Full wwPDB EM Validation Report ⓘ

Oct 5, 2024 – 02:45 pm BST

PDB ID	:	6QA9
EMDB ID	:	EMD-4482
Title	:	Isolated complex I class refinement from Ovine respiratory supercomplex I+III2
Authors	:	Letts, J.A.; Sazanov, L.A.
Deposited on	:	2018-12-19
Resolution	:	4.10 Å(reported)
Based on initial model	:	1PPJ

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

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/EMValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

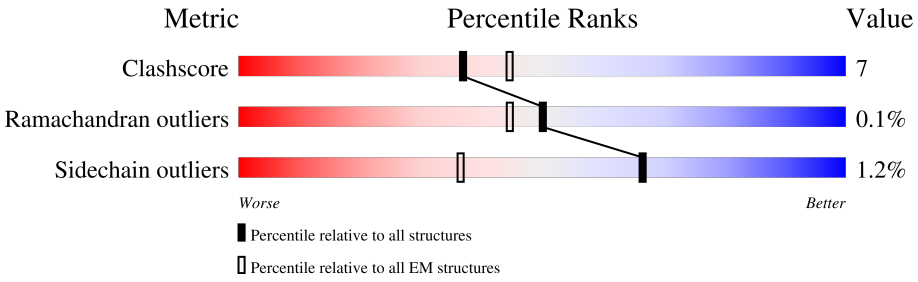
EMDB validation analysis	:	0.0.1.dev113
Mogul	:	1.8.4, CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

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 4.10 Å.

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



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

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=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	V1	445	18% 72% 24%
2	V2	217	24% 79% 18%
3	S1	704	21% 76% 21%
4	S2	430	25% 80% 19%
5	S3	228	17% 68% 23% 9%
6	S7	179	18% 70% 17% 13%
7	S8	176	19% 78% 22%
8	V3	75	15% 31% 20% 47%

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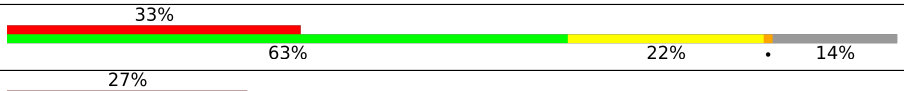
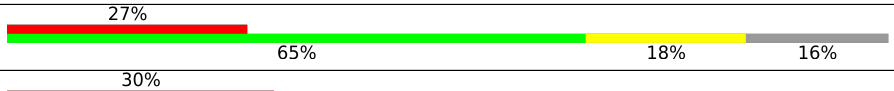
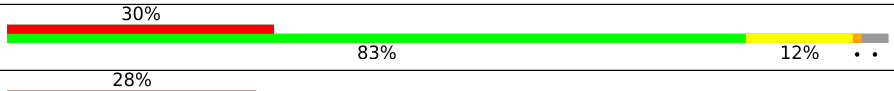
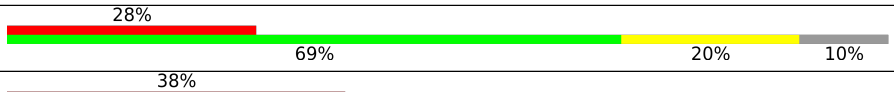
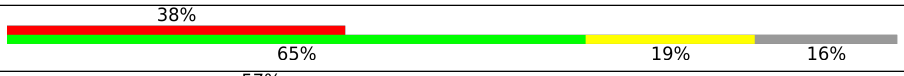
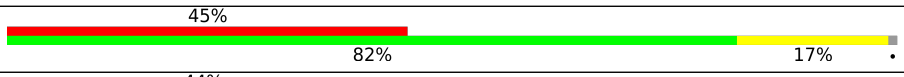
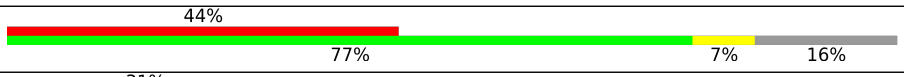
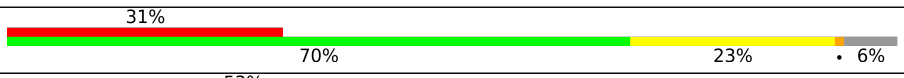
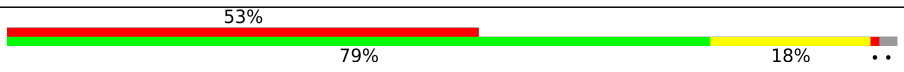
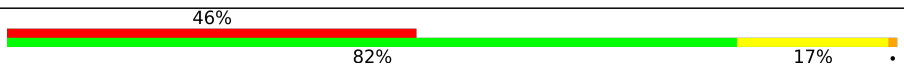
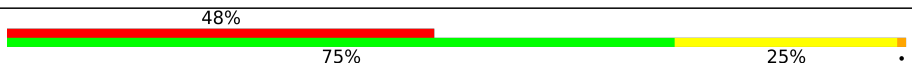
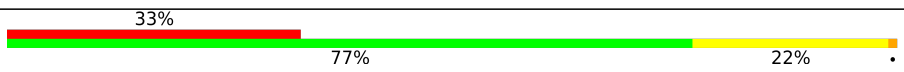
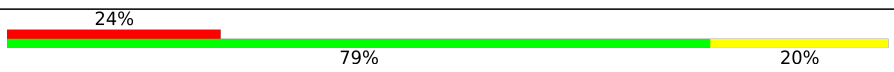
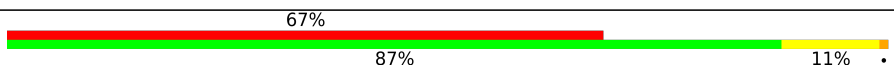
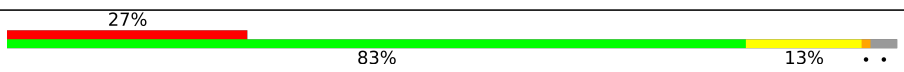
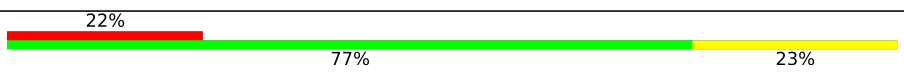
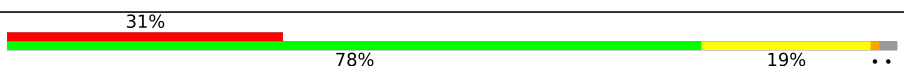
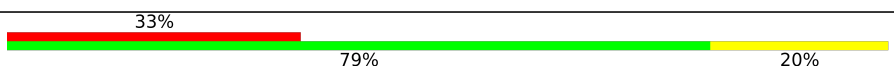
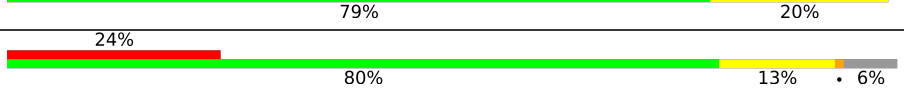
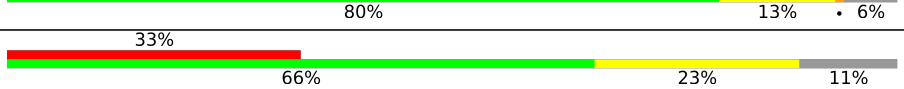
Mol	Chain	Length	Quality of chain
9	S6	96	
10	S4	133	
11	A9	338	
12	A2	98	
13	A5	115	
14	A6	127	
15	A7	112	
16	AL	145	
17	AA	88	
17	AB	88	
18	D3	115	
19	D1	318	
20	D6	175	
21	4L	98	
22	D5	606	
23	D4	459	
24	D2	347	
25	AK	140	
26	B5	143	
27	A8	171	
28	BJ	175	
29	AJ	320	
30	S5	105	
31	A3	83	
32	B3	97	

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Mol	Chain	Length	Quality of chain
33	C2	120	30% 83% 14%
34	B4	128	42% 84% 16%
35	AM	143	27% 78% 17%
36	B6	127	29% 56% 19% 24%
37	B7	136	39% 70% 16% 12%
38	B9	178	33% 74% 24%
39	B2	72	49% 69% 21% 10%
40	B8	158	43% 78% 22%
41	BK	125	36% 67% 14% 18%
42	C1	49	31% 86% 8% 6%
43	B1	57	44% 75% 16% 9%
44	A1	70	26% 83% 17%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
45	SF4	V1	500	-	-	X	-

2 Entry composition

There are 53 unique types of molecules in this entry. The entry contains 65403 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 NADH dehydrogenase [ubiquinone] flavoprotein 1, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	V1	430	3312	2086	593	613	20	0	0

- Molecule 2 is a protein called NADH dehydrogenase [ubiquinone] flavoprotein 2, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	V2	212	1647	1052	277	308	10	0	0

- Molecule 3 is a protein called NADH:ubiquinone oxidoreductase core subunit S1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	S1	688	5275	3301	922	1011	41	0	0

- Molecule 4 is a protein called NDUFS2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	S2	427	3436	2194	589	628	25	0	0

- Molecule 5 is a protein called NADH:ubiquinone oxidoreductase core subunit S3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	S3	208	1726	1112	296	315	3	0	0

- Molecule 6 is a protein called NDUFS7.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	S7	156	Total	C	N	O	S	0	0
			1248	795	225	214	14		

- Molecule 7 is a protein called NDUFS8.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	S8	176	Total	C	N	O	S	0	0
			1415	889	243	271	12		

- Molecule 8 is a protein called NDUFV3.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	V3	40	Total	C	N	O	S	0	0
			335	209	60	65	1		

- Molecule 9 is a protein called NDUFS6.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	S6	95	Total	C	N	O	S	0	0
			737	451	139	144	3		

- Molecule 10 is a protein called NADH:ubiquinone oxidoreductase subunit S4.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	S4	126	Total	C	N	O	S	0	0
			1025	646	182	194	3		

- Molecule 11 is a protein called NADH:ubiquinone oxidoreductase subunit A9.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	A9	290	Total	C	N	O	S	0	0
			2321	1483	423	410	5		

- Molecule 12 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	A2	82	Total	C	N	O	S	0	0
			665	419	124	120	2		

- Molecule 13 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 5.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	A5	111	Total	C	N	O	S	0	0
			902	583	151	166	2		

- Molecule 14 is a protein called NADH:ubiquinone oxidoreductase subunit A6.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	A6	114	Total	C	N	O	S	0	0
			970	619	180	167	4		

- Molecule 15 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 7.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	A7	94	Total	C	N	O	S	0	0
			752	470	143	136	3		

- Molecule 16 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 12.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	AL	143	Total	C	N	O	S	0	0
			1192	768	214	206	4		

- Molecule 17 is a protein called Acyl carrier protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	AA	80	Total	C	N	O	S	0	0
			645	416	96	128	5		
17	AB	87	Total	C	N	O	S	0	0
			702	451	103	143	5		

- Molecule 18 is a protein called NADH-ubiquinone oxidoreductase chain 3.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	D3	97	Total	C	N	O	S	0	0
			787	538	112	132	5		

- Molecule 19 is a protein called NADH-ubiquinone oxidoreductase chain 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	D1	299	Total	C	N	O	S	0	0
			2390	1618	364	389	19		

- Molecule 20 is a protein called NADH-ubiquinone oxidoreductase chain 6.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	D6	171	Total	C	N	O	S	0	0
			1308	878	187	230	13		

- Molecule 21 is a protein called NADH-ubiquinone oxidoreductase chain 4L.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	4L	98	Total	C	N	O	S	0	0
			748	489	112	132	15		

- Molecule 22 is a protein called NADH-ubiquinone oxidoreductase chain 5.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	D5	606	Total	C	N	O	S	0	0
			4805	3187	746	828	44		

- Molecule 23 is a protein called NADH-ubiquinone oxidoreductase chain 4.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	D4	459	Total	C	N	O	S	0	0
			3646	2428	571	607	40		

- Molecule 24 is a protein called NADH-ubiquinone oxidoreductase chain 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	D2	347	Total	C	N	O	S	0	0
			2724	1808	416	460	40		

- Molecule 25 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 11.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	AK	140	Total	C	N	O	S	0	0
			1025	654	175	190	6		

- Molecule 26 is a protein called NADH:ubiquinone oxidoreductase subunit B5.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	B5	139	Total	C	N	O	S	0	0
			1156	761	194	199	2		

- Molecule 27 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex sub-

unit 8.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	A8	171	Total	C	N	O	S	0	0
			1404	889	253	252	10		

- Molecule 28 is a protein called NDUFB10.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	BJ	171	Total	C	N	O	S	0	0
			1441	905	266	262	8		

- Molecule 29 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 10, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	AJ	319	Total	C	N	O	S	0	0
			2583	1653	430	490	10		

- Molecule 30 is a protein called NADH:ubiquinone oxidoreductase subunit S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	S5	99	Total	C	N	O	S	0	0
			822	520	154	142	6		

- Molecule 31 is a protein called NADH:ubiquinone oxidoreductase subunit A3.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	A3	74	Total	C	N	O	S	0	0
			582	379	96	105	2		

- Molecule 32 is a protein called NADH:ubiquinone oxidoreductase subunit B3.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	B3	73	Total	C	N	O	S	0	0
			578	378	100	98	2		

- Molecule 33 is a protein called NADH dehydrogenase [ubiquinone] 1 subunit C2.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	C2	119	Total	C	N	O	S	0	0
			997	647	174	172	4		

- Molecule 34 is a protein called NADH:ubiquinone oxidoreductase subunit B4.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	B4	128	Total	C	N	O	S	0	0
			1059	675	189	194	1		

- Molecule 35 is a protein called NDUFA13.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	AM	139	Total	C	N	O	S	0	0
			1143	733	200	201	9		

- Molecule 36 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 6.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	B6	96	Total	C	N	O	S	0	0
			815	536	139	139	1		

- Molecule 37 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 7.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	B7	119	Total	C	N	O	S	0	0
			1026	641	196	181	8		

- Molecule 38 is a protein called NADH:ubiquinone oxidoreductase subunit B9.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	B9	176	Total	C	N	O	S	0	0
			1515	970	278	261	6		

- Molecule 39 is a protein called NADH:ubiquinone oxidoreductase subunit B2.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	B2	65	Total	C	N	O	S	0	0
			563	372	93	97	1		

- Molecule 40 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 8, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	B8	157	Total	C	N	O	S	0	0
			1324	855	217	243	9		

- Molecule 41 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit

11, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	BK	102	Total	C	N	O	S	0	0
			853	547	141	161	4		

- Molecule 42 is a protein called NDUFC1.

Mol	Chain	Residues	Atoms				AltConf	Trace
42	C1	46	Total	C	N	O	0	0
			391	258	67	66		

- Molecule 43 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 1.

Mol	Chain	Residues	Atoms				AltConf	Trace
43	B1	52	Total	C	N	O	0	0
			449	296	79	74		

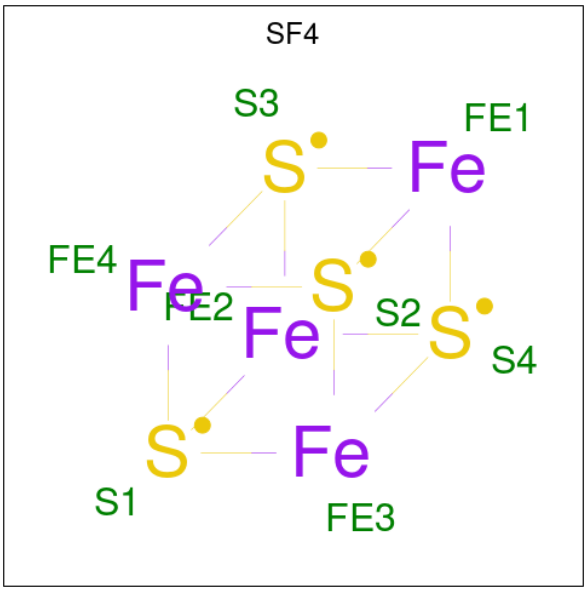
There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B1	16	VAL	GLY	conflict	UNP W5QG39
B1	35	ALA	THR	conflict	UNP W5QG39
B1	38	ARG	TRP	conflict	UNP W5QG39

- Molecule 44 is a protein called NDUFA1.

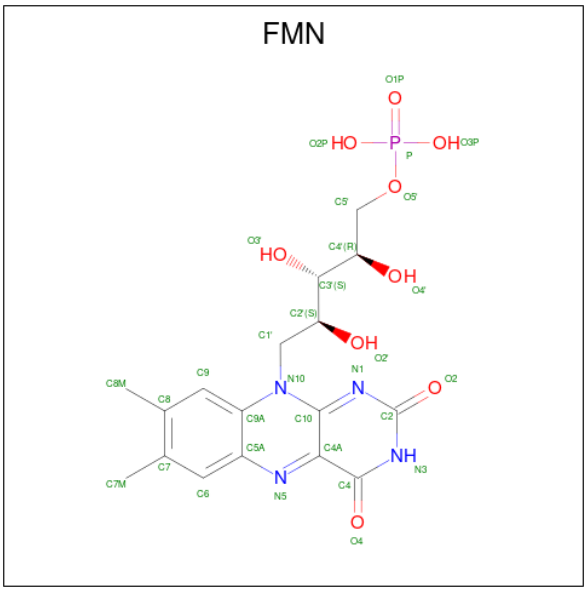
Mol	Chain	Residues	Atoms					AltConf	Trace
44	A1	70	Total	C	N	O	S	0	0
			577	369	106	97	5		

- Molecule 45 is IRON/SULFUR CLUSTER (three-letter code: SF4) (formula: Fe_4S_4).



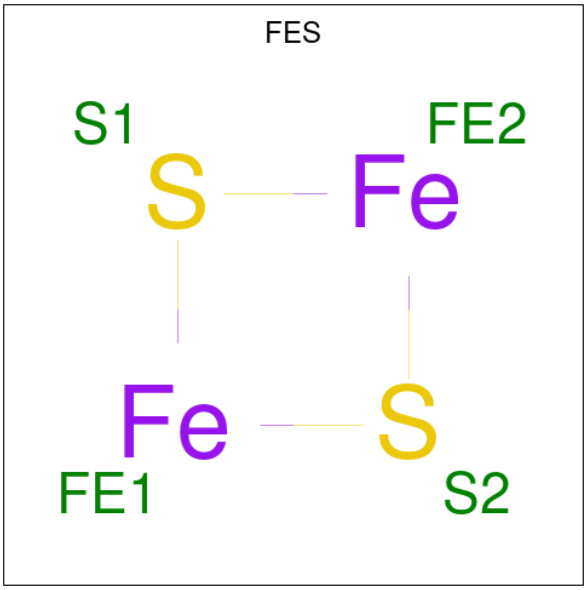
Mol	Chain	Residues	Atoms			AltConf
45	V1	1	Total	Fe	S	0
			8	4	4	
45	S1	1	Total	Fe	S	0
			8	4	4	
45	S1	1	Total	Fe	S	0
			8	4	4	
45	S7	1	Total	Fe	S	0
			8	4	4	
45	S8	1	Total	Fe	S	0
			8	4	4	
45	S8	1	Total	Fe	S	0
			8	4	4	

- Molecule 46 is FLAVIN MONONUCLEOTIDE (three-letter code: FMN) (formula: $C_{17}H_{21}N_4O_9P$).



Mol	Chain	Residues	Atoms					AltConf
46	V1	1	Total	C	N	O	P	0
			31	17	4	9	1	

- Molecule 47 is FE2/S2 (INORGANIC) CLUSTER (three-letter code: FES) (formula: Fe_2S_2).

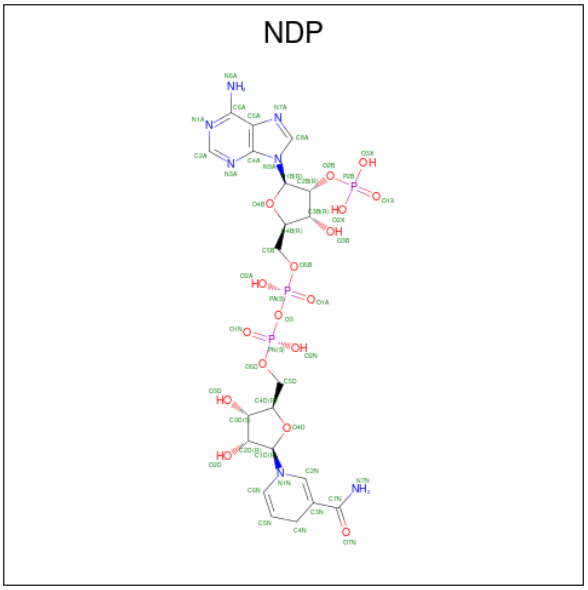


Mol	Chain	Residues	Atoms			AltConf
47	V2	1	Total	Fe	S	0
			4	2	2	
47	S1	1	Total	Fe	S	0
			4	2	2	

- Molecule 48 is ZINC ION (three-letter code: ZN) (formula: Zn).

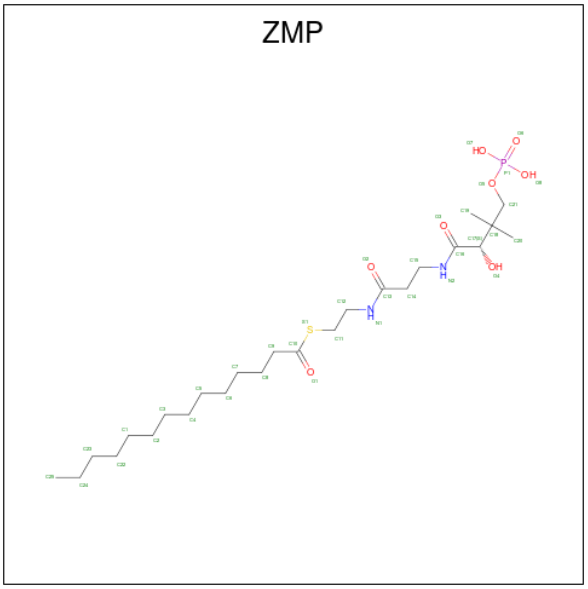
Mol	Chain	Residues	Atoms		AltConf
48	S6	1	Total	Zn	0
			1	1	

- Molecule 49 is NADPH DIHYDRO-NICOTINAMIDE-ADENINE-DINUCLEOTIDE PHOSPHATE (three-letter code: NDP) (formula: $C_{21}H_{30}N_7O_{17}P_3$).



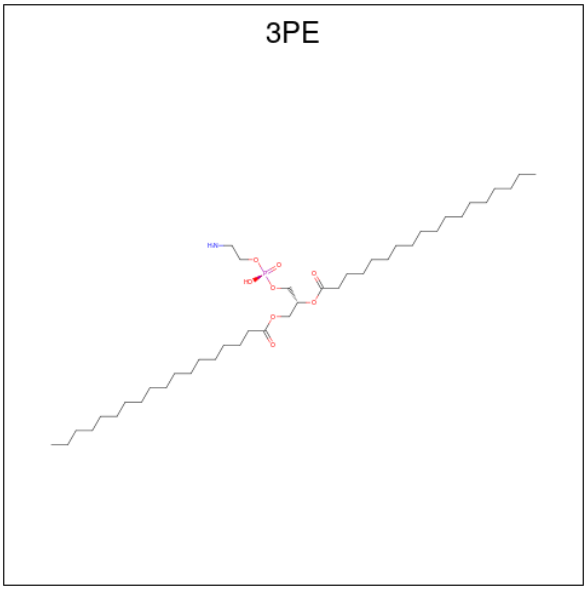
Mol	Chain	Residues	Atoms					AltConf
49	A9	1	Total	C	N	O	P	0
			48	21	7	17	3	

- Molecule 50 is S-[2-({N-[(2S)-2-hydroxy-3,3-dimethyl-4-(phosphonooxy)butanoyl]-beta-alanyl}amino)ethyl] tetradecanethioate (three-letter code: ZMP) (formula: $C_{25}H_{49}N_2O_8PS$).



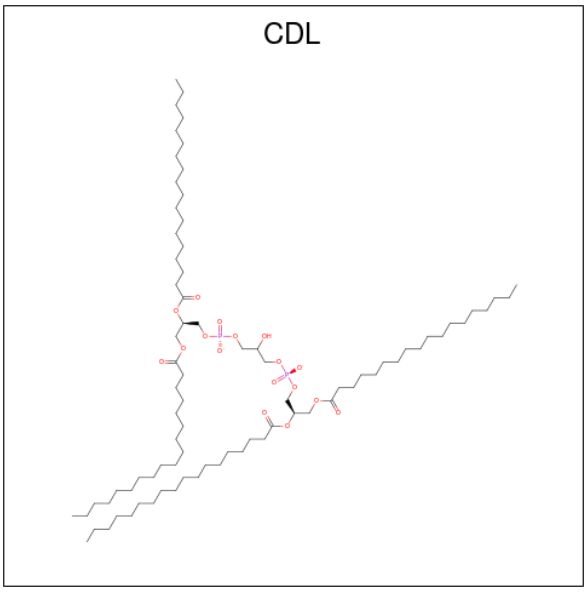
Mol	Chain	Residues	Atoms						AltConf
50	AA	1	Total	C	N	O	P	S	0
			34	23	2	7	1	1	
50	B9	1	Total	C	N	O	P	S	0
			31	20	2	7	1	1	

- Molecule 51 is 1,2-Distearoyl-sn-glycerophosphoethanolamine (three-letter code: 3PE) (formula: $C_{41}H_{82}NO_8P$).



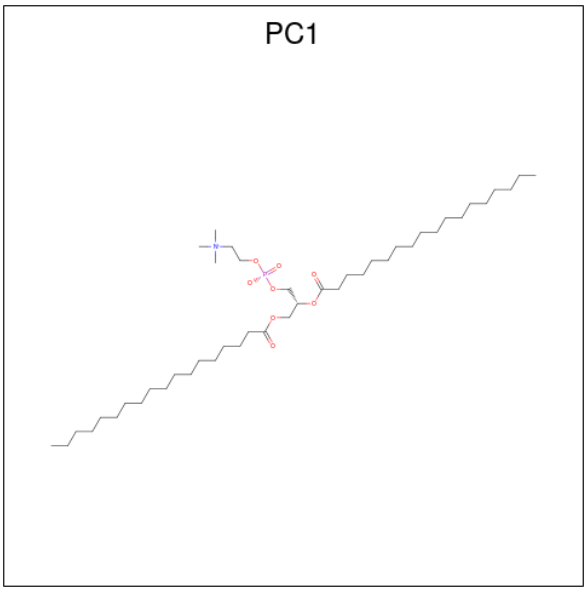
Mol	Chain	Residues	Atoms					AltConf
51	D1	1	Total	C	N	O	P	0
			19	9	1	8	1	
51	D5	1	Total	C	N	O	P	0
			38	28	1	8	1	
51	D4	1	Total	C	N	O	P	0
			40	30	1	8	1	
51	A8	1	Total	C	N	O	P	0
			25	15	1	8	1	

- Molecule 52 is CARDIOLIPIN (three-letter code: CDL) (formula: $C_{81}H_{156}O_{17}P_2$).



Mol	Chain	Residues	Atoms				AltConf
52	D5	1	Total	C	O	P	0
			36	17	17	2	

- Molecule 53 is 1,2-DIACYL-SN-GLYCERO-3-PHOSPHOCHOLINE (three-letter code: PC1) (formula: $C_{44}H_{88}NO_8P$).

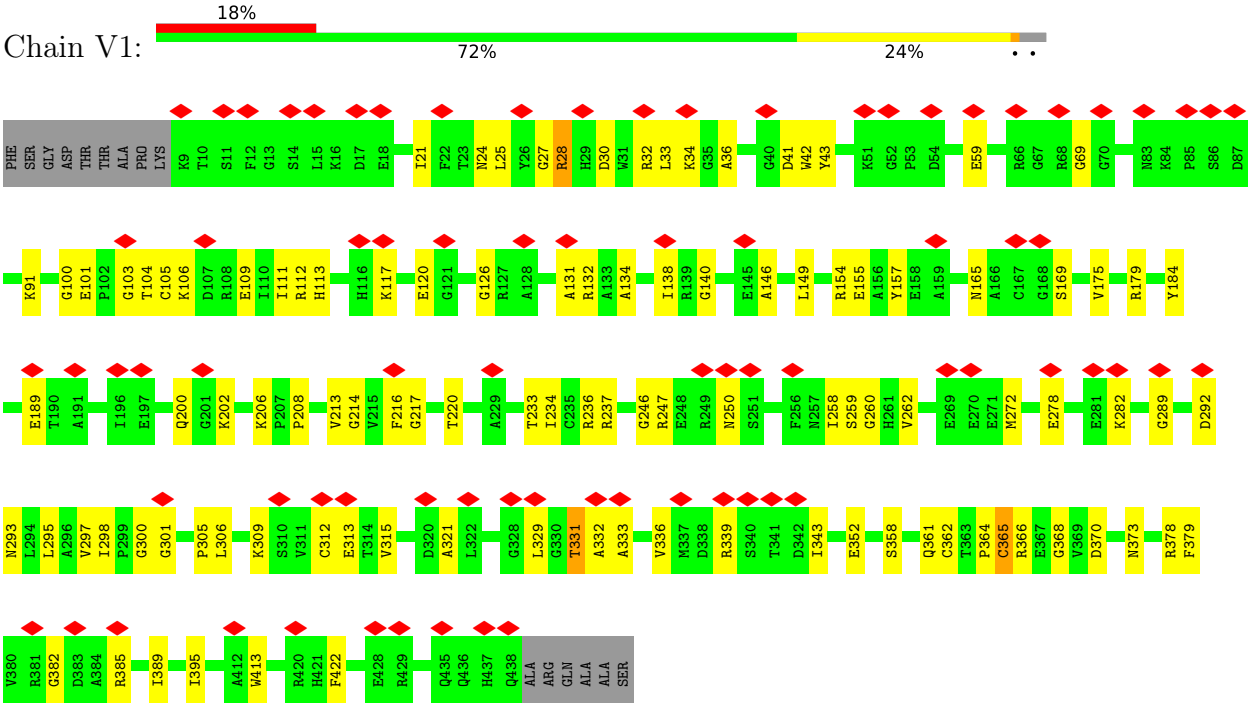


Mol	Chain	Residues	Atoms					AltConf
53	D4	1	Total	C	N	O	P	0
			28	18	1	8	1	

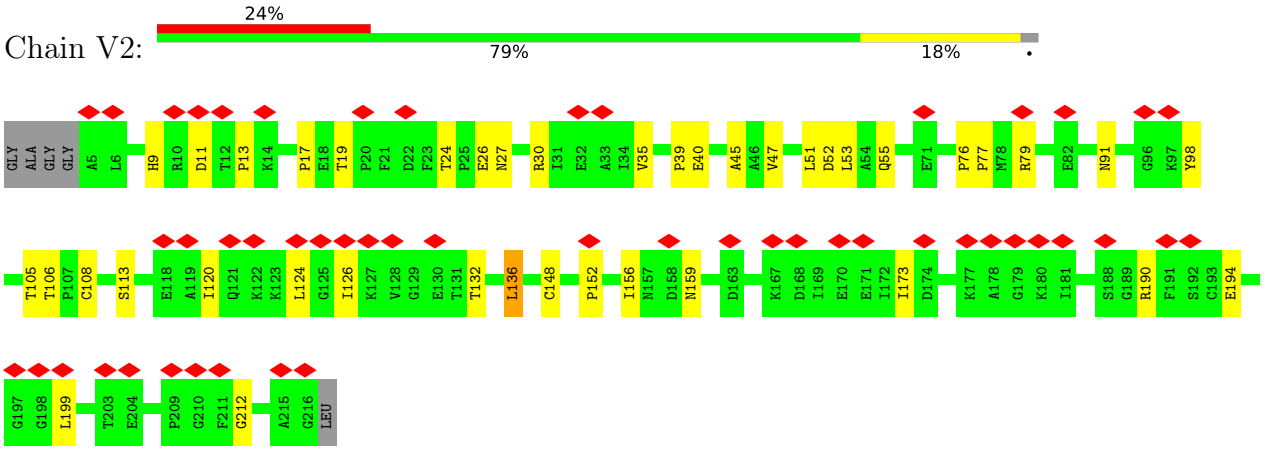
3 Residue-property plots (i)

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: NADH dehydrogenase [ubiquinone] flavoprotein 1, mitochondrial

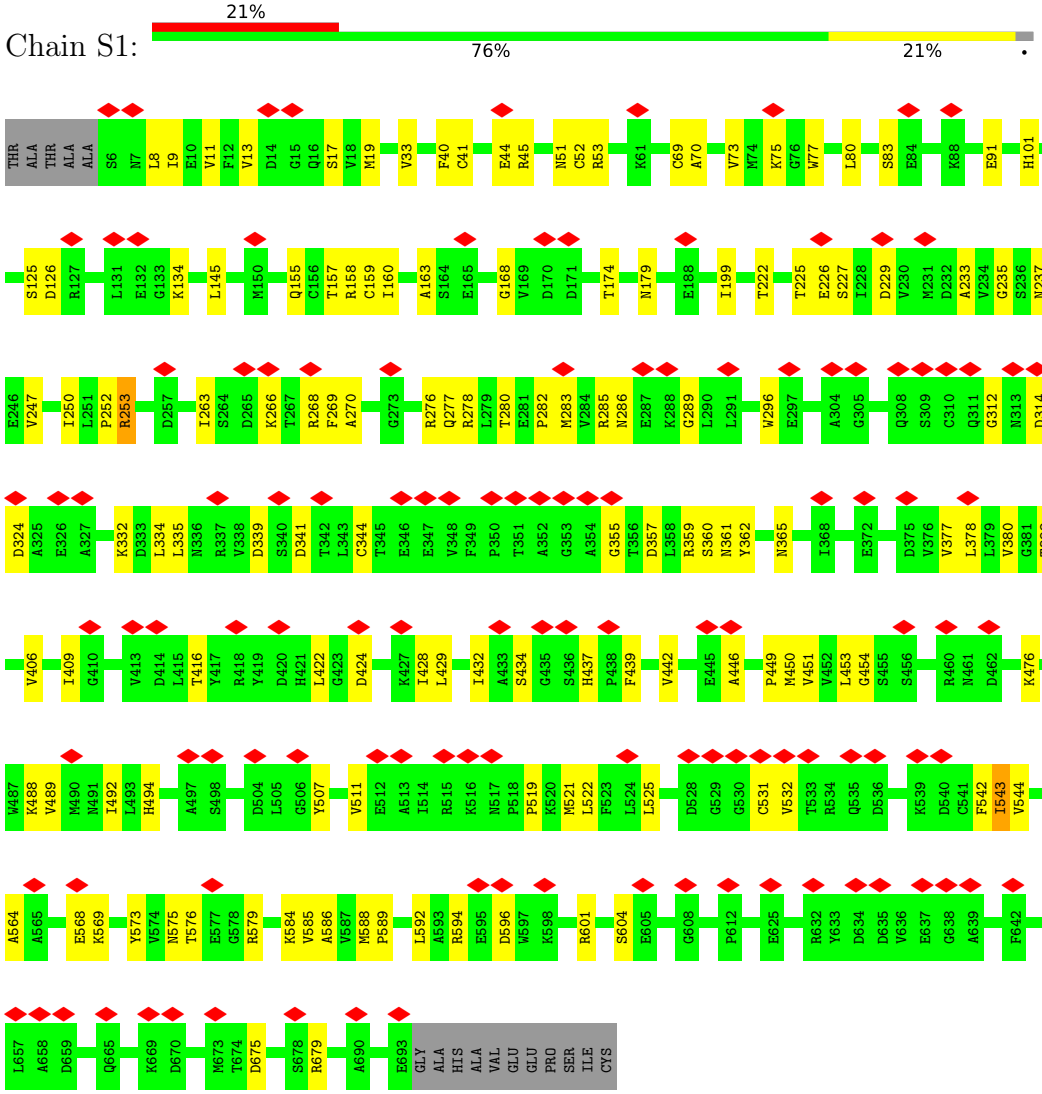


• Molecule 2: NADH dehydrogenase [ubiquinone] flavoprotein 2, mitochondrial



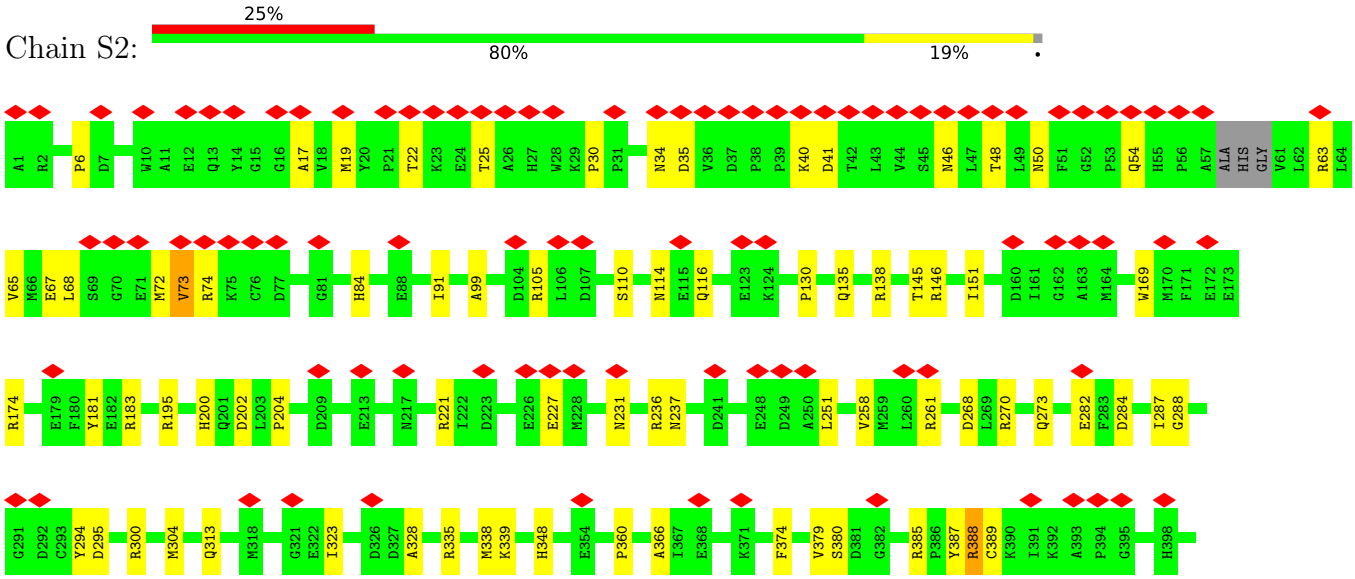
• Molecule 3: NADH:ubiquinone oxidoreductase core subunit S1

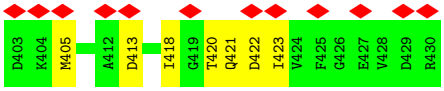
Chain S1:



• Molecule 4: NDUFS2

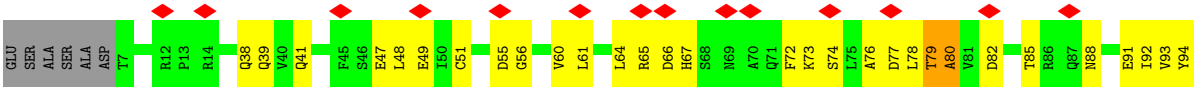
Chain S2:

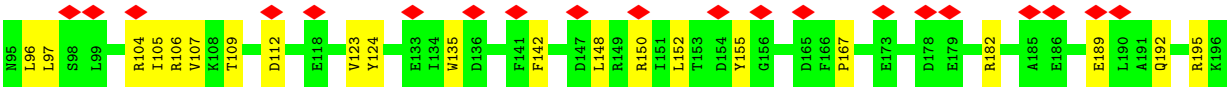


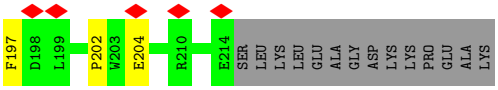


• Molecule 5: NADH:ubiquinone oxidoreductase core subunit S3

Chain S3:

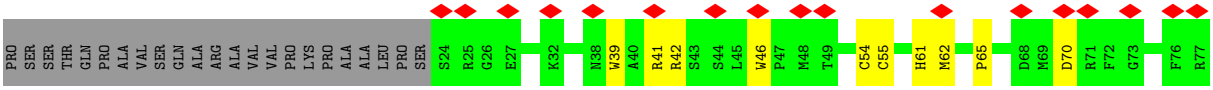


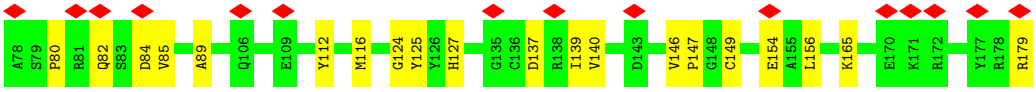




• Molecule 6: NDUFS7

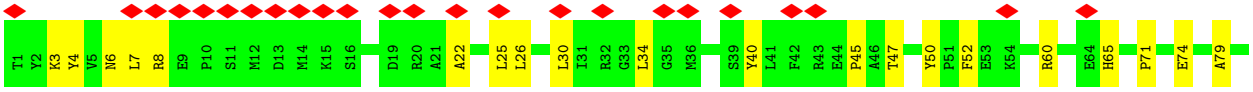
Chain S7:

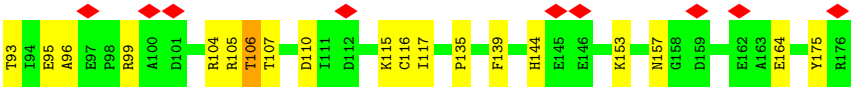




• Molecule 7: NDUFS8

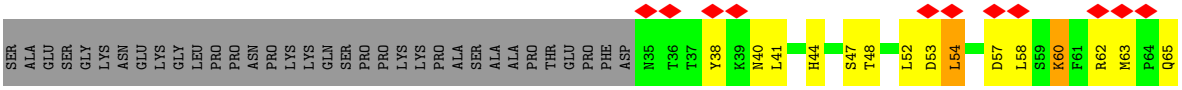
Chain S8:

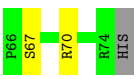




• Molecule 8: NDUFV3

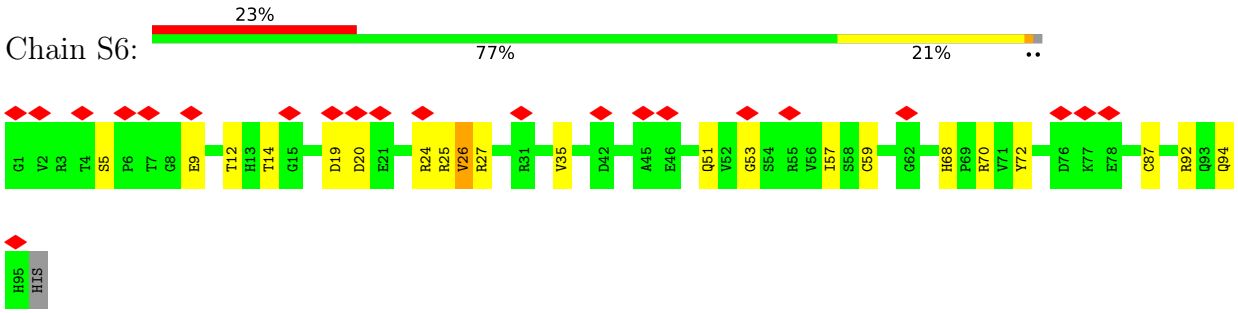
Chain V3:





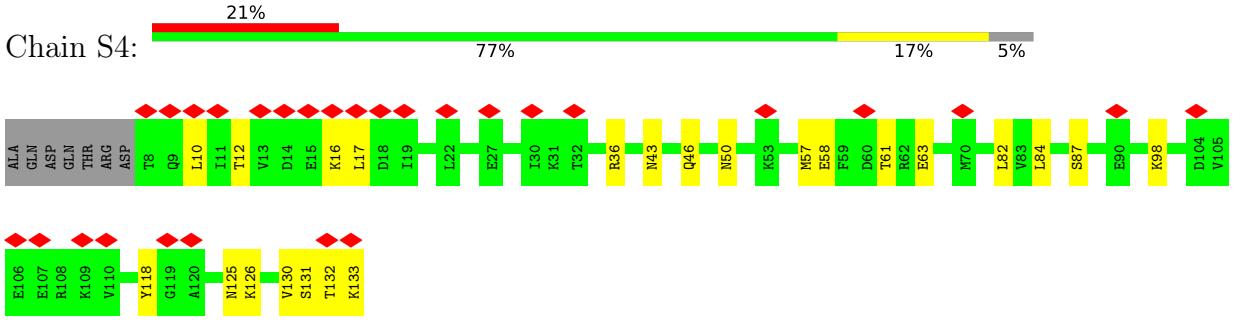
• Molecule 9: NDUFS6

Chain S6:



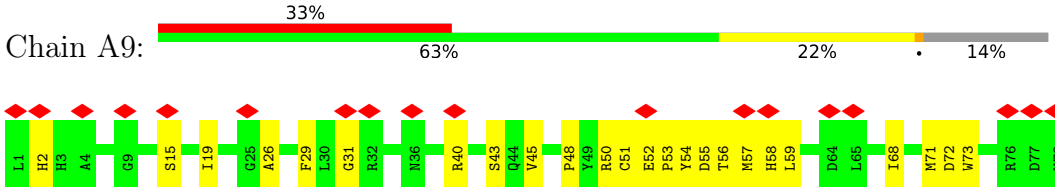
• Molecule 10: NADH:ubiquinone oxidoreductase subunit S4

Chain S4:



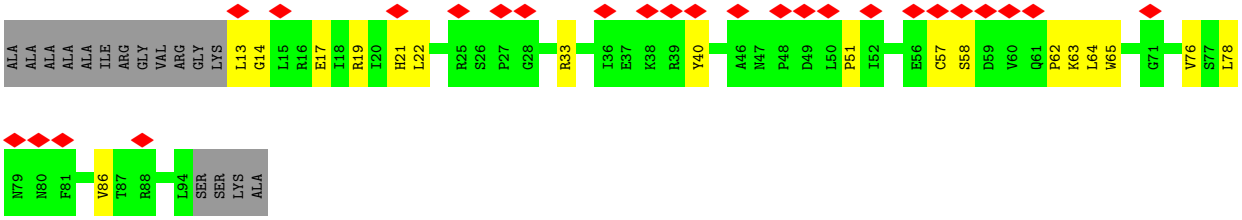
• Molecule 11: NADH:ubiquinone oxidoreductase subunit A9

Chain A9:



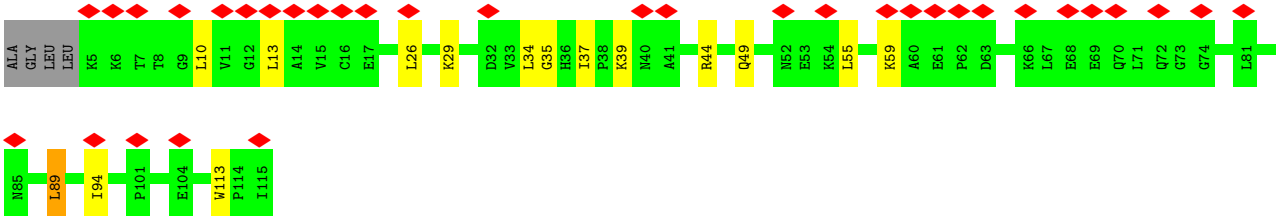
• Molecule 12: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 2

Chain A2:



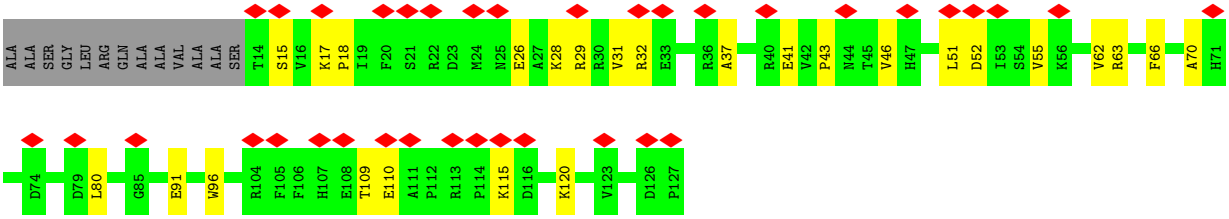
• Molecule 13: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 5

Chain A5:



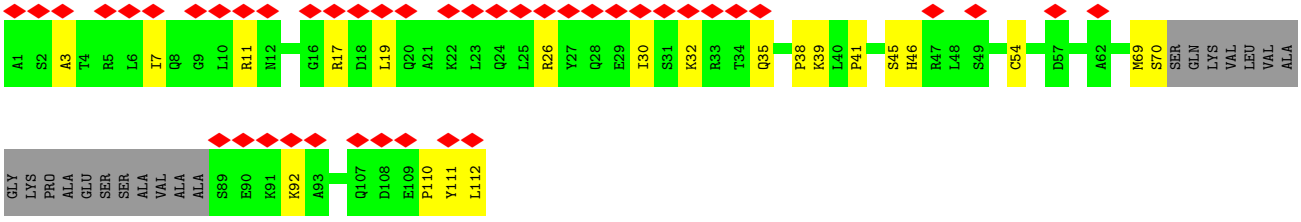
• Molecule 14: NADH:ubiquinone oxidoreductase subunit A6

Chain A6:



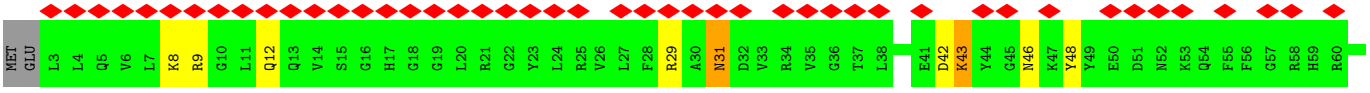
• Molecule 15: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 7

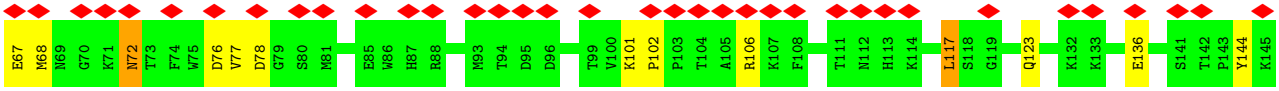
Chain A7:



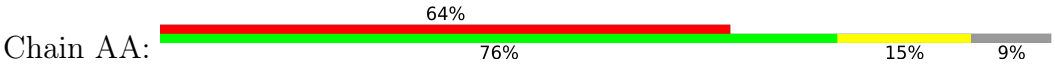
• Molecule 16: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 12

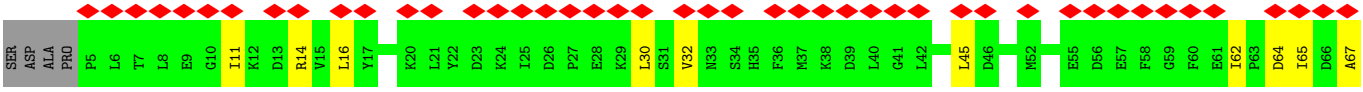
Chain AL:

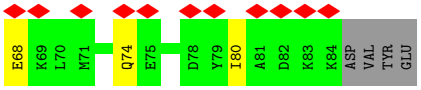




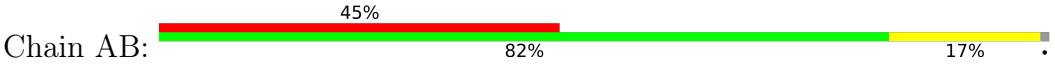
• Molecule 17: Acyl carrier protein

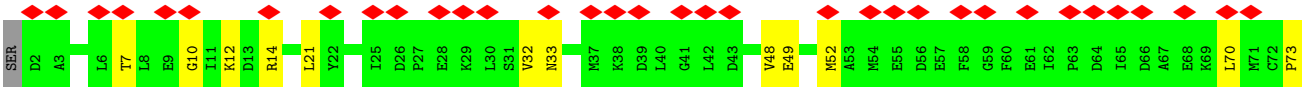


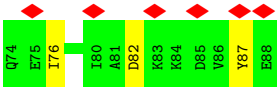




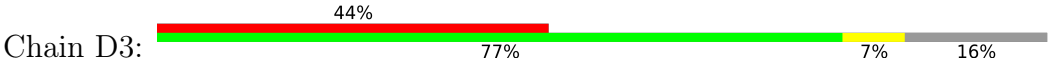
• Molecule 17: Acyl carrier protein

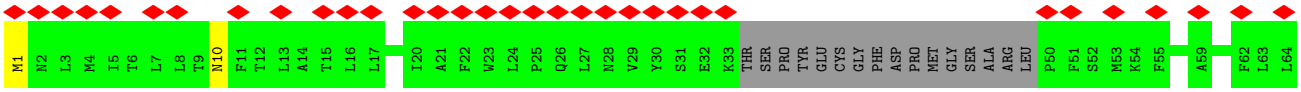


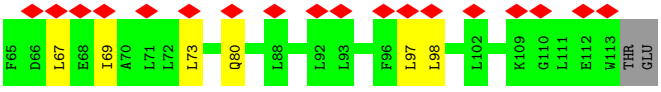




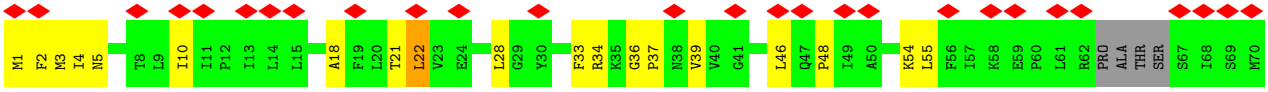
• Molecule 18: NADH-ubiquinone oxidoreductase chain 3

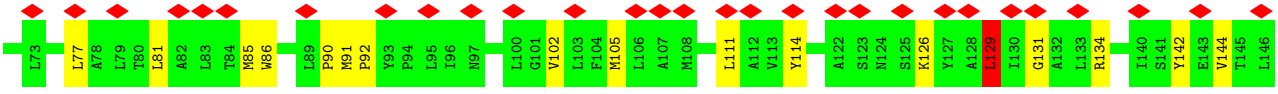


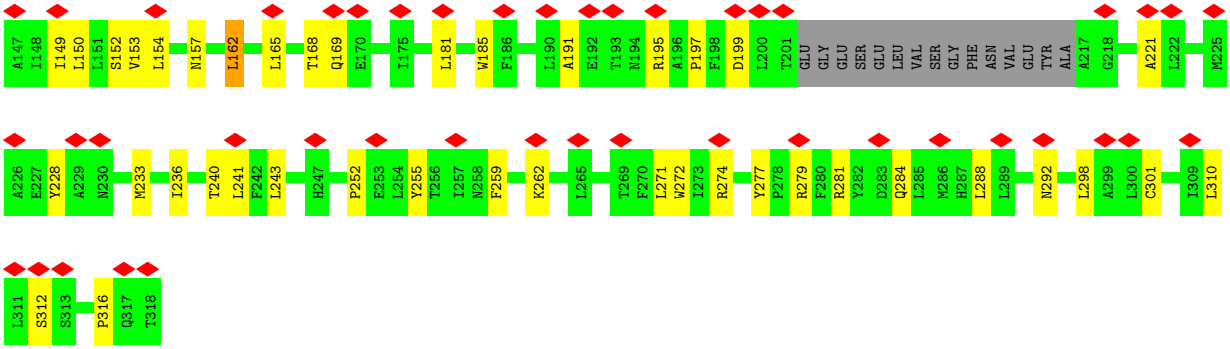




• Molecule 19: NADH-ubiquinone oxidoreductase chain 1

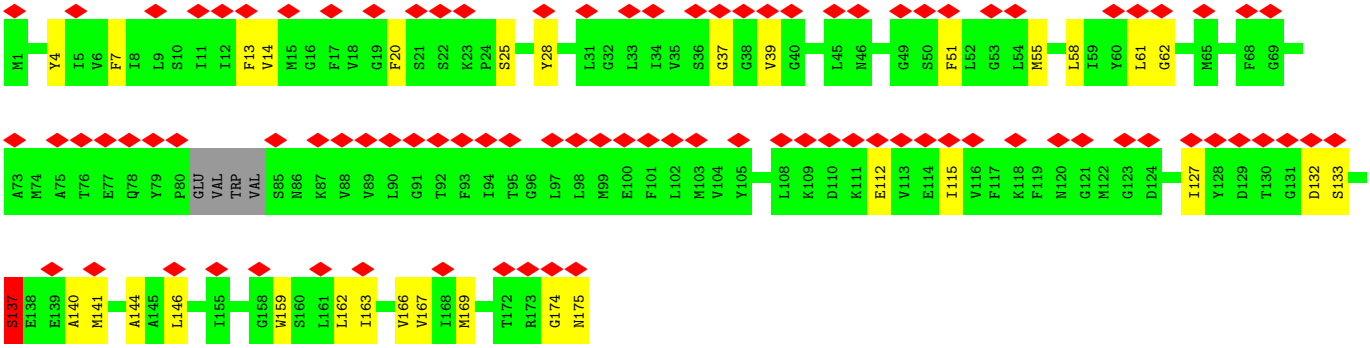






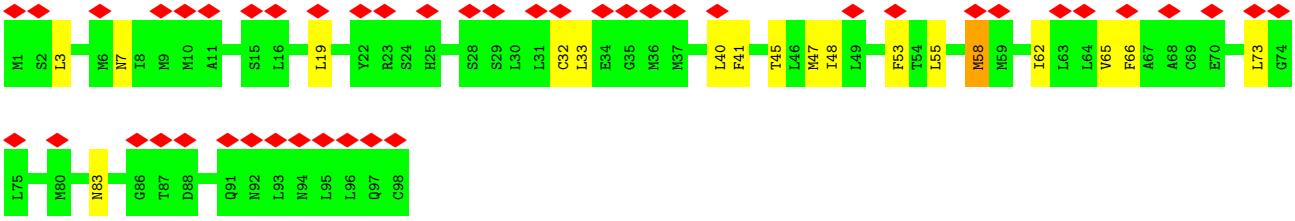
• Molecule 20: NADH-ubiquinone oxidoreductase chain 6

Chain D6:



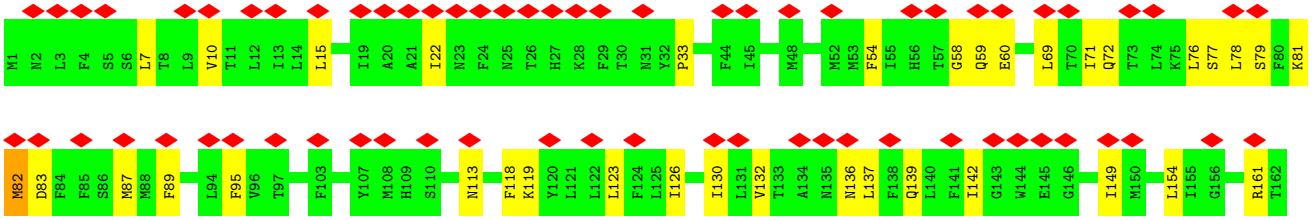
• Molecule 21: NADH-ubiquinone oxidoreductase chain 4L

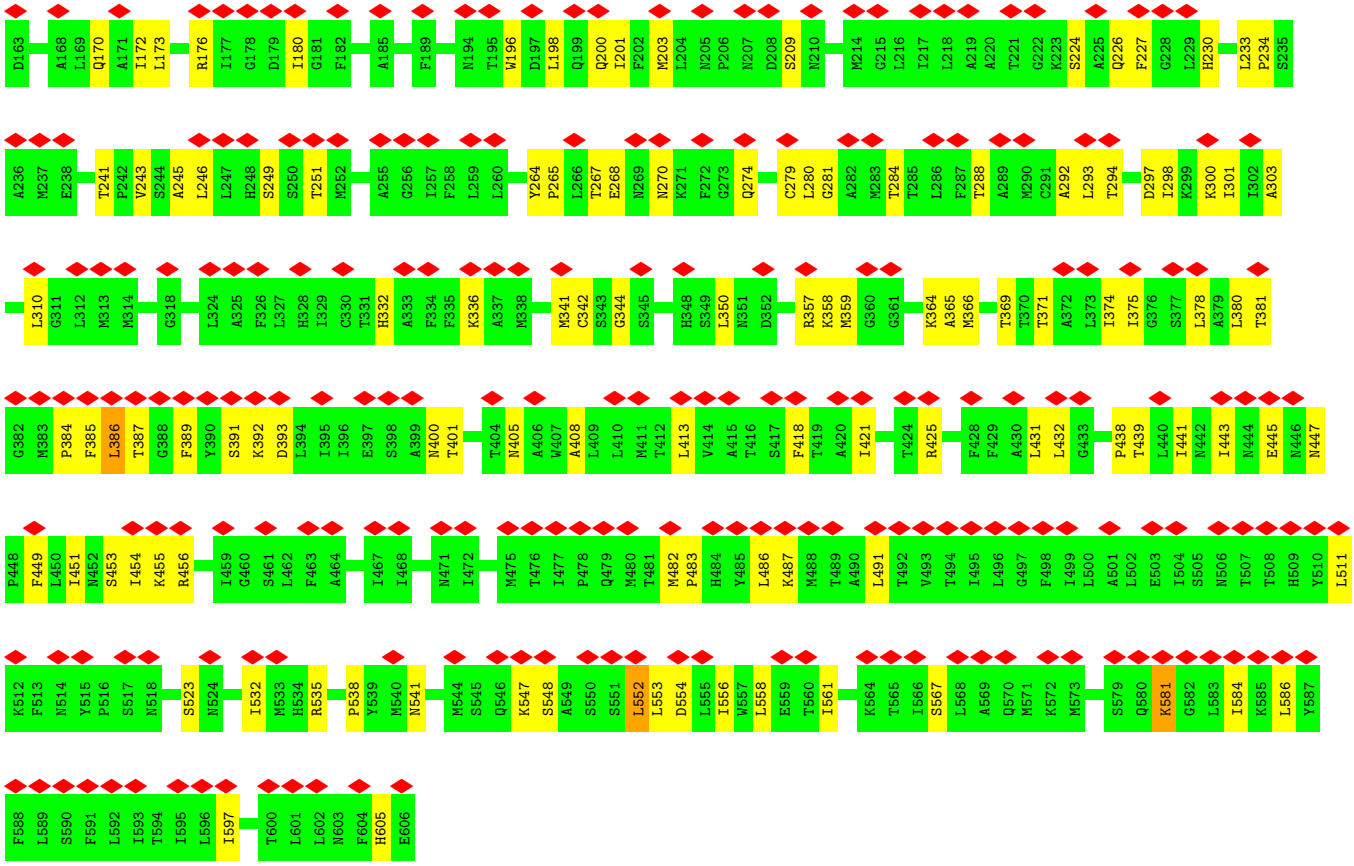
Chain 4L:



• Molecule 22: NADH-ubiquinone oxidoreductase chain 5

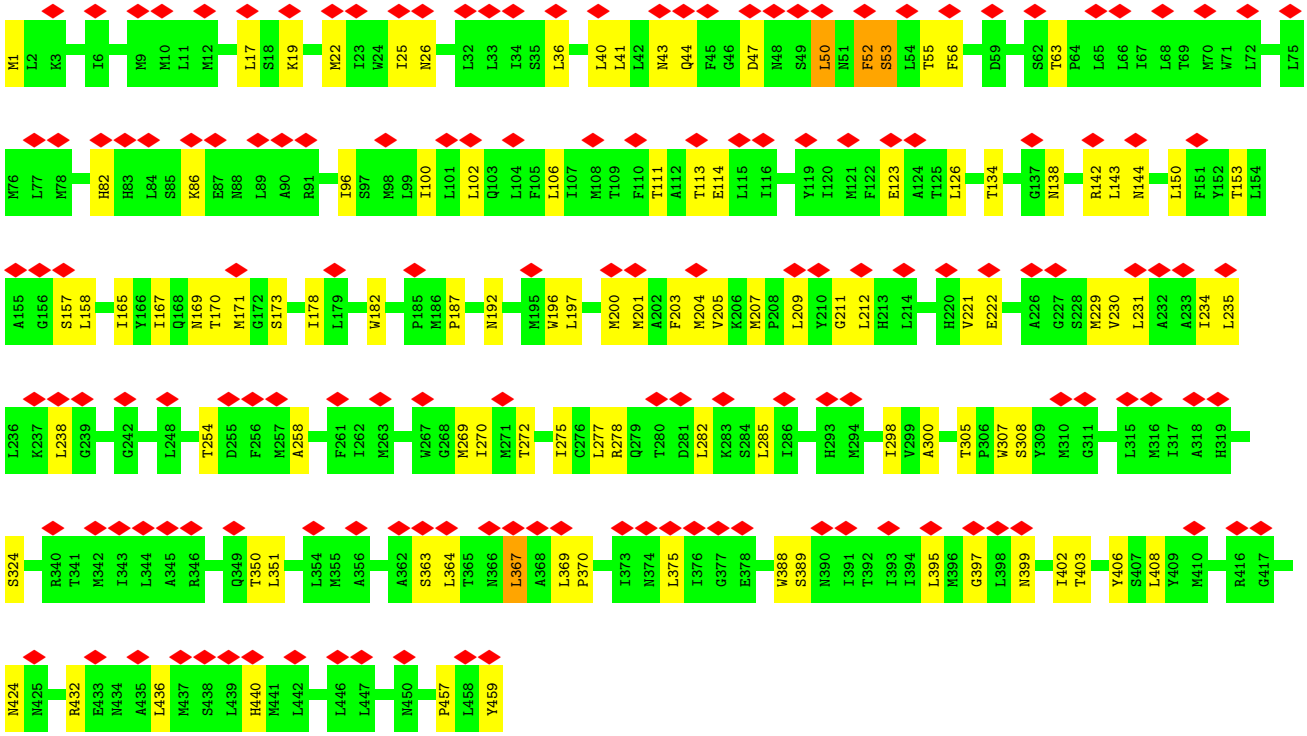
Chain D5:





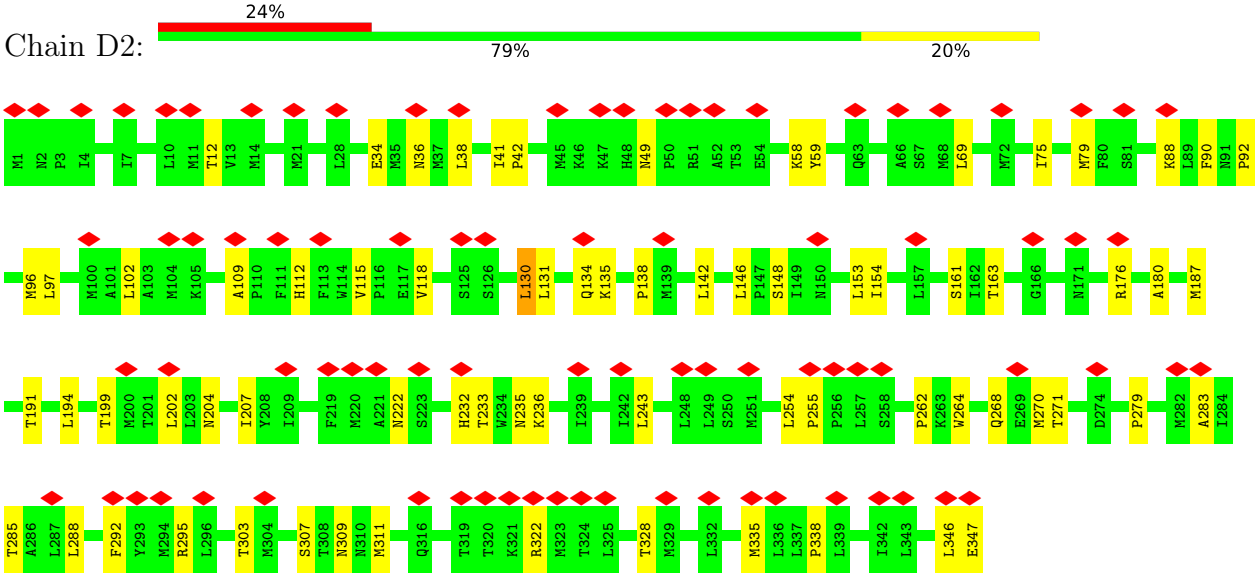
• Molecule 23: NADH-ubiquinone oxidoreductase chain 4

Chain D4:



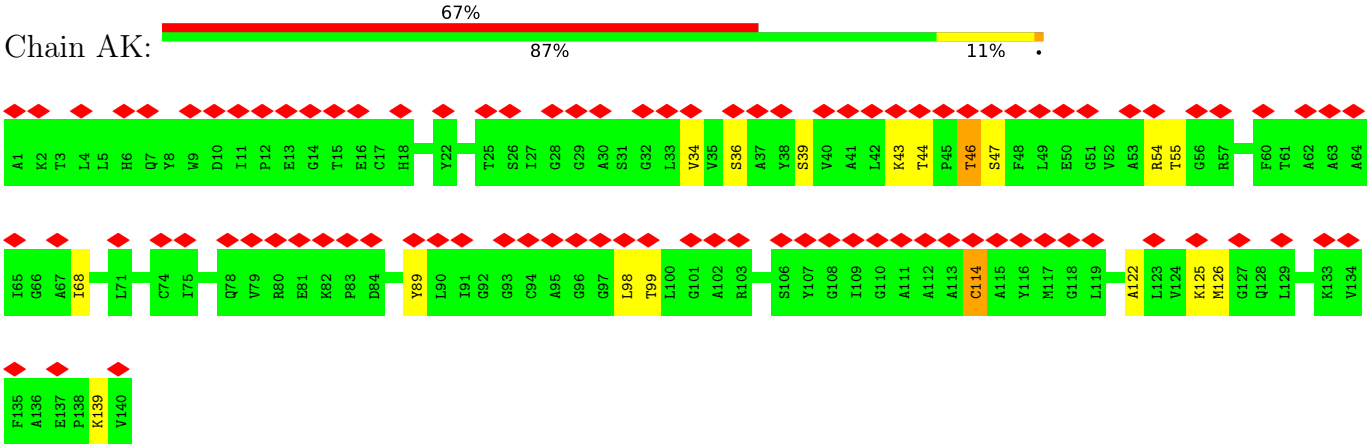
• Molecule 24: NADH-ubiquinone oxidoreductase chain 2

Chain D2:



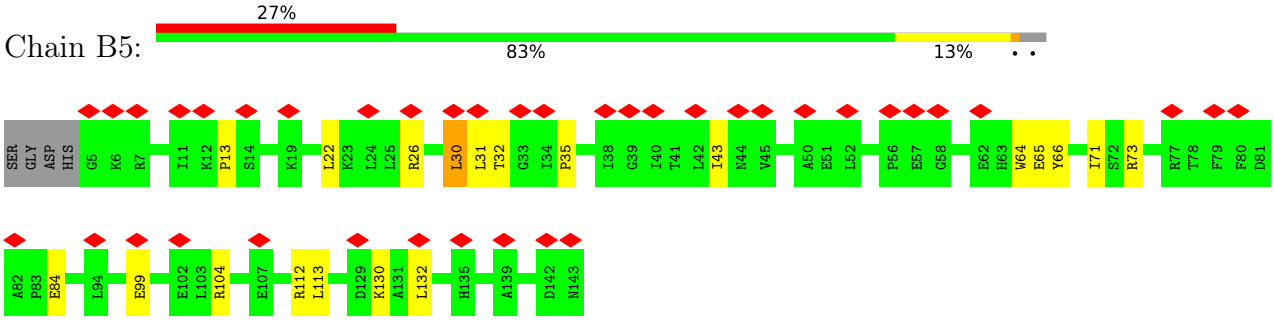
• Molecule 25: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 11

Chain AK:



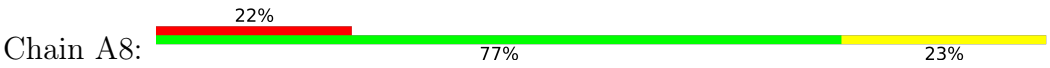
• Molecule 26: NADH:ubiquinone oxidoreductase subunit B5

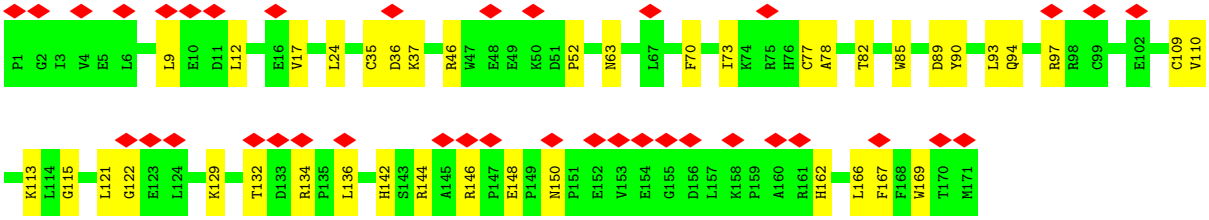
Chain B5:



• Molecule 27: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 8

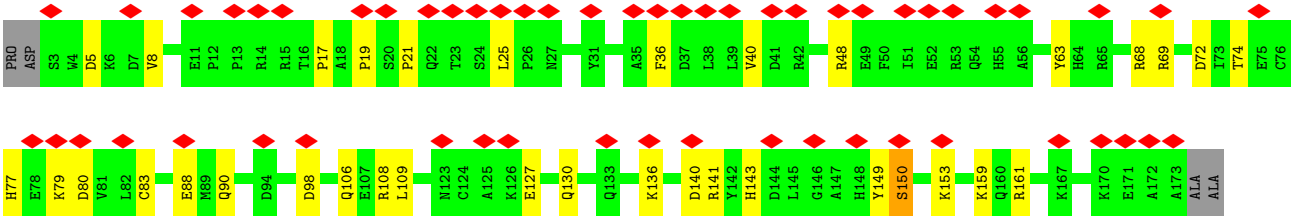
Chain A8:





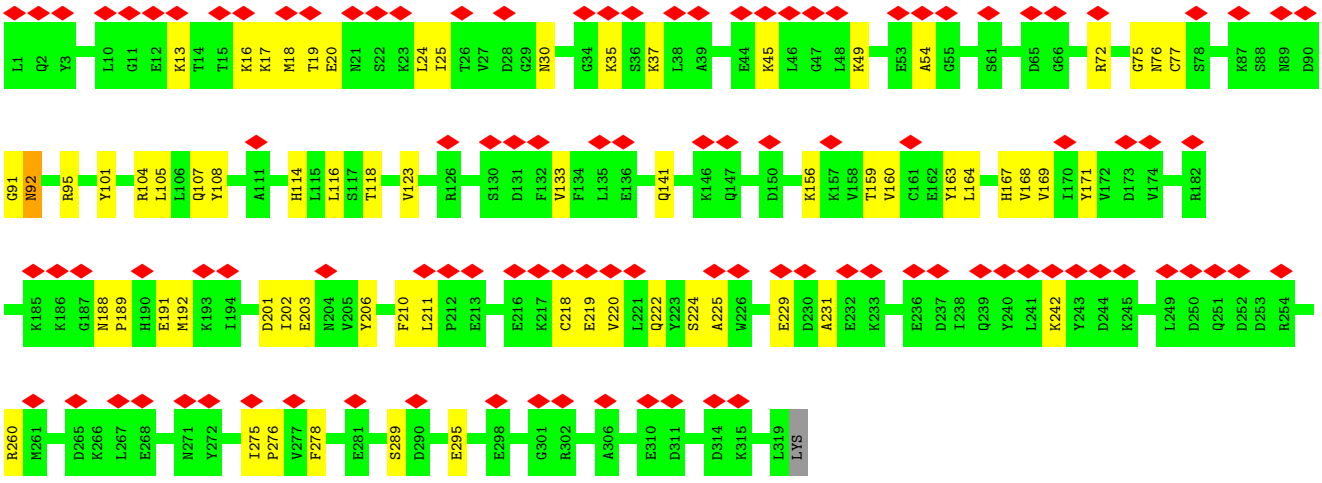
• Molecule 28: NDUFB10

Chain BJ:



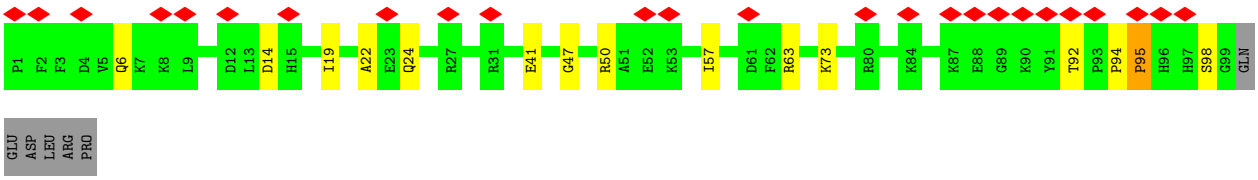
• Molecule 29: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 10, mitochondrial

Chain AJ:



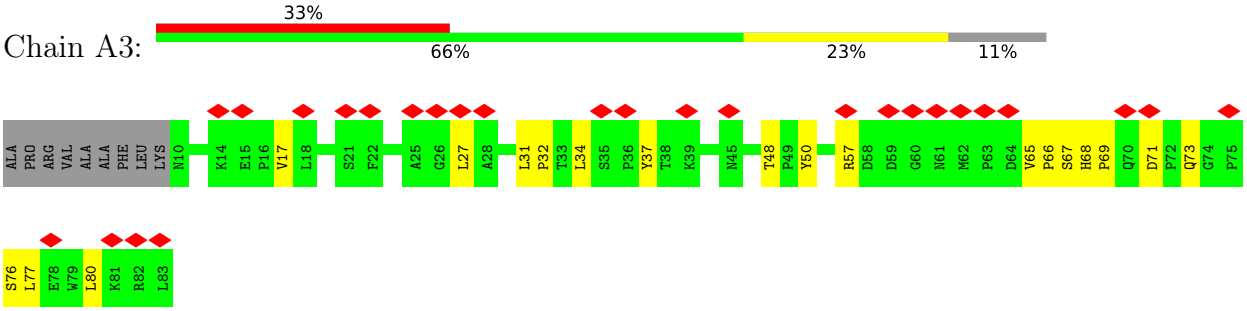
• Molecule 30: NADH:ubiquinone oxidoreductase subunit S5

Chain S5:



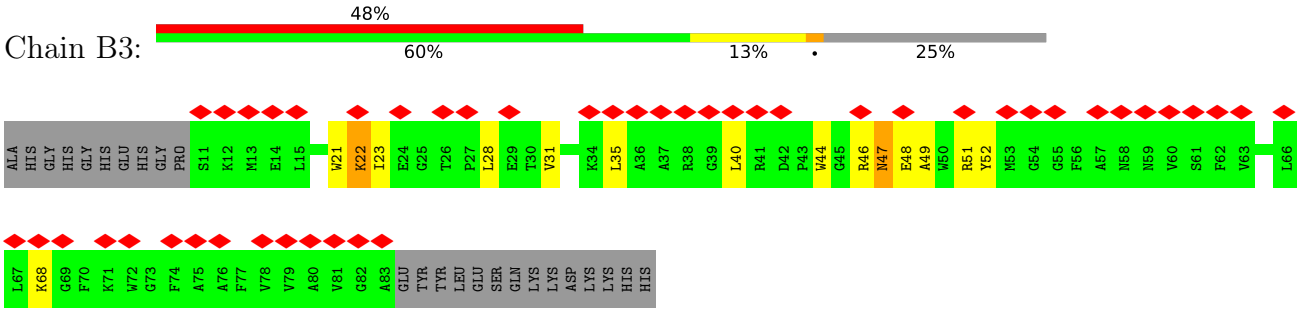
• Molecule 31: NADH:ubiquinone oxidoreductase subunit A3

Chain A3:



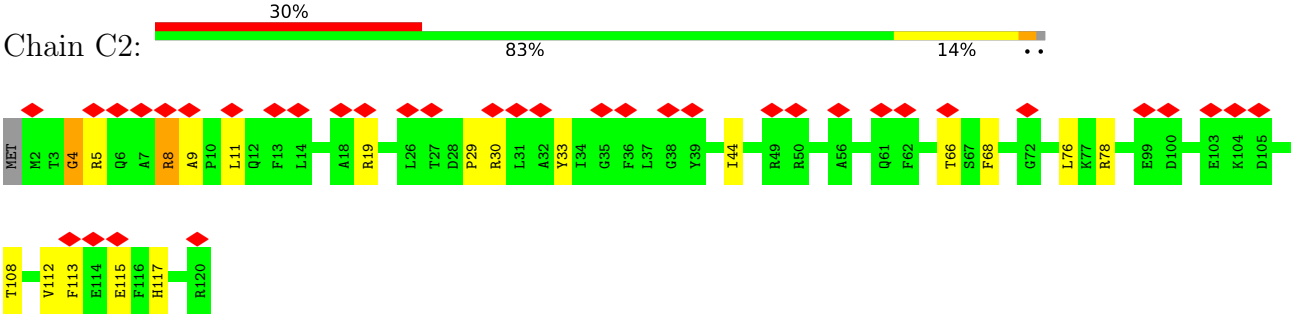
• Molecule 32: NADH:ubiquinone oxidoreductase subunit B3

Chain B3:



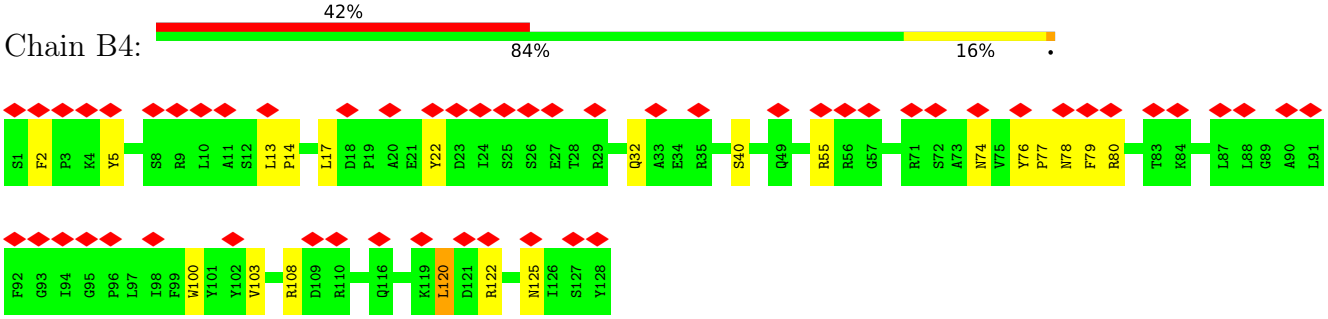
• Molecule 33: NADH dehydrogenase [ubiquinone] 1 subunit C2

Chain C2:



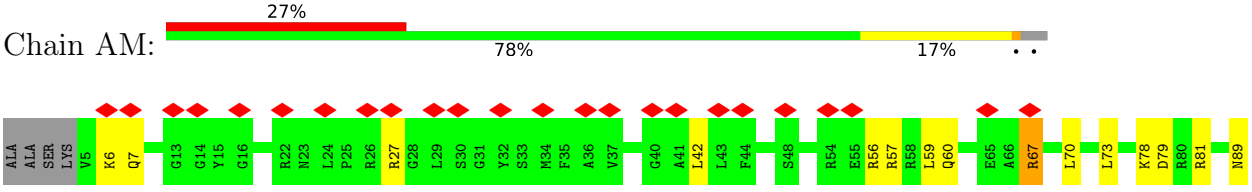
• Molecule 34: NADH:ubiquinone oxidoreductase subunit B4

Chain B4:



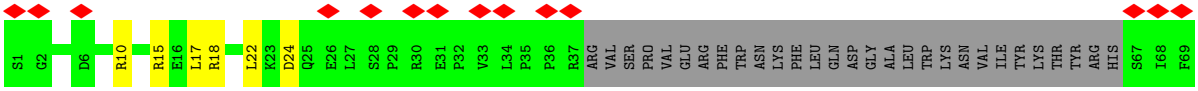
• Molecule 35: NDUFA13

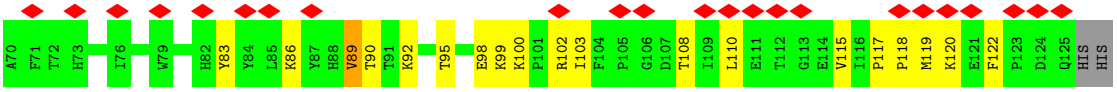
Chain AM:



• Molecule 36: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 6

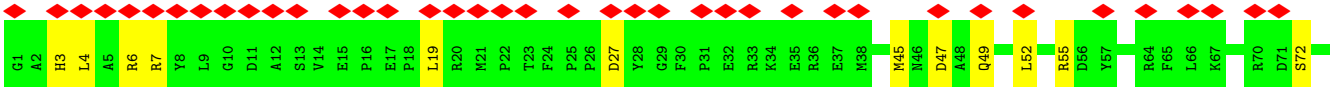
Chain B6:

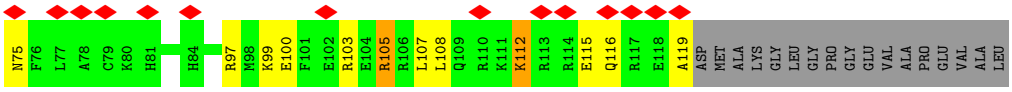




• Molecule 37: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 7

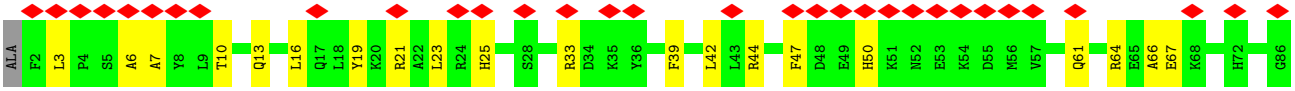
Chain B7:

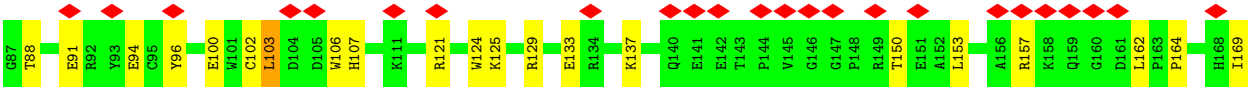




• Molecule 38: NADH:ubiquinone oxidoreductase subunit B9

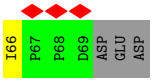
Chain B9:





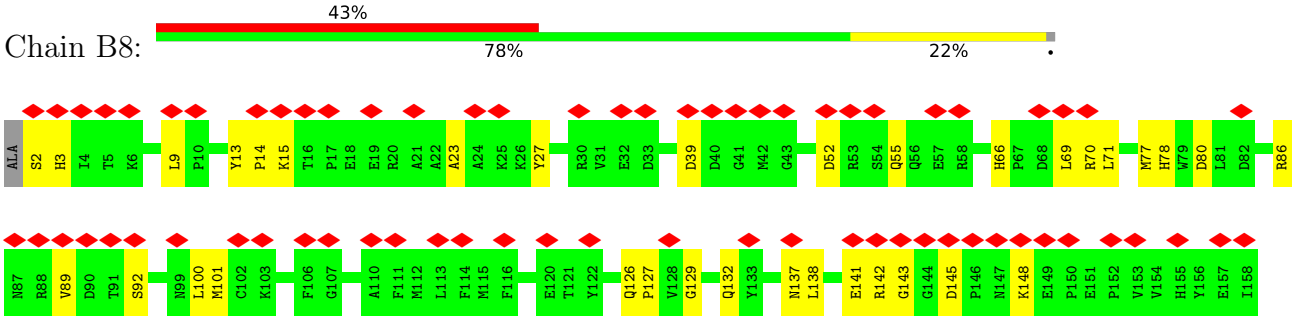
• Molecule 39: NADH:ubiquinone oxidoreductase subunit B2

Chain B2:



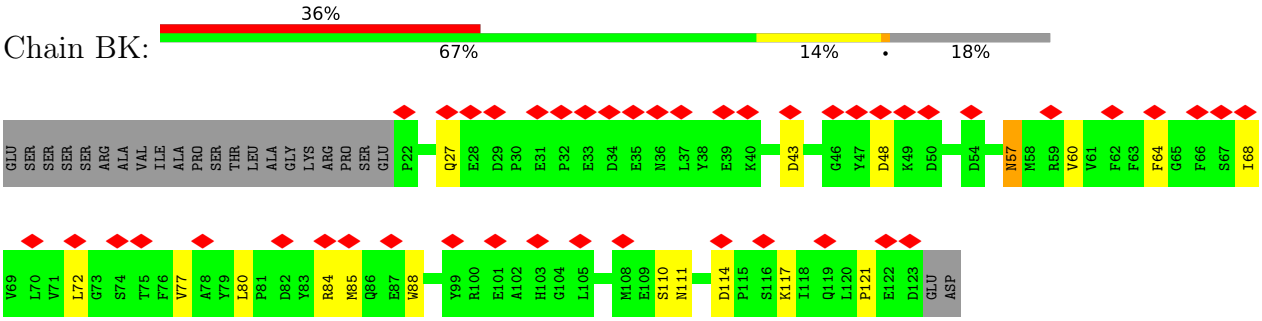
• Molecule 40: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 8, mitochondrial

Chain B8:



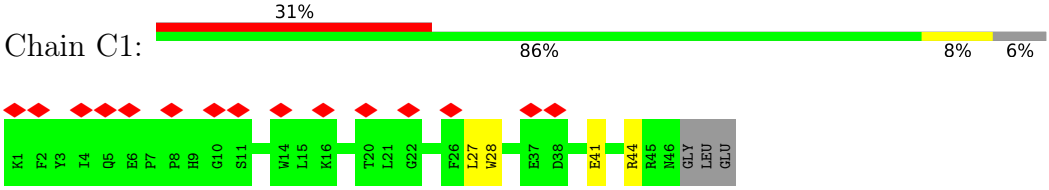
• Molecule 41: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 11, mitochondrial

Chain BK:



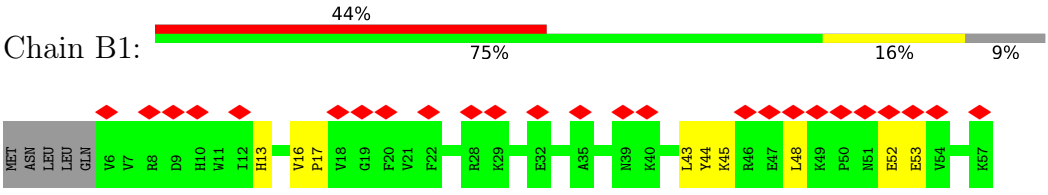
• Molecule 42: NDUFC1

Chain C1:



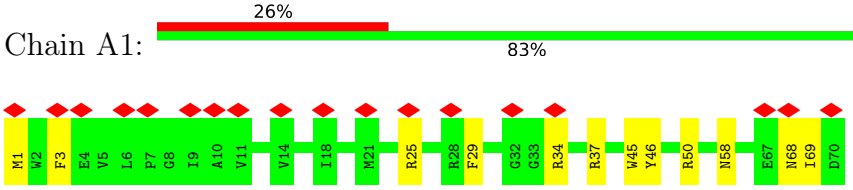
• Molecule 43: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 1

Chain B1:



• Molecule 44: NDUFA1

Chain A1:



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	57160	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 ($e^-/Å^2$)	51	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	FEI FALCON II (4k x 4k)	Depositor
Maximum map value	1.169	Depositor
Minimum map value	-0.272	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.016	Depositor
Recommended contour level	0.14	Depositor
Map size (Å)	716.8, 716.8, 716.8	wwPDB
Map dimensions	512, 512, 512	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.4, 1.4, 1.4	Depositor

5 Model quality (i)

5.1 Standard geometry (i)

Bond lengths and bond angles in the following residue types are not validated in this section: FMN, CDL, SF4, NDP, 3PE, ZMP, ZN, PC1, FES

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	V1	0.37	0/3386	0.60	0/4575
2	V2	0.36	0/1687	0.68	1/2295 (0.0%)
3	S1	0.37	0/5362	0.63	2/7266 (0.0%)
4	S2	0.42	0/3526	0.62	0/4778
5	S3	0.39	0/1776	0.60	0/2417
6	S7	0.43	0/1279	0.59	0/1728
7	S8	0.47	0/1446	0.61	0/1956
8	V3	0.33	0/344	0.69	0/465
9	S6	0.37	0/749	0.56	0/1009
10	S4	0.35	0/1048	0.58	0/1415
11	A9	0.35	0/2373	0.65	2/3207 (0.1%)
12	A2	0.31	0/676	0.61	0/911
13	A5	0.33	0/922	0.66	2/1249 (0.2%)
14	A6	0.32	0/994	0.55	1/1336 (0.1%)
15	A7	0.32	0/770	0.62	0/1040
16	AL	0.35	0/1233	0.62	1/1676 (0.1%)
17	AA	0.28	0/655	0.63	0/881
17	AB	0.32	0/714	0.62	0/963
18	D3	0.35	0/807	0.67	1/1103 (0.1%)
19	D1	0.40	0/2460	0.73	3/3361 (0.1%)
20	D6	0.38	0/1339	0.68	1/1810 (0.1%)
21	4L	0.36	0/758	0.73	0/1024
22	D5	0.37	0/4933	0.71	6/6710 (0.1%)
23	D4	0.39	0/3740	0.71	6/5095 (0.1%)
24	D2	0.40	0/2788	0.68	2/3795 (0.1%)
25	AK	0.31	0/1046	0.67	0/1419
26	B5	0.36	0/1189	0.57	1/1607 (0.1%)
27	A8	0.35	0/1441	0.66	1/1942 (0.1%)
28	BJ	0.35	0/1475	0.58	2/1989 (0.1%)
29	AJ	0.36	0/2644	0.64	2/3579 (0.1%)
30	S5	0.34	0/843	0.60	0/1128
31	A3	0.33	0/602	0.69	1/828 (0.1%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\#\|Z\| > 5$	RMSZ	$\#\|Z\| > 5$
32	B3	0.34	0/595	0.71	0/803
33	C2	0.37	0/1028	0.64	1/1388 (0.1%)
34	B4	0.34	0/1085	0.65	2/1467 (0.1%)
35	AM	0.36	0/1172	0.65	2/1579 (0.1%)
36	B6	0.34	0/841	0.68	0/1144
37	B7	0.34	0/1051	0.66	4/1408 (0.3%)
38	B9	0.35	0/1568	0.60	1/2123 (0.0%)
39	B2	0.36	0/590	0.63	1/810 (0.1%)
40	B8	0.37	0/1379	0.66	2/1884 (0.1%)
41	BK	0.37	0/880	0.62	1/1196 (0.1%)
42	C1	0.32	0/404	0.55	0/548
43	B1	0.32	0/462	0.61	0/624
44	A1	0.36	0/592	0.64	0/795
All	All	0.37	0/66652	0.65	49/90326 (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
1	V1	0	2
2	V2	0	3
3	S1	0	5
4	S2	0	1
5	S3	0	3
7	S8	0	1
11	A9	0	1
13	A5	0	1
15	A7	0	1
16	AL	0	3
19	D1	0	1
20	D6	0	2
22	D5	0	3
23	D4	0	3
25	AK	0	1
27	A8	0	1
28	BJ	0	1
29	AJ	0	1
30	S5	0	1
32	B3	0	1
33	C2	0	2

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Mol	Chain	#Chirality outliers	#Planarity outliers
34	B4	0	1
36	B6	0	3
39	B2	0	1
40	B8	0	1
43	B1	0	1
All	All	0	45

There are no bond length outliers.

All (49) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
11	A9	222	ASP	CB-CG-OD1	9.34	126.70	118.30
22	D5	69	LEU	CA-CB-CG	8.83	135.61	115.30
13	A5	89	LEU	CA-CB-CG	7.79	133.22	115.30
22	D5	413	LEU	CA-CB-CG	7.11	131.64	115.30
23	D4	367	LEU	CA-CB-CG	7.02	131.45	115.30
22	D5	552	LEU	CA-CB-CG	6.65	130.60	115.30
37	B7	27	ASP	CB-CG-OD1	6.58	124.22	118.30
37	B7	19	LEU	CA-CB-CG	6.51	130.28	115.30
22	D5	78	LEU	CA-CB-CG	6.27	129.72	115.30
19	D1	22	LEU	CA-CB-CG	6.25	129.67	115.30
23	D4	36	LEU	CA-CB-CG	6.13	129.40	115.30
2	V2	136	LEU	CA-CB-CG	6.02	129.15	115.30
22	D5	511	LEU	CA-CB-CG	6.00	129.10	115.30
19	D1	162	LEU	CA-CB-CG	5.88	128.83	115.30
23	D4	40	LEU	CA-CB-CG	5.86	128.79	115.30
22	D5	386	LEU	CA-CB-CG	5.85	128.75	115.30
3	S1	429	LEU	CA-CB-CG	5.84	128.72	115.30
27	A8	93	LEU	CA-CB-CG	5.80	128.65	115.30
3	S1	335	LEU	CA-CB-CG	5.80	128.65	115.30
34	B4	120	LEU	CA-CB-CG	5.72	128.45	115.30
28	BJ	21	PRO	C-N-CA	5.66	135.86	121.70
35	AM	126	LEU	CA-CB-CG	5.61	128.21	115.30
28	BJ	25	LEU	C-N-CD	-5.60	108.29	120.60
23	D4	50	LEU	CA-CB-CG	5.59	128.16	115.30
31	A3	34	LEU	CA-CB-CG	5.57	128.11	115.30
29	AJ	229	GLU	C-N-CA	5.56	135.60	121.70
37	B7	4	LEU	CA-CB-CG	5.55	128.06	115.30
24	D2	146	LEU	CA-CB-CG	5.52	128.00	115.30
40	B8	86	ARG	C-N-CA	5.52	135.51	121.70
16	AL	76	ASP	CB-CG-OD1	5.49	123.24	118.30
23	D4	126	LEU	CA-CB-CG	5.49	127.92	115.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
13	A5	89	LEU	CB-CG-CD2	-5.47	101.70	111.00
19	D1	129	LEU	CB-CG-CD2	5.44	120.25	111.00
11	A9	320	ARG	CA-CB-CG	5.43	125.34	113.40
37	B7	107	LEU	CA-CB-CG	5.42	127.77	115.30
29	AJ	275	ILE	C-N-CD	-5.39	108.73	120.60
34	B4	17	LEU	CA-CB-CG	5.36	127.62	115.30
35	AM	42	LEU	CA-CB-CG	5.35	127.60	115.30
26	B5	30	LEU	CA-CB-CG	5.35	127.60	115.30
23	D4	143	LEU	CA-CB-CG	5.34	127.58	115.30
20	D6	146	LEU	CA-CB-CG	5.29	127.47	115.30
38	B9	103	LEU	CA-CB-CG	5.28	127.45	115.30
41	BK	48	ASP	C-N-CA	5.25	134.83	121.70
24	D2	130	LEU	CA-CB-CG	5.25	127.37	115.30
33	C2	11	LEU	CA-CB-CG	5.24	127.36	115.30
39	B2	44	SER	C-N-CA	5.16	134.60	121.70
18	D3	73	LEU	CA-CB-CG	5.16	127.17	115.30
14	A6	110	GLU	C-N-CA	5.15	134.57	121.70
40	B8	100	LEU	CA-CB-CG	5.10	127.03	115.30

There are no chirality outliers.

All (45) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
13	A5	113	TRP	Peptide
15	A7	69	MET	Peptide
27	A8	52	PRO	Peptide
11	A9	310	LEU	Peptide
29	AJ	278	PHE	Peptide
25	AK	46	THR	Peptide
16	AL	102	PRO	Peptide
16	AL	31	ASN	Peptide
16	AL	43	LYS	Peptide
43	B1	52	GLU	Peptide
39	B2	56	PRO	Peptide
32	B3	22	LYS	Peptide
34	B4	76	TYR	Peptide
36	B6	122	PHE	Peptide
36	B6	86	LYS	Peptide
36	B6	98	GLU	Peptide
40	B8	141	GLU	Peptide
28	BJ	150	SER	Peptide
33	C2	4	GLY	Peptide

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Mol	Chain	Res	Type	Group
33	C2	8	ARG	Peptide
19	D1	91	MET	Peptide
23	D4	17	LEU	Peptide
23	D4	52	PHE	Peptide
23	D4	53	SER	Peptide
22	D5	359	MET	Peptide
22	D5	364	LYS	Peptide
22	D5	365	ALA	Peptide
20	D6	115	ILE	Peptide
20	D6	137	SER	Peptide
3	S1	247	VAL	Peptide
3	S1	253	ARG	Peptide
3	S1	341	ASP	Peptide
3	S1	380	VAL	Peptide
3	S1	484	THR	Peptide
4	S2	73	VAL	Peptide
5	S3	76	ALA	Peptide
5	S3	79	THR	Peptide
5	S3	80	ALA	Peptide
30	S5	92	THR	Peptide
7	S8	106	THR	Peptide
1	V1	28	ARG	Peptide
1	V1	331	THR	Peptide
2	V2	13	PRO	Peptide
2	V2	194	GLU	Peptide
2	V2	35	VAL	Peptide

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	V1	3312	0	3268	69	0
2	V2	1647	0	1660	28	0
3	S1	5275	0	5304	100	0
4	S2	3436	0	3379	56	0
5	S3	1726	0	1676	43	0
6	S7	1248	0	1256	25	0
7	S8	1415	0	1374	32	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
8	V3	335	0	316	13	0
9	S6	737	0	710	12	0
10	S4	1025	0	1023	21	0
11	A9	2321	0	2350	47	0
12	A2	665	0	678	10	0
13	A5	902	0	936	12	0
14	A6	970	0	980	25	0
15	A7	752	0	766	18	0
16	AL	1192	0	1164	12	0
17	AA	645	0	649	7	0
17	AB	702	0	692	13	0
18	D3	787	0	832	6	0
19	D1	2390	0	2517	53	0
20	D6	1308	0	1329	23	0
21	4L	748	0	794	15	0
22	D5	4805	0	4950	107	0
23	D4	3646	0	3850	66	0
24	D2	2724	0	2930	53	0
25	AK	1025	0	1033	10	0
26	B5	1156	0	1177	15	0
27	A8	1404	0	1384	30	0
28	BJ	1441	0	1417	26	0
29	AJ	2583	0	2547	37	0
30	S5	822	0	820	13	0
31	A3	582	0	583	16	0
32	B3	578	0	570	14	0
33	C2	997	0	983	18	0
34	B4	1059	0	1062	14	0
35	AM	1143	0	1137	20	0
36	B6	815	0	837	17	0
37	B7	1026	0	995	15	0
38	B9	1515	0	1469	29	0
39	B2	563	0	509	9	0
40	B8	1324	0	1219	23	0
41	BK	853	0	800	13	0
42	C1	391	0	391	6	0
43	B1	449	0	453	9	0
44	A1	577	0	570	8	0
45	S1	16	0	0	1	0
45	S7	8	0	0	0	0
45	S8	16	0	0	0	0
45	V1	8	0	0	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
46	V1	31	0	19	1	0
47	S1	4	0	0	0	0
47	V2	4	0	0	0	0
48	S6	1	0	0	0	0
49	A9	48	0	26	5	0
50	AA	34	0	40	7	0
50	B9	31	0	34	3	0
51	A8	25	0	24	1	0
51	D1	19	0	12	0	0
51	D4	40	0	54	2	0
51	D5	38	0	50	4	0
52	D5	36	0	16	2	0
53	D4	28	0	30	0	0
All	All	65403	0	65644	970	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 7.

All (970) 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)
5:S3:38:GLN:O	15:A7:70:SER:HA	1.62	0.98
3:S1:449:PRO:O	3:S1:489:VAL:HA	1.62	0.97
5:S3:38:GLN:HA	15:A7:70:SER:O	1.78	0.82
3:S1:266:LYS:O	3:S1:270:ALA:HB2	1.79	0.81
37:B7:108:LEU:O	37:B7:112:LYS:HB2	1.80	0.81
14:A6:70:ALA:HA	50:AA:101:ZMP:O2	1.82	0.80
37:B7:115:GLU:O	37:B7:119:ALA:HB3	1.84	0.78
7:S8:65:HIS:HE2	7:S8:116:CYS:HG	1.30	0.76
14:A6:37:ALA:O	14:A6:41:GLU:HB2	1.86	0.75
38:B9:50:HIS:NE2	50:B9:201:ZMP:H8A	2.02	0.74
12:A2:21:HIS:O	12:A2:62:PRO:HA	1.88	0.73
5:S3:80:ALA:HA	5:S3:91:GLU:O	1.90	0.71
11:A9:108:ASP:O	11:A9:112:LYS:HB3	1.91	0.70
27:A8:146:ARG:HH12	30:S5:41:GLU:HB3	1.56	0.70
15:A7:39:LYS:H	35:AM:7:GLN:HB2	1.58	0.69
14:A6:62:VAL:CG2	50:AA:101:ZMP:H22	2.23	0.69
3:S1:675:ASP:O	3:S1:679:ARG:HB2	1.93	0.68
4:S2:282:GLU:HB2	4:S2:313:GLN:HE22	1.59	0.66
14:A6:66:PHE:HA	50:AA:101:ZMP:O1	1.94	0.66
23:D4:204:MET:HB3	23:D4:209:LEU:HD22	1.77	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
23:D4:370:PRO:HA	23:D4:375:LEU:HD13	1.77	0.66
4:S2:105:ARG:NH1	6:S7:149:CYS:SG	2.62	0.66
11:A9:135:LEU:HA	11:A9:167:LYS:HD3	1.76	0.66
14:A6:62:VAL:HG23	50:AA:101:ZMP:H22	1.78	0.66
32:B3:22:LYS:H	32:B3:46:ARG:HH11	1.43	0.66
3:S1:126:ASP:HB2	4:S2:328:ALA:HB3	1.77	0.65
22:D5:597:ILE:HD11	25:AK:34:VAL:HG22	1.78	0.65
4:S2:405:MET:SD	4:S2:421:GLN:NE2	2.70	0.65
14:A6:63:ARG:HB2	17:AA:45:LEU:HD21	1.79	0.65
3:S1:117:GLN:NE2	45:S1:801:SF4:S3	2.70	0.65
23:D4:82:HIS:HB2	23:D4:432:ARG:HH12	1.62	0.65
33:C2:113:PHE:HB2	41:BK:121:PRO:HG2	1.79	0.65
3:S1:318:ILE:HA	3:S1:344:CYS:O	1.96	0.65
5:S3:48:LEU:HB3	5:S3:105:ILE:HG22	1.80	0.64
5:S3:88:ASN:HD22	5:S3:112:ASP:HB3	1.61	0.64
1:V1:213:VAL:HG13	1:V1:217:GLY:HA2	1.80	0.64
4:S2:19:MET:HG2	24:D2:295:ARG:HH12	1.63	0.63
35:AM:124:TYR:HB3	35:AM:132:ILE:HG22	1.78	0.63
22:D5:267:THR:O	22:D5:274:GLN:NE2	2.32	0.63
22:D5:380:LEU:HD23	22:D5:381:THR:HG23	1.80	0.63
29:AJ:13:LYS:HD2	29:AJ:16:LYS:HG3	1.79	0.63
1:V1:301:GLY:HA2	1:V1:333:ALA:HB3	1.81	0.63
3:S1:286:ASN:O	3:S1:289:GLY:N	2.32	0.63
19:D1:152:SER:HG	19:D1:301:CYS:HG	1.47	0.63
22:D5:288:THR:O	22:D5:292:ALA:HB2	1.98	0.62
22:D5:554:ASP:O	22:D5:558:LEU:HB3	2.00	0.62
3:S1:355:GLY:HA2	3:S1:361:ASN:HD21	1.65	0.62
22:D5:451:ILE:O	22:D5:455:LYS:HB2	1.98	0.62
33:C2:30:ARG:HE	33:C2:76:LEU:HD11	1.64	0.62
11:A9:109:VAL:O	11:A9:113:ILE:HB	1.98	0.62
22:D5:161:ARG:NH1	38:B9:88:THR:O	2.33	0.62
23:D4:231:LEU:O	23:D4:235:LEU:HB2	2.00	0.62
26:B5:132:LEU:HD11	30:S5:19:ILE:HD12	1.82	0.61
3:S1:40:PHE:O	3:S1:158:ARG:NH2	2.33	0.61
24:D2:347:GLU:O	33:C2:78:ARG:NH2	2.33	0.61
31:A3:66:PRO:HB3	31:A3:73:GLN:HB2	1.82	0.61
39:B2:7:ILE:HD12	39:B2:16:GLN:HE21	1.66	0.61
20:D6:133:SER:OG	35:AM:67:ARG:NH2	2.33	0.61
22:D5:482:MET:SD	22:D5:487:LYS:NZ	2.72	0.61
29:AJ:77:CYS:O	29:AJ:92:ASN:ND2	2.32	0.61
4:S2:48:THR:HG22	4:S2:67:GLU:HG2	1.82	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
24:D2:222:ASN:HD21	24:D2:233:THR:HG22	1.64	0.61
5:S3:78:LEU:HA	5:S3:93:VAL:O	2.00	0.61
6:S7:65:PRO:HB3	19:D1:33:PHE:HB2	1.83	0.61
6:S7:70:ASP:OD2	19:D1:34:ARG:NH1	2.34	0.61
1:V1:366:ARG:NH1	3:S1:155:GLN:OE1	2.34	0.61
16:AL:117:LEU:HD13	16:AL:123:GLN:HA	1.83	0.61
19:D1:310:LEU:HD21	31:A3:32:PRO:HA	1.82	0.61
3:S1:318:ILE:HG12	3:S1:344:CYS:HB2	1.82	0.61
3:S1:377:VAL:O	3:S1:406:VAL:HA	2.01	0.61
51:D4:501:3PE:H291	24:D2:288:LEU:HD23	1.82	0.61
13:A5:37:ILE:O	13:A5:44:ARG:NH1	2.33	0.61
29:AJ:19:THR:HG23	29:AJ:20:GLU:HG3	1.83	0.61
37:B7:112:LYS:O	37:B7:116:GLN:HB2	2.00	0.61
22:D5:267:THR:OG1	22:D5:274:GLN:NE2	2.34	0.60
22:D5:483:PRO:HD2	22:D5:486:LEU:HD22	1.82	0.60
4:S2:338:MET:SD	4:S2:348:HIS:ND1	2.74	0.60
3:S1:283:MET:HB2	3:S1:560:ILE:HB	1.84	0.60
23:D4:1:MET:HG2	23:D4:111:THR:HG21	1.84	0.60
29:AJ:101:TYR:HH	29:AJ:159:THR:HG1	1.48	0.60
33:C2:66:THR:HG1	42:C1:28:TRP:HE1	1.50	0.60
11:A9:51:CYS:SG	11:A9:52:GLU:N	2.74	0.60
13:A5:34:LEU:O	13:A5:44:ARG:NH1	2.35	0.60
22:D5:22:ILE:HD11	22:D5:119:LYS:HD3	1.83	0.60
18:D3:10:ASN:HD21	19:D1:10:ILE:HG21	1.65	0.60
17:AB:82:ASP:OD1	36:B6:15:ARG:NH2	2.34	0.60
1:V1:126:GLY:HA2	1:V1:131:ALA:HB3	1.84	0.60
11:A9:92:ILE:HG22	11:A9:130:ILE:HB	1.84	0.60
23:D4:269:MET:SD	23:D4:399:ASN:ND2	2.75	0.60
14:A6:62:VAL:HG22	50:AA:101:ZMP:H2	1.84	0.60
22:D5:556:ILE:HD11	34:B4:79:PHE:HB2	1.84	0.59
28:BJ:161:ARG:NH2	41:BK:111:ASN:OD1	2.34	0.59
3:S1:240:VAL:HG12	3:S1:250:ILE:HG22	1.83	0.59
4:S2:72:MET:HG3	4:S2:73:VAL:HG22	1.84	0.59
4:S2:130:PRO:HG2	4:S2:135:GLN:HE21	1.67	0.59
1:V1:134:ALA:HB3	1:V1:175:VAL:HG12	1.82	0.59
22:D5:342:CYS:HG	22:D5:369:THR:HG1	1.49	0.59
31:A3:27:LEU:O	31:A3:31:LEU:HB2	2.02	0.59
3:S1:227:SER:H	3:S1:253:ARG:HH22	1.49	0.59
7:S8:135:PRO:HG3	7:S8:164:GLU:HG2	1.83	0.59
2:V2:39:PRO:HA	8:V3:65:GLN:HB3	1.84	0.59
27:A8:136:LEU:HB3	31:A3:57:ARG:HH21	1.66	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:S2:360:PRO:HA	4:S2:380:SER:O	2.02	0.59
29:AJ:202:ILE:O	29:AJ:206:TYR:HB2	2.02	0.59
37:B7:6:ARG:HH12	37:B7:105:ARG:HH21	1.51	0.59
1:V1:27:GLY:H	1:V1:113:HIS:HE1	1.51	0.59
19:D1:22:LEU:HB3	19:D1:48:PRO:HG2	1.84	0.59
20:D6:141:MET:HA	20:D6:144:ALA:HB3	1.84	0.59
22:D5:54:PHE:HE1	22:D5:60:GLU:HG2	1.68	0.59
24:D2:235:ASN:HD21	29:AJ:289:SER:HB2	1.68	0.59
28:BJ:159:LYS:NZ	33:C2:112:VAL:O	2.36	0.58
3:S1:592:LEU:O	3:S1:594:ARG:NH1	2.35	0.58
38:B9:102:CYS:SG	38:B9:103:LEU:N	2.75	0.58
19:D1:131:GLY:HA2	19:D1:134:ARG:HE	1.66	0.58
23:D4:22:MET:O	23:D4:26:ASN:ND2	2.35	0.58
23:D4:221:VAL:HG23	23:D4:222:GLU:HG3	1.84	0.58
1:V1:32:ARG:HG3	1:V1:34:LYS:H	1.66	0.58
3:S1:41:CYS:SG	3:S1:52:CYS:HB3	2.43	0.58
1:V1:297:VAL:HG22	1:V1:336:VAL:HG12	1.86	0.58
21:4L:55:LEU:HD13	30:S5:24:GLN:HA	1.86	0.58
22:D5:83:ASP:O	22:D5:87:MET:HB2	2.04	0.58
38:B9:10:THR:HB	38:B9:13:GLN:H	1.69	0.58
24:D2:130:LEU:O	24:D2:134:GLN:HB2	2.04	0.58
28:BJ:98:ASP:OD2	28:BJ:141:ARG:NH2	2.37	0.58
32:B3:23:ILE:HB	32:B3:46:ARG:HG2	1.85	0.58
1:V1:202:LYS:HB3	1:V1:361:GLN:HE21	1.68	0.57
23:D4:170:THR:HG23	23:D4:171:MET:HG3	1.86	0.57
38:B9:91:GLU:HB3	38:B9:94:GLU:HB2	1.85	0.57
9:S6:68:HIS:HE1	9:S6:87:CYS:SG	2.14	0.57
6:S7:147:PRO:HG2	7:S8:139:PHE:HD2	1.70	0.57
15:A7:45:SER:O	15:A7:46:HIS:ND1	2.37	0.57
34:B4:13:LEU:HD22	34:B4:14:PRO:HD2	1.86	0.57
4:S2:413:ASP:OD2	19:D1:281:ARG:NH1	2.37	0.57
13:A5:10:LEU:HD22	13:A5:13:LEU:HD13	1.86	0.57
1:V1:109:GLU:OE2	1:V1:112:ARG:NH2	2.36	0.57
24:D2:232:HIS:HE1	29:AJ:276:PRO:HG3	1.68	0.57
24:D2:88:LYS:HG3	24:D2:148:SER:HB3	1.86	0.57
40:B8:145:ASP:HB3	40:B8:148:LYS:HB2	1.87	0.57
27:A8:144:ARG:HH12	30:S5:57:ILE:HD13	1.69	0.57
41:BK:114:ASP:HB3	41:BK:117:LYS:HB2	1.86	0.57
1:V1:154:ARG:HD2	8:V3:54:LEU:HD21	1.87	0.57
4:S2:261:ARG:NH2	4:S2:268:ASP:OD1	2.37	0.57
27:A8:9:LEU:HA	27:A8:12:LEU:HB2	1.86	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:S8:104:ARG:O	7:S8:105:ARG:NH1	2.37	0.57
24:D2:154:ILE:HG23	24:D2:191:THR:HG22	1.87	0.57
29:AJ:72:ARG:NH1	29:AJ:295:GLU:OE1	2.37	0.57
2:V2:98:TYR:H	2:V2:136:LEU:HA	1.70	0.56
20:D6:58:LEU:O	20:D6:62:GLY:CA	2.54	0.56
36:B6:89:VAL:HG22	36:B6:95:THR:HG21	1.87	0.56
5:S3:150:ARG:NH2	14:A6:91:GLU:OE1	2.38	0.56
28:BJ:8:VAL:O	28:BJ:108:ARG:NH2	2.32	0.56
29:AJ:19:THR:OG1	29:AJ:20:GLU:N	2.38	0.56
1:V1:106:LYS:HD3	1:V1:332:ALA:HB2	1.88	0.56
1:V1:165:ASN:ND2	1:V1:169:SER:O	2.37	0.56
6:S7:62:MET:HG2	6:S7:156:LEU:HD23	1.87	0.56
1:V1:362:CYS:HB3	1:V1:364:PRO:HD2	1.87	0.56
5:S3:94:TYR:HB2	5:S3:107:VAL:HB	1.87	0.56
12:A2:19:ARG:HH21	12:A2:65:TRP:HE3	1.52	0.56
25:AK:68:ILE:HG21	25:AK:99:THR:HG21	1.88	0.56
27:A8:46:ARG:NH1	35:AM:79:ASP:OD2	2.39	0.56
29:AJ:168:VAL:HG12	29:AJ:219:GLU:HB2	1.87	0.56
2:V2:105:THR:OG1	2:V2:106:THR:N	2.38	0.56
4:S2:204:PRO:HD3	7:S8:60:ARG:HH22	1.69	0.56
4:S2:388:ARG:NH1	4:S2:389:CYS:O	2.37	0.56
24:D2:69:LEU:HD11	24:D2:97:LEU:HD22	1.86	0.56
27:A8:35:CYS:SG	27:A8:36:ASP:N	2.78	0.56
22:D5:547:LYS:O	22:D5:552:LEU:CB	2.53	0.56
27:A8:142:HIS:H	35:AM:114:ARG:HD3	1.70	0.56
3:S1:252:PRO:HB3	3:S1:263:ILE:HB	1.88	0.56
23:D4:363:SER:O	23:D4:367:LEU:HB2	2.06	0.56
31:A3:48:THR:HG21	35:AM:57:ARG:HH21	1.71	0.56
44:A1:1:MET:HG3	44:A1:3:PHE:H	1.71	0.56
9:S6:12:THR:OG1	9:S6:14:THR:O	2.23	0.56
10:S4:12:THR:HG21	14:A6:15:SER:HA	1.88	0.56
22:D5:586:LEU:HD21	25:AK:44:THR:HG23	1.87	0.56
26:B5:43:ILE:HG13	26:B5:71:ILE:HD11	1.87	0.56
1:V1:292:ASP:HA	1:V1:309:LYS:HE3	1.86	0.56
4:S2:35:ASP:O	24:D2:49:ASN:ND2	2.35	0.56
2:V2:40:GLU:HB3	8:V3:67:SER:HB2	1.86	0.55
19:D1:152:SER:OG	19:D1:301:CYS:SG	2.58	0.55
28:BJ:68:ARG:NH1	43:B1:43:LEU:O	2.39	0.55
34:B4:120:LEU:HD12	34:B4:122:ARG:HB3	1.88	0.55
3:S1:453:LEU:HB3	3:S1:492:ILE:HG22	1.89	0.55
23:D4:165:ILE:HD11	24:D2:264:TRP:HE1	1.71	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
37:B7:97:ARG:NH2	40:B8:129:GLY:O	2.34	0.55
22:D5:119:LYS:NZ	52:D5:901:CDL:OB7	2.36	0.55
4:S2:231:ASN:OD1	4:S2:236:ARG:NH2	2.36	0.55
8:V3:58:LEU:O	8:V3:62:ARG:NH2	2.39	0.55
23:D4:52:PHE:O	23:D4:56:PHE:HB2	2.06	0.55
9:S6:20:ASP:OD1	9:S6:25:ARG:NH1	2.39	0.55
27:A8:148:GLU:OE1	30:S5:50:ARG:NH1	2.39	0.55
2:V2:98:TYR:HD2	2:V2:136:LEU:HB2	1.71	0.55
3:S1:225:THR:HB	3:S1:240:VAL:HG23	1.88	0.55
3:S1:396:ARG:NH1	3:S1:416:THR:O	2.40	0.55
22:D5:389:PHE:O	22:D5:393:ASP:HB2	2.06	0.55
15:A7:11:ARG:HB3	15:A7:19:LEU:HD13	1.88	0.55
25:AK:122:ALA:O	25:AK:126:MET:HB2	2.07	0.55
40:B8:55:GLN:O	40:B8:70:ARG:NH2	2.40	0.55
5:S3:85:THR:HG21	10:S4:87:SER:H	1.72	0.55
6:S7:165:LYS:NZ	16:AL:77:VAL:O	2.40	0.55
6:S7:165:LYS:NZ	16:AL:78:ASP:OD1	2.33	0.55
7:S8:22:ALA:O	7:S8:26:LEU:HB2	2.07	0.55
3:S1:382:THR:HB	3:S1:454:GLY:HA3	1.89	0.55
3:S1:588:MET:HG3	10:S4:63:GLU:HA	1.88	0.55
23:D4:25:ILE:HG23	41:BK:60:VAL:HG11	1.88	0.55
28:BJ:68:ARG:NH2	43:B1:45:LYS:O	2.39	0.55
5:S3:38:GLN:CA	15:A7:70:SER:O	2.53	0.54
23:D4:389:SER:OG	34:B4:108:ARG:NH2	2.40	0.54
3:S1:163:ALA:O	3:S1:168:GLY:N	2.38	0.54
22:D5:123:LEU:HA	22:D5:126:ILE:HD12	1.89	0.54
4:S2:116:GLN:HG3	4:S2:138:ARG:HD3	1.89	0.54
4:S2:151:ILE:HD13	4:S2:304:MET:HE1	1.90	0.54
4:S2:335:ARG:HG2	4:S2:339:LYS:HE2	1.89	0.54
3:S1:8:LEU:HD22	3:S1:19:MET:HB3	1.89	0.54
3:S1:40:PHE:HB2	3:S1:52:CYS:HB2	1.90	0.54
19:D1:165:LEU:HD21	19:D1:241:LEU:HA	1.89	0.54
22:D5:33:PRO:HB3	22:D5:118:PHE:HE2	1.73	0.54
28:BJ:88:GLU:OE1	28:BJ:150:SER:OG	2.26	0.54
1:V1:362:CYS:N	45:V1:500:SF4:S2	2.75	0.54
11:A9:137:ALA:HA	11:A9:146:LEU:HB3	1.88	0.54
19:D1:102:VAL:HB	19:D1:150:LEU:HD21	1.90	0.54
20:D6:51:PHE:O	20:D6:55:MET:HB2	2.07	0.54
23:D4:459:TYR:O	41:BK:84:ARG:NH1	2.41	0.54
37:B7:52:LEU:HD22	40:B8:138:LEU:HD21	1.89	0.54
22:D5:233:LEU:HG	22:D5:303:ALA:HB1	1.89	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
51:A8:301:3PE:H231	33:C2:29:PRO:HB2	1.89	0.54
3:S1:276:ARG:HG2	3:S1:277:GLN:HG3	1.89	0.54
5:S3:38:GLN:O	15:A7:70:SER:CA	2.47	0.54
7:S8:74:GLU:OE2	7:S8:105:ARG:NH2	2.40	0.54
20:D6:137:SER:HB2	20:D6:140:ALA:H	1.73	0.54
20:D6:159:TRP:HE1	24:D2:12:THR:HG22	1.73	0.54
3:S1:229:ASP:HB3	3:S1:235:GLY:HA2	1.90	0.54
22:D5:227:PHE:H	22:D5:284:THR:HG22	1.73	0.54
27:A8:110:VAL:O	27:A8:115:GLY:N	2.37	0.54
1:V1:305:PRO:HG3	1:V1:413:TRP:HB3	1.88	0.54
5:S3:41:GLN:NE2	5:S3:49:GLU:OE1	2.41	0.54
7:S8:79:ALA:HB2	7:S8:106:THR:HG22	1.89	0.54
11:A9:136:ASN:ND2	11:A9:291:ASP:OD1	2.41	0.54
20:D6:163:ILE:HG13	24:D2:12:THR:HG21	1.90	0.54
23:D4:134:THR:O	23:D4:142:ARG:NH1	2.41	0.54
24:D2:292:PHE:HA	24:D2:295:ARG:HG2	1.88	0.54
28:BJ:80:ASP:HB3	28:BJ:83:CYS:HB3	1.89	0.54
17:AB:87:TYR:HB2	36:B6:22:LEU:HD23	1.90	0.53
30:S5:94:PRO:O	30:S5:98:SER:OG	2.26	0.53
1:V1:101:GLU:O	1:V1:104:THR:OG1	2.25	0.53
22:D5:154:LEU:HB3	22:D5:243:VAL:HG13	1.91	0.53
38:B9:153:LEU:HD13	38:B9:164:PRO:HG2	1.90	0.53
24:D2:109:ALA:HB2	24:D2:161:SER:HA	1.90	0.53
1:V1:358:SER:OG	45:V1:500:SF4:S3	2.62	0.53
2:V2:24:THR:HG22	2:V2:26:GLU:H	1.73	0.53
11:A9:19:ILE:O	11:A9:43:SER:OG	2.27	0.53
22:D5:547:LYS:O	22:D5:552:LEU:HB3	2.09	0.53
1:V1:378:ARG:O	1:V1:382:GLY:N	2.42	0.53
4:S2:6:PRO:HG3	24:D2:303:THR:HB	1.91	0.53
6:S7:139:ILE:HG22	6:S7:140:VAL:HG13	1.90	0.53
11:A9:167:LYS:O	11:A9:229:ALA:HA	2.07	0.53
1:V1:309:LYS:NZ	1:V1:313:GLU:OE2	2.40	0.53
7:S8:3:LYS:HG3	15:A7:110:PRO:HA	1.88	0.53
29:AJ:169:VAL:O	29:AJ:220:VAL:HA	2.08	0.53
37:B7:72:SER:HB2	37:B7:75:ASN:HB2	1.91	0.53
3:S1:378:LEU:HG	3:S1:451:VAL:HG22	1.91	0.53
19:D1:77:LEU:HD11	19:D1:111:LEU:HD12	1.90	0.53
22:D5:294:THR:H	22:D5:425:ARG:HH12	1.56	0.53
25:AK:39:SER:HB2	25:AK:54:ARG:HH22	1.74	0.53
22:D5:149:ILE:HG12	23:D4:364:LEU:HD21	1.90	0.53
23:D4:55:THR:O	23:D4:113:THR:OG1	2.27	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
32:B3:28:LEU:HA	32:B3:31:VAL:HG12	1.90	0.53
40:B8:23:ALA:O	40:B8:27:TYR:HB2	2.09	0.53
2:V2:27:ASN:OD1	2:V2:30:ARG:NH1	2.42	0.53
5:S3:64:LEU:HD23	5:S3:96:LEU:HD22	1.90	0.53
12:A2:17:GLU:HG2	12:A2:51:PRO:HG2	1.90	0.53
23:D4:364:LEU:HD23	23:D4:367:LEU:HD23	1.89	0.53
40:B8:71:LEU:HD11	40:B8:77:MET:HG2	1.89	0.53
21:4L:73:LEU:HD21	24:D2:41:ILE:HG13	1.91	0.53
28:BJ:69:ARG:NH1	28:BJ:90:GLN:OE1	2.41	0.53
1:V1:33:LEU:HD23	1:V1:155:GLU:HB3	1.90	0.52
4:S2:146:ARG:HH22	4:S2:270:ARG:HD3	1.73	0.52
5:S3:192:GLN:HE21	5:S3:195:ARG:HH12	1.56	0.52
49:A9:401:NDP:N3A	49:A9:401:NDP:O3X	2.42	0.52
29:AJ:30:ASN:ND2	29:AJ:203:GLU:OE2	2.42	0.52
3:S1:312:GLY:N	3:S1:339:ASP:OD2	2.39	0.52
21:4L:58:MET:HB3	21:4L:62:ILE:HD12	1.91	0.52
22:D5:130:ILE:HG23	22:D5:139:GLN:HE21	1.74	0.52
23:D4:158:LEU:HD21	24:D2:283:ALA:HB1	1.91	0.52
23:D4:388:TRP:O	34:B4:108:ARG:NH2	2.42	0.52
23:D4:457:PRO:O	41:BK:84:ARG:NH2	2.42	0.52
27:A8:166:LEU:HD23	27:A8:167:PHE:H	1.73	0.52
38:B9:3:LEU:HD11	38:B9:6:ALA:HB3	1.90	0.52
40:B8:69:LEU:HB3	40:B8:71:LEU:HD23	1.90	0.52
1:V1:59:GLU:HG3	1:V1:234:ILE:HG22	1.91	0.52
3:S1:442:VAL:O	3:S1:446:ALA:HB2	2.09	0.52
10:S4:36:ARG:NH2	10:S4:58:GLU:OE1	2.43	0.52
17:AB:21:LEU:HD21	32:B3:47:ASN:HA	1.91	0.52
4:S2:295:ASP:OD1	7:S8:6:ASN:ND2	2.42	0.52
9:S6:51:GLN:HG2	9:S6:92:ARG:HB2	1.90	0.52
22:D5:76:LEU:HB2	22:D5:136:ASN:HD21	1.74	0.52
22:D5:264:TYR:HA	22:D5:267:THR:HG22	1.91	0.52
3:S1:41:CYS:H	3:S1:52:CYS:HB3	1.75	0.52
19:D1:153:VAL:O	19:D1:157:ASN:ND2	2.42	0.52
23:D4:153:THR:O	23:D4:157:SER:HB3	2.09	0.52
3:S1:157:THR:HG23	3:S1:160:ILE:HD12	1.91	0.52
19:D1:55:LEU:HD22	19:D1:221:ALA:HB2	1.91	0.52
24:D2:338:PRO:O	27:A8:169:TRP:NE1	2.42	0.52
28:BJ:68:ARG:HH12	43:B1:45:LYS:H	1.58	0.52
4:S2:46:ASN:HD21	4:S2:74:ARG:HH21	1.58	0.52
20:D6:132:ASP:OD1	35:AM:78:LYS:NZ	2.43	0.52
27:A8:17:VAL:HG21	35:AM:73:LEU:HD21	1.92	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:V1:36:ALA:HB1	1:V1:41:ASP:HB2	1.92	0.52
40:B8:52:ASP:OD1	40:B8:78:HIS:NE2	2.33	0.52
1:V1:28:ARG:HH21	2:V2:199:LEU:HD22	1.75	0.52
22:D5:224:SER:OG	22:D5:226:GLN:NE2	2.43	0.52
3:S1:403:ASP:OD1	10:S4:126:LYS:NZ	2.43	0.52
3:S1:564:ALA:HB3	3:S1:569:LYS:HD3	1.92	0.51
7:S8:25:LEU:HD21	31:A3:17:VAL:HA	1.92	0.51
29:AJ:116:LEU:O	29:AJ:260:ARG:NH2	2.41	0.51
8:V3:70:ARG:NH2	10:S4:125:ASN:O	2.43	0.51
26:B5:26:ARG:O	26:B5:30:LEU:HB2	2.11	0.51
36:B6:92:LYS:O	36:B6:95:THR:OG1	2.28	0.51
1:V1:368:GLY:HA2	1:V1:395:ILE:HD11	1.93	0.51
3:S1:285:ARG:HH22	16:AL:144:TYR:H	1.59	0.51
19:D1:111:LEU:HD13	19:D1:114:TYR:HD2	1.75	0.51
20:D6:25:SER:HB3	20:D6:28:TYR:HD2	1.76	0.51
24:D2:243:LEU:HD21	33:C2:44:ILE:HD11	1.91	0.51
26:B5:66:TYR:HA	28:BJ:63:TYR:H	1.75	0.51
27:A8:37:LYS:NZ	31:A3:67:SER:O	2.43	0.51
27:A8:77:CYS:HB2	27:A8:113:LYS:HD2	1.92	0.51
36:B6:100:LYS:HB3	37:B7:49:GLN:HE22	1.75	0.51
5:S3:78:LEU:CA	5:S3:93:VAL:O	2.58	0.51
18:D3:67:LEU:HD22	21:4L:65:VAL:HG23	1.92	0.51
20:D6:14:VAL:HG21	21:4L:7:ASN:HB2	1.92	0.51
26:B5:64:TRP:HB2	26:B5:73:ARG:HG3	1.92	0.51
3:S1:159:CYS:HB2	3:S1:199:ILE:HD11	1.92	0.51
3:S1:450:MET:HA	3:S1:489:VAL:O	2.11	0.51
3:S1:544:VAL:HG22	3:S1:559:VAL:HB	1.93	0.51
37:B7:115:GLU:O	37:B7:119:ALA:CB	2.58	0.51
1:V1:343:ILE:HD13	1:V1:422:PHE:HE2	1.75	0.51
4:S2:261:ARG:O	4:S2:288:GLY:N	2.43	0.51
14:A6:43:PRO:HA	14:A6:46:VAL:HG12	1.93	0.51
33:C2:66:THR:HG22	42:C1:27:LEU:HD23	1.93	0.51
38:B9:133:GLU:O	38:B9:137:LYS:HB2	2.11	0.51
11:A9:95:VAL:O	49:A9:401:NDP:O3D	2.29	0.51
12:A2:78:LEU:HD22	12:A2:86:VAL:HG22	1.92	0.51
19:D1:168:THR:HG22	35:AM:56:ARG:HH12	1.75	0.51
21:4L:40:LEU:HD22	24:D2:75:ILE:HD12	1.93	0.51
4:S2:91:ILE:HG12	4:S2:99:ALA:HB1	1.91	0.51
13:A5:34:LEU:HD11	13:A5:44:ARG:HA	1.92	0.51
22:D5:77:SER:OG	22:D5:79:SER:OG	2.25	0.51
36:B6:24:ASP:OD2	38:B9:124:TRP:NE1	2.40	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:V1:111:ILE:HD11	1:V1:149:LEU:HD22	1.92	0.51
1:V1:300:GLY:HA2	1:V1:329:LEU:HD12	1.93	0.51
3:S1:449:PRO:HG2	3:S1:489:VAL:HG22	1.93	0.51
5:S3:79:THR:O	5:S3:93:VAL:N	2.44	0.51
18:D3:97:LEU:HD21	20:D6:162:LEU:HB2	1.93	0.51
5:S3:74:SER:HB3	5:S3:97:LEU:HB3	1.92	0.51
5:S3:142:PHE:HB2	5:S3:148:LEU:HD11	1.93	0.51
3:S1:222:THR:HG22	3:S1:243:ARG:HB2	1.92	0.50
3:S1:434:SER:O	3:S1:476:LYS:NZ	2.44	0.50
3:S1:568:GLU:HB3	3:S1:589:PRO:HG3	1.91	0.50
16:AL:8:LYS:O	16:AL:12:GLN:NE2	2.44	0.50
19:D1:92:PRO:HG3	19:D1:255:TYR:HD2	1.76	0.50
19:D1:149:ILE:HG21	19:D1:185:TRP:HB2	1.93	0.50
23:D4:123:GLU:HB2	24:D2:255:PRO:HG2	1.93	0.50
26:B5:32:THR:HA	26:B5:35:PRO:HD2	1.93	0.50
1:V1:246:GLY:HA3	1:V1:272:MET:HB3	1.93	0.50
4:S2:50:ASN:HD22	4:S2:65:VAL:HG22	1.77	0.50
5:S3:47:GLU:OE1	5:S3:106:ARG:NH1	2.44	0.50
7:S8:74:GLU:OE1	7:S8:99:ARG:NH1	2.44	0.50
22:D5:245:ALA:O	22:D5:249:SER:CB	2.60	0.50
22:D5:386:LEU:HD23	22:D5:387:THR:H	1.76	0.50
17:AB:12:LYS:HE3	17:AB:32:VAL:HG11	1.92	0.50
36:B6:17:LEU:HD11	38:B9:162:LEU:HD22	1.92	0.50
1:V1:21:ILE:O	1:V1:117:LYS:NZ	2.44	0.50
3:S1:237:ASN:OD1	3:S1:253:ARG:NH2	2.44	0.50
7:S8:71:PRO:HB3	16:AL:106:ARG:HE	1.76	0.50
11:A9:50:ARG:HG2	49:A9:401:NDP:H2A	1.93	0.50
19:D1:236:ILE:HG23	19:D1:259:PHE:HZ	1.76	0.50
35:AM:93:GLU:HA	35:AM:96:ILE:HG22	1.94	0.50
24:D2:270:MET:HG2	24:D2:279:PRO:HG3	1.92	0.50
29:AJ:189:PRO:HA	29:AJ:192:MET:HB2	1.93	0.50
31:A3:68:HIS:HB3	31:A3:71:ASP:HB2	1.92	0.50
3:S1:114:CYS:SG	3:S1:115:ASP:N	2.85	0.50
4:S2:54:GLN:HE22	6:S7:80:PRO:HG3	1.76	0.50
31:A3:27:LEU:O	31:A3:31:LEU:CB	2.60	0.50
3:S1:113:GLU:OE2	10:S4:43:ASN:ND2	2.39	0.50
6:S7:46:TRP:N	6:S7:84:ASP:OD2	2.45	0.50
19:D1:154:LEU:HA	19:D1:157:ASN:HD22	1.76	0.50
3:S1:521:MET:HG3	3:S1:542:PHE:HD2	1.77	0.50
4:S2:40:LYS:HG2	4:S2:41:ASP:HB2	1.94	0.50
19:D1:126:LYS:O	19:D1:129:LEU:N	2.43	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
22:D5:200:GLN:OE1	28:BJ:106:GLN:NE2	2.39	0.50
23:D4:254:THR:O	23:D4:258:ALA:CB	2.59	0.50
28:BJ:5:ASP:HB2	28:BJ:8:VAL:HG12	1.93	0.50
30:S5:47:GLY:H	30:S5:50:ARG:HE	1.59	0.50
20:D6:167:VAL:HG22	24:D2:42:PRO:HG2	1.93	0.50
27:A8:129:LYS:HD2	31:A3:65:VAL:HG13	1.93	0.50
29:AJ:171:TYR:HD2	29:AJ:222:GLN:HG3	1.77	0.50
37:B7:99:LYS:HB3	39:B2:64:LEU:HD21	1.94	0.50
3:S1:280:THR:HG21	16:AL:136:GLU:HG2	1.94	0.50
6:S7:46:TRP:NE1	6:S7:82:GLN:O	2.45	0.50
19:D1:90:PRO:HG3	19:D1:162:LEU:HG	1.94	0.50
20:D6:4:TYR:HB3	20:D6:7:PHE:HB3	1.92	0.50
27:A8:132:THR:OG1	31:A3:57:ARG:NH1	2.40	0.50
22:D5:246:LEU:O	22:D5:251:THR:OG1	2.30	0.49
1:V1:259:SER:OG	1:V1:260:GLY:N	2.44	0.49
1:V1:295:LEU:HB2	1:V1:339:ARG:HA	1.93	0.49
3:S1:69:CYS:SG	3:S1:70:ALA:N	2.84	0.49
7:S8:93:THR:HB	7:S8:110:ASP:HB2	1.93	0.49
21:4L:47:MET:HE1	24:D2:79:MET:HA	1.94	0.49
3:S1:11:VAL:HG12	3:S1:77:TRP:HB2	1.94	0.49
11:A9:166:ILE:HG13	11:A9:228:PHE:HB2	1.93	0.49
19:D1:312:SER:OG	31:A3:37:TYR:O	2.31	0.49
22:D5:341:MET:SD	22:D5:453:SER:OG	2.66	0.49
22:D5:584:ILE:HD11	24:D2:58:LYS:HE2	1.95	0.49
24:D2:199:THR:HG23	24:D2:346:LEU:HD22	1.94	0.49
38:B9:169:ILE:O	38:B9:172:ARG:NH1	2.40	0.49
40:B8:66:HIS:HB3	40:B8:69:LEU:HB2	1.94	0.49
1:V1:100:GLY:HA3	1:V1:184:TYR:HD1	1.78	0.49
24:D2:163:THR:HA	24:D2:285:THR:HG21	1.94	0.49
29:AJ:141:GLN:NE2	29:AJ:201:ASP:OD2	2.41	0.49
3:S1:569:LYS:NZ	3:S1:596:ASP:OD2	2.39	0.49
9:S6:26:VAL:HB	11:A9:87:HIS:HB2	1.92	0.49
3:S1:531:CYS:SG	3:S1:532:VAL:N	2.85	0.49
1:V1:184:TYR:CZ	46:V1:501:FMN:H6	2.47	0.49
6:S7:55:CYS:HB3	6:S7:89:ALA:HB1	1.94	0.49
11:A9:29:PHE:N	49:A9:401:NDP:O1N	2.43	0.49
11:A9:48:PRO:HB3	11:A9:71:MET:HG3	1.94	0.49
1:V1:233:THR:O	1:V1:237:ARG:HB2	2.12	0.49
11:A9:50:ARG:NE	49:A9:401:NDP:O3X	2.42	0.49
16:AL:46:ASN:ND2	16:AL:48:TYR:OH	2.46	0.49
16:AL:67:GLU:HG2	16:AL:72:ASN:H	1.77	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
22:D5:294:THR:H	22:D5:425:ARG:NH1	2.10	0.49
22:D5:538:PRO:HG3	51:D5:902:3PE:H222	1.95	0.49
22:D5:547:LYS:O	22:D5:552:LEU:HB2	2.13	0.49
6:S7:41:ARG:HA	19:D1:54:LYS:HG3	1.94	0.49
11:A9:94:LEU:HG	11:A9:132:ILE:HG12	1.95	0.49
19:D1:195:ARG:NH2	19:D1:228:TYR:OH	2.45	0.49
31:A3:76:SER:OG	31:A3:77:LEU:N	2.45	0.49
38:B9:125:LYS:HE2	38:B9:129:ARG:HH22	1.77	0.49
4:S2:300:ARG:NH2	4:S2:420:THR:O	2.46	0.49
5:S3:65:ARG:NH1	5:S3:123:VAL:O	2.46	0.49
3:S1:52:CYS:SG	3:S1:53:ARG:N	2.85	0.48
12:A2:57:CYS:SG	12:A2:58:SER:N	2.83	0.48
22:D5:71:ILE:HG13	22:D5:72:GLN:H	1.78	0.48
23:D4:178:ILE:O	23:D4:182:TRP:N	2.46	0.48
3:S1:9:ILE:HG23	3:S1:75:LYS:HA	1.93	0.48
4:S2:258:VAL:HA	4:S2:261:ARG:HB2	1.94	0.48
11:A9:48:PRO:HA	11:A9:71:MET:O	2.13	0.48
22:D5:241:THR:HG21	22:D5:344:GLY:HA3	1.95	0.48
22:D5:358:LYS:HE2	22:D5:438:PRO:HD3	1.95	0.48
23:D4:165:ILE:HG21	24:D2:268:GLN:HA	1.95	0.48
39:B2:10:ARG:HD3	39:B2:13:GLN:HB2	1.94	0.48
1:V1:278:GLU:O	1:V1:282:LYS:HB2	2.13	0.48
3:S1:80:LEU:HB3	3:S1:83:SER:HB3	1.95	0.48
3:S1:377:VAL:HA	3:S1:450:MET:O	2.14	0.48
11:A9:215:ILE:HA	11:A9:218:ILE:HG22	1.95	0.48
22:D5:558:LEU:HA	22:D5:561:ILE:HG22	1.96	0.48
24:D2:109:ALA:O	24:D2:112:HIS:ND1	2.42	0.48
28:BJ:17:PRO:HB3	36:B6:103:ILE:HG22	1.94	0.48
33:C2:19:ARG:HB3	42:C1:41:GLU:HG2	1.94	0.48
5:S3:39:GLN:HB3	5:S3:51:CYS:HB2	1.94	0.48
40:B8:138:LEU:O	40:B8:142:ARG:N	2.40	0.48
20:D6:58:LEU:O	20:D6:62:GLY:HA3	2.13	0.48
23:D4:209:LEU:HG	23:D4:211:GLY:H	1.79	0.48
40:B8:2:SER:OG	40:B8:3:HIS:N	2.45	0.48
1:V1:103:GLY:N	2:V2:148:CYS:SG	2.86	0.48
19:D1:85:MET:HE1	19:D1:105:MET:HA	1.96	0.48
28:BJ:77:HIS:HA	33:C2:108:THR:HA	1.96	0.48
32:B3:21:TRP:HB2	32:B3:46:ARG:HD2	1.94	0.48
1:V1:179:ARG:NH1	2:V2:52:ASP:OD2	2.47	0.48
3:S1:237:ASN:HB3	3:S1:253:ARG:HG3	1.96	0.48
13:A5:49:GLN:HE22	15:A7:92:LYS:H	1.61	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
14:A6:115:LYS:HA	14:A6:120:LYS:HE3	1.96	0.48
22:D5:554:ASP:O	22:D5:558:LEU:CB	2.61	0.48
23:D4:350:THR:OG1	23:D4:351:LEU:N	2.47	0.48
1:V1:24:ASN:HA	1:V1:28:ARG:HB2	1.96	0.48
11:A9:56:THR:HA	11:A9:59:LEU:HG	1.96	0.48
18:D3:69:ILE:HD11	19:D1:144:VAL:HG13	1.95	0.48
22:D5:226:GLN:O	22:D5:230:HIS:N	2.47	0.48
22:D5:541:ASN:HD22	51:D5:902:3PE:H361	1.79	0.48
26:B5:99:GLU:OE1	27:A8:162:HIS:NE2	2.38	0.48
38:B9:50:HIS:CE1	50:B9:201:ZMP:H8A	2.49	0.48
1:V1:105:CYS:SG	2:V2:148:CYS:N	2.87	0.48
5:S3:67:HIS:HB2	13:A5:89:LEU:HD21	1.95	0.48
7:S8:7:LEU:HD22	15:A7:112:LEU:HB3	1.96	0.48
24:D2:233:THR:HA	24:D2:236:LYS:HG2	1.96	0.48
29:AJ:25:ILE:O	29:AJ:123:VAL:HA	2.12	0.47
32:B3:28:LEU:HD11	32:B3:48:GLU:HB2	1.96	0.47
34:B4:100:TRP:HA	34:B4:103:VAL:HG22	1.96	0.47
4:S2:385:ARG:NH2	5:S3:197:PHE:O	2.46	0.47
11:A9:202:LYS:NZ	11:A9:291:ASP:OD2	2.40	0.47
19:D1:149:ILE:HG23	19:D1:181:LEU:HG	1.96	0.47
23:D4:22:MET:HG2	23:D4:26:ASN:HD21	1.79	0.47
23:D4:364:LEU:HB3	23:D4:369:LEU:HD12	1.95	0.47
17:AB:48:VAL:HG21	38:B9:16:LEU:HD11	1.97	0.47
22:D5:371:THR:OG1	32:B3:68:LYS:NZ	2.47	0.47
23:D4:167:ILE:HA	23:D4:170:THR:HG22	1.96	0.47
29:AJ:54:ALA:HB2	29:AJ:107:GLN:HG2	1.96	0.47
36:B6:102:ARG:HG2	37:B7:49:GLN:HB2	1.96	0.47
38:B9:21:ARG:O	38:B9:25:HIS:ND1	2.32	0.47
1:V1:370:ASP:OD1	3:S1:179:ASN:ND2	2.48	0.47
3:S1:250:ILE:HD11	3:S1:268:ARG:HA	1.95	0.47
22:D5:605:HIS:HA	24:D2:92:PRO:HB2	1.96	0.47
28:BJ:149:TYR:HA	28:BJ:153:LYS:HD3	1.95	0.47
3:S1:282:PRO:HD2	3:S1:592:LEU:HD12	1.96	0.47
28:BJ:72:ASP:OD2	28:BJ:74:THR:OG1	2.30	0.47
39:B2:62:GLU:H	39:B2:66:ILE:HD11	1.78	0.47
14:A6:29:ARG:HH21	17:AA:65:ILE:HD13	1.79	0.47
19:D1:86:TRP:HE1	19:D1:233:MET:HB2	1.80	0.47
23:D4:300:ALA:O	23:D4:308:SER:OG	2.29	0.47
4:S2:17:ALA:HB2	4:S2:30:PRO:HA	1.97	0.47
4:S2:183:ARG:O	7:S8:60:ARG:NH2	2.48	0.47
19:D1:18:ALA:O	19:D1:21:THR:OG1	2.28	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
23:D4:187:PRO:O	23:D4:192:ASN:ND2	2.45	0.47
28:BJ:136:LYS:NZ	28:BJ:140:ASP:OD2	2.39	0.47
29:AJ:108:TYR:OH	29:AJ:164:LEU:O	2.29	0.47
4:S2:236:ARG:NH2	4:S2:294:TYR:OH	2.37	0.47
14:A6:70:ALA:HA	50:AA:101:ZMP:C13	2.43	0.47
23:D4:196:TRP:CE2	23:D4:200:MET:HG3	2.50	0.47
1:V1:43:TYR:O	1:V1:236:ARG:NH1	2.43	0.47
3:S1:113:GLU:HA	10:S4:46:GLN:HE21	1.78	0.47
3:S1:233:ALA:O	3:S1:576:THR:N	2.48	0.47
12:A2:13:LEU:HB3	12:A2:14:GLY:H	1.58	0.47
21:4L:55:LEU:HB2	30:S5:24:GLN:HG3	1.96	0.47
22:D5:137:LEU:HB3	22:D5:196:TRP:HB2	1.96	0.47
23:D4:114:GLU:OE2	23:D4:173:SER:OG	2.33	0.47
23:D4:234:ILE:O	23:D4:238:LEU:HB2	2.14	0.47
27:A8:70:PHE:HB3	44:A1:69:ILE:HD12	1.97	0.47
30:S5:6:GLN:NE2	30:S5:14:ASP:OD2	2.48	0.47
3:S1:334:LEU:HD12	3:S1:604:SER:HB2	1.96	0.47
6:S7:85:VAL:HG12	6:S7:112:TYR:HB2	1.97	0.47
24:D2:96:MET:HG3	24:D2:153:LEU:HD11	1.96	0.47
17:AB:7:THR:HG23	17:AB:10:GLY:H	1.80	0.47
28:BJ:143:HIS:NE2	34:B4:125:ASN:O	2.48	0.47
29:AJ:91:GLY:O	29:AJ:95:ARG:NH2	2.41	0.47
38:B9:96:TYR:HB2	38:B9:177:PRO:HG3	1.96	0.47
7:S8:34:LEU:HD12	19:D1:272:TRP:CE2	2.50	0.46
11:A9:52:GLU:HG2	11:A9:54:TYR:H	1.81	0.46
16:AL:31:ASN:HD21	19:D1:39:VAL:HG22	1.81	0.46
23:D4:254:THR:O	23:D4:258:ALA:HB3	2.14	0.46
37:B7:100:GLU:OE1	40:B8:132:GLN:NE2	2.48	0.46
3:S1:362:TYR:O	3:S1:494:HIS:NE2	2.42	0.46
7:S8:65:HIS:NE2	7:S8:116:CYS:SG	2.70	0.46
11:A9:289:THR:HG22	11:A9:290:THR:HG23	1.97	0.46
22:D5:180:ILE:HD12	23:D4:397:GLY:HA3	1.97	0.46
22:D5:384:PRO:HA	22:D5:385:PHE:HA	1.56	0.46
22:D5:447:ASN:HD21	22:D5:449:PHE:HB2	1.79	0.46
24:D2:59:TYR:HB2	24:D2:118:VAL:HG21	1.96	0.46
27:A8:97:ARG:HB3	35:AM:59:LEU:HD13	1.98	0.46
1:V1:216:PHE:HZ	2:V2:45:ALA:HB2	1.80	0.46
1:V1:247:ARG:HH22	1:V1:321:ALA:HB2	1.80	0.46
3:S1:145:LEU:HB3	3:S1:269:PHE:HE2	1.80	0.46
5:S3:189:GLU:OE1	11:A9:15:SER:OG	2.32	0.46
19:D1:36:GLY:HA2	19:D1:37:PRO:HA	1.78	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
19:D1:169:GLN:NE2	19:D1:240:THR:O	2.40	0.46
22:D5:293:LEU:O	22:D5:523:SER:OG	2.32	0.46
25:AK:36:SER:HB2	25:AK:55:THR:HG22	1.96	0.46
29:AJ:210:PHE:HD2	29:AJ:211:LEU:HD22	1.79	0.46
3:S1:675:ASP:O	3:S1:679:ARG:CB	2.62	0.46
22:D5:170:GLN:NE2	51:D5:902:3PE:O11	2.48	0.46
22:D5:418:PHE:HA	22:D5:421:ILE:HG12	1.98	0.46
14:A6:26:GLU:HG3	14:A6:29:ARG:HH12	1.81	0.46
23:D4:197:LEU:O	23:D4:201:MET:CB	2.63	0.46
33:C2:8:ARG:H	33:C2:9:ALA:HB3	1.80	0.46
33:C2:115:GLU:OE1	33:C2:117:HIS:NE2	2.43	0.46
7:S8:153:LYS:O	7:S8:157:ASN:HB2	2.16	0.46
13:A5:37:ILE:HD11	13:A5:94:ILE:HG13	1.97	0.46
22:D5:209:SER:O	22:D5:270:ASN:ND2	2.45	0.46
22:D5:400:ASN:O	40:B8:126:GLN:NE2	2.49	0.46
25:AK:98:LEU:HG	25:AK:114:CYS:HB2	1.98	0.46
26:B5:132:LEU:HD13	30:S5:22:ALA:HB2	1.97	0.46
29:AJ:49:LYS:HD2	29:AJ:114:HIS:CE1	2.50	0.46
29:AJ:202:ILE:O	29:AJ:206:TYR:CB	2.64	0.46
32:B3:49:ALA:HA	32:B3:52:TYR:HB2	1.98	0.46
5:S3:80:ALA:CA	5:S3:91:GLU:O	2.62	0.46
6:S7:116:MET:HA	6:S7:146:VAL:HG23	1.97	0.46
19:D1:81:LEU:HD11	19:D1:111:LEU:HB3	1.97	0.46
44:A1:25:ARG:O	44:A1:29:PHE:HB2	2.16	0.46
4:S2:221:ARG:HD3	4:S2:221:ARG:HA	1.73	0.46
11:A9:168:PRO:HA	11:A9:230:PHE:HB2	1.98	0.46
21:4L:73:LEU:HD22	24:D2:38:LEU:HD23	1.98	0.46
22:D5:245:ALA:O	22:D5:249:SER:HB3	2.15	0.46
22:D5:332:HIS:CE1	22:D5:336:LYS:HD2	2.51	0.46
33:C2:66:THR:OG1	42:C1:28:TRP:NE1	2.48	0.46
37:B7:3:HIS:CE1	40:B8:127:PRO:HD3	2.51	0.46
1:V1:30:ASP:OD1	1:V1:30:ASP:N	2.48	0.46
11:A9:134:HIS:ND1	11:A9:135:LEU:O	2.44	0.46
11:A9:185:ILE:HD11	11:A9:195:SER:HB3	1.98	0.46
13:A5:35:GLY:HA2	13:A5:44:ARG:HH22	1.81	0.46
13:A5:39:LYS:HA	13:A5:44:ARG:HD3	1.97	0.46
22:D5:82:MET:HB2	22:D5:87:MET:HE2	1.97	0.46
5:S3:77:ASP:O	5:S3:93:VAL:O	2.34	0.45
38:B9:100:GLU:O	38:B9:121:ARG:NH2	2.49	0.45
42:C1:41:GLU:OE2	42:C1:44:ARG:NH2	2.39	0.45
1:V1:237:ARG:NH2	2:V2:212:GLY:O	2.48	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:V1:365:CYS:SG	1:V1:366:ARG:N	2.88	0.45
3:S1:296:TRP:HE1	3:S1:592:LEU:HB3	1.82	0.45
3:S1:575:ASN:OD1	3:S1:579:ARG:N	2.46	0.45
7:S8:96:ALA:HA	7:S8:106:THR:HA	1.97	0.45
19:D1:199:ASP:HB2	19:D1:279:ARG:HD2	1.98	0.45
23:D4:197:LEU:O	23:D4:201:MET:HB2	2.17	0.45
34:B4:2:PHE:HE2	34:B4:5:TYR:HB2	1.81	0.45
40:B8:138:LEU:HB3	40:B8:142:ARG:HG2	1.98	0.45
5:S3:79:THR:O	5:S3:91:GLU:O	2.35	0.45
5:S3:135:TRP:HH2	14:A6:80:LEU:HD11	1.81	0.45
21:4L:48:ILE:HG23	21:4L:53:PHE:HB3	1.98	0.45
4:S2:287:ILE:HB	7:S8:4:TYR:HB3	1.97	0.45
11:A9:130:ILE:HG12	11:A9:164:THR:HB	1.97	0.45
22:D5:374:ILE:O	22:D5:378:LEU:HB2	2.17	0.45
1:V1:91:LYS:HB2	1:V1:131:ALA:HA	1.97	0.45
17:AA:32:VAL:HB	17:AA:74:GLN:HB2	1.99	0.45
1:V1:189:GLU:OE1	1:V1:206:LYS:NZ	2.49	0.45
3:S1:13:VAL:HG11	3:S1:33:VAL:HG21	1.99	0.45
5:S3:182:ARG:NH2	14:A6:52:ASP:OD2	2.49	0.45
23:D4:305:THR:HG22	23:D4:307:TRP:H	1.81	0.45
17:AB:70:LEU:HD23	17:AB:76:ILE:HG12	1.98	0.45
29:AJ:45:LYS:HG3	29:AJ:231:ALA:HB1	1.98	0.45
38:B9:19:TYR:HB2	38:B9:47:PHE:HE2	1.81	0.45
1:V1:214:GLY:HA3	1:V1:220:THR:HG22	1.99	0.45
4:S2:195:ARG:HG2	4:S2:200:HIS:HB2	1.99	0.45
9:S6:59:CYS:O	9:S6:70:ARG:HA	2.17	0.45
22:D5:172:ILE:HG21	23:D4:408:LEU:HD22	1.99	0.45
17:AB:14:ARG:HE	39:B2:11:TYR:HE1	1.65	0.45
35:AM:81:ARG:HH12	44:A1:46:TYR:HE1	1.63	0.45
3:S1:91:GLU:OE2	15:A7:54:CYS:N	2.50	0.45
4:S2:237:ASN:O	19:D1:284:GLN:NE2	2.49	0.45
5:S3:55:ASP:OD1	14:A6:17:LYS:NZ	2.38	0.45
9:S6:57:ILE:O	9:S6:72:TYR:HA	2.17	0.45
12:A2:64:LEU:HB3	12:A2:76:VAL:HG23	1.99	0.45
23:D4:403:THR:HA	23:D4:406:TYR:CE1	2.52	0.45
29:AJ:169:VAL:HG23	29:AJ:218:CYS:HB3	1.98	0.45
32:B3:51:ARG:HH12	38:B9:33:ARG:HE	1.64	0.45
3:S1:428:ILE:O	3:S1:432:ILE:HB	2.17	0.45
4:S2:366:ALA:HA	4:S2:374:PHE:O	2.17	0.45
15:A7:3:ALA:HB1	15:A7:7:ILE:HD11	1.99	0.45
20:D6:37:GLY:HA3	20:D6:61:LEU:HD11	1.98	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
22:D5:535:ARG:HH21	40:B8:92:SER:HB2	1.81	0.45
24:D2:328:THR:HG23	33:C2:68:PHE:HZ	1.82	0.45
26:B5:104:ARG:NH2	27:A8:166:LEU:O	2.50	0.45
5:S3:82:ASP:OD1	5:S3:82:ASP:N	2.49	0.45
22:D5:81:LYS:NZ	22:D5:83:ASP:OD2	2.41	0.45
22:D5:532:ILE:HD11	40:B8:101:MET:HB3	1.98	0.45
26:B5:112:ARG:HG3	26:B5:113:LEU:HD12	1.99	0.45
39:B2:35:TRP:O	39:B2:39:ARG:HB2	2.16	0.45
11:A9:245:VAL:HA	11:A9:248:VAL:HG12	1.99	0.44
22:D5:7:LEU:HA	22:D5:10:VAL:HG22	1.99	0.44
22:D5:234:PRO:HB3	22:D5:300:LYS:HG2	1.98	0.44
23:D4:26:ASN:OD1	43:B1:13:HIS:NE2	2.50	0.44
17:AB:21:LEU:HD11	32:B3:46:ARG:HB2	1.99	0.44
43:B1:48:LEU:HB2	43:B1:53:GLU:HA	1.98	0.44
11:A9:55:ASP:O	11:A9:58:HIS:ND1	2.51	0.44
22:D5:15:LEU:HB3	22:D5:126:ILE:HG12	1.98	0.44
27:A8:142:HIS:ND1	35:AM:113:THR:O	2.48	0.44
36:B6:103:ILE:HD11	37:B7:47:ASP:HB3	1.98	0.44
1:V1:250:ASN:OD1	1:V1:250:ASN:N	2.50	0.44
24:D2:309:ASN:HD21	29:AJ:95:ARG:HG3	1.82	0.44
29:AJ:24:LEU:HB2	29:AJ:167:HIS:H	1.83	0.44
35:AM:139:PHE:HB2	44:A1:45:TRP:CD1	2.52	0.44
38:B9:66:ALA:HB1	50:B9:201:ZMP:H6	2.00	0.44
44:A1:25:ARG:O	44:A1:29:PHE:CB	2.65	0.44
1:V1:289:GLY:HA3	1:V1:293:ASN:HD22	1.82	0.44
2:V2:47:VAL:O	2:V2:51:LEU:HB2	2.17	0.44
2:V2:113:SER:HA	2:V2:152:PRO:HG3	1.99	0.44
3:S1:41:CYS:SG	3:S1:52:CYS:N	2.91	0.44
3:S1:237:ASN:HB3	3:S1:253:ARG:O	2.17	0.44
8:V3:57:ASP:O	8:V3:60:LYS:NZ	2.47	0.44
15:A7:111:TYR:HA	15:A7:112:LEU:HA	1.77	0.44
22:D5:451:ILE:O	22:D5:455:LYS:CB	2.64	0.44
1:V1:208:PRO:HG3	10:S4:118:TYR:HD2	1.83	0.44
3:S1:242:THR:HG21	3:S1:586:ALA:HB1	2.00	0.44
19:D1:142:TYR:CE2	19:D1:191:ALA:HB1	2.53	0.44
21:4L:62:ILE:HA	21:4L:65:VAL:HG12	1.98	0.44
22:D5:224:SER:HB2	22:D5:310:LEU:HD23	2.00	0.44
23:D4:102:LEU:HD21	23:D4:230:VAL:HG11	2.00	0.44
24:D2:202:LEU:HB3	24:D2:346:LEU:HD11	1.99	0.44
19:D1:197:PRO:HA	19:D1:279:ARG:HG2	1.98	0.44
22:D5:279:CYS:SG	22:D5:405:ASN:ND2	2.90	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
35:AM:110:PHE:HE2	35:AM:116:VAL:HG21	1.83	0.44
2:V2:156:ILE:HD11	2:V2:159:ASN:HD22	1.83	0.44
3:S1:226:GLU:HA	3:S1:253:ARG:HH12	1.83	0.44
7:S8:45:PRO:HB2	7:S8:47:THR:HG23	1.99	0.44
9:S6:12:THR:HG22	9:S6:35:VAL:HG23	1.99	0.44
21:4L:19:LEU:HD13	21:4L:33:LEU:HB2	2.00	0.44
27:A8:90:TYR:HB3	44:A1:34:ARG:HH11	1.82	0.44
3:S1:357:ASP:OD2	12:A2:40:TYR:OH	2.35	0.44
4:S2:202:ASP:HB3	4:S2:323:ILE:HG23	1.99	0.44
7:S8:30:LEU:O	19:D1:277:TYR:OH	2.34	0.44
22:D5:198:LEU:HA	22:D5:201:ILE:HB	1.99	0.44
41:BK:68:ILE:HA	41:BK:72:LEU:HD13	2.00	0.44
23:D4:424:ASN:OD1	34:B4:55:ARG:NH1	2.51	0.44
34:B4:22:TYR:OH	38:B9:67:GLU:OE1	2.34	0.44
4:S2:379:VAL:HG12	4:S2:387:TYR:HB3	1.99	0.43
22:D5:441:ILE:HB	22:D5:443:ILE:HG13	1.98	0.43
23:D4:277:LEU:HD12	23:D4:402:ILE:HG23	1.98	0.43
27:A8:82:THR:HA	27:A8:85:TRP:CD1	2.53	0.43
34:B4:77:PRO:HA	34:B4:78:ASN:HA	1.75	0.43
43:B1:16:VAL:HG23	43:B1:17:PRO:HD3	2.00	0.43
1:V1:140:GLY:O	1:V1:179:ARG:NH2	2.52	0.43
4:S2:284:ASP:OD1	4:S2:284:ASP:N	2.51	0.43
14:A6:28:LYS:HB3	14:A6:32:ARG:HH21	1.83	0.43
19:D1:1:MET:HA	19:D1:4:ILE:HD12	2.00	0.43
20:D6:20:PHE:HE2	21:4L:32:CYS:HA	1.83	0.43
3:S1:332:LYS:HD3	3:S1:507:TYR:HE1	1.84	0.43
17:AA:64:ASP:O	17:AA:68:GLU:HB2	2.17	0.43
34:B4:32:GLN:HB3	38:B9:7:ALA:HB1	1.99	0.43
41:BK:77:VAL:HA	41:BK:80:LEU:HD23	2.01	0.43
1:V1:109:GLU:HG3	1:V1:113:HIS:HD2	1.83	0.43
11:A9:81:ILE:HG21	11:A9:117:ILE:HG22	1.98	0.43
29:AJ:133:VAL:HG11	29:AJ:206:TYR:HD1	1.84	0.43
3:S1:11:VAL:O	3:S1:17:SER:HA	2.18	0.43
3:S1:522:LEU:O	3:S1:543:ILE:HA	2.18	0.43
12:A2:21:HIS:HB2	12:A2:63:LYS:H	1.83	0.43
17:AA:16:LEU:HD23	17:AA:30:LEU:HD12	2.00	0.43
22:D5:375:ILE:HD12	39:B2:32:MET:HG3	2.00	0.43
23:D4:282:LEU:HD12	23:D4:285:LEU:HD12	2.00	0.43
31:A3:77:LEU:HB2	31:A3:80:LEU:HD23	2.00	0.43
39:B2:10:ARG:HD2	39:B2:15:PRO:HA	2.01	0.43
6:S7:137:ASP:OD2	7:S8:144:HIS:ND1	2.51	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
14:A6:28:LYS:HA	14:A6:31:VAL:HG12	2.01	0.43
22:D5:83:ASP:O	22:D5:87:MET:CB	2.66	0.43
3:S1:316:ALA:O	3:S1:522:LEU:HA	2.19	0.43
9:S6:24:ARG:HA	9:S6:27:ARG:HG2	2.01	0.43
11:A9:144:LYS:O	11:A9:148:ASN:ND2	2.51	0.43
23:D4:106:LEU:HD13	23:D4:234:ILE:HG21	2.01	0.43
25:AK:46:THR:HA	25:AK:47:SER:HA	1.71	0.43
27:A8:82:THR:HA	27:A8:85:TRP:NE1	2.34	0.43
3:S1:73:VAL:HA	3:S1:77:TRP:HE1	1.83	0.43
11:A9:53:PRO:O	11:A9:57:MET:HB2	2.18	0.43
14:A6:62:VAL:HG22	50:AA:101:ZMP:C2	2.49	0.43
22:D5:391:SER:OG	22:D5:392:LYS:N	2.52	0.43
22:D5:431:LEU:HB2	22:D5:432:LEU:HD12	2.00	0.43
33:C2:4:GLY:HA2	33:C2:5:ARG:HB3	2.01	0.43
41:BK:85:MET:HB3	41:BK:88:TRP:HB3	2.01	0.43
1:V1:25:LEU:O	1:V1:113:HIS:NE2	2.51	0.43
3:S1:226:GLU:HA	3:S1:253:ARG:NH1	2.33	0.43
10:S4:130:VAL:HG22	10:S4:132:THR:HG22	2.00	0.43
13:A5:26:LEU:HA	13:A5:29:LYS:HZ1	1.83	0.43
21:4L:41:PHE:O	21:4L:45:THR:OG1	2.30	0.43
23:D4:41:LEU:HD22	23:D4:63:THR:HG23	2.01	0.43
35:AM:94:ALA:HA	35:AM:103:TRP:HH2	1.82	0.43
3:S1:324:ASP:HA	3:S1:573:TYR:HE1	1.83	0.43
3:S1:357:ASP:N	3:S1:357:ASP:OD1	2.45	0.43
7:S8:175:TYR:CZ	15:A7:38:PRO:HG3	2.54	0.43
9:S6:19:ASP:OD2	11:A9:2:HIS:ND1	2.52	0.43
10:S4:17:LEU:HB2	10:S4:98:LYS:HG3	2.01	0.43
11:A9:91:VAL:O	11:A9:129:PHE:HA	2.19	0.43
22:D5:298:ILE:HA	22:D5:301:ILE:HD12	1.99	0.43
22:D5:341:MET:HE3	22:D5:454:ILE:HD13	2.00	0.43
17:AB:49:GLU:HB3	32:B3:44:TRP:HZ3	1.84	0.43
29:AJ:75:GLY:HA3	29:AJ:76:ASN:HA	1.72	0.43
8:V3:47:SER:OG	8:V3:48:THR:N	2.52	0.42
23:D4:47:ASP:OD1	23:D4:47:ASP:N	2.52	0.42
24:D2:90:PHE:HB3	30:S5:63:ARG:HH22	1.83	0.42
28:BJ:48:ARG:HD2	36:B6:83:TYR:HE1	1.83	0.42
2:V2:17:PRO:HA	2:V2:19:THR:H	1.83	0.42
4:S2:68:LEU:HA	4:S2:74:ARG:N	2.34	0.42
5:S3:150:ARG:HE	5:S3:155:TYR:HA	1.84	0.42
5:S3:204:GLU:H	10:S4:50:ASN:HD22	1.67	0.42
8:V3:41:LEU:HG	8:V3:44:HIS:HB2	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
15:A7:41:PRO:HB3	35:AM:6:LYS:HD2	2.01	0.42
22:D5:54:PHE:O	22:D5:58:GLY:N	2.42	0.42
23:D4:207:MET:HG3	23:D4:298:ILE:HD11	2.02	0.42
24:D2:102:LEU:HD22	24:D2:138:PRO:HB3	2.00	0.42
24:D2:243:LEU:HD23	24:D2:243:LEU:HA	1.80	0.42
28:BJ:36:PHE:O	28:BJ:40:VAL:HB	2.18	0.42
29:AJ:35:LYS:HG3	29:AJ:37:LYS:HG2	2.00	0.42
3:S1:314:ASP:HA	3:S1:519:PRO:HA	2.01	0.42
22:D5:439:THR:HG23	17:AB:14:ARG:HH21	1.84	0.42
23:D4:298:ILE:HD13	23:D4:298:ILE:HA	1.74	0.42
1:V1:157:TYR:HD2	8:V3:58:LEU:HD12	1.84	0.42
20:D6:127:ILE:H	20:D6:127:ILE:HG13	1.69	0.42
22:D5:89:PHE:HE2	22:D5:132:VAL:HG11	1.85	0.42
27:A8:85:TRP:O	27:A8:89:ASP:HB2	2.20	0.42
28:BJ:74:THR:O	33:C2:108:THR:OG1	2.29	0.42
3:S1:125:SER:OG	3:S1:126:ASP:N	2.52	0.42
22:D5:281:GLY:O	22:D5:284:THR:OG1	2.32	0.42
23:D4:169:ASN:ND2	24:D2:271:THR:O	2.51	0.42
23:D4:229:MET:SD	23:D4:324:SER:OG	2.71	0.42
40:B8:13:TYR:HE1	40:B8:39:ASP:H	1.67	0.42
41:BK:57:ASN:HA	41:BK:60:VAL:HG12	2.01	0.42
4:S2:251:LEU:HD13	5:S3:73:LYS:HG3	2.02	0.42
19:D1:2:PHE:HA	19:D1:5:ASN:HD22	1.84	0.42
22:D5:60:GLU:HB2	36:B6:99:LYS:HB3	2.02	0.42
22:D5:384:PRO:HG3	22:D5:491:LEU:HD13	2.00	0.42
23:D4:270:ILE:HG13	23:D4:395:LEU:HD22	2.00	0.42
29:AJ:18:MET:HB3	29:AJ:19:THR:HB	2.02	0.42
3:S1:424:ASP:OD1	3:S1:424:ASP:N	2.53	0.42
6:S7:39:TRP:HA	6:S7:42:ARG:HG2	2.01	0.42
11:A9:290:THR:HB	11:A9:292:ARG:HH11	1.84	0.42
19:D1:28:LEU:HG	19:D1:271:LEU:HD11	2.00	0.42
19:D1:310:LEU:HD23	19:D1:310:LEU:HA	1.86	0.42
22:D5:203:MET:HG2	28:BJ:109:LEU:HD11	2.02	0.42
23:D4:19:LYS:NZ	23:D4:22:MET:SD	2.91	0.42
24:D2:142:LEU:HB3	24:D2:194:LEU:HD21	2.01	0.42
26:B5:84:GLU:HG2	43:B1:44:TYR:CG	2.55	0.42
17:AB:52:MET:HG2	38:B9:23:LEU:HD12	2.01	0.42
29:AJ:188:ASN:HB3	29:AJ:191:GLU:HB2	2.01	0.42
1:V1:298:ILE:HG22	1:V1:306:LEU:HA	2.02	0.42
14:A6:46:VAL:HA	14:A6:51:LEU:HD12	2.02	0.42
24:D2:207:ILE:HD13	24:D2:262:PRO:HD3	2.00	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
27:A8:77:CYS:HA	27:A8:78:ALA:HA	1.68	0.42
32:B3:35:LEU:HG	32:B3:40:LEU:HB2	2.01	0.42
36:B6:108:THR:HB	36:B6:115:VAL:HG12	2.02	0.42
40:B8:14:PRO:HA	40:B8:15:LYS:HA	1.76	0.42
43:B1:48:LEU:HD13	43:B1:53:GLU:HG2	2.02	0.42
1:V1:69:GLY:H	1:V1:331:THR:HG21	1.85	0.42
2:V2:79:ARG:NE	10:S4:131:SER:O	2.52	0.42
4:S2:84:HIS:CD2	5:S3:152:LEU:HB3	2.54	0.42
4:S2:174:ARG:HD3	6:S7:61:HIS:CE1	2.54	0.42
7:S8:52:PHE:HZ	16:AL:29:ARG:HG2	1.85	0.42
8:V3:60:LYS:H	8:V3:60:LYS:HD2	1.85	0.42
10:S4:57:MET:HB3	10:S4:84:LEU:HB2	2.02	0.42
29:AJ:188:ASN:O	29:AJ:192:MET:N	2.50	0.42
1:V1:138:ILE:HD13	1:V1:146:ALA:HB2	2.01	0.42
1:V1:200:GLN:NE2	3:S1:174:THR:OG1	2.43	0.42
2:V2:9:HIS:CD2	2:V2:11:ASP:HA	2.54	0.42
2:V2:120:ILE:HD13	2:V2:173:ILE:HD11	2.01	0.42
2:V2:120:ILE:O	2:V2:124:LEU:HB3	2.20	0.42
3:S1:360:SER:O	3:S1:365:ASN:ND2	2.42	0.42
3:S1:437:HIS:HD2	3:S1:439:PHE:HB3	1.83	0.42
3:S1:511:VAL:HG11	3:S1:531:CYS:HB2	2.01	0.42
4:S2:110:SER:OG	4:S2:114:ASN:OD1	2.31	0.42
10:S4:10:LEU:HB3	14:A6:18:PRO:HD3	2.01	0.42
24:D2:335:MET:O	33:C2:33:TYR:OH	2.29	0.42
36:B6:18:ARG:HE	38:B9:172:ARG:CZ	2.32	0.42
2:V2:108:CYS:HB3	2:V2:152:PRO:HB3	2.02	0.41
3:S1:101:HIS:O	3:S1:134:LYS:NZ	2.53	0.41
4:S2:227:GLU:OE1	15:A7:17:ARG:NH2	2.45	0.41
22:D5:172:ILE:O	22:D5:176:ARG:HG2	2.20	0.41
22:D5:297:ASP:HB2	22:D5:300:LYS:HD3	2.02	0.41
22:D5:548:SER:HA	22:D5:552:LEU:HB3	2.02	0.41
23:D4:436:LEU:O	23:D4:440:HIS:ND1	2.49	0.41
31:A3:68:HIS:HD2	31:A3:69:PRO:HD2	1.85	0.41
34:B4:80:ARG:NH2	40:B8:39:ASP:O	2.44	0.41
3:S1:585:VAL:O	10:S4:61:THR:OG1	2.31	0.41
6:S7:124:GLY:HA2	7:S8:115:LYS:HA	2.01	0.41
8:V3:38:TYR:CZ	8:V3:40:ASN:HB2	2.54	0.41
11:A9:318:LEU:HD13	11:A9:318:LEU:HA	1.90	0.41
16:AL:42:ASP:OD1	16:AL:43:LYS:N	2.53	0.41
22:D5:95:PHE:HZ	22:D5:456:ARG:HG2	1.85	0.41
23:D4:203:PHE:O	23:D4:207:MET:HG2	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
27:A8:70:PHE:HA	27:A8:73:ILE:HG22	2.02	0.41
28:BJ:19:PRO:HD3	36:B6:110:LEU:HD12	2.02	0.41
33:C2:19:ARG:HH21	42:C1:41:GLU:HB2	1.85	0.41
36:B6:117:PRO:HA	36:B6:118:PRO:HD3	1.84	0.41
36:B6:119:MET:SD	36:B6:120:LYS:N	2.93	0.41
3:S1:44:GLU:O	3:S1:45:ARG:NH1	2.48	0.41
4:S2:63:ARG:NH1	14:A6:96:TRP:O	2.53	0.41
4:S2:145:THR:HG1	4:S2:181:TYR:HH	1.62	0.41
5:S3:56:GLY:O	5:S3:60:VAL:HB	2.21	0.41
5:S3:92:ILE:HB	5:S3:109:THR:HG23	2.02	0.41
15:A7:26:ARG:HG3	15:A7:30:ILE:HD11	2.02	0.41
20:D6:163:ILE:HA	20:D6:166:VAL:HG12	2.02	0.41
22:D5:366:MET:HG3	22:D5:445:GLU:HB2	2.02	0.41
5:S3:61:LEU:HD22	5:S3:124:TYR:HE2	1.85	0.41
9:S6:5:SER:OG	9:S6:9:GLU:N	2.46	0.41
11:A9:48:PRO:HB2	11:A9:73:TRP:CD1	2.55	0.41
11:A9:108:ASP:HA	11:A9:111:VAL:HB	2.02	0.41
14:A6:46:VAL:HG11	14:A6:55:VAL:HG22	2.02	0.41
20:D6:13:PHE:HD1	20:D6:39:VAL:HG23	1.85	0.41
20:D6:169:MET:O	20:D6:174:GLY:N	2.54	0.41
25:AK:89:TYR:HD2	25:AK:125:LYS:HB2	1.85	0.41
27:A8:94:GLN:HE22	44:A1:37:ARG:CZ	2.33	0.41
1:V1:379:PHE:CZ	1:V1:389:ILE:HG22	2.56	0.41
2:V2:76:PRO:HA	2:V2:77:PRO:HD3	1.89	0.41
4:S2:273:GLN:OE1	5:S3:104:ARG:NH1	2.45	0.41
4:S2:422:ASP:OD1	4:S2:422:ASP:N	2.52	0.41
17:AA:62:ILE:HG22	17:AA:67:ALA:HB2	2.02	0.41
19:D1:85:MET:HB3	19:D1:233:MET:SD	2.60	0.41
22:D5:265:PRO:HA	22:D5:268:GLU:HG3	2.03	0.41
24:D2:131:LEU:HD23	24:D2:131:LEU:HA	1.92	0.41
32:B3:23:ILE:HD13	32:B3:46:ARG:HA	2.02	0.41
1:V1:236:ARG:HG3	1:V1:237:ARG:HG3	2.02	0.41
11:A9:26:ALA:HA	11:A9:31:GLY:HA3	2.03	0.41
19:D1:288:LEU:O	19:D1:292:ASN:HB2	2.20	0.41
22:D5:245:ALA:O	22:D5:249:SER:OG	2.32	0.41
24:D2:235:ASN:ND2	24:D2:307:SER:OG	2.49	0.41
26:B5:13:PRO:O	38:B9:106:TRP:NE1	2.45	0.41
17:AB:73:PRO:HA	17:AB:76:ILE:HD12	2.03	0.41
4:S2:22:THR:H	4:S2:25:THR:HG22	1.85	0.41
5:S3:167:PRO:HA	10:S4:82:LEU:HD21	2.03	0.41
6:S7:39:TRP:CZ2	19:D1:46:LEU:HD13	2.56	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
22:D5:293:LEU:HA	22:D5:425:ARG:HH22	1.85	0.41
52:D5:901:CDL:HA31	26:B5:22:LEU:HD21	2.03	0.41
24:D2:254:LEU:HA	24:D2:255:PRO:HD3	1.94	0.41
34:B4:40:SER:OG	38:B9:150:THR:O	2.32	0.41
1:V1:312:CYS:HA	1:V1:315:VAL:HB	2.02	0.41
3:S1:278:ARG:HA	3:S1:549:HIS:HB3	2.02	0.41
4:S2:423:ILE:H	4:S2:423:ILE:HG13	1.65	0.41
9:S6:53:GLY:HA2	9:S6:94:GLN:H	1.86	0.41
11:A9:72:ASP:O	11:A9:80:SER:OG	2.38	0.41
19:D1:271:LEU:HD23	19:D1:274:ARG:HH21	1.85	0.41
20:D6:112:GLU:OE1	30:S5:73:LYS:NZ	2.54	0.41
21:4L:66:PHE:HB3	24:D2:34:GLU:OE1	2.20	0.41
22:D5:405:ASN:HB3	22:D5:408:ALA:H	1.86	0.41
22:D5:567:SER:OG	51:D4:501:3PE:O22	2.34	0.41
23:D4:205:VAL:HG22	23:D4:212:LEU:HD11	2.03	0.41
23:D4:278:ARG:NH2	40:B8:80:ASP:OD1	2.53	0.41
24:D2:115:VAL:HG12	24:D2:180:ALA:HB1	2.03	0.41
26:B5:64:TRP:CD1	26:B5:65:GLU:HG3	2.56	0.41
2:V2:30:ARG:NH2	8:V3:53:ASP:OD1	2.45	0.41
2:V2:53:LEU:HD12	8:V3:52:LEU:HD13	2.03	0.41
3:S1:323:VAL:HG11	3:S1:525:LEU:HB3	2.03	0.41
3:S1:409:ILE:HG12	3:S1:422:LEU:HB2	2.02	0.41
4:S2:19:MET:SD	24:D2:295:ARG:NH2	2.73	0.41
5:S3:72:PHE:HB3	5:S3:96:LEU:HD23	2.03	0.41
5:S3:202:PRO:HA	10:S4:50:ASN:HB3	2.03	0.41
6:S7:125:TYR:CG	7:S8:117:ILE:HD12	2.56	0.41
11:A9:45:VAL:HB	11:A9:68:ILE:HG22	2.03	0.41
18:D3:80:GLN:OE1	31:A3:50:TYR:OH	2.37	0.41
19:D1:243:LEU:HD13	19:D1:262:LYS:HD3	2.03	0.41
20:D6:174:GLY:HA2	20:D6:175:ASN:HA	1.78	0.41
22:D5:455:LYS:HG3	39:B2:28:PHE:HZ	1.86	0.41
22:D5:548:SER:O	22:D5:553:LEU:N	2.53	0.41
27:A8:24:LEU:HG	35:AM:70:LEU:HD11	2.02	0.41
29:AJ:156:LYS:HG2	29:AJ:160:VAL:HG21	2.02	0.41
41:BK:64:PHE:HA	41:BK:68:ILE:HG22	2.02	0.41
1:V1:202:LYS:HB3	1:V1:361:GLN:NE2	2.34	0.41
4:S2:169:TRP:CE2	7:S8:40:TYR:HD2	2.38	0.41
5:S3:66:ASP:HB2	13:A5:89:LEU:HD23	2.03	0.41
30:S5:95:PRO:HB3	35:AM:126:LEU:HD13	2.02	0.41
1:V1:258:ILE:HG22	1:V1:262:VAL:HG21	2.02	0.40
2:V2:55:GLN:NE2	2:V2:91:ASN:OD1	2.46	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:S1:112:GLY:O	10:S4:46:GLN:NE2	2.54	0.40
3:S1:584:LYS:HG3	10:S4:36:ARG:HH11	1.86	0.40
11:A9:165:ILE:O	11:A9:227:THR:HA	2.21	0.40
11:A9:203:GLN:HB3	11:A9:235:ARG:HA	2.03	0.40
19:D1:92:PRO:HG2	19:D1:252:PRO:HB2	2.03	0.40
22:D5:142:ILE:HA	23:D4:370:PRO:HB2	2.02	0.40
22:D5:280:LEU:O	22:D5:284:THR:HG23	2.20	0.40
22:D5:538:PRO:HB2	40:B8:89:VAL:HG22	2.03	0.40
23:D4:272:THR:HA	23:D4:275:ILE:HG22	2.02	0.40
28:BJ:68:ARG:NH1	43:B1:45:LYS:H	2.19	0.40
29:AJ:105:LEU:HD11	29:AJ:163:TYR:HE2	1.86	0.40
1:V1:42:TRP:N	1:V1:120:GLU:OE2	2.51	0.40
11:A9:40:ARG:HH12	14:A6:109:THR:HB	1.86	0.40
13:A5:55:LEU:HD11	13:A5:59:LYS:HE3	2.02	0.40
18:D3:98:LEU:HD22	19:D1:298:LEU:HD21	2.03	0.40
22:D5:82:MET:SD	22:D5:82:MET:N	2.93	0.40
22:D5:173:LEU:HD22	51:D5:902:3PE:H241	2.02	0.40
24:D2:135:LYS:HD2	24:D2:187:MET:HE2	2.04	0.40
29:AJ:17:LYS:HG2	29:AJ:118:THR:HA	2.03	0.40
37:B7:45:MET:HG2	37:B7:55:ARG:HH11	1.86	0.40
6:S7:154:GLU:HG3	7:S8:50:TYR:HE1	1.85	0.40
15:A7:32:LYS:O	15:A7:35:GLN:NE2	2.54	0.40
22:D5:581:LYS:NZ	25:AK:43:LYS:O	2.45	0.40
23:D4:96:ILE:O	23:D4:100:ILE:HG12	2.22	0.40
26:B5:31:LEU:HD23	26:B5:32:THR:HG23	2.03	0.40
27:A8:121:LEU:HA	27:A8:122:GLY:HA2	1.81	0.40
29:AJ:224:SER:OG	29:AJ:225:ALA:N	2.55	0.40
38:B9:107:HIS:NE2	41:BK:43:ASP:OD1	2.53	0.40
2:V2:126:ILE:HG21	2:V2:132:THR:HA	2.02	0.40
6:S7:127:HIS:CG	7:S8:115:LYS:HE3	2.56	0.40
7:S8:95:GLU:O	7:S8:107:THR:N	2.42	0.40
17:AA:11:ILE:HA	17:AA:14:ARG:HG2	2.03	0.40
20:D6:169:MET:HE1	20:D6:175:ASN:HA	2.03	0.40
28:BJ:127:GLU:HA	28:BJ:130:GLN:HG2	2.04	0.40
38:B9:39:PHE:HA	38:B9:42:LEU:HB2	2.02	0.40
38:B9:61:GLN:HG3	38:B9:64:ARG:NH2	2.36	0.40
41:BK:110:SER:OG	41:BK:111:ASN:N	2.54	0.40
1:V1:352:GLU:HG2	1:V1:373:ASN:HD21	1.87	0.40
2:V2:91:ASN:OD1	2:V2:91:ASN:N	2.55	0.40
3:S1:51:ASN:HD21	10:S4:133:LYS:NZ	2.19	0.40
6:S7:39:TRP:HH2	19:D1:46:LEU:HB2	1.86	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:S7:179:ARG:HG3	11:A9:50:ARG:HH22	1.85	0.40
11:A9:171:ILE:HD13	11:A9:207:ILE:HD13	2.04	0.40
12:A2:22:LEU:HD23	12:A2:22:LEU:HA	1.88	0.40
19:D1:316:PRO:HG3	35:AM:56:ARG:HG2	2.02	0.40
22:D5:401:THR:HA	40:B8:126:GLN:HE22	1.85	0.40
23:D4:44:GLN:HB2	23:D4:50:LEU:HD23	2.03	0.40
32:B3:28:LEU:HA	32:B3:28:LEU:HD23	1.93	0.40

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	V1	428/445 (96%)	380 (89%)	48 (11%)	0	100	100
2	V2	210/217 (97%)	166 (79%)	44 (21%)	0	100	100
3	S1	686/704 (97%)	619 (90%)	66 (10%)	1 (0%)	48	82
4	S2	423/430 (98%)	373 (88%)	50 (12%)	0	100	100
5	S3	206/228 (90%)	174 (84%)	32 (16%)	0	100	100
6	S7	154/179 (86%)	135 (88%)	19 (12%)	0	100	100
7	S8	174/176 (99%)	156 (90%)	18 (10%)	0	100	100
8	V3	38/75 (51%)	29 (76%)	9 (24%)	0	100	100
9	S6	93/96 (97%)	85 (91%)	8 (9%)	0	100	100
10	S4	124/133 (93%)	105 (85%)	19 (15%)	0	100	100
11	A9	284/338 (84%)	253 (89%)	31 (11%)	0	100	100
12	A2	80/98 (82%)	69 (86%)	11 (14%)	0	100	100
13	A5	109/115 (95%)	95 (87%)	14 (13%)	0	100	100
14	A6	112/127 (88%)	102 (91%)	10 (9%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
15	A7	90/112 (80%)	80 (89%)	10 (11%)	0	100	100
16	AL	141/145 (97%)	112 (79%)	29 (21%)	0	100	100
17	AA	78/88 (89%)	66 (85%)	12 (15%)	0	100	100
17	AB	85/88 (97%)	75 (88%)	10 (12%)	0	100	100
18	D3	93/115 (81%)	84 (90%)	9 (10%)	0	100	100
19	D1	293/318 (92%)	264 (90%)	29 (10%)	0	100	100
20	D6	167/175 (95%)	141 (84%)	25 (15%)	1 (1%)	22	59
21	4L	96/98 (98%)	89 (93%)	6 (6%)	1 (1%)	13	48
22	D5	604/606 (100%)	537 (89%)	67 (11%)	0	100	100
23	D4	457/459 (100%)	418 (92%)	38 (8%)	1 (0%)	44	77
24	D2	345/347 (99%)	320 (93%)	25 (7%)	0	100	100
25	AK	138/140 (99%)	127 (92%)	11 (8%)	0	100	100
26	B5	137/143 (96%)	125 (91%)	12 (9%)	0	100	100
27	A8	169/171 (99%)	139 (82%)	30 (18%)	0	100	100
28	BJ	169/175 (97%)	153 (90%)	16 (10%)	0	100	100
29	AJ	317/320 (99%)	279 (88%)	38 (12%)	0	100	100
30	S5	97/105 (92%)	79 (81%)	18 (19%)	0	100	100
31	A3	72/83 (87%)	63 (88%)	9 (12%)	0	100	100
32	B3	71/97 (73%)	60 (84%)	11 (16%)	0	100	100
33	C2	117/120 (98%)	105 (90%)	12 (10%)	0	100	100
34	B4	126/128 (98%)	108 (86%)	18 (14%)	0	100	100
35	AM	137/143 (96%)	122 (89%)	15 (11%)	0	100	100
36	B6	92/127 (72%)	80 (87%)	12 (13%)	0	100	100
37	B7	117/136 (86%)	97 (83%)	20 (17%)	0	100	100
38	B9	174/178 (98%)	142 (82%)	32 (18%)	0	100	100
39	B2	63/72 (88%)	55 (87%)	8 (13%)	0	100	100
40	B8	155/158 (98%)	127 (82%)	27 (17%)	1 (1%)	22	59
41	BK	100/125 (80%)	88 (88%)	12 (12%)	0	100	100
42	C1	44/49 (90%)	38 (86%)	6 (14%)	0	100	100
43	B1	50/57 (88%)	43 (86%)	7 (14%)	0	100	100
44	A1	68/70 (97%)	65 (96%)	3 (4%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
All	All	7983/8509 (94%)	7022 (88%)	956 (12%)	5 (0%)	50 82

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
23	D4	53	SER
20	D6	137	SER
21	4L	3	LEU
3	S1	359	ARG
40	B8	143	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	V1	344/354 (97%)	341 (99%)	3 (1%)	75 83
2	V2	182/183 (100%)	181 (100%)	1 (0%)	86 90
3	S1	578/588 (98%)	574 (99%)	4 (1%)	81 86
4	S2	370/371 (100%)	367 (99%)	3 (1%)	79 84
5	S3	189/204 (93%)	189 (100%)	0	100 100
6	S7	132/150 (88%)	131 (99%)	1 (1%)	79 84
7	S8	151/151 (100%)	150 (99%)	1 (1%)	81 86
8	V3	39/68 (57%)	36 (92%)	3 (8%)	10 32
9	S6	79/80 (99%)	78 (99%)	1 (1%)	65 77
10	S4	113/119 (95%)	112 (99%)	1 (1%)	75 83
11	A9	249/292 (85%)	245 (98%)	4 (2%)	58 74
12	A2	73/81 (90%)	72 (99%)	1 (1%)	62 76
13	A5	99/101 (98%)	99 (100%)	0	100 100
14	A6	107/113 (95%)	107 (100%)	0	100 100
15	A7	82/94 (87%)	82 (100%)	0	100 100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
16	AL	129/131 (98%)	124 (96%)	5 (4%)	27	50
17	AA	74/81 (91%)	73 (99%)	1 (1%)	62	76
17	AB	80/81 (99%)	79 (99%)	1 (1%)	65	77
18	D3	88/103 (85%)	87 (99%)	1 (1%)	70	80
19	D1	263/278 (95%)	261 (99%)	2 (1%)	79	84
20	D6	140/144 (97%)	140 (100%)	0	100	100
21	4L	87/87 (100%)	85 (98%)	2 (2%)	45	64
22	D5	539/539 (100%)	533 (99%)	6 (1%)	70	80
23	D4	412/412 (100%)	407 (99%)	5 (1%)	67	79
24	D2	315/315 (100%)	310 (98%)	5 (2%)	58	74
25	AK	101/101 (100%)	99 (98%)	2 (2%)	50	68
26	B5	122/125 (98%)	121 (99%)	1 (1%)	79	84
27	A8	154/154 (100%)	150 (97%)	4 (3%)	41	61
28	BJ	155/157 (99%)	154 (99%)	1 (1%)	84	88
29	AJ	283/284 (100%)	280 (99%)	3 (1%)	70	80
30	S5	88/94 (94%)	87 (99%)	1 (1%)	70	80
31	A3	65/71 (92%)	65 (100%)	0	100	100
32	B3	55/75 (73%)	54 (98%)	1 (2%)	54	71
33	C2	106/107 (99%)	106 (100%)	0	100	100
34	B4	114/114 (100%)	113 (99%)	1 (1%)	75	83
35	AM	119/121 (98%)	115 (97%)	4 (3%)	32	54
36	B6	92/121 (76%)	89 (97%)	3 (3%)	33	55
37	B7	108/119 (91%)	104 (96%)	4 (4%)	29	52
38	B9	159/160 (99%)	156 (98%)	3 (2%)	52	69
39	B2	59/62 (95%)	59 (100%)	0	100	100
40	B8	142/142 (100%)	140 (99%)	2 (1%)	62	76
41	BK	93/112 (83%)	91 (98%)	2 (2%)	47	65
42	C1	42/44 (96%)	42 (100%)	0	100	100
43	B1	48/53 (91%)	48 (100%)	0	100	100
44	A1	59/59 (100%)	56 (95%)	3 (5%)	20	43
All	All	7078/7395 (96%)	6992 (99%)	86 (1%)	66	79

All (86) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	V1	132	ARG
1	V1	365	CYS
1	V1	385	ARG
2	V2	190	ARG
3	S1	484	THR
3	S1	488	LYS
3	S1	543	ILE
3	S1	601	ARG
4	S2	34	ASN
4	S2	388	ARG
4	S2	418	ILE
6	S7	54	CYS
7	S8	8	ARG
8	V3	54	LEU
8	V3	60	LYS
8	V3	63	MET
9	S6	26	VAL
10	S4	16	LYS
11	A9	199	LYS
11	A9	281	ARG
11	A9	292	ARG
11	A9	320	ARG
12	A2	33	ARG
16	AL	9	ARG
16	AL	68	MET
16	AL	72	ASN
16	AL	101	LYS
16	AL	117	LEU
17	AA	80	ILE
18	D3	1	MET
19	D1	3	MET
19	D1	129	LEU
21	4L	58	MET
21	4L	83	ASN
22	D5	59	GLN
22	D5	82	MET
22	D5	113	ASN
22	D5	350	LEU
22	D5	357	ARG
22	D5	581	LYS
23	D4	43	ASN
23	D4	86	LYS

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Mol	Chain	Res	Type
23	D4	138	ASN
23	D4	144	ASN
23	D4	150	LEU
24	D2	36	ASN
24	D2	176	ARG
24	D2	204	ASN
24	D2	311	MET
24	D2	322	ARG
25	AK	114	CYS
25	AK	139	LYS
26	B5	130	LYS
17	AB	33	ASN
27	A8	63	ASN
27	A8	109	CYS
27	A8	134	ARG
27	A8	150	ASN
28	BJ	79	LYS
29	AJ	92	ASN
29	AJ	104	ARG
29	AJ	242	LYS
30	S5	95	PRO
32	B3	47	ASN
34	B4	74	ASN
35	AM	27	ARG
35	AM	60	GLN
35	AM	67	ARG
35	AM	89	ASN
36	B6	10	ARG
36	B6	89	VAL
36	B6	90	THR
37	B7	7	ARG
37	B7	103	ARG
37	B7	105	ARG
37	B7	112	LYS
38	B9	44	ARG
38	B9	157	ARG
38	B9	174	ARG
40	B8	9	LEU
40	B8	137	ASN
41	BK	27	GLN
41	BK	57	ASN
44	A1	50	ARG

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Mol	Chain	Res	Type
44	A1	58	ASN
44	A1	68	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (106) such sidechains are listed below:

Mol	Chain	Res	Type
1	V1	29	HIS
1	V1	361	GLN
1	V1	373	ASN
2	V2	9	HIS
2	V2	99	HIS
2	V2	150	ASN
2	V2	159	ASN
3	S1	51	ASN
3	S1	117	GLN
3	S1	437	HIS
3	S1	548	HIS
3	S1	621	ASN
4	S2	34	ASN
4	S2	46	ASN
4	S2	50	ASN
4	S2	54	GLN
4	S2	84	HIS
4	S2	135	GLN
4	S2	157	HIS
4	S2	347	HIS
5	S3	39	GLN
5	S3	88	ASN
5	S3	192	GLN
6	S7	82	GLN
6	S7	106	GLN
9	S6	94	GLN
10	S4	46	GLN
11	A9	3	HIS
11	A9	36	ASN
11	A9	148	ASN
11	A9	288	HIS
13	A5	49	GLN
13	A5	82	GLN
15	A7	20	GLN
16	AL	12	GLN
16	AL	31	ASN

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Mol	Chain	Res	Type
16	AL	72	ASN
16	AL	112	ASN
18	D3	10	ASN
19	D1	5	ASN
19	D1	157	ASN
19	D1	194	ASN
19	D1	287	HIS
20	D6	46	ASN
20	D6	175	ASN
21	4L	25	HIS
22	D5	113	ASN
22	D5	136	ASN
22	D5	139	GLN
22	D5	194	ASN
22	D5	226	GLN
22	D5	274	GLN
22	D5	323	HIS
22	D5	405	ASN
22	D5	447	ASN
22	D5	479	GLN
22	D5	484	HIS
22	D5	541	ASN
22	D5	570	GLN
22	D5	580	GLN
23	D4	26	ASN
23	D4	30	HIS
23	D4	138	ASN
23	D4	144	ASN
23	D4	293	HIS
23	D4	319	HIS
23	D4	399	ASN
24	D2	36	ASN
24	D2	235	ASN
24	D2	316	GLN
26	B5	124	GLN
17	AB	33	ASN
27	A8	63	ASN
27	A8	150	ASN
28	BJ	54	GLN
28	BJ	55	HIS
28	BJ	103	ASN
28	BJ	113	GLN

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Mol	Chain	Res	Type
28	BJ	122	GLN
29	AJ	92	ASN
29	AJ	151	HIS
29	AJ	200	GLN
29	AJ	204	ASN
29	AJ	251	GLN
29	AJ	258	ASN
29	AJ	271	ASN
31	A3	68	HIS
32	B3	47	ASN
34	B4	47	GLN
34	B4	51	ASN
35	AM	75	GLN
35	AM	89	ASN
36	B6	25	GLN
37	B7	91	HIS
38	B9	50	HIS
38	B9	168	HIS
39	B2	16	GLN
40	B8	66	HIS
40	B8	104	HIS
40	B8	126	GLN
40	B8	137	ASN
41	BK	36	ASN
41	BK	45	HIS
41	BK	57	ASN
44	A1	27	HIS
44	A1	58	ASN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 19 ligands modelled in this entry, 1 is monoatomic - leaving 18 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
45	SF4	S8	201	7	0,12,12	-	-	-		
47	FES	S1	803	3	0,4,4	-	-	-		
45	SF4	S1	802	3	0,12,12	-	-	-		
51	3PE	D1	501	-	18,18,50	0.42	0	21,23,55	0.43	0
51	3PE	D4	501	-	39,39,50	0.34	0	42,44,55	0.32	0
49	NDP	A9	401	-	45,52,52	0.61	0	53,80,80	0.62	2 (3%)
52	CDL	D5	901	-	35,35,99	0.43	0	41,47,111	0.73	2 (4%)
50	ZMP	AA	101	17	27,33,36	0.71	1 (3%)	32,40,45	0.95	1 (3%)
50	ZMP	B9	201	17	24,30,36	0.68	0	29,37,45	1.01	2 (6%)
51	3PE	D5	902	-	37,37,50	0.36	0	40,42,55	0.34	0
53	PC1	D4	502	-	27,27,53	0.39	0	33,35,61	0.39	0
45	SF4	V1	500	1	0,12,12	-	-	-		
51	3PE	A8	301	-	24,24,50	0.43	0	27,29,55	0.36	0
47	FES	V2	300	2	0,4,4	-	-	-		
46	FMN	V1	501	-	33,33,33	0.34	0	48,50,50	0.40	0
45	SF4	S7	300	6	0,12,12	-	-	-		
45	SF4	S8	202	7	0,12,12	-	-	-		
45	SF4	S1	801	3	0,12,12	-	-	-		

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
51	3PE	D4	501	-	-	7/43/43/54	-
45	SF4	S8	201	7	-	-	0/6/5/5
45	SF4	S1	802	3	-	-	0/6/5/5
51	3PE	D1	501	-	-	11/20/20/54	-
47	FES	S1	803	3	-	-	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
49	NDP	A9	401	-	-	14/30/77/77	0/5/5/5
52	CDL	D5	901	-	-	16/42/42/110	-
50	ZMP	AA	101	17	-	14/38/40/43	-
50	ZMP	B9	201	17	-	11/35/37/43	-
51	3PE	D5	902	-	-	9/41/41/54	-
53	PC1	D4	502	-	-	8/31/31/57	-
45	SF4	V1	500	1	-	-	0/6/5/5
51	3PE	A8	301	-	-	5/28/28/54	-
45	SF4	S7	300	6	-	-	0/6/5/5
46	FMN	V1	501	-	-	10/18/18/18	0/3/3/3
45	SF4	S8	202	7	-	-	0/6/5/5
47	FES	V2	300	2	-	-	0/1/1/1
45	SF4	S1	801	3	-	-	0/6/5/5

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
50	AA	101	ZMP	C9-C10	2.45	1.53	1.50

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
52	D5	901	CDL	CB4-OB6-CB5	2.84	123.19	117.90
50	B9	201	ZMP	O1-C10-C9	-2.42	121.13	123.99
50	B9	201	ZMP	C11-C12-N1	-2.34	107.50	112.42
50	AA	101	ZMP	O1-C10-C9	-2.30	121.28	123.99
49	A9	401	NDP	C5A-C6A-N6A	2.20	123.70	120.35
49	A9	401	NDP	C4A-C5A-N7A	2.11	111.60	109.40
52	D5	901	CDL	OB6-CB4-CB3	2.09	115.96	108.40

There are no chirality outliers.

All (105) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
46	V1	501	FMN	N10-C1'-C2'-O2'
46	V1	501	FMN	C1'-C2'-C3'-O3'
46	V1	501	FMN	C1'-C2'-C3'-C4'
46	V1	501	FMN	C5'-O5'-P-O1P
46	V1	501	FMN	C5'-O5'-P-O2P

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Mol	Chain	Res	Type	Atoms
46	V1	501	FMN	C5'-O5'-P-O3P
49	A9	401	NDP	C5B-O5B-PA-O1A
49	A9	401	NDP	C5B-O5B-PA-O2A
49	A9	401	NDP	C5B-O5B-PA-O3
49	A9	401	NDP	C1B-C2B-O2B-P2B
49	A9	401	NDP	C5D-O5D-PN-O3
49	A9	401	NDP	C2N-C3N-C7N-N7N
50	AA	101	ZMP	C20-C18-C21-O5
50	AA	101	ZMP	C17-C18-C21-O5
50	AA	101	ZMP	N2-C16-C17-O4
50	B9	201	ZMP	C12-C11-S1-C10
50	B9	201	ZMP	O1-C10-S1-C11
50	B9	201	ZMP	C9-C10-S1-C11
51	D1	501	3PE	C1-O11-P-O12
51	D1	501	3PE	C1-O11-P-O14
51	D1	501	3PE	C11-O13-P-O14
51	D5	902	3PE	C11-O13-P-O11
51	D5	902	3PE	C11-O13-P-O12
51	D5	902	3PE	C11-O13-P-O14
51	D5	902	3PE	O13-C11-C12-N
51	D5	902	3PE	O21-C2-C3-O31
51	D4	501	3PE	C11-O13-P-O12
51	A8	301	3PE	C11-O13-P-O14
52	D5	901	CDL	CA2-OA2-PA1-OA3
52	D5	901	CDL	CA3-OA5-PA1-OA3
52	D5	901	CDL	CB2-OB2-PB2-OB4
52	D5	901	CDL	CB3-OB5-PB2-OB3
52	D5	901	CDL	CB3-OB5-PB2-OB4
53	D4	502	PC1	C1-O11-P-O12
50	AA	101	ZMP	C14-C13-N1-C12
50	B9	201	ZMP	C14-C13-N1-C12
50	AA	101	ZMP	O2-C13-N1-C12
50	B9	201	ZMP	O2-C13-N1-C12
52	D5	901	CDL	OB5-CB3-CB4-OB6
51	D1	501	3PE	C1-O11-P-O13
51	A8	301	3PE	C11-O13-P-O11
52	D5	901	CDL	CA2-OA2-PA1-OA5
52	D5	901	CDL	CA3-OA5-PA1-OA2
52	D5	901	CDL	CB2-OB2-PB2-OB5
52	D5	901	CDL	CB3-OB5-PB2-OB2
53	D4	502	PC1	C1-O11-P-O13
51	D5	902	3PE	C21-C22-C23-C24

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Mol	Chain	Res	Type	Atoms
50	AA	101	ZMP	C19-C18-C21-O5
51	D1	501	3PE	C11-O13-P-O11
51	D4	501	3PE	C11-O13-P-O11
51	D5	902	3PE	C1-C2-C3-O31
50	AA	101	ZMP	O3-C16-C17-O4
51	D1	501	3PE	O21-C2-C3-O31
46	V1	501	FMN	O2'-C2'-C3'-O3'
51	D1	501	3PE	O13-C11-C12-N
51	A8	301	3PE	O13-C11-C12-N
50	AA	101	ZMP	C2-C3-C4-C5
51	D1	501	3PE	C1-C2-C3-O31
52	D5	901	CDL	C1-CA2-OA2-PA1
49	A9	401	NDP	PN-O3-PA-O5B
52	D5	901	CDL	OB5-CB3-CB4-CB6
53	D4	502	PC1	O11-C1-C2-C3
50	AA	101	ZMP	C16-C17-C18-C19
49	A9	401	NDP	C2B-O2B-P2B-O3X
46	V1	501	FMN	C4'-C5'-O5'-P
49	A9	401	NDP	C5D-O5D-PN-O1N
49	A9	401	NDP	C5D-O5D-PN-O2N
51	D1	501	3PE	C11-O13-P-O12
51	D4	501	3PE	C11-O13-P-O14
51	A8	301	3PE	C11-O13-P-O12
52	D5	901	CDL	CA2-OA2-PA1-OA4
52	D5	901	CDL	CA3-OA5-PA1-OA4
46	V1	501	FMN	N10-C1'-C2'-C3'
50	AA	101	ZMP	C16-C17-C18-C21
53	D4	502	PC1	O11-C1-C2-O21
49	A9	401	NDP	C2N-C3N-C7N-O7N
53	D4	502	PC1	O13-C11-C12-N
46	V1	501	FMN	O2'-C2'-C3'-C4'
50	B9	201	ZMP	C6-C7-C8-C9
50	B9	201	ZMP	O3-C16-C17-O4
51	D1	501	3PE	C2-C1-O11-P
53	D4	502	PC1	C11-O13-P-O11
51	D5	902	3PE	C26-C27-C28-C29
50	AA	101	ZMP	O4-C17-C18-C20
50	B9	201	ZMP	O4-C17-C18-C20
49	A9	401	NDP	O4D-C1D-N1N-C6N
49	A9	401	NDP	C4B-C5B-O5B-PA
51	D4	501	3PE	C2-C1-O11-P
52	D5	901	CDL	CB6-CB4-OB6-CB5

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Mol	Chain	Res	Type	Atoms
51	D4	501	3PE	C36-C37-C38-C39
51	D5	902	3PE	C22-C23-C24-C25
50	AA	101	ZMP	C12-C11-S1-C10
51	D4	501	3PE	C34-C35-C36-C37
51	A8	301	3PE	C2-C1-O11-P
50	AA	101	ZMP	C7-C8-C9-C10
52	D5	901	CDL	C1-CB2-OB2-PB2
53	D4	502	PC1	O31-C31-C32-C33
50	AA	101	ZMP	C16-C17-C18-C20
50	B9	201	ZMP	C16-C17-C18-C19
50	B9	201	ZMP	C16-C17-C18-C20
51	D4	501	3PE	C38-C39-C3A-C3B
53	D4	502	PC1	O32-C31-C32-C33
49	A9	401	NDP	O4B-C4B-C5B-O5B
51	D1	501	3PE	C12-C11-O13-P
50	B9	201	ZMP	C16-C17-C18-C21

There are no ring outliers.

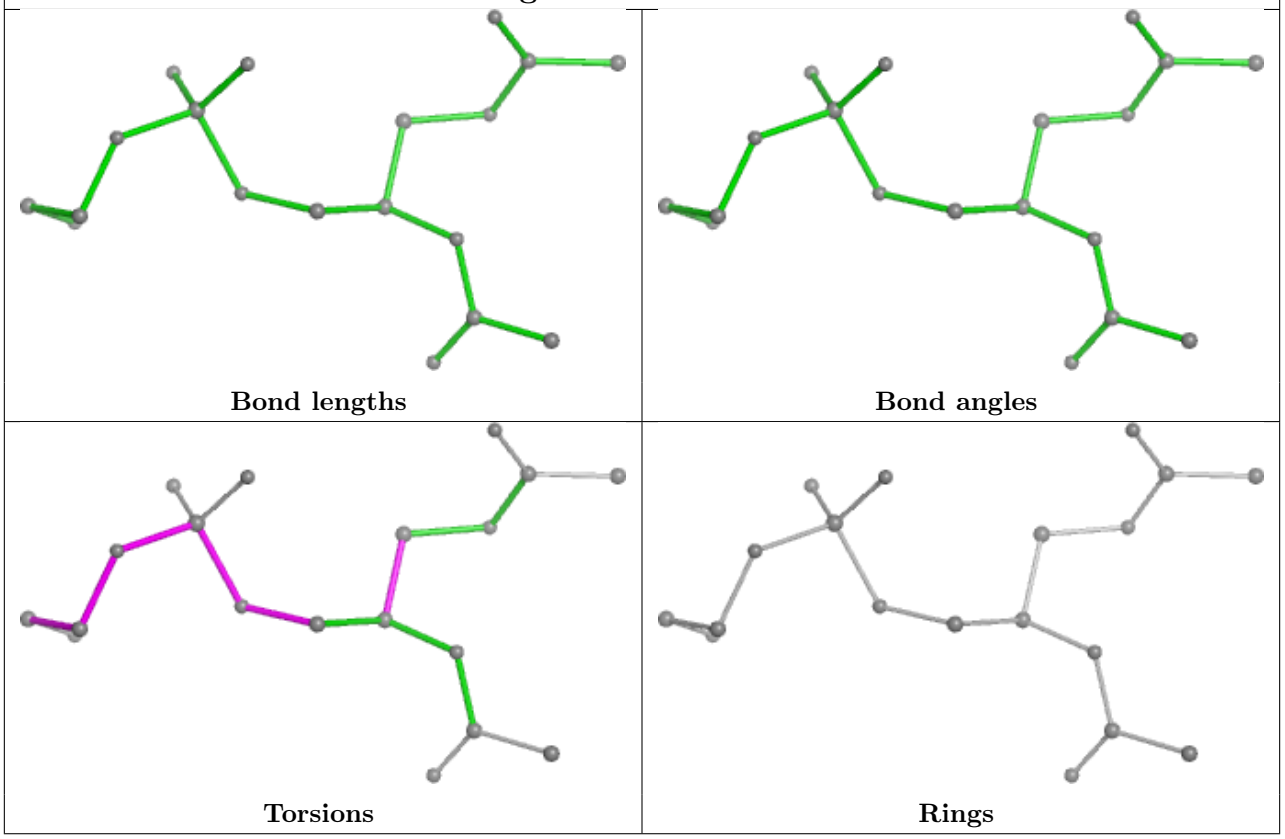
10 monomers are involved in 28 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
51	D4	501	3PE	2	0
49	A9	401	NDP	5	0
52	D5	901	CDL	2	0
50	AA	101	ZMP	7	0
50	B9	201	ZMP	3	0
51	D5	902	3PE	4	0
45	V1	500	SF4	2	0
51	A8	301	3PE	1	0
46	V1	501	FMN	1	0
45	S1	801	SF4	1	0

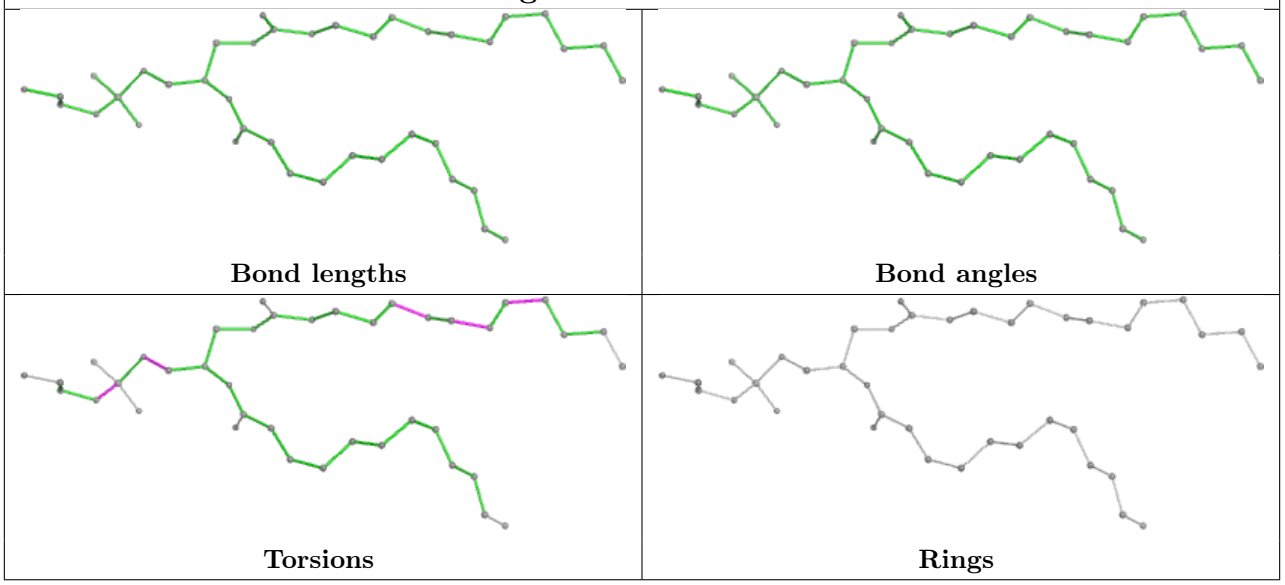
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier.

The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

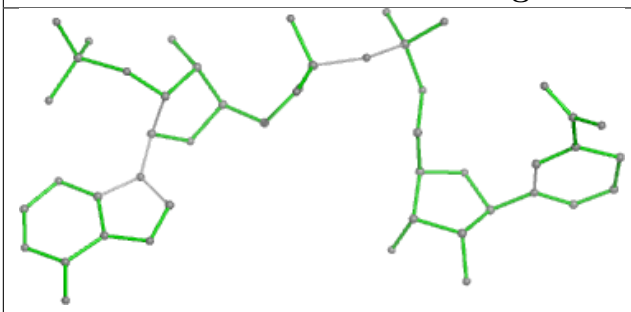
Ligand 3PE D1 501



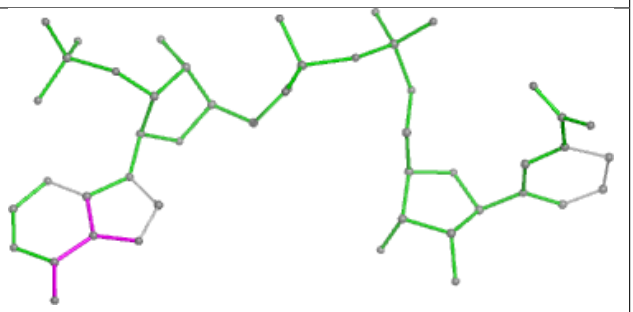
Ligand 3PE D4 501



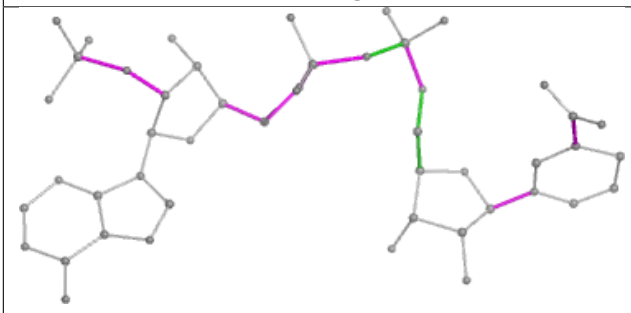
Ligand NDP A9 401



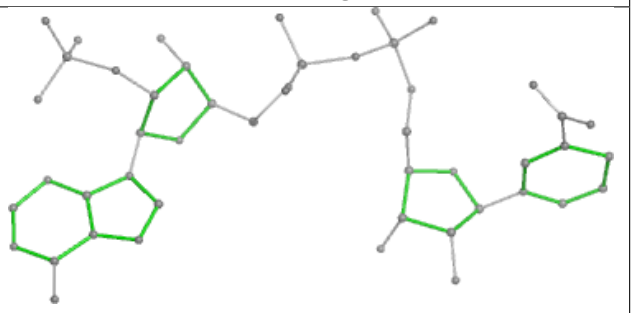
Bond lengths



Bond angles

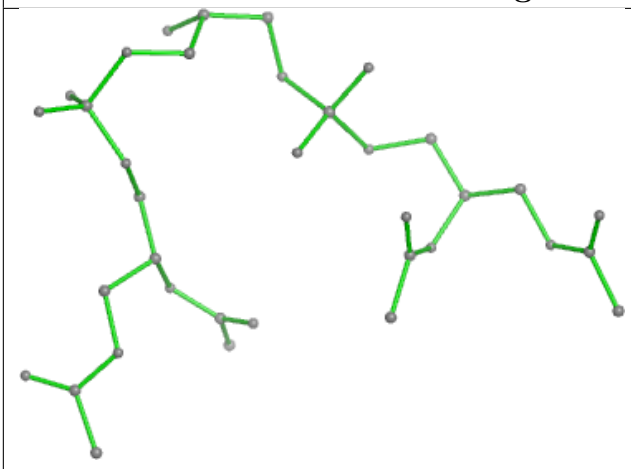


Torsions

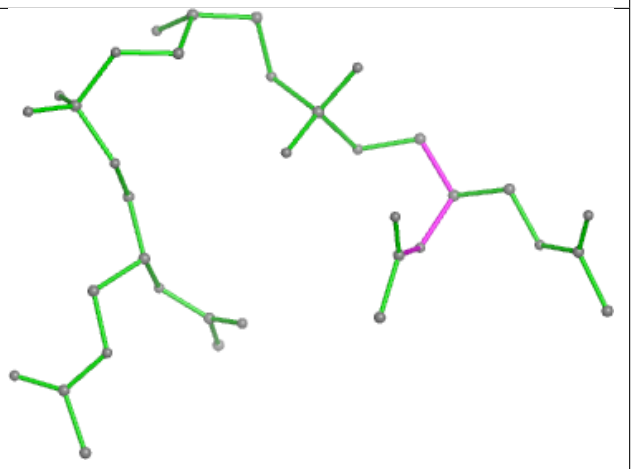


Rings

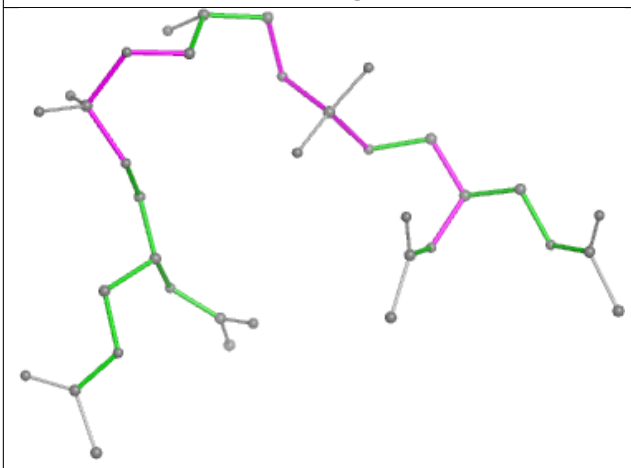
Ligand CDL D5 901



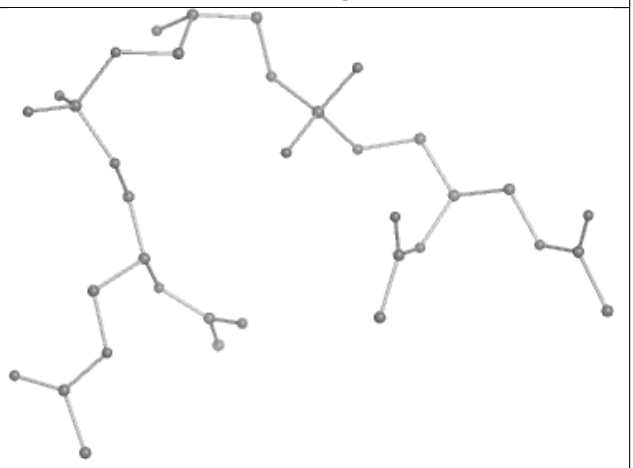
Bond lengths



Bond angles

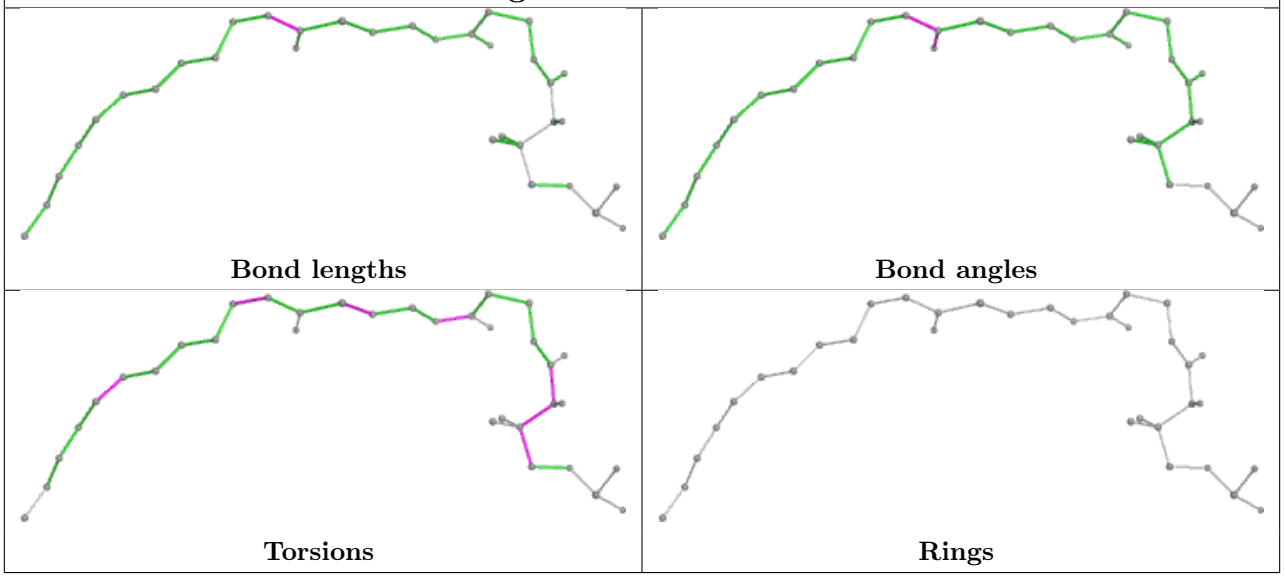


Torsions

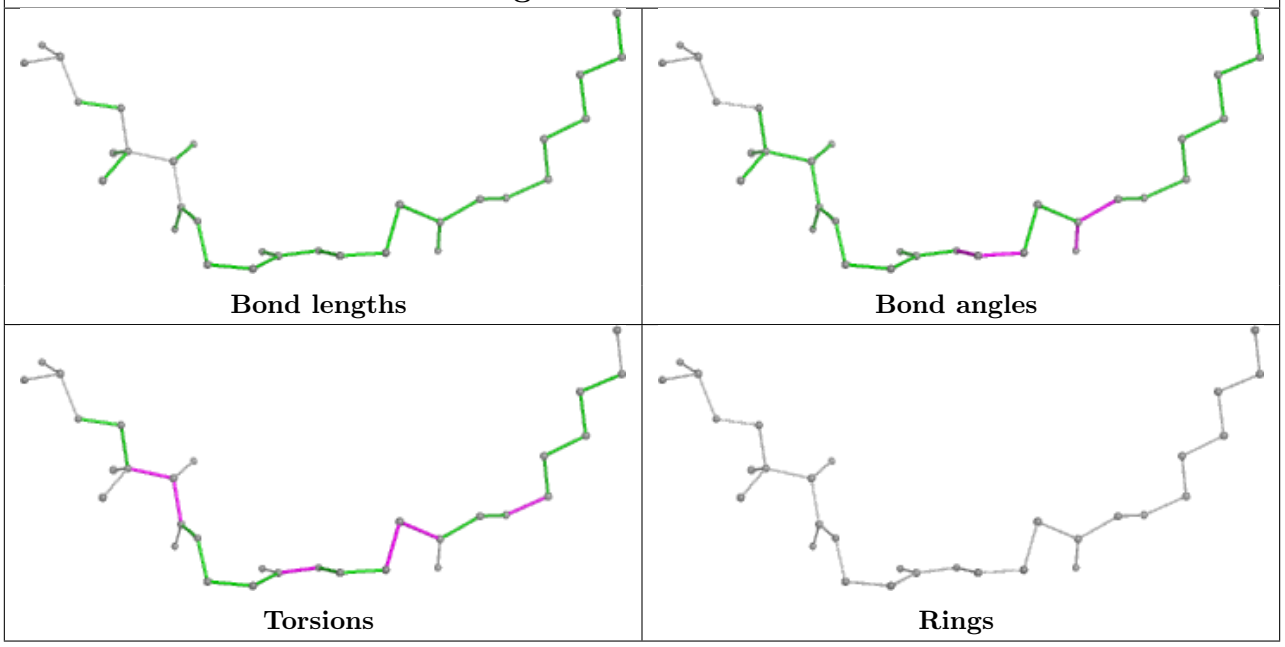


Rings

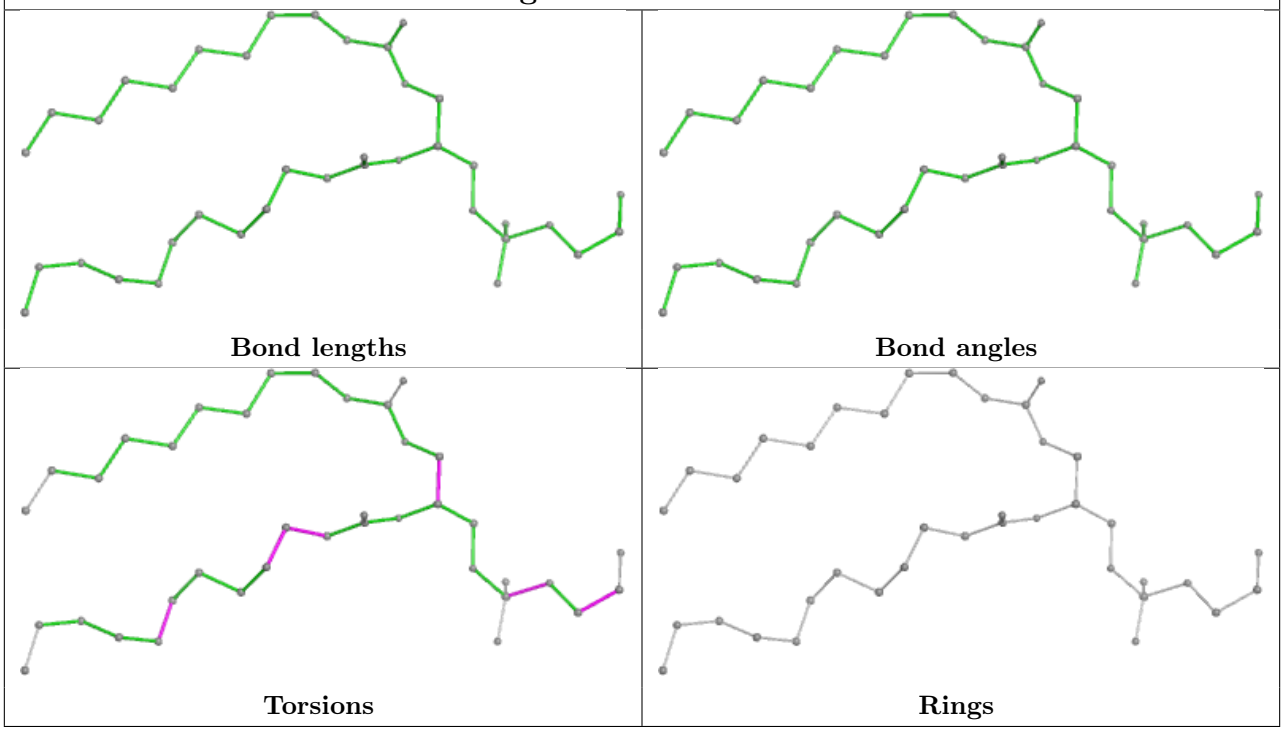
Ligand ZMP AA 101



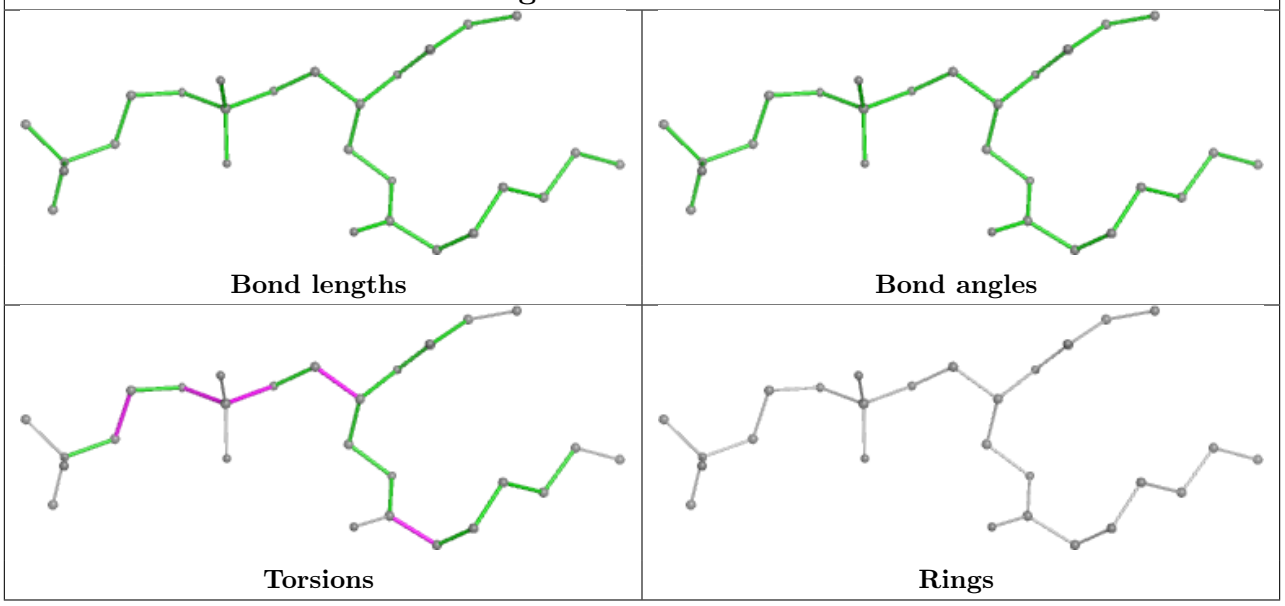
Ligand ZMP B9 201



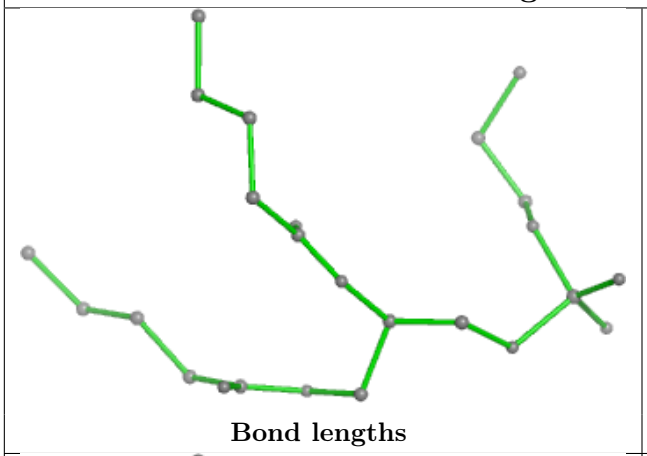
Ligand 3PE D5 902



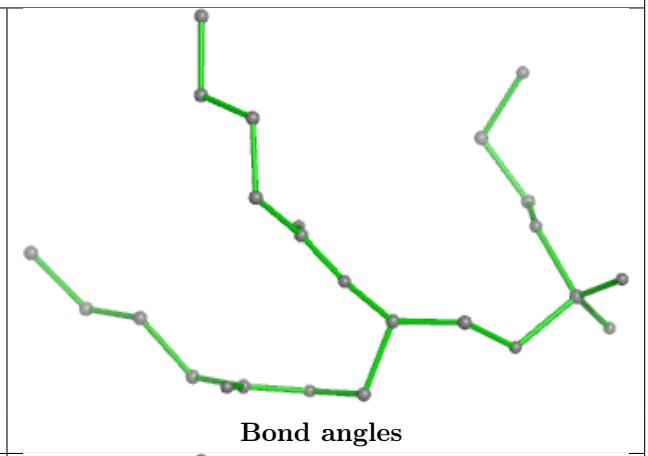
Ligand PC1 D4 502



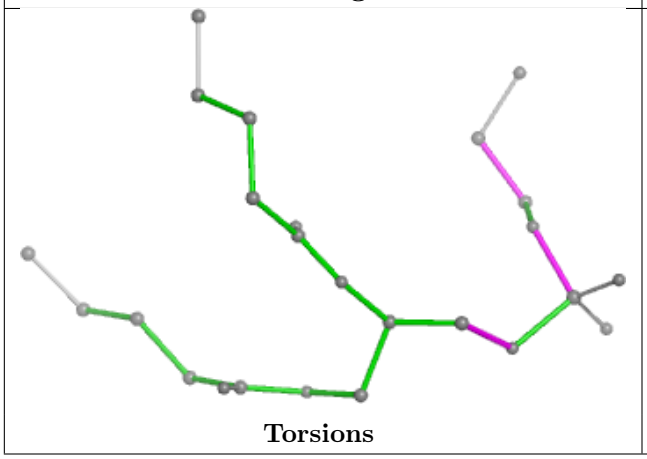
Ligand 3PE A8 301



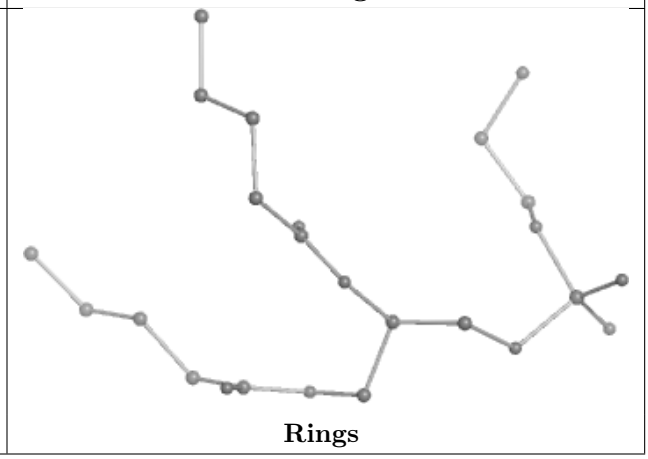
Bond lengths



Bond angles

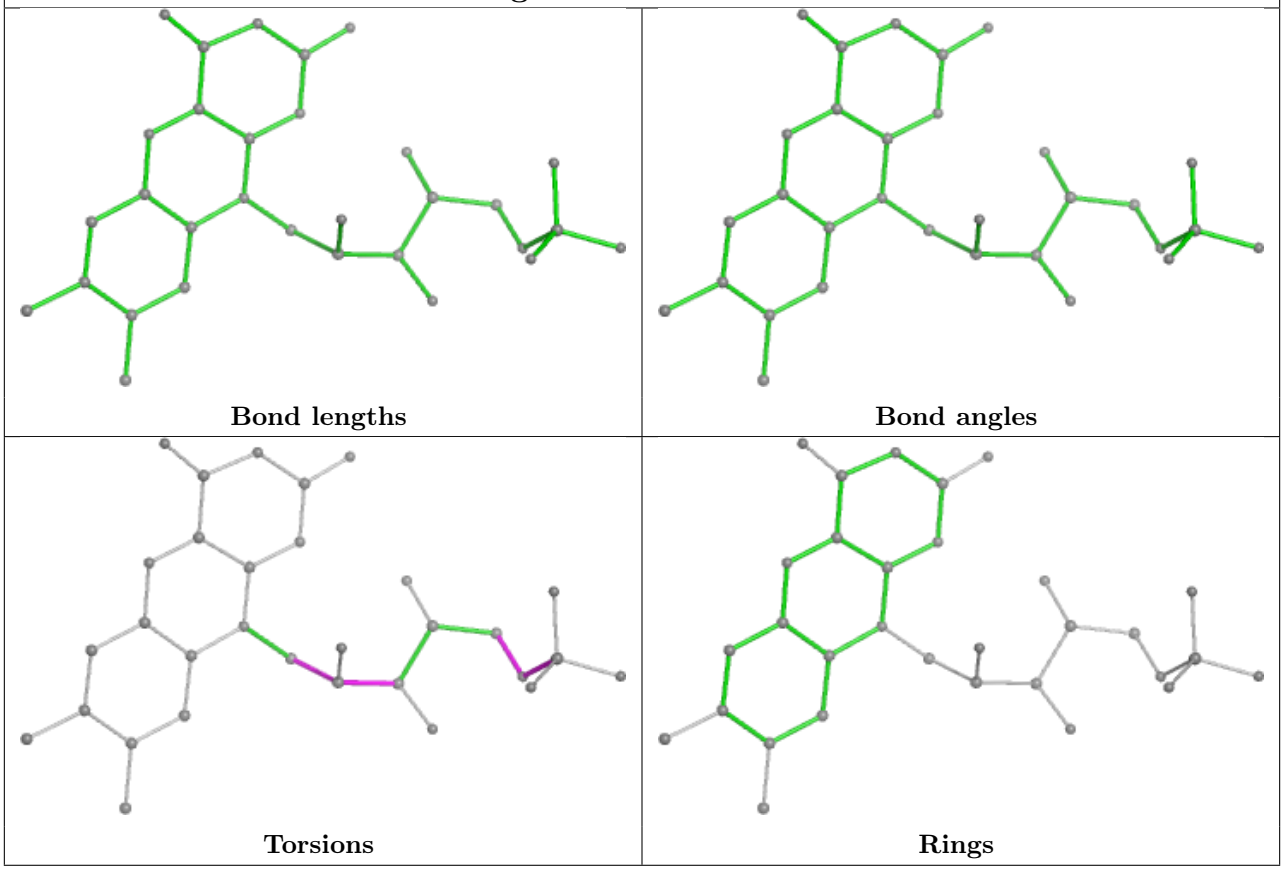


Torsions



Rings

Ligand FMN V1 501



5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

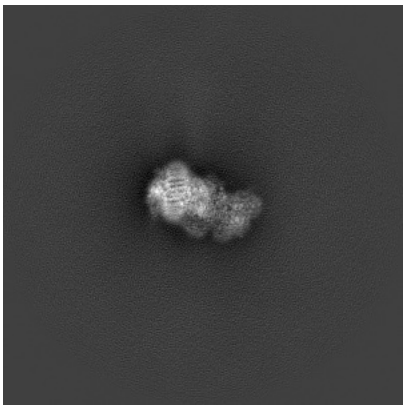
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-4482. These allow visual inspection of the internal detail of the map and identification of artifacts.

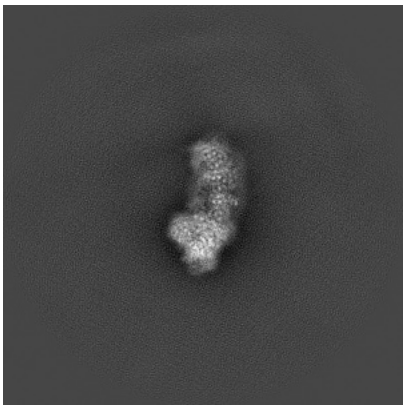
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

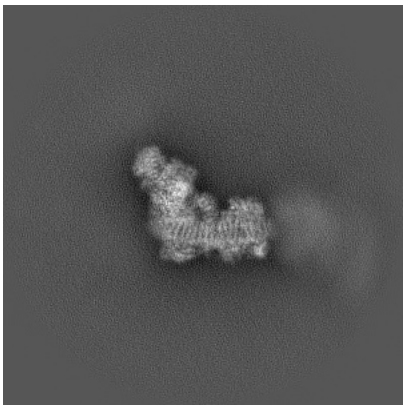
6.1.1 Primary map



X

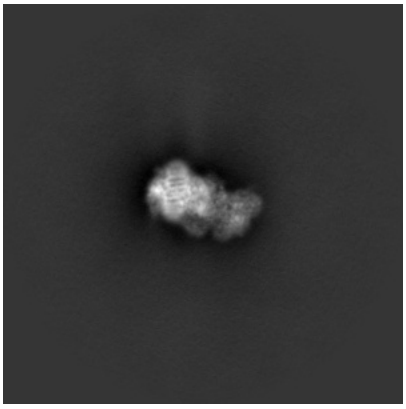


Y

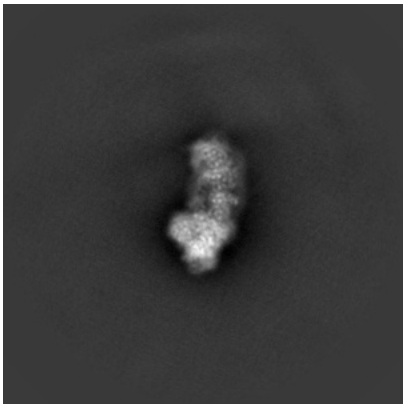


Z

6.1.2 Raw map



X



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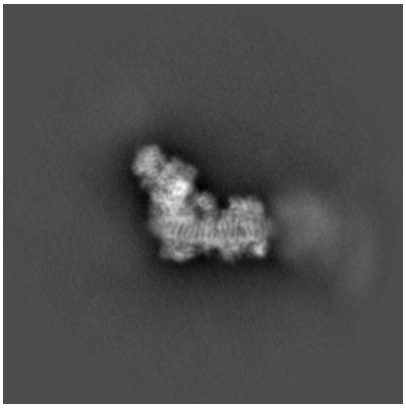
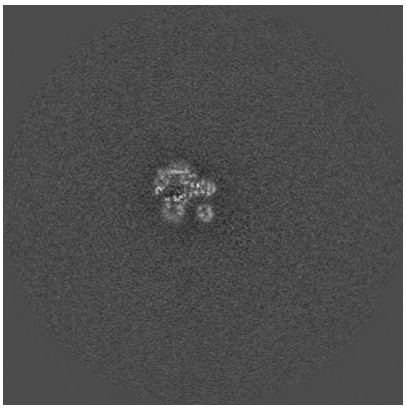


Z

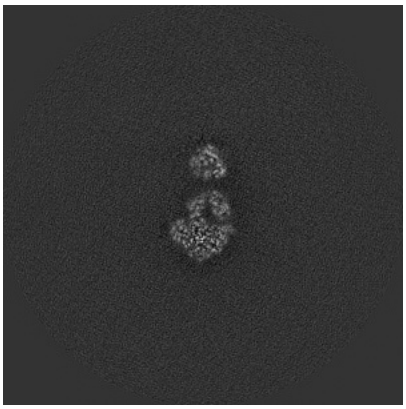
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

6.2.1 Primary map



X Index: 256



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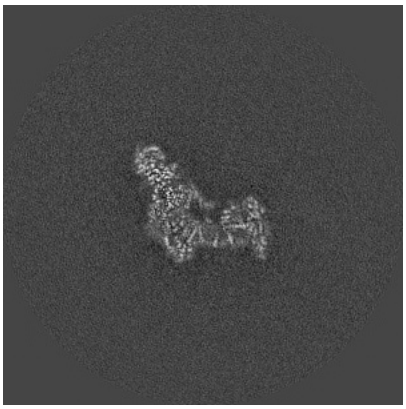
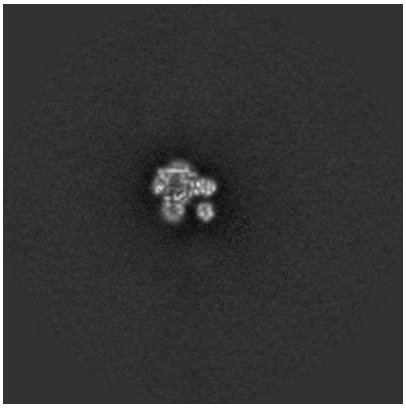


Z Index: 256

6.2.2 Raw map



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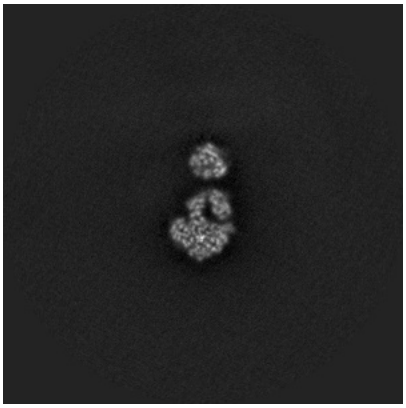
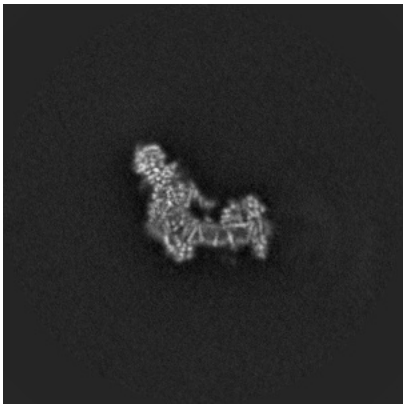


Y Index: 256

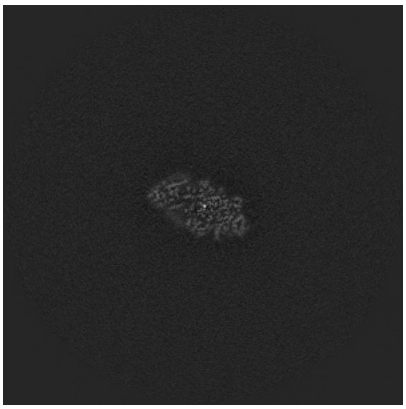


Z Index: 256

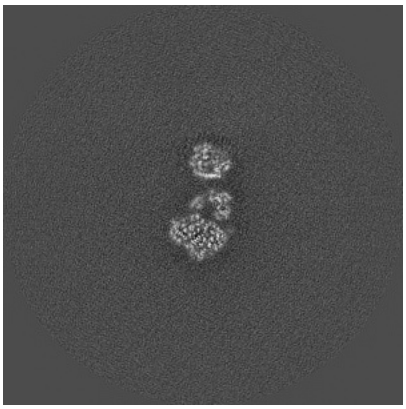
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

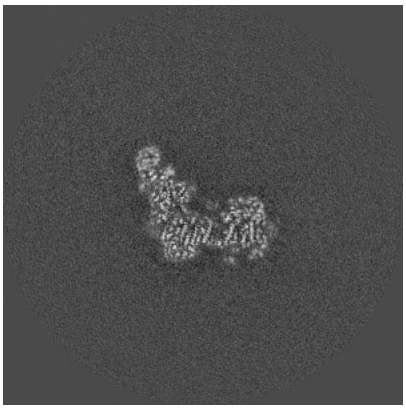
6.3.1 Primary map



X Index: 212

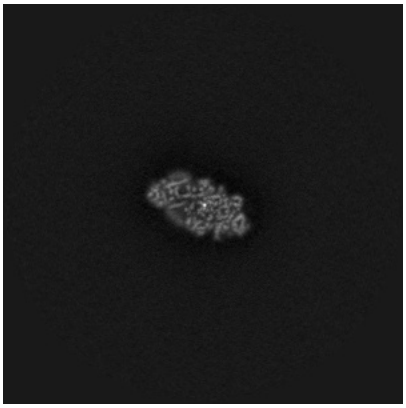


Y Index: 252

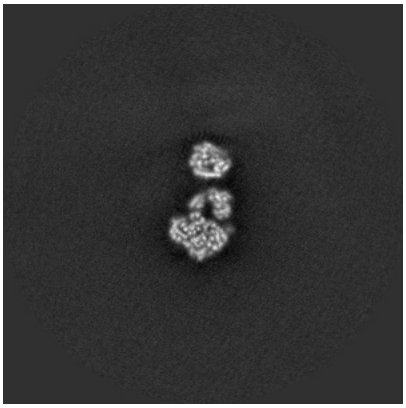


Z Index: 263

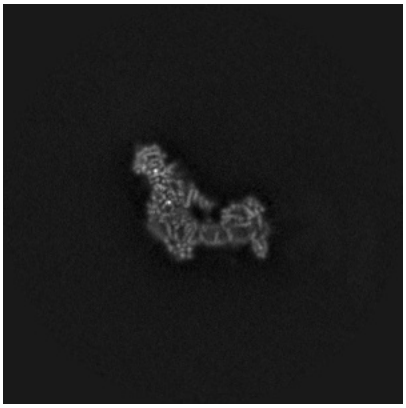
6.3.2 Raw map



X Index: 212



Y Index: 253

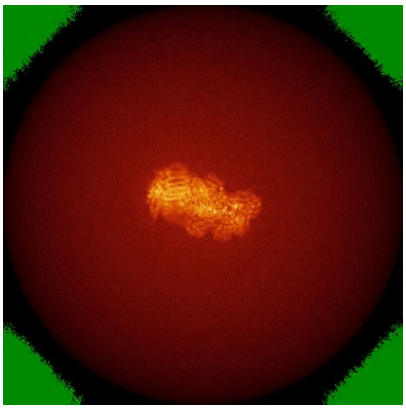


Z Index: 254

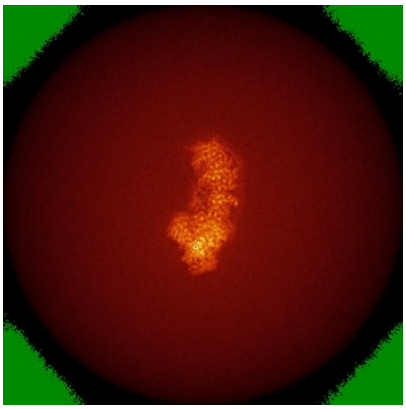
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) (i)

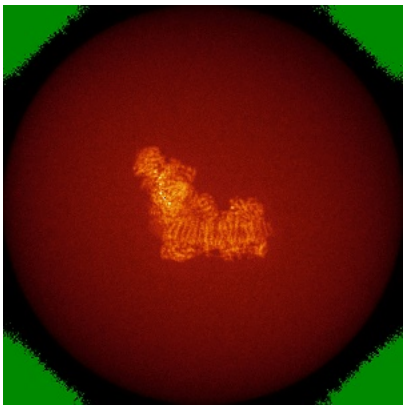
6.4.1 Primary map



X

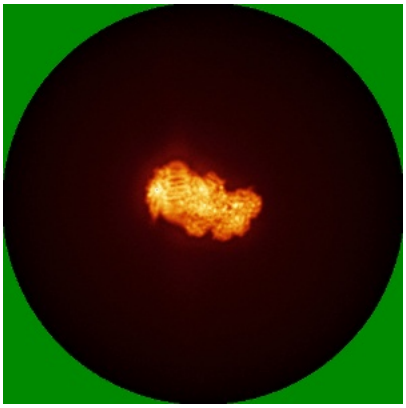


Y

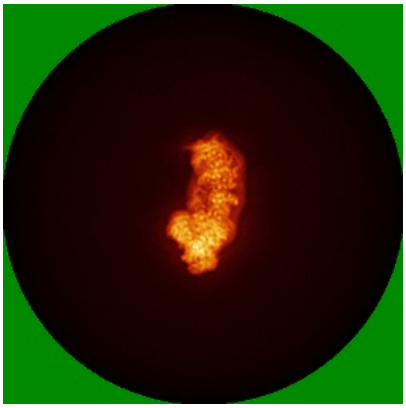


Z

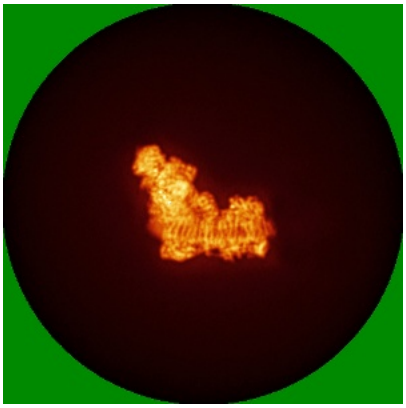
6.4.2 Raw map



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

X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.14. 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

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.

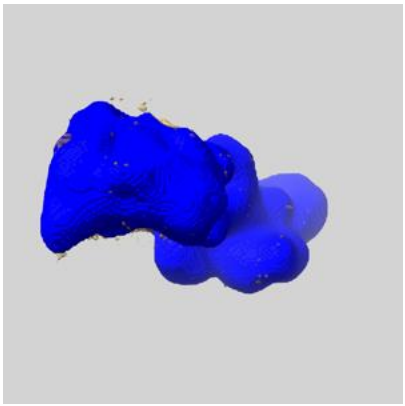
6.6 Mask visualisation (i)

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

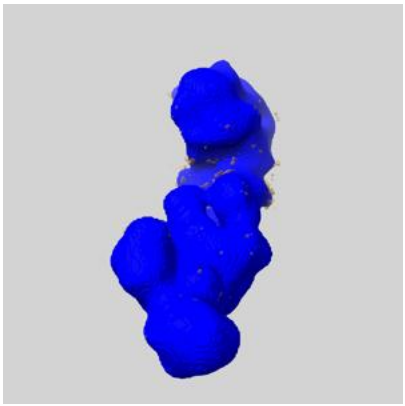
A mask typically either:

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

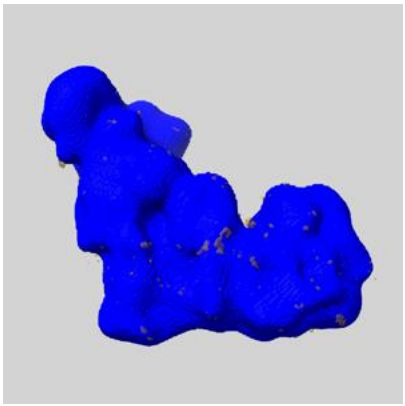
6.6.1 emd_4482_msk_1.map (i)



X



Y

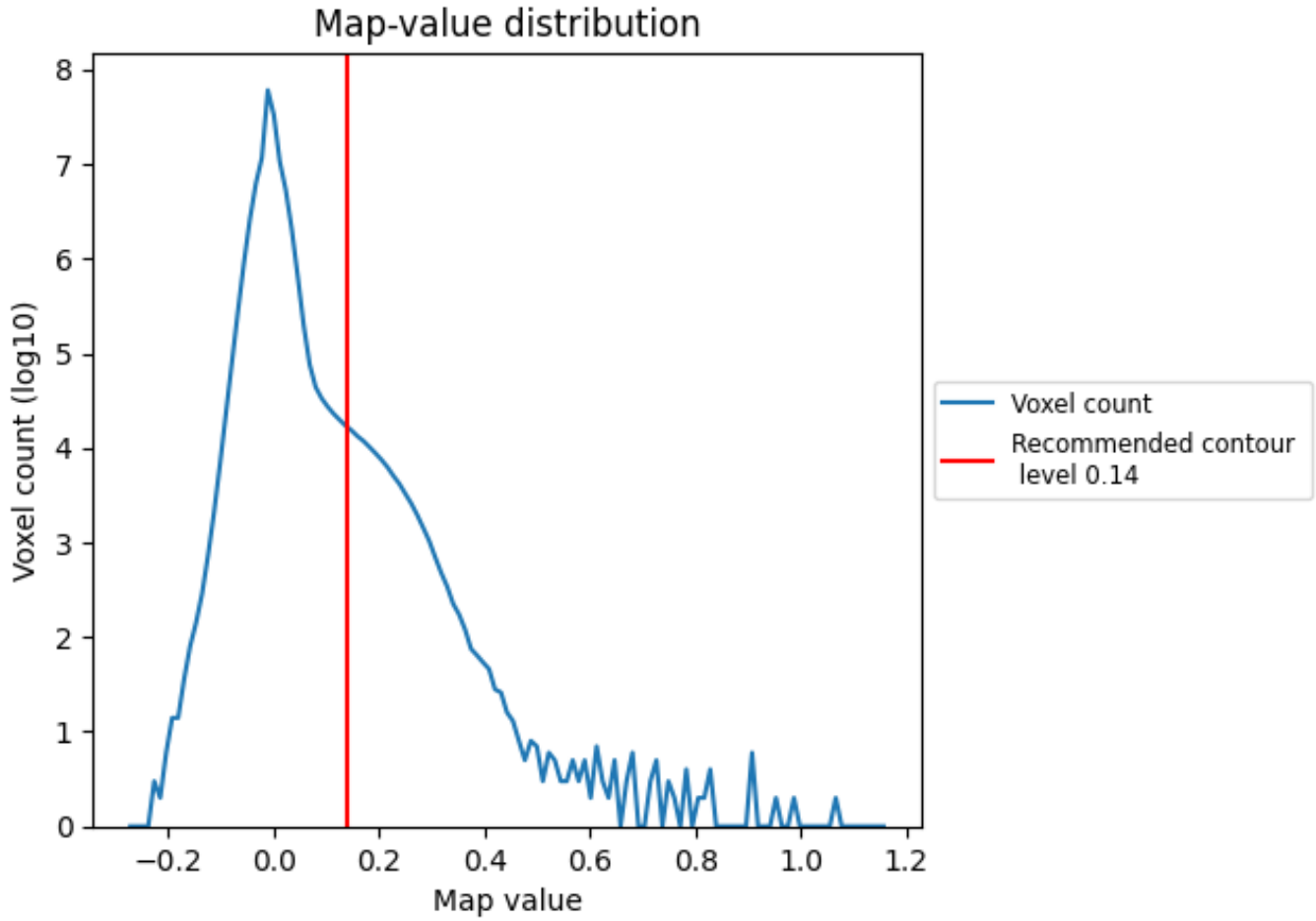


Z

7 Map analysis

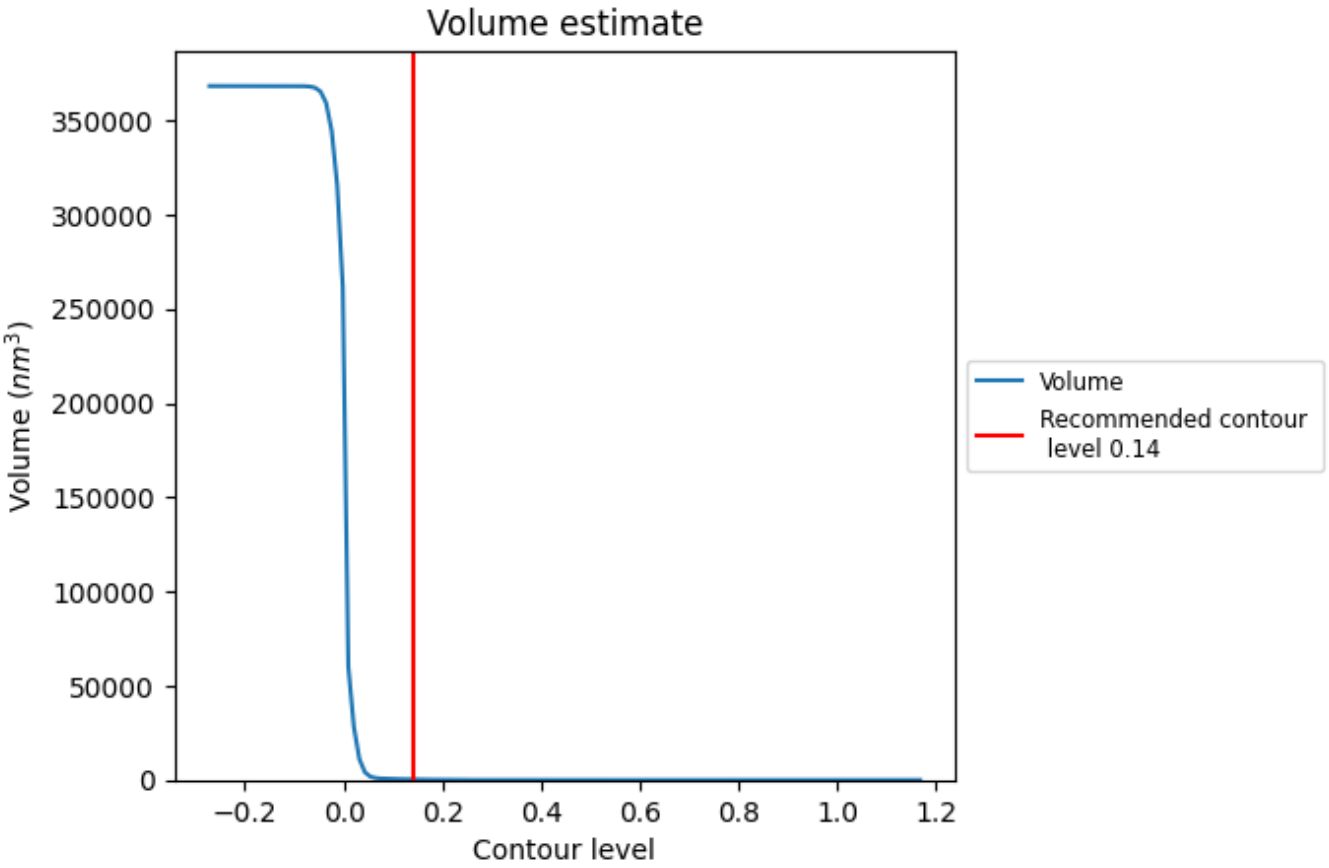
This section contains the results of statistical analysis of the map.

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.

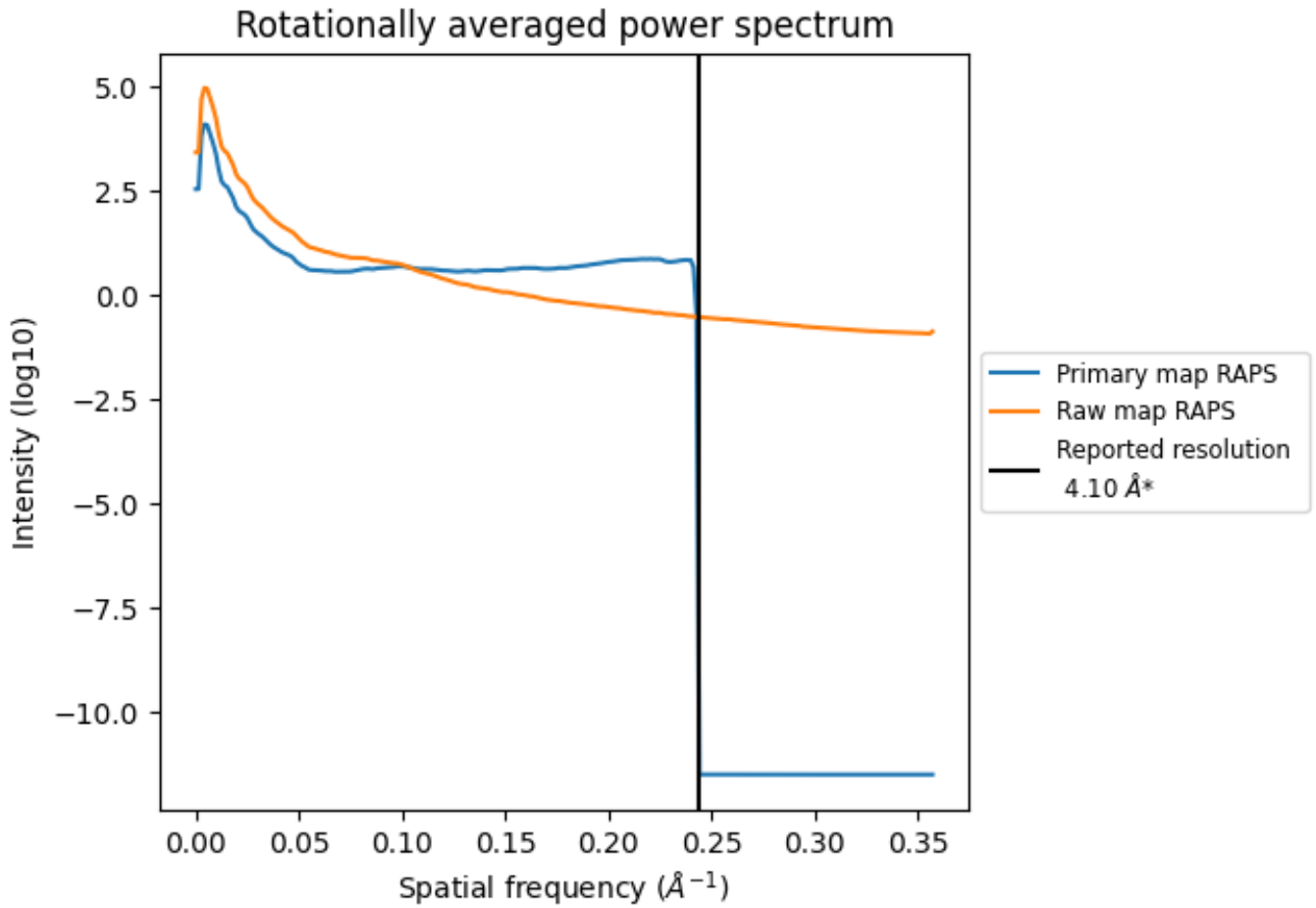
7.2 Volume estimate



The volume at the recommended contour level is 294 nm^3; this corresponds to an approximate mass of 266 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)

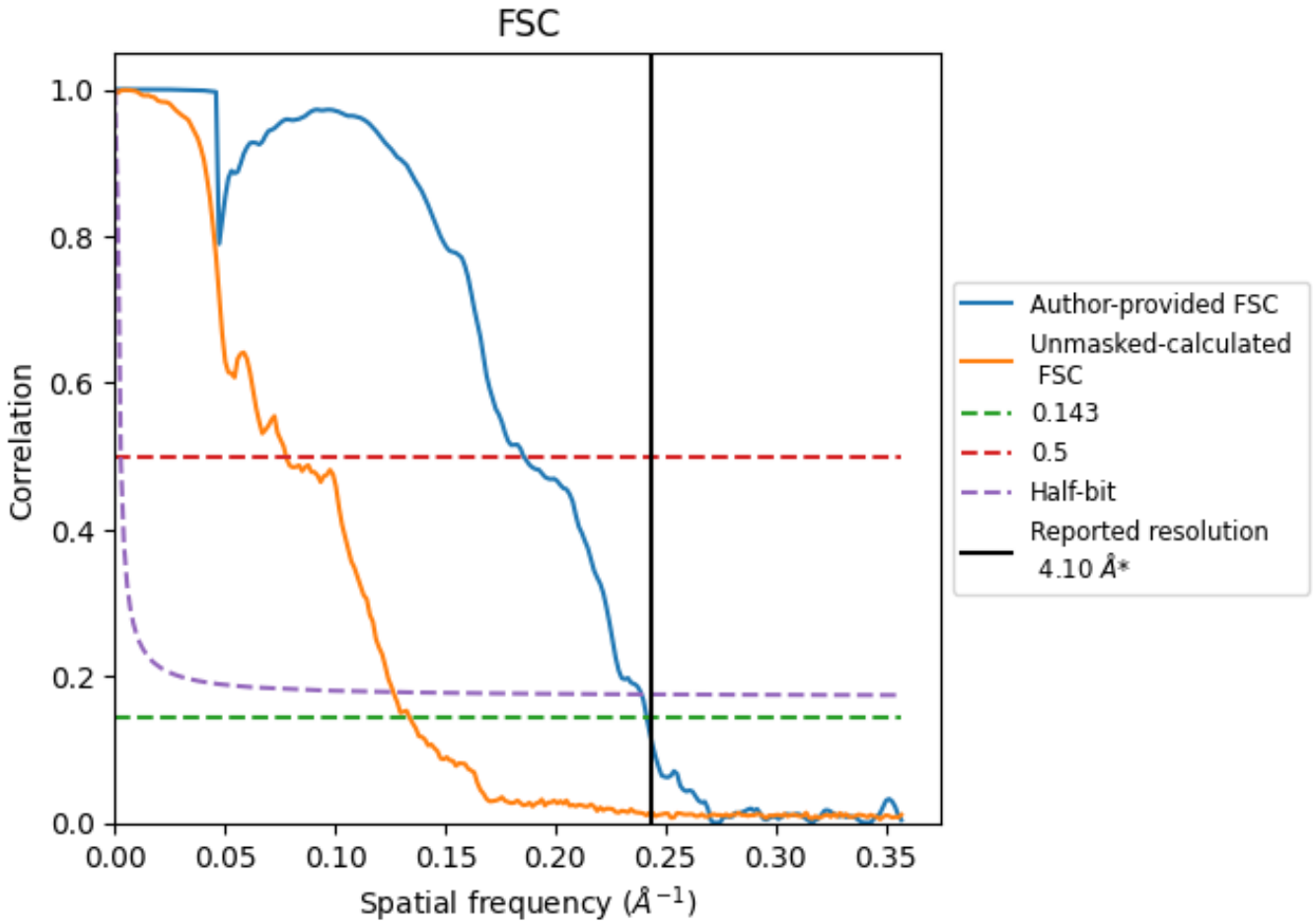


*Reported resolution corresponds to spatial frequency of 0.244 $Å^{-1}$

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 0.244 Å^{-1}

8.2 Resolution estimates (i)

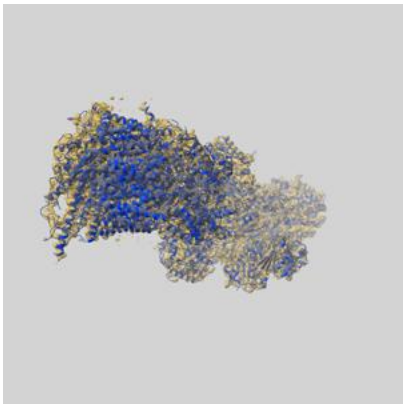
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.10	-	-
Author-provided FSC curve	4.14	5.39	4.18
Unmasked-calculated*	7.47	12.85	7.91

*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 7.47 differs from the reported value 4.1 by more than 10 %

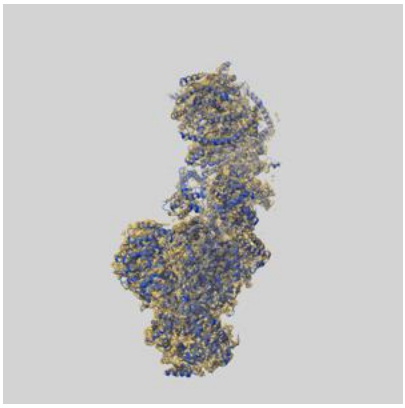
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-4482 and PDB model 6QA9. Per-residue inclusion information can be found in section 3 on page 17.

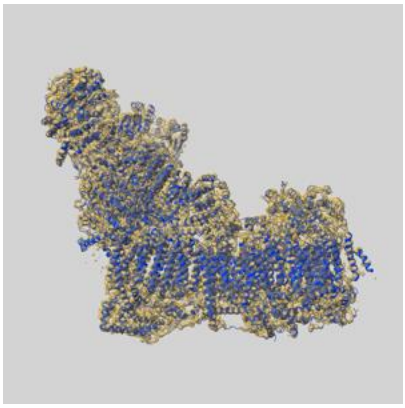
9.1 Map-model overlay



X



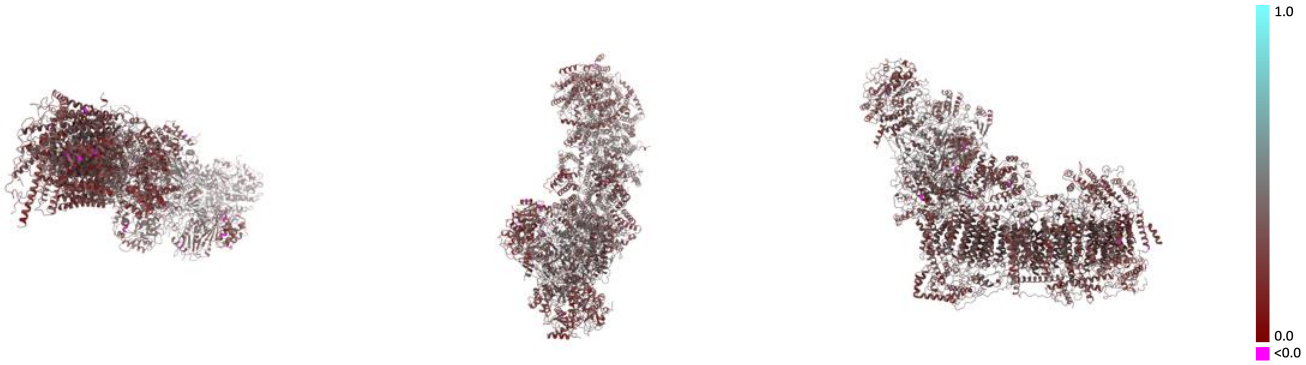
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.14 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.

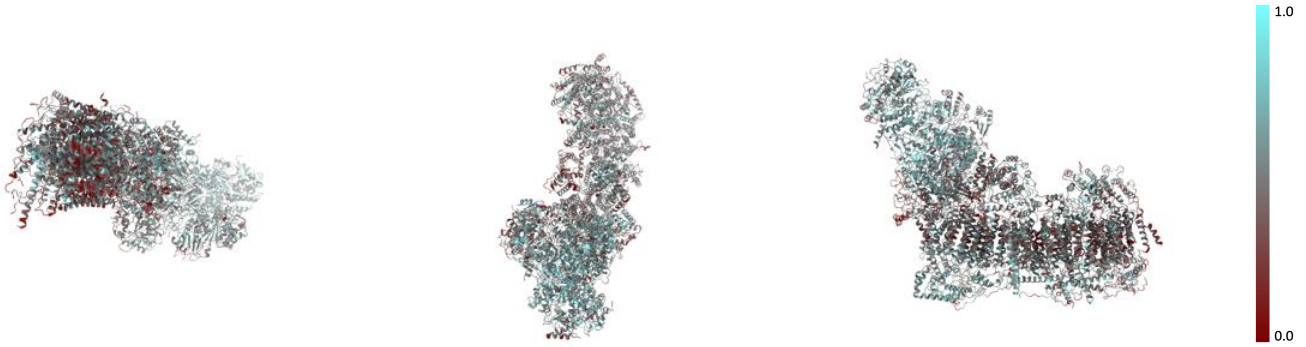
9.2 Q-score mapped to coordinate model (i)



X Y Z

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.

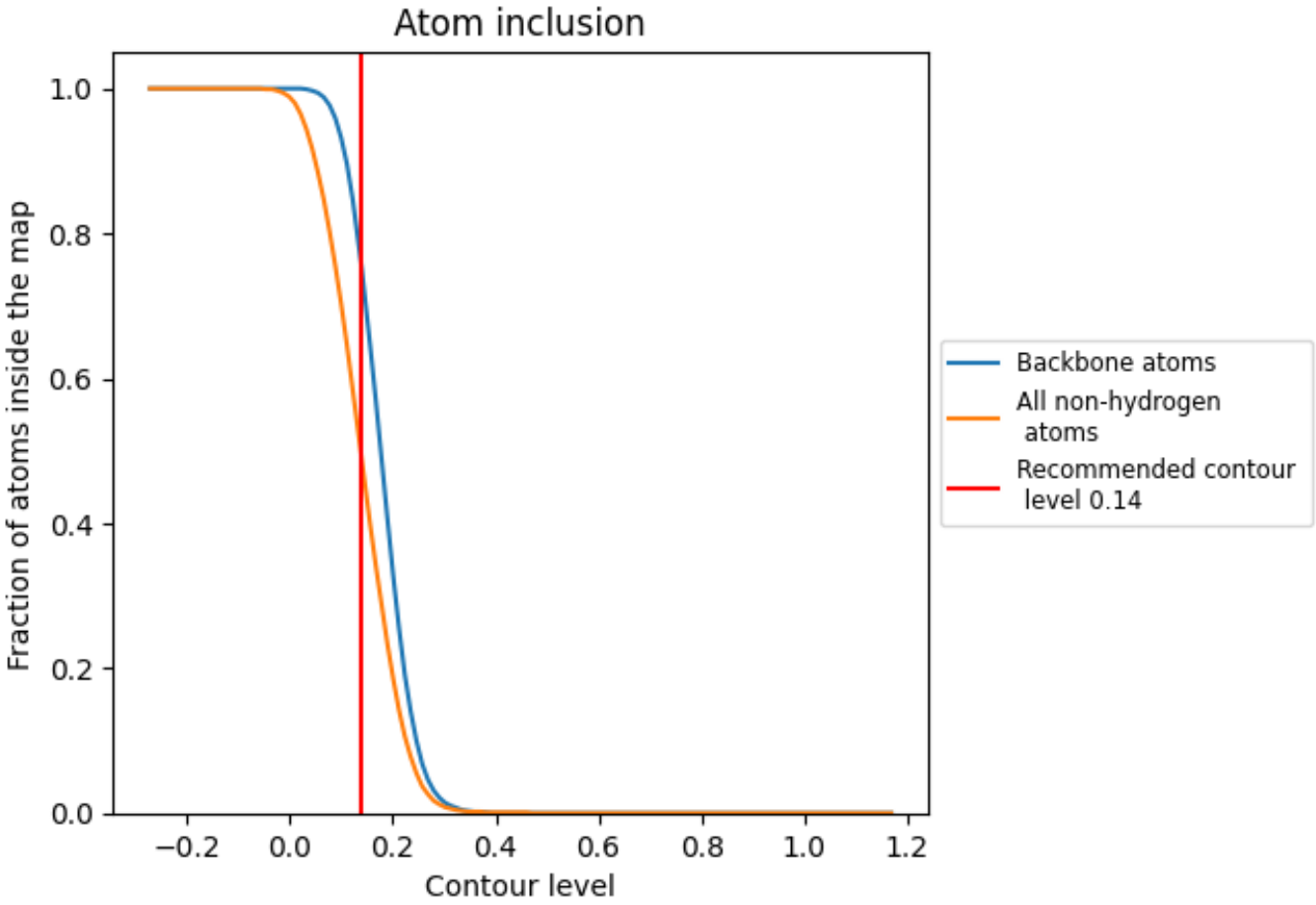
9.3 Atom inclusion mapped to coordinate model (i)



X Y Z

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 (0.14).

9.4 Atom inclusion (i)



At the recommended contour level, 75% of all backbone atoms, 49% 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 (0.14) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.4870	0.3370
4L	0.4330	0.3330
A1	0.5540	0.3400
A2	0.4890	0.2930
A3	0.4980	0.3470
A5	0.5120	0.3270
A6	0.4690	0.3290
A7	0.4300	0.3650
A8	0.5420	0.3340
A9	0.4630	0.3220
AA	0.2730	0.2560
AB	0.4250	0.2950
AJ	0.4670	0.3350
AK	0.3350	0.3040
AL	0.3600	0.3630
AM	0.5170	0.3260
B1	0.3900	0.3110
B2	0.3850	0.2960
B3	0.3470	0.2840
B4	0.4470	0.3120
B5	0.5190	0.3560
B6	0.4250	0.3000
B7	0.4240	0.2790
B8	0.4490	0.3290
B9	0.4920	0.3100
BJ	0.5000	0.3190
BK	0.4130	0.3130
C1	0.4710	0.3390
C2	0.4860	0.3340
D1	0.4880	0.3460
D2	0.5070	0.3630
D3	0.3850	0.3360
D4	0.4720	0.3590
D5	0.4170	0.3160
D6	0.3840	0.3110

Continued on next page...

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Chain	Atom inclusion	Q-score
S1	0.5570	0.3520
S2	0.5260	0.3680
S3	0.5750	0.3850
S4	0.5300	0.3790
S5	0.5270	0.3420
S6	0.5560	0.3780
S7	0.5630	0.3860
S8	0.6080	0.3900
V1	0.5730	0.3220
V2	0.5440	0.3160
V3	0.5640	0.3150