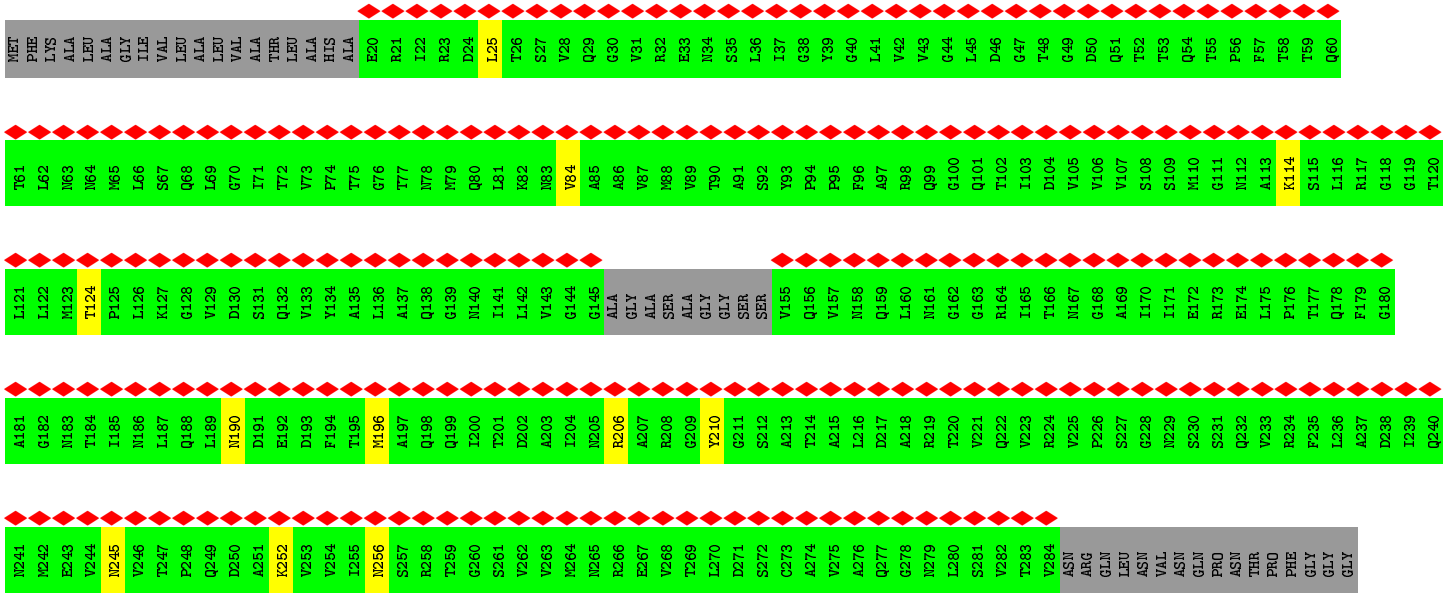




• Molecule 11: Flagellar P-ring protein

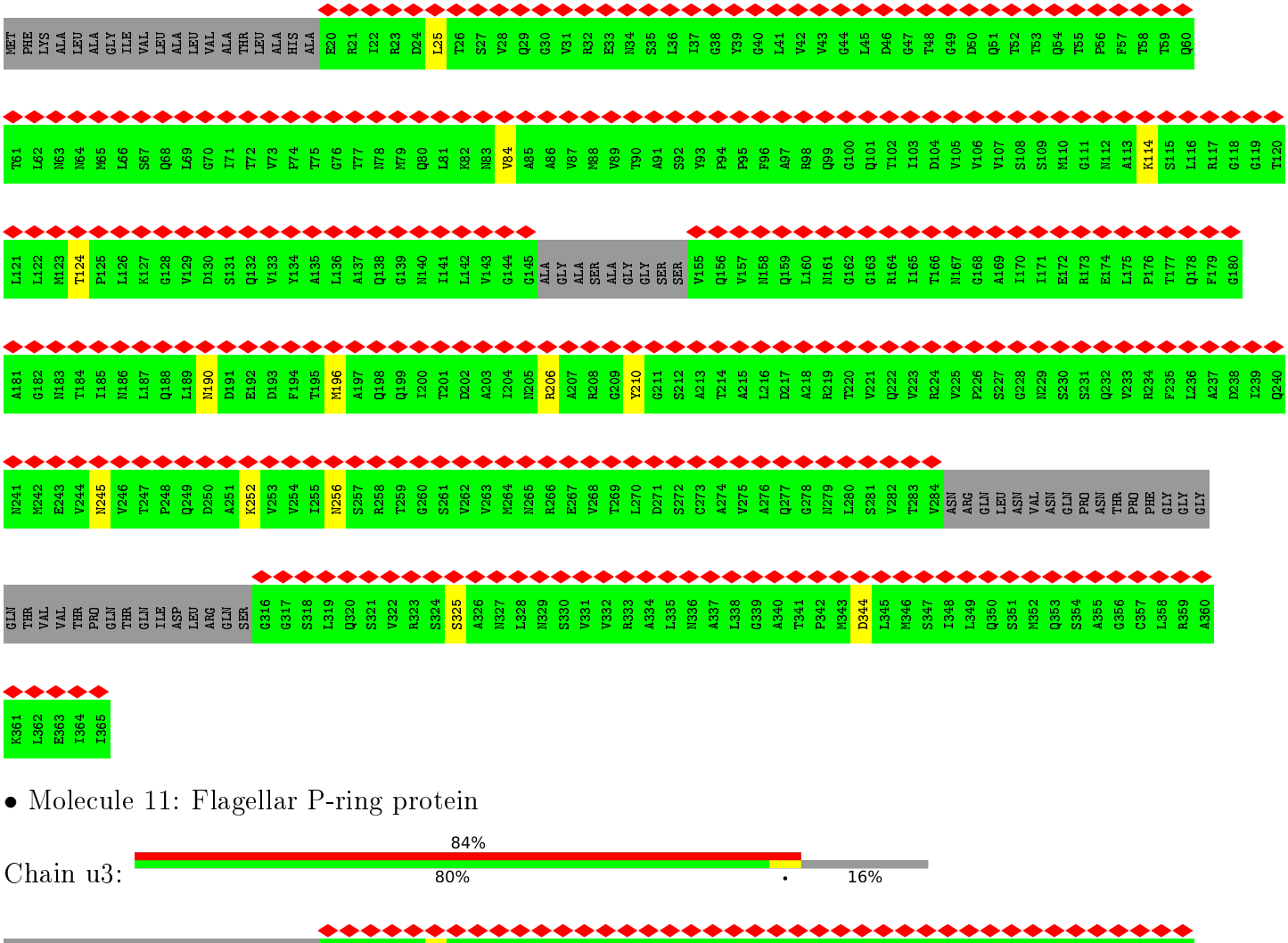
Chain s3:





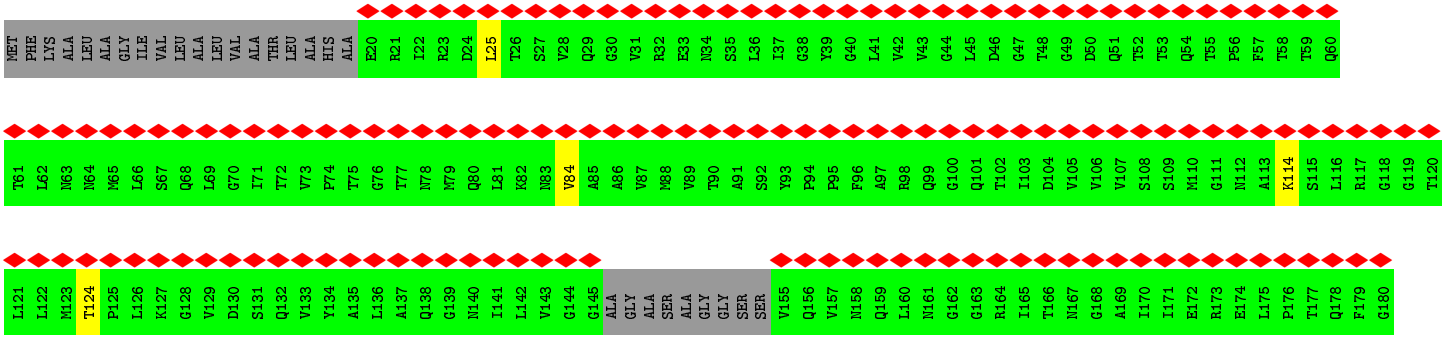
• Molecule 11: Flagellar P-ring protein

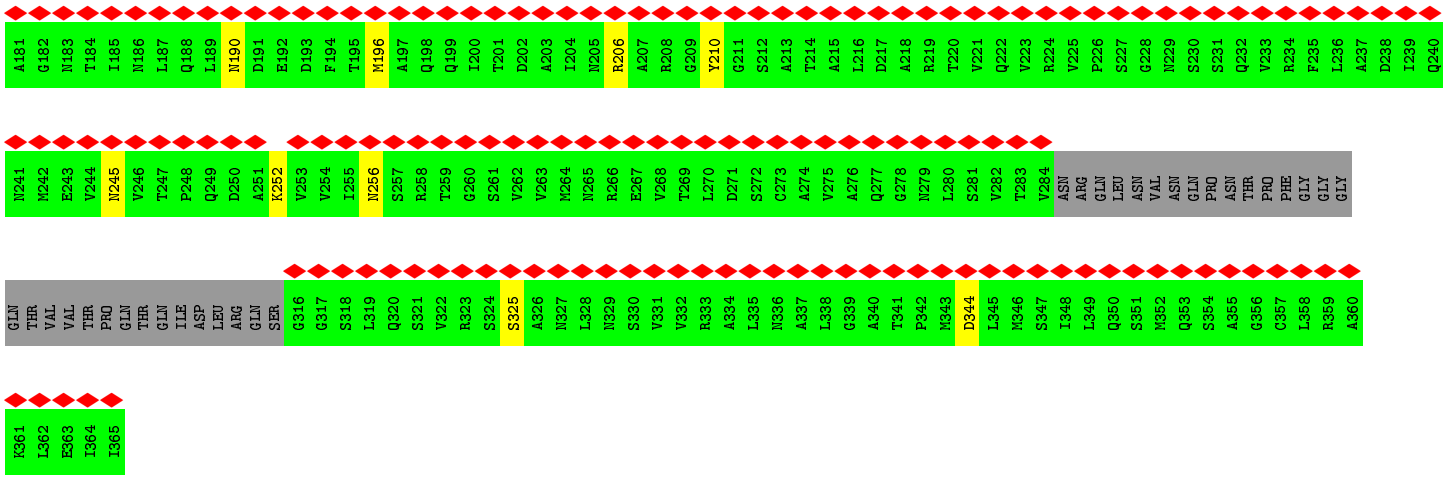
Chain t3:



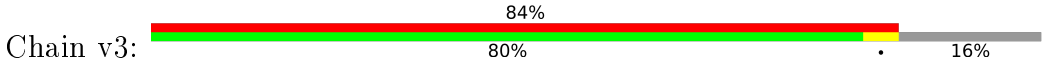
• Molecule 11: Flagellar P-ring protein

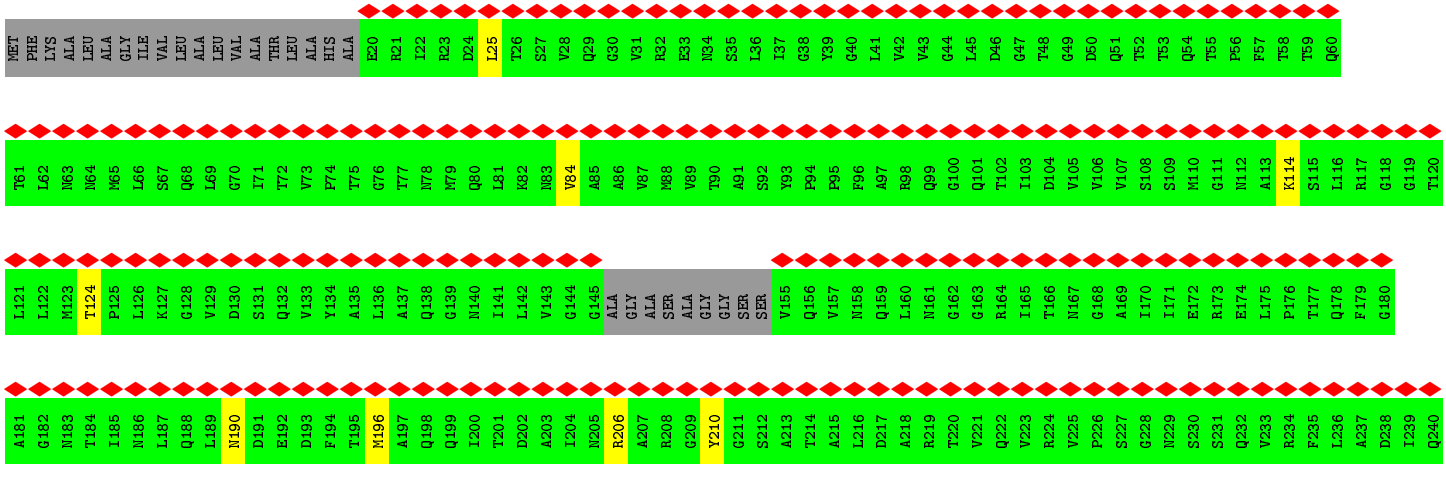
Chain u3:



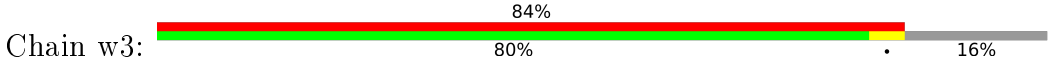


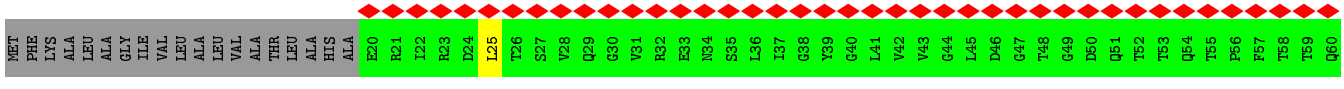
- Molecule 11: Flagellar P-ring protein

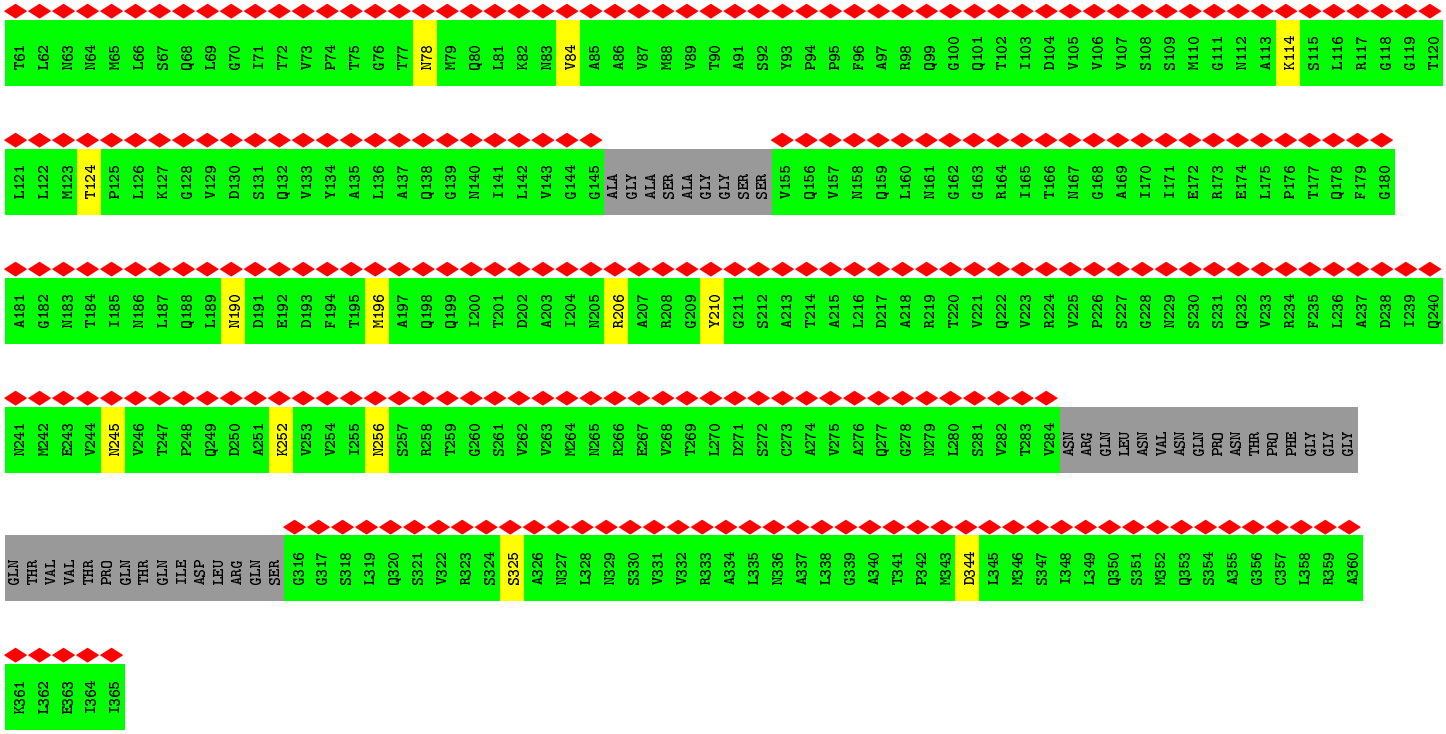




- Molecule 11: Flagellar P-ring protein

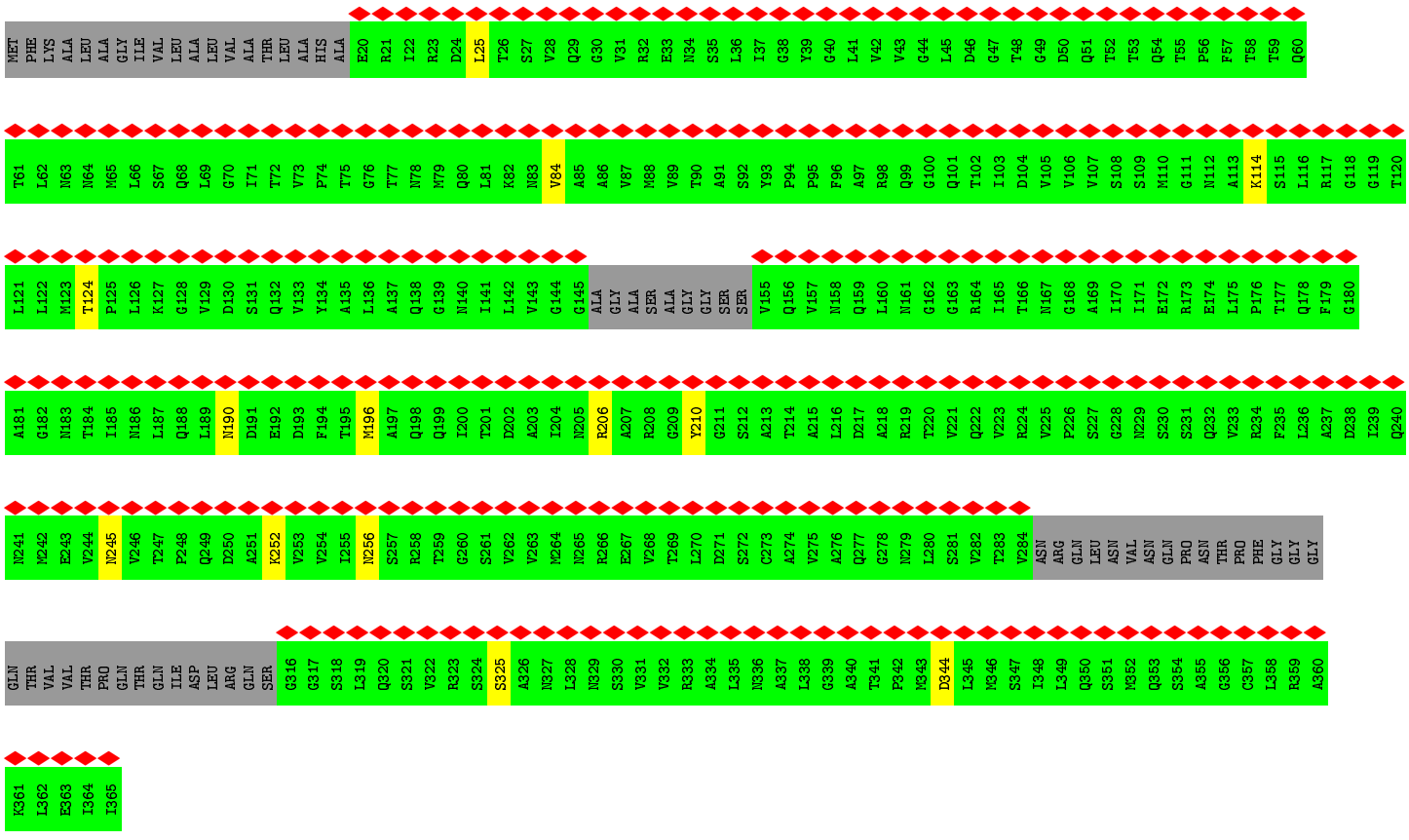






- Molecule 11: Flagellar P-ring protein

Chain x3:

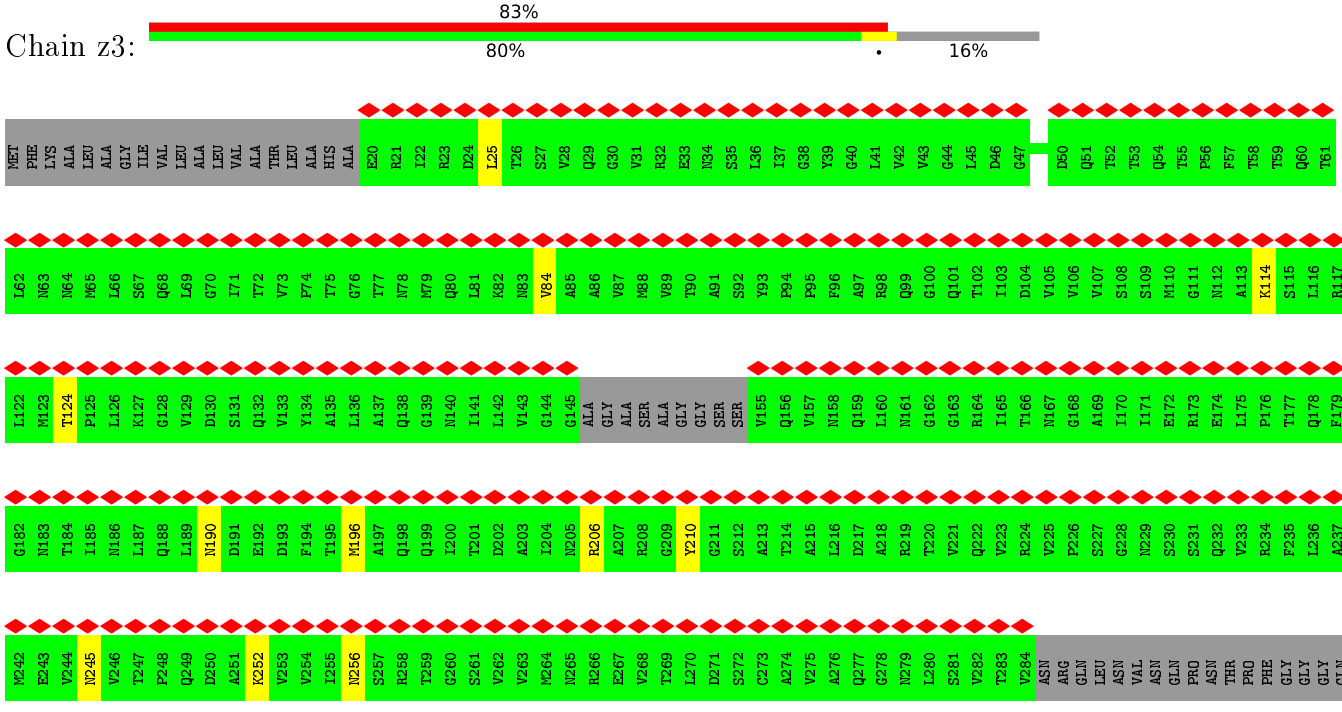


• Molecule 11: Flagellar P-ring protein

Chain y3:

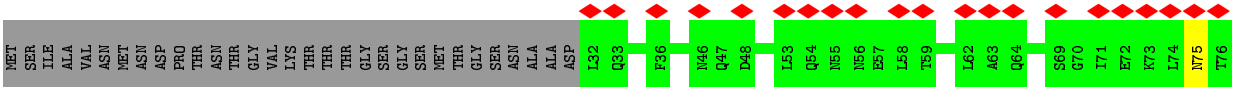
• Molecule 11: Flagellar P-ring protein

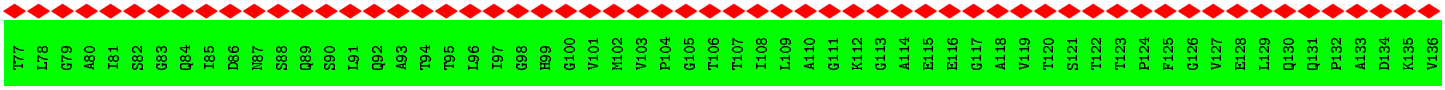
Chain z3:

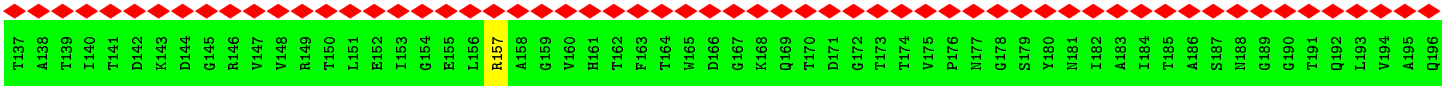


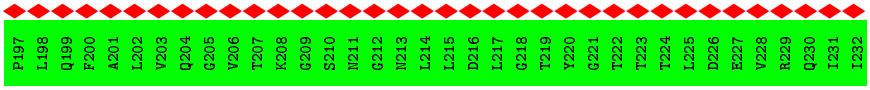
• Molecule 12: Basal-body rod modification protein FlgD

Chain A4:



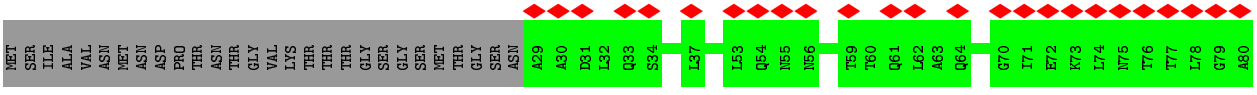


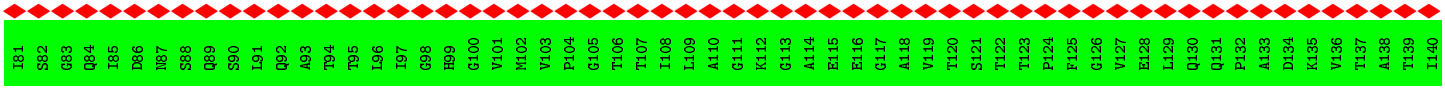


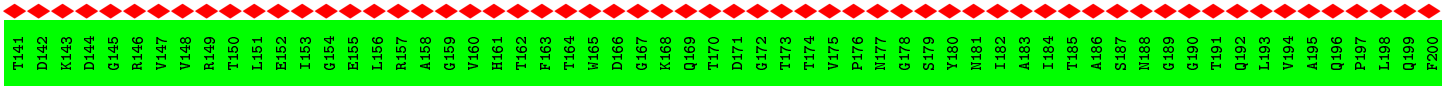


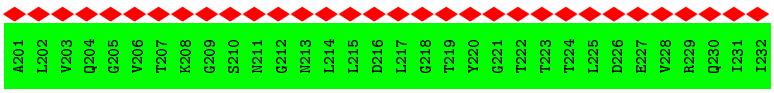
• Molecule 12: Basal-body rod modification protein FlgD

Chain B4:



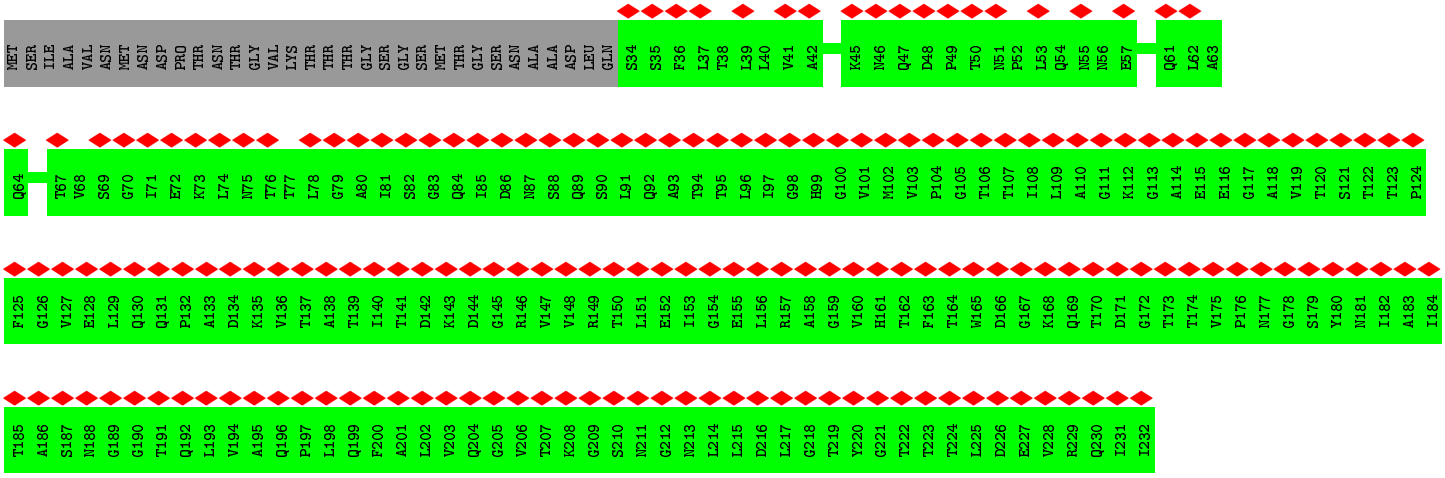






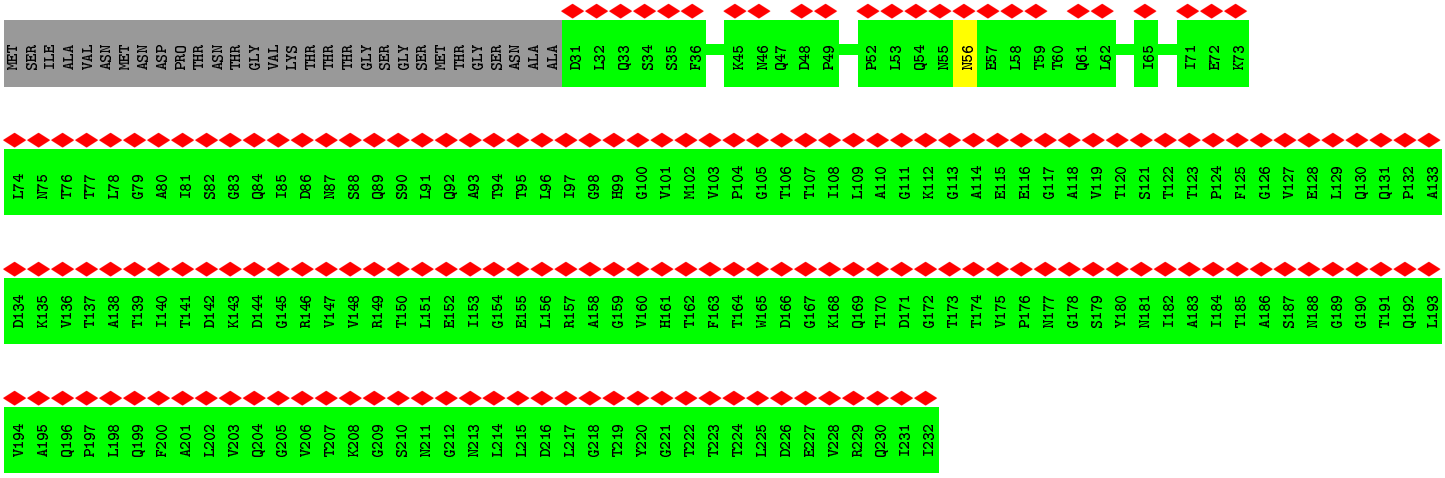
• Molecule 12: Basal-body rod modification protein FlgD

Chain C4:



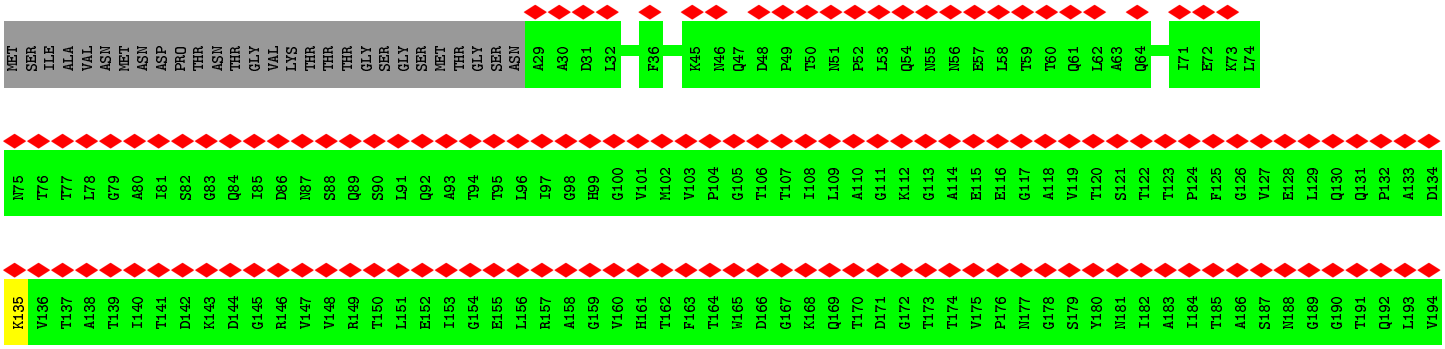
• Molecule 12: Basal-body rod modification protein FlgD

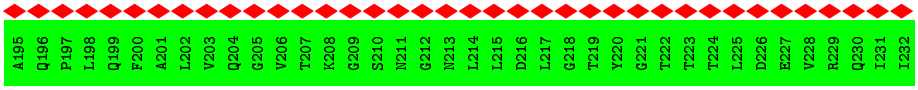
Chain D4:



• Molecule 12: Basal-body rod modification protein FlgD

Chain E4:




A195
Q196
P197
L198
Q199
F200
A201
L202
V203
Q204
G205
V206
T207
K208
G209
S210
N211
G212
N213
L214
L215
D216
L217
G218
T219
Y220
G221
T222
T223
T224
L225
D226
E227
V228
R229
Q230
I231
I232

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	60497	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	59	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	0.023	Depositor
Minimum map value	-0.010	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.001	Depositor
Recommended contour level	0.0075	Depositor
Map size (Å)	638.976, 638.976, 638.976	wwPDB
Map dimensions	768, 768, 768	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.832, 0.832, 0.832	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	A1	0.39	0/1205	0.52	0/1624
1	B1	0.38	0/1955	0.55	0/2645
1	C1	0.39	0/1955	0.54	1/2645 (0.0%)
1	D1	0.40	0/1205	0.53	0/1624
1	E1	0.38	0/1955	0.55	1/2645 (0.0%)
1	F1	0.39	0/1205	0.57	1/1624 (0.1%)
1	G1	0.37	0/1955	0.54	0/2645
1	H1	0.38	0/1955	0.56	0/2645
1	I1	0.37	0/1955	0.53	0/2645
1	J1	0.42	0/1205	0.53	1/1624 (0.1%)
1	K1	0.36	0/1955	0.52	0/2645
1	L1	0.36	0/1955	0.54	0/2645
1	M1	0.40	0/1205	0.55	1/1624 (0.1%)
1	N1	0.36	0/1955	0.55	0/2645
1	O1	0.35	0/1955	0.53	1/2645 (0.0%)
1	P1	0.37	0/1205	0.52	1/1624 (0.1%)
1	Q1	0.35	0/1955	0.52	0/2645
1	R1	0.35	0/1955	0.51	1/2645 (0.0%)
1	S1	0.38	0/1205	0.50	1/1624 (0.1%)
1	T1	0.35	0/1955	0.52	0/2645
1	U1	0.36	0/1955	0.56	0/2645
1	V1	0.38	0/1205	0.52	0/1624
1	W1	0.35	0/1955	0.52	1/2645 (0.0%)
1	X1	0.35	0/1955	0.52	1/2645 (0.0%)
1	Y1	0.34	0/1955	0.53	0/2645
1	Z1	0.41	0/1205	0.54	0/1624
1	a1	0.36	0/1955	0.53	0/2645
1	b1	0.39	0/1205	0.51	0/1624
1	c1	0.37	0/1955	0.53	1/2645 (0.0%)
1	d1	0.37	0/1955	0.54	0/2645
1	e1	0.39	0/1205	0.52	1/1624 (0.1%)
1	f1	0.37	0/1955	0.53	0/2645
1	g1	0.37	0/1955	0.54	1/2645 (0.0%)
1	h1	0.37	0/1955	0.51	0/2645

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
2	A2	0.39	0/1662	0.62	1/2263 (0.0%)
2	B2	0.41	0/1662	0.61	0/2263
2	C2	0.40	0/1662	0.61	0/2263
2	D2	0.43	1/1662 (0.1%)	0.58	0/2263
2	E2	0.61	1/1662 (0.1%)	0.71	1/2263 (0.0%)
3	F2	0.35	0/2035	0.58	0/2777
4	G2	0.34	0/681	0.61	0/930
4	H2	0.34	0/681	0.55	0/930
4	I2	0.37	0/681	0.53	0/930
4	J2	2.82	6/681 (0.9%)	0.65	0/930
5	K2	0.35	0/296	0.60	1/395 (0.3%)
5	L2	0.33	0/567	0.44	0/761
5	M2	0.36	0/567	0.45	0/761
5	N2	0.36	0/567	0.46	0/761
5	O2	0.34	0/567	0.47	0/761
5	P2	0.36	0/567	0.47	0/761
6	Q2	0.39	0/1035	0.52	0/1399
6	R2	0.37	0/941	0.53	0/1269
6	S2	0.40	0/951	0.51	0/1281
6	T2	0.40	0/842	0.53	0/1132
6	U2	0.37	0/934	0.50	0/1259
7	V2	0.44	0/981	0.65	0/1334
7	W2	0.44	0/976	0.57	0/1327
7	X2	0.48	0/976	0.56	0/1327
7	Y2	0.46	0/976	0.56	0/1327
7	Z2	0.46	0/976	0.55	0/1327
7	a2	0.42	0/976	0.57	0/1327
8	b2	0.39	0/1836	0.59	0/2502
8	c2	0.42	0/1836	0.59	0/2502
8	d2	0.44	0/1836	0.58	0/2502
8	e2	0.43	0/1836	0.56	0/2502
8	f2	0.40	0/1836	0.56	0/2502
9	12	0.38	0/1973	0.55	0/2682
9	22	0.37	0/1973	0.54	0/2682
9	32	0.36	0/1971	0.55	1/2677 (0.0%)
9	42	0.31	0/1973	0.56	1/2682 (0.0%)
9	g2	0.41	0/1973	0.52	0/2682
9	h2	0.43	0/1973	0.51	0/2682
9	i2	0.43	0/1973	0.53	0/2682
9	j2	0.44	0/1973	0.52	0/2682
9	k2	0.43	0/1973	0.54	0/2682
9	l2	0.43	0/1894	0.51	0/2573
9	m2	0.46	0/1894	0.54	0/2573

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
9	n2	0.43	0/1894	0.51	0/2573
9	o2	0.44	0/1894	0.53	0/2573
9	p2	0.44	0/1894	0.52	0/2573
9	q2	0.43	0/1907	0.52	0/2590
9	r2	0.42	0/1973	0.56	0/2682
9	s2	0.43	0/1973	0.56	0/2682
9	t2	0.42	0/1973	0.58	2/2682 (0.1%)
9	u2	0.42	0/1973	0.56	0/2682
9	v2	0.43	0/1973	0.54	0/2682
9	w2	0.42	0/1973	0.57	1/2682 (0.0%)
9	x2	0.39	0/1973	0.54	0/2682
9	y2	0.36	0/1973	0.53	0/2682
9	z2	0.35	0/1973	0.54	2/2682 (0.1%)
10	A3	0.26	0/1614	0.52	1/2194 (0.0%)
10	B3	0.27	0/1614	0.52	1/2194 (0.0%)
10	C3	0.26	0/1614	0.52	1/2194 (0.0%)
10	D3	0.26	0/1614	0.52	1/2194 (0.0%)
10	E3	0.26	0/1614	0.52	1/2194 (0.0%)
10	F3	0.26	0/1614	0.52	1/2194 (0.0%)
10	G3	0.26	0/1614	0.52	1/2194 (0.0%)
10	H3	0.26	0/1614	0.52	1/2194 (0.0%)
10	I3	0.26	0/1614	0.52	1/2194 (0.0%)
10	J3	0.26	0/1614	0.52	1/2194 (0.0%)
10	K3	0.26	0/1614	0.52	1/2194 (0.0%)
10	L3	0.26	0/1614	0.52	1/2194 (0.0%)
10	M3	0.26	0/1614	0.52	1/2194 (0.0%)
10	N3	0.26	0/1614	0.52	1/2194 (0.0%)
10	O3	0.26	0/1614	0.52	1/2194 (0.0%)
10	P3	0.26	0/1614	0.52	1/2194 (0.0%)
10	Q3	0.26	0/1614	0.52	1/2194 (0.0%)
10	R3	0.26	0/1614	0.52	1/2194 (0.0%)
10	S3	0.27	0/1614	0.52	1/2194 (0.0%)
10	T3	0.26	0/1614	0.52	1/2194 (0.0%)
10	U3	0.26	0/1614	0.52	1/2194 (0.0%)
10	V3	0.26	0/1614	0.52	1/2194 (0.0%)
10	W3	0.26	0/1611	0.52	1/2188 (0.0%)
10	X3	0.26	0/1614	0.52	1/2194 (0.0%)
10	Y3	0.26	0/1614	0.52	1/2194 (0.0%)
10	Z3	0.26	0/1614	0.52	1/2194 (0.0%)
11	a3	0.24	0/2267	0.50	0/3073
11	b3	0.24	0/2267	0.50	0/3073
11	c3	0.24	0/2267	0.50	0/3073
11	d3	0.24	0/2267	0.50	0/3073

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
11	e3	0.24	0/2267	0.50	0/3073
11	f3	0.24	0/2267	0.50	0/3073
11	g3	0.24	0/2267	0.50	0/3073
11	h3	0.24	0/2266	0.50	0/3071
11	i3	0.24	0/2267	0.50	0/3073
11	j3	0.24	0/2267	0.50	0/3073
11	k3	0.24	0/2267	0.50	0/3073
11	l3	0.24	0/2267	0.50	0/3073
11	m3	0.24	0/2267	0.50	0/3073
11	n3	0.24	0/2267	0.50	0/3073
11	o3	0.24	0/2267	0.50	0/3073
11	p3	0.24	0/2267	0.50	0/3073
11	q3	0.24	0/2267	0.50	0/3073
11	r3	0.24	0/2264	0.50	0/3066
11	s3	0.24	0/2267	0.50	0/3073
11	t3	0.24	0/2267	0.50	0/3073
11	u3	0.24	0/2267	0.50	0/3073
11	v3	0.24	0/2267	0.50	0/3073
11	w3	0.24	0/2267	0.50	0/3073
11	x3	0.24	0/2267	0.50	0/3073
11	y3	0.24	0/2267	0.50	0/3073
11	z3	0.24	0/2267	0.50	0/3073
12	A4	0.25	0/1491	0.47	0/2033
12	B4	0.25	0/1509	0.48	0/2058
12	C4	0.25	0/1474	0.48	0/2010
12	D4	0.25	0/1496	0.49	0/2040
12	E4	0.25	0/1509	0.48	0/2058
All	All	0.37	8/249431 (0.0%)	0.53	50/338382 (0.0%)

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	B1	0	1
1	E1	0	1
1	G1	0	1
1	H1	0	1
1	L1	0	1
1	N1	0	1
2	B2	0	2

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Mol	Chain	#Chirality outliers	#Planarity outliers
2	C2	0	2
2	D2	0	2
2	E2	0	1
3	F2	0	2
4	G2	0	1
4	H2	0	1
4	I2	0	1
4	J2	0	1
6	U2	0	1
8	b2	0	2
8	c2	0	2
8	d2	0	1
8	e2	0	3
8	f2	0	3
All	All	0	31

The worst 5 of 8 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	J2	51	PHE	CE2-CZ	34.87	2.03	1.37
4	J2	51	PHE	CE1-CZ	33.72	2.01	1.37
4	J2	51	PHE	CD1-CE1	32.60	2.04	1.39
4	J2	51	PHE	CD2-CE2	31.33	2.02	1.39
4	J2	51	PHE	CG-CD1	21.84	1.71	1.38

The worst 5 of 50 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	E2	205	MET	CG-SD-CE	20.16	132.46	100.20
9	t2	167	PRO	CA-N-CD	-8.46	99.66	111.50
1	E1	282	TYR	C-N-CA	-6.66	105.04	121.70
1	g1	282	TYR	C-N-CA	-6.65	105.07	121.70
10	Z3	43	PRO	CA-N-CD	-6.36	102.59	111.50

There are no chirality outliers.

5 of 31 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B1	163	SER	Peptide
1	E1	162	PRO	Peptide
1	G1	165	PHE	Peptide

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Mol	Chain	Res	Type	Group
1	H1	165	PHE	Peptide
1	L1	125	GLN	Peptide

5.2 Too-close contacts (i)

Due to software issues we are unable to calculate clashes - this section is therefore empty.

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	A1	145/560 (26%)	143 (99%)	2 (1%)	0	100	100
1	B1	242/560 (43%)	227 (94%)	15 (6%)	0	100	100
1	C1	242/560 (43%)	230 (95%)	11 (4%)	1 (0%)	34	69
1	D1	145/560 (26%)	142 (98%)	3 (2%)	0	100	100
1	E1	242/560 (43%)	226 (93%)	16 (7%)	0	100	100
1	F1	145/560 (26%)	141 (97%)	4 (3%)	0	100	100
1	G1	242/560 (43%)	225 (93%)	16 (7%)	1 (0%)	34	69
1	H1	242/560 (43%)	221 (91%)	19 (8%)	2 (1%)	19	56
1	I1	242/560 (43%)	229 (95%)	12 (5%)	1 (0%)	34	69
1	J1	145/560 (26%)	142 (98%)	3 (2%)	0	100	100
1	K1	242/560 (43%)	230 (95%)	11 (4%)	1 (0%)	34	69
1	L1	242/560 (43%)	224 (93%)	18 (7%)	0	100	100
1	M1	145/560 (26%)	141 (97%)	4 (3%)	0	100	100
1	N1	242/560 (43%)	223 (92%)	19 (8%)	0	100	100
1	O1	242/560 (43%)	231 (96%)	10 (4%)	1 (0%)	34	69
1	P1	145/560 (26%)	142 (98%)	3 (2%)	0	100	100
1	Q1	242/560 (43%)	224 (93%)	17 (7%)	1 (0%)	34	69

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	R1	242/560 (43%)	229 (95%)	13 (5%)	0	100	100
1	S1	145/560 (26%)	142 (98%)	3 (2%)	0	100	100
1	T1	242/560 (43%)	230 (95%)	12 (5%)	0	100	100
1	U1	242/560 (43%)	231 (96%)	11 (4%)	0	100	100
1	V1	145/560 (26%)	141 (97%)	4 (3%)	0	100	100
1	W1	242/560 (43%)	227 (94%)	14 (6%)	1 (0%)	34	69
1	X1	242/560 (43%)	225 (93%)	17 (7%)	0	100	100
1	Y1	242/560 (43%)	228 (94%)	14 (6%)	0	100	100
1	Z1	145/560 (26%)	142 (98%)	3 (2%)	0	100	100
1	a1	242/560 (43%)	227 (94%)	14 (6%)	1 (0%)	34	69
1	b1	145/560 (26%)	140 (97%)	5 (3%)	0	100	100
1	c1	242/560 (43%)	225 (93%)	16 (7%)	1 (0%)	34	69
1	d1	242/560 (43%)	225 (93%)	16 (7%)	1 (0%)	34	69
1	e1	145/560 (26%)	144 (99%)	1 (1%)	0	100	100
1	f1	242/560 (43%)	229 (95%)	12 (5%)	1 (0%)	34	69
1	g1	242/560 (43%)	226 (93%)	15 (6%)	1 (0%)	34	69
1	h1	242/560 (43%)	232 (96%)	10 (4%)	0	100	100
2	A2	207/245 (84%)	182 (88%)	23 (11%)	2 (1%)	15	51
2	B2	207/245 (84%)	183 (88%)	22 (11%)	2 (1%)	15	51
2	C2	207/245 (84%)	177 (86%)	29 (14%)	1 (0%)	29	66
2	D2	207/245 (84%)	181 (87%)	25 (12%)	1 (0%)	29	66
2	E2	207/245 (84%)	183 (88%)	22 (11%)	2 (1%)	15	51
3	F2	254/264 (96%)	223 (88%)	30 (12%)	1 (0%)	34	69
4	G2	87/89 (98%)	75 (86%)	12 (14%)	0	100	100
4	H2	87/89 (98%)	77 (88%)	10 (12%)	0	100	100
4	I2	87/89 (98%)	78 (90%)	9 (10%)	0	100	100
4	J2	87/89 (98%)	77 (88%)	10 (12%)	0	100	100
5	K2	37/104 (36%)	37 (100%)	0	0	100	100
5	L2	73/104 (70%)	68 (93%)	5 (7%)	0	100	100
5	M2	73/104 (70%)	68 (93%)	5 (7%)	0	100	100
5	N2	73/104 (70%)	69 (94%)	4 (6%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
5	O2	73/104 (70%)	69 (94%)	4 (6%)	0	100	100
5	P2	73/104 (70%)	68 (93%)	5 (7%)	0	100	100
6	Q2	131/138 (95%)	115 (88%)	16 (12%)	0	100	100
6	R2	114/138 (83%)	98 (86%)	16 (14%)	0	100	100
6	S2	116/138 (84%)	104 (90%)	12 (10%)	0	100	100
6	T2	102/138 (74%)	95 (93%)	7 (7%)	0	100	100
6	U2	113/138 (82%)	102 (90%)	11 (10%)	0	100	100
7	V2	131/134 (98%)	112 (86%)	18 (14%)	1 (1%)	19	56
7	W2	130/134 (97%)	108 (83%)	22 (17%)	0	100	100
7	X2	130/134 (97%)	107 (82%)	22 (17%)	1 (1%)	19	56
7	Y2	130/134 (97%)	109 (84%)	21 (16%)	0	100	100
7	Z2	130/134 (97%)	113 (87%)	17 (13%)	0	100	100
7	a2	130/134 (97%)	109 (84%)	21 (16%)	0	100	100
8	b2	247/251 (98%)	217 (88%)	29 (12%)	1 (0%)	34	69
8	c2	247/251 (98%)	212 (86%)	35 (14%)	0	100	100
8	d2	247/251 (98%)	215 (87%)	32 (13%)	0	100	100
8	e2	247/251 (98%)	212 (86%)	35 (14%)	0	100	100
8	f2	247/251 (98%)	210 (85%)	37 (15%)	0	100	100
9	12	258/260 (99%)	231 (90%)	27 (10%)	0	100	100
9	22	258/260 (99%)	231 (90%)	27 (10%)	0	100	100
9	32	256/260 (98%)	230 (90%)	26 (10%)	0	100	100
9	42	258/260 (99%)	239 (93%)	19 (7%)	0	100	100
9	g2	258/260 (99%)	240 (93%)	18 (7%)	0	100	100
9	h2	258/260 (99%)	239 (93%)	19 (7%)	0	100	100
9	i2	258/260 (99%)	240 (93%)	18 (7%)	0	100	100
9	j2	258/260 (99%)	240 (93%)	18 (7%)	0	100	100
9	k2	258/260 (99%)	242 (94%)	16 (6%)	0	100	100
9	l2	245/260 (94%)	229 (94%)	16 (6%)	0	100	100
9	m2	245/260 (94%)	230 (94%)	15 (6%)	0	100	100
9	n2	245/260 (94%)	232 (95%)	13 (5%)	0	100	100
9	o2	245/260 (94%)	230 (94%)	15 (6%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
9	p2	245/260 (94%)	232 (95%)	13 (5%)	0	100	100
9	q2	247/260 (95%)	233 (94%)	14 (6%)	0	100	100
9	r2	258/260 (99%)	233 (90%)	25 (10%)	0	100	100
9	s2	258/260 (99%)	230 (89%)	28 (11%)	0	100	100
9	t2	258/260 (99%)	236 (92%)	22 (8%)	0	100	100
9	u2	258/260 (99%)	234 (91%)	24 (9%)	0	100	100
9	v2	258/260 (99%)	233 (90%)	25 (10%)	0	100	100
9	w2	258/260 (99%)	232 (90%)	26 (10%)	0	100	100
9	x2	258/260 (99%)	236 (92%)	22 (8%)	0	100	100
9	y2	258/260 (99%)	238 (92%)	20 (8%)	0	100	100
9	z2	258/260 (99%)	240 (93%)	18 (7%)	0	100	100
10	A3	209/232 (90%)	193 (92%)	16 (8%)	0	100	100
10	B3	209/232 (90%)	193 (92%)	16 (8%)	0	100	100
10	C3	209/232 (90%)	193 (92%)	16 (8%)	0	100	100
10	D3	209/232 (90%)	193 (92%)	16 (8%)	0	100	100
10	E3	209/232 (90%)	193 (92%)	16 (8%)	0	100	100
10	F3	209/232 (90%)	192 (92%)	17 (8%)	0	100	100
10	G3	209/232 (90%)	192 (92%)	17 (8%)	0	100	100
10	H3	209/232 (90%)	193 (92%)	16 (8%)	0	100	100
10	I3	209/232 (90%)	192 (92%)	17 (8%)	0	100	100
10	J3	209/232 (90%)	193 (92%)	16 (8%)	0	100	100
10	K3	209/232 (90%)	192 (92%)	17 (8%)	0	100	100
10	L3	209/232 (90%)	193 (92%)	16 (8%)	0	100	100
10	M3	209/232 (90%)	193 (92%)	16 (8%)	0	100	100
10	N3	209/232 (90%)	193 (92%)	16 (8%)	0	100	100
10	O3	209/232 (90%)	193 (92%)	16 (8%)	0	100	100
10	P3	209/232 (90%)	193 (92%)	16 (8%)	0	100	100
10	Q3	209/232 (90%)	193 (92%)	16 (8%)	0	100	100
10	R3	209/232 (90%)	193 (92%)	16 (8%)	0	100	100
10	S3	209/232 (90%)	193 (92%)	16 (8%)	0	100	100
10	T3	209/232 (90%)	192 (92%)	17 (8%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
10	U3	209/232 (90%)	192 (92%)	17 (8%)	0	100	100
10	V3	209/232 (90%)	193 (92%)	16 (8%)	0	100	100
10	W3	208/232 (90%)	192 (92%)	16 (8%)	0	100	100
10	X3	209/232 (90%)	193 (92%)	16 (8%)	0	100	100
10	Y3	209/232 (90%)	193 (92%)	16 (8%)	0	100	100
10	Z3	209/232 (90%)	193 (92%)	16 (8%)	0	100	100
11	a3	300/365 (82%)	288 (96%)	12 (4%)	0	100	100
11	b3	300/365 (82%)	288 (96%)	12 (4%)	0	100	100
11	c3	300/365 (82%)	288 (96%)	12 (4%)	0	100	100
11	d3	300/365 (82%)	288 (96%)	12 (4%)	0	100	100
11	e3	300/365 (82%)	288 (96%)	12 (4%)	0	100	100
11	f3	300/365 (82%)	288 (96%)	12 (4%)	0	100	100
11	g3	300/365 (82%)	288 (96%)	12 (4%)	0	100	100
11	h3	300/365 (82%)	288 (96%)	12 (4%)	0	100	100
11	i3	300/365 (82%)	288 (96%)	12 (4%)	0	100	100
11	j3	300/365 (82%)	288 (96%)	12 (4%)	0	100	100
11	k3	300/365 (82%)	288 (96%)	12 (4%)	0	100	100
11	l3	300/365 (82%)	288 (96%)	12 (4%)	0	100	100
11	m3	300/365 (82%)	288 (96%)	12 (4%)	0	100	100
11	n3	300/365 (82%)	288 (96%)	12 (4%)	0	100	100
11	o3	300/365 (82%)	288 (96%)	12 (4%)	0	100	100
11	p3	300/365 (82%)	288 (96%)	12 (4%)	0	100	100
11	q3	300/365 (82%)	288 (96%)	12 (4%)	0	100	100
11	r3	299/365 (82%)	288 (96%)	11 (4%)	0	100	100
11	s3	300/365 (82%)	288 (96%)	12 (4%)	0	100	100
11	t3	300/365 (82%)	288 (96%)	12 (4%)	0	100	100
11	u3	300/365 (82%)	288 (96%)	12 (4%)	0	100	100
11	v3	300/365 (82%)	288 (96%)	12 (4%)	0	100	100
11	w3	300/365 (82%)	288 (96%)	12 (4%)	0	100	100
11	x3	300/365 (82%)	288 (96%)	12 (4%)	0	100	100
11	y3	300/365 (82%)	288 (96%)	12 (4%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
11	z3	300/365 (82%)	288 (96%)	12 (4%)	0	100	100
12	A4	199/232 (86%)	194 (98%)	5 (2%)	0	100	100
12	B4	202/232 (87%)	200 (99%)	2 (1%)	0	100	100
12	C4	197/232 (85%)	185 (94%)	12 (6%)	0	100	100
12	D4	200/232 (86%)	194 (97%)	6 (3%)	0	100	100
12	E4	202/232 (87%)	197 (98%)	5 (2%)	0	100	100
All	All	32138/47180 (68%)	29936 (93%)	2176 (7%)	26 (0%)	54	83

5 of 26 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B2	42	VAL
2	C2	42	VAL
2	D2	42	VAL
2	A2	42	VAL
2	E2	42	VAL

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	A1	134/467 (29%)	133 (99%)	1 (1%)	84	91
1	B1	217/467 (46%)	215 (99%)	2 (1%)	78	88
1	C1	217/467 (46%)	216 (100%)	1 (0%)	88	94
1	D1	134/467 (29%)	133 (99%)	1 (1%)	84	91
1	E1	217/467 (46%)	217 (100%)	0	100	100
1	F1	134/467 (29%)	133 (99%)	1 (1%)	84	91
1	G1	217/467 (46%)	216 (100%)	1 (0%)	88	94
1	H1	217/467 (46%)	216 (100%)	1 (0%)	88	94
1	I1	217/467 (46%)	216 (100%)	1 (0%)	88	94
1	J1	134/467 (29%)	132 (98%)	2 (2%)	65	81

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	K1	217/467 (46%)	215 (99%)	2 (1%)	78 88
1	L1	217/467 (46%)	216 (100%)	1 (0%)	88 94
1	M1	134/467 (29%)	133 (99%)	1 (1%)	84 91
1	N1	217/467 (46%)	215 (99%)	2 (1%)	78 88
1	O1	217/467 (46%)	213 (98%)	4 (2%)	59 77
1	P1	134/467 (29%)	131 (98%)	3 (2%)	52 72
1	Q1	217/467 (46%)	215 (99%)	2 (1%)	78 88
1	R1	217/467 (46%)	216 (100%)	1 (0%)	88 94
1	S1	134/467 (29%)	133 (99%)	1 (1%)	84 91
1	T1	217/467 (46%)	216 (100%)	1 (0%)	88 94
1	U1	217/467 (46%)	215 (99%)	2 (1%)	78 88
1	V1	134/467 (29%)	132 (98%)	2 (2%)	65 81
1	W1	217/467 (46%)	215 (99%)	2 (1%)	78 88
1	X1	217/467 (46%)	215 (99%)	2 (1%)	78 88
1	Y1	217/467 (46%)	215 (99%)	2 (1%)	78 88
1	Z1	134/467 (29%)	132 (98%)	2 (2%)	65 81
1	a1	217/467 (46%)	215 (99%)	2 (1%)	78 88
1	b1	134/467 (29%)	133 (99%)	1 (1%)	84 91
1	c1	217/467 (46%)	216 (100%)	1 (0%)	88 94
1	d1	217/467 (46%)	215 (99%)	2 (1%)	78 88
1	e1	134/467 (29%)	133 (99%)	1 (1%)	84 91
1	f1	217/467 (46%)	216 (100%)	1 (0%)	88 94
1	g1	217/467 (46%)	216 (100%)	1 (0%)	88 94
1	h1	217/467 (46%)	216 (100%)	1 (0%)	88 94
2	A2	179/204 (88%)	179 (100%)	0	100 100
2	B2	179/204 (88%)	179 (100%)	0	100 100
2	C2	179/204 (88%)	178 (99%)	1 (1%)	86 93
2	D2	179/204 (88%)	179 (100%)	0	100 100
2	E2	179/204 (88%)	179 (100%)	0	100 100
3	F2	215/221 (97%)	215 (100%)	0	100 100
4	G2	74/74 (100%)	74 (100%)	0	100 100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
4	H2	74/74 (100%)	74 (100%)	0	100	100
4	I2	74/74 (100%)	74 (100%)	0	100	100
4	J2	74/74 (100%)	74 (100%)	0	100	100
5	K2	33/79 (42%)	33 (100%)	0	100	100
5	L2	59/79 (75%)	59 (100%)	0	100	100
5	M2	59/79 (75%)	59 (100%)	0	100	100
5	N2	59/79 (75%)	59 (100%)	0	100	100
5	O2	59/79 (75%)	59 (100%)	0	100	100
5	P2	59/79 (75%)	59 (100%)	0	100	100
6	Q2	109/113 (96%)	109 (100%)	0	100	100
6	R2	100/113 (88%)	100 (100%)	0	100	100
6	S2	100/113 (88%)	99 (99%)	1 (1%)	76	86
6	T2	89/113 (79%)	88 (99%)	1 (1%)	73	85
6	U2	99/113 (88%)	97 (98%)	2 (2%)	55	74
7	V2	104/105 (99%)	103 (99%)	1 (1%)	76	86
7	W2	104/105 (99%)	104 (100%)	0	100	100
7	X2	104/105 (99%)	104 (100%)	0	100	100
7	Y2	104/105 (99%)	104 (100%)	0	100	100
7	Z2	104/105 (99%)	103 (99%)	1 (1%)	76	86
7	a2	104/105 (99%)	104 (100%)	0	100	100
8	b2	191/193 (99%)	191 (100%)	0	100	100
8	c2	191/193 (99%)	191 (100%)	0	100	100
8	d2	191/193 (99%)	191 (100%)	0	100	100
8	e2	191/193 (99%)	191 (100%)	0	100	100
8	f2	191/193 (99%)	191 (100%)	0	100	100
9	12	215/215 (100%)	215 (100%)	0	100	100
9	22	215/215 (100%)	215 (100%)	0	100	100
9	32	214/215 (100%)	214 (100%)	0	100	100
9	42	215/215 (100%)	214 (100%)	1 (0%)	88	94
9	g2	215/215 (100%)	215 (100%)	0	100	100
9	h2	215/215 (100%)	215 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
9	i2	215/215 (100%)	215 (100%)	0	100 100
9	j2	215/215 (100%)	215 (100%)	0	100 100
9	k2	215/215 (100%)	215 (100%)	0	100 100
9	l2	206/215 (96%)	206 (100%)	0	100 100
9	m2	206/215 (96%)	206 (100%)	0	100 100
9	n2	206/215 (96%)	205 (100%)	1 (0%)	88 94
9	o2	206/215 (96%)	206 (100%)	0	100 100
9	p2	206/215 (96%)	206 (100%)	0	100 100
9	q2	207/215 (96%)	206 (100%)	1 (0%)	88 94
9	r2	215/215 (100%)	214 (100%)	1 (0%)	88 94
9	s2	215/215 (100%)	215 (100%)	0	100 100
9	t2	215/215 (100%)	215 (100%)	0	100 100
9	u2	215/215 (100%)	215 (100%)	0	100 100
9	v2	215/215 (100%)	215 (100%)	0	100 100
9	w2	215/215 (100%)	215 (100%)	0	100 100
9	x2	215/215 (100%)	215 (100%)	0	100 100
9	y2	215/215 (100%)	214 (100%)	1 (0%)	88 94
9	z2	215/215 (100%)	215 (100%)	0	100 100
10	A3	170/186 (91%)	164 (96%)	6 (4%)	36 63
10	B3	170/186 (91%)	164 (96%)	6 (4%)	36 63
10	C3	170/186 (91%)	164 (96%)	6 (4%)	36 63
10	D3	170/186 (91%)	164 (96%)	6 (4%)	36 63
10	E3	170/186 (91%)	164 (96%)	6 (4%)	36 63
10	F3	170/186 (91%)	164 (96%)	6 (4%)	36 63
10	G3	170/186 (91%)	164 (96%)	6 (4%)	36 63
10	H3	170/186 (91%)	164 (96%)	6 (4%)	36 63
10	I3	170/186 (91%)	164 (96%)	6 (4%)	36 63
10	J3	170/186 (91%)	164 (96%)	6 (4%)	36 63
10	K3	170/186 (91%)	164 (96%)	6 (4%)	36 63
10	L3	170/186 (91%)	164 (96%)	6 (4%)	36 63
10	M3	170/186 (91%)	164 (96%)	6 (4%)	36 63

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
10	N3	170/186 (91%)	164 (96%)	6 (4%)	36	63
10	O3	170/186 (91%)	164 (96%)	6 (4%)	36	63
10	P3	170/186 (91%)	164 (96%)	6 (4%)	36	63
10	Q3	170/186 (91%)	164 (96%)	6 (4%)	36	63
10	R3	170/186 (91%)	164 (96%)	6 (4%)	36	63
10	S3	170/186 (91%)	164 (96%)	6 (4%)	36	63
10	T3	170/186 (91%)	164 (96%)	6 (4%)	36	63
10	U3	170/186 (91%)	164 (96%)	6 (4%)	36	63
10	V3	170/186 (91%)	164 (96%)	6 (4%)	36	63
10	W3	170/186 (91%)	164 (96%)	6 (4%)	36	63
10	X3	170/186 (91%)	164 (96%)	6 (4%)	36	63
10	Y3	170/186 (91%)	164 (96%)	6 (4%)	36	63
10	Z3	170/186 (91%)	164 (96%)	6 (4%)	36	63
11	a3	251/294 (85%)	238 (95%)	13 (5%)	23	55
11	b3	251/294 (85%)	238 (95%)	13 (5%)	23	55
11	c3	251/294 (85%)	238 (95%)	13 (5%)	23	55
11	d3	251/294 (85%)	238 (95%)	13 (5%)	23	55
11	e3	251/294 (85%)	238 (95%)	13 (5%)	23	55
11	f3	251/294 (85%)	238 (95%)	13 (5%)	23	55
11	g3	251/294 (85%)	238 (95%)	13 (5%)	23	55
11	h3	251/294 (85%)	238 (95%)	13 (5%)	23	55
11	i3	251/294 (85%)	238 (95%)	13 (5%)	23	55
11	j3	251/294 (85%)	238 (95%)	13 (5%)	23	55
11	k3	251/294 (85%)	238 (95%)	13 (5%)	23	55
11	l3	251/294 (85%)	238 (95%)	13 (5%)	23	55
11	m3	251/294 (85%)	238 (95%)	13 (5%)	23	55
11	n3	251/294 (85%)	238 (95%)	13 (5%)	23	55
11	o3	251/294 (85%)	238 (95%)	13 (5%)	23	55
11	p3	251/294 (85%)	238 (95%)	13 (5%)	23	55
11	q3	251/294 (85%)	238 (95%)	13 (5%)	23	55
11	r3	250/294 (85%)	237 (95%)	13 (5%)	23	55

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
11	s3	251/294 (85%)	238 (95%)	13 (5%)	23 55
11	t3	251/294 (85%)	238 (95%)	13 (5%)	23 55
11	u3	251/294 (85%)	238 (95%)	13 (5%)	23 55
11	v3	251/294 (85%)	238 (95%)	13 (5%)	23 55
11	w3	251/294 (85%)	237 (94%)	14 (6%)	21 53
11	x3	251/294 (85%)	238 (95%)	13 (5%)	23 55
11	y3	251/294 (85%)	238 (95%)	13 (5%)	23 55
11	z3	251/294 (85%)	238 (95%)	13 (5%)	23 55
12	A4	164/188 (87%)	162 (99%)	2 (1%)	71 84
12	B4	165/188 (88%)	165 (100%)	0	100 100
12	C4	162/188 (86%)	162 (100%)	0	100 100
12	D4	164/188 (87%)	163 (99%)	1 (1%)	86 93
12	E4	165/188 (88%)	164 (99%)	1 (1%)	86 93
All	All	27146/38629 (70%)	26584 (98%)	562 (2%)	56 74

5 of 562 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
11	s3	256	ASN
11	t3	256	ASN
11	s3	252	LYS
11	x3	84	VAL
10	V3	144	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 200 such sidechains are listed below:

Mol	Chain	Res	Type
11	e3	161	ASN
11	m3	161	ASN
12	E4	54	GLN
11	f3	350	GLN
11	j3	161	ASN

5.3.3 RNA

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains

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

5.5 Carbohydrates

There are no monosaccharides in this entry.

5.6 Ligand geometry

There are no ligands in this entry.

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

The following chains have linkage breaks:

Mol	Chain	Number of breaks
3	F2	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	F2	115:ASP	C	116:PRO	N	5.09

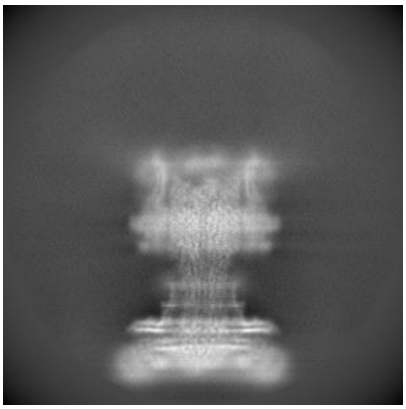
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-12603. These allow visual inspection of the internal detail of the map and identification of artifacts.

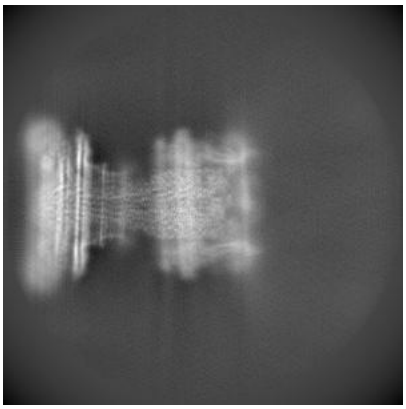
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

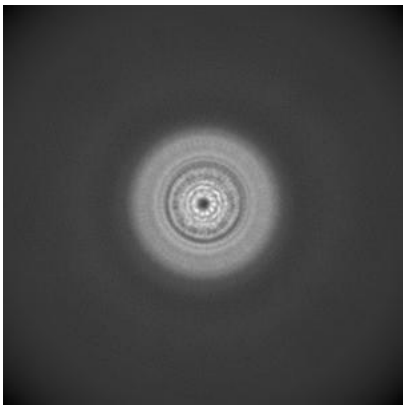
6.1.1 Primary map



X

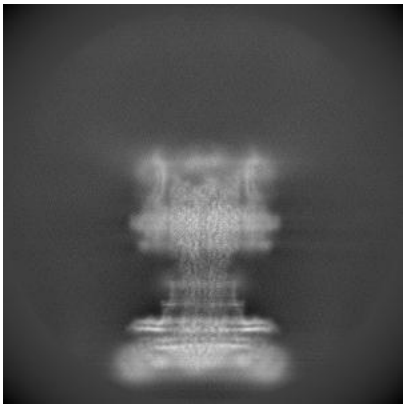


Y

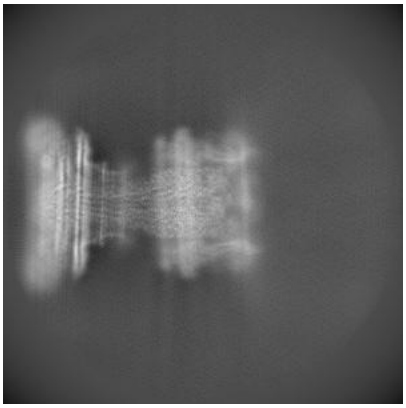


Z

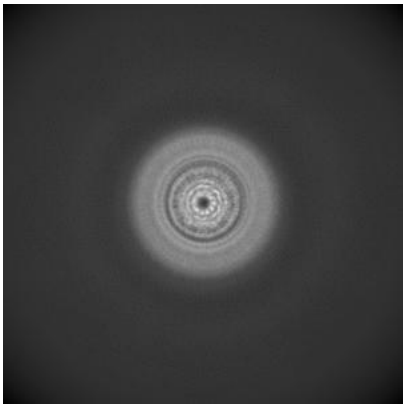
6.1.2 Raw map



X



Y



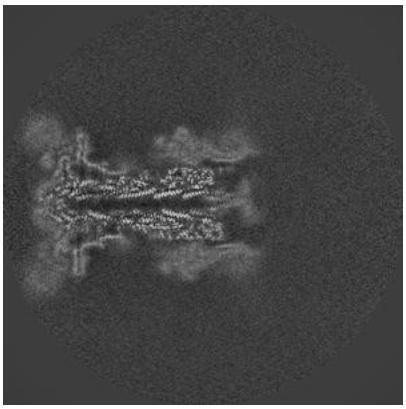
Z

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

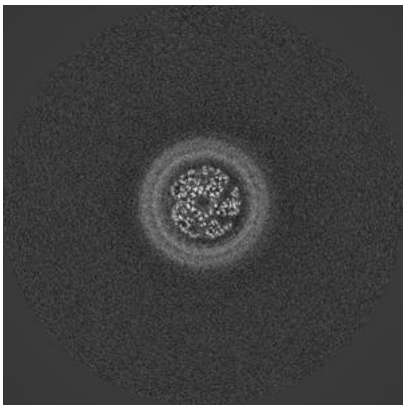
6.2 Central slices (i)

6.2.1 Primary map

X Index: 384

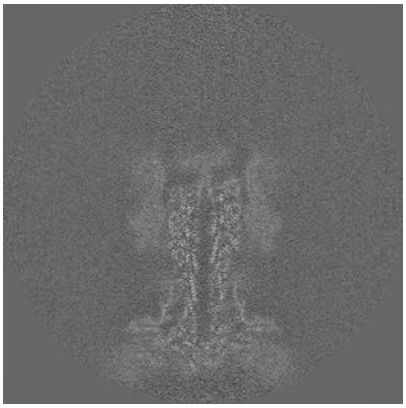


Y Index: 384

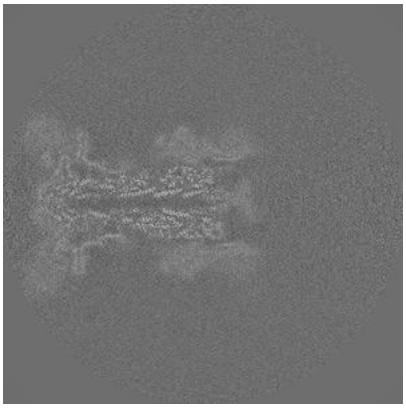


Z Index: 384

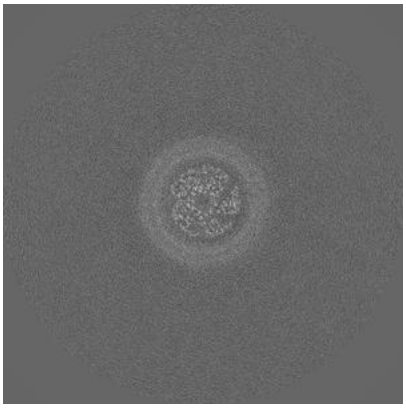
6.2.2 Raw map



X Index: 384



Y Index: 384



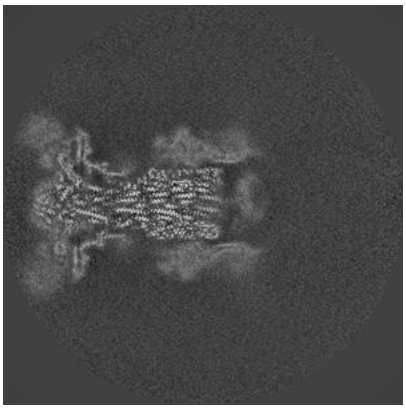
Z Index: 384

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

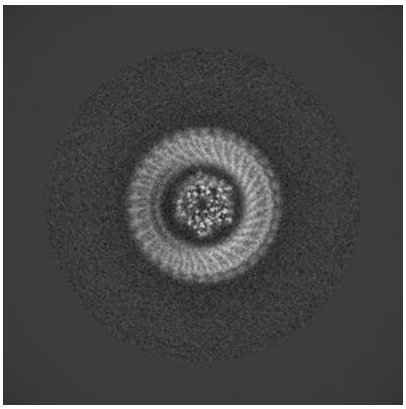
6.3 Largest variance slices (i)

6.3.1 Primary map

X Index: 402

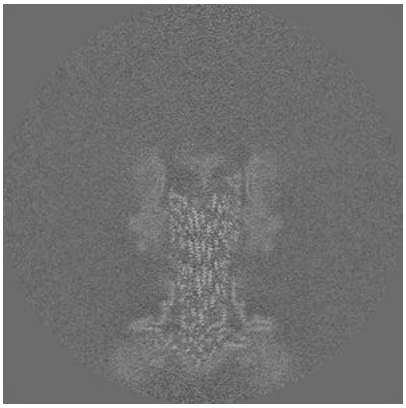


Y Index: 371

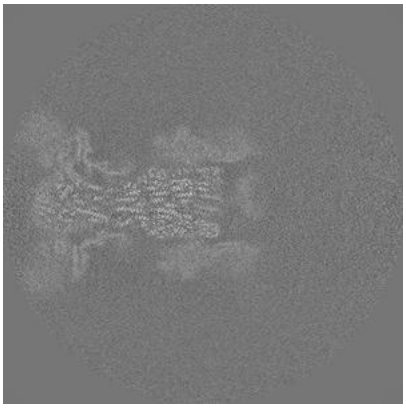


Z Index: 144

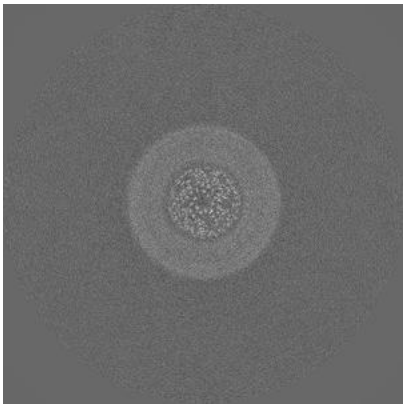
6.3.2 Raw map



X Index: 402



Y Index: 371



Z Index: 350

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

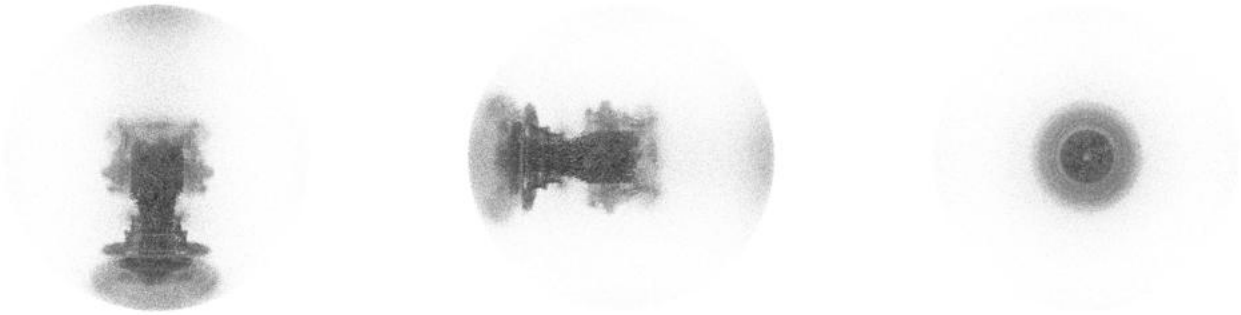
6.4 Orthogonal surface views (i)

6.4.1 Primary map

X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.0075. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.4.2 Raw map



X Y Z

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.

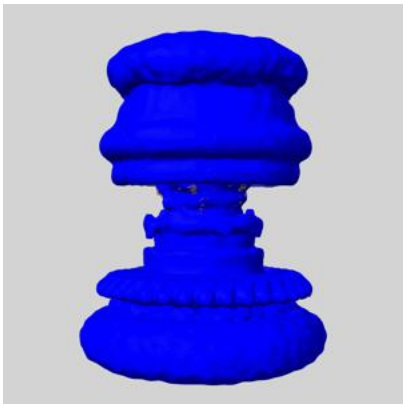
6.5 Mask visualisation

This section shows the 3D surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency

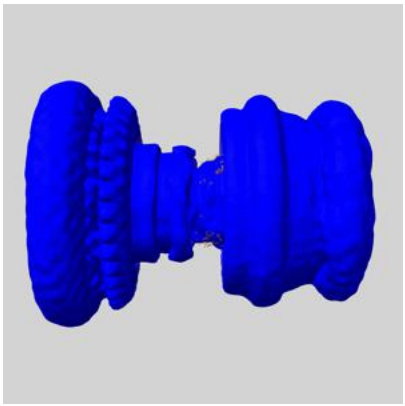
A mask typically either:

- Encompasses the whole structure
- Separates out a domain, a functional unit, a monomer or an area of interest from a larger structure

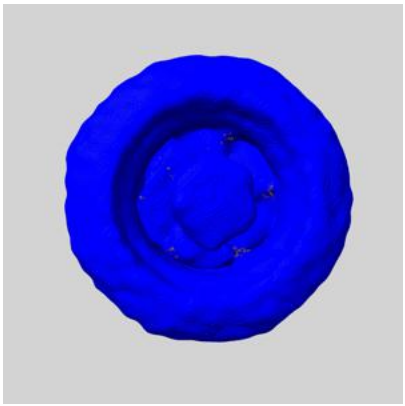
6.5.1 emd_12603_msk_1.map



X



Y

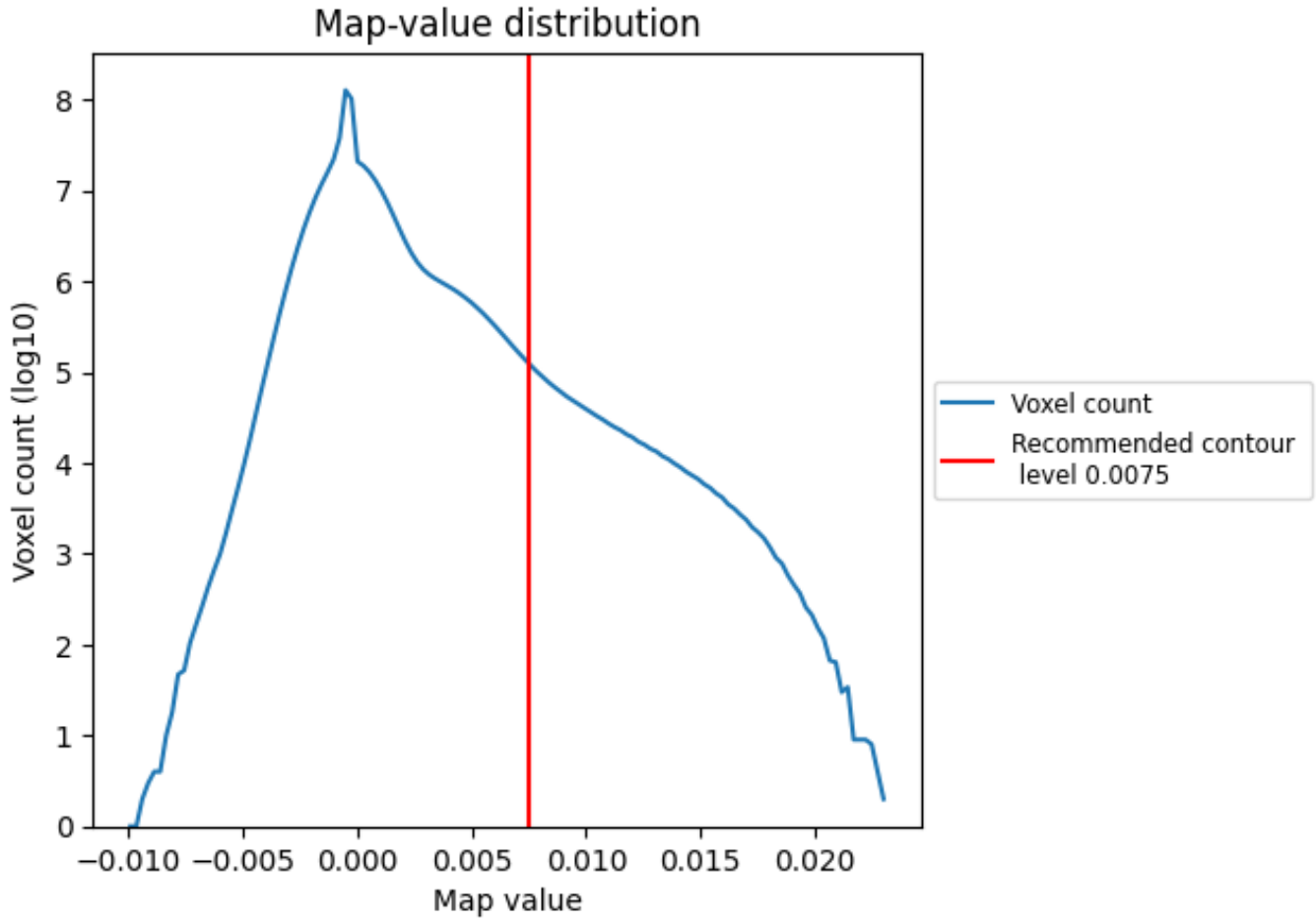


Z

7 Map analysis

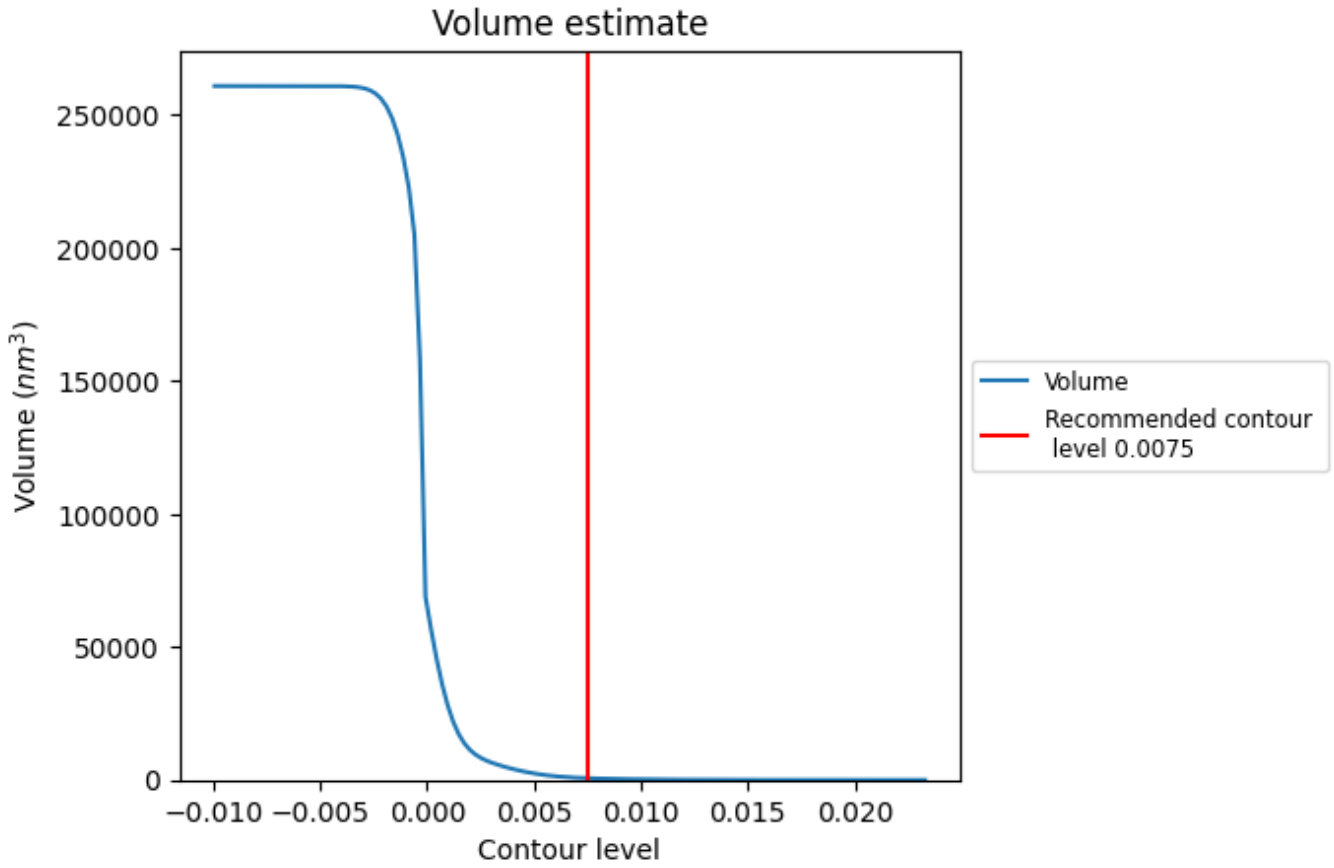
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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.

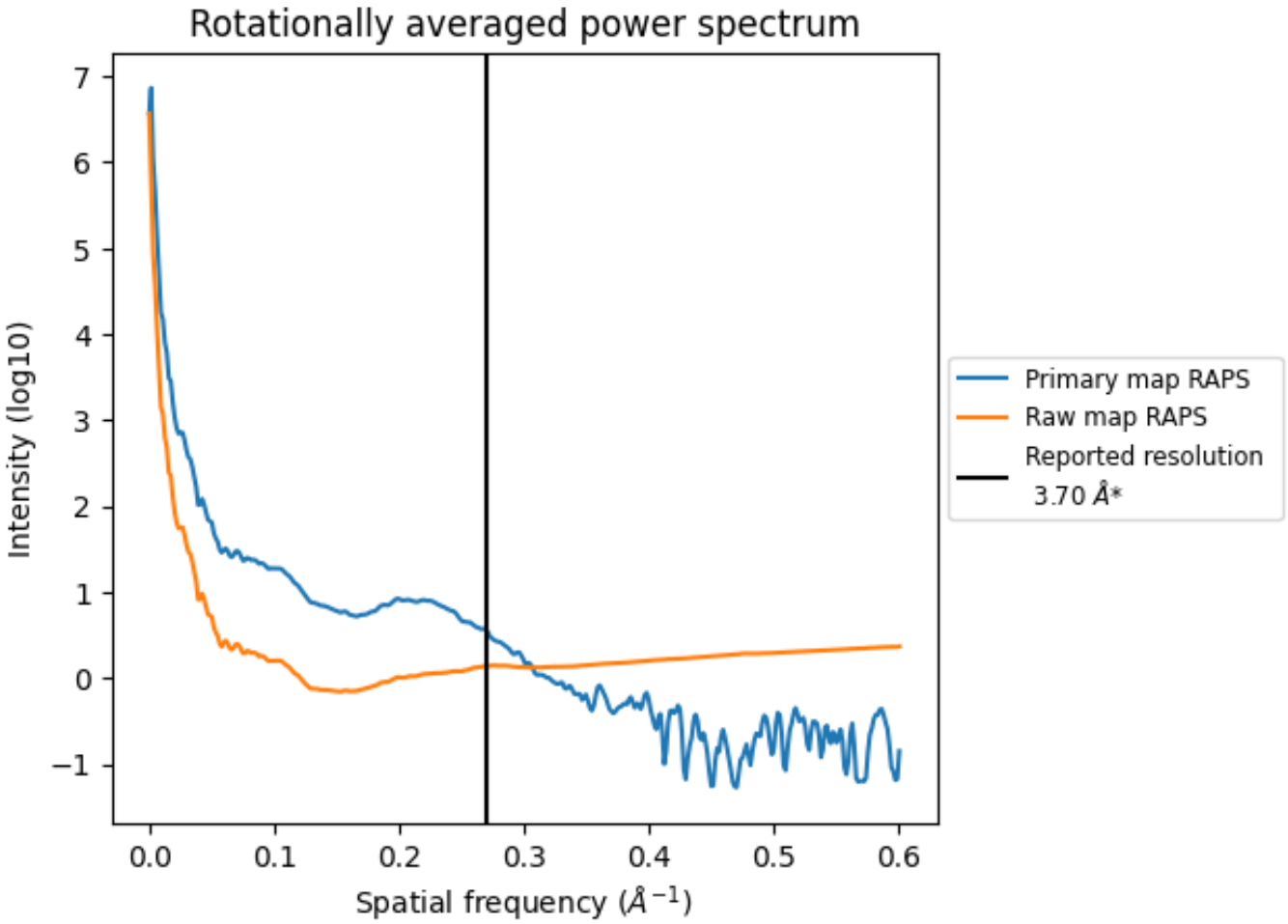
7.2 Volume estimate (i)



The volume at the recommended contour level is 648 nm^3; this corresponds to an approximate mass of 586 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)

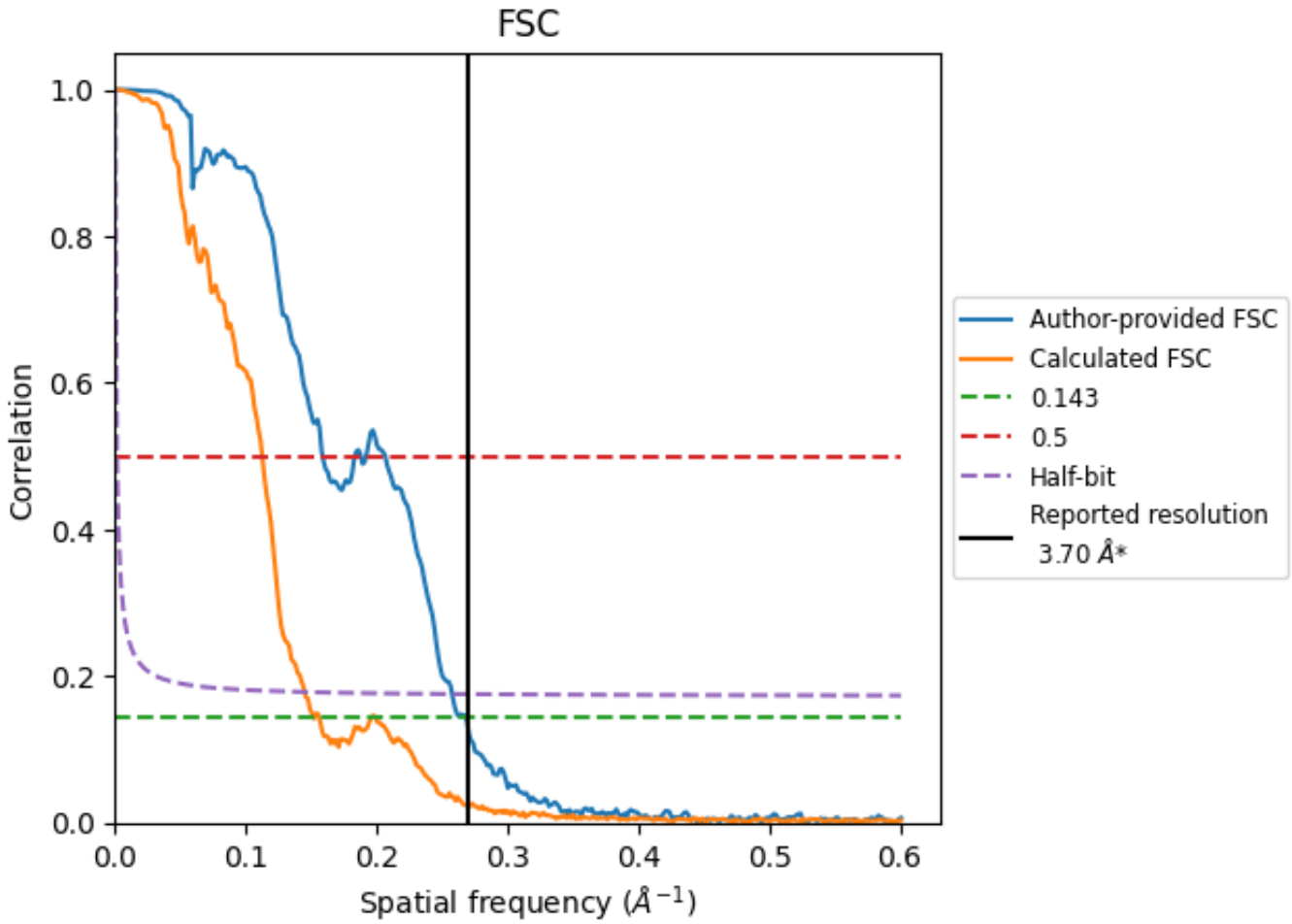


*Reported resolution corresponds to spatial frequency of 0.270 Å^{-1}

8 Fourier-Shell correlation

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



*Reported resolution corresponds to spatial frequency of 0.270 Å^{-1}

8.2 Resolution estimates (i)

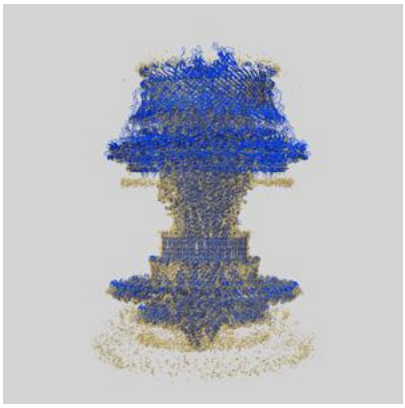
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.70	-	-
Author-provided FSC curve	3.73	6.30	3.88
Calculated*	6.58	8.88	6.89

*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 6.58 differs from the reported value 3.7 by more than 10 %

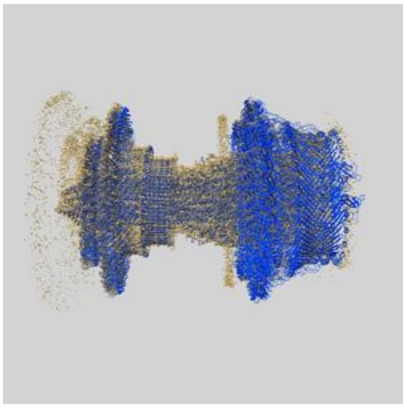
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-12603 and PDB model 7NVG. Per-residue inclusion information can be found in section 3 on page 18.

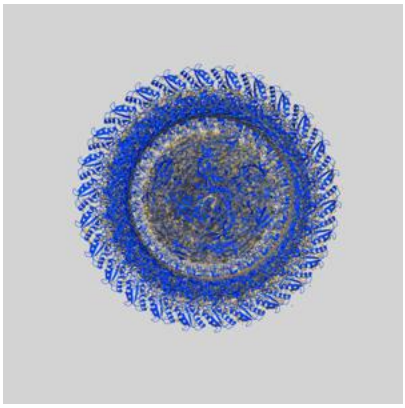
9.1 Map-model overlay



X



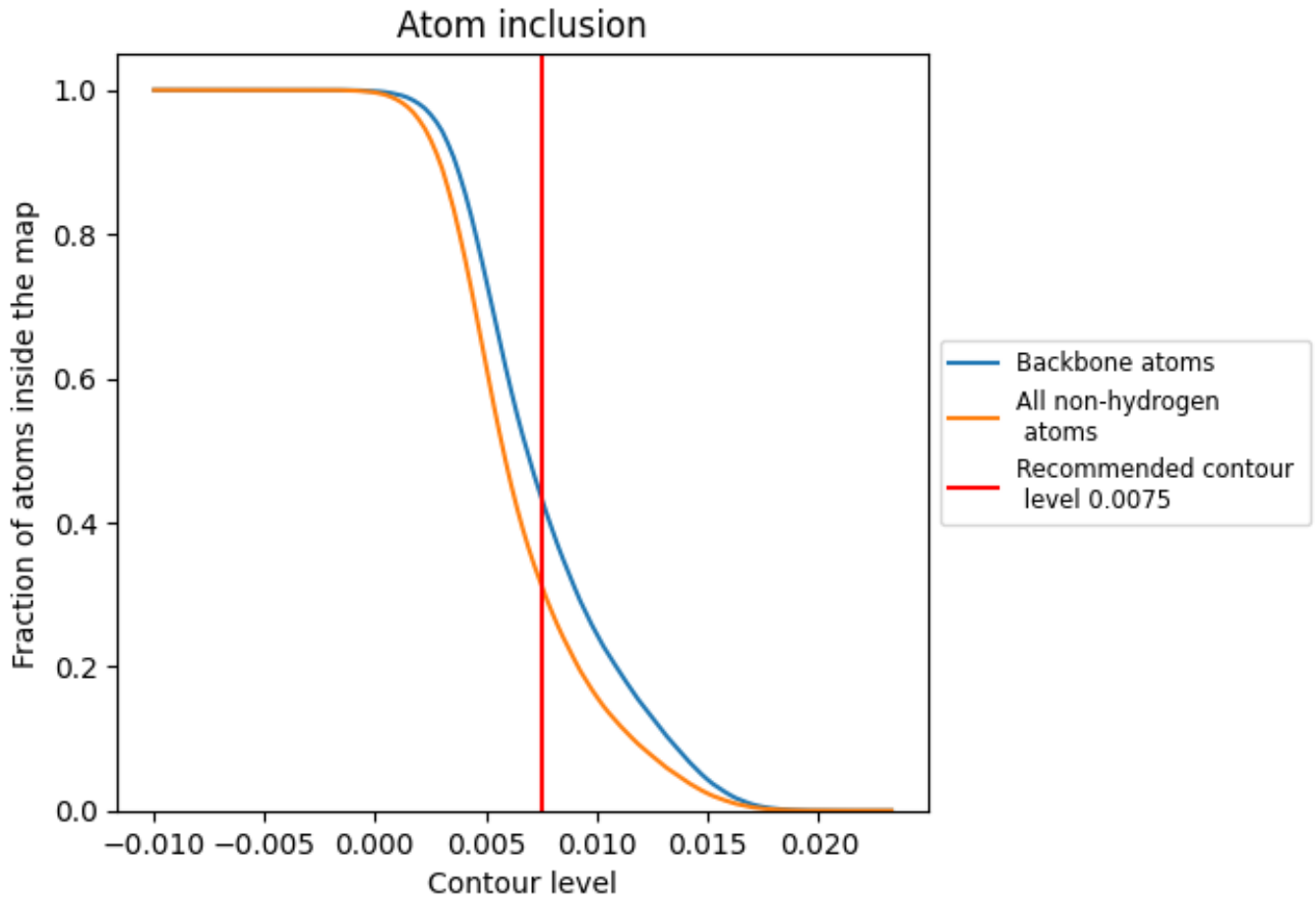
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.0075 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 Atom inclusion (i)



At the recommended contour level, 43% of all backbone atoms, 31% of all non-hydrogen atoms, are inside the map.