



## Full wwPDB EM Validation Report ⓘ

Jul 15, 2024 – 06:28 am BST

PDB ID : 7ZNL  
EMDB ID : EMD-14808  
Title : Structure of the human TREX core THO-UAP56 complex  
Authors : Pacheco-Fiallos, F.B.; Vorlaender, M.K.; Plaschka, C.  
Deposited on : 2022-04-21  
Resolution : 3.45 Å (reported)

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

We welcome your comments at [validation@mail.wwpdb.org](mailto: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>.

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

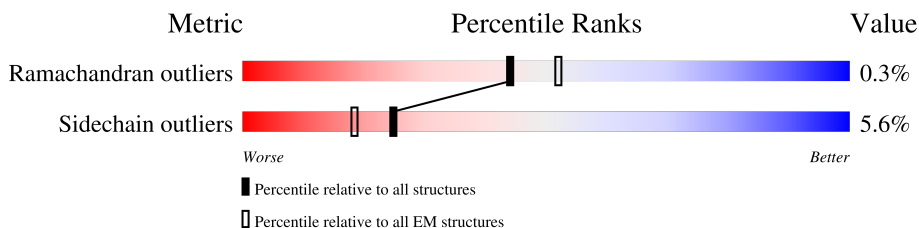
EMDB validation analysis : 0.0.1.dev92  
MolProbity : 4.02b-467  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.37.1

# 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 3.45 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  $\geq 3$ , 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	657	
1	I	657	
1	a	657	
1	i	657	
2	B	1593	
2	J	1593	
2	b	1593	
2	j	1593	
3	C	351	

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Mol	Chain	Length	Quality of chain
3	K	351	88% 77% 11% 12%
3	c	351	88% 77% 11% 12%
3	k	351	88% 77% 11% 12%
4	E	683	78% 78% 21%
4	M	683	80% 80% 20%
4	e	683	77% 77% 23%
4	m	683	80% 80% 20%
5	F	341	99% 98% ..
5	N	341	99% 98% ..
5	f	341	96% 96% ..
5	n	341	99% 98% ..
6	G	204	75% 79% 21%
6	O	204	80% 80% 20%
6	g	204	79% 79% 21%
6	o	204	80% 80% 20%
7	H	428	32% 40% 60%
7	P	428	40% 40% 60%
7	h	428	40% 40% 60%
7	p	428	40% 40% 60%

## 2 Entry composition [i](#)

There are 7 unique types of molecules in this entry. The entry contains 84821 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 THO complex subunit 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	356	Total 2889	C 1864	N 481	O 531	S 13	0	0
1	I	363	Total 2935	C 1894	N 489	O 539	S 13	0	0
1	a	356	Total 2889	C 1864	N 481	O 531	S 13	0	0
1	i	363	Total 2936	C 1894	N 489	O 540	S 13	0	0

- Molecule 2 is a protein called THO complex subunit 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	919	Total 7012	C 4486	N 1206	O 1278	S 42	0	0
2	J	914	Total 6956	C 4452	N 1194	O 1268	S 42	0	0
2	b	919	Total 7012	C 4486	N 1206	O 1278	S 42	0	0
2	j	914	Total 6956	C 4452	N 1194	O 1268	S 42	0	0

- Molecule 3 is a protein called THO complex subunit 3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	C	309	Total 2433	C 1538	N 423	O 457	S 15	0	0
3	K	309	Total 2433	C 1538	N 423	O 457	S 15	0	0
3	c	309	Total 2433	C 1538	N 423	O 457	S 15	0	0
3	k	309	Total 2433	C 1538	N 423	O 457	S 15	0	0

- Molecule 4 is a protein called THO complex subunit 5 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	E	538	Total	C	N	O	S	0	0
			3763	2383	663	696	21		
4	M	549	Total	C	N	O	S	0	0
			4134	2634	725	752	23		
4	e	527	Total	C	N	O	S	0	0
			3674	2327	649	679	19		
4	m	549	Total	C	N	O	S	0	0
			4134	2634	725	752	23		

- Molecule 5 is a protein called THO complex subunit 6 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	F	337	Total	C	N	O	S	0	0
			2604	1647	459	483	15		
5	N	337	Total	C	N	O	S	0	0
			2604	1647	459	483	15		
5	f	329	Total	C	N	O	S	0	0
			2537	1604	448	470	15		
5	n	337	Total	C	N	O	S	0	0
			2604	1647	459	483	15		

- Molecule 6 is a protein called THO complex subunit 7 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	G	161	Total	C	N	O		0	0
			800	478	161	161			
6	O	164	Total	C	N	O	S	0	0
			1129	696	210	216	7		
6	g	161	Total	C	N	O		0	0
			800	478	161	161			
6	o	164	Total	C	N	O	S	0	0
			1129	696	210	216	7		

- Molecule 7 is a protein called Spliceosome RNA helicase DDX39B.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	H	170	Total	C	N	O	S	0	0
			1398	888	245	261	4		
7	P	170	Total	C	N	O	S	0	0
			1398	888	245	261	4		
7	h	170	Total	C	N	O	S	0	0
			1398	888	245	261	4		

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Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	p	170	1398	888	245	261	4	0	0

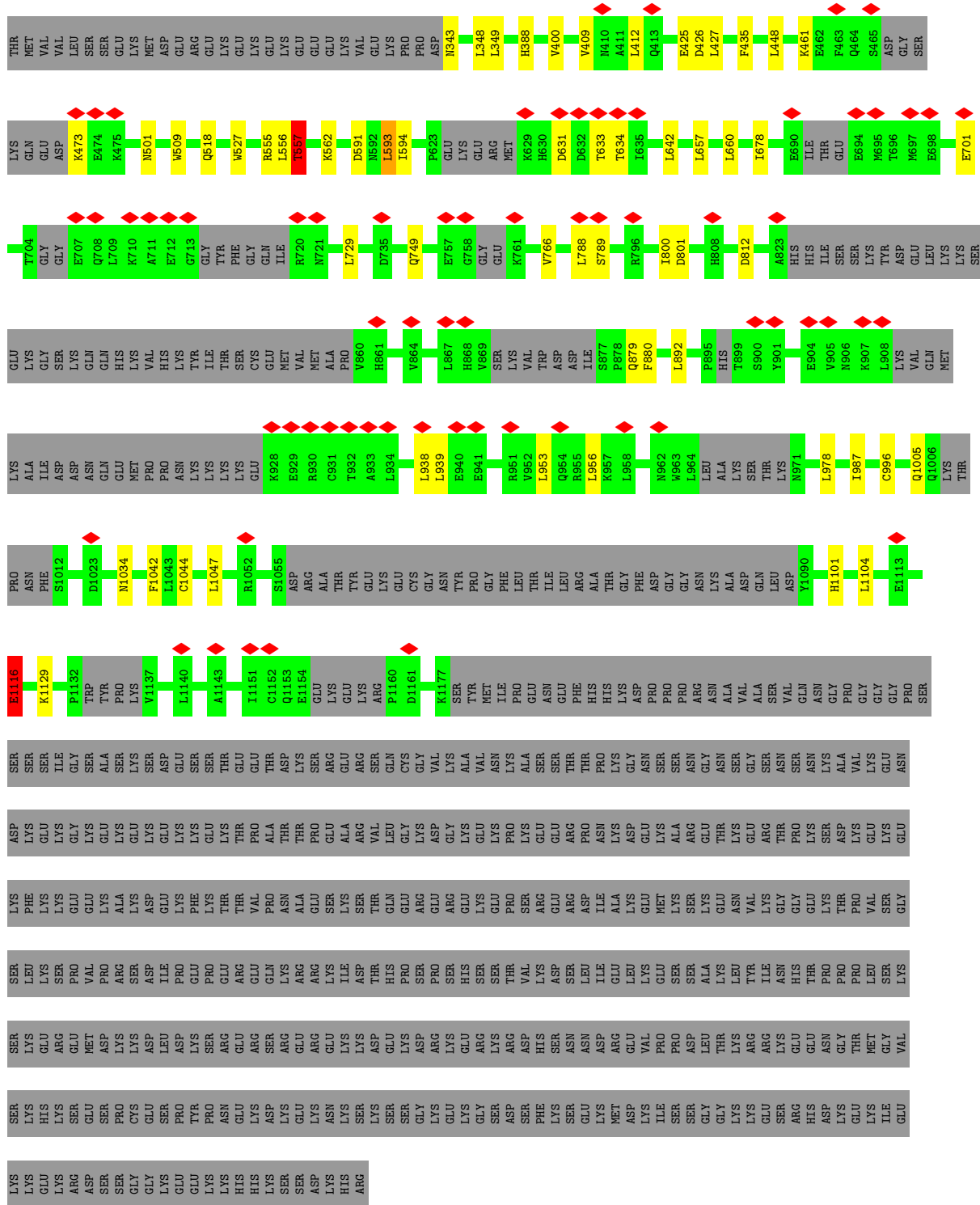




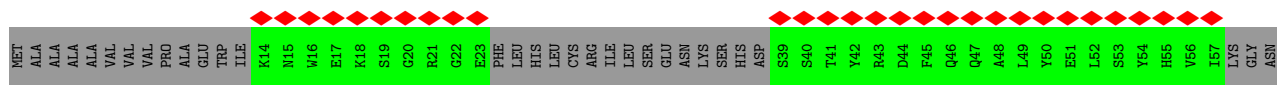








• Molecule 2: THO complex subunit 2







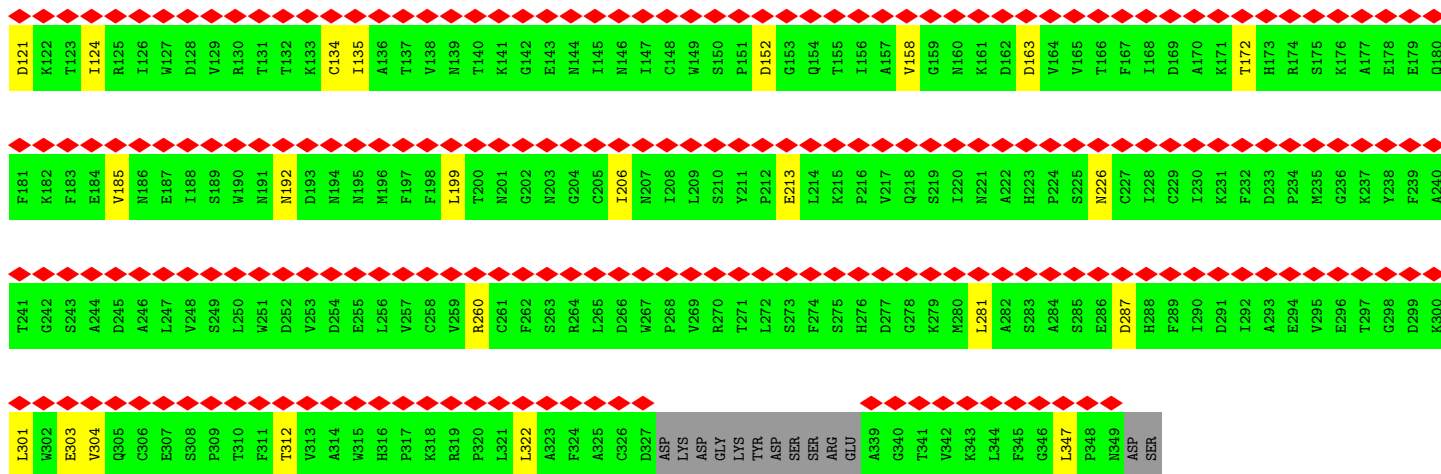




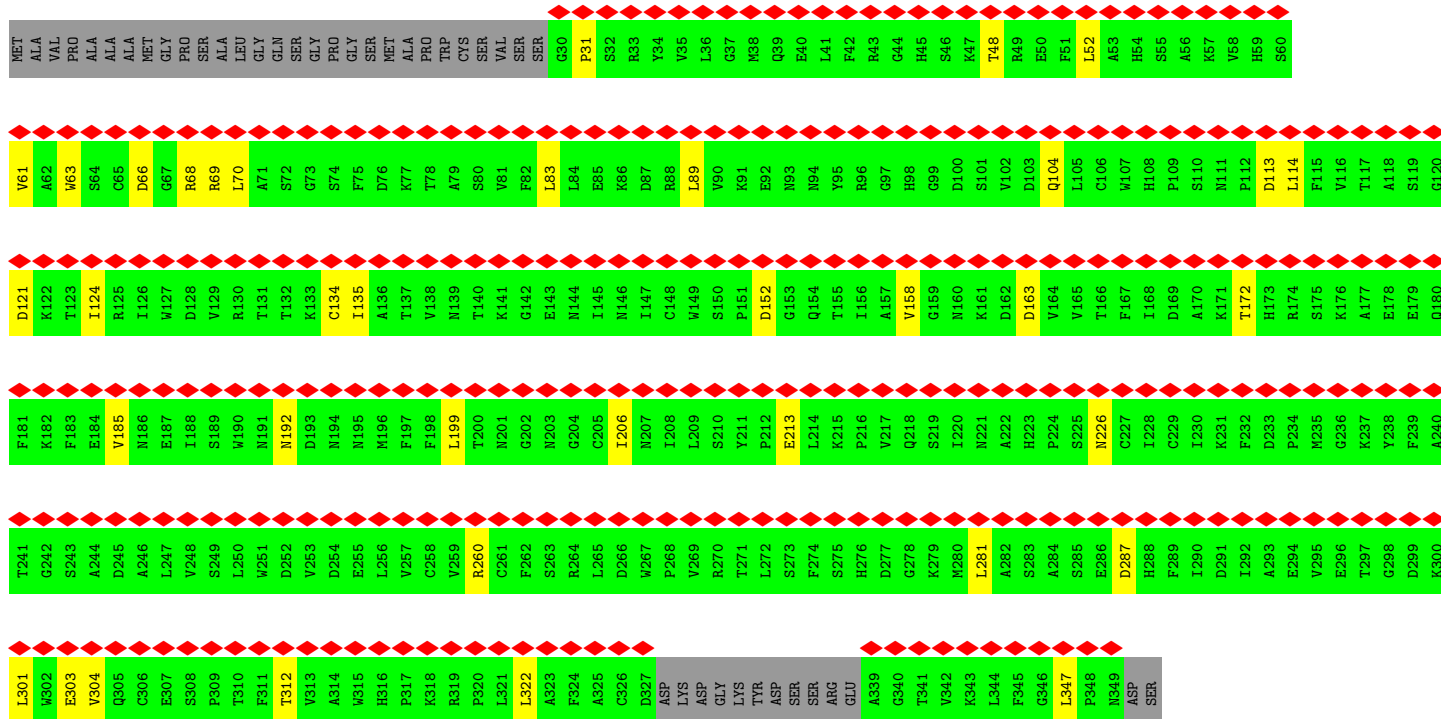
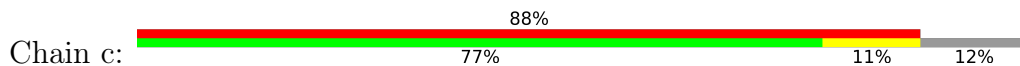
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A361	Q362	N363	I364	M365	D366	Q367	M368	P369	P370	Y371	Y372	A373	A374	A375	S375	H376	K377	L378	I379	A380	L381	A382	I383	C384	K385	K386	I387	H388	I389	T390	I391	E392	P393	L394	Y395	R396	R397	L398	G399	V400	P401	K402	G403	A404	K405	G406	S407	P408	V409	N410	A411	L412	Q413	N414	K415	R416	A417	P418	K419	Q420						
A421	E422	F423	F424	E425	D426	L427	R428	R429	D430	V431	F432	N433	M434	F435	C436	L437	L438	G439	P440	H441	L442	S443	H444	D445	K446	I447	L448	F449	A450	K451	V452	V453	V454	L455	G456	K457	S458	F459	M460	K461	F462	F463	Q464	S465	ASP	GLY	SER	SER	LYS	GLN	GLU	ASP	K473	E474	K475	T476	E477	V478	I479	L480						
S481	C482	L483	L484	S485	I486	T487	D488	Q489	D490	V491	L492	P493	S494	L495	S496	L497	M498	D499	C500	N501	A502	C503	M504	S505	S506	E507	L508	W509	G510	M511	F512	K513	T514	F515	P516	Y517	Q518	H519	R520	Y521	R522	L523	Y524	G525	Q526	W527	K528	N529	E530	T531	Y532	N533	S534	H535	P536	L537	V538	V539	K540							
V541	K542	A543	Q544	T545	I546	D547	R548	A549	K550	Y551	I552	M553	K554	R555	L556	T557	K558	E559	N560	V561	K562	P563	S564	G565	R566	Q567	I568	G569	K570	L571	S572	H573	S574	N575	P576	T577	I578	L579	F580	D581	R582	I583	L584	S585	Q586	I587	Q588	K589	L590	D591	N592	L593	I594	T595	P596	V597	L598	D599	S600							
L601	K602	Y603	L604	T605	S606	L607	N608	Y609	D610	V611	L612	A613	Y614	C615	I616	I617	E618	A619	L620	A621	N622	P623	GLU	GLY	ARG	MET	K629	H630	D631	D632	T633	T634	I635	S636	S637	W638	L639	Q640	S641	L642	A643	S644	F645	C646	G647	A648	V649	F650	R651	K652	Y653	P654	I655	D656	L657	A658	G659	L660								
L661	Q662	Y663	V664	A665	N666	Q667	L668	K669	A670	G671	K672	S673	F674	D675	L676	L677	L678	L679	K680	E681	V682	V683	Q684	K685	M686	A687	G688	I689	E690	I691	THR	T692	E694	M695	T696	M697	E698	Q699	L700	E701	A702	M703	W704	GLY	GLY	E707	Q708	L709	K710	A711	E712	GLY	GLY	T713	P714	PHE	GLY	GLN	I715	R720						
M721	T722	K723	K724	S725	S726	Q727	R728	L729	K730	D731	A732	L733	L734	D735	H736	D737	L738	A739	L740	P741	L742	C743	L744	L745	M746	A747	Q748	Q749	R750	M751	G752	L753	L754	F755	Q756	E757	E758	GLY	GLU	K761	H762	L763	K764	L765	V766	G767	K768	L769	Y770	D771	Q772	C773	H774	D775	T776	L777	V778	Q779	F780							
G781	G782	F783	L784	A785	S786	M787	L788	S789	T790	E791	D792	Y793	L794	K795	R796	V797	L798	A799	I800	D801	V802	L803	C804	N805	E806	F807	H808	T809	P810	H811	D812	A813	L814	F815	F816	L817	S818	R819	P820	M821	A822	HIS	ILE	ILE	SER	SER	LYS	TYR	ASP	GLU	LEU	LYS	LYS	SER	GLU	LYS	LYS	G789	L892	A893	V894	F895	T899	S900	Y901	E902
LYS	GLN	HIS	LYS	VAL	HIS	LYS	TYR	ILE	THR	GLN	MET	LYS	ALA	ASN	ALA	PRO	V860	H861	E862	A863	V864	V865	S866	L867	H868	SER	LYS	VAL	TRP	ASP	ILE	S877	F878	K879	F880	F881	A882	T883	F884	W885	S886	L887	T888	M889	Y890	D891	L892	A893	V894	F895	HIS	T899	S900	Y901	E902											
R903	E904	Y905	N906	K907	L908	LYS	VAL	GLN	MET	LYS	ALA	ILE	ASP	ASP	GLN	GLU	MET	PRO	PRO	ASN	LYS	LYS	LYS	K928	E929	R930	C931	F932	A933	L934	Q935	D936	K937	L938	L939	E940	E941	E942	K943	K944	Q945	M946	E947	H948	Y949	Q950	R951	L953	Q954	R955	L956	K957	L958	E959	K960											
D961	N962	W963	L964	LEU	ALA	LYS	SER	THR	THR	LYS	N971	E972	T973	I974	T975	K976	F977	L978	Q979	L980	C981	I982	F983	P984	R985	C986	I987	F988	S989	A990	I991	D992	A993	V994	Y995	C996	A997	R998	F999	V1000	E1001	L1002	V1003	H1004	Q1005	Q1006	LYS	THR	PHE	THR	ASN	PHE	S1012	T1013	L1014	ALA	ALA	THR	GLY	PHE	ASP					
F1021	S1022	D1023	I1024	I1025	Y1026	T1027	V1028	A1029	S1030	C1031	T1032	E1033	M1034	E1035	A1036	S1037	R1038	Y1039	G1040	R1041	F1042	L1043	C1044	M1045	M1046	L1047	E1048	T1049	V1050	T1051	R1052	W1053	W1054	S1055	ASP	ARG	ALA	THR	TYR	GLU	LYS	CYS	GLY	ASN	TYR	PRO	GLY	PHE	LEU	THR	ILE	ARG	LEU	ALA	THR	GLY	PHE	ASP								



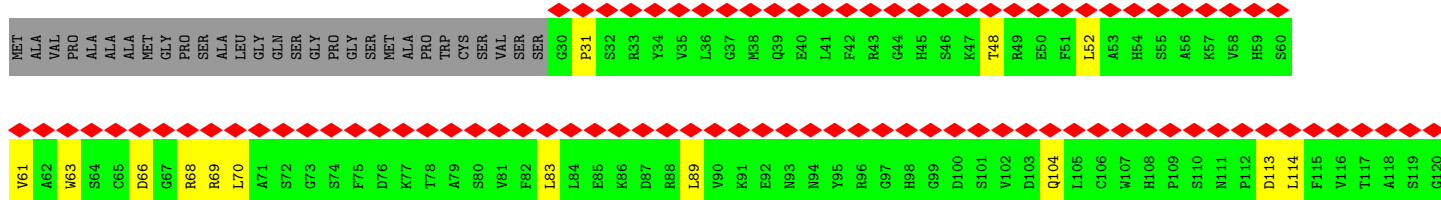
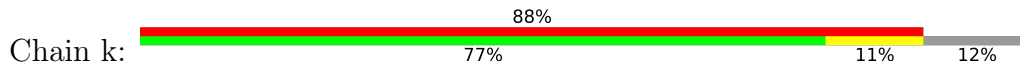




• Molecule 3: THO complex subunit 3

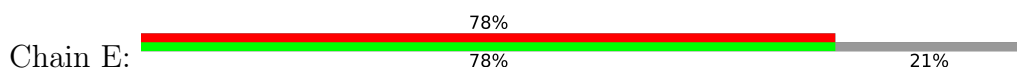


• Molecule 3: THO complex subunit 3

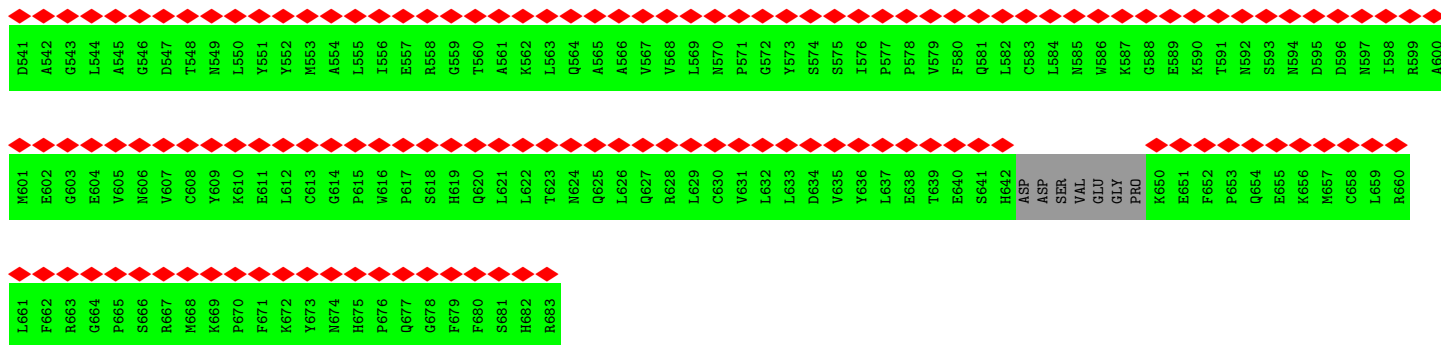


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G242	K182	K122
S243	F183	T123
A244	E184	I124
D245	V185	R125
A246	N186	I126
L247	E187	W127
V248	I188	D128
S249	S189	V129
L250	W190	R130
W251	M191	T131
D252	M192	T132
V253	D193	K133
D254	N194	C134
E255	N195	I135
L256	M196	A136
V257	F197	T137
C258	F198	V138
V259	L199	N139
R260	T200	T140
C261	N201	K141
F262	G202	G142
S263	N203	E143
R264	G204	N144
L265	C205	I145
D266	T206	N146
W267	N207	I147
P268	I208	C148
V269	L209	W149
R270	S210	S150
T271	Y211	P151
L272	P212	D152
S273	E213	G153
F274	L214	Q154
S275	K215	T155
H276	P216	I156
D277	V217	A157
G278	Q218	V158
K279	S219	G159
M280	I220	N160
L281	N221	K161
A282	A222	D162
S283	H223	D163
A284	P224	V164
S285	S225	V165
E286	N226	T166
D287	C227	F167
H288	I228	I168
F289	C229	D169
I290	I230	A170
D291	K231	K171
I292	F232	T172
A293	D233	H173
E294	P234	R174
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K300	A240	E179

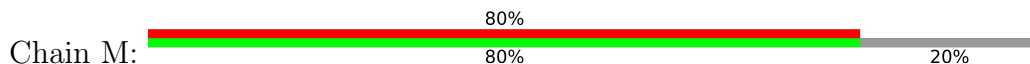
• Molecule 4: THO complex subunit 5 homolog



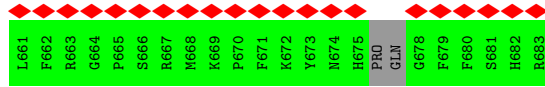
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R57	LYS	R57
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L55	LYS	L55
L54	LEU	L54
E53	ASP	E53
E52	PRO	E52
L51	PRO	L51
L50	ALA	L50
L49	ALA	L49
R48	ALA	R48
R47	LEU	R47
L46	LEU	L46
L45	SER	L45
D44	VAL	D44
D43	VAL	D43
A41	GLU	A41
E40	GLU	E40
E39	SER	E39
S38	SER	S38
T37	TYR	T37
L36	LYS	L36
L35	GLY	L35
L34	GLY	L34
L33	GLY	L33
L32	GLY	L32
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L30	ARG	L30
L29	ARG	L29
L28	ASN	L28
L27	GLY	L27
L26	GLY	L26
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L5	GLY	L5
L4	GLY	L4
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L1	GLY	L1
L0	GLY	L0
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L-6	GLY	L-6
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L-27	GLY	L-27
L-28	GLY	L-28
L-29	GLY	L-29
L-30	GLY	L-30
L-31	GLY	L-31
L-32	GLY	L-32
L-33	GLY	L-33
L-34	GLY	L-34
L-35	GLY	L-35
L-36	GLY	L-36
L-37	GLY	L-37
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L-41	GLY	L-41
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L-71	GLY	L-71
L-72	GLY	L-72
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L-74	GLY	L-74
L-75	GLY	L-75
L-76	GLY	L-76
L-77	GLY	L-77
L-78	GLY	L-78
L-79	GLY	L-79
L-80	GLY	L-80
L-81	GLY	L-81
L-82	GLY	L-82
L-83	GLY	L-83
L-84	GLY	L-84
L-85	GLY	L-85
L-86	GLY	L-86
L-87	GLY	L-87
L-88	GLY	L-88
L-89	GLY	L-89
L-90	GLY	L-90
L-91	GLY	L-91
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L-93	GLY	L-93
L-94	GLY	L-94
L-95	GLY	L-95
L-96	GLY	L-96
L-97	GLY	L-97
L-98	GLY	L-98
L-99	GLY	L-99
L-100	GLY	L-100
L-101	GLY	L-101
L-102	GLY	L-102
L-103	GLY	L-103
L-104	GLY	L-104
L-105	GLY	L-105
L-106	GLY	L-106
L-107	GLY	L-107
L-108	GLY	L-108
L-109	GLY	L-109
L-110	GLY	L-110
L-111	GLY	L-111
L-112	GLY	L-112
L-113	GLY	L-113
L-114	GLY	L-114
L-115	GLY	L-115
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L-119	GLY	L-119
L-120	GLY	L-120
L-121	GLY	L-121
L-122	GLY	L-122
L-123	GLY	L-123
L-124	GLY	L-124
L-125	GLY	L-125
L-126	GLY	L-126
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L-129	GLY	L-129
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L-133	GLY	L-133
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L-135	GLY	L-135
L-136	GLY	L-136
L-137	GLY	L-137
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L-143	GLY	L-143
L-144	GLY	L-144
L-145	GLY	L-145
L-146	GLY	L-146
L-147	GLY	L-147
L-148	GLY	L-148
L-149	GLY	L-149
L-150	GLY	L-150
L-151	GLY	L-151
L-152	GLY	L-152
L-153	GLY	L-153
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L-161	GLY	L-161
L-162	GLY	L-162
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L-164	GLY	L-164
L-165	GLY	L-165
L-166	GLY	L-166
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L-168	GLY	L-168
L-169	GLY	L-169
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L-172	GLY	L-172
L-173	GLY	L-173
L-174	GLY	L-174
L-175	GLY	L-175
L-176	GLY	L-176
L-177	GLY	L-177
L-178	GLY	L-178
L-179	GLY	L-179
L-180	GLY	L-180
L-181	GLY	L-181
L-182	GLY	L-182
L-183	GLY	L-183
L-184	GLY	L-184
L-185	GLY	L-185
L-186	GLY	L-186
L-187	GLY	L-187
L-188	GLY	L-188
L-189	GLY	L-189
L-190	GLY	L-190
L-191	GLY	L-191
L-192	GLY	L-192
L-193	GLY	L-193
L-194	GLY	L-194
L-195	GLY	L-195
L-196	GLY	L-196
L-197	GLY	L-197
L-198	GLY	L-198
L-199	GLY	L-199
L-200	GLY	L-200
L-201	GLY	L-201
L-202	GLY	L-202
L-203	GLY	L-203
L-204	GLY	L-204
L-205	GLY	L-205
L-206	GLY	L-206
L-207	GLY	L-207
L-208	GLY	L-208
L-209	GLY	L-209
L-210	GLY	L-210
L-211	GLY	L-211
L-212	GLY	L-212
L-213	GLY	L-213
L-214	GLY	L-214
L-215	GLY	L-215
L-216	GLY	L-216
L-217	GLY	L-217
L-218	GLY	L-218
L-219	GLY	L-219
L-220	GLY	L-220
L-221	GLY	L-221
L-222	GLY	L-222
L-223	GLY	L-223
L-224	GLY	L-224
L-225	GLY	L-225
L-226	GLY	L-226
L-227	GLY	L-227
L-228	GLY	L-228
L-229	GLY	L-229
L-230	GLY	L-230
L-231	GLY	L-231
L-232	GLY	L-232
L-233	GLY	L-233
L-234	GLY	L-234
L-235	GLY	L-235
L-236	GLY	L-236
L-237	GLY	L-237
L-238	GLY	L-238
L-239	GLY	L-239
L-240	GLY	L-240
L-241	GLY	L-241
L-242	GLY	L-242
L-243	GLY	L-243
L-244	GLY	L-244
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L-247	GLY	L-247
L-248	GLY	L-248
L-249	GLY	L-249
L-250	GLY	L-250
L-251	GLY	L-251
L-252	GLY	L-252
L-253	GLY	L-253
L-254	GLY	L-254
L-255	GLY	L-255
L-256	GLY	L-256
L-257	GLY	L-257
L-258	GLY	L-258
L-259	GLY	L-259
L-260	GLY	L-260
L-261	GLY	L-261
L-262	GLY	L-262
L-263	GLY	L-263
L-264	GLY	L-264
L-265	GLY	L-265
L-266	GLY	L-266
L-267	GLY	L-267
L-268	GLY	L-268
L-269	GLY	L-269
L-270	GLY	L-270
L-271	GLY	L-271
L-272	GLY	L-272
L-273	GLY	L-273
L-274	GLY	L-274
L-275	GLY	L-275
L-276	GLY	L-276
L-277	GLY	L-277
L-278	GLY	L-278
L-279	GLY	L-279
L-280	GLY	L-280
L-281	GLY	L-281
L-282	GLY	L-282
L-283	GLY	L-283
L-284	GLY	L-284
L-285	GLY	L-285
L-286	GLY	L-286
L-287	GLY	L-287
L-288	GLY	L-288
L-289	GLY	L-289
L-290	GLY	L-290
L-291	GLY	L-291
L-292	GLY	L-292
L-293	GLY	L-293
L-294	GLY	L-294
L-295	GLY	L-295
L-296	GLY	L-296
L-297	GLY	L-297
L-298	GLY	L-298
L-299	GLY	L-299
L-300	GLY	L-300
L-301	GLY	L-301



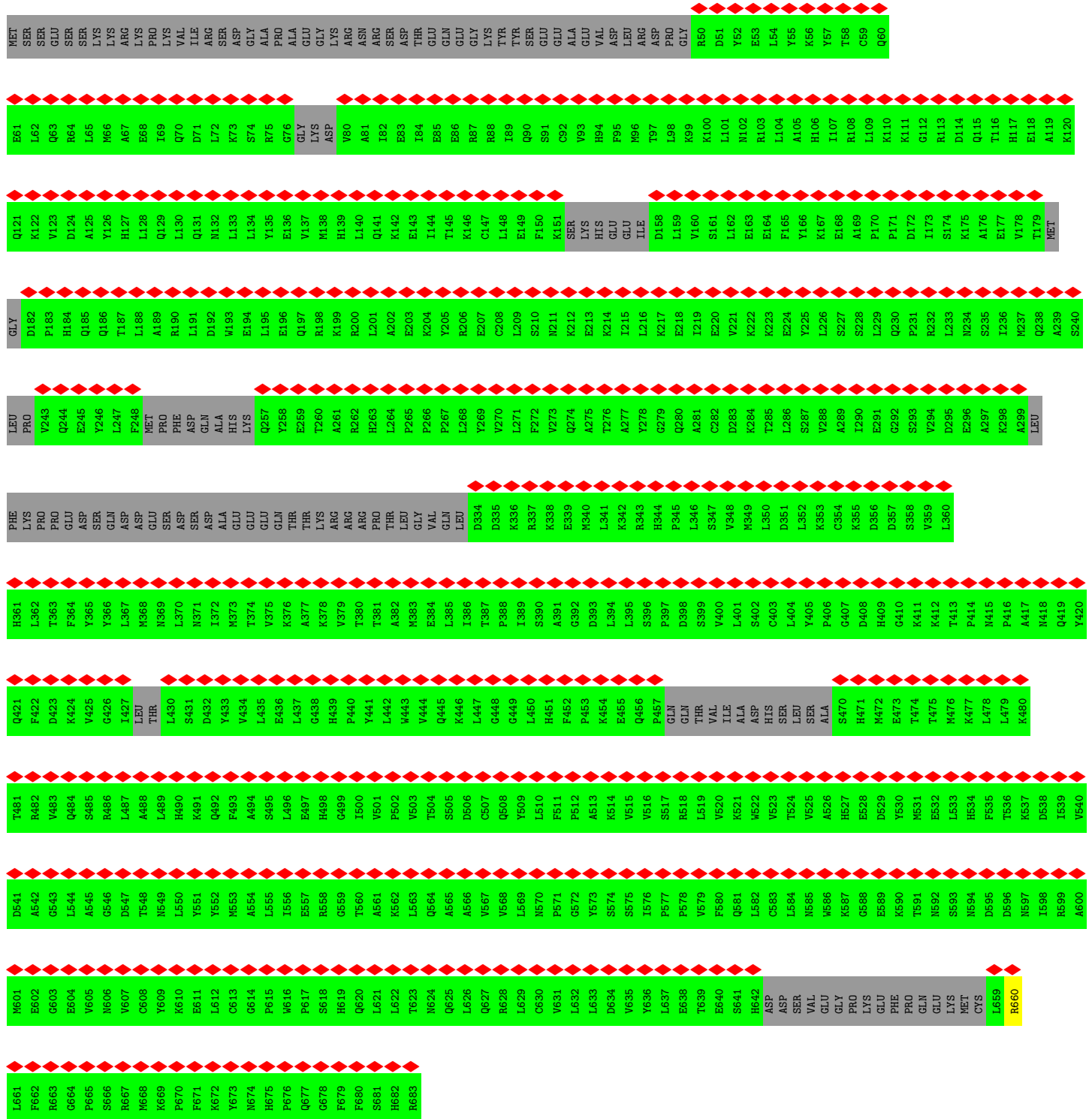
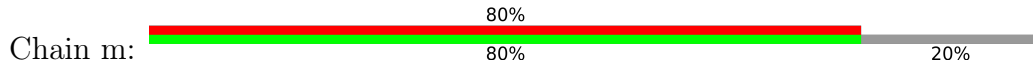
• Molecule 4: THO complex subunit 5 homolog





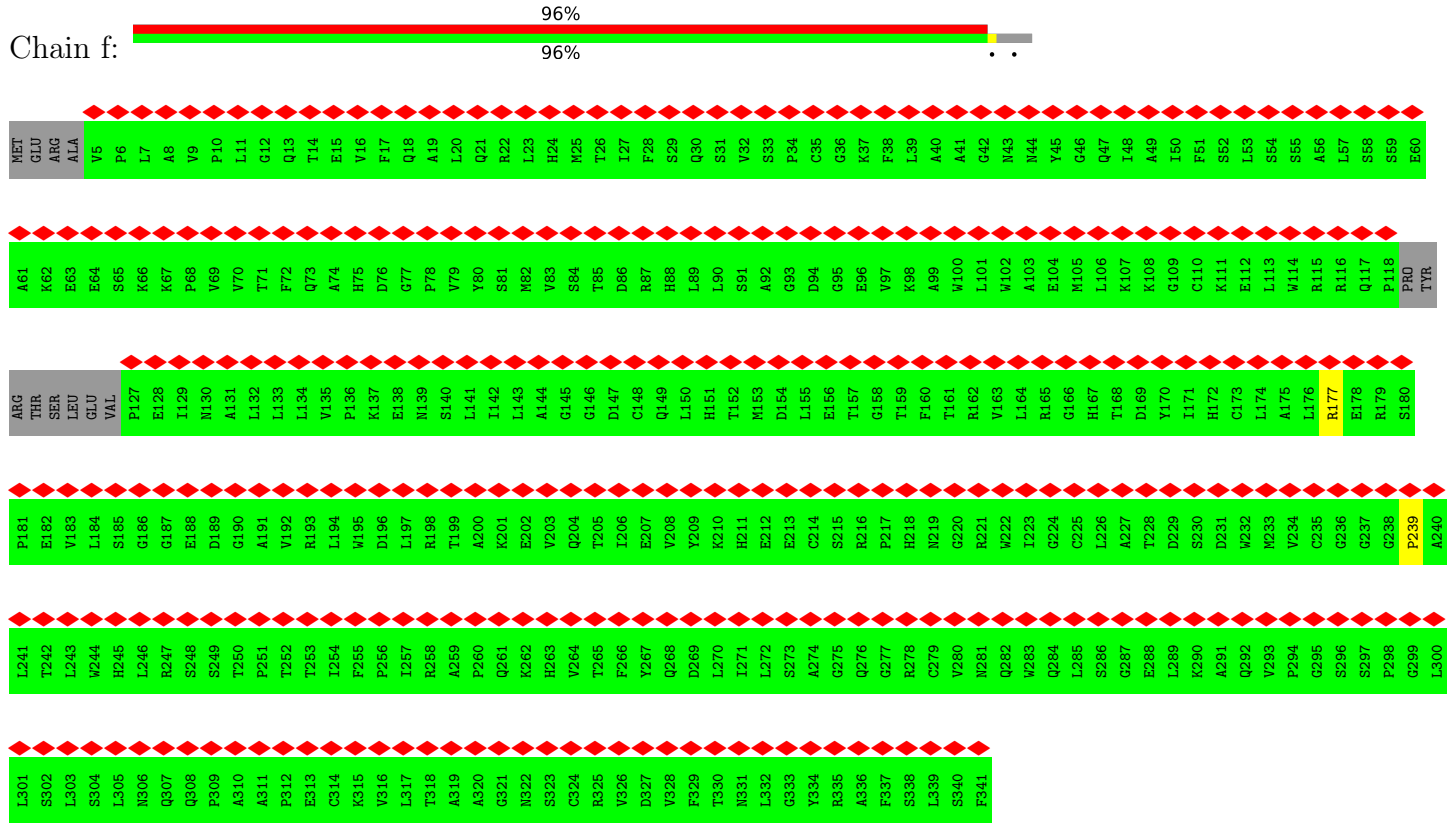


• Molecule 4: THO complex subunit 5 homolog

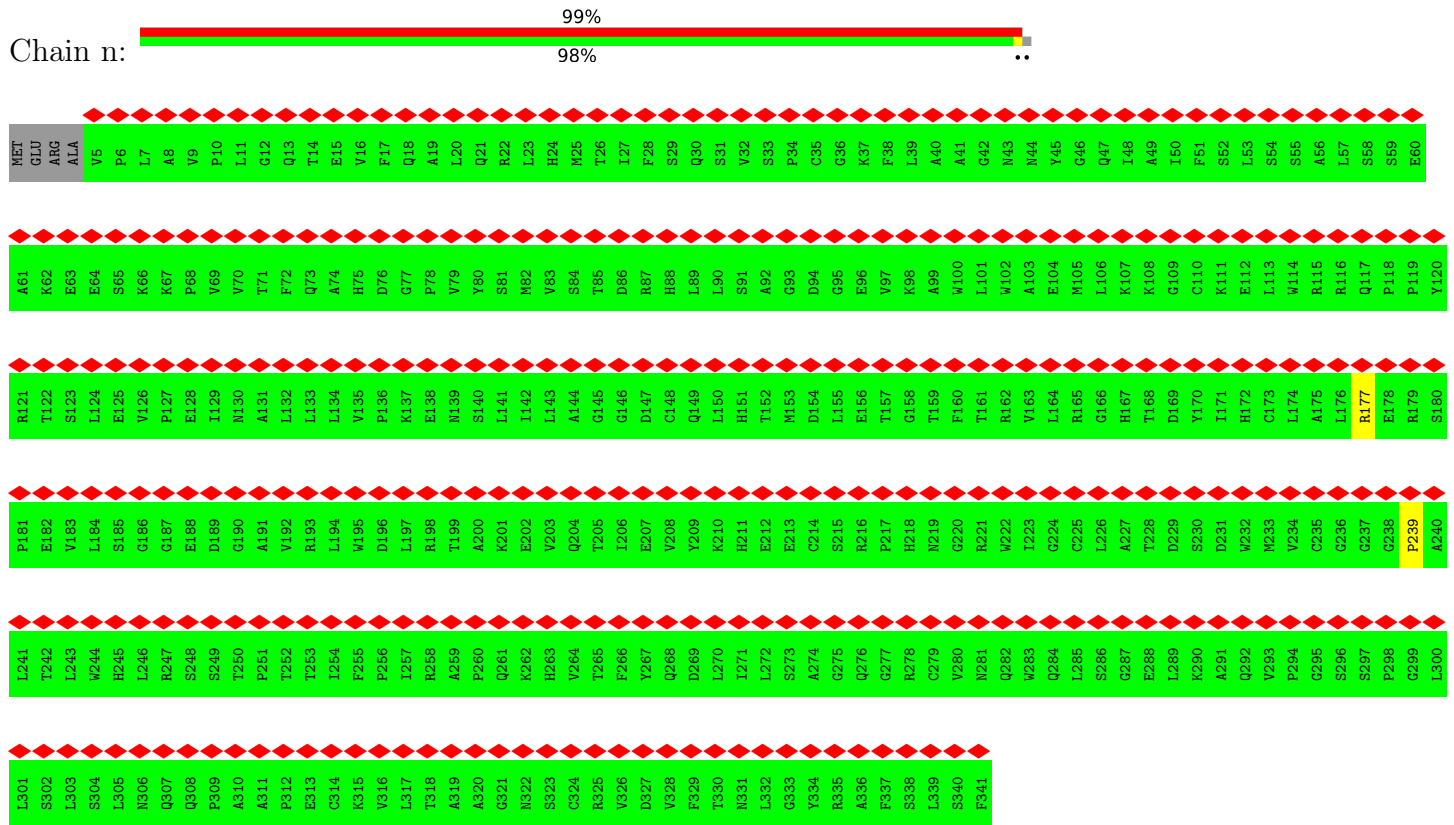




• Molecule 5: THO complex subunit 6 homolog



• Molecule 5: THO complex subunit 6 homolog













## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	246457	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 ( $e^-/\text{\AA}^2$ )	50	Depositor
Minimum defocus (nm)	400	Depositor
Maximum defocus (nm)	3700	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	6.605	Depositor
Minimum map value	-4.523	Depositor
Average map value	0.003	Depositor
Map value standard deviation	0.048	Depositor
Recommended contour level	0.9	Depositor
Map size ( $\text{\AA}$ )	589.60004, 589.60004, 589.60004	wwPDB
Map dimensions	440, 440, 440	wwPDB
Map angles ( $^\circ$ )	90.0, 90.0, 90.0	wwPDB
Pixel spacing ( $\text{\AA}$ )	1.34, 1.34, 1.34	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	0.26	0/2942	0.38	0/3969
1	I	0.28	0/2989	0.46	0/4034
1	a	0.26	0/2942	0.38	0/3969
1	i	0.28	0/2990	0.45	0/4035
2	B	0.28	0/7129	0.43	1/9633 (0.0%)
2	J	0.28	1/7071 (0.0%)	0.43	1/9556 (0.0%)
2	b	0.28	0/7129	0.43	1/9633 (0.0%)
2	j	0.28	1/7071 (0.0%)	0.43	1/9556 (0.0%)
3	C	0.32	0/2494	0.49	0/3384
3	K	0.32	0/2494	0.49	0/3384
3	c	0.32	0/2494	0.49	0/3384
3	k	0.31	0/2494	0.49	0/3384
4	E	0.34	1/3830 (0.0%)	0.49	0/5225
4	M	0.29	0/4215	0.49	0/5717
4	e	0.34	1/3737 (0.0%)	0.49	0/5098
4	m	0.29	0/4215	0.49	0/5717
5	F	0.32	0/2666	0.57	0/3623
5	N	0.32	0/2666	0.56	0/3623
5	f	0.33	0/2596	0.57	0/3524
5	n	0.32	0/2666	0.57	0/3623
6	G	0.24	0/796	0.30	0/1105
6	O	0.27	0/1138	0.39	0/1536
6	g	0.24	0/796	0.30	0/1105
6	o	0.27	0/1138	0.39	0/1536
7	H	0.24	0/1421	0.39	0/1915
7	P	0.24	0/1421	0.39	0/1915
7	h	0.24	0/1421	0.39	0/1915
7	p	0.24	0/1421	0.39	0/1915
All	All	0.29	4/86382 (0.0%)	0.46	4/117013 (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
2	B	0	5
2	J	0	4
2	b	0	5
2	j	0	4
3	C	0	1
3	K	0	1
3	c	0	1
3	k	0	1
4	M	0	1
4	m	0	1
All	All	0	24

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	e	86	GLU	C-N	-10.02	1.11	1.34
4	E	86	GLU	C-N	-10.00	1.11	1.34
2	j	234	SER	C-N	-5.83	1.20	1.34
2	J	234	SER	C-N	-5.79	1.20	1.34

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	b	593	LEU	CA-CB-CG	6.33	129.86	115.30
2	J	593	LEU	CA-CB-CG	6.31	129.81	115.30
2	j	593	LEU	CA-CB-CG	6.31	129.80	115.30
2	B	593	LEU	CA-CB-CG	6.30	129.79	115.30

There are no chirality outliers.

All (24) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	B	1116	GLU	Peptide
2	B	163	ASN	Peptide
2	B	557	THR	Peptide
2	B	562	LYS	Peptide
2	B	788	LEU	Peptide
3	C	287	ASP	Peptide
2	J	1116	GLU	Peptide
2	J	557	THR	Peptide
2	J	562	LYS	Peptide
2	J	788	LEU	Peptide

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Mol	Chain	Res	Type	Group
3	K	287	ASP	Peptide
4	M	660	ARG	Peptide
2	b	1116	GLU	Peptide
2	b	163	ASN	Peptide
2	b	557	THR	Peptide
2	b	562	LYS	Peptide
2	b	788	LEU	Peptide
3	c	287	ASP	Peptide
2	j	1116	GLU	Peptide
2	j	557	THR	Peptide
2	j	562	LYS	Peptide
2	j	788	LEU	Peptide
3	k	287	ASP	Peptide
4	m	660	ARG	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	A	330/657 (50%)	309 (94%)	19 (6%)	2 (1%)	25	62
1	I	335/657 (51%)	309 (92%)	23 (7%)	3 (1%)	17	54
1	a	330/657 (50%)	309 (94%)	19 (6%)	2 (1%)	25	62
1	i	335/657 (51%)	309 (92%)	23 (7%)	3 (1%)	17	54
2	B	871/1593 (55%)	805 (92%)	62 (7%)	4 (0%)	29	66
2	J	864/1593 (54%)	802 (93%)	59 (7%)	3 (0%)	41	75
2	b	871/1593 (55%)	805 (92%)	62 (7%)	4 (0%)	29	66
2	j	864/1593 (54%)	802 (93%)	59 (7%)	3 (0%)	41	75

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
3	C	305/351 (87%)	267 (88%)	37 (12%)	1 (0%)	41	75
3	K	305/351 (87%)	268 (88%)	36 (12%)	1 (0%)	41	75
3	c	305/351 (87%)	267 (88%)	37 (12%)	1 (0%)	41	75
3	k	305/351 (87%)	267 (88%)	37 (12%)	1 (0%)	41	75
4	E	520/683 (76%)	494 (95%)	25 (5%)	1 (0%)	47	80
4	M	529/683 (78%)	504 (95%)	25 (5%)	0	100	100
4	e	507/683 (74%)	485 (96%)	22 (4%)	0	100	100
4	m	529/683 (78%)	503 (95%)	26 (5%)	0	100	100
5	F	335/341 (98%)	305 (91%)	29 (9%)	1 (0%)	41	75
5	N	335/341 (98%)	306 (91%)	28 (8%)	1 (0%)	41	75
5	f	325/341 (95%)	298 (92%)	26 (8%)	1 (0%)	41	75
5	n	335/341 (98%)	305 (91%)	29 (9%)	1 (0%)	41	75
6	G	153/204 (75%)	153 (100%)	0	0	100	100
6	O	158/204 (78%)	158 (100%)	0	0	100	100
6	g	153/204 (75%)	153 (100%)	0	0	100	100
6	o	158/204 (78%)	158 (100%)	0	0	100	100
7	H	168/428 (39%)	162 (96%)	6 (4%)	0	100	100
7	P	168/428 (39%)	162 (96%)	6 (4%)	0	100	100
7	h	168/428 (39%)	162 (96%)	6 (4%)	0	100	100
7	p	168/428 (39%)	162 (96%)	6 (4%)	0	100	100
All	All	10729/17028 (63%)	9989 (93%)	707 (7%)	33 (0%)	44	75

All (33) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	789	SER
2	J	789	SER
2	b	789	SER
2	j	789	SER
2	B	557	THR
2	B	1116	GLU
1	I	308	MET
2	J	557	THR
2	J	1116	GLU
2	b	557	THR

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Mol	Chain	Res	Type
2	b	1116	GLU
1	i	308	MET
2	j	557	THR
2	j	1116	GLU
2	B	164	LEU
1	I	105	PRO
2	b	164	LEU
1	i	105	PRO
3	C	31	PRO
3	K	31	PRO
3	c	31	PRO
3	k	31	PRO
4	E	409	HIS
5	F	239	PRO
5	N	239	PRO
5	f	239	PRO
5	n	239	PRO
1	A	105	PRO
1	A	434	GLY
1	I	434	GLY
1	a	105	PRO
1	a	434	GLY
1	i	434	GLY

### 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	310/601 (52%)	287 (93%)	23 (7%)	13 43
1	I	312/601 (52%)	307 (98%)	5 (2%)	62 83
1	a	310/601 (52%)	287 (93%)	23 (7%)	13 43
1	i	313/601 (52%)	308 (98%)	5 (2%)	62 83
2	B	704/1442 (49%)	632 (90%)	72 (10%)	7 30
2	J	697/1442 (48%)	632 (91%)	65 (9%)	9 34

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	b	704/1442 (49%)	633 (90%)	71 (10%)	7	30
2	j	697/1442 (48%)	632 (91%)	65 (9%)	9	34
3	C	268/300 (89%)	233 (87%)	35 (13%)	4	20
3	K	268/300 (89%)	233 (87%)	35 (13%)	4	20
3	c	268/300 (89%)	233 (87%)	35 (13%)	4	20
3	k	268/300 (89%)	233 (87%)	35 (13%)	4	20
4	E	322/615 (52%)	321 (100%)	1 (0%)	92	98
4	M	404/615 (66%)	404 (100%)	0	100	100
4	e	312/615 (51%)	312 (100%)	0	100	100
4	m	404/615 (66%)	404 (100%)	0	100	100
5	F	284/287 (99%)	283 (100%)	1 (0%)	91	97
5	N	284/287 (99%)	283 (100%)	1 (0%)	91	97
5	f	276/287 (96%)	275 (100%)	1 (0%)	91	97
5	n	284/287 (99%)	283 (100%)	1 (0%)	91	97
6	O	85/184 (46%)	85 (100%)	0	100	100
6	o	85/184 (46%)	85 (100%)	0	100	100
7	H	153/381 (40%)	153 (100%)	0	100	100
7	P	153/381 (40%)	153 (100%)	0	100	100
7	h	153/381 (40%)	153 (100%)	0	100	100
7	p	153/381 (40%)	153 (100%)	0	100	100
All	All	8471/14872 (57%)	7997 (94%)	474 (6%)	25	53

All (474) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	51	LEU
1	A	73	LEU
1	A	92	THR
1	A	142	ASP
1	A	152	ASN
1	A	234	LEU
1	A	251	CYS
1	A	271	PHE
1	A	301	PHE
1	A	323	LEU

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	325	TYR
1	A	348	GLU
1	A	376	LYS
1	A	379	GLU
1	A	380	HIS
1	A	386	GLU
1	A	389	ASN
1	A	392	LYS
1	A	432	LEU
1	A	436	GLU
1	A	503	ARG
1	A	520	GLU
1	A	522	LEU
2	B	145	ASN
2	B	160	GLN
2	B	161	LYS
2	B	164	LEU
2	B	165	LEU
2	B	166	ARG
2	B	190	ASP
2	B	223	GLU
2	B	248	LEU
2	B	268	ARG
2	B	274	LEU
2	B	281	LEU
2	B	284	LEU
2	B	289	LEU
2	B	292	ASP
2	B	343	ASN
2	B	348	LEU
2	B	349	LEU
2	B	388	HIS
2	B	400	VAL
2	B	409	VAL
2	B	412	LEU
2	B	425	GLU
2	B	426	ASP
2	B	427	LEU
2	B	435	PHE
2	B	448	LEU
2	B	461	LYS
2	B	473	LYS

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
2	B	501	ASN
2	B	509	TRP
2	B	518	GLN
2	B	527	TRP
2	B	555	ARG
2	B	556	LEU
2	B	557	THR
2	B	591	ASP
2	B	593	LEU
2	B	594	ILE
2	B	631	ASP
2	B	633	THR
2	B	634	THR
2	B	642	LEU
2	B	657	LEU
2	B	660	LEU
2	B	678	ILE
2	B	701	GLU
2	B	729	LEU
2	B	749	GLN
2	B	766	VAL
2	B	800	ILE
2	B	801	ASP
2	B	812	ASP
2	B	879	GLN
2	B	880	PHE
2	B	892	LEU
2	B	938	LEU
2	B	939	LEU
2	B	953	LEU
2	B	956	LEU
2	B	978	LEU
2	B	987	ILE
2	B	996	CYS
2	B	1005	GLN
2	B	1034	ASN
2	B	1042	PHE
2	B	1044	CYS
2	B	1047	LEU
2	B	1101	HIS
2	B	1104	LEU
2	B	1116	GLU

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
2	B	1129	LYS
3	C	48	THR
3	C	52	LEU
3	C	61	VAL
3	C	63	TRP
3	C	66	ASP
3	C	68	ARG
3	C	69	ARG
3	C	70	LEU
3	C	83	LEU
3	C	89	LEU
3	C	104	GLN
3	C	113	ASP
3	C	114	LEU
3	C	121	ASP
3	C	124	ILE
3	C	134	CYS
3	C	135	ILE
3	C	152	ASP
3	C	158	VAL
3	C	163	ASP
3	C	172	THR
3	C	185	VAL
3	C	192	ASN
3	C	199	LEU
3	C	206	ILE
3	C	213	GLU
3	C	226	ASN
3	C	260	ARG
3	C	281	LEU
3	C	301	LEU
3	C	303	GLU
3	C	304	VAL
3	C	312	THR
3	C	322	LEU
3	C	347	LEU
4	E	524	THR
5	F	177	ARG
1	I	432	LEU
1	I	436	GLU
1	I	503	ARG
1	I	520	GLU

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	I	522	LEU
2	J	145	ASN
2	J	204	ASN
2	J	248	LEU
2	J	268	ARG
2	J	274	LEU
2	J	281	LEU
2	J	284	LEU
2	J	289	LEU
2	J	292	ASP
2	J	343	ASN
2	J	348	LEU
2	J	349	LEU
2	J	388	HIS
2	J	400	VAL
2	J	409	VAL
2	J	412	LEU
2	J	425	GLU
2	J	426	ASP
2	J	427	LEU
2	J	435	PHE
2	J	448	LEU
2	J	461	LYS
2	J	473	LYS
2	J	501	ASN
2	J	509	TRP
2	J	518	GLN
2	J	527	TRP
2	J	555	ARG
2	J	556	LEU
2	J	557	THR
2	J	591	ASP
2	J	593	LEU
2	J	594	ILE
2	J	631	ASP
2	J	633	THR
2	J	634	THR
2	J	642	LEU
2	J	657	LEU
2	J	660	LEU
2	J	678	ILE
2	J	729	LEU

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
2	J	749	GLN
2	J	766	VAL
2	J	800	ILE
2	J	801	ASP
2	J	812	ASP
2	J	879	GLN
2	J	880	PHE
2	J	892	LEU
2	J	938	LEU
2	J	939	LEU
2	J	953	LEU
2	J	956	LEU
2	J	978	LEU
2	J	987	ILE
2	J	996	CYS
2	J	1005	GLN
2	J	1034	ASN
2	J	1042	PHE
2	J	1044	CYS
2	J	1047	LEU
2	J	1101	HIS
2	J	1104	LEU
2	J	1116	GLU
2	J	1129	LYS
3	K	48	THR
3	K	52	LEU
3	K	61	VAL
3	K	63	TRP
3	K	66	ASP
3	K	68	ARG
3	K	69	ARG
3	K	70	LEU
3	K	83	LEU
3	K	89	LEU
3	K	104	GLN
3	K	113	ASP
3	K	114	LEU
3	K	121	ASP
3	K	124	ILE
3	K	134	CYS
3	K	135	ILE
3	K	152	ASP

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
3	K	158	VAL
3	K	163	ASP
3	K	172	THR
3	K	185	VAL
3	K	192	ASN
3	K	199	LEU
3	K	206	ILE
3	K	213	GLU
3	K	226	ASN
3	K	260	ARG
3	K	281	LEU
3	K	301	LEU
3	K	303	GLU
3	K	304	VAL
3	K	312	THR
3	K	322	LEU
3	K	347	LEU
5	N	177	ARG
1	a	51	LEU
1	a	73	LEU
1	a	92	THR
1	a	142	ASP
1	a	152	ASN
1	a	234	LEU
1	a	251	CYS
1	a	271	PHE
1	a	301	PHE
1	a	323	LEU
1	a	325	TYR
1	a	348	GLU
1	a	376	LYS
1	a	379	GLU
1	a	380	HIS
1	a	386	GLU
1	a	389	ASN
1	a	392	LYS
1	a	432	LEU
1	a	436	GLU
1	a	503	ARG
1	a	520	GLU
1	a	522	LEU
2	b	145	ASN

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
2	b	160	GLN
2	b	161	LYS
2	b	164	LEU
2	b	165	LEU
2	b	166	ARG
2	b	190	ASP
2	b	223	GLU
2	b	248	LEU
2	b	268	ARG
2	b	274	LEU
2	b	281	LEU
2	b	284	LEU
2	b	289	LEU
2	b	292	ASP
2	b	343	ASN
2	b	348	LEU
2	b	349	LEU
2	b	388	HIS
2	b	400	VAL
2	b	409	VAL
2	b	412	LEU
2	b	425	GLU
2	b	426	ASP
2	b	427	LEU
2	b	435	PHE
2	b	448	LEU
2	b	461	LYS
2	b	473	LYS
2	b	501	ASN
2	b	509	TRP
2	b	518	GLN
2	b	527	TRP
2	b	555	ARG
2	b	556	LEU
2	b	557	THR
2	b	591	ASP
2	b	593	LEU
2	b	594	ILE
2	b	631	ASP
2	b	633	THR
2	b	634	THR
2	b	642	LEU

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
2	b	657	LEU
2	b	660	LEU
2	b	678	ILE
2	b	729	LEU
2	b	749	GLN
2	b	766	VAL
2	b	800	ILE
2	b	801	ASP
2	b	812	ASP
2	b	879	GLN
2	b	880	PHE
2	b	892	LEU
2	b	938	LEU
2	b	939	LEU
2	b	953	LEU
2	b	956	LEU
2	b	978	LEU
2	b	987	ILE
2	b	996	CYS
2	b	1005	GLN
2	b	1034	ASN
2	b	1042	PHE
2	b	1044	CYS
2	b	1047	LEU
2	b	1101	HIS
2	b	1104	LEU
2	b	1116	GLU
2	b	1129	LYS
3	c	48	THR
3	c	52	LEU
3	c	61	VAL
3	c	63	TRP
3	c	66	ASP
3	c	68	ARG
3	c	69	ARG
3	c	70	LEU
3	c	83	LEU
3	c	89	LEU
3	c	104	GLN
3	c	113	ASP
3	c	114	LEU
3	c	121	ASP

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
3	c	124	ILE
3	c	134	CYS
3	c	135	ILE
3	c	152	ASP
3	c	158	VAL
3	c	163	ASP
3	c	172	THR
3	c	185	VAL
3	c	192	ASN
3	c	199	LEU
3	c	206	ILE
3	c	213	GLU
3	c	226	ASN
3	c	260	ARG
3	c	281	LEU
3	c	301	LEU
3	c	303	GLU
3	c	304	VAL
3	c	312	THR
3	c	322	LEU
3	c	347	LEU
5	f	177	ARG
1	i	432	LEU
1	i	436	GLU
1	i	503	ARG
1	i	520	GLU
1	i	522	LEU
2	j	145	ASN
2	j	204	ASN
2	j	248	LEU
2	j	268	ARG
2	j	274	LEU
2	j	281	LEU
2	j	284	LEU
2	j	289	LEU
2	j	292	ASP
2	j	343	ASN
2	j	348	LEU
2	j	349	LEU
2	j	388	HIS
2	j	400	VAL
2	j	409	VAL

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
2	j	412	LEU
2	j	425	GLU
2	j	426	ASP
2	j	427	LEU
2	j	435	PHE
2	j	448	LEU
2	j	461	LYS
2	j	473	LYS
2	j	501	ASN
2	j	509	TRP
2	j	518	GLN
2	j	527	TRP
2	j	555	ARG
2	j	556	LEU
2	j	557	THR
2	j	591	ASP
2	j	593	LEU
2	j	594	ILE
2	j	631	ASP
2	j	633	THR
2	j	634	THR
2	j	642	LEU
2	j	657	LEU
2	j	660	LEU
2	j	678	ILE
2	j	729	LEU
2	j	749	GLN
2	j	766	VAL
2	j	800	ILE
2	j	801	ASP
2	j	812	ASP
2	j	879	GLN
2	j	880	PHE
2	j	892	LEU
2	j	938	LEU
2	j	939	LEU
2	j	953	LEU
2	j	956	LEU
2	j	978	LEU
2	j	987	ILE
2	j	996	CYS
2	j	1005	GLN

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
2	j	1034	ASN
2	j	1042	PHE
2	j	1044	CYS
2	j	1047	LEU
2	j	1101	HIS
2	j	1104	LEU
2	j	1116	GLU
2	j	1129	LYS
3	k	48	THR
3	k	52	LEU
3	k	61	VAL
3	k	63	TRP
3	k	66	ASP
3	k	68	ARG
3	k	69	ARG
3	k	70	LEU
3	k	83	LEU
3	k	89	LEU
3	k	104	GLN
3	k	113	ASP
3	k	114	LEU
3	k	121	ASP
3	k	124	ILE
3	k	134	CYS
3	k	135	ILE
3	k	152	ASP
3	k	158	VAL
3	k	163	ASP
3	k	172	THR
3	k	185	VAL
3	k	192	ASN
3	k	199	LEU
3	k	206	ILE
3	k	213	GLU
3	k	226	ASN
3	k	260	ARG
3	k	281	LEU
3	k	301	LEU
3	k	303	GLU
3	k	304	VAL
3	k	312	THR
3	k	322	LEU

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Mol	Chain	Res	Type
3	k	347	LEU
5	n	177	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (189) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	160	GLN
1	A	242	GLN
1	A	320	HIS
1	A	324	GLN
1	A	512	ASN
1	A	524	ASN
2	B	160	GLN
2	B	204	ASN
2	B	256	GLN
2	B	343	ASN
2	B	360	HIS
2	B	362	GLN
2	B	367	GLN
2	B	388	HIS
2	B	441	HIS
2	B	489	GLN
2	B	526	GLN
2	B	535	HIS
2	B	567	GLN
2	B	573	HIS
2	B	586	GLN
2	B	592	ASN
2	B	608	ASN
2	B	640	GLN
2	B	727	GLN
2	B	749	GLN
2	B	779	GLN
2	B	787	ASN
2	B	805	ASN
2	B	945	GLN
2	B	1005	GLN
3	C	59	HIS
3	C	104	GLN
3	C	146	ASN
3	C	195	ASN
3	C	203	ASN

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
3	C	207	ASN
3	C	305	GLN
3	C	316	HIS
4	E	274	GLN
4	E	369	ASN
4	E	465	HIS
4	E	492	GLN
4	E	675	HIS
5	F	130	ASN
5	F	149	GLN
5	F	172	HIS
5	F	261	GLN
7	H	331	GLN
7	H	404	GLN
1	I	141	ASN
1	I	242	GLN
1	I	512	ASN
1	I	524	ASN
2	J	204	ASN
2	J	224	HIS
2	J	256	GLN
2	J	343	ASN
2	J	360	HIS
2	J	362	GLN
2	J	367	GLN
2	J	388	HIS
2	J	441	HIS
2	J	489	GLN
2	J	526	GLN
2	J	535	HIS
2	J	567	GLN
2	J	573	HIS
2	J	586	GLN
2	J	592	ASN
2	J	608	ASN
2	J	640	GLN
2	J	727	GLN
2	J	749	GLN
2	J	779	GLN
2	J	787	ASN
2	J	805	ASN
2	J	945	GLN

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
2	J	1005	GLN
3	K	59	HIS
3	K	104	GLN
3	K	146	ASN
3	K	195	ASN
3	K	203	ASN
3	K	207	ASN
3	K	305	GLN
3	K	316	HIS
4	M	369	ASN
4	M	492	GLN
4	M	675	HIS
5	N	149	GLN
5	N	172	HIS
5	N	261	GLN
7	P	331	GLN
7	P	404	GLN
1	a	160	GLN
1	a	242	GLN
1	a	320	HIS
1	a	324	GLN
1	a	512	ASN
1	a	524	ASN
2	b	160	GLN
2	b	204	ASN
2	b	256	GLN
2	b	343	ASN
2	b	360	HIS
2	b	362	GLN
2	b	367	GLN
2	b	388	HIS
2	b	441	HIS
2	b	489	GLN
2	b	526	GLN
2	b	535	HIS
2	b	567	GLN
2	b	573	HIS
2	b	586	GLN
2	b	592	ASN
2	b	608	ASN
2	b	640	GLN
2	b	727	GLN

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
2	b	749	GLN
2	b	779	GLN
2	b	787	ASN
2	b	805	ASN
2	b	945	GLN
2	b	1005	GLN
3	c	59	HIS
3	c	104	GLN
3	c	146	ASN
3	c	195	ASN
3	c	203	ASN
3	c	207	ASN
3	c	305	GLN
3	c	316	HIS
4	e	274	GLN
4	e	369	ASN
4	e	465	HIS
4	e	492	GLN
4	e	675	HIS
5	f	130	ASN
5	f	172	HIS
5	f	261	GLN
7	h	331	GLN
7	h	404	GLN
1	i	141	ASN
1	i	242	GLN
1	i	512	ASN
1	i	524	ASN
2	j	204	ASN
2	j	224	HIS
2	j	256	GLN
2	j	343	ASN
2	j	360	HIS
2	j	362	GLN
2	j	367	GLN
2	j	388	HIS
2	j	441	HIS
2	j	489	GLN
2	j	526	GLN
2	j	535	HIS
2	j	567	GLN
2	j	573	HIS

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Mol	Chain	Res	Type
2	j	586	GLN
2	j	592	ASN
2	j	608	ASN
2	j	640	GLN
2	j	727	GLN
2	j	749	GLN
2	j	779	GLN
2	j	787	ASN
2	j	805	ASN
2	j	945	GLN
2	j	1005	GLN
3	k	59	HIS
3	k	104	GLN
3	k	146	ASN
3	k	195	ASN
3	k	203	ASN
3	k	207	ASN
3	k	305	GLN
3	k	316	HIS
4	m	369	ASN
4	m	492	GLN
4	m	675	HIS
5	n	149	GLN
5	n	172	HIS
5	n	261	GLN
7	p	331	GLN
7	p	404	GLN

### 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
4	E	1
4	e	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	E	86:GLU	C	87:ARG	N	1.11
1	e	86:GLU	C	87:ARG	N	1.11

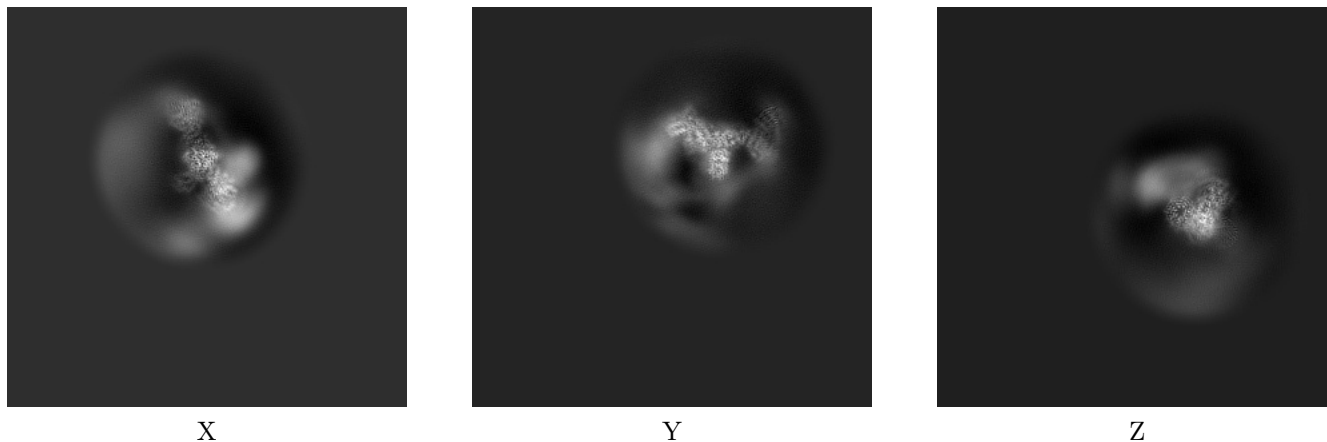
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-14808. These allow visual inspection of the internal detail of the map and identification of artifacts.

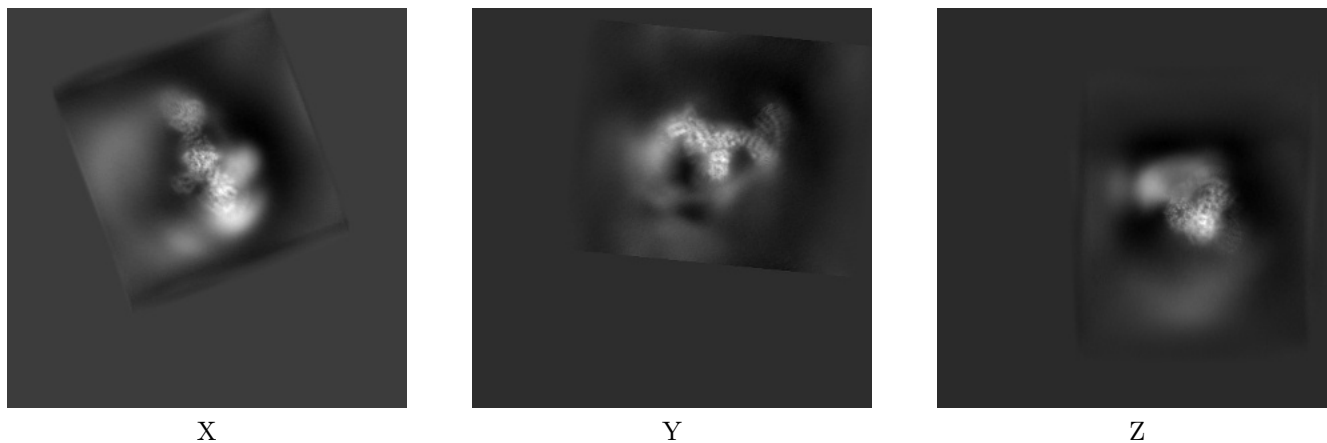
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

### 6.1 Orthogonal projections [i](#)

#### 6.1.1 Primary map



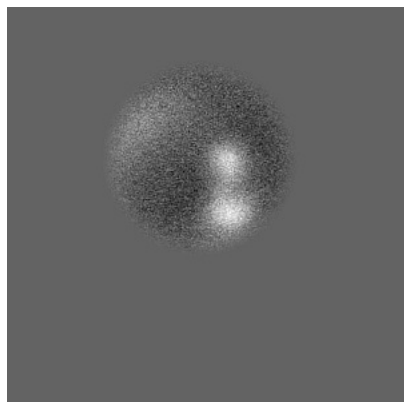
#### 6.1.2 Raw map



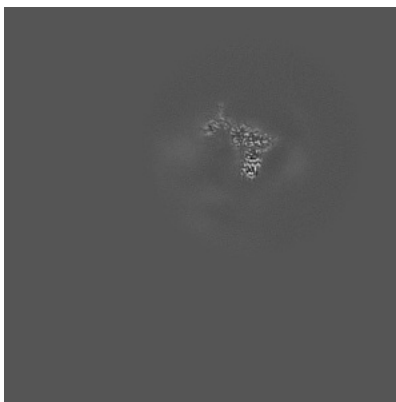
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

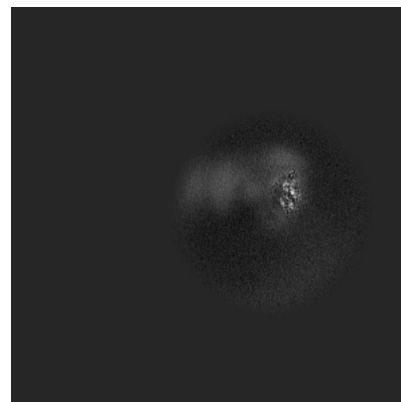
### 6.2.1 Primary map



X Index: 220

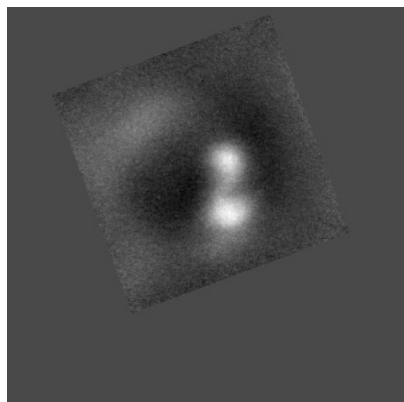


Y Index: 220

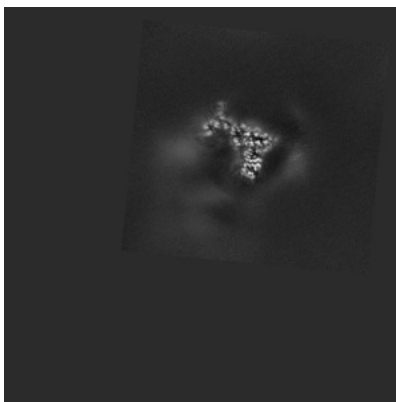


Z Index: 220

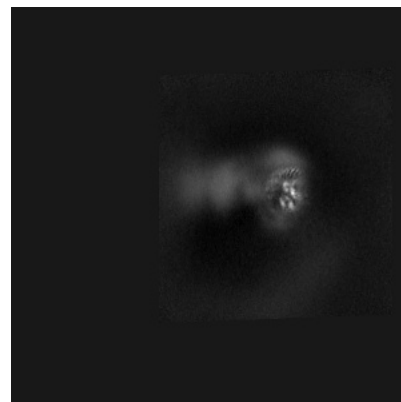
### 6.2.2 Raw map



X Index: 220



Y Index: 220

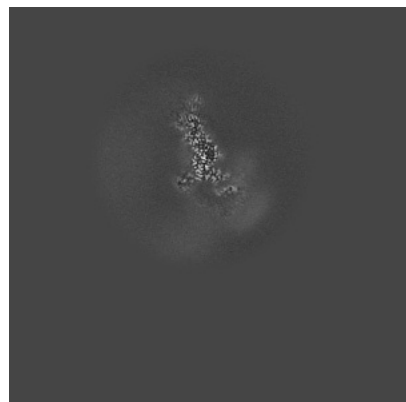


Z Index: 220

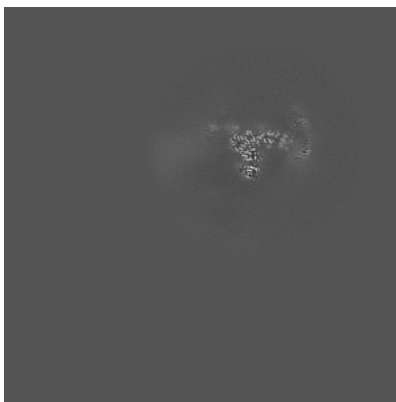
The images above show central slices of the map in three orthogonal directions.

## 6.3 Largest variance slices [i](#)

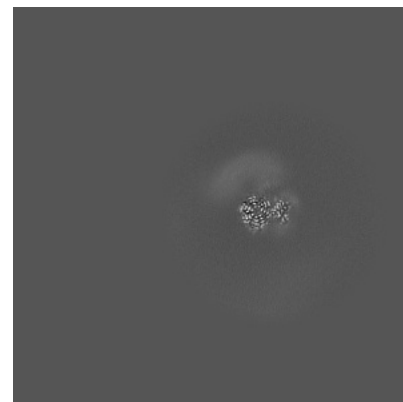
### 6.3.1 Primary map



X Index: 295

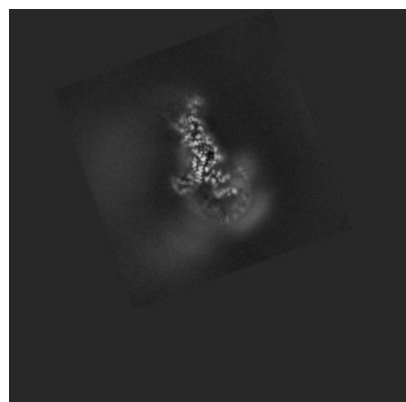


Y Index: 211

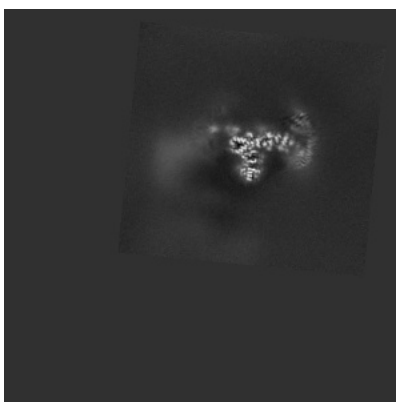


Z Index: 272

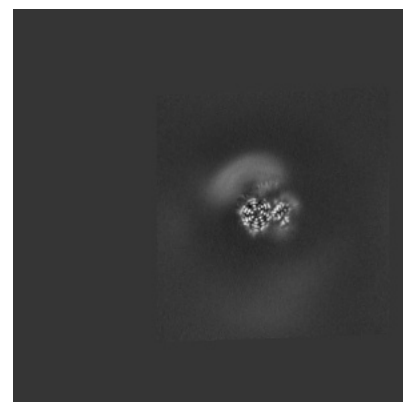
### 6.3.2 Raw map



X Index: 295



Y Index: 210

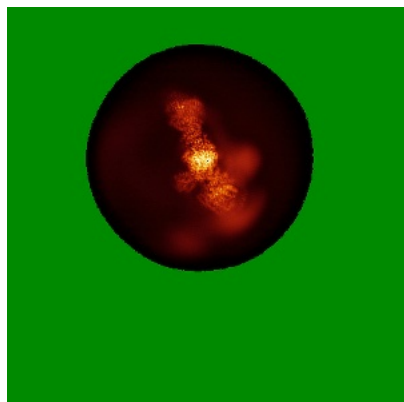


Z Index: 272

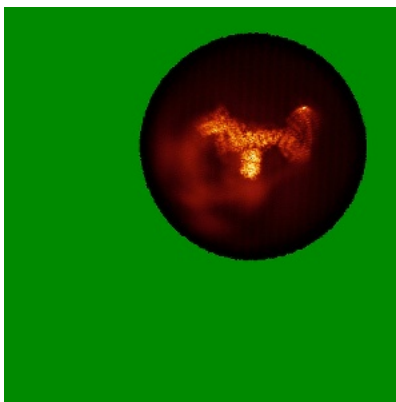
The images above show the largest variance slices of the map in three orthogonal directions.

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

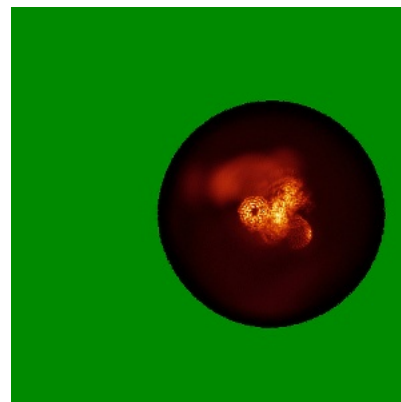
### 6.4.1 Primary map



X

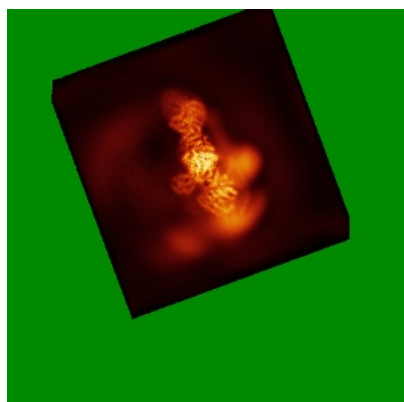


Y

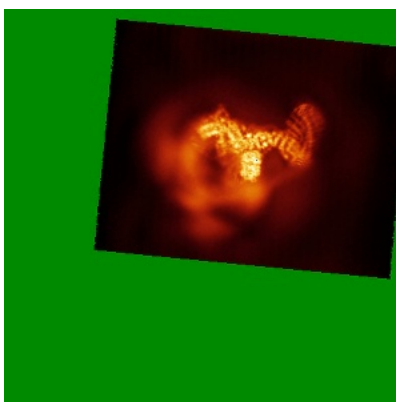


Z

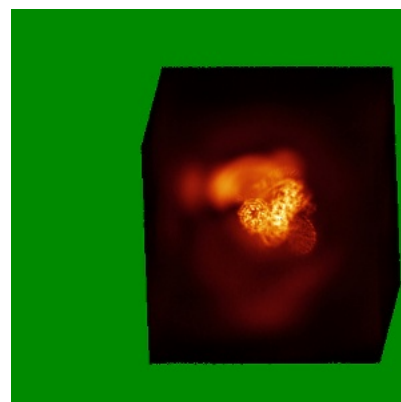
### 6.4.2 Raw map



X



Y



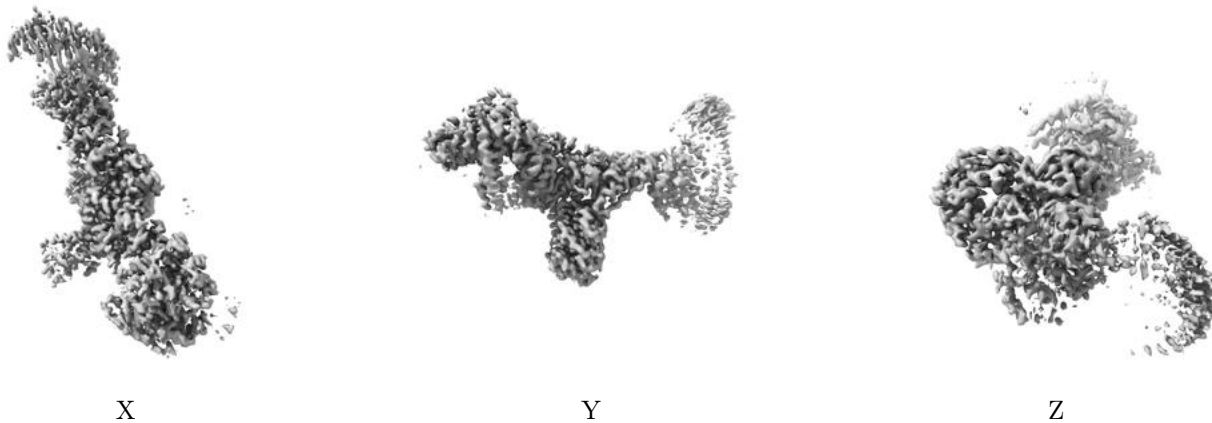
Z

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



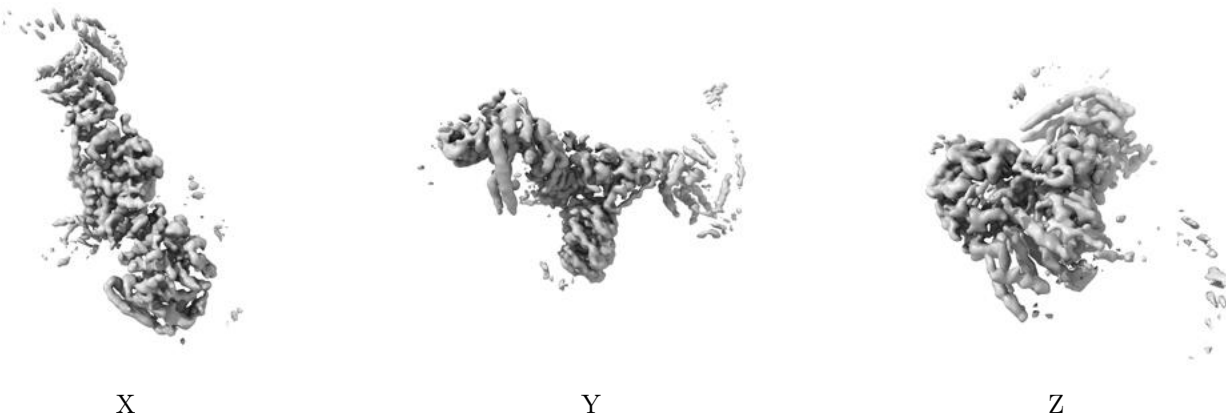
## 6.5 Orthogonal surface views [i](#)

### 6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.9. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

### 6.5.2 Raw map



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

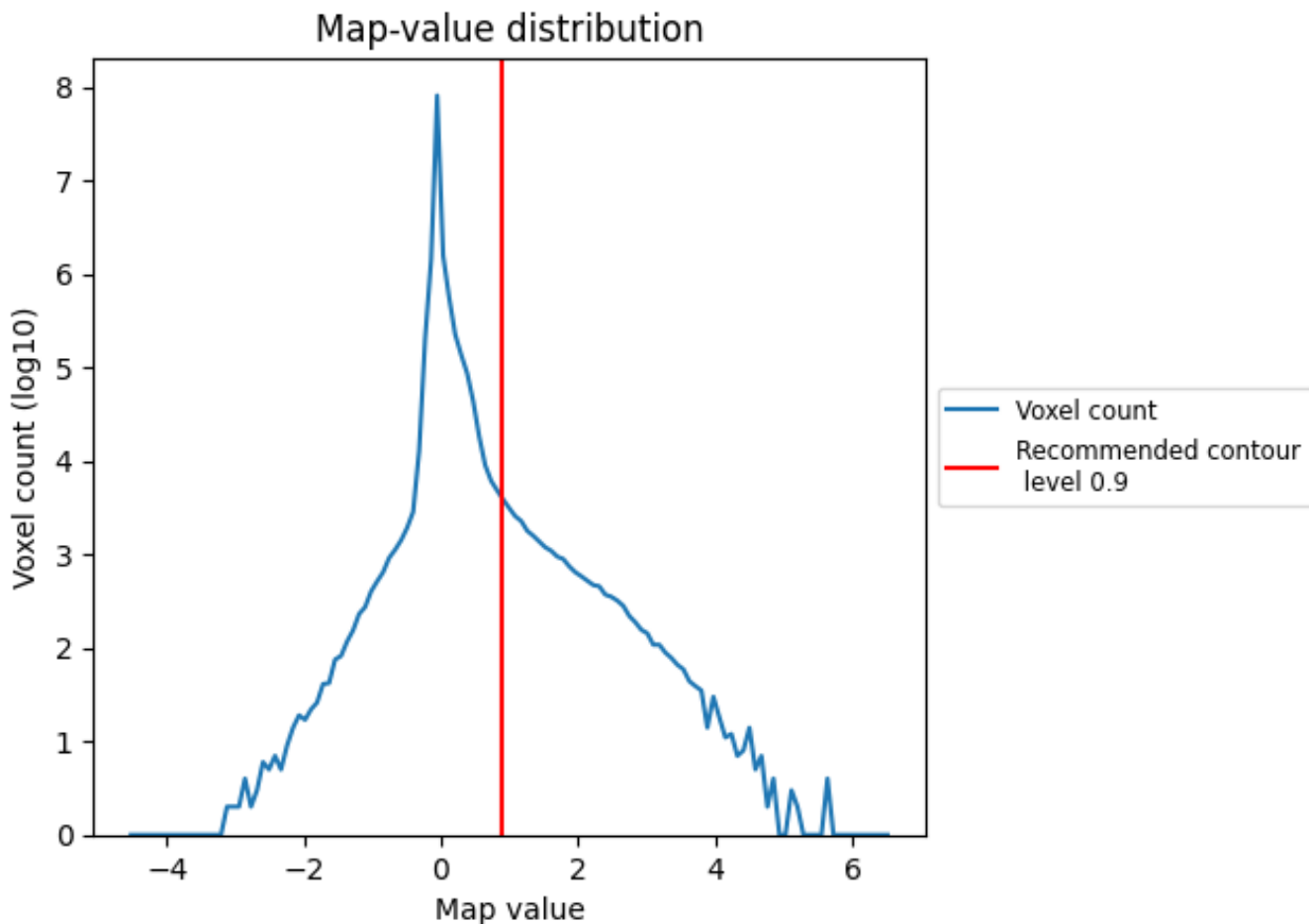
## 6.6 Mask visualisation [i](#)

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

## 7 Map analysis [i](#)

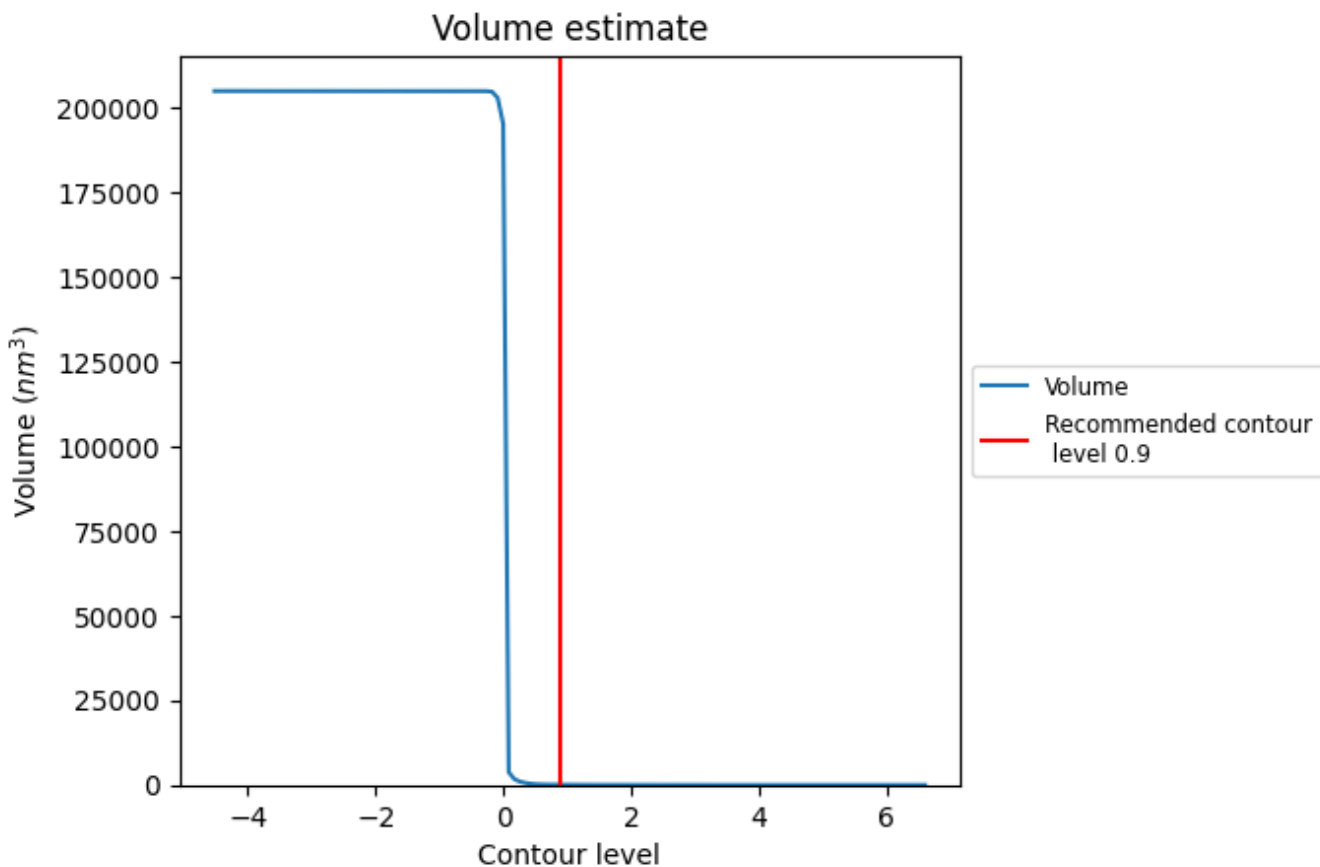
This section contains the results of statistical analysis of the map.

### 7.1 Map-value distribution [i](#)



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

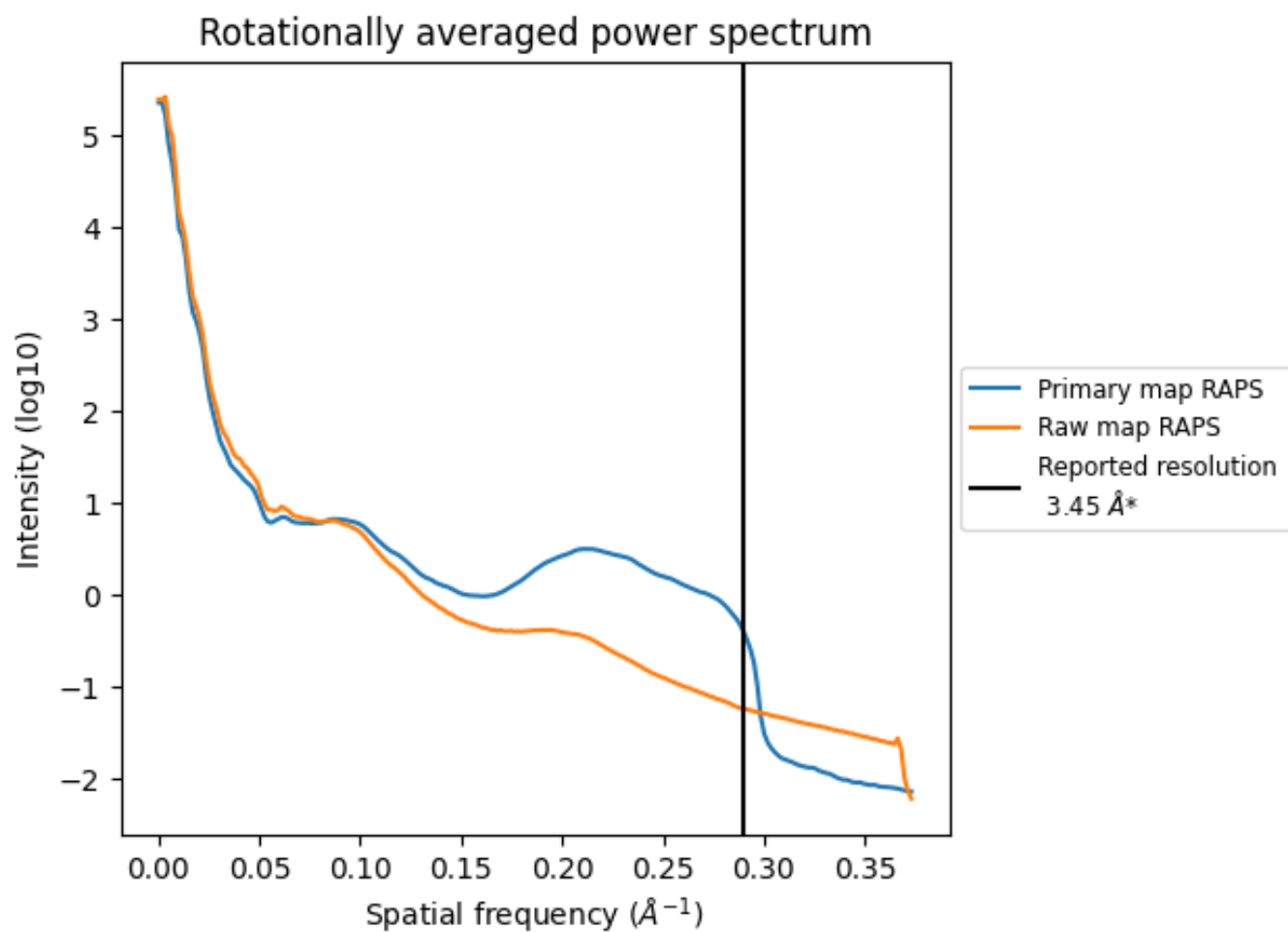
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 66 nm<sup>3</sup>; this corresponds to an approximate mass of 60 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

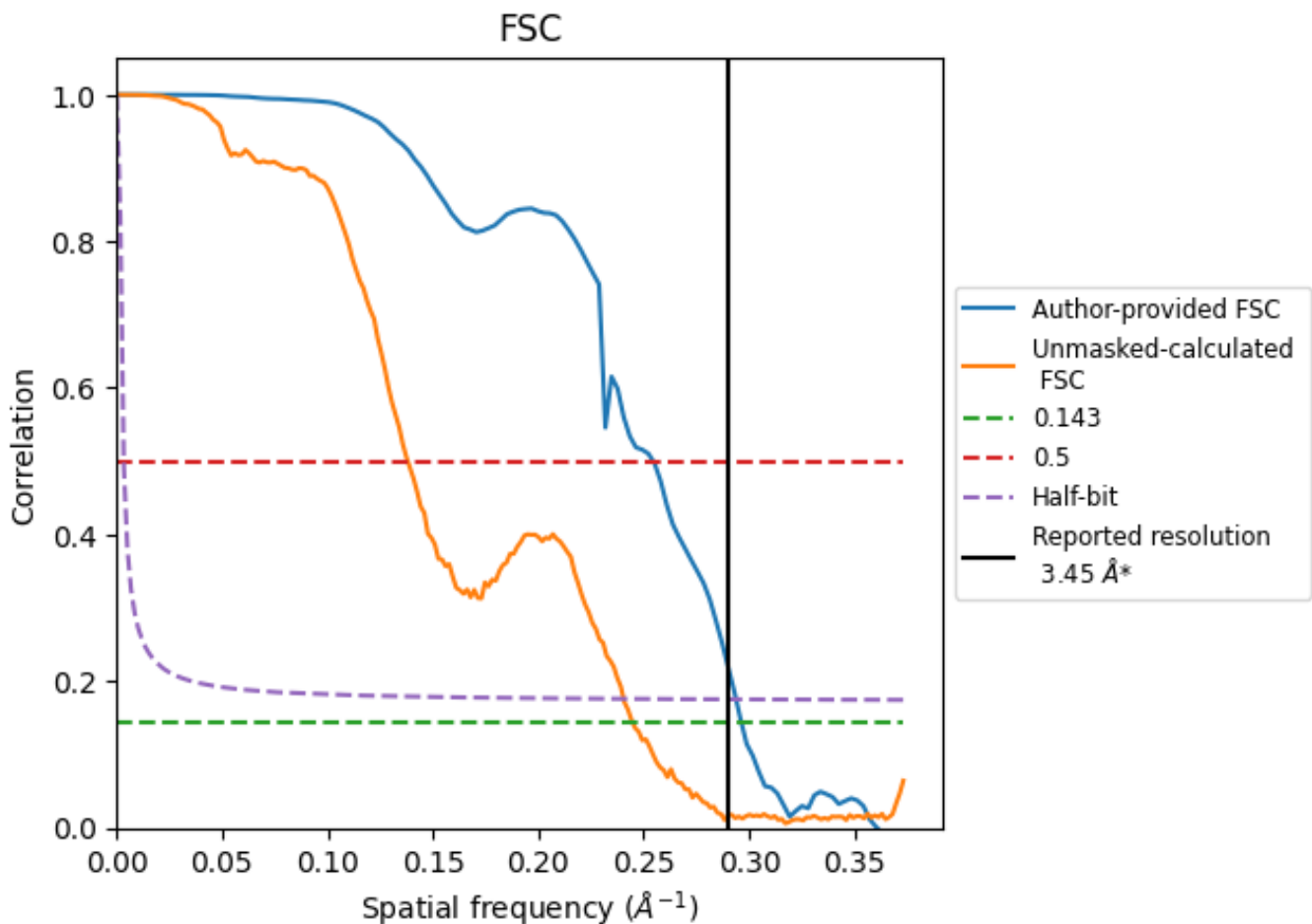


\*Reported resolution corresponds to spatial frequency of 0.290 Å<sup>-1</sup>

## 8 Fourier-Shell correlation [i](#)

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

### 8.1 FSC [i](#)



\*Reported resolution corresponds to spatial frequency of 0.290 Å<sup>-1</sup>

## 8.2 Resolution estimates [i](#)

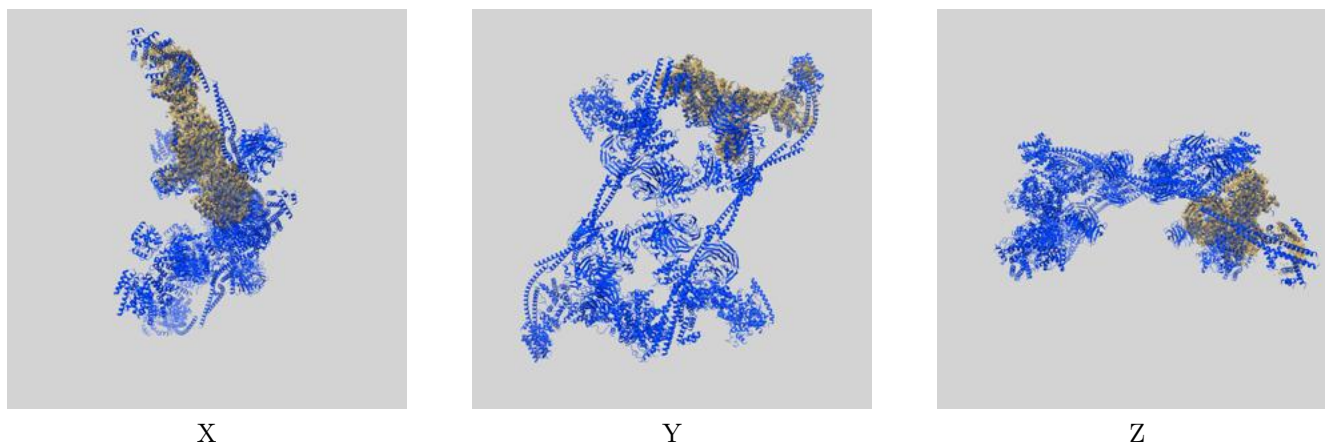
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.45	-	-
Author-provided FSC curve	3.37	3.93	3.41
Unmasked-calculated*	4.08	7.25	4.16

\*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 4.08 differs from the reported value 3.45 by more than 10 %

## 9 Map-model fit [i](#)

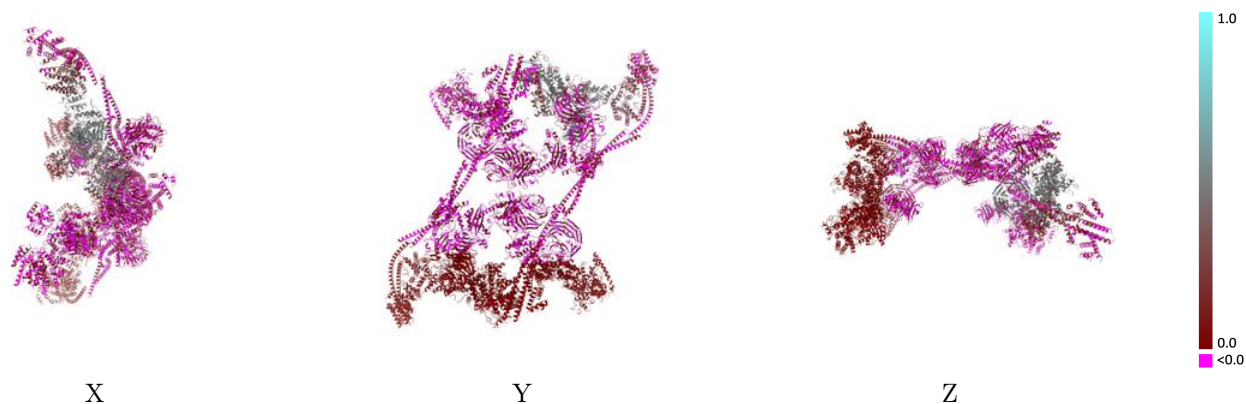
This section contains information regarding the fit between EMDB map EMD-14808 and PDB model 7ZNL. Per-residue inclusion information can be found in section 3 on page 7.

### 9.1 Map-model overlay [i](#)



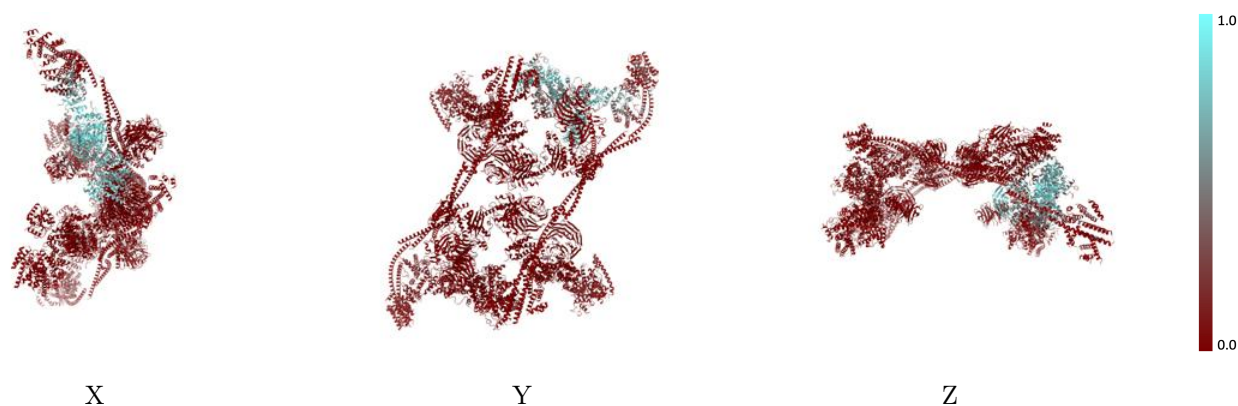
The images above show the 3D surface view of the map at the recommended contour level 0.9 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



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

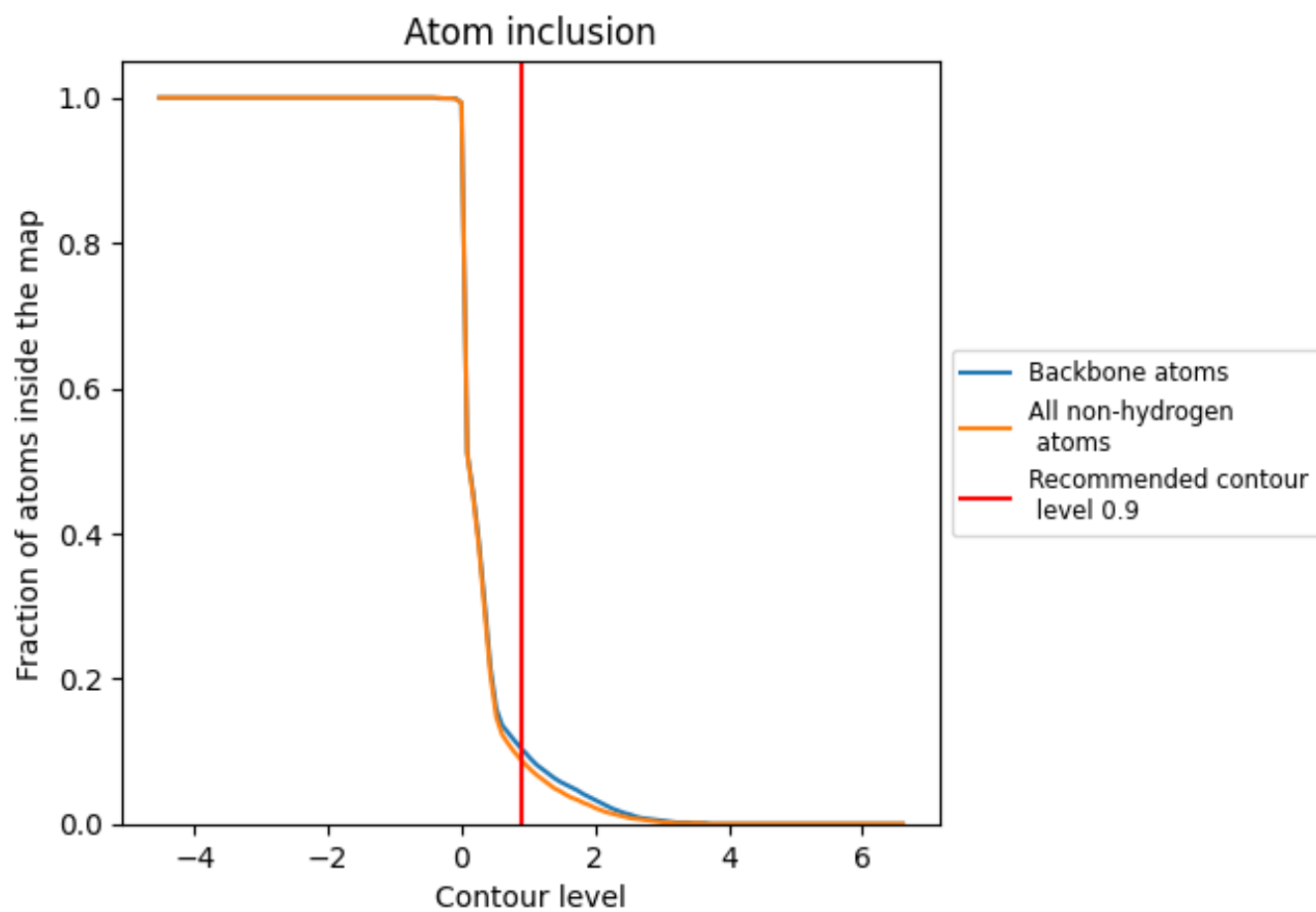
## 9.3 Atom inclusion mapped to coordinate model [i](#)



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.9).





























































## 9.4 Atom inclusion [i](#)



At the recommended contour level, 10% of all backbone atoms, 9% of all non-hydrogen atoms, are inside the map.

## 9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (0.9) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.0870	 0.0690
A	 0.2270	 0.2380
B	 0.6300	 0.4210
C	 0.7970	 0.5090
E	 0.0090	 0.0360
F	 0.0000	 0.0190
G	 0.0750	 0.0590
H	 0.1960	 0.3320
I	 0.0000	 -0.0080
J	 0.0000	 0.0010
K	 0.0000	 -0.0070
M	 0.0000	 0.0170
N	 0.0000	 0.0240
O	 0.0000	 -0.0040
P	 0.0000	 -0.0000
a	 0.0000	 0.0000
b	 0.0000	 0.0000
c	 0.0000	 0.0080
e	 0.0000	 0.0040
f	 0.0000	 0.0200
g	 0.0000	 -0.0010
h	 0.0000	 0.0000
i	 0.0000	 0.0180
j	 0.0000	 0.0040
k	 0.0000	 0.0140
m	 0.0000	 -0.0070
n	 0.0000	 -0.0030
o	 0.0000	 0.0020
p	 0.0000	 -0.0130

