



wwPDB EM Validation Summary Report ⓘ

Nov 20, 2022 – 09:14 pm GMT

PDB ID : 3ZIF
EMDB ID : EMD-2273
Title : Cryo-EM structures of two intermediates provide insight into adenovirus assembly and disassembly
Authors : Cheng, L.; Huang, X.; Li, X.; Xiong, W.; Sun, W.; Yang, C.; Zhang, K.; Wang, Y.; Liu, H.; Ji, G.; Sun, F.; Zheng, C.; Zhu, P.
Deposited on : 2013-01-09
Resolution : 4.50 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 ⓘ symbol.

The types of validation reports are described at

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

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

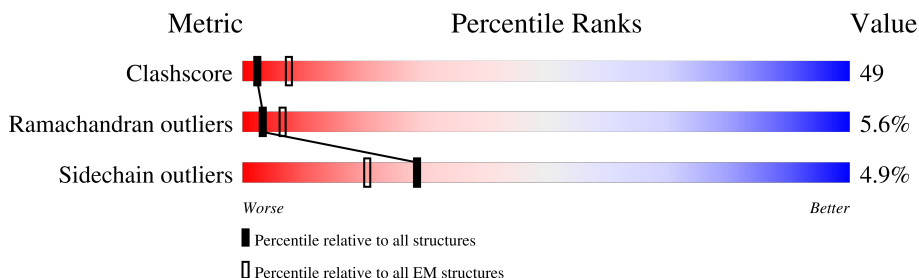
EMDB validation analysis : 0.0.1.dev43
MolProbity : 4.02b-467
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.9
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.31.2

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 4.50 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
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 $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion $< 40\%$). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	911	91% 42% 51% 5% ..
1	B	911	90% 42% 51% 5% ..
1	C	911	88% 44% 49% 5% ..
1	D	911	92% 42% 50% 5% ..
1	E	911	86% 42% 51% 5% ..
1	F	911	89% 44% 50% 5% ..
1	G	911	85% 41% 52% 5% ..
1	H	911	92% 43% 51% 5% ..

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Mol	Chain	Length	Quality of chain
1	I	911	85% 44% 50% 5% ..
1	J	911	86% 42% 51% 5% ..
1	K	911	90% 42% 52% 5% ..
1	L	911	83% 43% 50% 5% ..
2	M	482	92% 46% 41% 6% 7%
3	N	125	83% 10% 36% 25% 14% 14%
3	O	125	66% 10% 37% 25% 14% 14%
3	P	125	74% 8% 38% 25% 14% 14%
3	Q	125	74% 10% 37% 25% 14% 14%
4	R	216	41% 15% 27% 5% 52%

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 94377 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 HEXON PROTEIN.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	903	7222	4573	1265	1354	30	0	0
1	B	903	7222	4573	1265	1354	30	0	0
1	C	903	7222	4573	1265	1354	30	0	0
1	D	903	7222	4573	1265	1354	30	0	0
1	E	903	7222	4573	1265	1354	30	0	0
1	F	903	7222	4573	1265	1354	30	0	0
1	G	903	7222	4573	1265	1354	30	0	0
1	H	903	7222	4573	1265	1354	30	0	0
1	I	903	7222	4573	1265	1354	30	0	0
1	J	904	7223	4573	1266	1354	30	0	1
1	K	903	7222	4573	1265	1354	30	0	0
1	L	903	7222	4573	1265	1354	30	0	0

- Molecule 2 is a protein called PENTON PROTEIN.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	M	450	3596	2275	621	688	12	0	0

- Molecule 3 is a protein called PIX.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	N	107	Total	C	N	O	S	0	0
			826	507	155	161	3		
3	O	107	Total	C	N	O	S	0	0
			826	507	155	161	3		
3	P	107	Total	C	N	O	S	0	0
			826	507	155	161	3		
3	Q	107	Total	C	N	O	S	0	0
			826	507	155	161	3		

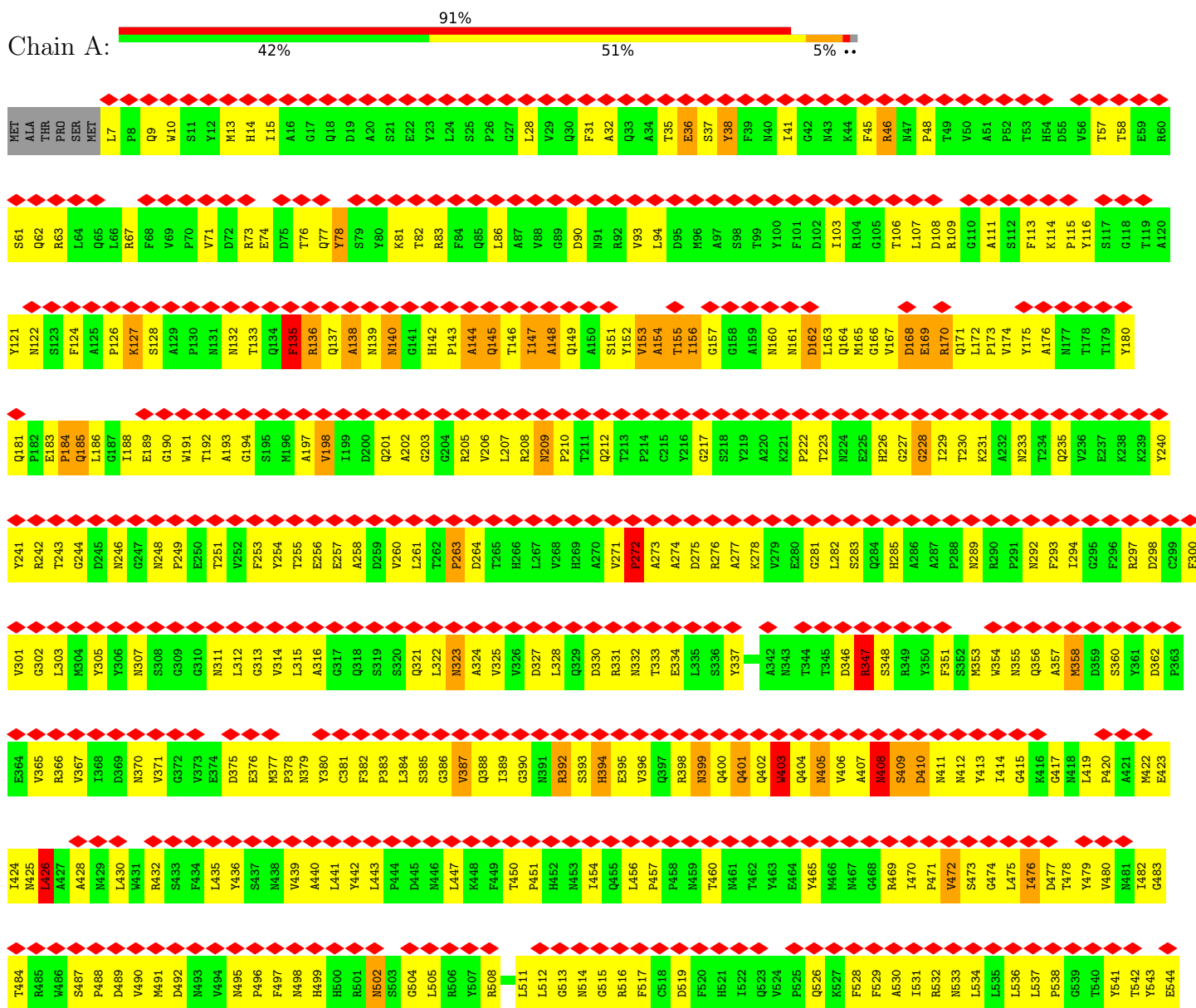
- Molecule 4 is a protein called PVIII.

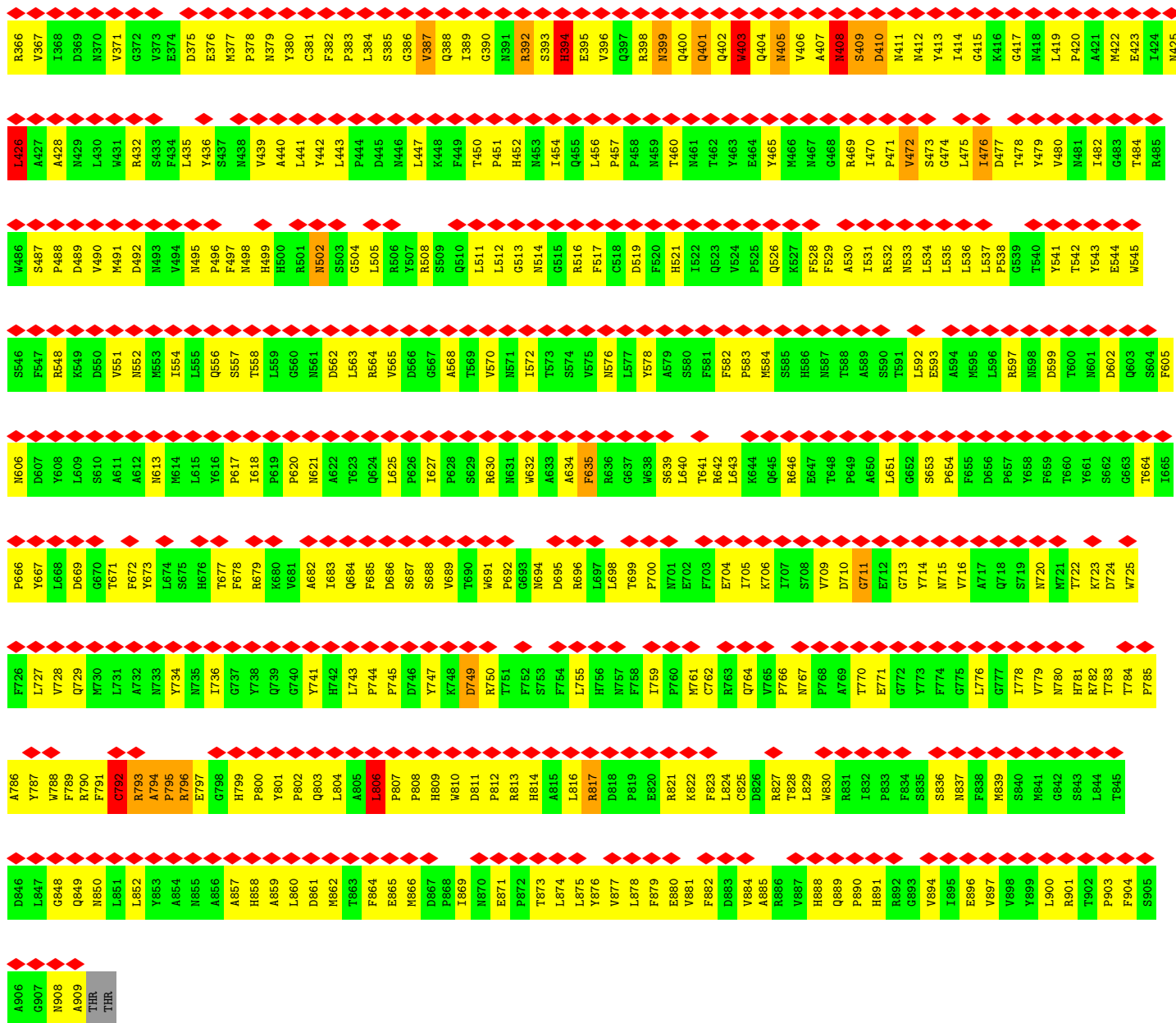
Mol	Chain	Residues	Atoms					AltConf	Trace
4	R	103	Total	C	N	O	S	0	0
			812	514	138	156	4		

3 Residue-property plots

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: HEXON PROTEIN

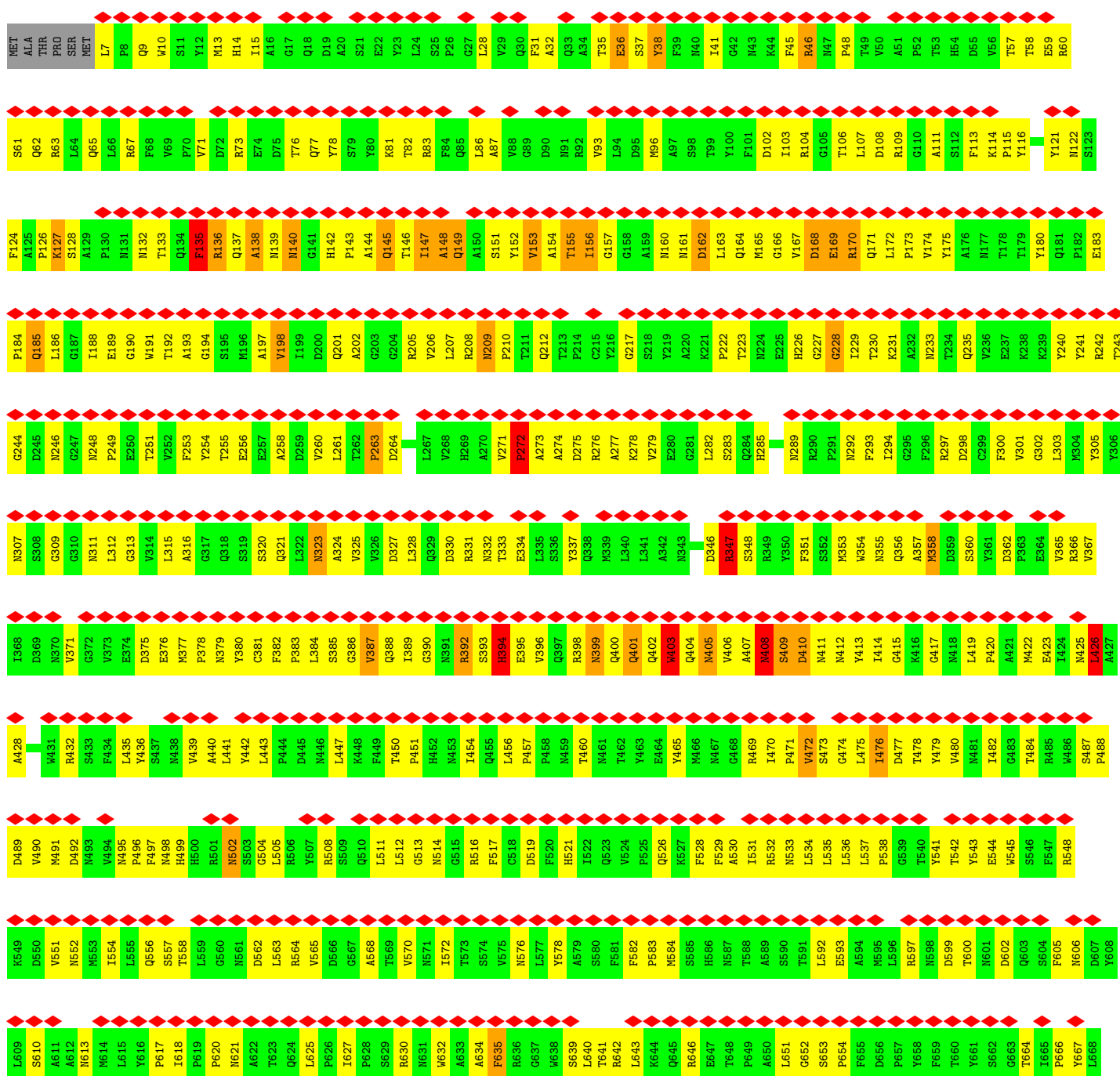
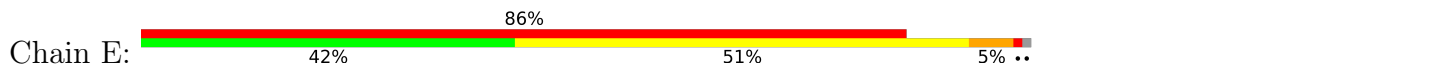


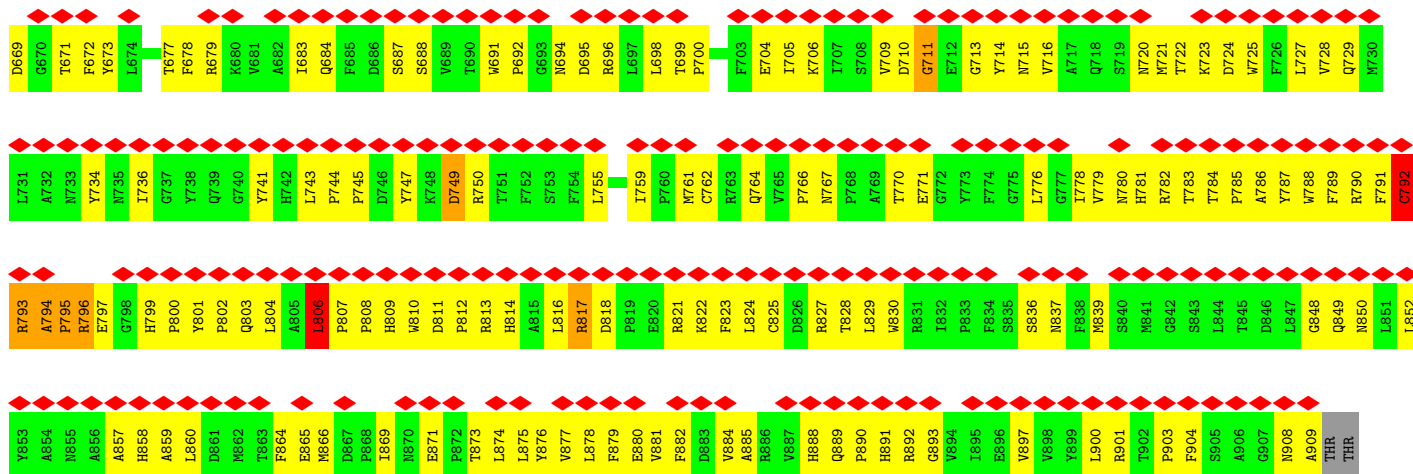


MET	ALA	THR	PRO	SER	MET	L7	P8	Q9	W10	S11	Y12	M13	H14	L15	A16	G17	Q18	D19	A20	S21	E22	Y23	L24	S25	P26	G27	L28	W29	Q30	F31	A32	Q33	A34	T35	E36	S37	Y38	F39	N40	L41	O42	N43	K44	F45	R46	N47	P48	T49	V50	A51	P52	T53	H54	D55	V56	T57	S58	E59	R60		
S61	Q62	R63	L64	Q65	L66	R67	F68	V69	W70	Y71	D72	M73	R74	E75	D76	Q77	Y78	S79	Y80	K81	T82	R83	F84	R205	O85	L86	A87	V88	D89	N91	Y92	R93	L94	D95	H96	A97	G98	S98	T99	M100	F101	D102	L103	R104	G105	T106	L107	D108	R109	G110	A111	S112	F113	K114	P115	Y116	S117	G118	T119	A120	
Y121	N122	S123	F124	M125	P126	K127	S128	A129	P130	M131	N132	T133	E134	F135	R136	Q137	A138	M139	N140	G141	H142	P143	A144	Q145	L146	I147	A148	Q149	A150	S151	Y152	V153	A154	T155	L156	G157	G158	A159	N160	M161	D162	L163	Q164	M165	G166	V167	D168	L107	E169	R170	Q171	L172	P173	V174	Y175	A176	M177	T178	Y180		
Q181	P182	E183	P184	Q185	L186	G187	I188	E189	G190	W191	T192	A193	G194	S195	M196	A197	V198	I199	D200	Q201	A202	G203	S204	R205	V206	L207	R208	M209	P210	T211	Q212	T213	P214	C215	Y216	G217	S218	Y219	A220	K221	P222	T223	N224	E225	G227	O228	L229	T230	K231	A232	M233	T234	Q235	V236	E237	K238	K239	Y240			
Y241	R242	T243	G244	D245	A246	G247	N248	P249	E250	T251	V252	F253	Y254	T255	E256	A257	D258	V260	L261	T262	P263	D264	T265	H266	L267	V268	H269	A270	V271	P272	A273	A274	D275	R276	A277	K278	V279	E280	G281	L282	D283	O284	H285	A286	A287	P288	R289	N290	P291	N292	F293	G295	P296	R297	D298	C299	F300				
V301	G302	L303	M304	Y305	Y306	N307	S308	G309	G310	N311	L312	G313	V314	L315	A316	P317	G317	Q318	S319	Q321	L322	M323	A324	V325	Q326	L328	Q329	D330	R331	N332	T333	E334	L335	S336	Y337	Q338	A340	N342	N343	T344	T345	L346	S347	S348	R349	Y350	F351	S352	M353	W354	N355	Q356	A357	M358	D359	S360	Y361	D362			
P363	E364	V365	R366	P367	I368	D369	N370	G371	G372	V373	E374	E376	M377	P378	N379	Y380	C381	F382	P383	L384	S385	G386	V387	Q388	I389	G390	N391	R392	S393	H394	E395	V396	Q397	R398	N399	Q400	Q401	Q402	W403	Q404	N405	V406	A407	W408	S409	D410	Y411	N412	Y413	I414	G415	K416	G417	N418	L419	P420	A421	M422			
E423	I424	N425	L426	A427	A428	N429	W430	W431	R432	S433	F434	L435	Y436	S437	N438	V439	A440	L441	Y442	L443	D444	D445	N446	L447	F448	P449	P451	H452	M453	I454	Q455	L456	P457	P458	M459	T460	N461	T462	Y463	E464	Y465	M466	N467	G468	R469	I470	N471	A472	S473	G474	L475	A476	D477	L478	Y479	V480	N481	I482			
G483	T484	R485	W486	S487	P488	D489	V490	M491	D492	N493	V494	M495	P496	F497	N498	H499	H500	R501	M502	S503	G504	L505	R506	Y507	R508	L511	L512	G513	N514	G515	R516	F517	C518	D519	F520	H521	I522	Q523	V524	P525	Q526	F528	F529	A530	R469	I531	R532	N533	L534	L535	L536	L537	P538	G539	T540	Y541	T542	Y543			
E544	W545	S546	F547	R548	K549	D550	A551	N552	M553	I554	L555	Q556	S557	T558	P559	G560	H561	D562	L563	R564	V565	D566	G567	A568	F569	V570	M571	I572	T573	S574	V575	M576	L577	Y578	A579	S580	L640	F581	F582	P583	M584	S585	H586	N587	T588	A589	S590	I591	L592	E593	A594	F595	D596	L597	R597	M598	D599	T600	N601	D602	Q603
S604	F605	N606	D607	Y608	L609	S610	A611	A612	M613	M614	L615	Y616	P617	I618	R619	P620	M621	A622	T623	Q624	L625	P626	I627	P628	S629	R630	M631	W632	A633	A634	F635	R636	L637	W638	S639	L640	T641	R642	L643	K644	G645	R646	E647	P648	P649	A650	L651	G652	G653	P654	F655	D656	P657	Y658	F659	T660	Y661	S662	G663		
T664	I665	P666	Y667	L668	P669	G670	T671	F672	G673	L674	S675	H676	T677	F678	R679	K680	V681	A682	I683	Q684	F685	D686	S687	K688	V689	T690	W691	P692	G693	N694	D695	R696	L697	L698	T699	P700	N701	E702	F703	E704	I705	K706	T707	S708	V709	D710	G711	E712	G713	Y714	N715	V716	A717	Q718	S719	N720	M721	T722	K723		
D724	W725	F726	L727	W728	Q729	M730	L731	N732	N733	Y734	N735	I736	G737	Y738	Q739	G740	Y741	H742	L743	P744	P745	D746	Y747	K748	D749	R750	T751	F752	S753	F754	H755	N757	F758	I759	P760	M761	C762	F763	Q764	V765	P766	N767	F768	A769	T770	E771	G772	Y773	F774	G775	L776	G777	I778	W779	N780	H781	R782	T783			
T784	P785	A786	Y787	W788	F789	R790	F791	C792	R793	A794	P795	R796	E797	G798	H799	P800	Y801	P802	Q803	L804	A805	L806	P807	P808	H809	W810	D811	P812	R813	H814	A815	L816	R817	D818	P819	E820	R821	K822	F823	L824	C825	D826	R827	T828	W830	R831	L832	P833	F834	S835	S836	N837	F838	M839	S840	H841	G842	S843			

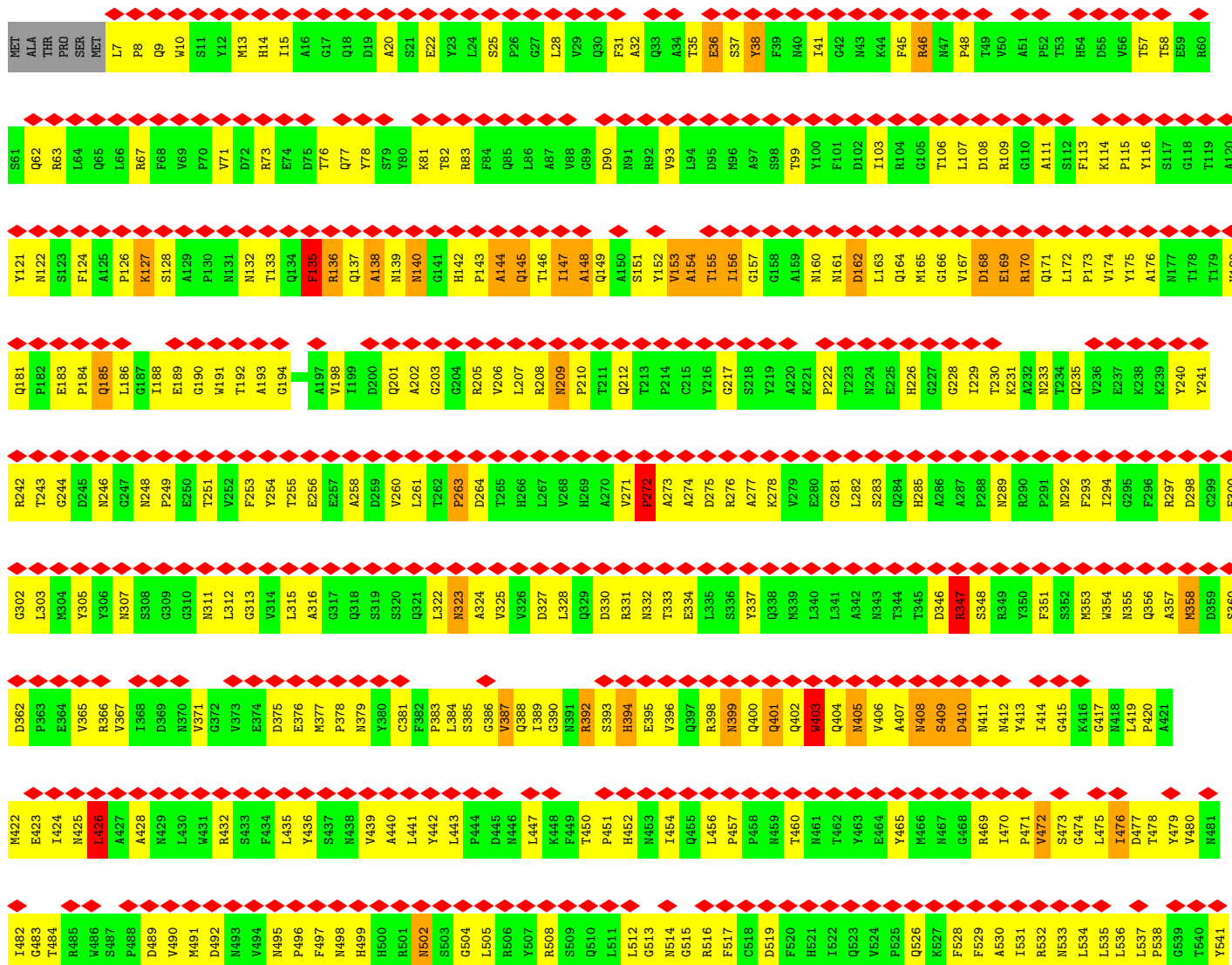
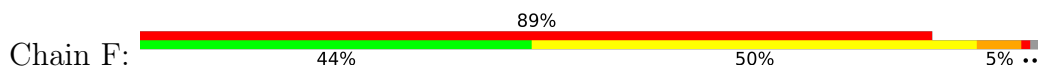


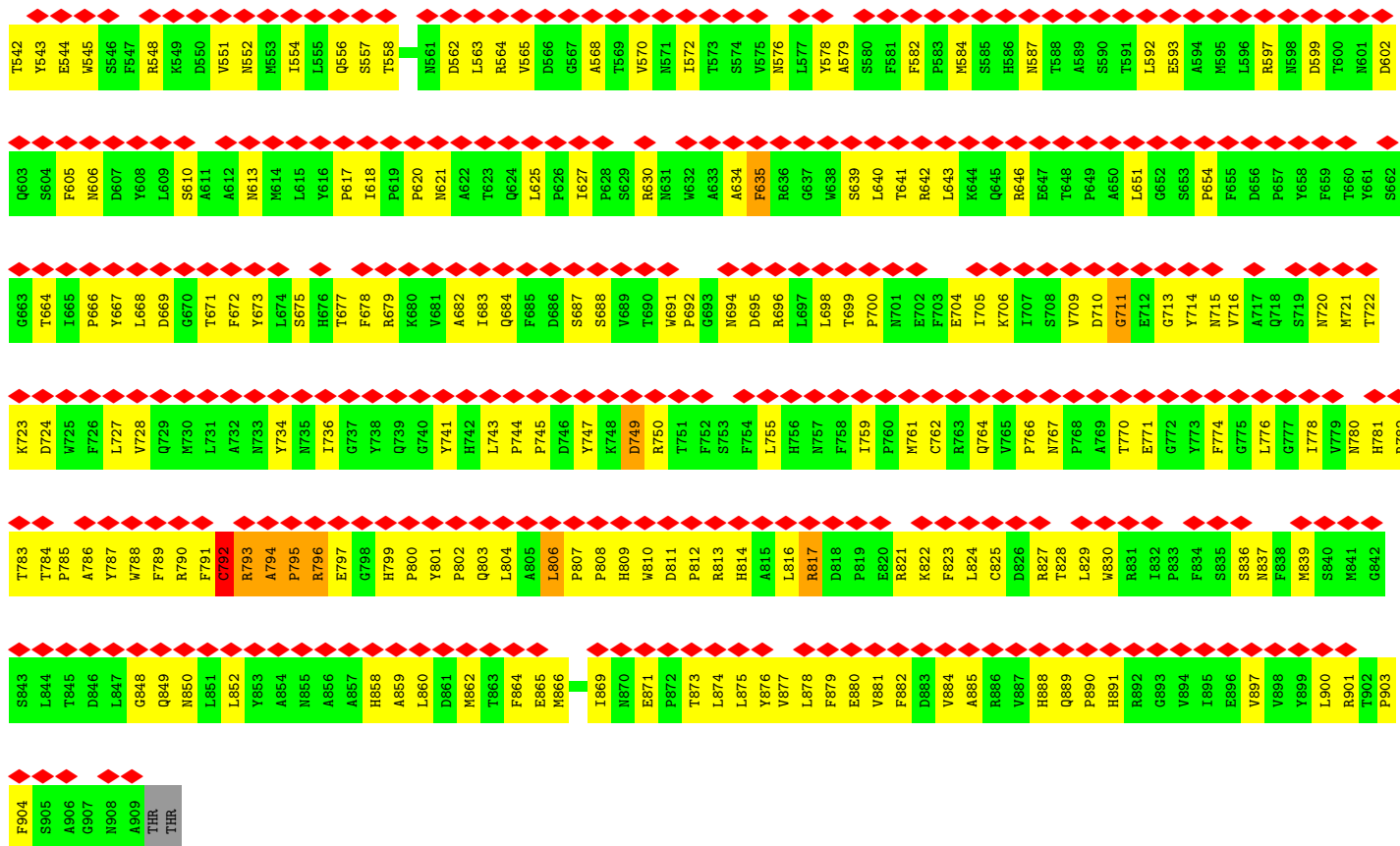
• Molecule 1: HEXON PROTEIN



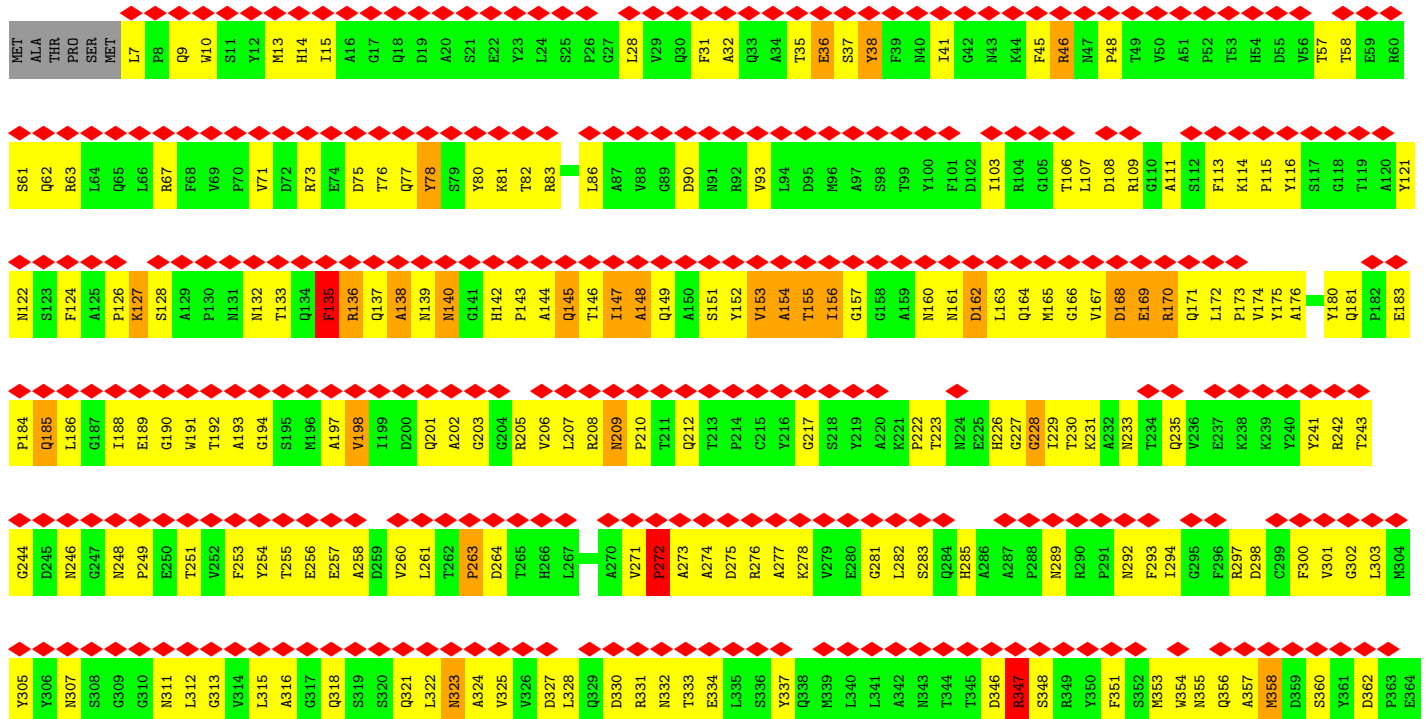
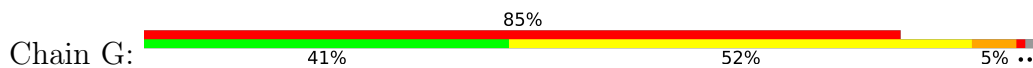


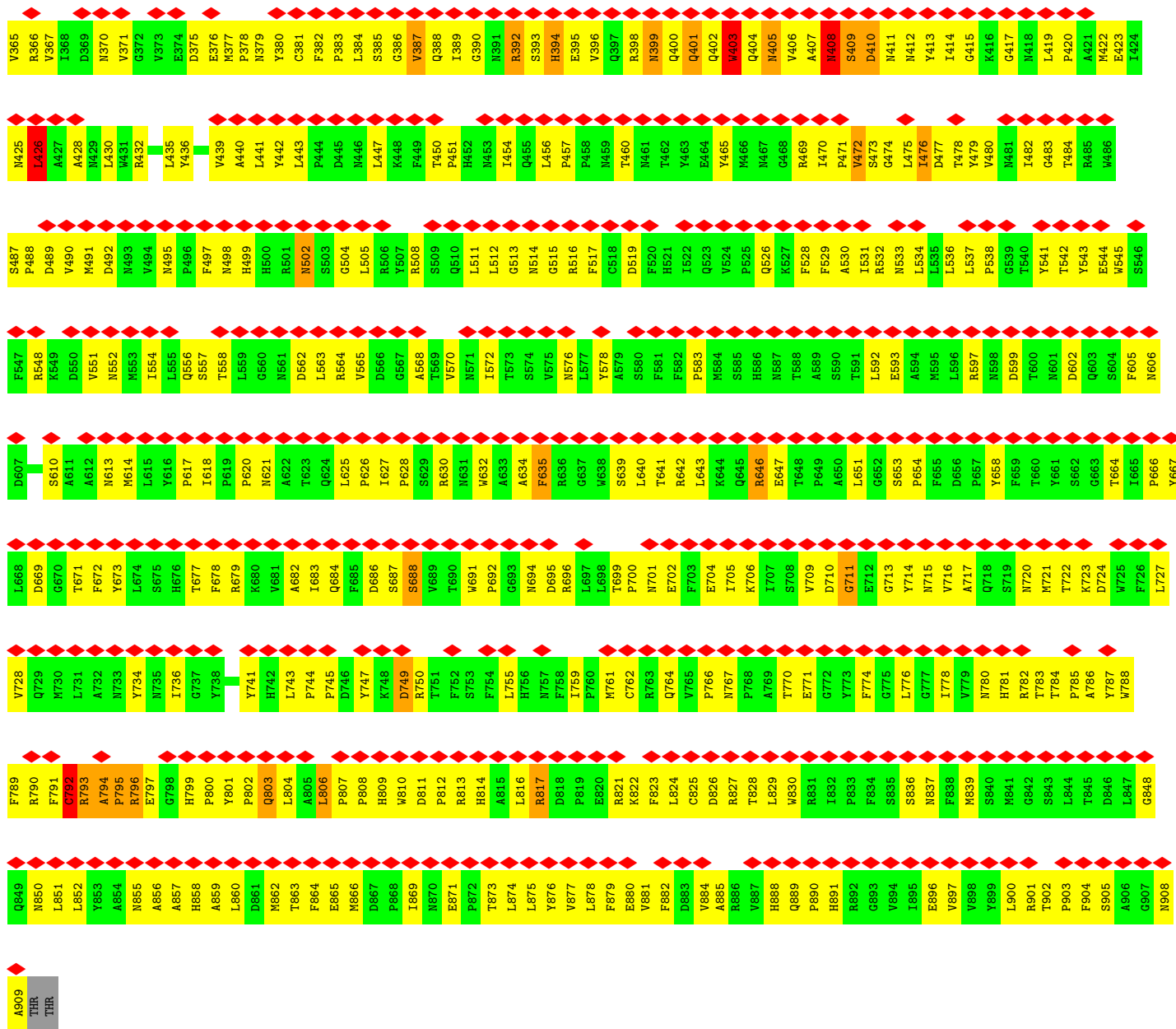
● Molecule 1: HEXON PROTEIN



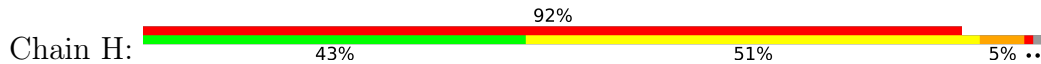


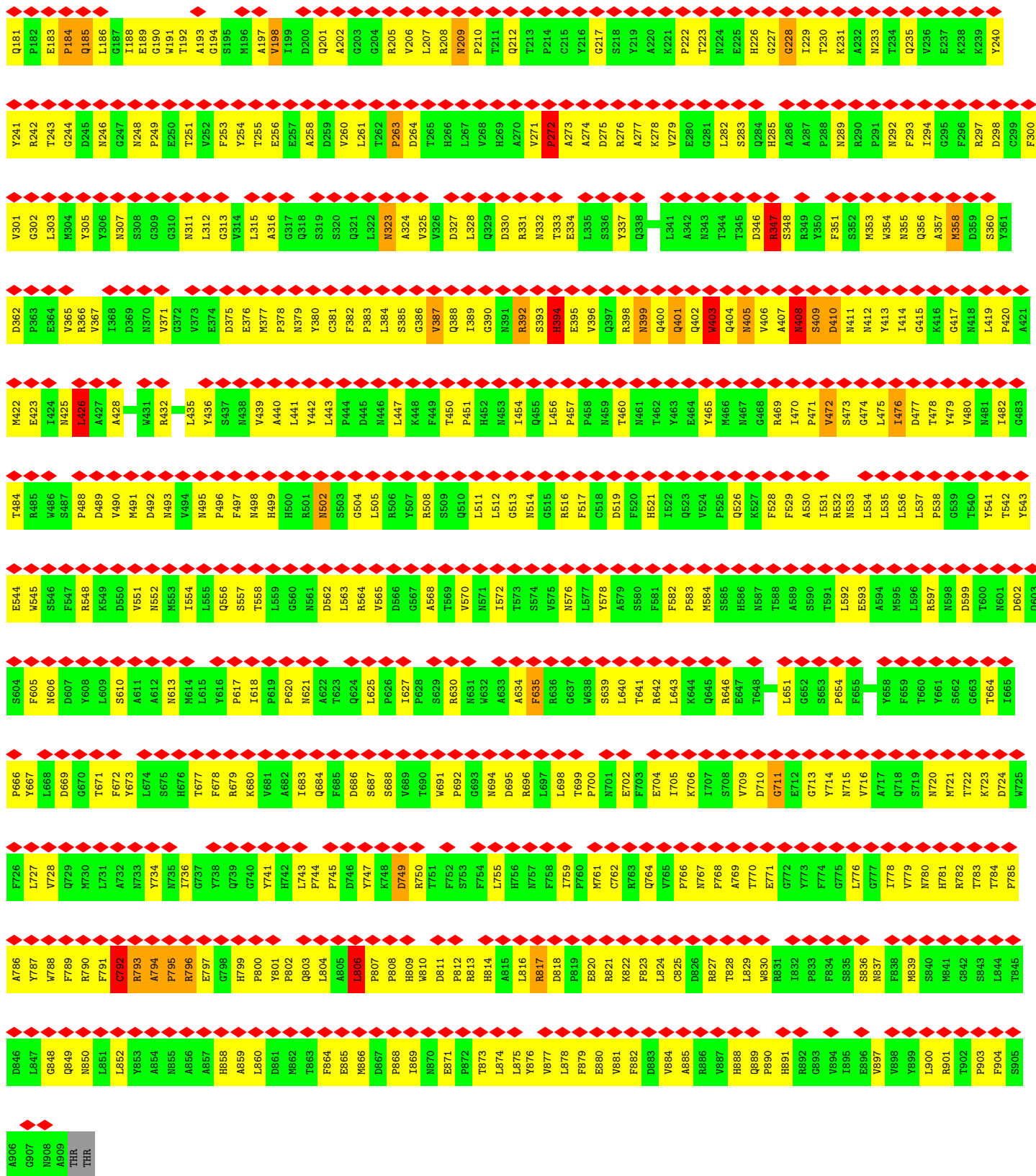
● Molecule 1: HEXON PROTEIN



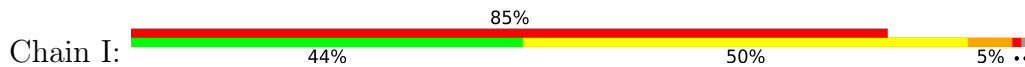


● Molecule 1: HEXON PROTEIN

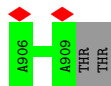




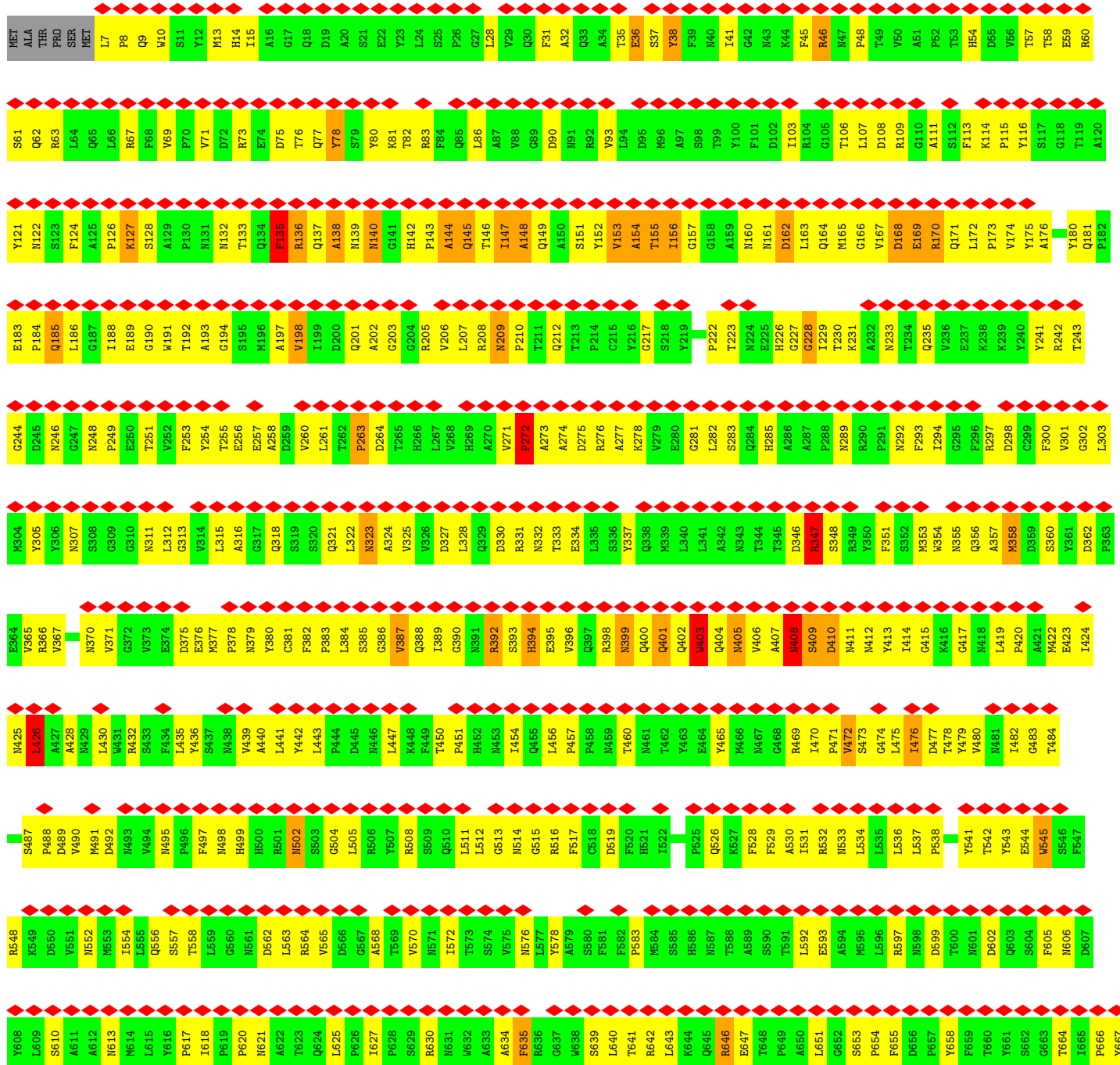
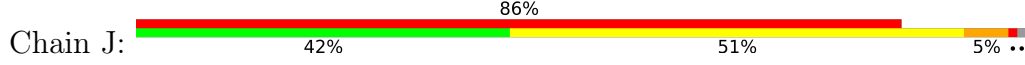
● Molecule 1: HEXON PROTEIN

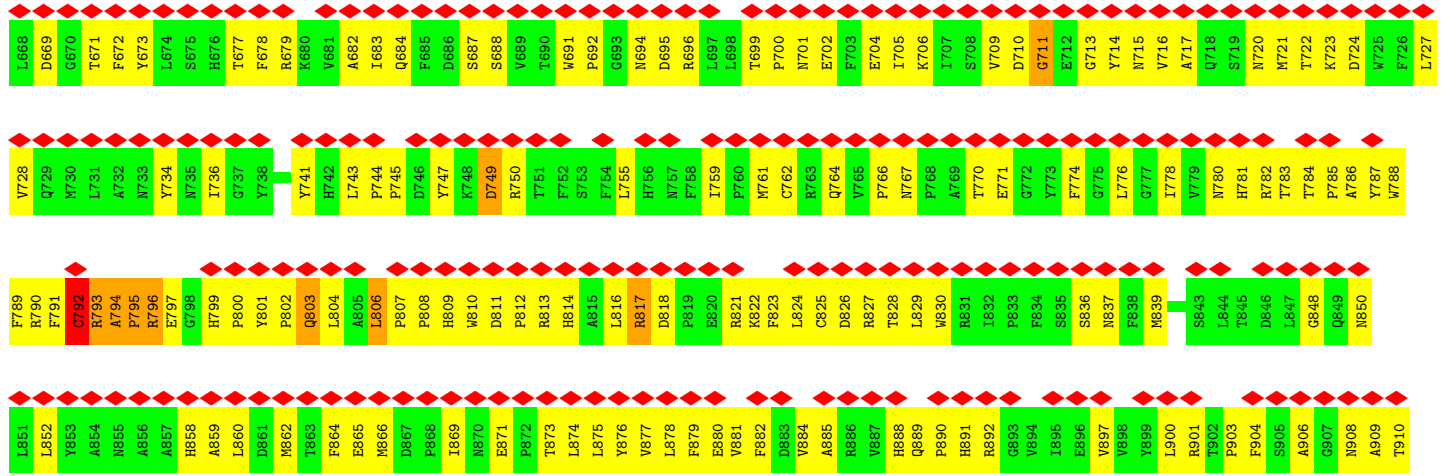


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S61	Q62	R63	L64	Q65	L66	R67	F68	V69	W70	Y71	D72	M73	H74	E75	A76	D77	Q78	Y79	R80	S81	E82	Y83	L84	S85	P86	Q87	L88	V89	Q90	F91	A92	Q93	A94	T95	E96	S97	Y98	F99	M100	I101	G102	M103	R104	G105	T106	L107	D108	F109	M110	G111	A112	H113	D114	V115	T116	S117	G118	L119	A120			
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L303	M304	Y305	Y306	N307	S308	G309	G310	N311	L312	G313	V314	L315	A316	G317	Q318	S319	S320	Q321	L322	N323	A324	V325	V326	D327	H328	Q329	D330	R331	N332	T333	E334	L335	S336	Y337	R338	Q339	M339	L340	L341	A342	N343	T344	T345	D346	R347	S348	R349	Y350	F351	S352	M353	W354	N355	Q356	A357	M358	D359	S360	Y361	D362		
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E423	I424	M425	L426	A427	A428	M429	L430	W431	R432	S433	F434	L435	Y436	M437	S438	V439	A440	L441	Y442	L443	P444	D445	N446	L447	K448	R449	T450	P451	H452	N453	I454	Q455	Q456	P457	M458	M459	T460	M461	T462	Y463	E464	Y465	M466	A467	G468	R469	I470	N471	V472	S473	G474	L475	I476	D477	T478	Y479	V480	M481	I482			
G483	T484	R485	W486	S487	P488	D489	V490	M491	D492	M493	V494	M495	S496	T497	M498	H499	H500	R501	S503	G504	L505	R506	Y507	R508	S509	Q510	L511	L512	G513	M514	G515	R516	F517	C518	D519	F520	H521	I522	Q523	V524	Y525	Q526	K527	F528	L529	R530	A531	M532	L533	L534	L535	L536	L537	P538	G539	T540	Y541	T542				
Y543	E544	W545	F546	F547	R548	V551	N552	M553	I554	L555	P556	S557	T558	L559	G560	N561	D562	L563	R564	V565	A566	T567	V568	R569	L570	N571	I572	T573	S574	V575	L576	L577	Y578	A579	S580	F581	F582	P583	M584	S585	H586	M587	T588	A589	S590	L591	L592	E593	S594	A595	M595	L596	R597	Y598	L599	P600	M601	D602	Q603	S604		
F605	N606	D607	Y608	L609	S610	A611	M612	N613	M614	L615	Y616	P617	I618	P619	P620	M621	A622	T623	Q624	L625	P626	I627	P628	S629	R630	M631	W632	A633	A634	F635	P636	G637	W638	S639	L640	T641	R642	L643	K644	Q645	R646	E647	A650	L651	G652	S653	G654	F655	D656	P657	Y658	F659	Y661	T660	S662	G663	T664	L665				
P666	Y667	L668	D669	G670	T671	F672	Y673	L674	S675	H676	T677	F678	R679	K680	V681	A682	L683	Q684	F685	S686	S687	R688	V689	T690	M691	P692	G693	M694	D695	R696	L697	L698	T699	P700	N701	E702	F703	E704	I705	K706	I707	S708	V709	D710	L711	E712	G713	Y714	M715	N716	V717	A718	Q718	S719	T660	Y661	M720	T721	T722	G663	T664	W725
F726	L727	V728	Q729	M730	L731	A732	N733	Y734	M735	L736	G737	Y738	Q739	G740	Y741	H742	L743	P744	P745	D746	Y747	K748	D749	W750	T751	F752	S753	F754	L755	H756	D757	F758	I759	P760	M761	C762	R763	Q764	V765	P766	F768	A769	T770	E771	G772	Y773	F774	G775	L776	G777	L778	V779	N780	H781	R782	T783	T784	P785				
A786	Y787	W788	F789	R790	Y791	C792	A793	Y794	P795	R796	E797	G798	H799	P800	Y801	P802	Q803	P744	A805	L806	P807	P808	H809	W810	D811	P812	R813	H814	A815	L816	R817	D818	P819	E820	R821	K822	F823	L824	C825	D826	R827	T828	W830	R831	L832	P833	F834	S835	S836	N837	F838	M839	S840	M841	G842	S843	L844	T845				



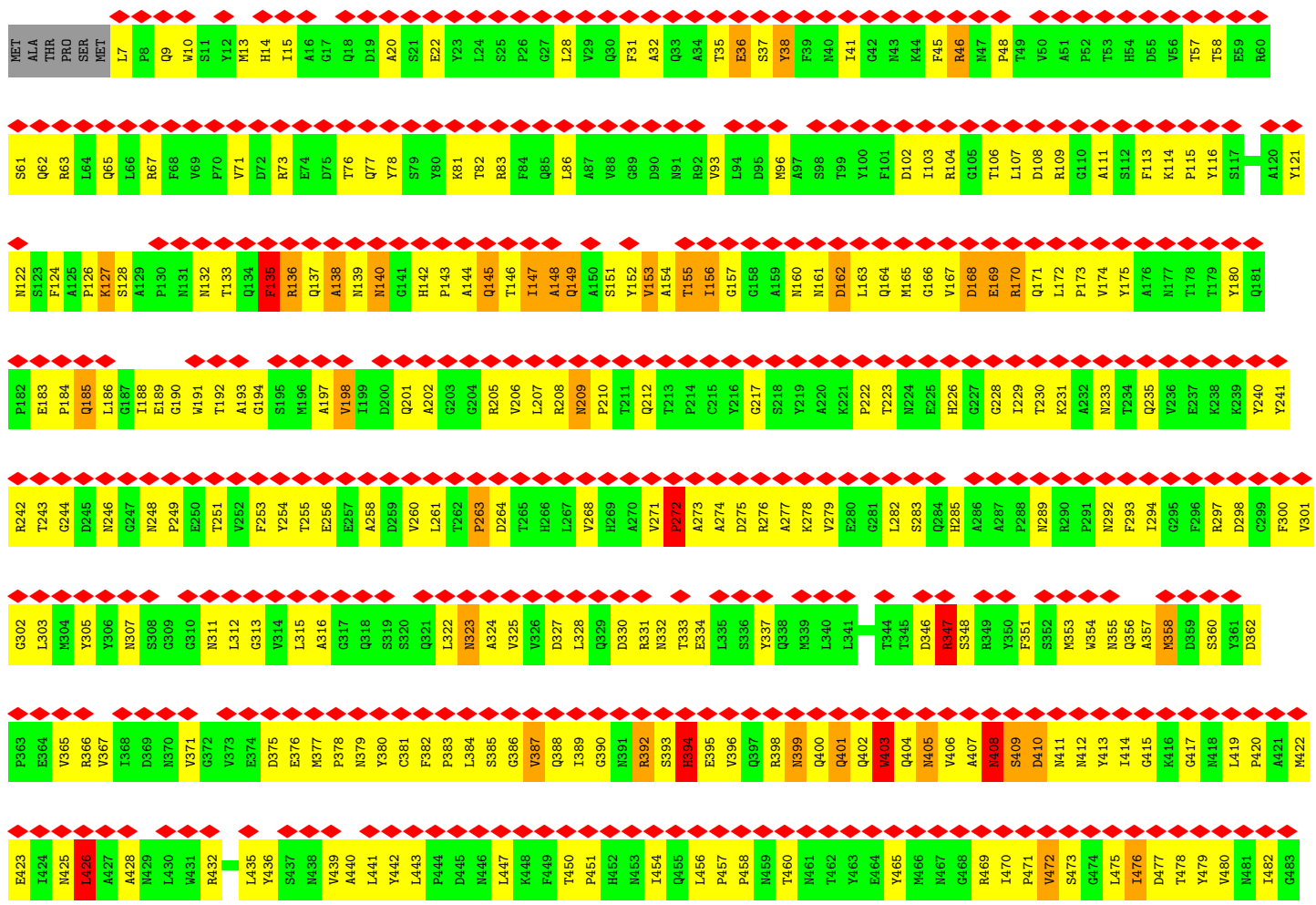
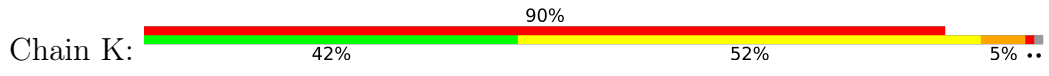
• Molecule 1: HEXON PROTEIN

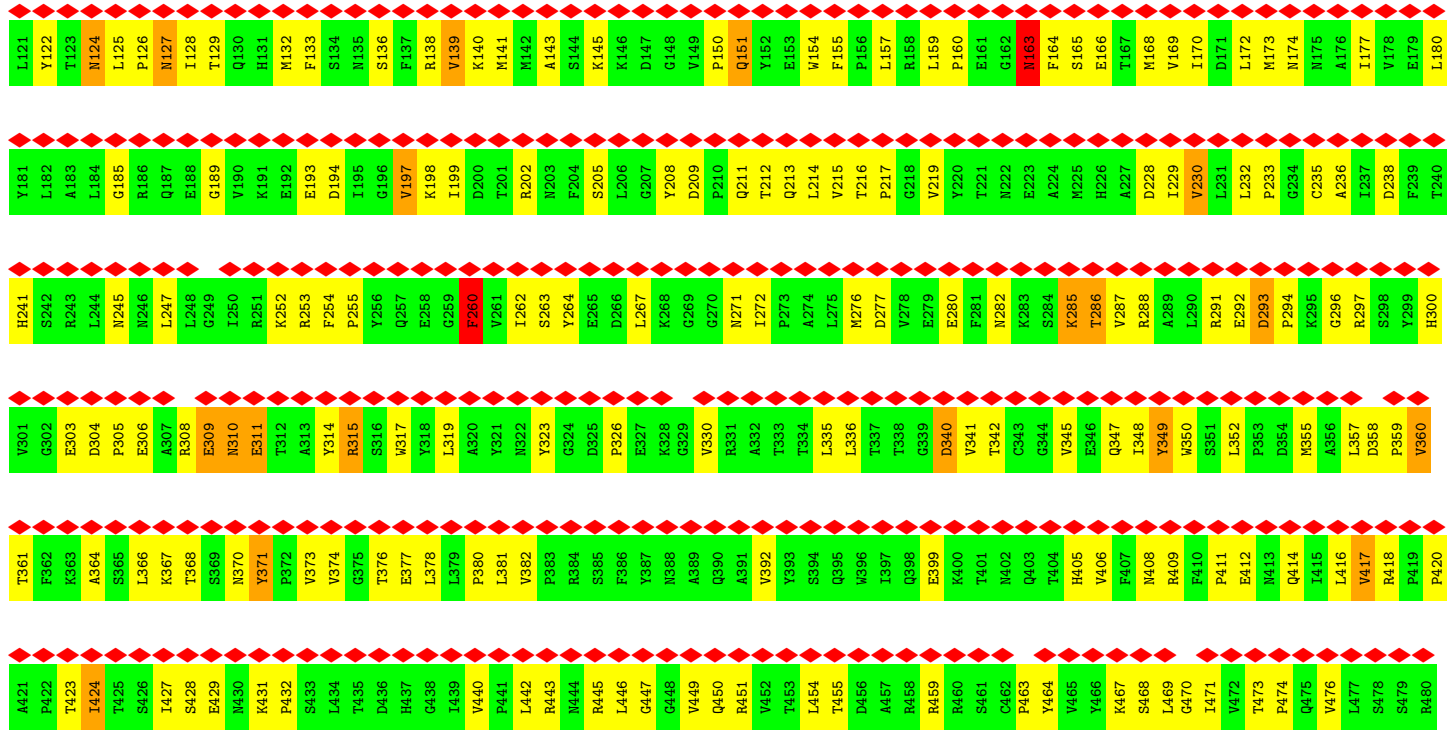




THR

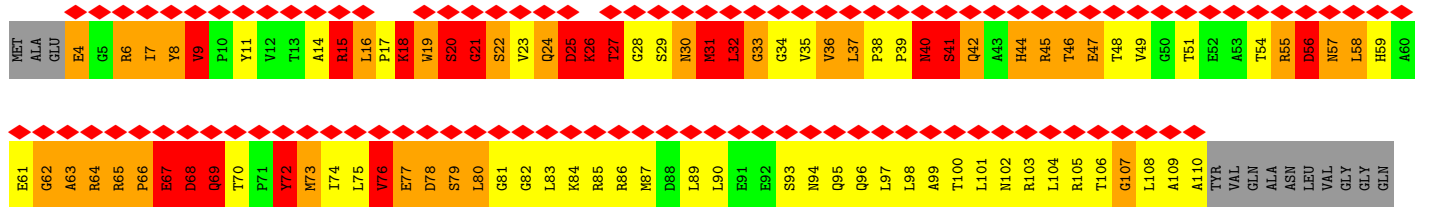
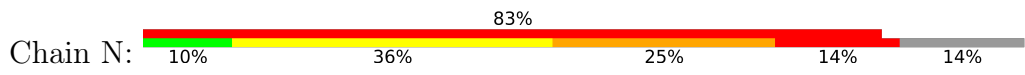
• Molecule 1: HEXON PROTEIN





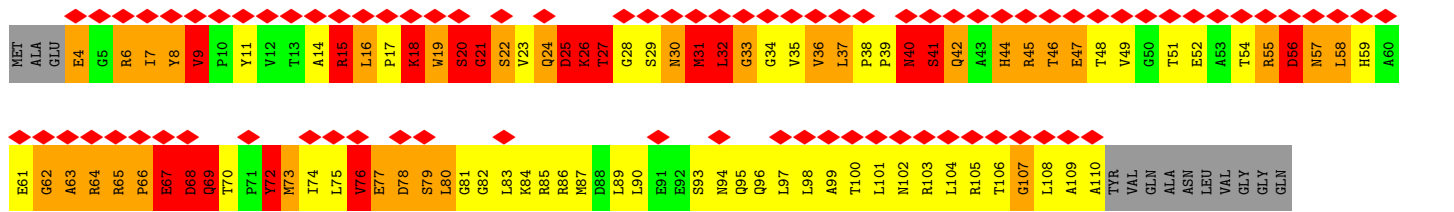
THR
PHE

• Molecule 3: PIX



VAL
ASN
PRO
PHE
VAL

• Molecule 3: PIX



VAL
ASN
PRO
PHE
VAL

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, I	Depositor
Number of particles used	11910	Depositor
Resolution determination method	Not provided	
CTF correction method	INDIVIDUAL IMAGES	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	25	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	3500	Depositor
Magnification	125390	Depositor
Image detector	GENERIC GATAN	Depositor
Maximum map value	34.829	Depositor
Minimum map value	-25.396	Depositor
Average map value	0.159	Depositor
Map value standard deviation	3.830	Depositor
Recommended contour level	9.0	Depositor
Map size (\AA)	928.0, 928.0, 928.0	wwPDB
Map dimensions	800, 800, 800	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	1.16, 1.16, 1.16	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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	A	0.27	0/7431	0.48	0/10139
1	B	0.27	0/7431	0.48	0/10139
1	C	0.27	0/7431	0.48	0/10139
1	D	0.27	0/7431	0.48	0/10139
1	E	0.27	0/7431	0.47	0/10139
1	F	0.27	0/7431	0.48	0/10139
1	G	0.27	0/7431	0.47	0/10139
1	H	0.27	0/7431	0.47	0/10139
1	I	0.27	0/7431	0.48	0/10139
1	J	0.27	0/7432	0.47	0/10141
1	K	0.27	0/7431	0.47	0/10139
1	L	0.27	0/7431	0.48	0/10139
2	M	0.67	2/3682 (0.1%)	1.02	8/5013 (0.2%)
3	N	0.92	4/838 (0.5%)	1.94	34/1135 (3.0%)
3	O	0.92	4/838 (0.5%)	1.93	33/1135 (2.9%)
3	P	0.91	4/838 (0.5%)	1.93	34/1135 (3.0%)
3	Q	0.91	4/838 (0.5%)	1.94	34/1135 (3.0%)
4	R	0.27	0/837	0.42	0/1142
All	All	0.33	18/97044 (0.0%)	0.61	143/132365 (0.1%)

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
2	M	0	2
3	N	1	5
3	O	1	5
3	P	1	5
3	Q	1	5
All	All	4	22

The worst 5 of 18 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	O	69	GLN	CB-CG	-8.32	1.30	1.52
3	N	69	GLN	CB-CG	-8.31	1.30	1.52
3	P	69	GLN	CB-CG	-8.30	1.30	1.52
3	Q	69	GLN	CB-CG	-8.29	1.30	1.52
2	M	65	LEU	C-N	-6.67	1.18	1.34

The worst 5 of 143 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	Q	68	ASP	N-CA-C	21.04	167.81	111.00
3	P	68	ASP	N-CA-C	21.04	167.79	111.00
3	N	68	ASP	N-CA-C	21.02	167.77	111.00
3	O	68	ASP	N-CA-C	21.02	167.75	111.00
3	N	26	LYS	CA-C-N	-13.04	88.51	117.20

All (4) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
3	N	68	ASP	CA
3	O	68	ASP	CA
3	P	68	ASP	CA
3	Q	68	ASP	CA

5 of 22 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	M	282	ASN	Peptide
2	M	371	TYR	Sidechain
3	N	26	LYS	Mainchain
3	N	67	GLU	Mainchain,Peptide
3	N	68	ASP	Mainchain

5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	7222	0	6877	712	0
1	B	7222	0	6873	816	0
1	C	7222	0	6877	663	0
1	D	7222	0	6875	756	0
1	E	7222	0	6877	781	0
1	F	7222	0	6878	650	0
1	G	7222	0	6875	827	0
1	H	7222	0	6878	727	0
1	I	7222	0	6878	646	0
1	J	7223	0	6875	835	0
1	K	7222	0	6875	745	0
1	L	7222	0	6871	698	0
2	M	3596	0	3533	265	0
3	N	826	0	826	443	0
3	O	826	0	826	465	0
3	P	826	0	821	501	0
3	Q	826	0	828	308	0
4	R	812	0	744	192	0
All	All	94377	0	90087	8994	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 49.

The worst 5 of 8994 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:632:TRP:CD1	1:G:321:GLN:HB3	1.25	1.68
1:K:658:TYR:CZ	3:P:39:PRO:HD3	1.33	1.64
3:N:83:LEU:CD2	3:P:83:LEU:HD21	1.18	1.64
3:N:104:LEU:CD2	3:O:104:LEU:HD13	1.26	1.63
1:E:909:ALA:HB3	1:G:544:GLU:CB	1.25	1.62

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	901/911 (99%)	722 (80%)	132 (15%)	47 (5%)	2	22
1	B	901/911 (99%)	722 (80%)	133 (15%)	46 (5%)	2	22
1	C	901/911 (99%)	726 (81%)	131 (14%)	44 (5%)	2	23
1	D	901/911 (99%)	720 (80%)	134 (15%)	47 (5%)	2	22
1	E	901/911 (99%)	722 (80%)	132 (15%)	47 (5%)	2	22
1	F	901/911 (99%)	726 (81%)	131 (14%)	44 (5%)	2	23
1	G	901/911 (99%)	721 (80%)	133 (15%)	47 (5%)	2	22
1	H	901/911 (99%)	723 (80%)	131 (14%)	47 (5%)	2	22
1	I	901/911 (99%)	726 (81%)	131 (14%)	44 (5%)	2	23
1	J	902/911 (99%)	722 (80%)	133 (15%)	47 (5%)	2	22
1	K	901/911 (99%)	723 (80%)	131 (14%)	47 (5%)	2	22
1	L	901/911 (99%)	726 (81%)	131 (14%)	44 (5%)	2	23
2	M	448/482 (93%)	321 (72%)	90 (20%)	37 (8%)	1	13
3	N	105/125 (84%)	64 (61%)	26 (25%)	15 (14%)	0	4
3	O	105/125 (84%)	64 (61%)	26 (25%)	15 (14%)	0	4
3	P	105/125 (84%)	64 (61%)	26 (25%)	15 (14%)	0	4
3	Q	105/125 (84%)	64 (61%)	26 (25%)	15 (14%)	0	4
4	R	99/216 (46%)	80 (81%)	12 (12%)	7 (7%)	1	16
All	All	11780/12130 (97%)	9336 (79%)	1789 (15%)	655 (6%)	3	21

5 of 655 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	138	ALA
1	A	140	ASN
1	A	162	ASP
1	A	169	GLU
1	A	170	ARG

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	A	779/786 (99%)	752 (96%)	27 (4%)	36	60
1	B	779/786 (99%)	751 (96%)	28 (4%)	35	60
1	C	779/786 (99%)	752 (96%)	27 (4%)	36	60
1	D	779/786 (99%)	752 (96%)	27 (4%)	36	60
1	E	779/786 (99%)	751 (96%)	28 (4%)	35	60
1	F	779/786 (99%)	752 (96%)	27 (4%)	36	60
1	G	779/786 (99%)	752 (96%)	27 (4%)	36	60
1	H	779/786 (99%)	751 (96%)	28 (4%)	35	60
1	I	779/786 (99%)	752 (96%)	27 (4%)	36	60
1	J	779/786 (99%)	752 (96%)	27 (4%)	36	60
1	K	779/786 (99%)	751 (96%)	28 (4%)	35	60
1	L	779/786 (99%)	752 (96%)	27 (4%)	36	60
2	M	401/432 (93%)	393 (98%)	8 (2%)	55	73
3	N	89/103 (86%)	51 (57%)	38 (43%)	0	0
3	O	89/103 (86%)	51 (57%)	38 (43%)	0	0
3	P	89/103 (86%)	51 (57%)	38 (43%)	0	0
3	Q	89/103 (86%)	51 (57%)	38 (43%)	0	0
4	R	87/179 (49%)	77 (88%)	10 (12%)	5	23
All	All	10192/10455 (98%)	9694 (95%)	498 (5%)	29	51

5 of 498 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	I	392	ARG
3	P	72	TYR
1	K	401	GLN
3	P	56	ASP
3	Q	51	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 420 such sidechains are listed below:

Mol	Chain	Res	Type
1	H	132	ASN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	I	587	ASN
2	M	402	ASN
1	H	311	ASN
1	H	870	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
2	M	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	M	65:LEU	C	66:ILE	N	1.18

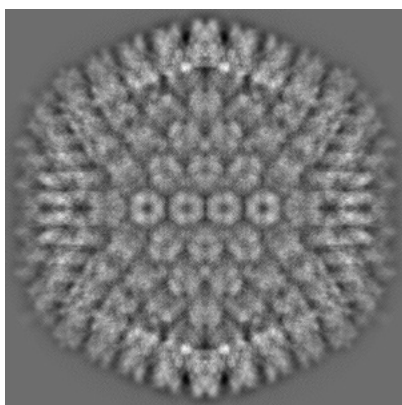
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-2273. These allow visual inspection of the internal detail of the map and identification of artifacts.

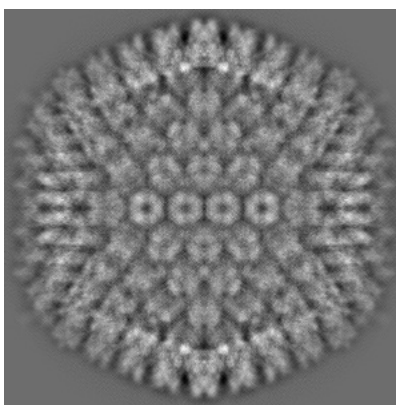
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

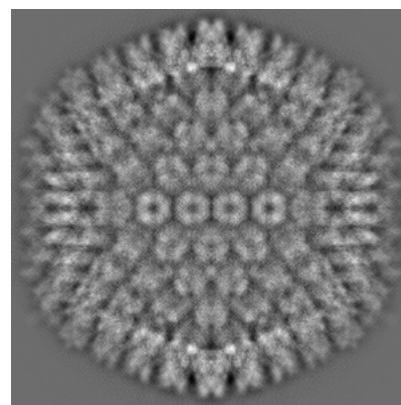
6.1.1 Primary map



X



Y

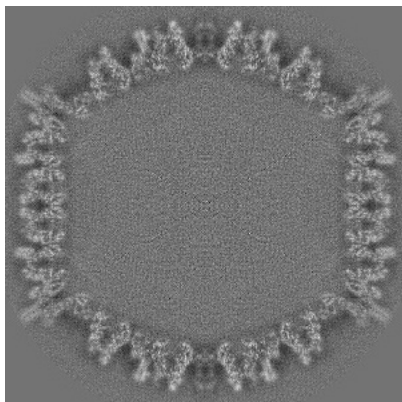


Z

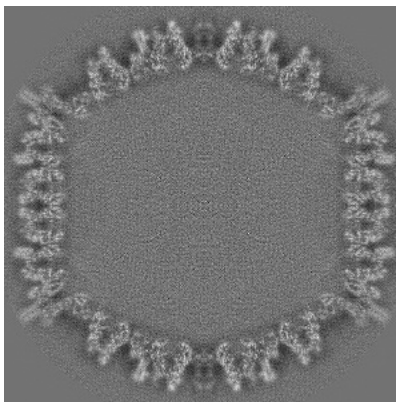
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

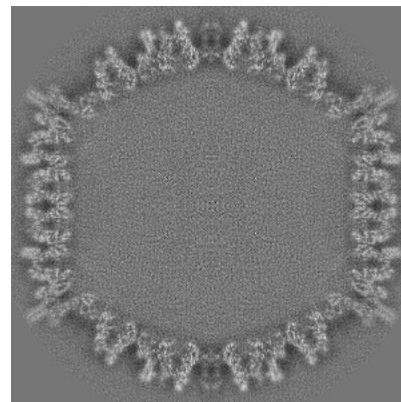
6.2.1 Primary map



X Index: 400



Y Index: 400

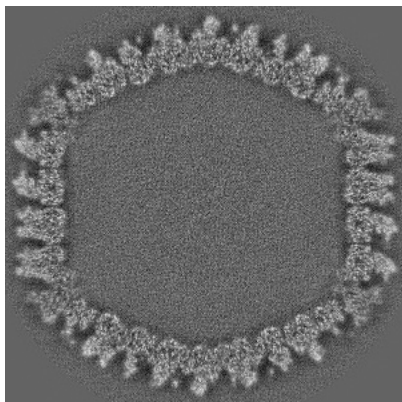


Z Index: 400

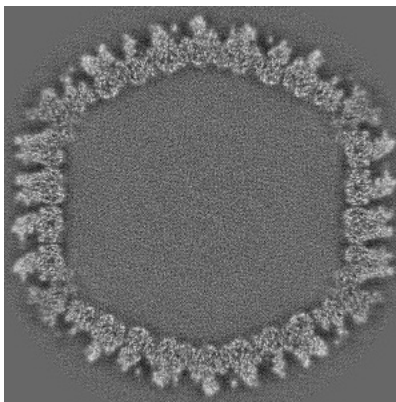
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

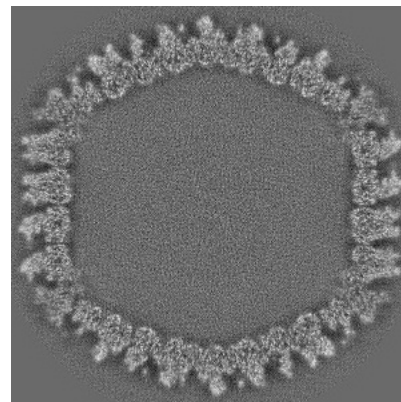
6.3.1 Primary map



X Index: 383



Y Index: 417



Z Index: 417

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

6.4 Orthogonal surface views [i](#)

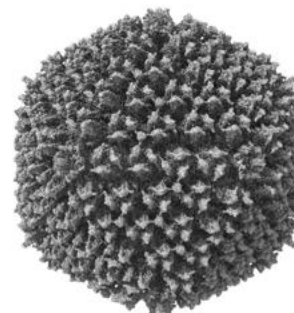
6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 9.0. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

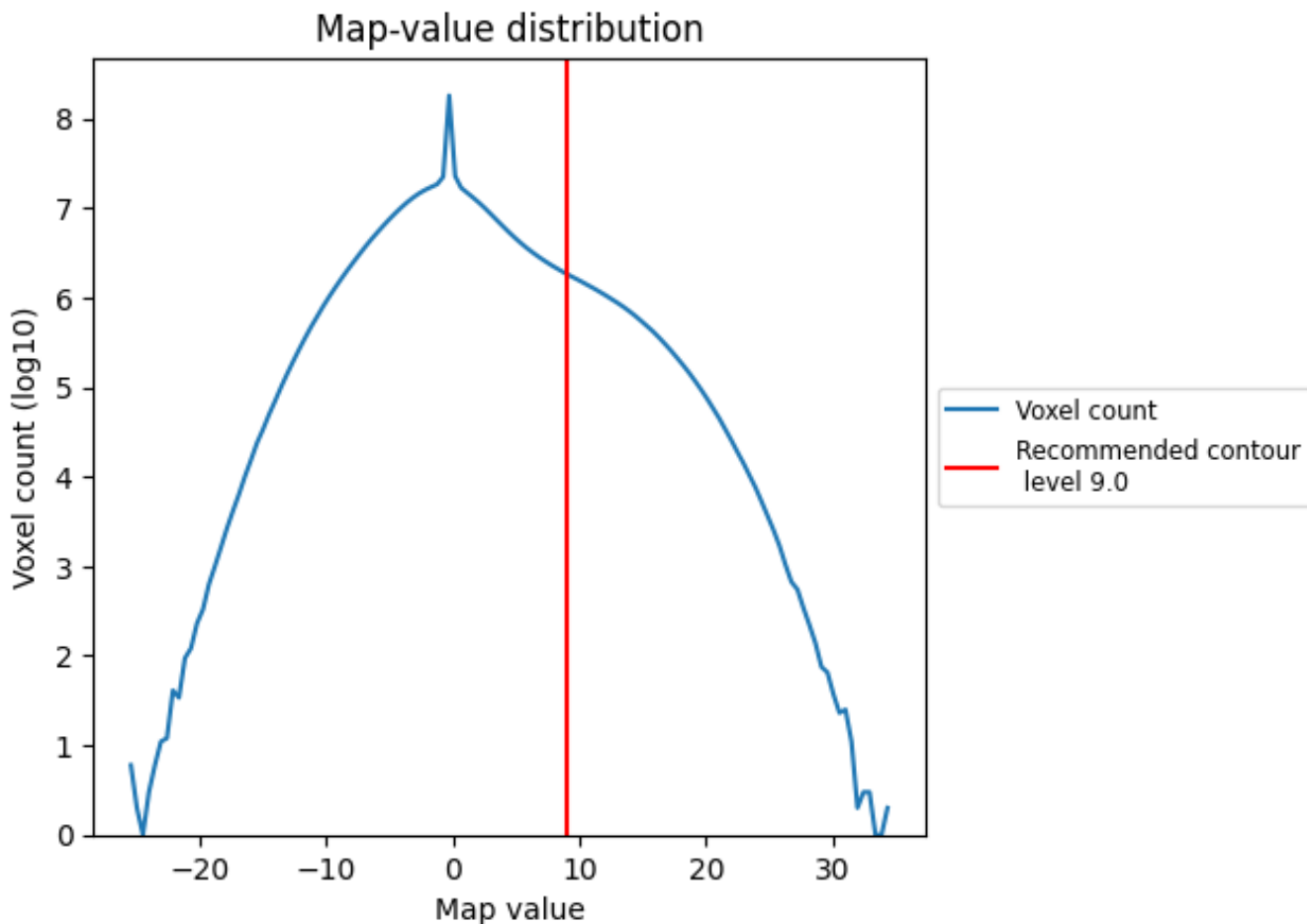
6.5 Mask visualisation

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

7 Map analysis [i](#)

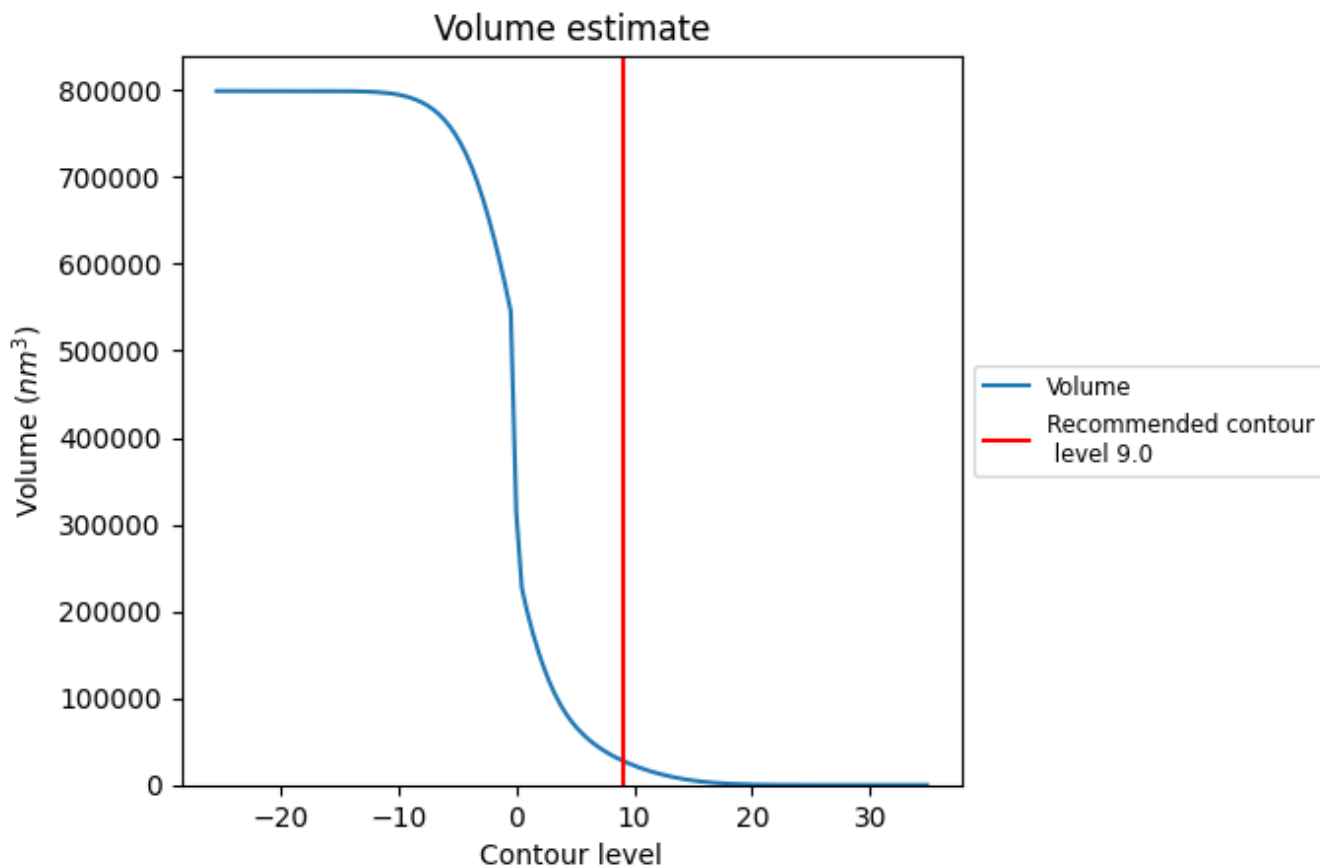
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

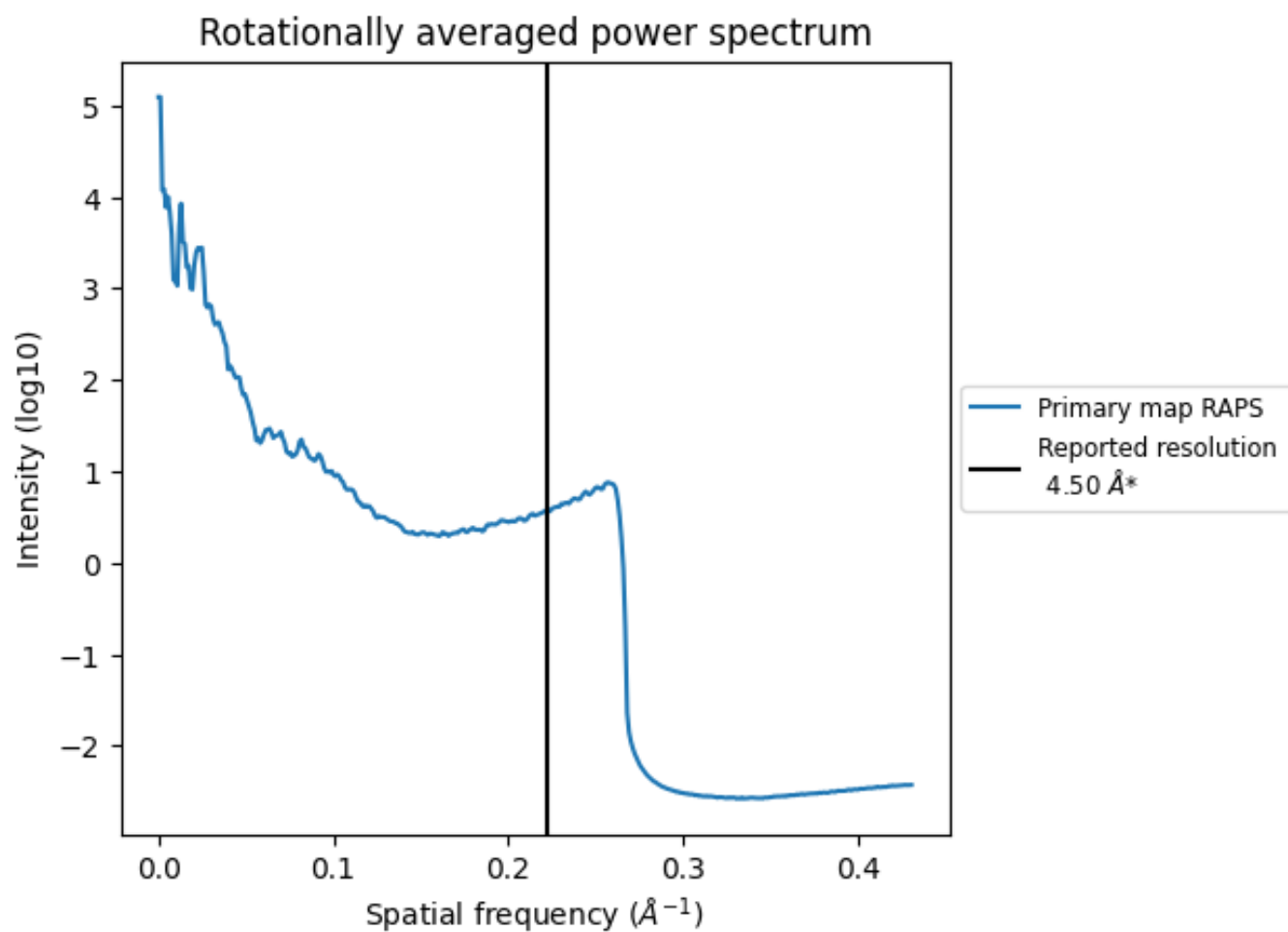
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 28074 nm³; this corresponds to an approximate mass of 25360 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 0.222 Å⁻¹

8 Fourier-Shell correlation

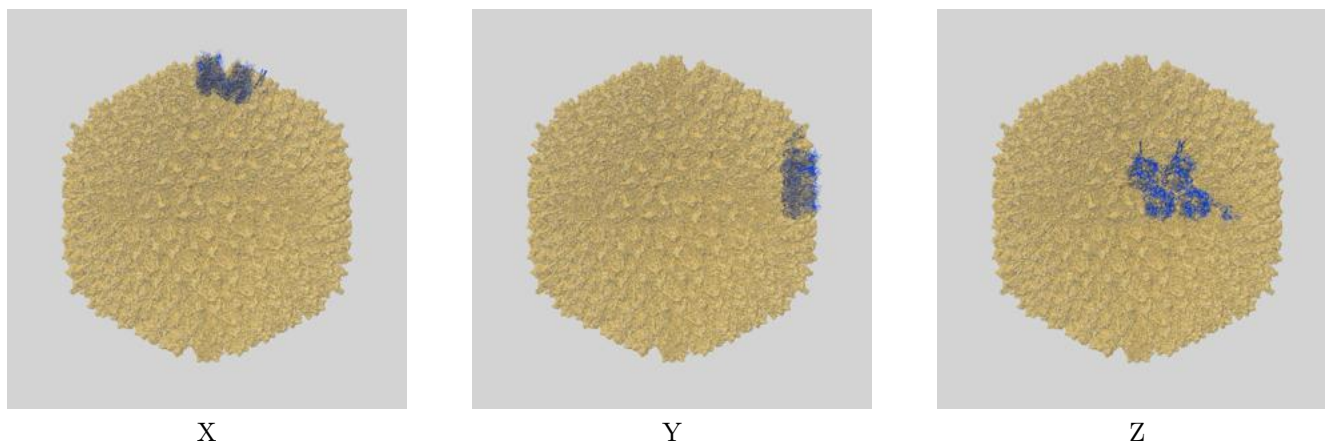
This section was not generated. No FSC curve or half-maps provided.

9 Map-model fit [i](#)

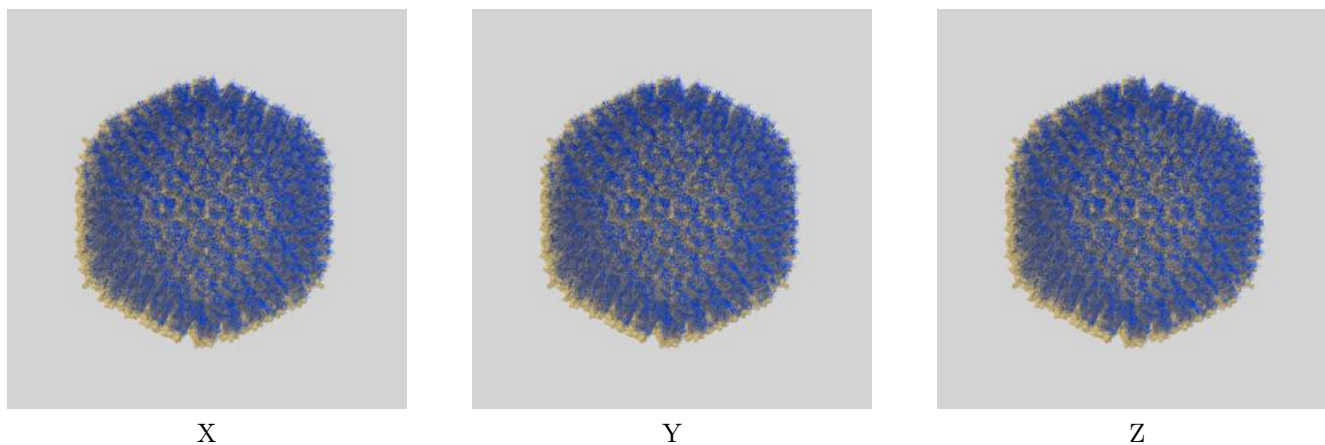
This section contains information regarding the fit between EMDB map EMD-2273 and PDB model 3ZIF. Per-residue inclusion information can be found in section 3 on page 6.

9.1 Map-model overlays

9.1.1 Map-model overlay [i](#)

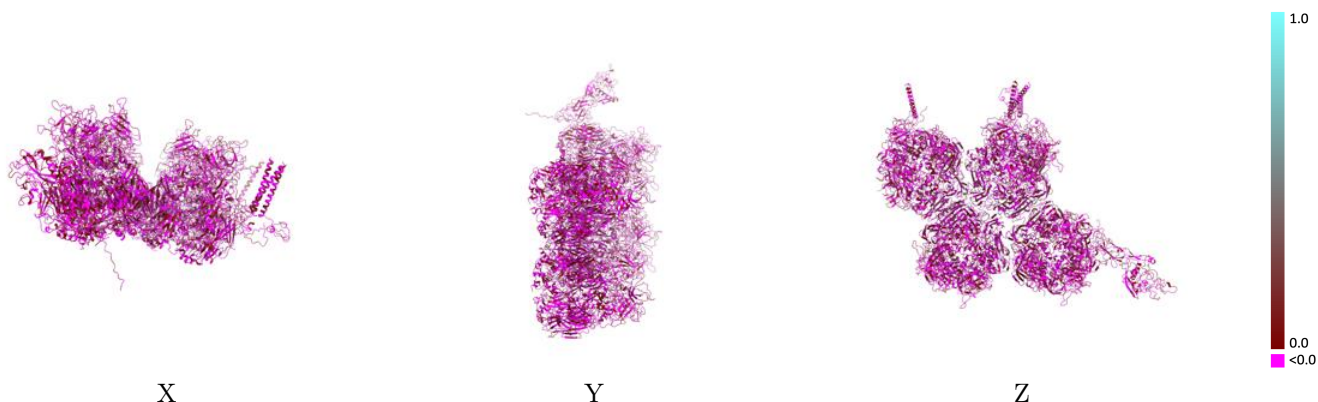


9.1.2 Map-model assembly overlay [i](#)



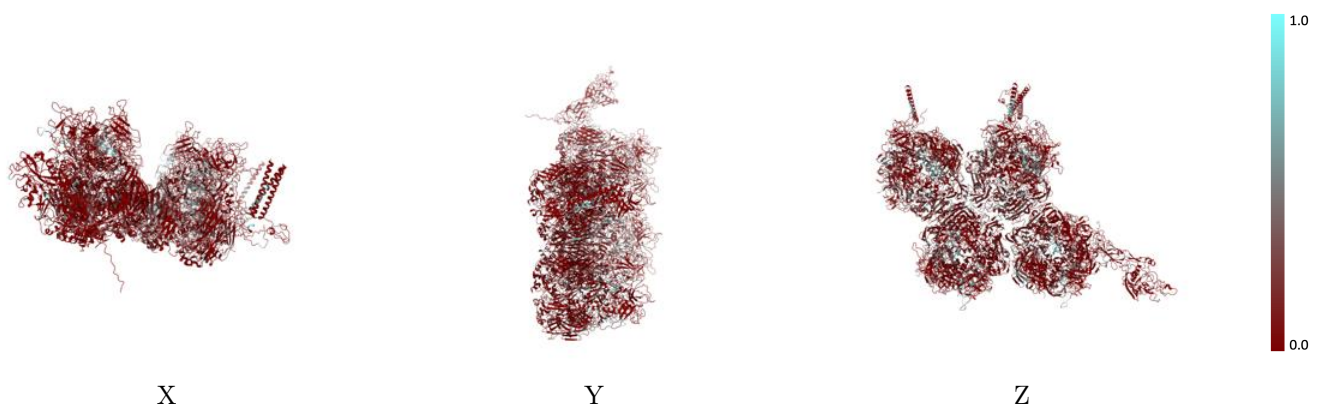
The images above show the 3D surface view of the map at the recommended contour level 9.0 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



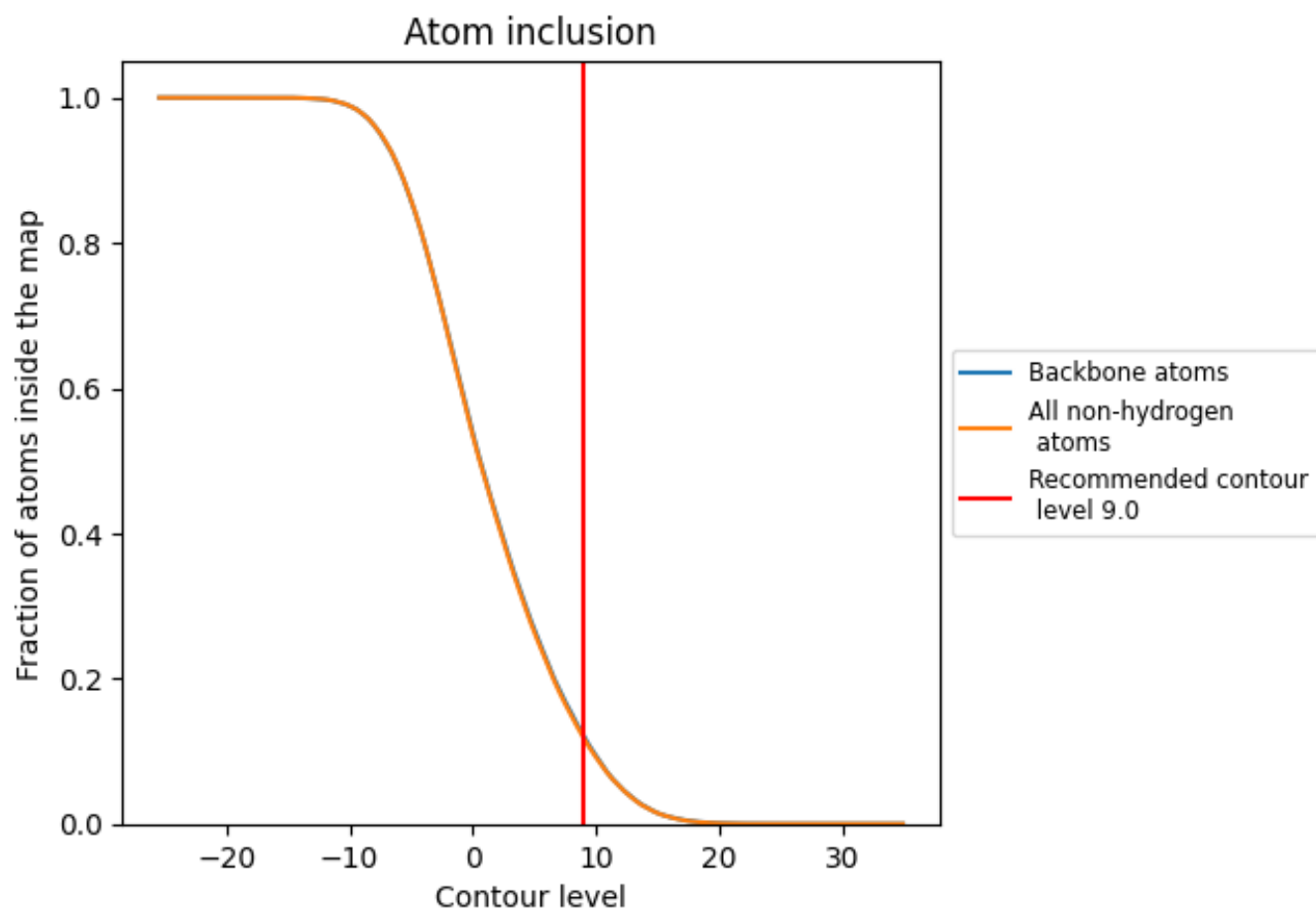
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

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



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (9.0).







































9.4 Atom inclusion [i](#)



At the recommended contour level, 12% of all backbone atoms, 12% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary [i](#)

The table lists the average atom inclusion at the recommended contour level (9.0) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.1174	 -0.0080
A	 0.0827	 -0.0010
B	 0.1065	 -0.0080
C	 0.1242	 -0.0050
D	 0.0861	 -0.0150
E	 0.1363	 0.0030
F	 0.1206	 -0.0210
G	 0.1455	 -0.0010
H	 0.0889	 -0.0110
I	 0.1496	 -0.0120
J	 0.1427	 -0.0090
K	 0.0920	 -0.0060
L	 0.1668	 -0.0150
M	 0.0390	 -0.0070
N	 0.0399	 -0.0360
O	 0.1870	 0.0280
P	 0.1309	 -0.0070
Q	 0.1272	 -0.0020
R	 0.1564	 0.0330

