



Full wwPDB EM Validation Report ⓘ

Dec 11, 2022 – 10:02 am GMT

PDB ID : 6S6U
EMDB ID : EMD-10106
Title : Structure of Azospirillum brasilense Glutamate Synthase in a6b4 oligomeric state.
Authors : Chaves-Sanjuan, A.; Bolognesi, M.
Deposited on : 2019-07-03
Resolution : 3.50 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

EMDB validation analysis : 0.0.1.dev43
Mogul : 1.8.4, CSD as541be (2020)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.9
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.31.3

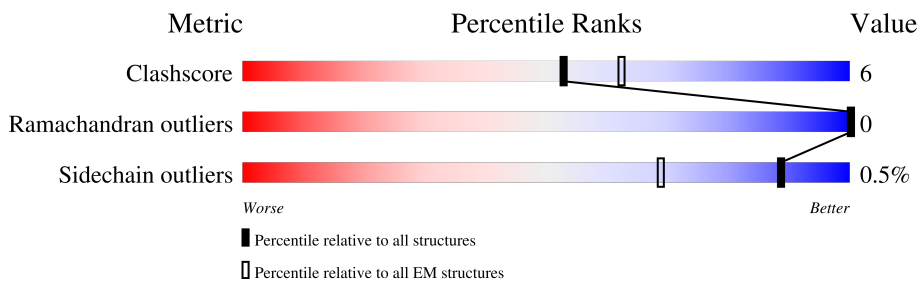
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.50 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

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

Mol	Chain	Length	Quality of chain
1	A	1515	
1	B	1515	
1	C	1515	
1	D	1515	
1	E	1515	
1	F	1515	
2	G	482	
2	H	482	

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Mol	Chain	Length	Quality of chain
2	I	482	
2	J	482	

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
6	FAD	H	503	X	-	-	-

2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 82978 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.

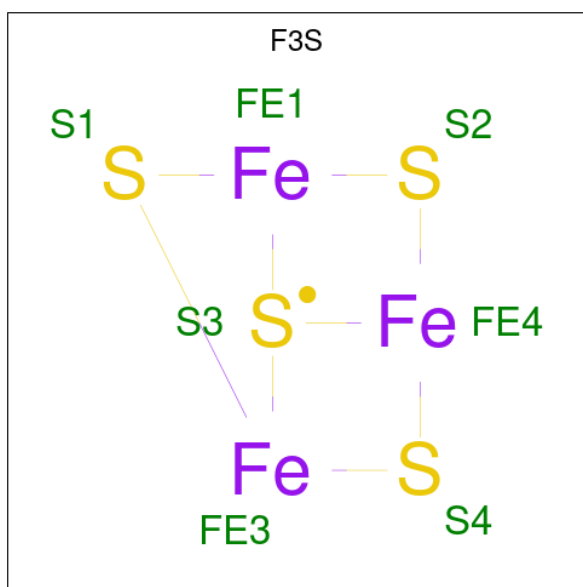
- Molecule 1 is a protein called Glutamate synthase [NADPH] large chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	1472	11337	7109	2036	2132	60	0	0
1	B	1472	11337	7109	2036	2132	60	0	0
1	C	1472	11337	7109	2036	2132	60	0	0
1	D	1472	11337	7109	2036	2132	60	0	0
1	E	1472	11337	7109	2036	2132	60	0	0
1	F	1472	11337	7109	2036	2132	60	0	0

- Molecule 2 is a protein called Glutamate synthase [NADPH] small chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	G	472	3613	2250	660	686	17	0	0
2	H	472	3613	2250	660	686	17	0	0
2	I	472	3613	2250	660	686	17	0	0
2	J	472	3613	2250	660	686	17	0	0

- Molecule 3 is FLAVIN MONONUCLEOTIDE (three-letter code: FMN) (formula: C₁₇H₂₁N₄O₉P) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms			AltConf
4	A	1	Total	Fe	S	0
			7	3	4	
4	B	1	Total	Fe	S	0
			7	3	4	
4	C	1	Total	Fe	S	0
			7	3	4	
4	D	1	Total	Fe	S	0
			7	3	4	
4	E	1	Total	Fe	S	0
			7	3	4	
4	F	1	Total	Fe	S	0
			7	3	4	

- Molecule 5 is IRON/SULFUR CLUSTER (three-letter code: SF4) (formula: Fe₄S₄).



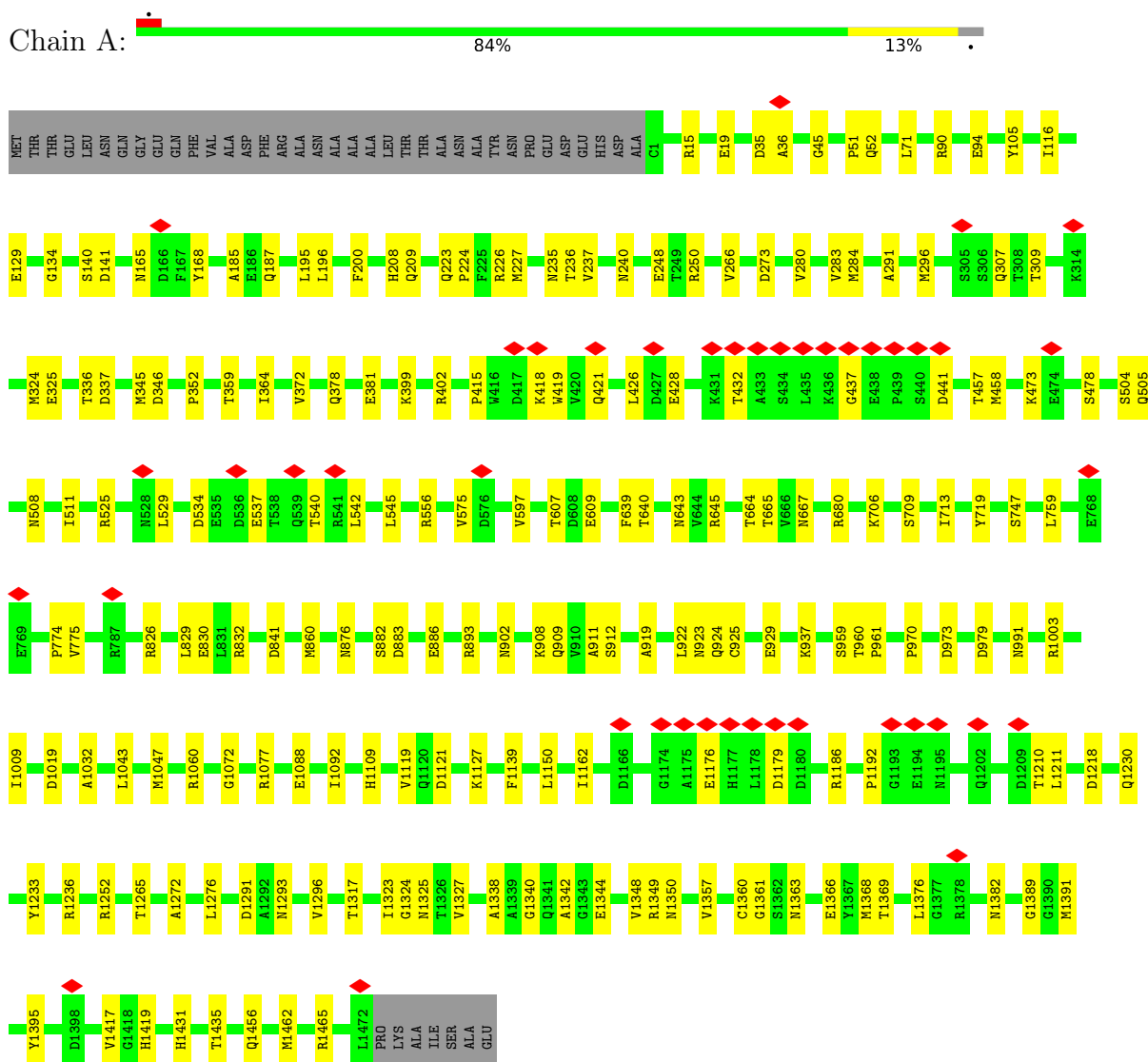
Mol	Chain	Residues	Atoms			AltConf
			Total	Fe	S	
5	G	1	16	8	8	0
5	G	1	16	8	8	0
5	H	1	16	8	8	0
5	H	1	16	8	8	0
5	I	1	16	8	8	0
5	I	1	16	8	8	0
5	J	1	16	8	8	0
5	J	1	16	8	8	0

- Molecule 6 is FLAVIN-ADENINE DINUCLEOTIDE (three-letter code: FAD) (formula: $C_{27}H_{33}N_9O_{15}P_2$) (labeled as "Ligand of Interest" by depositor).

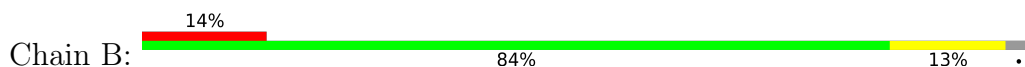
3 Residue-property plots

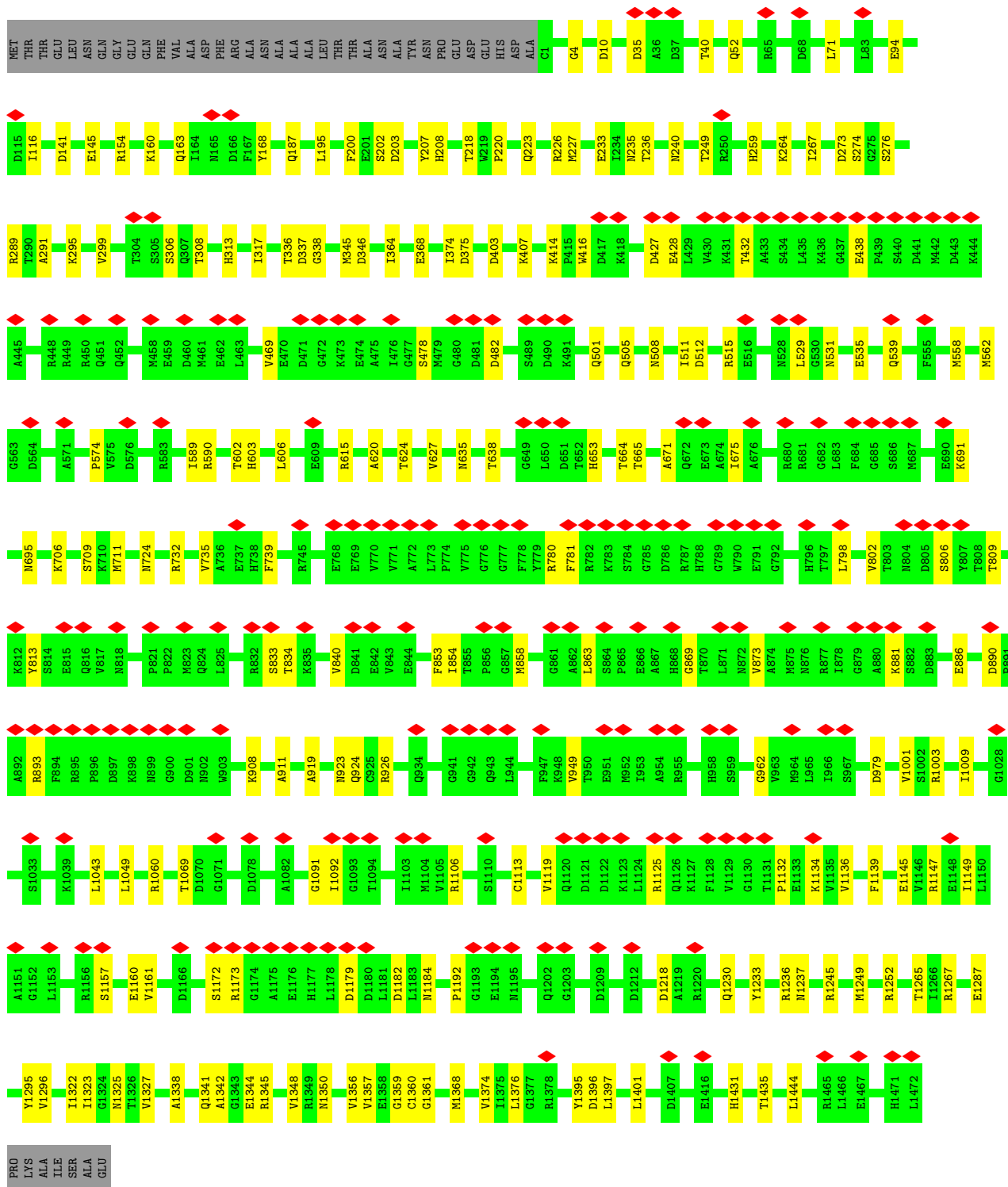
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

- Molecule 1: Glutamate synthase [NADPH] large chain

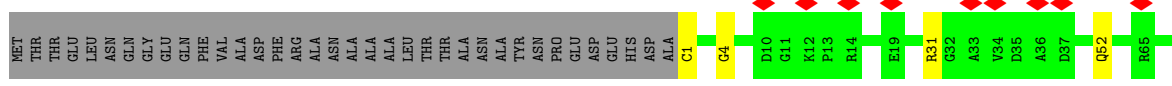
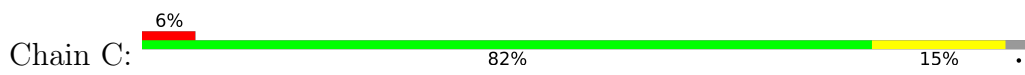


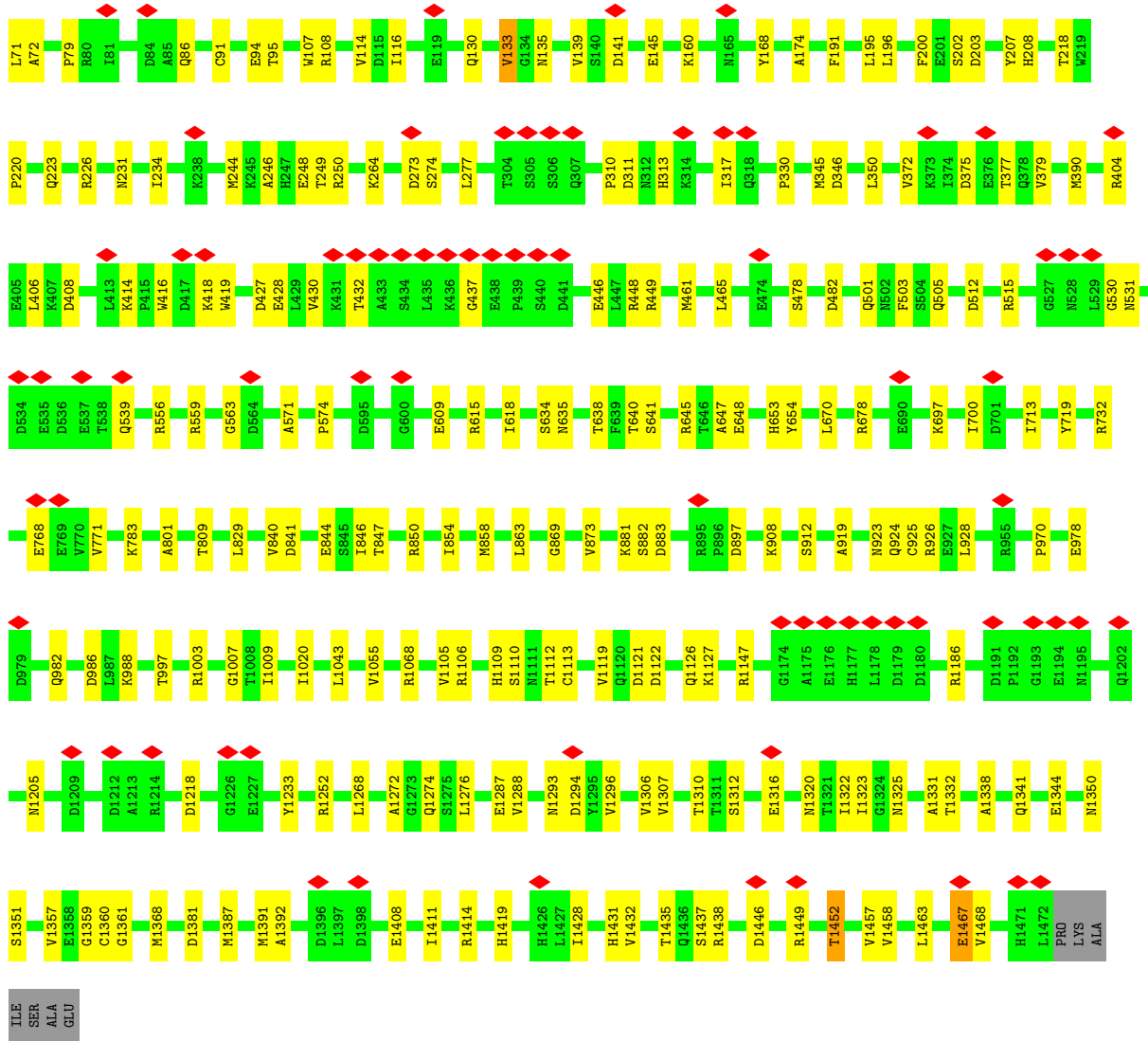
- Molecule 1: Glutamate synthase [NADPH] large chain



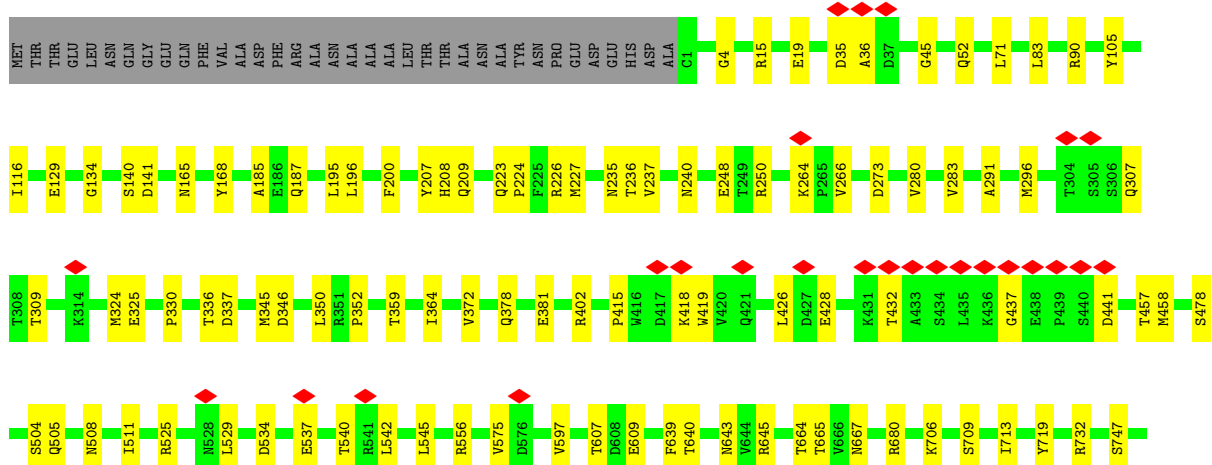
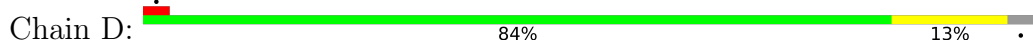


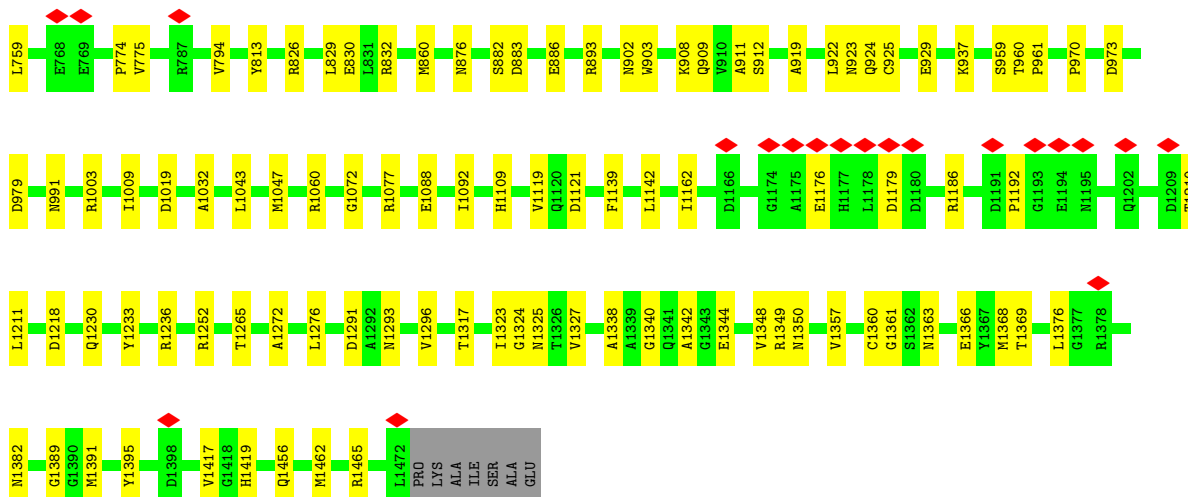
• Molecule 1: Glutamate synthase [NADPH] large chain



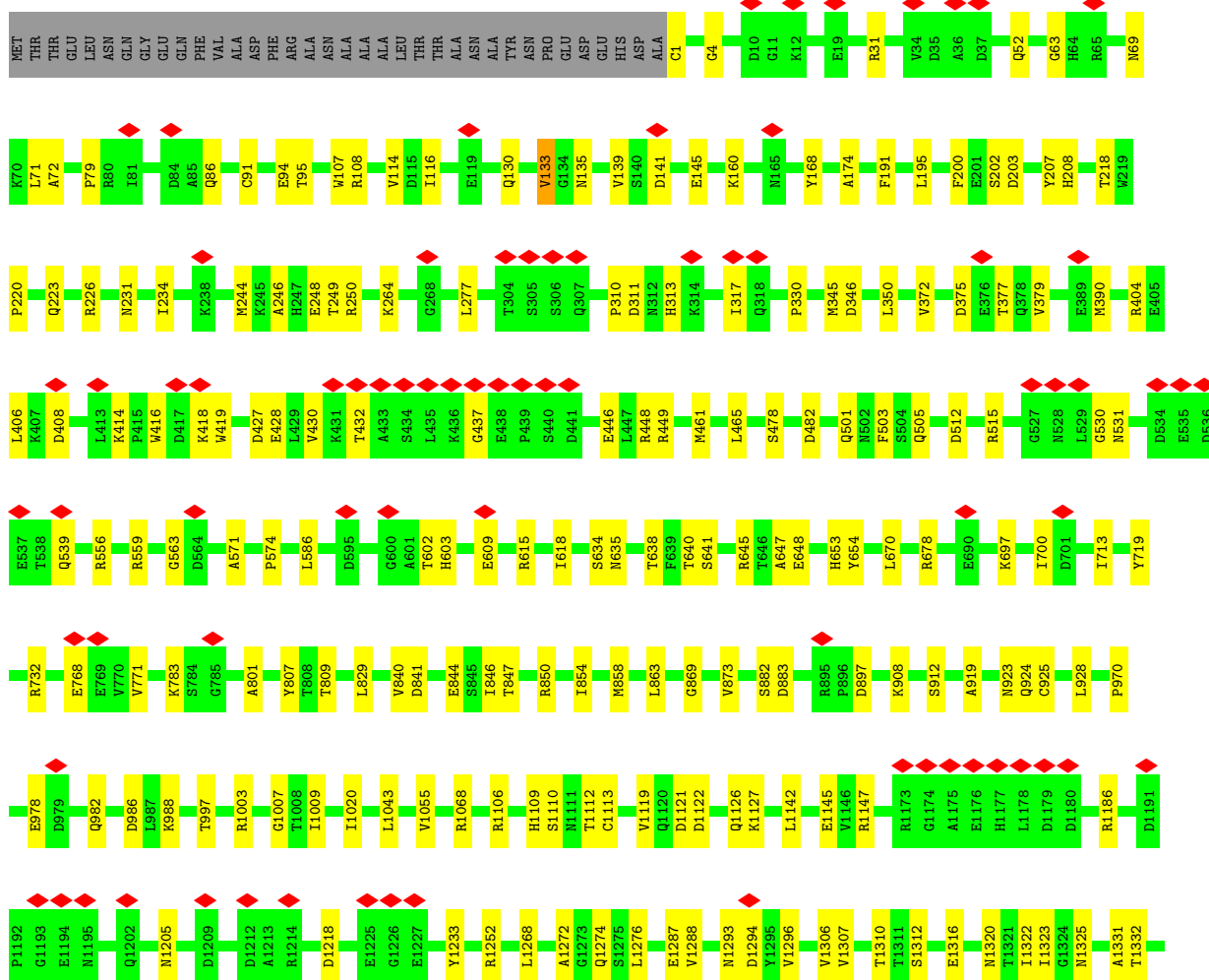
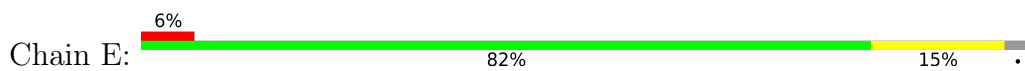


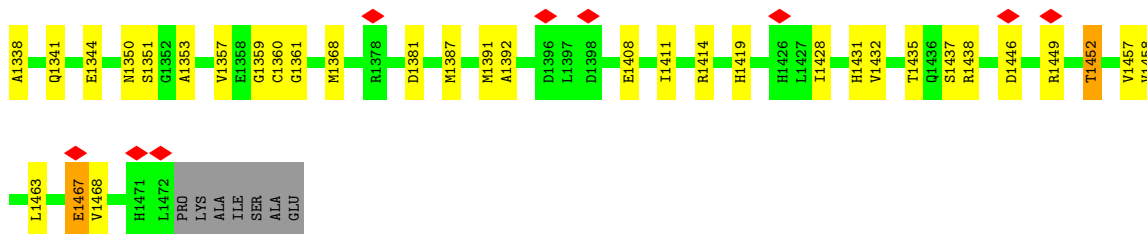
• Molecule 1: Glutamate synthase [NADPH] large chain



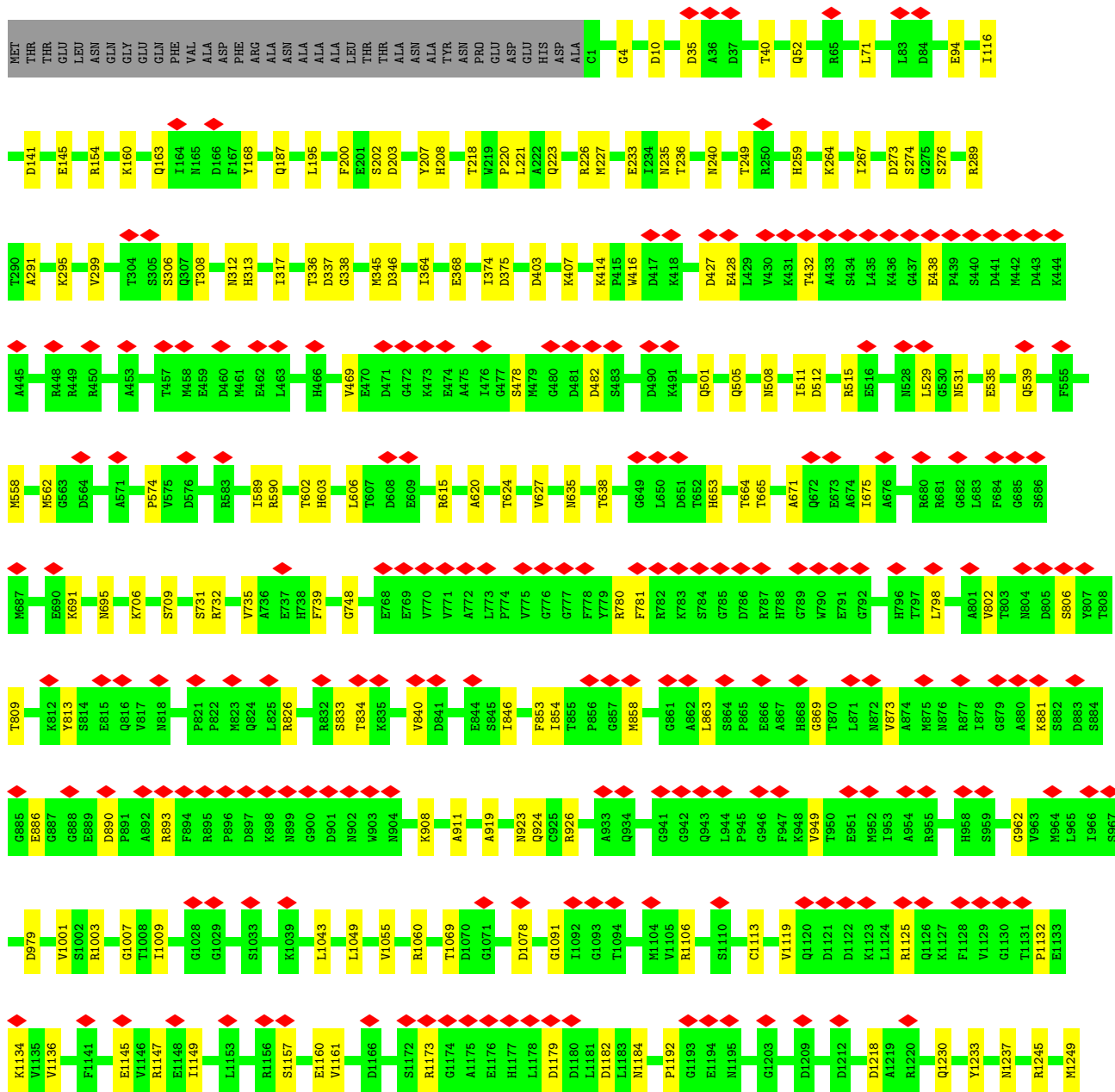
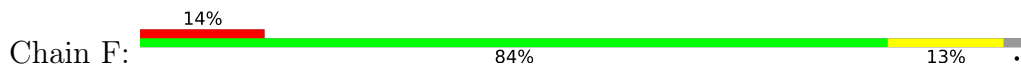


• Molecule 1: Glutamate synthase [NADPH] large chain



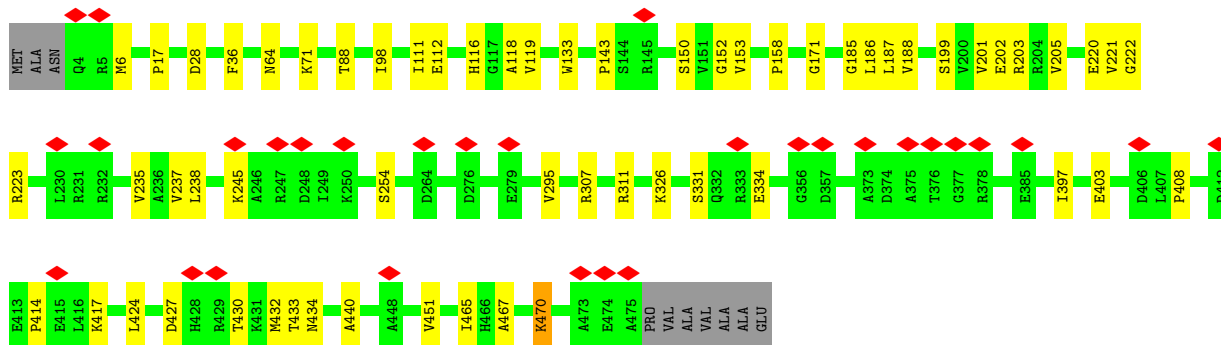
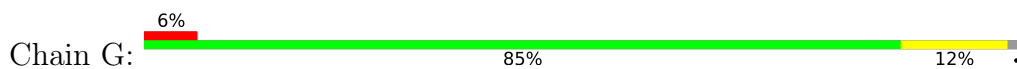


• Molecule 1: Glutamate synthase [NADPH] large chain

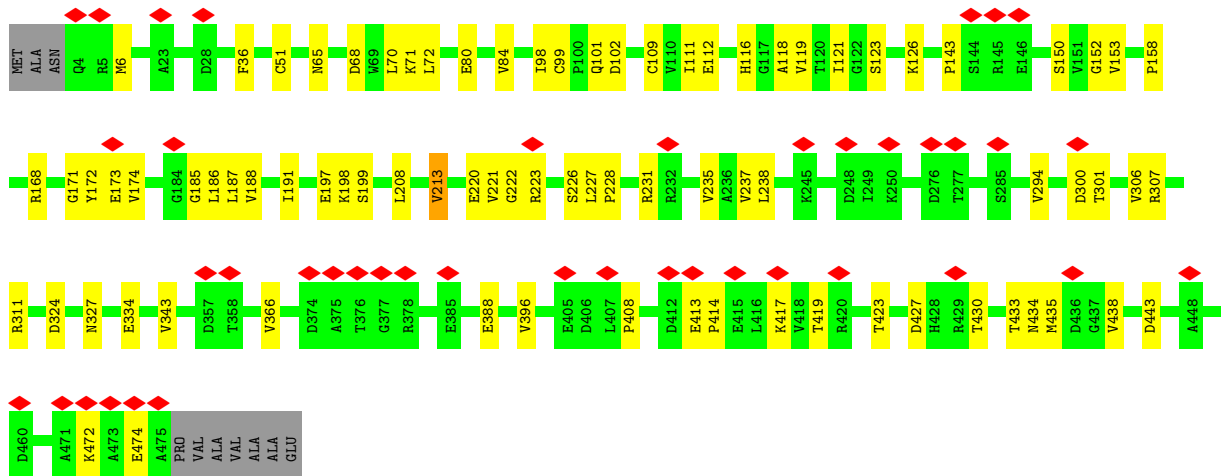
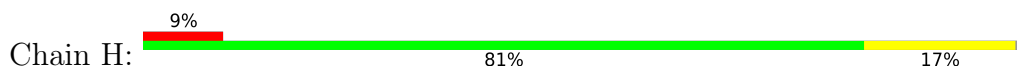




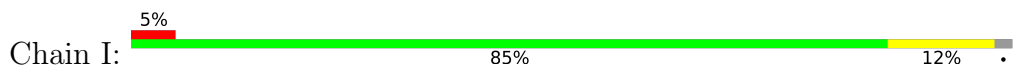
• Molecule 2: Glutamate synthase [NADPH] small chain

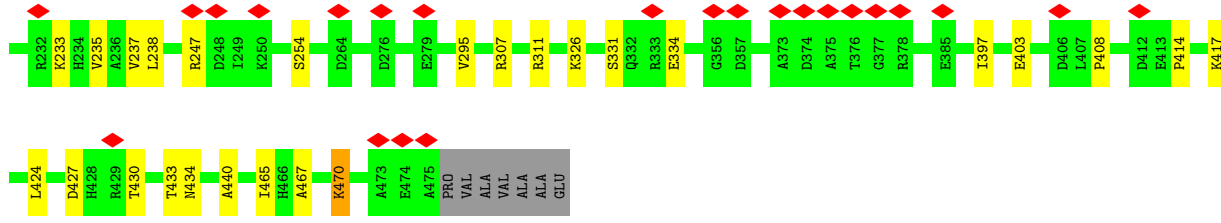


• Molecule 2: Glutamate synthase [NADPH] small chain

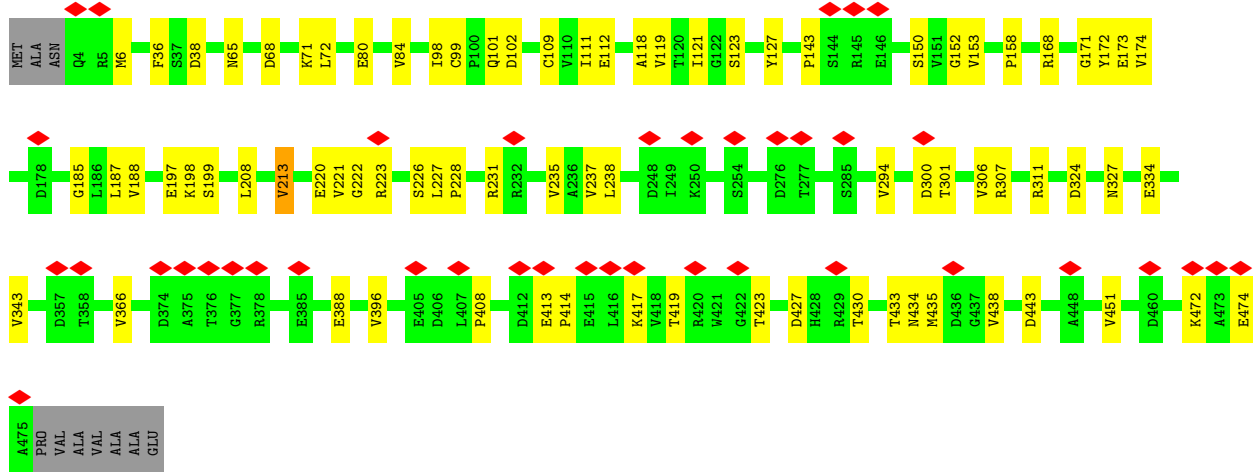
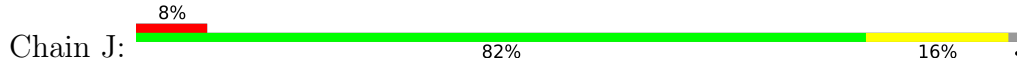


• Molecule 2: Glutamate synthase [NADPH] small chain





• Molecule 2: Glutamate synthase [NADPH] small chain



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C2	Depositor
Number of particles used	76146	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TALOS ARCTICA	Depositor
Voltage (kV)	200	Depositor
Electron dose ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	FEI FALCON III (4k x 4k)	Depositor
Maximum map value	0.842	Depositor
Minimum map value	-0.264	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.020	Depositor
Recommended contour level	0.09	Depositor
Map size (Å)	439.208, 439.208, 439.208	wwPDB
Map dimensions	308, 308, 308	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.426, 1.426, 1.426	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: FAD, FMN, SF4, F3S

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.27	0/11545	0.43	0/15613
1	B	0.26	0/11545	0.43	0/15613
1	C	0.26	0/11545	0.44	0/15613
1	D	0.27	0/11545	0.43	0/15613
1	E	0.26	0/11545	0.44	0/15613
1	F	0.26	0/11545	0.43	0/15613
2	G	0.27	0/3681	0.44	0/4988
2	H	0.27	0/3681	0.43	0/4988
2	I	0.27	0/3681	0.44	0/4988
2	J	0.27	0/3681	0.43	0/4988
All	All	0.27	0/83994	0.43	0/113630

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

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	A	11337	0	11355	122	0
1	B	11337	0	11355	120	0
1	C	11337	0	11355	130	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	D	11337	0	11355	119	0
1	E	11337	0	11355	134	0
1	F	11337	0	11355	119	0
2	G	3613	0	3553	37	0
2	H	3613	0	3553	56	0
2	I	3613	0	3553	37	0
2	J	3613	0	3553	54	0
3	A	31	0	19	0	0
3	B	31	0	19	0	0
3	C	31	0	19	1	0
3	D	31	0	19	0	0
3	E	31	0	19	0	0
3	F	31	0	19	0	0
4	A	7	0	0	0	0
4	B	7	0	0	1	0
4	C	7	0	0	0	0
4	D	7	0	0	0	0
4	E	7	0	0	0	0
4	F	7	0	0	1	0
5	G	16	0	0	0	0
5	H	16	0	0	0	0
5	I	16	0	0	0	0
5	J	16	0	0	0	0
6	G	53	0	31	7	0
6	H	53	0	31	10	0
6	I	53	0	31	6	0
6	J	53	0	31	13	0
All	All	82978	0	82580	929	0

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

All (929) 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)
6:H:503:FAD:H2'	6:H:503:FAD:H9	1.26	1.15
6:H:503:FAD:H9	6:H:503:FAD:C2'	2.01	0.91
1:A:235:ASN:OD1	1:A:508:ASN:ND2	2.06	0.88
1:D:235:ASN:OD1	1:D:508:ASN:ND2	2.06	0.88
6:I:503:FAD:H9	6:I:503:FAD:H2'	1.55	0.87
6:J:503:FAD:H2'	6:J:503:FAD:H9	1.62	0.80

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:829:LEU:HD11	1:C:1186:ARG:HH22	1.51	0.76
1:E:854:ILE:HD11	1:E:1068:ARG:HD3	1.68	0.76
6:H:503:FAD:H2'	6:H:503:FAD:C9	2.13	0.75
1:C:854:ILE:HD11	1:C:1068:ARG:HD3	1.68	0.75
1:C:94:GLU:OE1	1:F:732:ARG:NH1	2.19	0.75
1:E:829:LEU:HD11	1:E:1186:ARG:HH22	1.51	0.75
2:H:433:THR:HG22	2:H:434:ASN:H	1.54	0.72
2:J:433:THR:HG22	2:J:434:ASN:H	1.53	0.72
1:B:732:ARG:NH1	1:E:94:GLU:OE1	2.23	0.71
1:C:1287:GLU:HG3	1:C:1306:VAL:HB	1.73	0.71
1:E:1268:LEU:HB2	1:E:1288:VAL:HG12	1.72	0.71
6:H:503:FAD:C2'	6:H:503:FAD:C9	2.66	0.71
1:C:1268:LEU:HB2	1:C:1288:VAL:HG12	1.72	0.70
1:E:1287:GLU:HG3	1:E:1306:VAL:HB	1.73	0.70
1:F:919:ALA:O	1:F:923:ASN:ND2	2.25	0.70
1:A:525:ARG:HB3	1:A:542:LEU:HD12	1.73	0.70
1:D:525:ARG:HB3	1:D:542:LEU:HD12	1.73	0.70
1:B:919:ALA:O	1:B:923:ASN:ND2	2.25	0.69
6:G:503:FAD:H2'	6:G:503:FAD:H9	1.74	0.69
1:D:504:SER:HB3	1:D:508:ASN:HB3	1.75	0.69
1:D:1119:VAL:HG12	1:D:1121:ASP:H	1.59	0.68
1:A:236:THR:O	1:A:240:ASN:ND2	2.27	0.68
1:D:236:THR:O	1:D:240:ASN:ND2	2.27	0.68
6:J:503:FAD:H8A	6:J:503:FAD:H3B	1.76	0.68
1:A:504:SER:HB3	1:A:508:ASN:HB3	1.75	0.68
1:F:529:LEU:HD22	1:F:638:THR:HA	1.76	0.67
1:B:116:ILE:HD12	1:B:187:GLN:HB3	1.75	0.67
1:F:116:ILE:HD12	1:F:187:GLN:HB3	1.75	0.67
6:J:503:FAD:H9	6:J:503:FAD:C2'	2.25	0.67
1:B:529:LEU:HD22	1:B:638:THR:HA	1.77	0.66
1:E:1325:ASN:HD22	1:E:1344:GLU:H	1.44	0.66
1:E:1419:HIS:HD2	1:E:1468:VAL:HG21	1.60	0.66
1:C:1325:ASN:HD22	1:C:1344:GLU:H	1.43	0.66
1:C:1419:HIS:HD2	1:C:1468:VAL:HG21	1.60	0.66
1:A:1119:VAL:HG12	1:A:1121:ASP:H	1.59	0.65
2:H:221:VAL:HG12	6:H:503:FAD:H62A	1.61	0.65
1:F:235:ASN:OD1	1:F:508:ASN:ND2	2.30	0.65
1:B:218:THR:HG22	1:B:220:PRO:HD2	1.79	0.65
1:A:1348:VAL:HG12	1:A:1366:GLU:HB3	1.79	0.65
1:A:1360:CYS:SG	1:A:1361:GLY:N	2.69	0.65
1:D:1360:CYS:SG	1:D:1361:GLY:N	2.69	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:72:ALA:HB3	1:C:133:VAL:HG12	1.79	0.65
1:E:1338:ALA:HB3	1:E:1357:VAL:HG12	1.79	0.64
1:C:1338:ALA:HB3	1:C:1357:VAL:HG12	1.79	0.64
1:A:458:MET:HG2	1:A:775:VAL:HA	1.79	0.64
1:B:235:ASN:OD1	1:B:508:ASN:ND2	2.30	0.64
1:E:72:ALA:HB3	1:E:133:VAL:HG12	1.79	0.64
1:B:1003:ARG:HA	1:B:1043:LEU:HD12	1.80	0.64
2:G:111:ILE:HD11	2:G:119:VAL:HG23	1.80	0.64
1:D:52:GLN:HE22	1:D:71:LEU:H	1.46	0.64
1:F:1003:ARG:HA	1:F:1043:LEU:HD12	1.80	0.64
1:E:1446:ASP:OD2	1:E:1449:ARG:NH2	2.31	0.64
2:I:111:ILE:HD11	2:I:119:VAL:HG23	1.80	0.64
1:C:768:GLU:OE1	1:C:768:GLU:N	2.31	0.64
1:E:448:ARG:NH1	1:E:771:VAL:O	2.31	0.64
1:E:768:GLU:N	1:E:768:GLU:OE1	2.31	0.64
1:C:446:GLU:OE1	1:C:449:ARG:NH2	2.29	0.63
1:C:1446:ASP:OD2	1:C:1449:ARG:NH2	2.31	0.63
1:B:482:ASP:OD1	1:B:1106:ARG:NH2	2.30	0.63
1:C:448:ARG:NH1	1:C:771:VAL:O	2.31	0.63
1:C:1360:CYS:SG	1:C:1361:GLY:N	2.72	0.63
1:D:1348:VAL:HG12	1:D:1366:GLU:HB3	1.79	0.63
6:G:503:FAD:H9	6:G:503:FAD:C2'	2.27	0.63
1:D:458:MET:HG2	1:D:775:VAL:HA	1.79	0.63
6:I:503:FAD:H9	6:I:503:FAD:C2'	2.26	0.63
1:F:482:ASP:OD1	1:F:1106:ARG:NH2	2.30	0.63
2:G:295:VAL:HG12	2:G:397:ILE:HB	1.80	0.63
1:F:218:THR:HG22	1:F:220:PRO:HD2	1.79	0.63
1:E:1360:CYS:SG	1:E:1361:GLY:N	2.72	0.63
2:I:295:VAL:HG12	2:I:397:ILE:HB	1.80	0.63
2:J:227:LEU:HD23	2:J:413:GLU:HG3	1.81	0.62
1:B:512:ASP:OD2	1:B:515:ARG:NH1	2.32	0.62
2:G:220:GLU:HG2	2:G:223:ARG:HG3	1.82	0.62
6:H:503:FAD:O4'	6:H:503:FAD:O2'	2.18	0.62
1:A:52:GLN:HE22	1:A:71:LEU:H	1.46	0.62
1:F:512:ASP:OD2	1:F:515:ARG:NH1	2.32	0.61
1:E:1411:ILE:HD11	1:E:1463:LEU:HD21	1.82	0.61
1:C:1411:ILE:HD11	1:C:1463:LEU:HD21	1.82	0.61
1:F:1267:ARG:NH1	1:F:1287:GLU:OE1	2.34	0.61
1:A:1338:ALA:HB3	1:A:1357:VAL:HG12	1.83	0.61
1:B:505:GLN:HE22	1:B:1001:VAL:H	1.49	0.61
2:H:227:LEU:HD23	2:H:413:GLU:HG3	1.81	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:511:ILE:O	1:B:709:SER:OG	2.19	0.61
1:F:511:ILE:O	1:F:709:SER:OG	2.19	0.61
1:B:1267:ARG:NH1	1:B:1287:GLU:OE1	2.34	0.61
1:E:446:GLU:OE1	1:E:449:ARG:NH2	2.29	0.61
1:C:1003:ARG:HA	1:C:1043:LEU:HD12	1.83	0.60
1:F:289:ARG:NH1	1:F:535:GLU:OE1	2.34	0.60
1:F:923:ASN:OD1	1:F:1252:ARG:NH2	2.34	0.60
2:I:220:GLU:HG2	2:I:223:ARG:HG3	1.82	0.60
1:E:1414:ARG:NH1	1:E:1452:THR:O	2.34	0.60
1:C:1414:ARG:NH1	1:C:1452:THR:O	2.34	0.60
1:D:364:ILE:HD13	1:D:372:VAL:HG21	1.83	0.60
1:D:1338:ALA:HB3	1:D:1357:VAL:HG12	1.83	0.60
1:E:1003:ARG:HA	1:E:1043:LEU:HD12	1.83	0.60
1:B:289:ARG:NH1	1:B:535:GLU:OE1	2.34	0.60
1:C:1218:ASP:OD2	1:C:1233:TYR:OH	2.19	0.60
1:A:876:ASN:ND2	1:A:902:ASN:OD1	2.35	0.60
1:C:116:ILE:HD11	1:C:191:PHE:HB2	1.84	0.60
1:B:168:TYR:OH	1:B:226:ARG:NH1	2.35	0.59
1:D:876:ASN:ND2	1:D:902:ASN:OD1	2.35	0.59
1:C:512:ASP:OD2	1:C:515:ARG:NH1	2.35	0.59
1:A:364:ILE:HD13	1:A:372:VAL:HG21	1.83	0.59
1:A:643:ASN:ND2	1:A:665:THR:OG1	2.35	0.59
1:C:732:ARG:NH1	1:F:94:GLU:OE2	2.35	0.59
1:E:512:ASP:OD2	1:E:515:ARG:NH1	2.35	0.59
1:D:1003:ARG:HA	1:D:1043:LEU:HD12	1.84	0.59
1:D:1060:ARG:NH2	1:D:1192:PRO:O	2.36	0.59
1:E:1276:LEU:HB3	1:E:1296:VAL:HG23	1.84	0.59
1:A:1060:ARG:NH2	1:A:1192:PRO:O	2.36	0.59
1:B:923:ASN:OD1	1:B:1252:ARG:NH2	2.34	0.59
1:D:52:GLN:NE2	1:D:71:LEU:H	2.01	0.59
1:F:505:GLN:HE22	1:F:1001:VAL:H	1.49	0.59
1:A:1003:ARG:HA	1:A:1043:LEU:HD12	1.84	0.59
1:E:1218:ASP:OD2	1:E:1233:TYR:OH	2.19	0.59
1:B:858:MET:HB3	1:B:863:LEU:HD13	1.85	0.59
1:F:168:TYR:OH	1:F:226:ARG:NH1	2.35	0.59
1:F:858:MET:HB3	1:F:863:LEU:HD13	1.85	0.59
6:J:503:FAD:H3B	6:J:503:FAD:C8A	2.33	0.59
1:F:1338:ALA:HB3	1:F:1357:VAL:HG12	1.85	0.58
1:C:1276:LEU:HB3	1:C:1296:VAL:HG23	1.84	0.58
1:A:52:GLN:NE2	1:A:71:LEU:H	2.01	0.58
1:E:116:ILE:HD11	1:E:191:PHE:HB2	1.84	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:558:MET:O	1:B:562:MET:HG3	2.04	0.58
1:A:165:ASN:HD21	1:D:165:ASN:HD21	1.52	0.58
1:F:1049:LEU:HD22	1:F:1069:THR:HG21	1.86	0.58
1:C:531:ASN:O	1:C:539:GLN:NE2	2.37	0.58
1:E:531:ASN:O	1:E:539:GLN:NE2	2.37	0.58
2:J:112:GLU:HB2	2:J:118:ALA:HB2	1.86	0.58
1:D:912:SER:OG	1:D:970:PRO:O	2.22	0.57
1:F:558:MET:O	1:F:562:MET:HG3	2.04	0.57
1:B:1049:LEU:HD22	1:B:1069:THR:HG21	1.86	0.57
1:E:923:ASN:OD1	1:E:1252:ARG:NH2	2.37	0.57
1:F:881:LYS:HE2	1:F:926:ARG:HH12	1.69	0.57
1:A:381:GLU:OE1	1:A:402:ARG:NH2	2.37	0.57
1:A:426:LEU:HD22	1:A:545:LEU:HD22	1.86	0.57
1:D:1391:MET:SD	1:D:1456:GLN:NE2	2.75	0.57
1:B:854:ILE:HD12	1:B:881:LYS:HB2	1.86	0.57
1:B:1338:ALA:HB3	1:B:1357:VAL:HG12	1.85	0.57
1:C:1274:GLN:HG2	1:C:1294:ASP:HB2	1.86	0.57
1:E:1274:GLN:HG2	1:E:1294:ASP:HB2	1.86	0.57
1:D:426:LEU:HD22	1:D:545:LEU:HD22	1.86	0.57
1:C:840:VAL:HG12	1:C:1147:ARG:HH21	1.70	0.57
1:E:310:PRO:HD3	1:E:404:ARG:HH22	1.68	0.57
1:F:854:ILE:HD12	1:F:881:LYS:HB2	1.86	0.57
1:B:94:GLU:OE2	1:E:732:ARG:NH1	2.38	0.57
1:C:248:GLU:O	1:C:264:LYS:NZ	2.32	0.57
1:C:310:PRO:HD3	1:C:404:ARG:HH22	1.69	0.57
1:D:345:MET:HG3	1:D:346:ASP:H	1.70	0.57
1:E:908:LYS:NZ	1:E:924:GLN:O	2.38	0.57
1:B:881:LYS:HE2	1:B:926:ARG:HH12	1.69	0.56
1:C:923:ASN:OD1	1:C:1252:ARG:NH2	2.37	0.56
1:A:195:LEU:HD23	1:A:200:PHE:HD2	1.70	0.56
1:A:511:ILE:O	1:A:709:SER:OG	2.24	0.56
1:D:1236:ARG:NH1	1:E:841:ASP:OD1	2.35	0.56
1:F:505:GLN:HB2	1:F:1009:ILE:HD13	1.87	0.56
1:B:505:GLN:HB2	1:B:1009:ILE:HD13	1.88	0.56
1:C:160:LYS:HD2	1:F:163:GLN:HE22	1.71	0.56
1:D:116:ILE:HD12	1:D:187:GLN:HB3	1.87	0.56
1:E:919:ALA:O	1:E:923:ASN:ND2	2.39	0.56
1:A:345:MET:HG3	1:A:346:ASP:H	1.70	0.56
1:E:840:VAL:HG12	1:E:1147:ARG:HH21	1.70	0.56
2:H:112:GLU:HB2	2:H:118:ALA:HB2	1.86	0.56
1:A:291:ALA:HB2	1:A:337:ASP:HB2	1.88	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:919:ALA:O	1:C:923:ASN:ND2	2.39	0.56
1:D:291:ALA:HB2	1:D:337:ASP:HB2	1.88	0.56
1:A:116:ILE:HD12	1:A:187:GLN:HB3	1.87	0.56
1:C:908:LYS:NZ	1:C:924:GLN:O	2.38	0.56
1:A:912:SER:OG	1:A:970:PRO:O	2.22	0.55
1:D:195:LEU:HD23	1:D:200:PHE:HD2	1.70	0.55
1:F:1060:ARG:NH2	1:F:1192:PRO:O	2.39	0.55
1:D:511:ILE:O	1:D:709:SER:OG	2.23	0.55
1:E:559:ARG:NH1	1:E:563:GLY:O	2.40	0.55
1:F:291:ALA:HB2	1:F:337:ASP:HB2	1.88	0.55
1:F:427:ASP:OD1	1:F:428:GLU:N	2.39	0.55
1:B:1350:ASN:HB3	1:B:1368:MET:HG3	1.89	0.55
1:E:647:ALA:HB1	1:E:670:LEU:HD22	1.89	0.55
1:F:295:LYS:HE2	1:F:299:VAL:HG23	1.89	0.55
1:B:291:ALA:HB2	1:B:337:ASP:HB2	1.88	0.55
1:C:1392:ALA:HB3	1:C:1457:VAL:HB	1.89	0.55
1:E:978:GLU:OE1	1:E:978:GLU:N	2.37	0.55
1:F:1350:ASN:HB3	1:F:1368:MET:HG3	1.88	0.55
6:J:503:FAD:C2'	6:J:503:FAD:C9	2.84	0.55
1:D:919:ALA:O	1:D:923:ASN:ND2	2.40	0.55
1:F:833:SER:OG	1:F:834:THR:N	2.39	0.55
1:B:427:ASP:OD1	1:B:428:GLU:N	2.39	0.55
1:B:1060:ARG:NH2	1:B:1192:PRO:O	2.39	0.55
1:B:833:SER:OG	1:B:834:THR:N	2.39	0.55
2:G:153:VAL:HG12	2:G:238:LEU:HB3	1.89	0.55
2:G:424:LEU:HD11	2:G:440:ALA:HB3	1.89	0.55
2:I:153:VAL:HG12	2:I:238:LEU:HB3	1.89	0.55
2:J:417:LYS:HG2	2:J:434:ASN:HD22	1.71	0.55
2:H:158:PRO:HG3	2:H:187:LEU:HD11	1.88	0.55
1:A:236:THR:OG1	1:A:240:ASN:ND2	2.40	0.54
1:C:574:PRO:HG3	1:C:615:ARG:HH12	1.72	0.54
1:C:1331:ALA:O	1:C:1351:SER:OG	2.21	0.54
1:D:1350:ASN:HB3	1:D:1368:MET:HG3	1.89	0.54
1:A:1350:ASN:HB3	1:A:1368:MET:HG3	1.89	0.54
1:B:375:ASP:OD1	1:B:375:ASP:N	2.40	0.54
1:D:1088:GLU:HG2	1:D:1162:ILE:HD13	1.89	0.54
1:D:1323:ILE:HG13	1:D:1342:ALA:HA	1.89	0.54
2:H:417:LYS:HG2	2:H:434:ASN:HD22	1.71	0.54
1:A:1323:ILE:HG13	1:A:1342:ALA:HA	1.89	0.54
1:E:1325:ASN:ND2	1:E:1344:GLU:H	2.05	0.54
2:J:158:PRO:HG3	2:J:187:LEU:HD11	1.88	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:J:197:GLU:HG3	2:J:199:SER:H	1.73	0.54
1:A:919:ALA:O	1:A:923:ASN:ND2	2.40	0.54
1:B:295:LYS:HE2	1:B:299:VAL:HG23	1.89	0.54
1:C:647:ALA:HB1	1:C:670:LEU:HD22	1.89	0.54
1:D:236:THR:OG1	1:D:240:ASN:ND2	2.40	0.54
1:D:418:LYS:HG3	1:D:419:TRP:CD1	2.42	0.54
1:E:574:PRO:HG3	1:E:615:ARG:HH12	1.72	0.54
2:H:168:ARG:NH1	2:H:172:TYR:O	2.39	0.54
2:H:433:THR:HG22	2:H:434:ASN:N	2.22	0.54
1:A:418:LYS:HG3	1:A:419:TRP:CD1	2.42	0.54
1:A:478:SER:HB3	1:A:1109:HIS:ND1	2.22	0.54
1:C:559:ARG:NH1	1:C:563:GLY:O	2.40	0.54
1:D:1019:ASP:OD1	1:D:1019:ASP:N	2.39	0.54
2:I:220:GLU:HG3	2:I:222:GLY:H	1.73	0.54
1:A:1088:GLU:HG2	1:A:1162:ILE:HD13	1.89	0.54
1:A:1391:MET:SD	1:A:1456:GLN:NE2	2.75	0.54
1:D:381:GLU:OE1	1:D:402:ARG:NH2	2.37	0.54
2:H:197:GLU:HG3	2:H:199:SER:H	1.73	0.54
2:I:424:LEU:HD11	2:I:440:ALA:HB3	1.89	0.54
1:E:1392:ALA:HB3	1:E:1457:VAL:HB	1.89	0.54
1:B:35:ASP:OD2	1:B:40:THR:OG1	2.26	0.53
1:E:713:ILE:HD12	1:E:719:TYR:HD1	1.73	0.53
1:F:273:ASP:OD1	1:F:274:SER:N	2.40	0.53
1:F:368:GLU:OE1	1:F:1237:ASN:ND2	2.39	0.53
1:B:1360:CYS:SG	1:B:1361:GLY:N	2.82	0.53
2:G:417:LYS:HB2	2:G:434:ASN:HD22	1.73	0.53
6:G:503:FAD:C2'	6:G:503:FAD:C9	2.86	0.53
1:C:249:THR:HB	1:C:635:ASN:HD22	1.72	0.53
1:C:713:ILE:HD12	1:C:719:TYR:HD1	1.73	0.53
1:C:1325:ASN:ND2	1:C:1344:GLU:H	2.05	0.53
2:I:64:ASN:HD22	2:I:88:THR:HG23	1.73	0.53
1:B:163:GLN:HE22	1:E:160:LYS:HD2	1.73	0.53
1:B:802:VAL:HG12	1:B:1134:LYS:HG3	1.90	0.53
1:F:375:ASP:OD1	1:F:375:ASP:N	2.40	0.53
1:C:978:GLU:OE1	1:C:978:GLU:N	2.37	0.53
1:E:313:HIS:O	1:E:317:ILE:HG13	2.09	0.53
1:F:154:ARG:HH11	1:F:259:HIS:HD2	1.56	0.53
2:G:220:GLU:HG3	2:G:222:GLY:H	1.73	0.53
1:A:437:GLY:O	1:A:556:ARG:NH2	2.40	0.53
1:E:249:THR:HB	1:E:635:ASN:HD22	1.72	0.53
2:G:64:ASN:HD22	2:G:88:THR:HG23	1.73	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:I:503:FAD:H2'	6:I:503:FAD:C9	2.33	0.53
1:A:607:THR:HG22	1:A:609:GLU:H	1.72	0.53
1:A:1019:ASP:OD1	1:A:1019:ASP:N	2.39	0.53
1:F:1113:CYS:HB2	4:F:1502:F3S:S2	2.49	0.53
1:F:802:VAL:HG12	1:F:1134:LYS:HG3	1.90	0.53
2:I:417:LYS:HB2	2:I:434:ASN:HD22	1.73	0.53
1:A:908:LYS:HG2	1:A:925:CYS:HB3	1.90	0.53
1:B:1113:CYS:HB2	4:B:1502:F3S:S2	2.49	0.53
1:D:478:SER:HB3	1:D:1109:HIS:ND1	2.22	0.53
1:D:607:THR:HG22	1:D:609:GLU:H	1.72	0.53
1:F:403:ASP:OD1	1:F:407:LYS:NZ	2.40	0.53
1:F:1360:CYS:SG	1:F:1361:GLY:N	2.82	0.53
2:I:427:ASP:OD2	2:I:430:THR:OG1	2.26	0.53
1:E:1272:ALA:O	1:E:1293:ASN:ND2	2.43	0.52
2:H:197:GLU:OE1	2:H:198:LYS:N	2.42	0.52
2:H:366:VAL:HG12	2:H:388:GLU:HG2	1.91	0.52
1:B:469:VAL:HG21	1:B:675:ILE:HD12	1.91	0.52
1:B:1173:ARG:NH2	1:B:1179:ASP:OD2	2.38	0.52
2:J:433:THR:HG22	2:J:434:ASN:N	2.22	0.52
1:B:691:LYS:HE3	1:B:695:ASN:HD21	1.75	0.52
1:E:168:TYR:OH	1:E:226:ARG:NH1	2.43	0.52
2:J:197:GLU:OE1	2:J:198:LYS:N	2.42	0.52
1:F:313:HIS:O	1:F:317:ILE:HG13	2.10	0.52
1:C:478:SER:HB3	1:C:1109:HIS:ND1	2.25	0.52
1:D:643:ASN:ND2	1:D:665:THR:OG1	2.34	0.52
1:A:1047:MET:HG2	1:A:1186:ARG:HH22	1.75	0.52
1:B:313:HIS:O	1:B:317:ILE:HG13	2.10	0.52
1:E:478:SER:HB3	1:E:1109:HIS:ND1	2.25	0.52
1:E:1331:ALA:O	1:E:1351:SER:OG	2.21	0.52
1:C:648:GLU:OE1	1:C:654:TYR:OH	2.18	0.52
1:F:1296:VAL:HG13	1:F:1327:VAL:HG13	1.92	0.52
1:A:882:SER:OG	1:A:883:ASP:N	2.43	0.52
1:C:168:TYR:OH	1:C:226:ARG:NH1	2.43	0.52
1:C:313:HIS:O	1:C:317:ILE:HG13	2.09	0.52
1:C:428:GLU:O	1:C:432:THR:HG23	2.10	0.52
1:D:908:LYS:HG2	1:D:925:CYS:HB3	1.90	0.52
1:D:1047:MET:HG2	1:D:1186:ARG:HH22	1.75	0.52
1:F:469:VAL:HG21	1:F:675:ILE:HD12	1.91	0.52
1:F:798:LEU:HD13	1:F:813:TYR:CZ	2.45	0.52
1:B:1341:GLN:HG2	1:B:1359:GLY:HA3	1.91	0.52
1:F:691:LYS:HE3	1:F:695:ASN:HD21	1.75	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:419:TRP:O	1:A:540:THR:OG1	2.25	0.52
1:B:154:ARG:HH11	1:B:259:HIS:HD2	1.56	0.52
2:J:366:VAL:HG12	2:J:388:GLU:HG2	1.91	0.52
1:B:908:LYS:NZ	1:B:924:GLN:O	2.43	0.51
1:E:418:LYS:HG3	1:E:419:TRP:CD1	2.46	0.51
1:E:428:GLU:O	1:E:432:THR:HG23	2.10	0.51
1:F:52:GLN:HE22	1:F:71:LEU:H	1.58	0.51
1:F:574:PRO:HG3	1:F:615:ARG:HH12	1.76	0.51
1:F:908:LYS:NZ	1:F:924:GLN:O	2.43	0.51
1:C:408:ASP:OD1	1:C:408:ASP:N	2.43	0.51
1:C:418:LYS:HG3	1:C:419:TRP:CD1	2.46	0.51
1:C:1272:ALA:O	1:C:1293:ASN:ND2	2.43	0.51
1:C:1310:THR:HG22	1:C:1312:SER:H	1.75	0.51
1:E:1310:THR:HG22	1:E:1312:SER:H	1.75	0.51
2:G:112:GLU:HB2	2:G:118:ALA:HB2	1.91	0.51
1:A:597:VAL:HG22	1:A:640:THR:HG21	1.92	0.51
1:F:35:ASP:OD2	1:F:40:THR:OG1	2.26	0.51
6:I:503:FAD:C2'	6:I:503:FAD:C9	2.85	0.51
1:B:273:ASP:OD1	1:B:274:SER:N	2.40	0.51
1:C:858:MET:HB3	1:C:863:LEU:HD13	1.93	0.51
1:D:597:VAL:HG22	1:D:640:THR:HG21	1.92	0.51
1:D:882:SER:OG	1:D:883:ASP:N	2.43	0.51
1:D:1325:ASN:HD22	1:D:1344:GLU:HB2	1.76	0.51
1:E:427:ASP:HA	1:E:430:VAL:HG12	1.93	0.51
1:B:798:LEU:HD13	1:B:813:TYR:CZ	2.45	0.51
1:B:1296:VAL:HG13	1:B:1327:VAL:HG13	1.92	0.51
1:F:345:MET:HG3	1:F:346:ASP:H	1.76	0.51
1:F:1230:GLN:HG2	1:F:1265:THR:HG23	1.91	0.51
2:I:112:GLU:HB2	2:I:118:ALA:HB2	1.91	0.51
1:A:236:THR:O	1:A:236:THR:OG1	2.29	0.51
1:A:1325:ASN:HD22	1:A:1344:GLU:HB2	1.76	0.51
1:B:664:THR:HG22	1:B:665:THR:HG23	1.93	0.51
1:F:1341:GLN:HG2	1:F:1359:GLY:HA3	1.91	0.51
2:J:168:ARG:NH1	2:J:172:TYR:O	2.39	0.51
1:C:1113:CYS:HB3	1:C:1119:VAL:HG13	1.93	0.51
1:F:664:THR:HG22	1:F:665:THR:HG23	1.93	0.51
1:B:208:HIS:CD2	1:B:223:GLN:HB2	2.46	0.51
1:D:908:LYS:NZ	1:D:924:GLN:O	2.44	0.51
1:D:1291:ASP:OD1	1:D:1291:ASP:N	2.43	0.51
2:J:152:GLY:O	2:J:237:VAL:HA	2.11	0.51
1:F:1325:ASN:HD22	1:F:1344:GLU:HB2	1.76	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:J:187:LEU:O	2:J:198:LYS:NZ	2.42	0.50
1:A:94:GLU:OE2	1:D:732:ARG:NH1	2.45	0.50
1:A:1291:ASP:OD1	1:A:1291:ASP:N	2.43	0.50
1:C:195:LEU:HD23	1:C:200:PHE:HD2	1.77	0.50
1:C:505:GLN:HB2	1:C:1009:ILE:HD13	1.92	0.50
1:E:1:CYS:SG	1:E:231:ASN:ND2	2.85	0.50
1:F:1173:ARG:NH2	1:F:1179:ASP:OD2	2.38	0.50
2:H:187:LEU:O	2:H:198:LYS:NZ	2.42	0.50
1:B:368:GLU:OE1	1:B:1237:ASN:ND2	2.39	0.50
1:B:574:PRO:HG3	1:B:615:ARG:HH12	1.75	0.50
1:C:1322:ILE:HG23	1:C:1323:ILE:HG23	1.93	0.50
1:E:505:GLN:HB2	1:E:1009:ILE:HD13	1.92	0.50
1:E:858:MET:HB3	1:E:863:LEU:HD13	1.93	0.50
1:C:1:CYS:SG	1:C:231:ASN:ND2	2.85	0.50
1:F:1119:VAL:HG23	1:F:1125:ARG:HG3	1.93	0.50
1:C:208:HIS:CD2	1:C:223:GLN:HB2	2.47	0.50
1:D:959:SER:OG	1:D:960:THR:N	2.44	0.50
2:H:152:GLY:O	2:H:237:VAL:HA	2.11	0.50
1:A:908:LYS:NZ	1:A:924:GLN:O	2.44	0.50
1:B:1230:GLN:HG2	1:B:1265:THR:HG23	1.91	0.50
1:B:1397:LEU:HD23	1:B:1397:LEU:H	1.77	0.50
1:E:208:HIS:CD2	1:E:223:GLN:HB2	2.47	0.50
1:E:248:GLU:O	1:E:264:LYS:NZ	2.32	0.50
1:E:1113:CYS:HB3	1:E:1119:VAL:HG13	1.93	0.50
2:J:158:PRO:HD2	6:J:503:FAD:P	2.52	0.50
1:A:505:GLN:HB2	1:A:1009:ILE:HD13	1.94	0.50
1:B:52:GLN:HE22	1:B:71:LEU:H	1.58	0.50
1:C:912:SER:OG	1:C:970:PRO:O	2.29	0.50
1:D:437:GLY:O	1:D:556:ARG:NH2	2.40	0.50
1:D:505:GLN:HB2	1:D:1009:ILE:HD13	1.94	0.50
1:E:882:SER:OG	1:E:883:ASP:N	2.45	0.50
2:H:98:ILE:O	6:H:503:FAD:HM71	2.12	0.50
1:B:345:MET:HG3	1:B:346:ASP:H	1.76	0.50
1:B:403:ASP:OD1	1:B:407:LYS:NZ	2.40	0.50
1:C:203:ASP:OD1	1:C:203:ASP:N	2.43	0.50
2:I:186:LEU:HG	6:I:503:FAD:O2A	2.12	0.50
1:A:959:SER:OG	1:A:960:THR:N	2.44	0.49
1:C:503:PHE:HE1	1:C:505:GLN:HE21	1.60	0.49
1:C:1350:ASN:HB3	1:C:1368:MET:HG3	1.94	0.49
1:E:982:GLN:NE2	1:E:986:ASP:OD1	2.45	0.49
2:I:152:GLY:O	2:I:237:VAL:HA	2.12	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:J:158:PRO:HD2	6:J:503:FAD:O1P	2.12	0.49
1:C:427:ASP:HA	1:C:430:VAL:HG12	1.93	0.49
1:C:882:SER:OG	1:C:883:ASP:N	2.45	0.49
1:E:195:LEU:HD23	1:E:200:PHE:HD2	1.77	0.49
1:A:266:VAL:HG21	1:A:283:VAL:HG11	1.94	0.49
1:B:1325:ASN:HD22	1:B:1344:GLU:HB2	1.76	0.49
1:D:1293:ASN:O	1:D:1324:GLY:HA3	2.13	0.49
1:F:208:HIS:CD2	1:F:223:GLN:HB2	2.46	0.49
1:B:428:GLU:O	1:B:432:THR:HG23	2.13	0.49
1:C:869:GLY:O	1:C:873:VAL:HG23	2.13	0.49
1:C:982:GLN:NE2	1:C:986:ASP:OD1	2.45	0.49
1:D:1272:ALA:O	1:D:1293:ASN:ND2	2.46	0.49
1:E:503:PHE:HE1	1:E:505:GLN:HE21	1.60	0.49
1:F:1397:LEU:H	1:F:1397:LEU:HD23	1.77	0.49
2:J:98:ILE:O	6:J:503:FAD:HM71	2.12	0.49
1:A:1230:GLN:HG2	1:A:1265:THR:HG23	1.95	0.49
2:G:152:GLY:O	2:G:237:VAL:HA	2.12	0.49
2:H:307:ARG:O	2:H:311:ARG:HG2	2.13	0.49
1:E:1391:MET:HG3	1:E:1458:VAL:HG12	1.94	0.49
1:B:1119:VAL:HG23	1:B:1125:ARG:HG3	1.93	0.49
1:C:1391:MET:HG3	1:C:1458:VAL:HG12	1.94	0.49
1:F:428:GLU:O	1:F:432:THR:HG23	2.12	0.49
1:A:1272:ALA:O	1:A:1293:ASN:ND2	2.46	0.49
2:H:6:MET:SD	2:H:71:LYS:HA	2.53	0.49
2:H:427:ASP:OD2	2:H:430:THR:OG1	2.30	0.49
1:A:15:ARG:HG3	1:A:19:GLU:HG3	1.95	0.48
1:A:237:VAL:HG11	1:A:273:ASP:HB3	1.95	0.48
1:A:1293:ASN:O	1:A:1324:GLY:HA3	2.13	0.48
1:D:441:ASP:OD2	1:D:680:ARG:NH2	2.46	0.48
1:A:1349:ARG:NH1	1:A:1369:THR:OG1	2.47	0.48
1:B:840:VAL:O	1:B:1147:ARG:NH2	2.46	0.48
1:D:1230:GLN:HG2	1:D:1265:THR:HG23	1.95	0.48
1:E:1322:ILE:HG23	1:E:1323:ILE:HG23	1.94	0.48
1:F:337:ASP:OD1	1:F:338:GLY:N	2.45	0.48
1:F:1356:VAL:HG22	1:F:1374:VAL:HB	1.95	0.48
2:J:6:MET:SD	2:J:71:LYS:HA	2.53	0.48
1:A:830:GLU:OE2	1:A:832:ARG:NH1	2.46	0.48
1:C:218:THR:HG22	1:C:220:PRO:HD2	1.95	0.48
1:C:978:GLU:H	1:C:978:GLU:CD	2.17	0.48
1:D:830:GLU:OE2	1:D:832:ARG:NH1	2.46	0.48
1:D:1349:ARG:NH1	1:D:1369:THR:OG1	2.46	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:735:VAL:HA	1:F:739:PHE:HD2	1.78	0.48
2:J:307:ARG:O	2:J:311:ARG:HG2	2.13	0.48
1:A:307:GLN:OE1	1:A:307:GLN:N	2.46	0.48
1:C:571:ALA:O	1:C:618:ILE:HG22	2.13	0.48
1:D:15:ARG:HG3	1:D:19:GLU:HG3	1.94	0.48
1:D:237:VAL:HG11	1:D:273:ASP:HB3	1.95	0.48
1:D:922:LEU:O	1:D:991:ASN:ND2	2.46	0.48
1:E:869:GLY:O	1:E:873:VAL:HG23	2.13	0.48
1:A:441:ASP:OD2	1:A:680:ARG:NH2	2.45	0.48
1:A:575:VAL:HG23	1:A:759:LEU:HD22	1.96	0.48
1:B:414:LYS:HB2	1:B:416:TRP:CZ2	2.49	0.48
1:E:571:ALA:O	1:E:618:ILE:HG22	2.13	0.48
1:A:208:HIS:CD2	1:A:223:GLN:HB2	2.49	0.48
1:B:735:VAL:HA	1:B:739:PHE:HD2	1.78	0.48
1:B:1431:HIS:O	1:B:1435:THR:HG22	2.14	0.48
1:E:330:PRO:HG3	1:E:350:LEU:HD12	1.96	0.48
2:G:427:ASP:OD2	2:G:430:THR:OG1	2.26	0.48
2:J:65:ASN:HB3	2:J:68:ASP:OD2	2.14	0.48
1:F:840:VAL:O	1:F:1147:ARG:NH2	2.46	0.48
2:I:158:PRO:HG3	2:I:187:LEU:HD11	1.96	0.48
2:I:307:ARG:O	2:I:311:ARG:HG2	2.14	0.48
2:J:306:VAL:HG11	2:J:343:VAL:HG11	1.96	0.48
1:A:195:LEU:HD23	1:A:200:PHE:CD2	2.49	0.48
1:D:266:VAL:HG21	1:D:283:VAL:HG11	1.95	0.48
1:D:1210:THR:OG1	1:D:1211:LEU:N	2.47	0.48
1:B:233:GLU:OE1	1:B:508:ASN:ND2	2.46	0.48
1:D:208:HIS:CD2	1:D:223:GLN:HB2	2.49	0.48
1:D:307:GLN:OE1	1:D:307:GLN:N	2.46	0.48
2:J:294:VAL:O	2:J:396:VAL:HA	2.14	0.48
1:E:912:SER:OG	1:E:970:PRO:O	2.29	0.48
1:E:1350:ASN:HB3	1:E:1368:MET:HG3	1.94	0.48
2:H:237:VAL:HG23	2:H:438:VAL:HG23	1.96	0.48
2:I:199:SER:O	2:I:202:GLU:HG3	2.14	0.48
1:A:922:LEU:O	1:A:991:ASN:ND2	2.46	0.47
1:C:1316:GLU:O	1:C:1320:ASN:ND2	2.41	0.47
1:D:575:VAL:HG23	1:D:759:LEU:HD22	1.96	0.47
1:F:1431:HIS:O	1:F:1435:THR:HG22	2.14	0.47
2:G:158:PRO:HG3	2:G:187:LEU:HD11	1.96	0.47
2:G:307:ARG:O	2:G:311:ARG:HG2	2.14	0.47
2:H:174:VAL:HG23	2:H:213:VAL:HG13	1.96	0.47
1:F:414:LYS:HB2	1:F:416:TRP:CZ2	2.49	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:G:199:SER:O	2:G:202:GLU:HG3	2.14	0.47
1:D:419:TRP:O	1:D:540:THR:OG1	2.25	0.47
2:G:254:SER:O	2:G:254:SER:OG	2.32	0.47
1:C:330:PRO:HG3	1:C:350:LEU:HD12	1.96	0.47
1:D:664:THR:HG22	1:D:665:THR:HG23	1.96	0.47
1:E:648:GLU:OE1	1:E:654:TYR:OH	2.18	0.47
6:J:503:FAD:C8A	6:J:503:FAD:C3B	2.92	0.47
1:A:415:PRO:HB2	1:A:418:LYS:HG2	1.96	0.47
1:E:79:PRO:O	1:E:86:GLN:NE2	2.47	0.47
2:J:174:VAL:HG23	2:J:213:VAL:HG13	1.96	0.47
1:A:1296:VAL:HG13	1:A:1327:VAL:HG13	1.96	0.47
1:C:52:GLN:NE2	1:C:71:LEU:H	2.13	0.47
1:D:1296:VAL:HG13	1:D:1327:VAL:HG13	1.96	0.47
2:H:36:PHE:CE2	2:H:123:SER:HB3	2.50	0.47
1:B:236:THR:O	1:B:240:ASN:ND2	2.48	0.47
1:B:1356:VAL:HG22	1:B:1374:VAL:HB	1.95	0.47
1:C:52:GLN:HE22	1:C:71:LEU:H	1.63	0.47
1:C:375:ASP:OD2	1:C:377:THR:OG1	2.26	0.47
1:D:415:PRO:HB2	1:D:418:LYS:HG2	1.96	0.47
1:E:218:THR:HG22	1:E:220:PRO:HD2	1.95	0.47
2:H:65:ASN:HB3	2:H:68:ASP:OD2	2.14	0.47
2:H:294:VAL:O	2:H:396:VAL:HA	2.14	0.47
2:H:408:PRO:HB3	2:H:414:PRO:HA	1.96	0.47
1:A:1210:THR:OG1	1:A:1211:LEU:N	2.47	0.47
1:B:52:GLN:NE2	1:B:71:LEU:H	2.13	0.47
1:C:234:ILE:HD11	1:C:277:LEU:HD22	1.97	0.47
1:E:52:GLN:NE2	1:E:71:LEU:H	2.13	0.47
2:J:80:GLU:O	2:J:84:VAL:HG23	2.15	0.47
1:A:1176:GLU:OE2	1:A:1176:GLU:N	2.48	0.47
1:D:195:LEU:HD23	1:D:200:PHE:CD2	2.49	0.47
1:F:890:ASP:HB3	1:F:893:ARG:HG3	1.97	0.47
2:H:80:GLU:O	2:H:84:VAL:HG23	2.15	0.47
2:J:36:PHE:CE2	2:J:123:SER:HB3	2.50	0.47
2:G:98:ILE:HB	6:G:503:FAD:HM73	1.97	0.47
2:J:153:VAL:HG23	2:J:238:LEU:HB3	1.97	0.47
2:J:226:SER:OG	2:J:228:PRO:HD2	2.15	0.47
1:D:1176:GLU:OE2	1:D:1176:GLU:N	2.48	0.46
1:E:844:GLU:O	1:E:1147:ARG:HD2	2.15	0.46
1:F:236:THR:O	1:F:240:ASN:ND2	2.48	0.46
1:F:478:SER:O	1:F:478:SER:OG	2.32	0.46
2:J:443:ASP:HB3	6:J:503:FAD:O2P	2.15	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:664:THR:HG22	1:A:665:THR:HG23	1.96	0.46
1:A:1376:LEU:HA	1:A:1395:TYR:HB3	1.98	0.46
1:B:890:ASP:HB3	1:B:893:ARG:HG3	1.97	0.46
1:B:949:VAL:HG23	1:B:962:GLY:H	1.80	0.46
1:B:979:ASP:OD2	1:B:1295:TYR:OH	2.32	0.46
1:E:246:ALA:O	1:E:638:THR:OG1	2.32	0.46
1:E:978:GLU:H	1:E:978:GLU:CD	2.17	0.46
1:E:1127:LYS:HB3	1:E:1127:LYS:HE2	1.52	0.46
1:F:780:ARG:HD2	1:F:781:PHE:H	1.80	0.46
2:H:153:VAL:HG23	2:H:238:LEU:HB3	1.97	0.46
2:J:237:VAL:HG23	2:J:438:VAL:HG23	1.96	0.46
1:A:250:ARG:HD2	1:A:639:PHE:HE1	1.80	0.46
1:A:1236:ARG:NH1	1:C:841:ASP:OD1	2.38	0.46
1:B:203:ASP:OD1	1:B:203:ASP:N	2.46	0.46
1:B:780:ARG:HD2	1:B:781:PHE:H	1.80	0.46
1:D:250:ARG:HD2	1:D:639:PHE:HE1	1.80	0.46
1:D:961:PRO:O	1:D:1465:ARG:NH1	2.48	0.46
1:E:697:LYS:HA	1:E:700:ILE:HG22	1.97	0.46
2:H:150:SER:O	2:H:235:VAL:HG12	2.16	0.46
1:A:961:PRO:O	1:A:1465:ARG:NH1	2.48	0.46
1:C:1122:ASP:O	1:C:1126:GLN:HG2	2.15	0.46
1:F:949:VAL:HG23	1:F:962:GLY:H	1.80	0.46
2:H:306:VAL:HG11	2:H:343:VAL:HG11	1.96	0.46
1:E:609:GLU:OE2	1:E:645:ARG:NH1	2.49	0.46
1:F:52:GLN:NE2	1:F:71:LEU:H	2.13	0.46
1:D:280:VAL:HA	1:D:283:VAL:HG12	1.98	0.46
1:D:1376:LEU:HA	1:D:1395:TYR:HB3	1.98	0.46
1:E:846:ILE:HD13	1:E:1147:ARG:HD3	1.97	0.46
1:D:713:ILE:HG21	1:D:719:TYR:HB2	1.98	0.46
1:E:988:LYS:NZ	1:E:1205:ASN:O	2.43	0.46
2:H:174:VAL:CG2	2:H:213:VAL:HG13	2.45	0.46
1:A:280:VAL:HA	1:A:283:VAL:HG12	1.98	0.46
1:C:844:GLU:O	1:C:1147:ARG:HD2	2.15	0.46
1:C:988:LYS:NZ	1:C:1205:ASN:O	2.43	0.46
1:C:609:GLU:OE2	1:C:645:ARG:NH1	2.49	0.46
1:E:807:TYR:OH	1:E:1145:GLU:OE1	2.28	0.46
1:F:10:ASP:N	1:F:10:ASP:OD1	2.49	0.46
2:I:433:THR:OG1	2:I:434:ASN:N	2.49	0.46
1:A:713:ILE:HG21	1:A:719:TYR:HB2	1.97	0.46
1:E:1122:ASP:O	1:E:1126:GLN:HG2	2.15	0.46
1:F:233:GLU:OE1	1:F:508:ASN:ND2	2.46	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:249:THR:HB	1:F:635:ASN:HD22	1.81	0.46
1:A:841:ASP:OD2	1:B:1236:ARG:NH2	2.49	0.45
1:B:141:ASP:O	1:B:145:GLU:HG2	2.16	0.45
1:E:203:ASP:OD1	1:E:203:ASP:N	2.43	0.45
1:E:1121:ASP:OD1	1:E:1122:ASP:N	2.49	0.45
2:H:226:SER:OG	2:H:228:PRO:HD2	2.15	0.45
2:I:17:PRO:HD3	2:I:36:PHE:CZ	2.51	0.45
1:B:249:THR:HB	1:B:635:ASN:HD22	1.81	0.45
2:G:433:THR:OG1	2:G:434:ASN:N	2.49	0.45
2:J:174:VAL:CG2	2:J:213:VAL:HG13	2.45	0.45
1:C:416:TRP:CZ3	1:C:419:TRP:HE3	2.34	0.45
1:C:846:ILE:HD13	1:C:1147:ARG:HD3	1.97	0.45
1:D:236:THR:O	1:D:236:THR:OG1	2.29	0.45
1:E:52:GLN:HE22	1:E:71:LEU:H	1.63	0.45
1:E:345:MET:HG3	1:E:346:ASP:H	1.82	0.45
1:A:645:ARG:HE	1:A:667:ASN:HD22	1.64	0.45
1:B:478:SER:O	1:B:478:SER:OG	2.32	0.45
1:B:869:GLY:O	1:B:873:VAL:HG23	2.16	0.45
1:C:1121:ASP:OD1	1:C:1122:ASP:N	2.49	0.45
1:C:1467:GLU:N	1:C:1467:GLU:OE1	2.50	0.45
1:D:1218:ASP:OD2	1:D:1233:TYR:OH	2.32	0.45
1:E:1007:GLY:HA3	1:E:1055:VAL:HG21	1.98	0.45
1:E:1431:HIS:O	1:E:1435:THR:HG22	2.16	0.45
1:F:869:GLY:O	1:F:873:VAL:HG23	2.16	0.45
1:A:227:MET:HG3	1:A:336:THR:O	2.17	0.45
1:A:1218:ASP:OD2	1:A:1233:TYR:OH	2.32	0.45
1:C:697:LYS:HA	1:C:700:ILE:HG22	1.97	0.45
1:D:352:PRO:HB3	1:D:1325:ASN:OD1	2.17	0.45
1:F:501:GLN:HE21	1:F:653:HIS:CD2	2.35	0.45
2:G:201:VAL:O	2:G:205:VAL:HG23	2.16	0.45
2:J:408:PRO:HB3	2:J:414:PRO:HA	1.97	0.45
1:A:352:PRO:HB3	1:A:1325:ASN:OD1	2.17	0.45
1:D:457:THR:HG22	1:D:774:PRO:HG2	1.99	0.45
1:E:234:ILE:HD11	1:E:277:LEU:HD22	1.97	0.45
1:E:640:THR:OG1	1:E:641:SER:N	2.50	0.45
2:H:300:ASP:OD1	2:H:301:THR:N	2.50	0.45
2:I:201:VAL:O	2:I:205:VAL:HG23	2.16	0.45
2:J:300:ASP:OD1	2:J:301:THR:N	2.50	0.45
1:E:408:ASP:OD1	1:E:408:ASP:N	2.43	0.45
1:E:416:TRP:CZ3	1:E:419:TRP:HE3	2.34	0.45
1:E:1467:GLU:N	1:E:1467:GLU:OE1	2.50	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:J:150:SER:O	2:J:235:VAL:HG12	2.16	0.45
1:B:531:ASN:O	1:B:539:GLN:NE2	2.50	0.45
1:C:847:THR:HG22	1:C:850:ARG:HH21	1.82	0.45
1:D:826:ARG:NH2	1:D:1072:GLY:O	2.50	0.45
1:E:801:ALA:HB2	1:E:809:THR:HG22	1.98	0.45
1:F:1113:CYS:HB3	1:F:1119:VAL:HG13	1.99	0.45
2:H:36:PHE:HE2	2:H:123:SER:HB3	1.81	0.45
1:B:501:GLN:HE21	1:B:653:HIS:CD2	2.35	0.45
1:C:461:MET:HE3	1:C:678:ARG:HD2	1.99	0.45
1:C:908:LYS:HG2	1:C:925:CYS:HB3	1.99	0.45
1:C:1408:GLU:HA	1:C:1408:GLU:OE2	2.17	0.45
1:D:227:MET:HG3	1:D:336:THR:O	2.17	0.45
1:D:1179:ASP:OD1	1:D:1179:ASP:N	2.45	0.45
1:F:531:ASN:O	1:F:539:GLN:NE2	2.50	0.45
2:J:220:GLU:HG2	2:J:223:ARG:HG3	1.99	0.45
1:A:826:ARG:NH2	1:A:1072:GLY:O	2.50	0.45
1:B:1113:CYS:HB3	1:B:1119:VAL:HG13	1.99	0.45
2:I:233:LYS:HB3	2:I:233:LYS:HE2	1.80	0.45
2:I:254:SER:O	2:I:254:SER:OG	2.32	0.45
1:A:1179:ASP:OD1	1:A:1179:ASP:N	2.45	0.44
1:B:10:ASP:OD1	1:B:10:ASP:N	2.49	0.44
1:B:1245:ARG:O	1:B:1249:MET:HG2	2.18	0.44
1:C:1007:GLY:HA3	1:C:1055:VAL:HG21	1.98	0.44
1:E:72:ALA:HB2	1:E:174:ALA:HB2	1.98	0.44
1:E:482:ASP:OD1	1:E:482:ASP:N	2.50	0.44
2:J:419:THR:HG22	2:J:423:THR:O	2.17	0.44
1:C:72:ALA:HB2	1:C:174:ALA:HB2	1.98	0.44
1:C:640:THR:OG1	1:C:641:SER:N	2.50	0.44
1:D:645:ARG:HE	1:D:667:ASN:HD22	1.64	0.44
1:E:141:ASP:O	1:E:145:GLU:HG2	2.16	0.44
1:F:141:ASP:O	1:F:145:GLU:HG2	2.16	0.44
2:G:185:GLY:O	2:G:188:VAL:HG12	2.17	0.44
1:F:195:LEU:HD23	1:F:200:PHE:HD2	1.83	0.44
2:G:17:PRO:HD3	2:G:36:PHE:CZ	2.51	0.44
2:H:208:LEU:O	2:H:213:VAL:HG23	2.17	0.44
1:A:90:ARG:NH2	1:A:129:GLU:OE2	2.50	0.44
1:A:273:ASP:OD1	1:A:273:ASP:N	2.50	0.44
1:B:1184:ASN:ND2	1:E:107:TRP:O	2.50	0.44
1:C:1127:LYS:HB3	1:C:1127:LYS:HE2	1.52	0.44
1:C:1431:HIS:O	1:C:1435:THR:HG22	2.16	0.44
1:D:324:MET:HG3	1:D:325:GLU:N	2.33	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:220:GLU:HG3	2:H:222:GLY:H	1.82	0.44
2:J:36:PHE:HE2	2:J:123:SER:HB3	1.81	0.44
2:J:208:LEU:O	2:J:213:VAL:HG23	2.17	0.44
2:J:221:VAL:HG12	6:J:503:FAD:N1A	2.32	0.44
1:B:264:LYS:HA	1:B:264:LYS:HD3	1.79	0.44
1:B:1147:ARG:HE	1:B:1147:ARG:HB3	1.61	0.44
1:C:482:ASP:OD1	1:C:1106:ARG:NH2	2.51	0.44
1:C:1287:GLU:N	1:C:1287:GLU:OE1	2.50	0.44
1:D:1363:ASN:HD22	1:D:1382:ASN:HD22	1.66	0.44
1:F:1376:LEU:HA	1:F:1395:TYR:HB3	1.99	0.44
1:A:324:MET:HG3	1:A:325:GLU:N	2.33	0.44
1:A:457:THR:HG22	1:A:774:PRO:HG2	1.99	0.44
1:B:195:LEU:HD23	1:B:200:PHE:HD2	1.82	0.44
1:C:141:ASP:O	1:C:145:GLU:HG2	2.16	0.44
1:F:979:ASP:OD2	1:F:1295:TYR:OH	2.32	0.44
1:F:1323:ILE:HG13	1:F:1342:ALA:HA	2.00	0.44
2:H:220:GLU:HG2	2:H:223:ARG:HG3	1.99	0.44
2:I:408:PRO:HB3	2:I:414:PRO:HA	1.99	0.44
1:B:4:GLY:HA3	1:B:207:TYR:CZ	2.53	0.44
1:B:706:LYS:HE3	1:B:706:LYS:HB2	1.81	0.44
1:C:437:GLY:O	1:C:556:ARG:NH2	2.51	0.44
6:J:503:FAD:H8A	6:J:503:FAD:C3B	2.46	0.44
1:C:801:ALA:HB2	1:C:809:THR:HG22	1.98	0.44
1:D:937:LYS:NZ	1:D:1032:ALA:O	2.38	0.44
1:E:437:GLY:O	1:E:556:ARG:NH2	2.51	0.44
1:E:1408:GLU:OE2	1:E:1408:GLU:HA	2.17	0.44
1:A:168:TYR:OH	1:A:226:ARG:NH1	2.51	0.44
1:A:909:GLN:NE2	1:A:929:GLU:OE2	2.49	0.44
1:A:1363:ASN:HD22	1:A:1382:ASN:HD22	1.66	0.44
1:C:345:MET:HG3	1:C:346:ASP:H	1.82	0.44
1:D:35:ASP:OD1	1:D:36:ALA:N	2.51	0.44
1:E:482:ASP:OD1	1:E:1106:ARG:NH2	2.50	0.44
1:F:4:GLY:HA3	1:F:207:TYR:CZ	2.53	0.44
1:F:1245:ARG:O	1:F:1249:MET:HG2	2.18	0.44
2:I:185:GLY:O	2:I:188:VAL:HG12	2.17	0.44
1:B:602:THR:O	1:B:603:HIS:ND1	2.51	0.43
1:C:1105:VAL:HG13	2:H:51:CYS:HB3	2.00	0.43
1:E:840:VAL:O	1:E:1147:ARG:NH2	2.51	0.43
1:F:602:THR:O	1:F:603:HIS:ND1	2.51	0.43
2:J:185:GLY:O	2:J:188:VAL:HG22	2.18	0.43
2:J:220:GLU:HG3	2:J:222:GLY:H	1.82	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:418:LYS:HG3	1:A:419:TRP:HD1	1.83	0.43
1:B:1132:PRO:O	1:B:1136:VAL:HG23	2.18	0.43
1:D:168:TYR:OH	1:D:226:ARG:NH1	2.51	0.43
1:D:264:LYS:HA	1:D:264:LYS:HD3	1.77	0.43
1:F:1147:ARG:HE	1:F:1147:ARG:HB3	1.61	0.43
1:F:1322:ILE:HG23	1:F:1323:ILE:HG23	2.00	0.43
1:A:35:ASP:OD1	1:A:36:ALA:N	2.51	0.43
1:B:606:LEU:HD11	1:B:627:VAL:HG21	1.99	0.43
1:B:1145:GLU:O	1:B:1149:ILE:HG13	2.18	0.43
1:B:1172:SER:HG	1:E:63:GLY:HA3	1.83	0.43
1:C:202:SER:OG	1:C:203:ASP:N	2.52	0.43
1:C:246:ALA:O	1:C:638:THR:OG1	2.32	0.43
1:C:482:ASP:OD1	1:C:482:ASP:N	2.50	0.43
1:C:840:VAL:O	1:C:1147:ARG:NH2	2.51	0.43
1:D:1276:LEU:HD23	1:D:1296:VAL:HG23	1.99	0.43
1:E:847:THR:HG22	1:E:850:ARG:HH21	1.82	0.43
2:H:419:THR:HG22	2:H:423:THR:O	2.17	0.43
2:I:331:SER:HB3	2:I:334:GLU:HG3	1.99	0.43
1:C:107:TRP:O	1:F:1184:ASN:ND2	2.51	0.43
1:E:1287:GLU:N	1:E:1287:GLU:OE1	2.50	0.43
1:F:1132:PRO:O	1:F:1136:VAL:HG23	2.18	0.43
2:J:427:ASP:OD2	2:J:430:THR:OG1	2.30	0.43
1:B:1376:LEU:HA	1:B:1395:TYR:HB3	1.99	0.43
1:D:706:LYS:HE3	1:D:706:LYS:HB2	1.76	0.43
1:E:908:LYS:HG2	1:E:925:CYS:HB3	1.99	0.43
2:G:408:PRO:HB3	2:G:414:PRO:HA	1.99	0.43
2:H:70:LEU:HD23	2:H:70:LEU:HA	1.85	0.43
2:H:186:LEU:HG	6:H:503:FAD:O1A	2.19	0.43
1:A:399:LYS:HE3	1:A:399:LYS:HB2	1.86	0.43
1:A:1127:LYS:HE3	2:G:116:HIS:CD2	2.54	0.43
1:B:1396:ASP:OD2	1:B:1401:LEU:N	2.52	0.43
1:D:90:ARG:NH2	1:D:129:GLU:OE2	2.50	0.43
2:G:221:VAL:HG12	6:G:503:FAD:N1A	2.34	0.43
2:H:158:PRO:HD2	6:H:503:FAD:O2P	2.19	0.43
1:A:284:MET:HE2	1:A:284:MET:HB3	1.75	0.43
1:A:1276:LEU:HD23	1:A:1296:VAL:HG23	2.00	0.43
1:C:108:ARG:NH1	1:C:130:GLN:OE1	2.49	0.43
1:E:1142:LEU:HD12	1:E:1142:LEU:HA	1.88	0.43
1:F:606:LEU:HD11	1:F:627:VAL:HG21	1.99	0.43
2:I:133:TRP:NE1	2:I:203:ARG:HD2	2.34	0.43
2:I:221:VAL:HG12	6:I:503:FAD:N1A	2.33	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:J:102:ASP:OD1	2:J:102:ASP:N	2.51	0.43
1:A:537:GLU:N	1:A:537:GLU:OE1	2.52	0.43
1:A:937:LYS:NZ	1:A:1032:ALA:O	2.38	0.43
1:B:1323:ILE:HG13	1:B:1342:ALA:HA	2.00	0.43
1:C:1428:ILE:O	1:C:1432:VAL:HG23	2.19	0.43
1:F:1145:GLU:O	1:F:1149:ILE:HG13	2.18	0.43
1:F:1182:ASP:OD1	1:F:1184:ASN:HB2	2.18	0.43
2:G:331:SER:HB3	2:G:334:GLU:HG3	1.99	0.43
2:H:307:ARG:NH1	2:H:334:GLU:OE2	2.51	0.43
1:B:337:ASP:OD1	1:B:338:GLY:N	2.45	0.43
1:D:196:LEU:HD23	1:D:196:LEU:HA	1.88	0.43
1:E:390:MET:HG3	1:E:406:LEU:HD23	2.01	0.43
1:E:461:MET:HE3	1:E:678:ARG:HD2	2.00	0.43
1:F:306:SER:OG	1:F:308:THR:HG23	2.18	0.43
1:F:364:ILE:HD12	1:F:374:ILE:HD11	2.00	0.43
2:J:472:LYS:HE3	2:J:472:LYS:HB3	1.80	0.43
1:F:267:ILE:HD13	1:F:276:SER:HB2	2.01	0.43
1:F:706:LYS:HE3	1:F:706:LYS:HB2	1.81	0.43
1:F:886:GLU:HB3	1:F:911:ALA:HB2	2.00	0.43
2:J:307:ARG:NH1	2:J:334:GLU:OE2	2.51	0.43
1:A:886:GLU:HB3	1:A:911:ALA:HB2	2.01	0.42
1:D:537:GLU:OE1	1:D:537:GLU:N	2.52	0.42
1:D:886:GLU:HB3	1:D:911:ALA:HB2	2.01	0.42
1:E:135:ASN:ND2	1:E:139:VAL:O	2.52	0.42
1:F:589:ILE:HG13	1:F:590:ARG:N	2.34	0.42
1:F:1157:SER:N	1:F:1160:GLU:OE1	2.52	0.42
2:I:467:ALA:O	2:I:470:LYS:HG3	2.19	0.42
1:B:1182:ASP:OD1	1:B:1184:ASN:HB2	2.18	0.42
1:C:390:MET:HG3	1:C:406:LEU:HD23	2.01	0.42
1:C:461:MET:HA	1:C:465:LEU:HB3	2.01	0.42
1:C:1368:MET:HB3	1:C:1387:MET:HG3	2.01	0.42
1:D:223:GLN:HB3	1:D:224:PRO:HA	2.01	0.42
1:D:1317:THR:O	1:D:1340:GLY:HA2	2.20	0.42
2:G:186:LEU:HG	6:G:503:FAD:O2A	2.19	0.42
2:H:72:LEU:HD13	2:H:80:GLU:HB3	2.01	0.42
2:I:311:ARG:HA	2:I:311:ARG:HD3	1.86	0.42
1:A:1150:LEU:HD23	1:A:1150:LEU:HA	1.87	0.42
1:B:306:SER:OG	1:B:308:THR:HG23	2.18	0.42
1:C:79:PRO:O	1:C:86:GLN:NE2	2.47	0.42
1:E:108:ARG:NH1	1:E:130:GLN:OE1	2.49	0.42
1:E:783:LYS:HD2	1:E:783:LYS:HA	1.74	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:1396:ASP:OD2	1:F:1401:LEU:N	2.52	0.42
2:J:72:LEU:HD13	2:J:80:GLU:HB3	2.01	0.42
2:J:443:ASP:CB	6:J:503:FAD:O2P	2.67	0.42
1:A:223:GLN:HB3	1:A:224:PRO:HA	2.01	0.42
1:B:886:GLU:HB3	1:B:911:ALA:HB2	2.00	0.42
1:C:135:ASN:ND2	1:C:139:VAL:O	2.52	0.42
2:H:126:LYS:HB3	2:H:126:LYS:HE2	1.70	0.42
2:I:326:LYS:HD2	2:I:326:LYS:HA	1.69	0.42
2:J:38:ASP:OD1	2:J:127:TYR:OH	2.28	0.42
1:B:364:ILE:HD12	1:B:374:ILE:HD11	2.00	0.42
1:B:854:ILE:O	1:B:1091:GLY:HA2	2.20	0.42
1:B:1157:SER:N	1:B:1160:GLU:OE1	2.52	0.42
1:B:1322:ILE:HG23	1:B:1323:ILE:HG23	2.00	0.42
1:E:250:ARG:NH2	1:E:530:GLY:HA2	2.35	0.42
1:E:375:ASP:OD2	1:E:377:THR:OG1	2.26	0.42
1:E:1368:MET:HB3	1:E:1387:MET:HG3	2.01	0.42
2:G:326:LYS:HD2	2:G:326:LYS:HA	1.69	0.42
2:G:467:ALA:O	2:G:470:LYS:HG3	2.20	0.42
1:C:881:LYS:HE2	1:C:926:ARG:HH12	1.85	0.42
1:E:202:SER:OG	1:E:203:ASP:N	2.52	0.42
1:E:264:LYS:HA	1:E:264:LYS:HD3	1.78	0.42
1:E:1428:ILE:O	1:E:1432:VAL:HG23	2.19	0.42
1:F:227:MET:HG3	1:F:336:THR:O	2.20	0.42
1:F:854:ILE:O	1:F:1091:GLY:HA2	2.20	0.42
2:H:185:GLY:O	2:H:188:VAL:HG22	2.18	0.42
1:C:783:LYS:HD2	1:C:783:LYS:HA	1.74	0.42
1:D:418:LYS:HG3	1:D:419:TRP:HD1	1.83	0.42
1:D:1389:GLY:HA2	1:D:1462:MET:SD	2.60	0.42
2:H:472:LYS:HB3	2:H:472:LYS:HE3	1.80	0.42
1:A:140:SER:OG	1:A:141:ASP:N	2.53	0.42
1:A:1389:GLY:HA2	1:A:1462:MET:SD	2.60	0.42
1:B:267:ILE:HD13	1:B:276:SER:HB2	2.01	0.42
1:B:589:ILE:HG13	1:B:590:ARG:N	2.34	0.42
1:B:806:SER:OG	1:B:809:THR:HG22	2.20	0.42
1:C:1341:GLN:HG2	1:C:1359:GLY:HA3	2.01	0.42
1:F:826:ARG:NE	1:F:1078:ASP:OD2	2.50	0.42
2:G:311:ARG:HA	2:G:311:ARG:HD3	1.86	0.42
2:I:63:SER:O	2:I:63:SER:OG	2.36	0.42
1:A:973:ASP:O	1:A:979:ASP:HB3	2.19	0.42
1:E:1316:GLU:O	1:E:1320:ASN:ND2	2.41	0.42
1:F:806:SER:OG	1:F:809:THR:HG22	2.20	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:J:119:VAL:O	2:J:121:ILE:HG13	2.20	0.42
1:C:997:THR:HB	1:C:1020:ILE:HB	2.02	0.42
1:D:248:GLU:OE2	1:D:266:VAL:HG12	2.20	0.42
1:E:1110:SER:O	1:E:1112:THR:HG23	2.20	0.42
2:H:102:ASP:OD1	2:H:102:ASP:N	2.51	0.42
1:D:83:LEU:HD23	1:D:83:LEU:HA	1.87	0.41
1:D:185:ALA:HB2	1:D:209:GLN:NE2	2.35	0.41
1:D:973:ASP:O	1:D:979:ASP:HB3	2.19	0.41
1:D:1092:ILE:HD12	1:D:1139:PHE:CZ	2.55	0.41
1:F:798:LEU:HB2	1:F:813:TYR:CE1	2.55	0.41
2:G:238:LEU:HD12	2:G:465:ILE:HD12	2.02	0.41
2:H:231:ARG:HH22	2:H:435:MET:HB3	1.85	0.41
2:I:150:SER:O	2:I:235:VAL:HG12	2.20	0.41
1:A:860:MET:CE	1:A:893:ARG:HH12	2.33	0.41
1:A:1092:ILE:HD12	1:A:1139:PHE:CZ	2.55	0.41
1:A:1317:THR:O	1:A:1340:GLY:HA2	2.20	0.41
1:C:501:GLN:HE21	1:C:653:HIS:CD2	2.38	0.41
1:D:529:LEU:H	1:D:529:LEU:HD12	1.85	0.41
1:E:414:LYS:HB2	1:E:416:TRP:NE1	2.36	0.41
1:F:1427:LEU:HD23	1:F:1427:LEU:HA	1.92	0.41
2:G:6:MET:SD	2:G:71:LYS:HA	2.60	0.41
2:G:133:TRP:NE1	2:G:203:ARG:HD2	2.34	0.41
2:J:99:CYS:O	2:J:101:GLN:HG3	2.20	0.41
1:B:620:ALA:O	1:B:624:THR:HG22	2.20	0.41
1:C:1110:SER:O	1:C:1112:THR:HG23	2.20	0.41
1:C:1127:LYS:HZ2	2:H:116:HIS:CD2	2.37	0.41
1:E:1437:SER:OG	1:E:1438:ARG:N	2.54	0.41
1:A:45:GLY:HA3	1:A:224:PRO:HD3	2.02	0.41
1:A:248:GLU:OE2	1:A:266:VAL:HG12	2.20	0.41
3:C:1501:FMN:H9	3:C:1501:FMN:H1'2	1.86	0.41
1:D:273:ASP:N	1:D:273:ASP:OD1	2.50	0.41
1:E:91:CYS:O	1:E:95:THR:HG22	2.21	0.41
2:H:191:ILE:O	2:H:198:LYS:NZ	2.53	0.41
2:H:324:ASP:OD1	2:H:327:ASN:ND2	2.54	0.41
2:J:324:ASP:OD1	2:J:327:ASN:ND2	2.54	0.41
1:A:473:LYS:HE2	1:A:473:LYS:HB3	1.87	0.41
1:B:227:MET:HG3	1:B:336:THR:O	2.19	0.41
1:C:250:ARG:NH2	1:C:530:GLY:HA2	2.35	0.41
1:D:909:GLN:NE2	1:D:929:GLU:OE2	2.49	0.41
1:E:997:THR:HB	1:E:1020:ILE:HB	2.02	0.41
1:E:1341:GLN:HG2	1:E:1359:GLY:HA3	2.01	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:202:SER:OG	1:F:203:ASP:N	2.53	0.41
1:F:221:LEU:HD23	1:F:221:LEU:HA	1.92	0.41
2:I:70:LEU:HD23	2:I:70:LEU:HA	1.88	0.41
2:J:98:ILE:HD11	2:J:451:VAL:HG21	2.03	0.41
2:J:109:CYS:SG	2:J:111:ILE:HG12	2.61	0.41
1:A:359:THR:HG23	1:A:378:GLN:O	2.21	0.41
1:A:923:ASN:OD1	1:A:1252:ARG:NH2	2.54	0.41
1:B:236:THR:O	1:B:236:THR:OG1	2.36	0.41
1:C:1437:SER:OG	1:C:1438:ARG:N	2.54	0.41
1:D:359:THR:HG23	1:D:378:GLN:O	2.21	0.41
1:F:264:LYS:HA	1:F:264:LYS:HD3	1.79	0.41
1:F:312:ASN:OD1	1:F:313:HIS:N	2.53	0.41
2:H:99:CYS:O	2:H:101:GLN:HG3	2.20	0.41
2:H:109:CYS:SG	2:H:111:ILE:HG12	2.60	0.41
2:H:220:GLU:HG3	2:H:222:GLY:N	2.36	0.41
1:B:202:SER:OG	1:B:203:ASP:N	2.53	0.41
1:B:853:PHE:O	1:B:854:ILE:HD13	2.20	0.41
1:D:140:SER:OG	1:D:141:ASP:N	2.53	0.41
1:D:893:ARG:HD2	1:D:903:TRP:HB3	2.03	0.41
1:E:461:MET:HA	1:E:465:LEU:HB3	2.01	0.41
1:E:1350:ASN:HD21	1:E:1353:ALA:HB3	1.86	0.41
1:F:853:PHE:O	1:F:854:ILE:HD13	2.20	0.41
1:C:273:ASP:OD1	1:C:274:SER:N	2.52	0.41
1:D:428:GLU:O	1:D:432:THR:HG23	2.20	0.41
1:E:69:ASN:OD1	1:E:69:ASN:N	2.54	0.41
2:H:143:PRO:HB3	2:H:171:GLY:HA2	2.03	0.41
2:J:143:PRO:HB3	2:J:171:GLY:HA2	2.03	0.41
1:A:105:TYR:HE2	1:A:134:GLY:HA3	1.86	0.41
1:A:829:LEU:O	1:A:1077:ARG:NH2	2.54	0.41
1:B:798:LEU:HB2	1:B:813:TYR:CE1	2.55	0.41
1:B:1172:SER:OG	1:E:63:GLY:HA3	2.20	0.41
1:B:1345:ARG:HB3	1:B:1348:VAL:HG21	2.02	0.41
1:C:4:GLY:HA3	1:C:207:TYR:CZ	2.55	0.41
1:C:91:CYS:O	1:C:95:THR:HG22	2.20	0.41
1:C:244:MET:O	1:C:248:GLU:HG3	2.20	0.41
1:D:860:MET:CE	1:D:893:ARG:HH12	2.33	0.41
1:D:923:ASN:OD1	1:D:1252:ARG:NH2	2.54	0.41
1:D:1417:VAL:HG12	1:D:1419:HIS:H	1.86	0.41
1:E:503:PHE:HE1	1:E:505:GLN:NE2	2.19	0.41
1:E:928:LEU:O	1:E:997:THR:HG22	2.21	0.41
1:F:236:THR:O	1:F:236:THR:OG1	2.36	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:620:ALA:O	1:F:624:THR:HG22	2.20	0.41
1:F:671:ALA:O	1:F:675:ILE:HG12	2.21	0.41
1:F:1325:ASN:ND2	1:F:1344:GLU:HB2	2.35	0.41
2:G:28:ASP:OD1	2:G:28:ASP:N	2.53	0.41
2:G:245:LYS:HB3	2:G:403:GLU:O	2.21	0.41
2:I:6:MET:SD	2:I:71:LYS:HA	2.60	0.41
2:I:238:LEU:HD12	2:I:465:ILE:HD12	2.03	0.41
2:J:150:SER:HA	2:J:173:GLU:O	2.20	0.41
2:J:220:GLU:HG3	2:J:222:GLY:N	2.36	0.41
1:C:264:LYS:HD3	1:C:264:LYS:HA	1.79	0.41
1:D:794:VAL:HG13	1:D:813:TYR:HE1	1.87	0.41
1:D:1142:LEU:HA	1:D:1142:LEU:HD12	1.83	0.41
1:E:244:MET:O	1:E:248:GLU:HG3	2.20	0.41
2:H:119:VAL:O	2:H:121:ILE:HG13	2.20	0.41
2:H:443:ASP:HB3	6:H:503:FAD:O1P	2.21	0.41
2:I:247:ARG:NE	2:I:403:GLU:OE2	2.41	0.41
1:A:428:GLU:O	1:A:432:THR:HG23	2.20	0.40
1:A:706:LYS:HB2	1:A:706:LYS:HE3	1.76	0.40
1:A:1417:VAL:HG12	1:A:1419:HIS:H	1.86	0.40
1:B:1092:ILE:HD12	1:B:1139:PHE:CZ	2.56	0.40
1:B:1218:ASP:OD2	1:B:1233:TYR:OH	2.39	0.40
1:D:4:GLY:HA3	1:D:207:TYR:CZ	2.56	0.40
1:D:45:GLY:HA3	1:D:224:PRO:HD3	2.02	0.40
1:F:1345:ARG:HB3	1:F:1348:VAL:HG21	2.02	0.40
1:A:51:PRO:HG3	1:A:200:PHE:CD1	2.56	0.40
1:A:841:ASP:O	1:B:1236:ARG:NH2	2.54	0.40
1:B:711:MET:HE3	1:B:724:ASN:HB3	2.03	0.40
1:B:1325:ASN:ND2	1:B:1344:GLU:HB2	2.35	0.40
1:C:928:LEU:O	1:C:997:THR:HG22	2.21	0.40
1:D:105:TYR:HE2	1:D:134:GLY:HA3	1.86	0.40
1:D:296:MET:HB2	1:D:296:MET:HE2	1.94	0.40
1:D:330:PRO:HG3	1:D:350:LEU:HD12	2.02	0.40
1:E:4:GLY:HA3	1:E:207:TYR:CZ	2.55	0.40
1:E:586:LEU:HD23	1:E:586:LEU:HA	1.92	0.40
1:F:1218:ASP:OD2	1:F:1233:TYR:OH	2.39	0.40
2:G:451:VAL:HG23	6:G:503:FAD:HM83	2.03	0.40
2:I:28:ASP:N	2:I:28:ASP:OD1	2.53	0.40
1:A:196:LEU:HD23	1:A:196:LEU:HA	1.88	0.40
1:A:418:LYS:HA	1:A:421:GLN:NE2	2.36	0.40
1:B:1444:LEU:HD23	1:B:1444:LEU:HA	1.95	0.40
1:F:846:ILE:CD1	1:F:1147:ARG:HD3	2.52	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:G:427:ASP:OD1	2:G:432:MET:N	2.37	0.40
2:J:231:ARG:HH22	2:J:435:MET:HB3	1.85	0.40
1:A:185:ALA:HB2	1:A:209:GLN:NE2	2.35	0.40
1:A:296:MET:HE2	1:A:296:MET:HB2	1.94	0.40
1:A:529:LEU:HD12	1:A:529:LEU:H	1.85	0.40
1:B:671:ALA:O	1:B:675:ILE:HG12	2.21	0.40
1:C:196:LEU:HD23	1:C:196:LEU:HA	1.92	0.40
1:C:414:LYS:HB2	1:C:416:TRP:NE1	2.36	0.40
1:E:501:GLN:HE21	1:E:653:HIS:CD2	2.38	0.40
1:E:602:THR:O	1:E:603:HIS:ND1	2.55	0.40
1:F:1007:GLY:HA3	1:F:1055:VAL:HG21	2.04	0.40
2:G:143:PRO:HB3	2:G:171:GLY:HA2	2.04	0.40
2:H:150:SER:HA	2:H:173:GLU:O	2.21	0.40
2:I:208:LEU:HD23	2:I:208:LEU:HA	1.94	0.40
1:A:1431:HIS:O	1:A:1435:THR:HG22	2.22	0.40
1:C:31:ARG:HH12	1:C:1274:GLN:HE22	1.70	0.40
1:D:829:LEU:O	1:D:1077:ARG:NH2	2.54	0.40
1:E:31:ARG:HH12	1:E:1274:GLN:HE22	1.70	0.40
1:F:731:SER:HA	1:F:748:GLY:H	1.87	0.40
2:G:150:SER:O	2:G:235:VAL:HG12	2.20	0.40
2:I:37:SER:HB2	2:I:39:GLU:OE2	2.22	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	A	1470/1515 (97%)	1421 (97%)	49 (3%)	0	100	100
1	B	1470/1515 (97%)	1429 (97%)	41 (3%)	0	100	100
1	C	1470/1515 (97%)	1427 (97%)	43 (3%)	0	100	100
1	D	1470/1515 (97%)	1421 (97%)	49 (3%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	E	1470/1515 (97%)	1429 (97%)	41 (3%)	0	100	100
1	F	1470/1515 (97%)	1429 (97%)	41 (3%)	0	100	100
2	G	470/482 (98%)	447 (95%)	23 (5%)	0	100	100
2	H	470/482 (98%)	444 (94%)	26 (6%)	0	100	100
2	I	470/482 (98%)	447 (95%)	23 (5%)	0	100	100
2	J	470/482 (98%)	445 (95%)	25 (5%)	0	100	100
All	All	10700/11018 (97%)	10339 (97%)	361 (3%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	1201/1233 (97%)	1198 (100%)	3 (0%)	93	98
1	B	1201/1233 (97%)	1198 (100%)	3 (0%)	93	98
1	C	1201/1233 (97%)	1189 (99%)	12 (1%)	76	88
1	D	1201/1233 (97%)	1198 (100%)	3 (0%)	93	98
1	E	1201/1233 (97%)	1189 (99%)	12 (1%)	76	88
1	F	1201/1233 (97%)	1198 (100%)	3 (0%)	93	98
2	G	373/379 (98%)	372 (100%)	1 (0%)	92	97
2	H	373/379 (98%)	371 (100%)	2 (0%)	88	94
2	I	373/379 (98%)	372 (100%)	1 (0%)	92	97
2	J	373/379 (98%)	371 (100%)	2 (0%)	88	94
All	All	8698/8914 (98%)	8656 (100%)	42 (0%)	89	94

All (42) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	309	THR

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Mol	Chain	Res	Type
1	A	534	ASP
1	A	747	SER
1	B	160	LYS
1	B	438	GLU
1	B	1161	VAL
1	C	114	VAL
1	C	133	VAL
1	C	311	ASP
1	C	372	VAL
1	C	379	VAL
1	C	634	SER
1	C	897	ASP
1	C	1307	VAL
1	C	1332	THR
1	C	1381	ASP
1	C	1452	THR
1	C	1467	GLU
1	D	309	THR
1	D	534	ASP
1	D	747	SER
1	E	114	VAL
1	E	133	VAL
1	E	311	ASP
1	E	372	VAL
1	E	379	VAL
1	E	634	SER
1	E	897	ASP
1	E	1307	VAL
1	E	1332	THR
1	E	1381	ASP
1	E	1452	THR
1	E	1467	GLU
1	F	160	LYS
1	F	438	GLU
1	F	1161	VAL
2	G	470	LYS
2	H	213	VAL
2	H	474	GLU
2	I	470	LYS
2	J	213	VAL
2	J	474	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (128)

such sidechains are listed below:

Mol	Chain	Res	Type
1	A	30	HIS
1	A	52	GLN
1	A	208	HIS
1	A	240	ASN
1	A	259	HIS
1	A	539	GLN
1	A	635	ASN
1	A	643	ASN
1	A	653	HIS
1	A	667	ASN
1	A	762	HIS
1	A	767	ASN
1	A	824	GLN
1	A	876	ASN
1	A	902	ASN
1	A	1159	ASN
1	A	1177	HIS
1	A	1363	ASN
1	B	52	GLN
1	B	143	GLN
1	B	163	GLN
1	B	165	ASN
1	B	240	ASN
1	B	259	HIS
1	B	497	HIS
1	B	505	GLN
1	B	635	ASN
1	B	643	ASN
1	B	653	HIS
1	B	695	ASN
1	B	762	HIS
1	B	824	GLN
1	B	872	ASN
1	B	1159	ASN
1	B	1177	HIS
1	B	1184	ASN
1	B	1363	ASN
1	C	52	GLN
1	C	143	GLN
1	C	165	ASN
1	C	259	HIS
1	C	635	ASN

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Mol	Chain	Res	Type
1	C	653	HIS
1	C	762	HIS
1	C	824	GLN
1	C	872	ASN
1	C	982	GLN
1	C	1063	HIS
1	C	1177	HIS
1	C	1274	GLN
1	C	1325	ASN
1	C	1363	ASN
1	C	1419	HIS
1	C	1423	GLN
1	D	30	HIS
1	D	52	GLN
1	D	165	ASN
1	D	208	HIS
1	D	240	ASN
1	D	259	HIS
1	D	539	GLN
1	D	635	ASN
1	D	643	ASN
1	D	653	HIS
1	D	667	ASN
1	D	762	HIS
1	D	767	ASN
1	D	824	GLN
1	D	876	ASN
1	D	902	ASN
1	D	1159	ASN
1	D	1177	HIS
1	D	1325	ASN
1	D	1363	ASN
1	E	52	GLN
1	E	143	GLN
1	E	165	ASN
1	E	259	HIS
1	E	635	ASN
1	E	653	HIS
1	E	762	HIS
1	E	824	GLN
1	E	872	ASN
1	E	982	GLN

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Mol	Chain	Res	Type
1	E	1063	HIS
1	E	1177	HIS
1	E	1274	GLN
1	E	1325	ASN
1	E	1363	ASN
1	E	1419	HIS
1	E	1423	GLN
1	F	52	GLN
1	F	143	GLN
1	F	163	GLN
1	F	165	ASN
1	F	240	ASN
1	F	259	HIS
1	F	497	HIS
1	F	505	GLN
1	F	635	ASN
1	F	653	HIS
1	F	695	ASN
1	F	762	HIS
1	F	824	GLN
1	F	872	ASN
1	F	1159	ASN
1	F	1177	HIS
1	F	1184	ASN
1	F	1325	ASN
1	F	1363	ASN
2	G	64	ASN
2	G	218	ASN
2	G	234	HIS
2	G	270	ASN
2	G	409	ASN
2	G	434	ASN
2	H	64	ASN
2	H	216	HIS
2	H	234	HIS
2	I	64	ASN
2	I	218	ASN
2	I	234	HIS
2	I	270	ASN
2	I	409	ASN
2	I	434	ASN
2	J	64	ASN

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Mol	Chain	Res	Type
2	J	216	HIS
2	J	234	HIS

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

24 ligands are modelled in this entry.

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
5	SF4	H	501	2	0,12,12	-	-	-		
5	SF4	H	502	2	0,12,12	-	-	-		
5	SF4	G	502	2	0,12,12	-	-	-		
5	SF4	I	501	2	0,12,12	-	-	-		
3	FMN	F	1501	-	33,33,33	1.08	2 (6%)	48,50,50	1.22	8 (16%)
4	F3S	E	1502	1	0,9,9	-	-	-		
3	FMN	E	1501	-	33,33,33	1.10	2 (6%)	48,50,50	1.21	7 (14%)
5	SF4	G	501	2	0,12,12	-	-	-		
5	SF4	I	502	2	0,12,12	-	-	-		
4	F3S	D	1502	1	0,9,9	-	-	-		
6	FAD	H	503	-	53,58,58	0.68	0	68,89,89	0.93	4 (5%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	F3S	A	1502	1	0,9,9	-	-	-		
4	F3S	F	1502	1	0,9,9	-	-	-		
3	FMN	C	1501	-	33,33,33	1.09	2 (6%)	48,50,50	1.21	8 (16%)
5	SF4	J	502	2	0,12,12	-	-	-		
4	F3S	B	1502	1	0,9,9	-	-	-		
3	FMN	D	1501	-	33,33,33	1.10	2 (6%)	48,50,50	1.21	7 (14%)
3	FMN	A	1501	-	33,33,33	1.11	2 (6%)	48,50,50	1.22	8 (16%)
6	FAD	I	503	-	53,58,58	0.69	0	68,89,89	0.79	4 (5%)
4	F3S	C	1502	1	0,9,9	-	-	-		
5	SF4	J	501	2	0,12,12	-	-	-		
3	FMN	B	1501	-	33,33,33	1.08	2 (6%)	48,50,50	1.22	8 (16%)
6	FAD	G	503	-	53,58,58	0.70	0	68,89,89	0.82	3 (4%)
6	FAD	J	503	-	53,58,58	0.69	0	68,89,89	0.91	4 (5%)

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
5	SF4	H	501	2	-	-	0/6/5/5
5	SF4	H	502	2	-	-	0/6/5/5
5	SF4	G	502	2	-	-	0/6/5/5
5	SF4	I	501	2	-	-	0/6/5/5
3	FMN	F	1501	-	-	1/18/18/18	0/3/3/3
4	F3S	E	1502	1	-	-	0/3/3/3
3	FMN	E	1501	-	-	1/18/18/18	0/3/3/3
5	SF4	G	501	2	-	-	0/6/5/5
5	SF4	I	502	2	-	-	0/6/5/5
4	F3S	D	1502	1	-	-	0/3/3/3
6	FAD	H	503	-	2/2/9/9	9/30/50/50	0/6/6/6
4	F3S	A	1502	1	-	-	0/3/3/3
4	F3S	F	1502	1	-	-	0/3/3/3
3	FMN	C	1501	-	-	1/18/18/18	0/3/3/3
5	SF4	J	502	2	-	-	0/6/5/5
4	F3S	B	1502	1	-	-	0/3/3/3
3	FMN	D	1501	-	-	0/18/18/18	0/3/3/3
3	FMN	A	1501	-	-	0/18/18/18	0/3/3/3
6	FAD	I	503	-	-	12/30/50/50	0/6/6/6
4	F3S	C	1502	1	-	-	0/3/3/3
5	SF4	J	501	2	-	-	0/6/5/5

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	FMN	B	1501	-	-	1/18/18/18	0/3/3/3
6	FAD	G	503	-	-	7/30/50/50	0/6/6/6
6	FAD	J	503	-	-	10/30/50/50	0/6/6/6

All (12) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	F	1501	FMN	C4A-N5	3.81	1.38	1.30
3	B	1501	FMN	C4A-N5	3.80	1.38	1.30
3	C	1501	FMN	C4A-N5	3.69	1.37	1.30
3	E	1501	FMN	C4A-N5	3.69	1.37	1.30
3	A	1501	FMN	C4A-N5	3.62	1.37	1.30
3	D	1501	FMN	C4A-N5	3.59	1.37	1.30
3	F	1501	FMN	C10-N1	2.44	1.38	1.33
3	B	1501	FMN	C10-N1	2.44	1.38	1.33
3	A	1501	FMN	C10-N1	2.39	1.38	1.33
3	E	1501	FMN	C10-N1	2.39	1.38	1.33
3	D	1501	FMN	C10-N1	2.39	1.38	1.33
3	C	1501	FMN	C10-N1	2.37	1.38	1.33

All (61) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	H	503	FAD	P-O3P-PA	-3.39	121.20	132.83
6	J	503	FAD	P-O3P-PA	-3.38	121.24	132.83
3	C	1501	FMN	C4-N3-C2	-3.14	119.83	125.64
3	D	1501	FMN	C4-N3-C2	-3.14	119.84	125.64
3	E	1501	FMN	C4-N3-C2	-3.14	119.84	125.64
3	A	1501	FMN	C4-N3-C2	-3.12	119.87	125.64
3	B	1501	FMN	C4-N3-C2	-3.12	119.88	125.64
3	F	1501	FMN	C4-N3-C2	-3.09	119.94	125.64
6	H	503	FAD	O4B-C1B-C2B	-2.98	102.58	106.93
6	G	503	FAD	O4B-C1B-C2B	-2.81	102.82	106.93
3	C	1501	FMN	C4A-C4-N3	2.68	120.00	113.19
3	D	1501	FMN	C4A-C4-N3	2.68	119.98	113.19
3	E	1501	FMN	C4A-C4-N3	2.68	119.98	113.19
3	B	1501	FMN	C4A-C4-N3	2.67	119.97	113.19
3	A	1501	FMN	C4A-C4-N3	2.66	119.94	113.19
3	F	1501	FMN	C4A-C4-N3	2.66	119.93	113.19
3	A	1501	FMN	C4A-C10-N10	2.58	120.25	116.48
3	D	1501	FMN	O4-C4-C4A	-2.57	119.78	126.60
3	A	1501	FMN	O4-C4-C4A	-2.57	119.79	126.60

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	1501	FMN	C4A-C10-N10	2.56	120.22	116.48
3	B	1501	FMN	O4-C4-C4A	-2.55	119.82	126.60
3	F	1501	FMN	O4-C4-C4A	-2.55	119.83	126.60
3	C	1501	FMN	O4-C4-C4A	-2.52	119.92	126.60
3	E	1501	FMN	O4-C4-C4A	-2.51	119.94	126.60
6	J	503	FAD	C2B-C3B-C4B	-2.49	97.80	102.64
3	F	1501	FMN	C4A-C10-N10	2.48	120.10	116.48
3	B	1501	FMN	C4A-C10-N10	2.46	120.08	116.48
3	C	1501	FMN	C4A-C10-N10	2.44	120.04	116.48
3	E	1501	FMN	C4A-C10-N10	2.43	120.03	116.48
6	J	503	FAD	C5A-C6A-N6A	2.22	123.73	120.35
3	E	1501	FMN	C10-C4A-N5	-2.21	120.17	124.86
3	C	1501	FMN	C10-C4A-N5	-2.20	120.18	124.86
6	I	503	FAD	O4B-C1B-C2B	-2.19	103.72	106.93
3	C	1501	FMN	C9A-C5A-N5	-2.19	120.05	122.43
3	A	1501	FMN	C10-C4A-N5	-2.18	120.23	124.86
3	D	1501	FMN	C4A-C10-N1	-2.18	119.67	124.73
6	I	503	FAD	P-O3P-PA	-2.18	125.35	132.83
3	B	1501	FMN	C9A-C5A-N5	-2.18	120.07	122.43
3	A	1501	FMN	C4A-C10-N1	-2.18	119.68	124.73
3	E	1501	FMN	C4A-C10-N1	-2.17	119.69	124.73
3	F	1501	FMN	C10-C4A-N5	-2.17	120.25	124.86
3	D	1501	FMN	C10-C4A-N5	-2.17	120.26	124.86
3	F	1501	FMN	C9A-C5A-N5	-2.16	120.08	122.43
3	B	1501	FMN	C10-C4A-N5	-2.16	120.27	124.86
3	C	1501	FMN	C4A-C10-N1	-2.16	119.72	124.73
3	E	1501	FMN	C9A-C5A-N5	-2.16	120.09	122.43
3	B	1501	FMN	C5A-C9A-N10	2.15	120.17	117.95
6	I	503	FAD	C5A-C6A-N6A	2.15	123.61	120.35
3	F	1501	FMN	C5A-C9A-N10	2.14	120.16	117.95
3	F	1501	FMN	C4A-C10-N1	-2.11	119.83	124.73
3	B	1501	FMN	C4A-C10-N1	-2.10	119.85	124.73
6	H	503	FAD	C5A-C6A-N6A	2.10	123.54	120.35
6	I	503	FAD	C4-N3-C2	-2.10	121.77	125.64
6	G	503	FAD	C4-N3-C2	-2.09	121.78	125.64
3	A	1501	FMN	C9A-C5A-N5	-2.08	120.17	122.43
6	G	503	FAD	C5A-C6A-N6A	2.08	123.52	120.35
3	D	1501	FMN	C9A-C5A-N5	-2.08	120.17	122.43
3	A	1501	FMN	C5A-C9A-N10	2.05	120.07	117.95
3	C	1501	FMN	C5A-C9A-N10	2.02	120.04	117.95
6	J	503	FAD	C4-N3-C2	-2.01	121.92	125.64
6	H	503	FAD	C4-N3-C2	-2.00	121.94	125.64

All (2) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
6	H	503	FAD	C4'
6	H	503	FAD	C3'

All (42) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	G	503	FAD	C2'-C1'-N10-C10
6	G	503	FAD	N10-C1'-C2'-O2'
6	G	503	FAD	N10-C1'-C2'-C3'
6	H	503	FAD	C2'-C1'-N10-C9A
6	H	503	FAD	C2'-C1'-N10-C10
6	H	503	FAD	C1'-C2'-C3'-O3'
6	H	503	FAD	C1'-C2'-C3'-C4'
6	H	503	FAD	O2'-C2'-C3'-C4'
6	I	503	FAD	C2'-C1'-N10-C10
6	I	503	FAD	C1'-C2'-C3'-C4'
6	I	503	FAD	O4'-C4'-C5'-O5'
6	I	503	FAD	C5'-O5'-P-O2P
6	I	503	FAD	C5'-O5'-P-O3P
6	J	503	FAD	C2'-C1'-N10-C10
6	J	503	FAD	N10-C1'-C2'-O2'
6	J	503	FAD	C3'-C4'-C5'-O5'
6	J	503	FAD	O4'-C4'-C5'-O5'
6	J	503	FAD	C5'-O5'-P-O3P
6	H	503	FAD	O2'-C2'-C3'-O3'
6	G	503	FAD	O4B-C4B-C5B-O5B
6	G	503	FAD	C3B-C4B-C5B-O5B
6	I	503	FAD	O2'-C2'-C3'-C4'
6	I	503	FAD	C3'-C4'-C5'-O5'
6	G	503	FAD	C2'-C1'-N10-C9A
6	I	503	FAD	C2'-C1'-N10-C9A
6	J	503	FAD	C2'-C1'-N10-C9A
6	I	503	FAD	O4B-C4B-C5B-O5B
6	H	503	FAD	PA-O3P-P-O5'
6	I	503	FAD	PA-O3P-P-O5'
6	J	503	FAD	C3B-C4B-C5B-O5B
6	J	503	FAD	C5'-O5'-P-O1P
6	I	503	FAD	C1'-C2'-C3'-O3'
3	B	1501	FMN	C5'-O5'-P-O1P
3	C	1501	FMN	C5'-O5'-P-O1P
3	E	1501	FMN	C5'-O5'-P-O1P
3	F	1501	FMN	C5'-O5'-P-O1P

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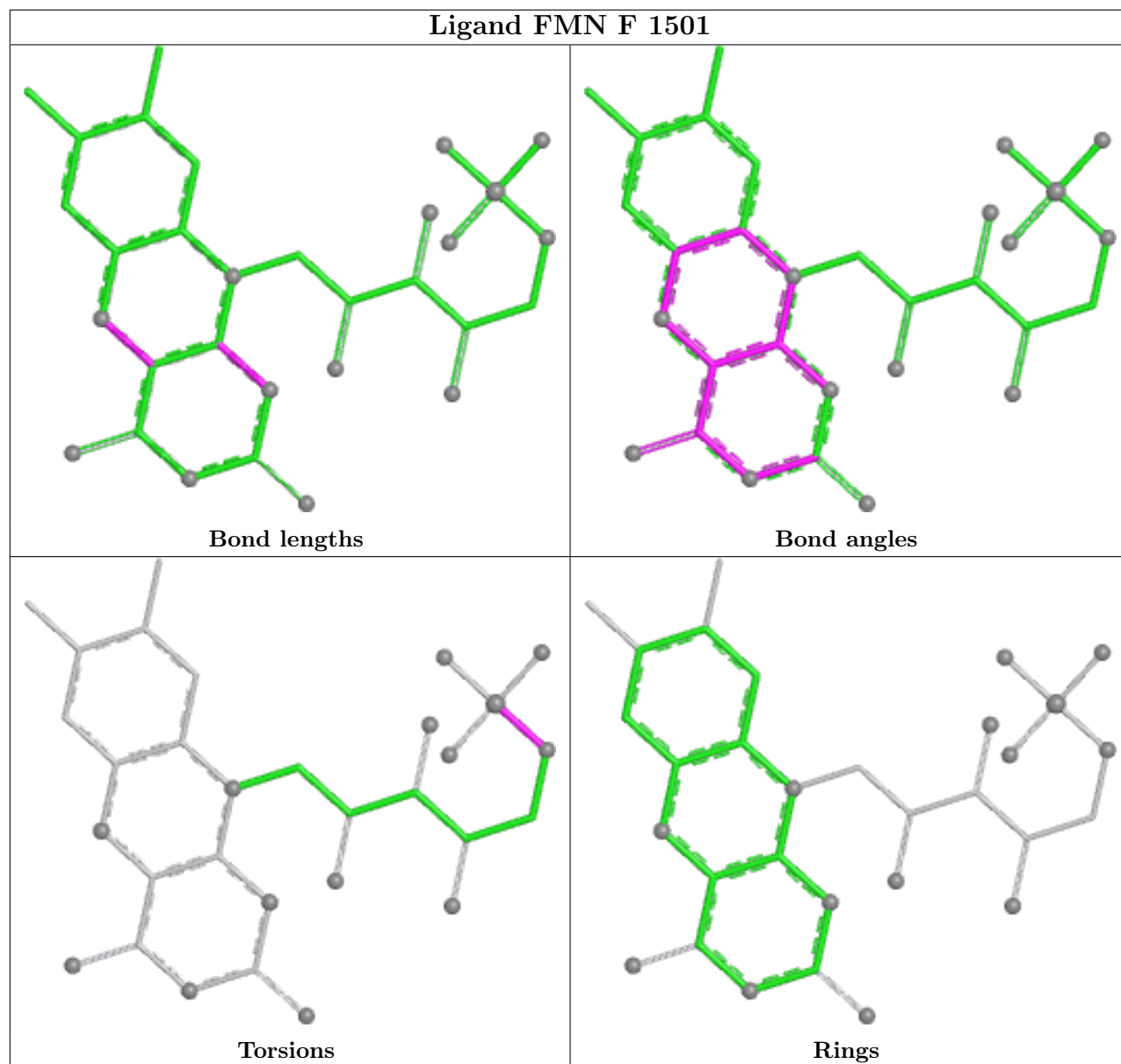
Mol	Chain	Res	Type	Atoms
6	G	503	FAD	C5B-O5B-PA-O3P
6	H	503	FAD	C5'-O5'-P-O3P
6	J	503	FAD	C5B-O5B-PA-O3P
6	I	503	FAD	O2'-C2'-C3'-O3'
6	H	503	FAD	O4B-C4B-C5B-O5B
6	J	503	FAD	N10-C1'-C2'-C3'

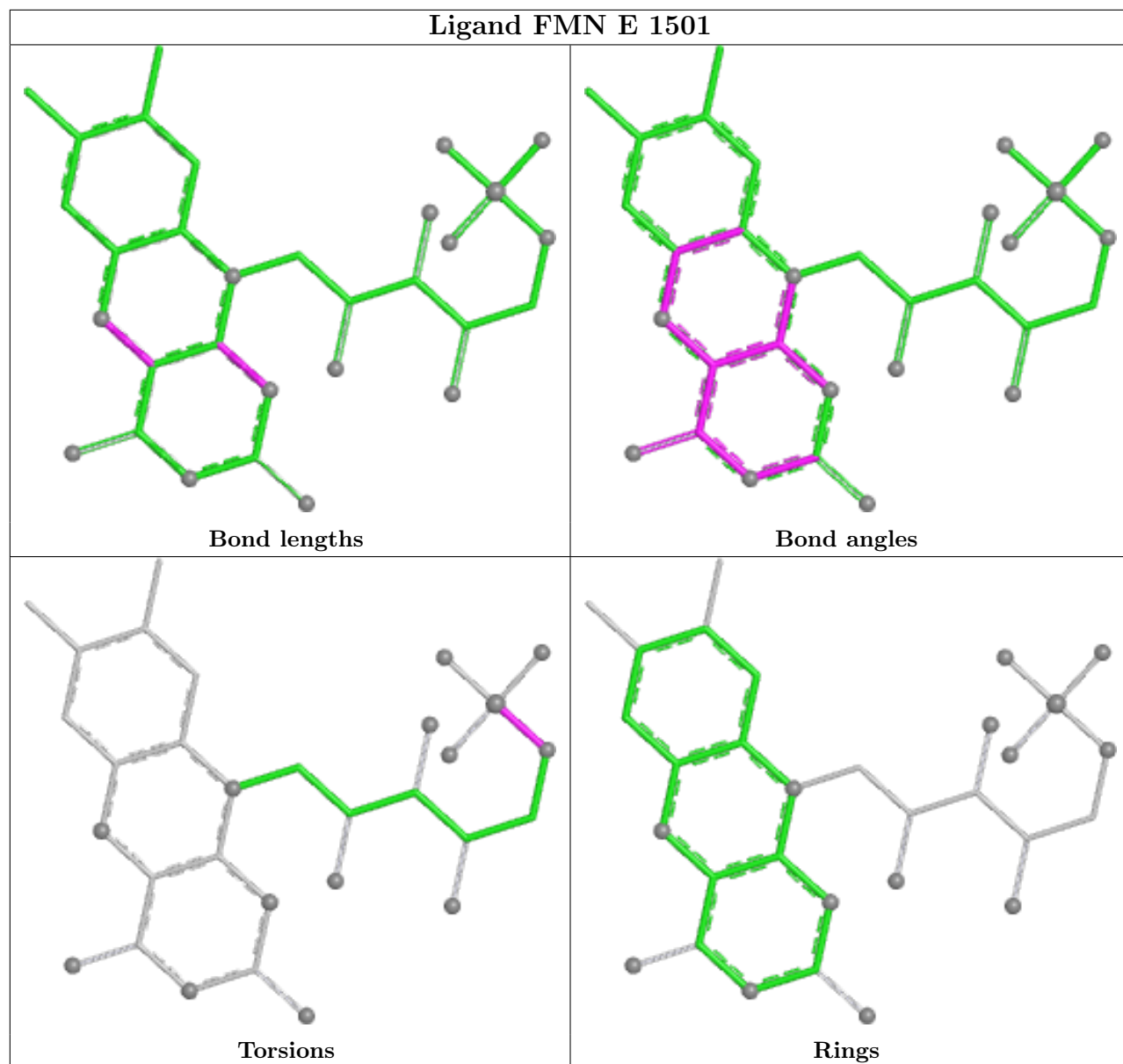
There are no ring outliers.

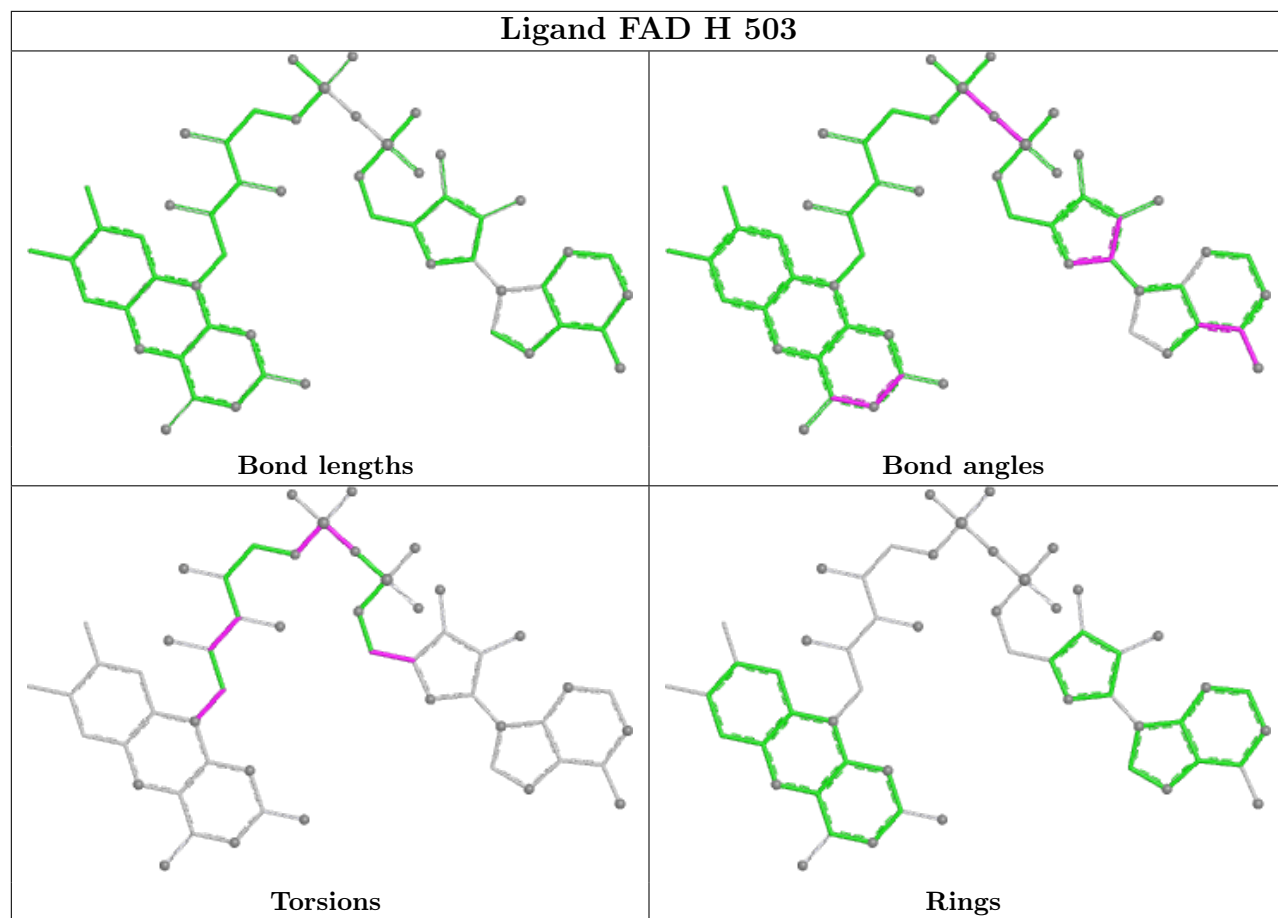
7 monomers are involved in 39 short contacts:

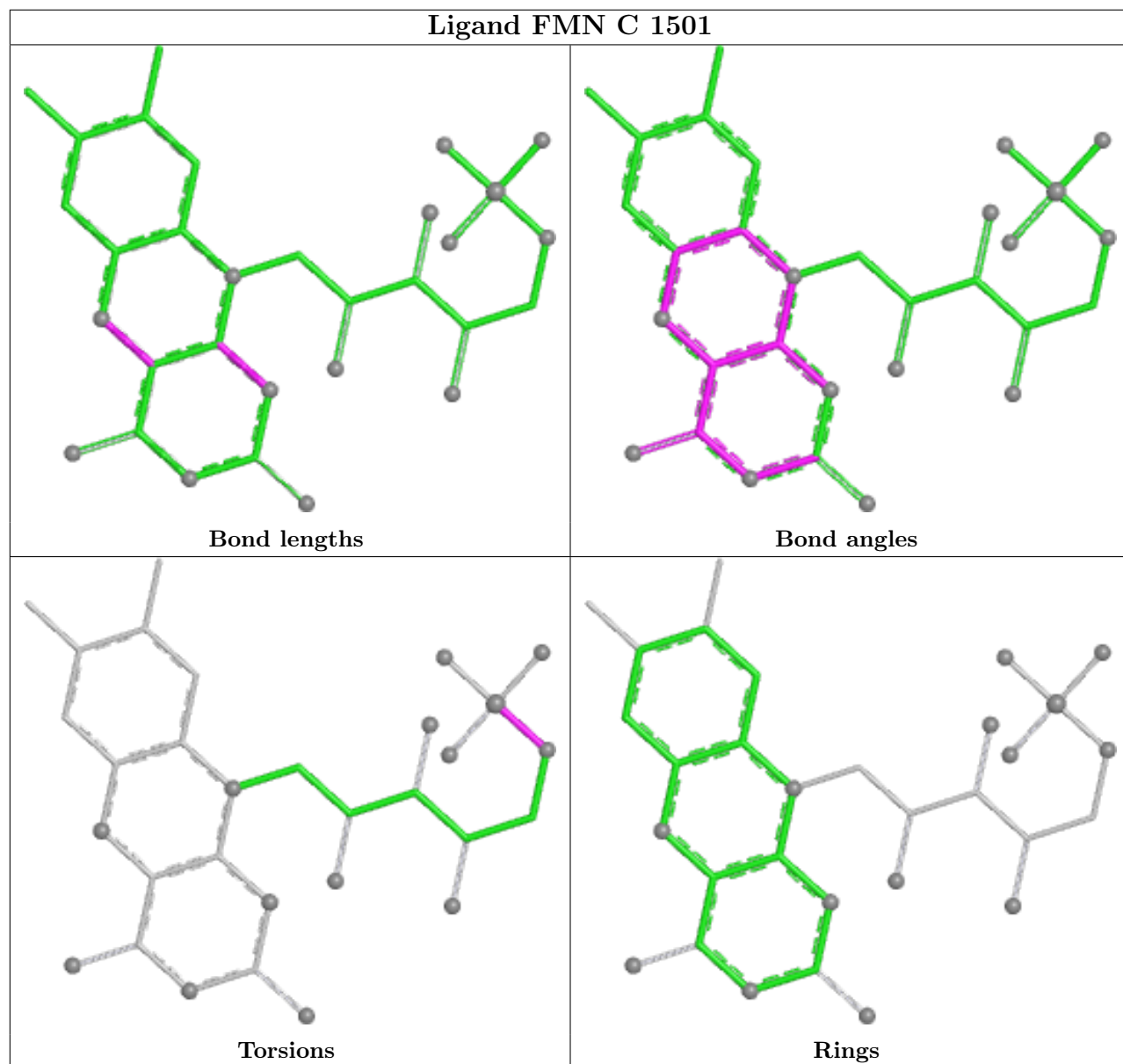
Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	H	503	FAD	10	0
4	F	1502	F3S	1	0
3	C	1501	FMN	1	0
4	B	1502	F3S	1	0
6	I	503	FAD	6	0
6	G	503	FAD	7	0
6	J	503	FAD	13	0

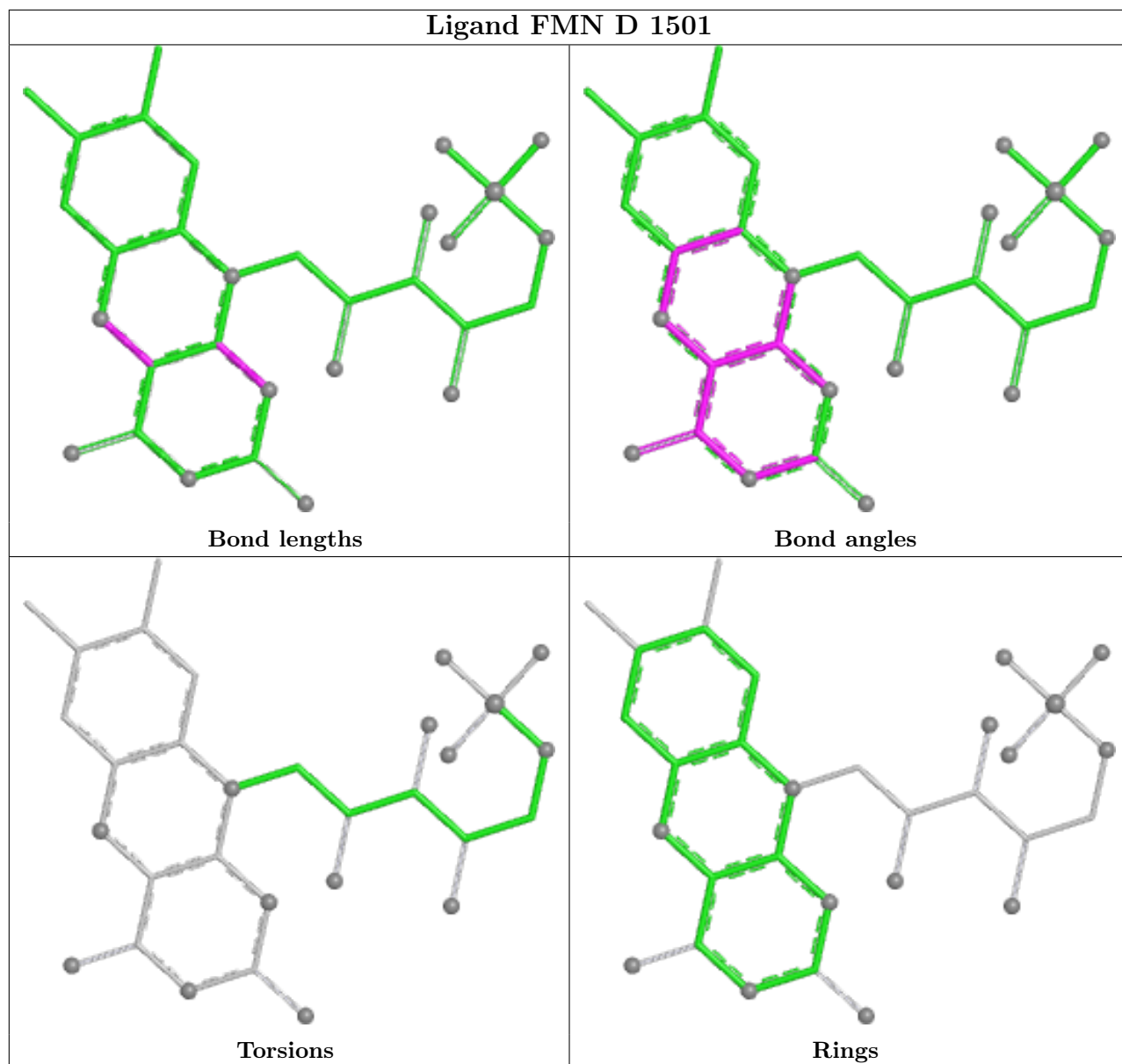
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 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.

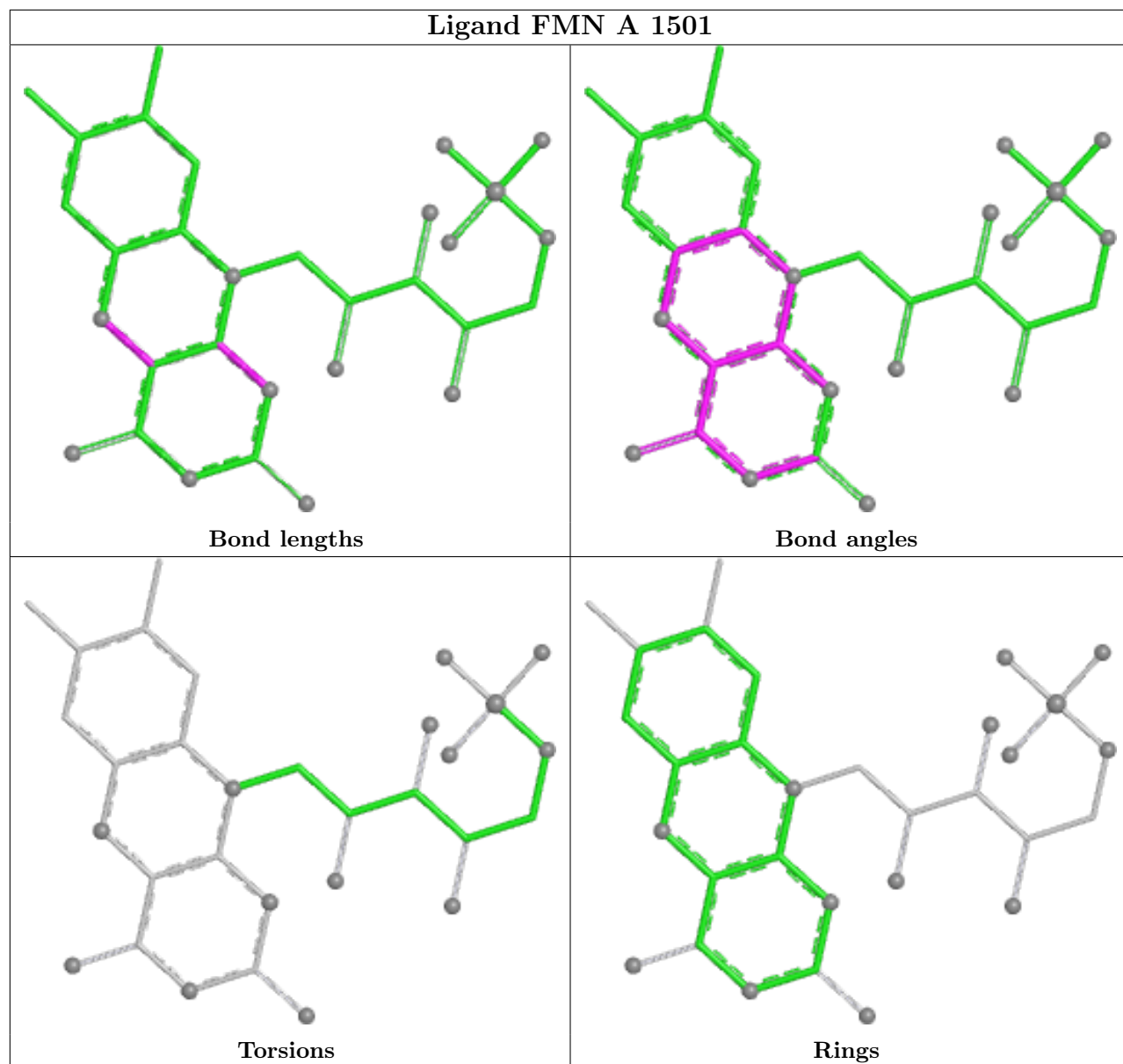


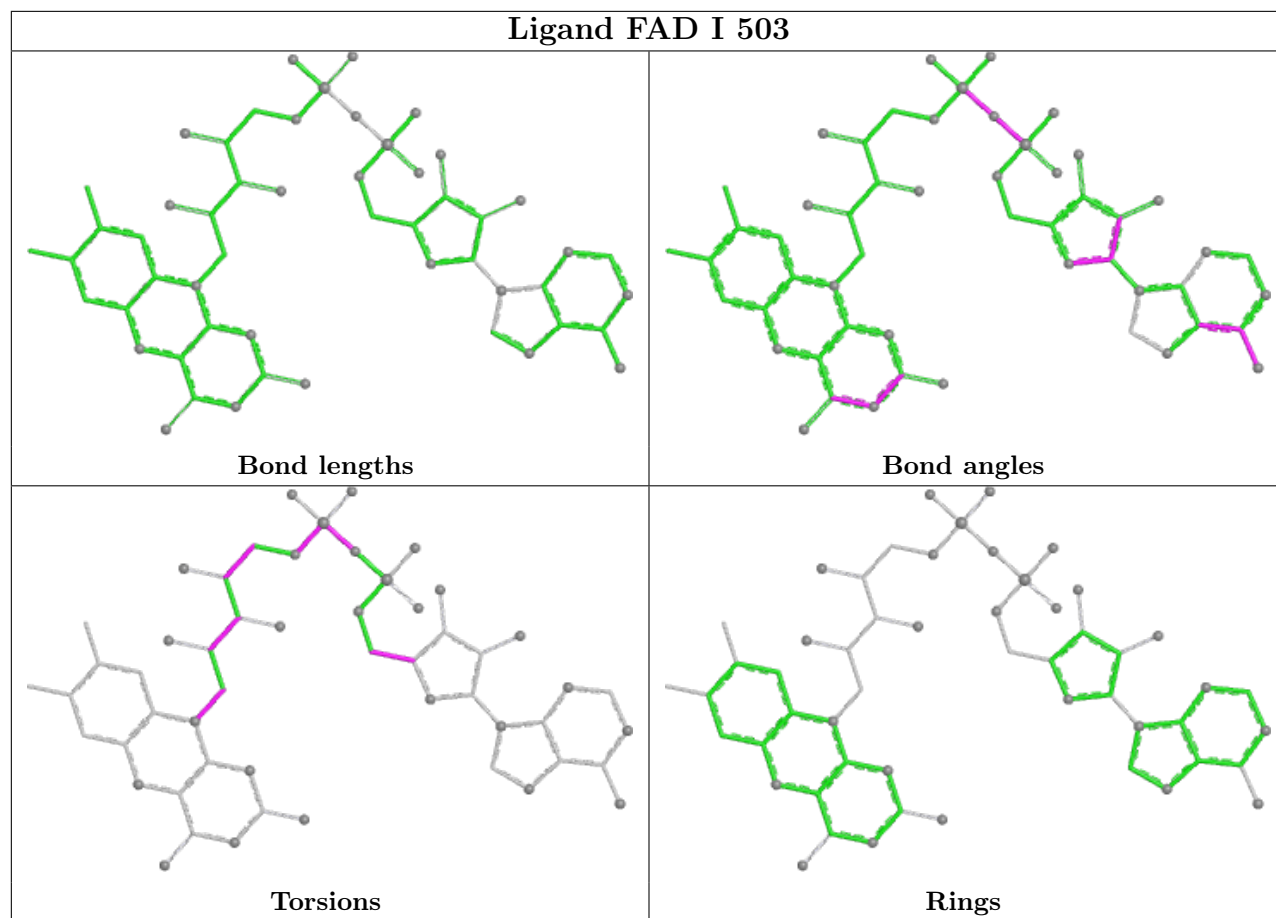


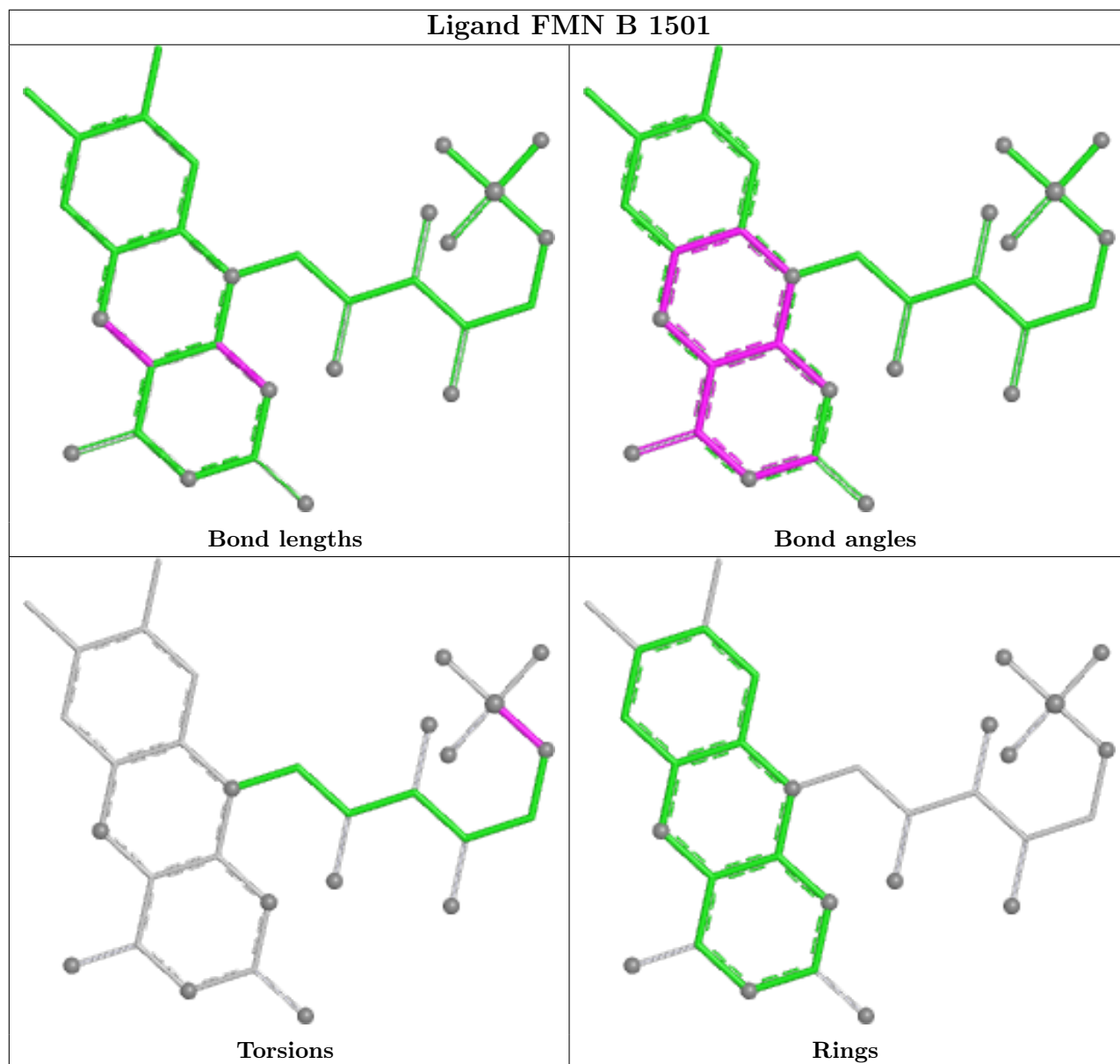


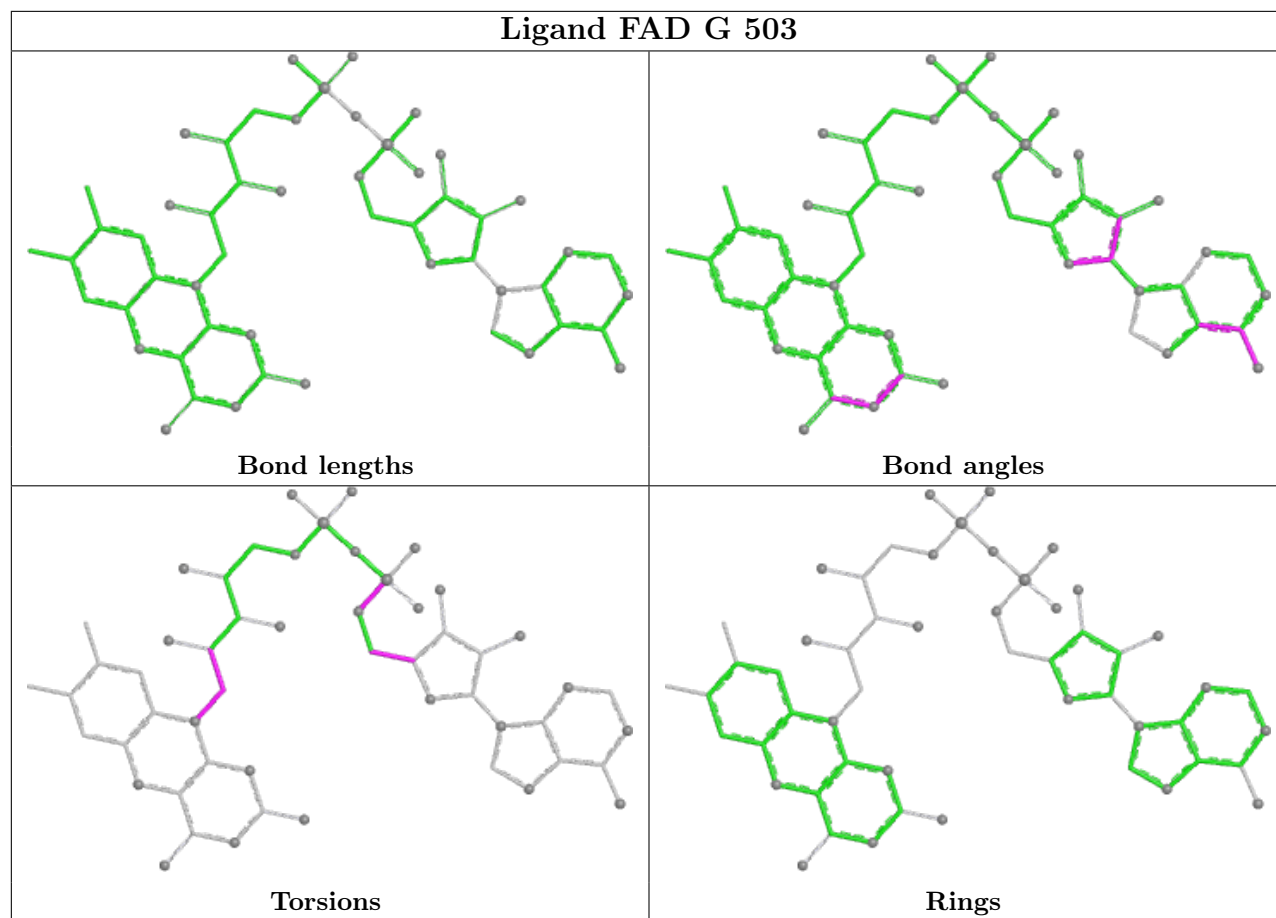


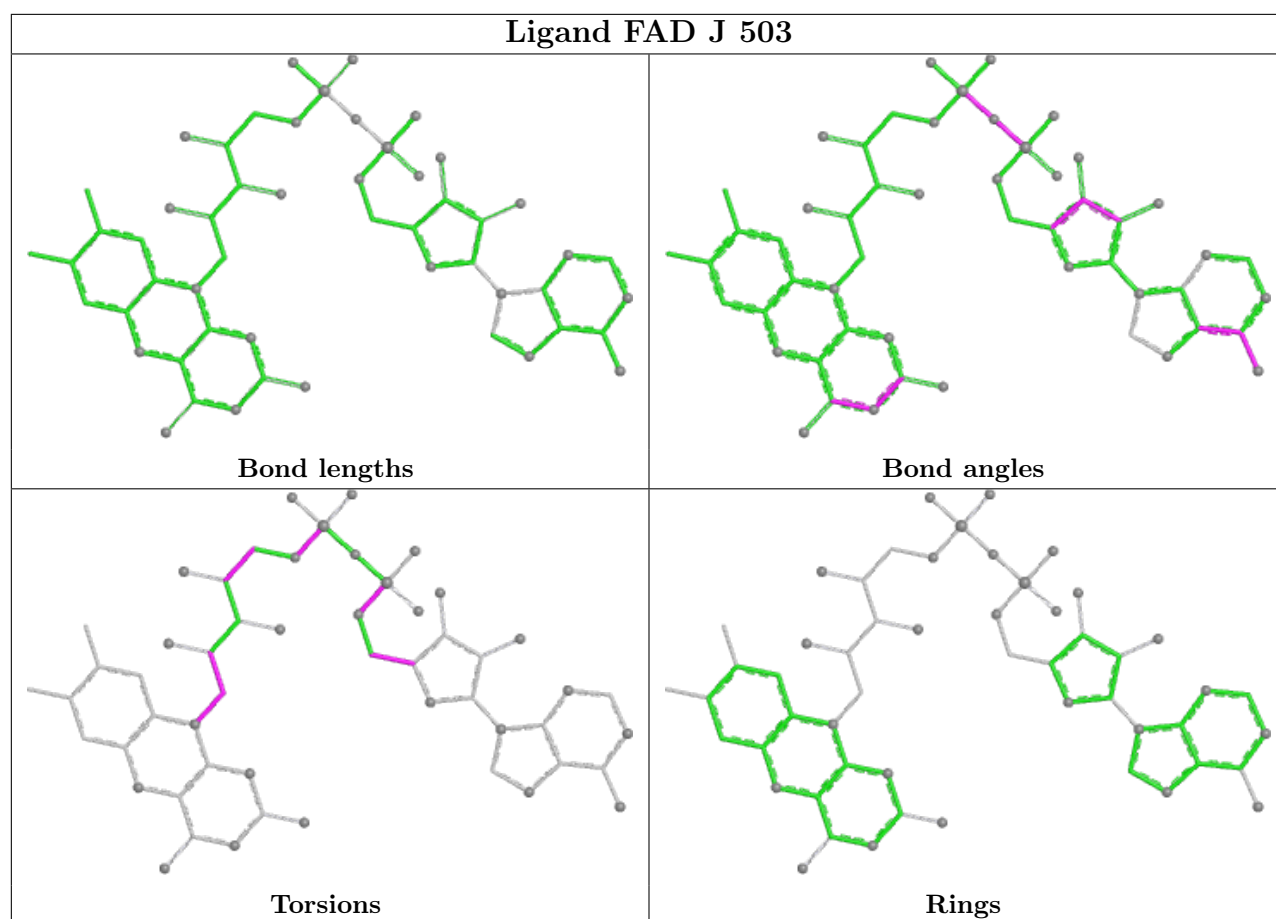












5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

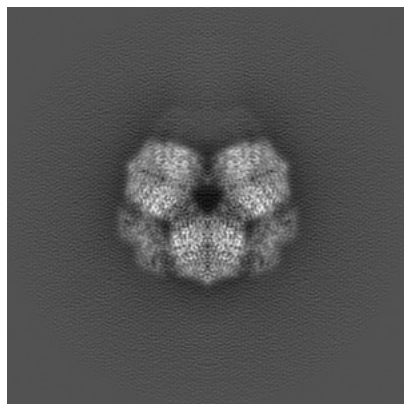
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-10106. These allow visual inspection of the internal detail of the map and identification of artifacts.

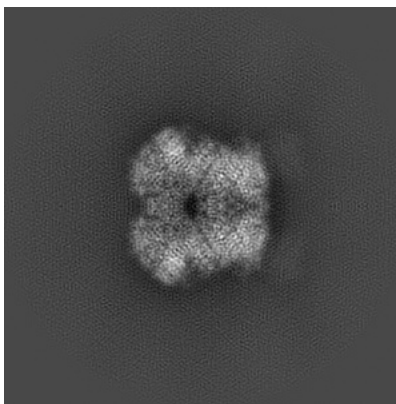
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

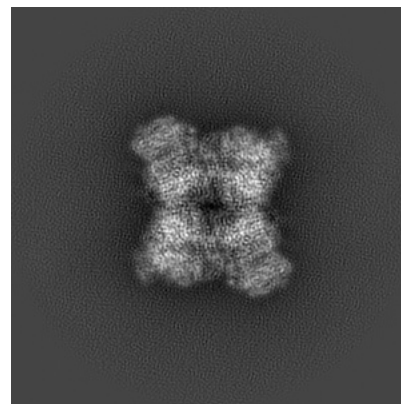
6.1.1 Primary map



X

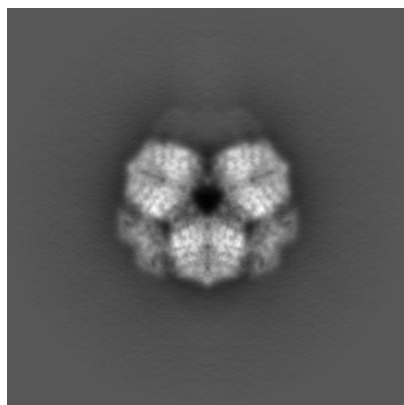


Y

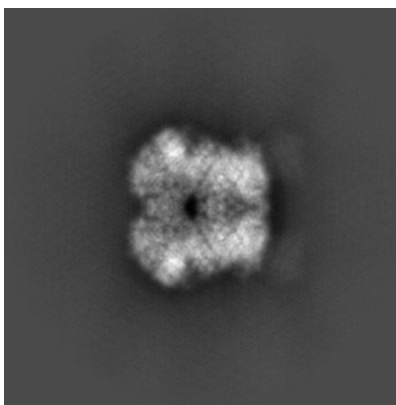


Z

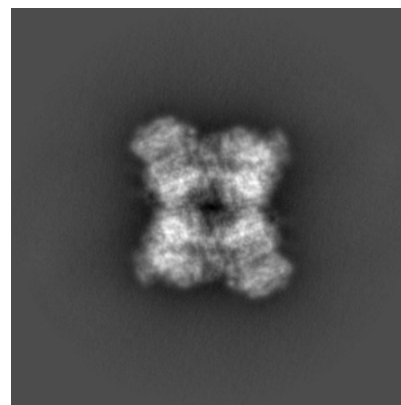
6.1.2 Raw map



X



Y

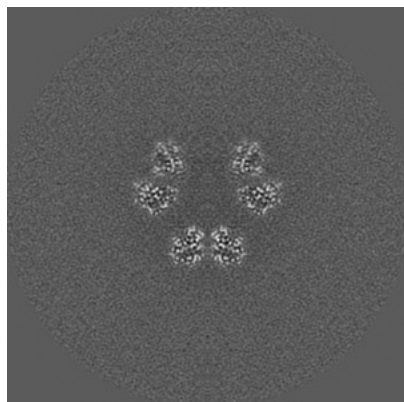


Z

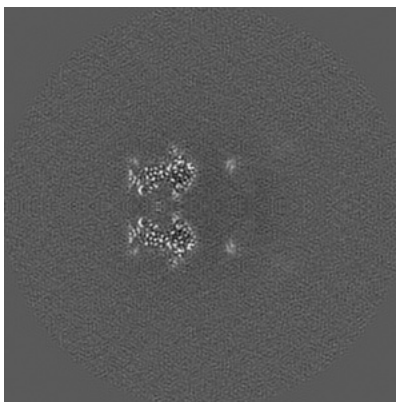
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

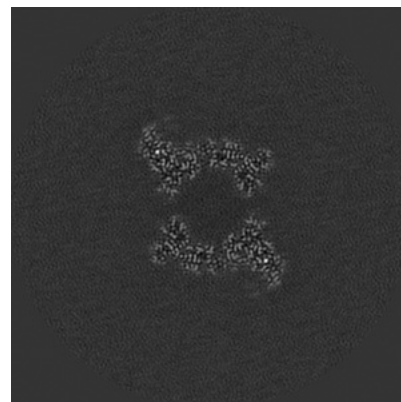
6.2.1 Primary map



X Index: 154

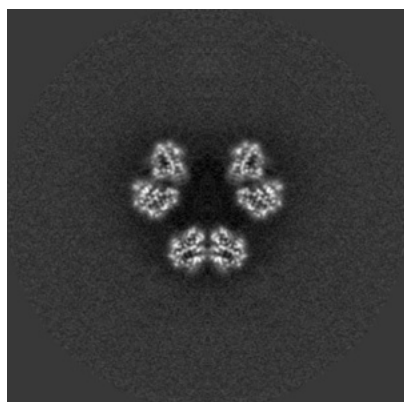


Y Index: 154

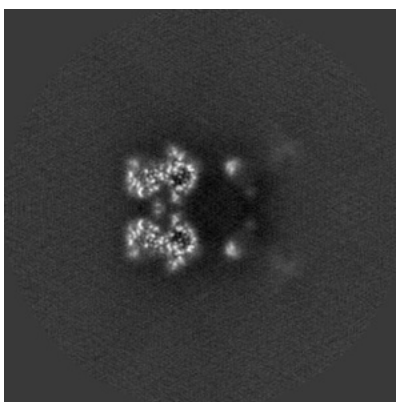


Z Index: 154

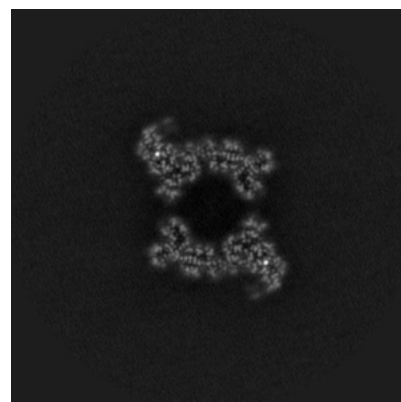
6.2.2 Raw map



X Index: 154



Y Index: 154

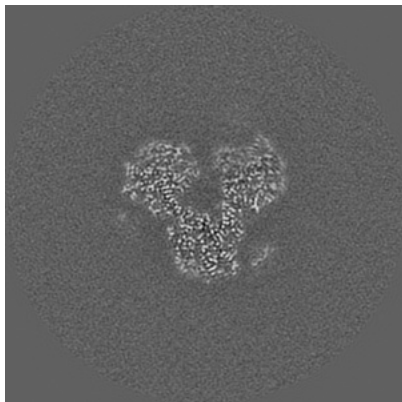


Z Index: 154

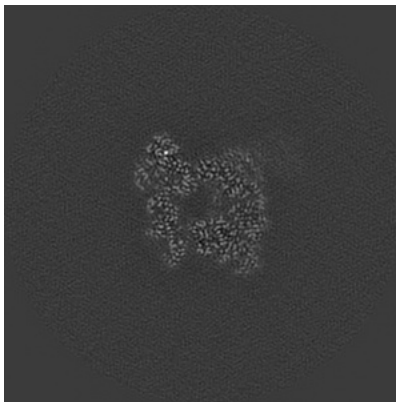
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

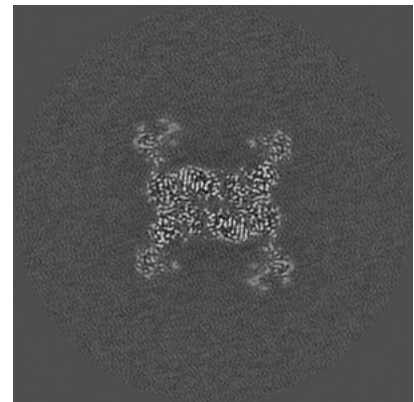
6.3.1 Primary map



X Index: 177

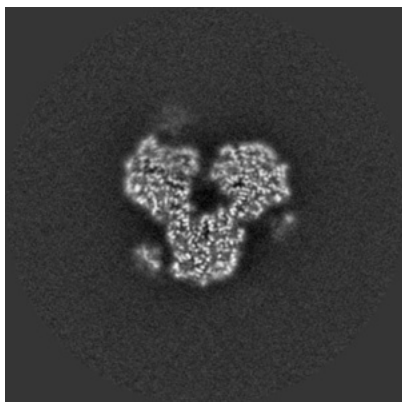


Y Index: 177

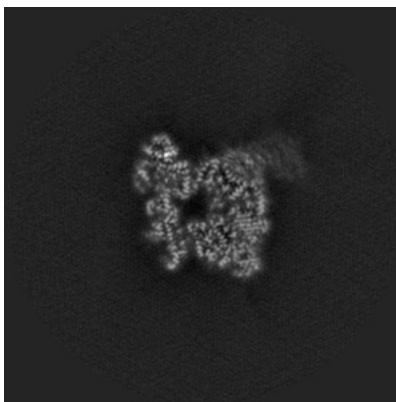


Z Index: 128

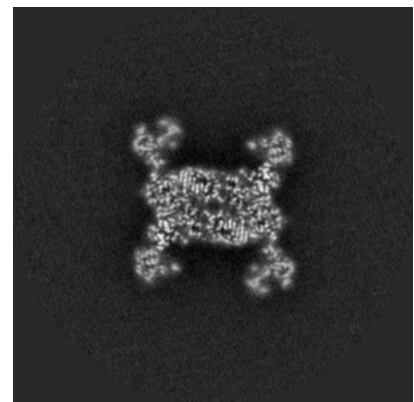
6.3.2 Raw map



X Index: 131



Y Index: 178

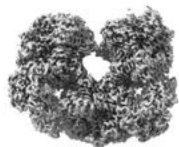


Z Index: 128

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

6.4 Orthogonal surface views [i](#)

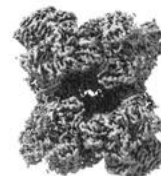
6.4.1 Primary map



X



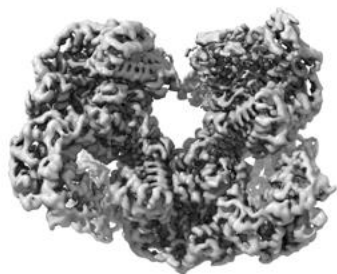
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.09. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

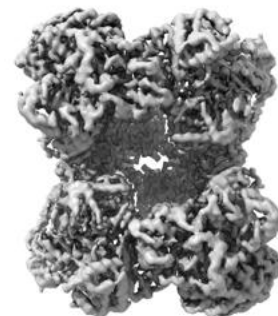
6.4.2 Raw map



X



Y



Z

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

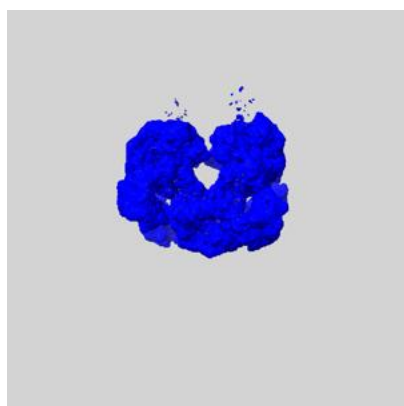
6.5 Mask visualisation [i](#)

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

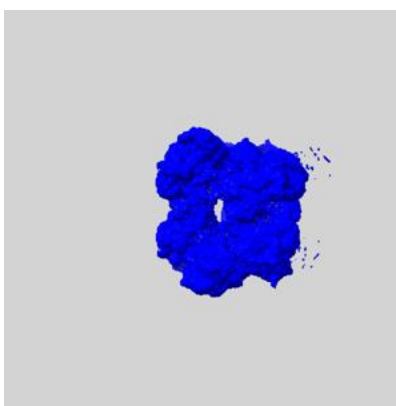
A mask typically either:

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

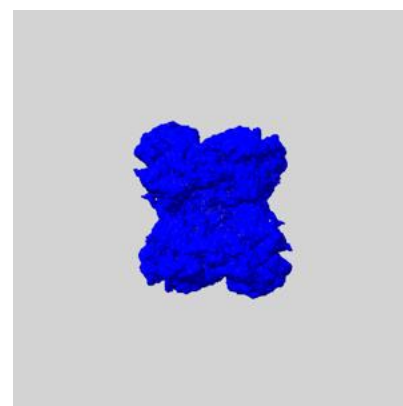
6.5.1 emd_10106_msk_1.map [i](#)



X



Y

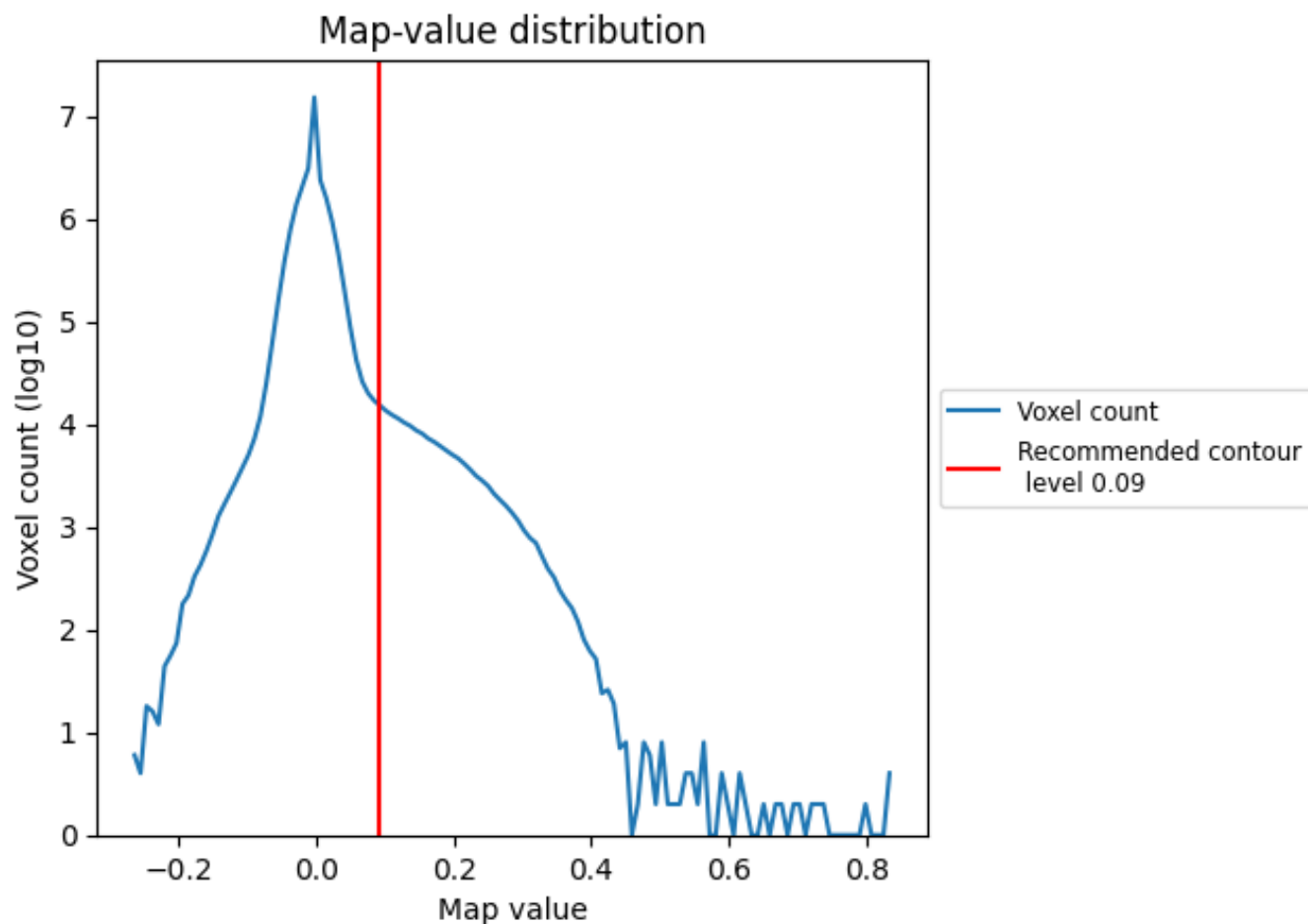


Z

7 Map analysis [i](#)

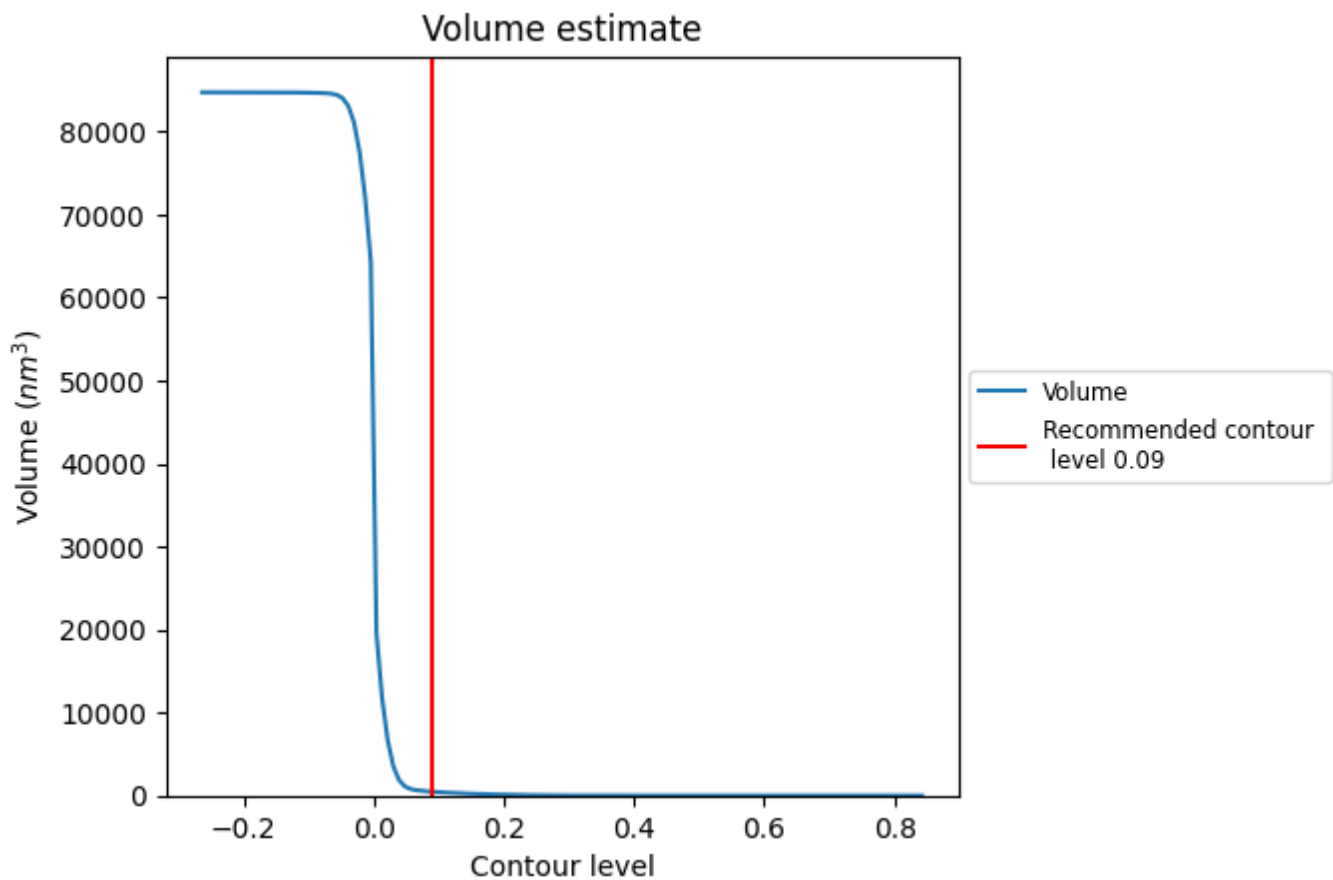
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

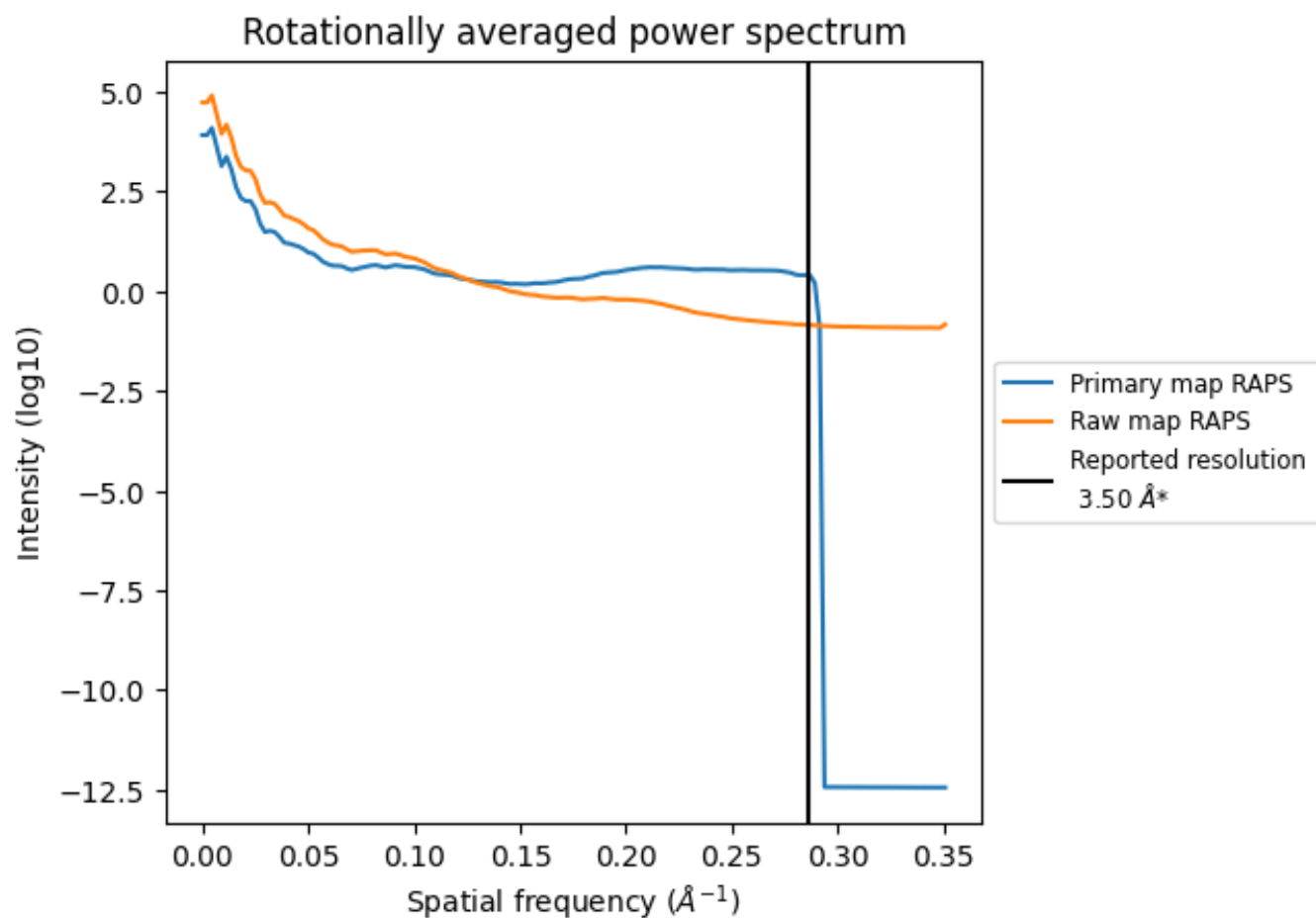
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 463 nm³; this corresponds to an approximate mass of 418 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](#)

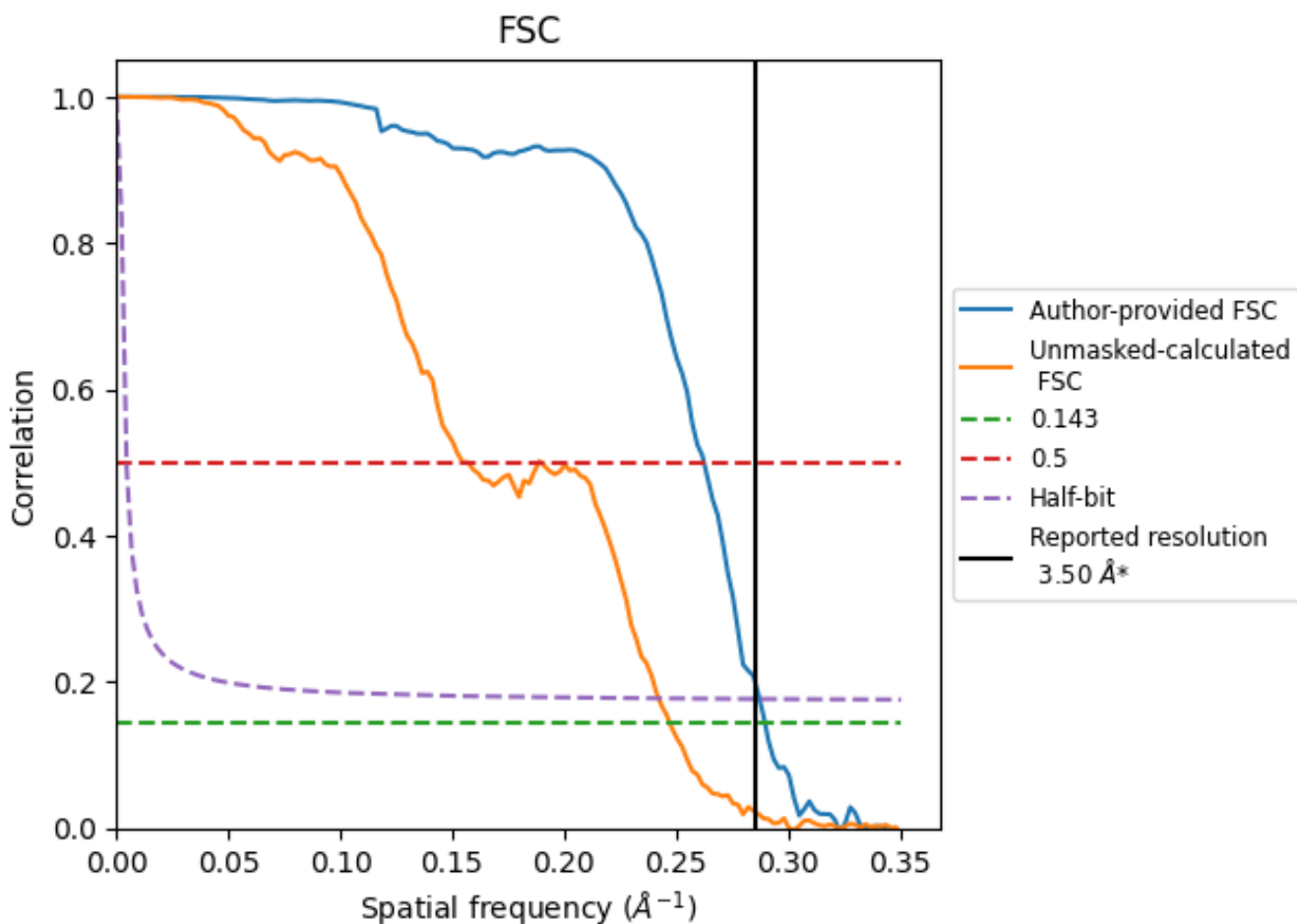


*Reported resolution corresponds to spatial frequency of 0.286 Å⁻¹

8 Fourier-Shell correlation [i](#)

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

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.286 Å⁻¹

8.2 Resolution estimates [i](#)

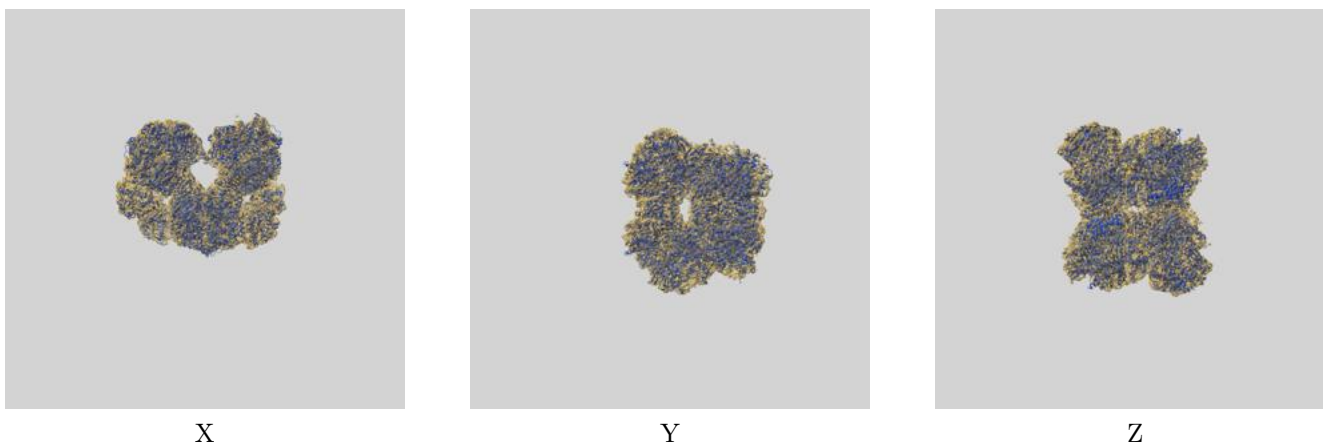
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.50	-	-
Author-provided FSC curve	3.45	3.81	3.48
Unmasked-calculated*	4.04	6.41	4.13

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.04 differs from the reported value 3.5 by more than 10 %

9 Map-model fit [i](#)

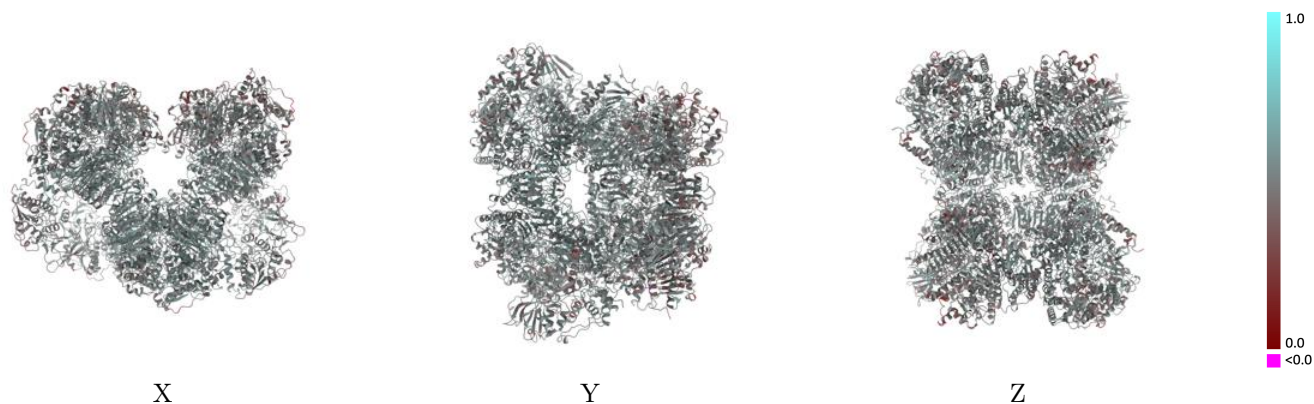
This section contains information regarding the fit between EMDB map EMD-10106 and PDB model 6S6U. Per-residue inclusion information can be found in section 3 on page 9.

9.1 Map-model overlay [i](#)



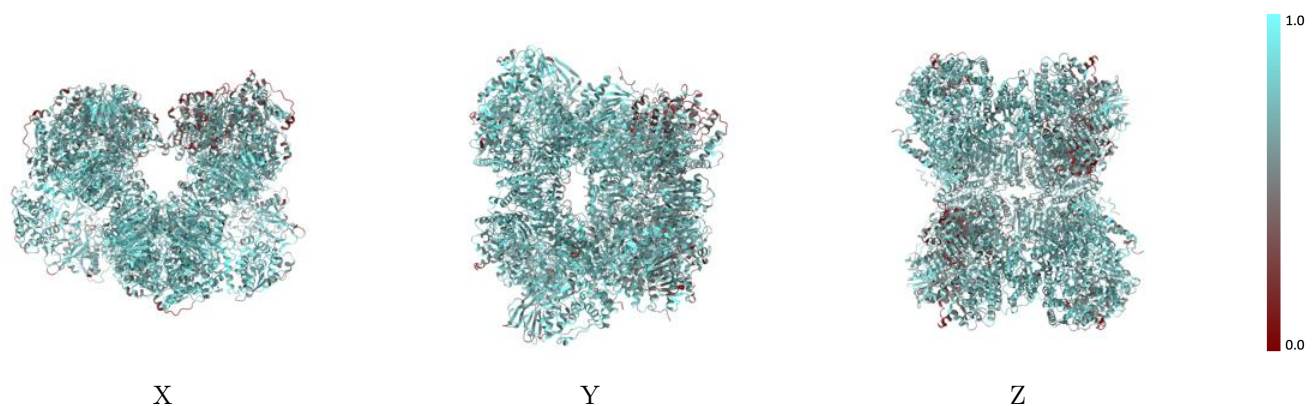
The images above show the 3D surface view of the map at the recommended contour level 0.09 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



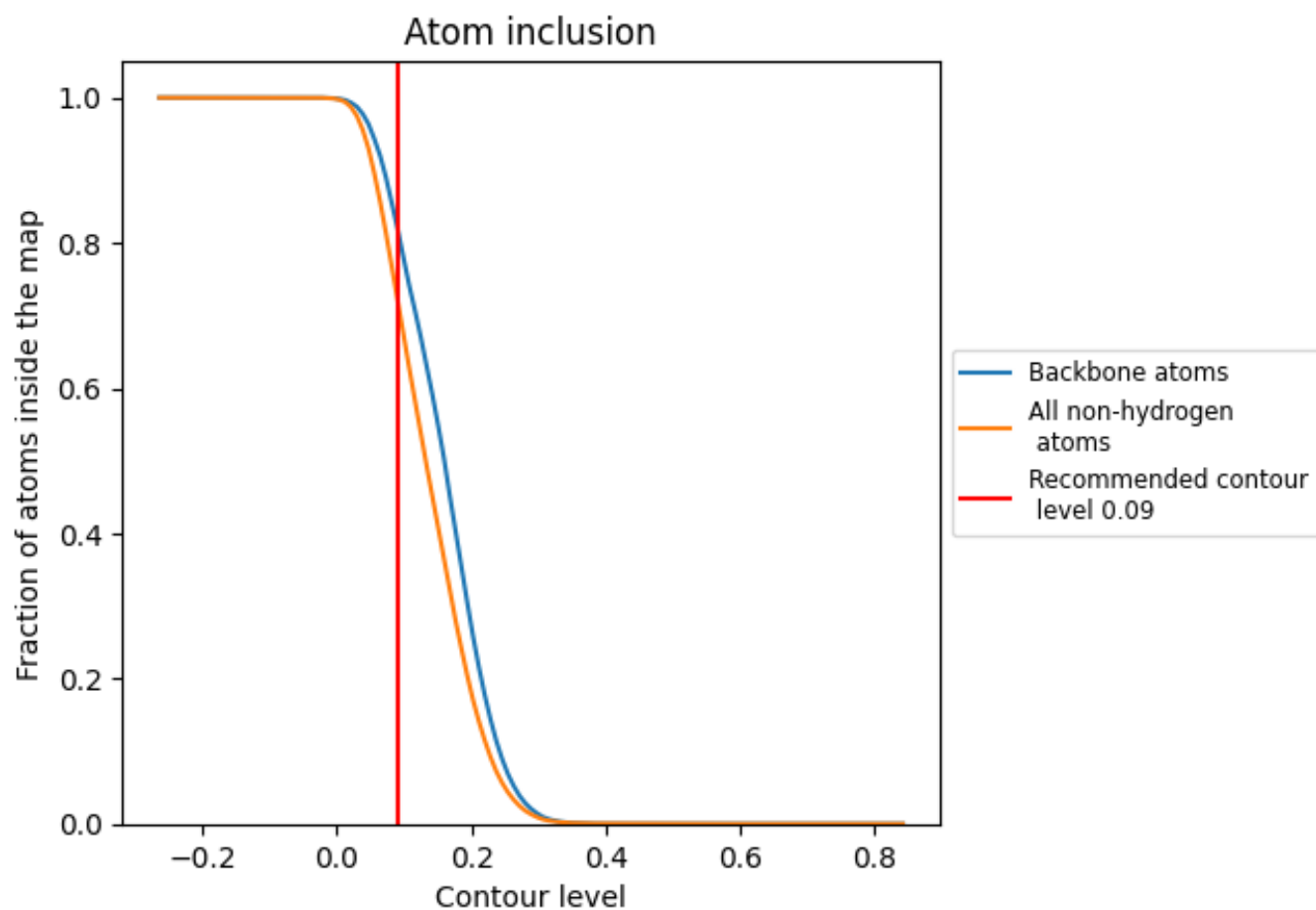
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

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



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.09).























9.4 Atom inclusion [i](#)



At the recommended contour level, 82% of all backbone atoms, 72% 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 (0.09) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7236	 0.5010
A	 0.7889	 0.5260
B	 0.6580	 0.4870
C	 0.7251	 0.4970
D	 0.7892	 0.5260
E	 0.7220	 0.4990
F	 0.6570	 0.4880
G	 0.7402	 0.4900
H	 0.7031	 0.4830
I	 0.7471	 0.4920
J	 0.7070	 0.4820

