



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 04:23 PM UTC

PDB ID : 4DJF / pdb_00004djf
Title : Crystal structure of folate-bound corrinoid iron-sulfur protein (CFeSP) in complex with its methyltransferase (MeTr), co-crystallized with folate and Ti(III) citrate reductant
Authors : Kung, Y.; Drennan, C.L.
Deposited on : 2012-02-01
Resolution : 3.03 Å(reported)

This is a Full wwPDB X-ray Structure 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/XrayValidationReportHelp>

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:

MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

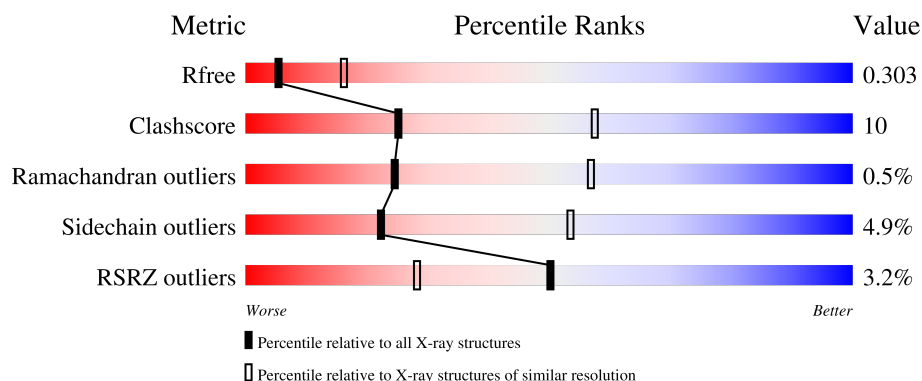
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.03 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)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	3685 (3.08-3.00)
Clashscore	190562	4007 (3.08-3.00)
Ramachandran outliers	187476	3834 (3.08-3.00)
Sidechain outliers	187428	3836 (3.08-3.00)
RSRZ outliers	180081	3684 (3.08-3.00)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower 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 electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	262	 85% 14% .
1	B	262	 3% 83% 16%
2	C	446	 5% 69% 25% 5% .
2	E	446	 7% 77% 20% ..

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Mol	Chain	Length	Quality of chain
3	D	323	 84% 14% •
3	F	323	%  87% 11% •

2 Entry composition

There are 8 unique types of molecules in this entry. The entry contains 15397 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, 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 5-methyltetrahydrofolate corrinoid/iron sulfur protein methyltransferase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	262	Total	C	N	O	S	0	0	0
			1997	1252	344	384	17			
1	B	262	Total	C	N	O	S	0	0	0
			1997	1252	344	384	17			

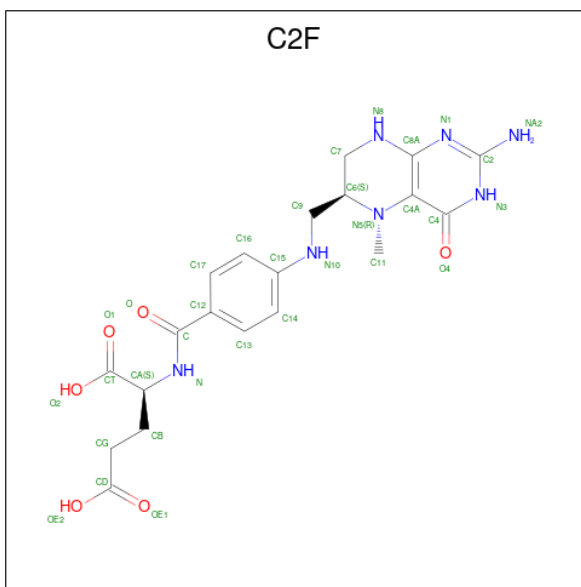
- Molecule 2 is a protein called Corrinoid/iron-sulfur protein large subunit.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	C	441	Total	C	N	O	S	0	0	0
			3147	1985	543	609	10			
2	E	441	Total	C	N	O	S	0	0	0
			3053	1921	538	585	9			

- Molecule 3 is a protein called Corrinoid/iron-sulfur protein small subunit.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	D	323	Total	C	N	O	S	0	0	0
			2461	1553	426	467	15			
3	F	323	Total	C	N	O	S	0	0	0
			2461	1553	426	467	15			

- Molecule 4 is 5-METHYL-5,6,7,8-TETRAHYDROFOLIC ACID (CCD ID: C2F) (formula: C₂₀H₂₅N₇O₆).

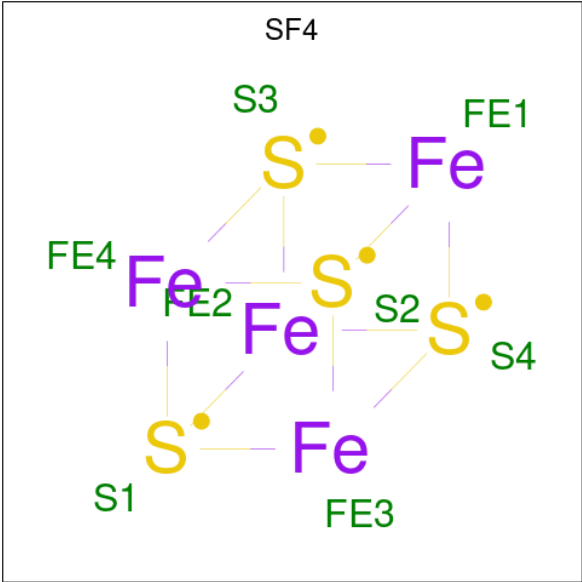


Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	1	Total	C	N	O	0	0
			32	19	7	6		
4	B	1	Total	C	N	O	0	0
			32	19	7	6		

- Molecule 5 is CALCIUM ION (CCD ID: CA) (formula: Ca).

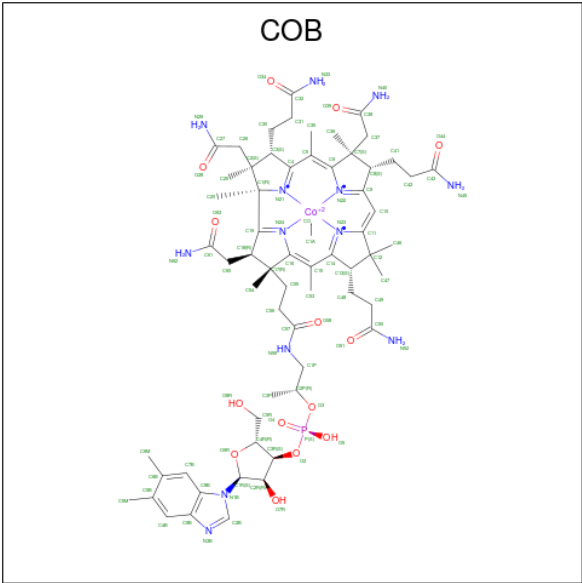
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	1	Total	Ca	0	0
			1	1		
5	B	1	Total	Ca	0	0
			1	1		

- Molecule 6 is IRON/SULFUR CLUSTER (CCD ID: SF4) (formula: Fe₄S₄).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	C	1	Total	Fe	S	0	0
			8	4	4		
6	E	1	Total	Fe	S	0	0
			8	4	4		

- Molecule 7 is CO-METHYLCOBALAMIN (CCD ID: COB) (formula: C₆₃H₉₁CoN₁₃O₁₄P).



Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
7	C	1	Total	C	Co	N	O	P	0	0
			92	63	1	13	14	1		
7	E	1	Total	C	Co	N	O	P	0	0
			92	63	1	13	14	1		

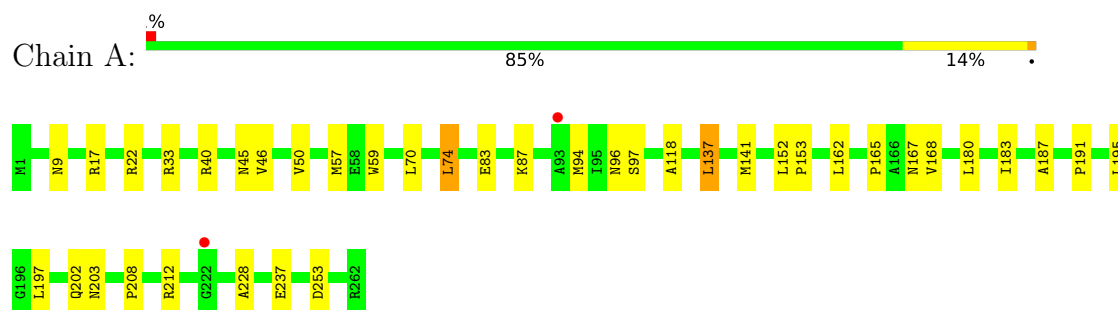
- Molecule 8 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	A	6	Total 6	O 6	0	0
8	B	4	Total 4	O 4	0	0
8	C	1	Total 1	O 1	0	0
8	D	1	Total 1	O 1	0	0
8	E	1	Total 1	O 1	0	0
8	F	2	Total 2	O 2	0	0

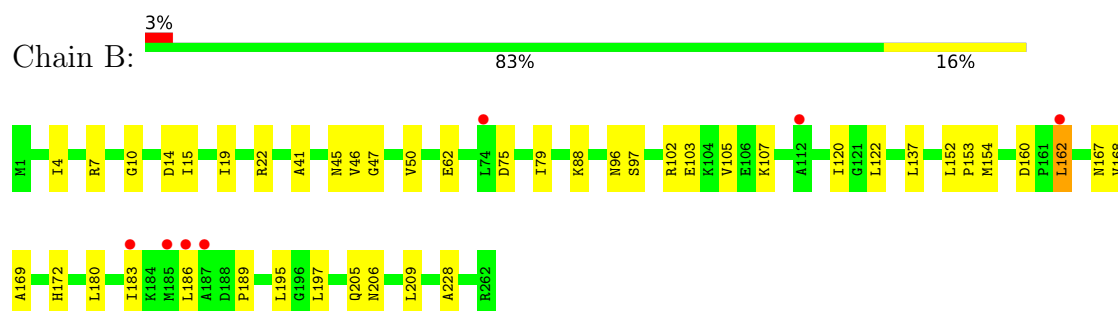
3 Residue-property plots [i](#)

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 electron 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 dot above a residue indicates a poor fit to the electron density ($RSRZ > 2$). 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.

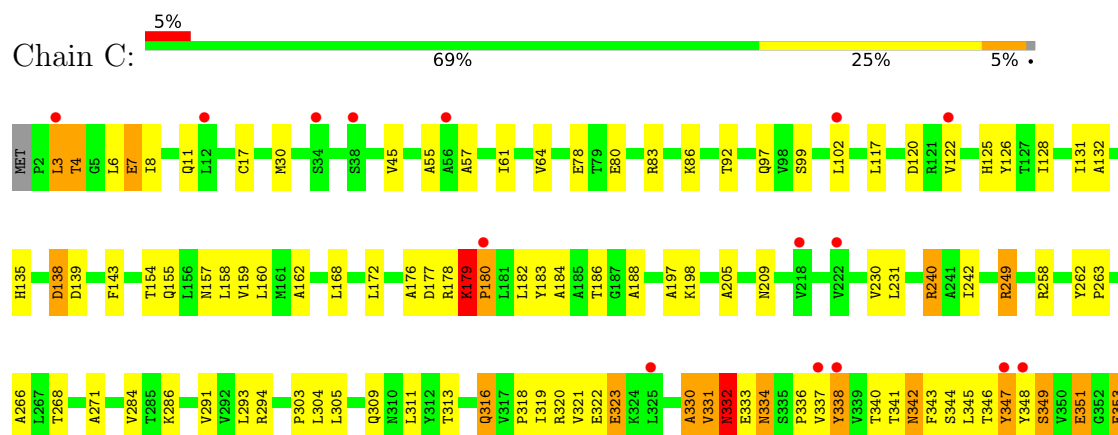
- Molecule 1: 5-methyltetrahydrofolate corrinoid/iron sulfur protein methyltransferase

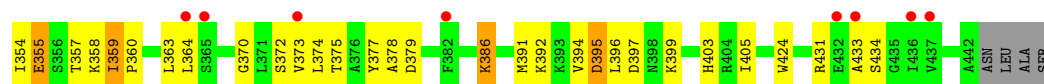


- Molecule 1: 5-methyltetrahydrofolate corrinoid/iron sulfur protein methyltransferase

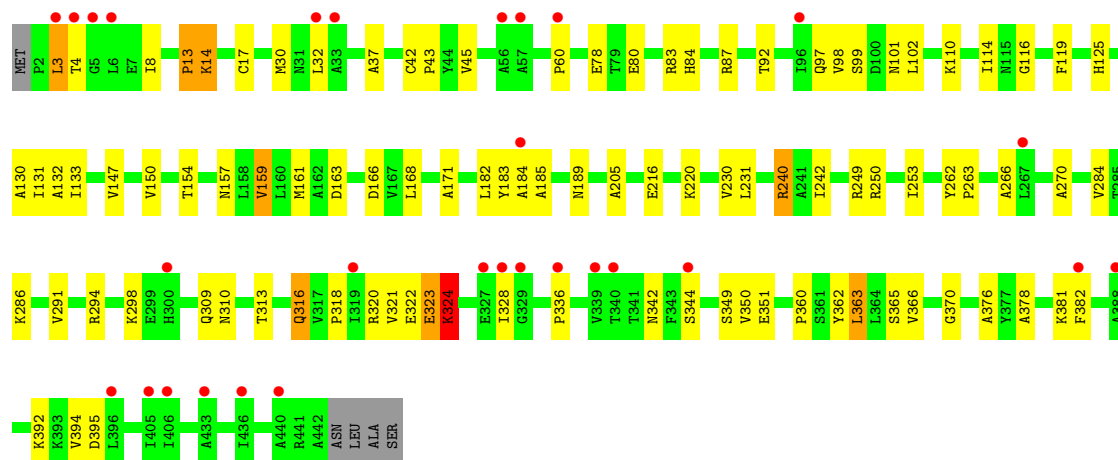
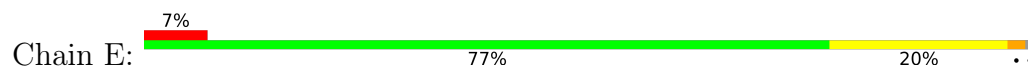


- Molecule 2: Corrinoid/iron-sulfur protein large subunit

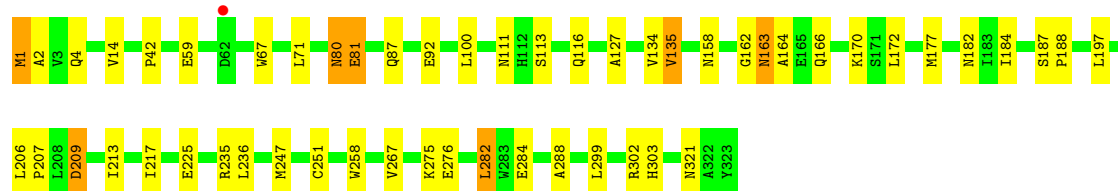
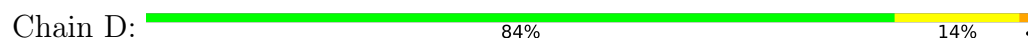




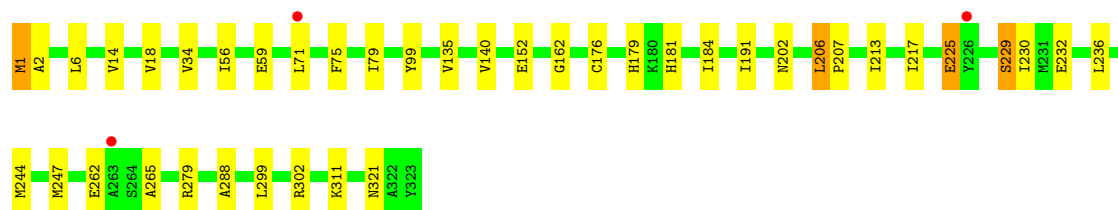
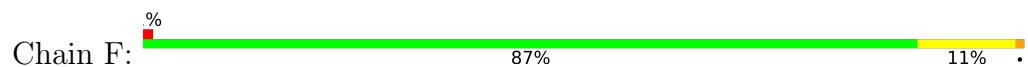
• Molecule 2: Corrinoid/iron-sulfur protein large subunit



• Molecule 3: Corrinoid/iron-sulfur protein small subunit



• Molecule 3: Corrinoid/iron-sulfur protein small subunit



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α , β , γ	136.01Å 250.69Å 81.80Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	49.75 – 3.03 49.75 – 3.03	Depositor EDS
% Data completeness (in resolution range)	99.2 (49.75-3.03) 99.2 (49.75-3.03)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.01 (at 3.01Å)	Xtriage
Refinement program	PHENIX (phenix.refine: 1.7.2_869)	Depositor
R, R_{free}	0.269 , 0.308 0.265 , 0.303	Depositor DCC
R_{free} test set	2792 reflections (5.07%)	wwPDB-VP
Wilson B-factor (Å ²)	84.5	Xtriage
Anisotropy	0.695	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.30 , 78.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.92	EDS
Total number of atoms	15397	wwPDB-VP
Average B, all atoms (Å ²)	110.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.89% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: C2F, SF4, COB, CA

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	0.29	0/2023	0.70	0/2738
1	B	0.28	0/2023	0.72	0/2738
2	C	0.39	0/3204	0.85	5/4380 (0.1%)
2	E	0.46	0/3104	0.87	5/4248 (0.1%)
3	D	0.27	0/2507	0.73	2/3408 (0.1%)
3	F	0.27	0/2507	0.73	2/3408 (0.1%)
All	All	0.35	0/15368	0.78	14/20920 (0.1%)

There are no bond length outliers.

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	355	GLU	N-CA-C	-7.09	103.55	111.28
2	E	349	SER	N-CA-C	-5.86	104.80	111.07
2	C	349	SER	N-CA-C	-5.75	104.92	111.07
2	E	376	ALA	N-CA-C	-5.75	105.02	111.28
2	C	330	ALA	N-CA-C	5.29	117.12	111.36
2	C	179	LYS	CA-C-N	5.26	126.42	119.84
2	C	179	LYS	C-N-CA	5.26	126.42	119.84
3	D	303	HIS	CA-C-N	5.26	124.44	118.97
3	D	303	HIS	C-N-CA	5.26	124.44	118.97
3	F	206	LEU	CA-C-N	5.17	125.16	119.89
3	F	206	LEU	C-N-CA	5.17	125.16	119.89
2	E	336	PRO	N-CA-C	5.13	119.10	111.41
2	E	392	LYS	CA-C-N	5.12	127.10	120.44
2	E	392	LYS	C-N-CA	5.12	127.10	120.44

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1997	0	2039	20	0
1	B	1997	0	2039	25	0
2	C	3147	0	2930	118	0
2	E	3053	0	2789	66	0
3	D	2461	0	2461	27	0
3	F	2461	0	2461	23	0
4	A	32	0	20	1	0
4	B	32	0	20	1	0
5	A	1	0	0	0	0
5	B	1	0	0	0	0
6	C	8	0	0	0	0
6	E	8	0	0	1	0
7	C	92	0	87	18	0
7	E	92	0	87	14	0
8	A	6	0	0	0	0
8	B	4	0	0	0	0
8	C	1	0	0	0	0
8	D	1	0	0	0	0
8	E	1	0	0	0	0
8	F	2	0	0	0	0
All	All	15397	0	14933	294	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 10.

All (294) 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)
2:C:386:LYS:O	2:C:386:LYS:HD3	1.39	1.19
2:C:353:GLU:OE1	2:C:353:GLU:HA	1.43	1.10
2:C:336:PRO:HB2	2:C:338:TYR:HE1	1.15	1.08
2:C:386:LYS:HD3	2:C:386:LYS:C	1.75	1.06
2:C:336:PRO:HB2	2:C:338:TYR:CE1	1.90	1.05
7:E:502:COB:H541	7:E:502:COB:H621	1.26	1.00
2:C:331:VAL:H	2:C:360:PRO:HB3	1.24	1.00

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:C:502:COB:H541	7:C:502:COB:H621	1.27	0.97
2:E:323:GLU:O	2:E:324:LYS:HG3	1.66	0.93
2:C:347:TYR:HD1	2:C:347:TYR:C	1.82	0.86
2:C:323:GLU:O	2:C:323:GLU:HG2	1.76	0.86
2:C:343:PHE:CE2	2:C:345:LEU:HB3	2.15	0.81
2:E:350:VAL:HG12	2:E:363:LEU:HD11	1.62	0.81
2:E:328:ILE:O	2:E:360:PRO:HA	1.80	0.80
2:C:359:ILE:N	2:C:359:ILE:CD1	2.45	0.79
2:C:359:ILE:N	2:C:359:ILE:HD13	1.97	0.79
2:C:347:TYR:C	2:C:347:TYR:CD1	2.57	0.78
2:C:336:PRO:CB	2:C:338:TYR:HE1	1.97	0.74
2:C:395:ASP:O	2:C:395:ASP:CG	2.30	0.74
2:E:316:GLN:O	2:E:318:PRO:HD3	1.87	0.73
2:C:391:MET:HE1	2:C:405:ILE:CB	2.19	0.73
2:E:266:ALA:HB3	2:E:291:VAL:HG12	1.72	0.72
2:E:323:GLU:O	2:E:324:LYS:CG	2.37	0.71
7:E:502:COB:H362	7:E:502:COB:H351	1.74	0.70
7:C:502:COB:H362	7:C:502:COB:H351	1.74	0.70
2:C:321:VAL:HG23	2:C:344:SER:HA	1.73	0.70
2:C:386:LYS:O	2:C:386:LYS:CD	2.30	0.69
2:E:350:VAL:HG12	2:E:363:LEU:CD1	2.23	0.69
2:C:338:TYR:N	2:C:338:TYR:HD1	1.92	0.68
2:C:331:VAL:N	2:C:360:PRO:HB3	2.05	0.67
1:B:79:ILE:HG13	1:B:107:LYS:HD3	1.77	0.67
2:C:338:TYR:N	2:C:338:TYR:CD1	2.63	0.65
2:C:386:LYS:C	2:C:386:LYS:CD	2.60	0.65
2:C:340:THR:HG23	2:C:341:THR:N	2.11	0.65
2:C:331:VAL:O	2:C:332:ASN:CB	2.45	0.64
2:C:342:ASN:C	2:C:342:ASN:ND2	2.55	0.64
2:C:331:VAL:O	2:C:332:ASN:HB3	1.98	0.64
2:C:4:THR:HG23	2:C:7:GLU:HB2	1.80	0.63
2:C:372:SER:HB2	7:C:502:COB:O4	1.99	0.63
2:C:330:ALA:HB3	2:C:360:PRO:CG	2.28	0.63
2:C:375:THR:HG21	7:C:502:COB:H482	1.81	0.63
2:C:92:THR:HG21	2:C:284:VAL:HG12	1.80	0.62
1:A:57:MET:HE2	1:A:74:LEU:HD12	1.80	0.62
3:D:164:ALA:HB2	3:D:172:LEU:HD23	1.81	0.62
2:C:353:GLU:OE1	2:C:353:GLU:CA	2.30	0.62
2:C:347:TYR:HE1	2:C:351:GLU:HB2	1.64	0.62
2:E:321:VAL:HG23	2:E:344:SER:HA	1.81	0.62
2:C:319:ILE:HG22	2:C:344:SER:CB	2.30	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:350:VAL:CG1	2:E:363:LEU:CD1	2.79	0.61
2:C:342:ASN:ND2	2:C:370:GLY:HA2	2.16	0.60
2:C:323:GLU:O	2:C:323:GLU:CG	2.45	0.60
2:C:331:VAL:H	2:C:360:PRO:CB	2.04	0.60
2:E:92:THR:HG21	2:E:284:VAL:HG12	1.83	0.60
7:C:502:COB:H541	7:C:502:COB:N62	2.09	0.60
3:D:206:LEU:HD12	3:D:207:PRO:HD2	1.84	0.60
2:C:230:VAL:HG12	2:C:263:PRO:HG2	1.82	0.59
7:C:502:COB:H621	7:C:502:COB:C54	2.09	0.59
2:E:116:GLY:O	2:E:298:LYS:NZ	2.35	0.59
2:E:230:VAL:HG12	2:E:263:PRO:HG2	1.84	0.59
2:C:347:TYR:HD1	2:C:347:TYR:O	1.85	0.59
2:C:266:ALA:HB3	2:C:291:VAL:HG12	1.85	0.59
2:C:378:ALA:HB2	7:C:502:COB:H302	1.85	0.59
1:B:152:LEU:HD12	1:B:153:PRO:HD2	1.83	0.59
2:C:341:THR:HG21	2:C:373:VAL:HA	1.84	0.59
3:D:247:MET:SD	3:D:247:MET:N	2.76	0.59
7:C:502:COB:H491	7:C:502:COB:H533	1.85	0.58
2:C:358:LYS:C	2:C:359:ILE:CD1	2.76	0.58
3:D:288:ALA:HB1	3:D:299:LEU:HD13	1.84	0.57
3:D:217:ILE:HD13	3:D:251:CYS:HB3	1.86	0.57
2:C:391:MET:HB3	2:C:424:TRP:CZ3	2.39	0.57
2:C:231:LEU:HD13	2:C:262:TYR:HB2	1.86	0.57
2:C:320:ARG:HB2	2:C:342:ASN:ND2	2.20	0.57
1:A:83:GLU:HG2	1:A:87:LYS:HE3	1.86	0.57
2:C:99:SER:HB3	2:C:102:LEU:HD13	1.87	0.57
7:E:502:COB:H531	7:E:502:COB:H543	1.86	0.56
1:B:160:ASP:OD2	4:B:300:C2F:NA2	2.34	0.56
2:C:348:TYR:HA	2:C:351:GLU:HB3	1.86	0.56
2:C:342:ASN:C	2:C:342:ASN:HD22	2.13	0.56
2:E:231:LEU:HD13	2:E:262:TYR:HB2	1.87	0.56
7:E:502:COB:H621	7:E:502:COB:C54	2.10	0.56
1:B:19:ILE:O	1:B:22:ARG:NH1	2.33	0.55
2:E:131:ILE:HD12	2:E:154:THR:HG21	1.88	0.55
7:E:502:COB:H541	7:E:502:COB:N62	2.10	0.55
3:F:59:GLU:HA	3:F:99:TYR:HB3	1.89	0.55
3:D:209:ASP:OD1	3:D:209:ASP:N	2.36	0.55
2:C:332:ASN:O	2:C:333:GLU:CB	2.55	0.55
1:A:94:MET:HG2	1:A:118:ALA:HB3	1.89	0.54
2:C:131:ILE:HD12	2:C:154:THR:HG21	1.89	0.54
1:B:75:ASP:OD1	1:B:96:ASN:ND2	2.40	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:358:LYS:C	2:C:359:ILE:HD13	2.33	0.54
2:C:330:ALA:HB3	2:C:360:PRO:HG2	1.90	0.54
1:A:137:LEU:HD23	2:C:30:MET:HE1	1.88	0.54
2:E:316:GLN:HA	2:E:316:GLN:NE2	2.22	0.54
3:F:202:ASN:HD22	3:F:244:MET:HE1	1.72	0.54
1:A:165:PRO:HG3	1:A:202:GLN:HB3	1.89	0.53
7:C:502:COB:H203	7:C:502:COB:H301	1.91	0.53
2:C:353:GLU:HG3	2:C:434:SER:HA	1.91	0.53
2:C:357:THR:O	2:C:358:LYS:CB	2.57	0.53
2:C:83:ARG:HD2	2:C:311:LEU:HD12	1.90	0.53
2:C:394:VAL:O	2:C:395:ASP:OD1	2.26	0.53
3:D:258:TRP:NE1	3:D:284:GLU:OE1	2.40	0.53
7:E:502:COB:H533	7:E:502:COB:H491	1.91	0.53
3:F:262:GLU:N	3:F:262:GLU:OE1	2.40	0.52
2:E:119:PHE:O	2:E:125:HIS:ND1	2.42	0.52
2:E:99:SER:OG	2:E:101:ASN:OD1	2.25	0.52
2:C:157:ASN:HA	2:C:179:LYS:HG3	1.90	0.52
2:C:155:GLN:OE1	2:C:155:GLN:N	2.43	0.52
1:A:197:LEU:HB3	1:A:228:ALA:HB2	1.92	0.52
1:B:122:LEU:HD22	1:B:162:LEU:HD21	1.92	0.52
3:F:18:VAL:HG22	3:F:34:VAL:HG22	1.91	0.51
3:F:162:GLY:HA2	3:F:184:ILE:HB	1.93	0.51
3:D:80:ASN:HD22	3:D:80:ASN:H	1.58	0.51
2:C:332:ASN:OD1	2:C:332:ASN:C	2.52	0.51
2:C:354:ILE:O	2:C:355:GLU:C	2.52	0.51
2:C:61:ILE:HB	2:C:78:GLU:H	1.76	0.51
3:D:80:ASN:ND2	3:D:81:GLU:OE1	2.44	0.51
2:E:310:ASN:O	2:E:313:THR:OG1	2.28	0.51
1:A:9:ASN:HA	1:A:45:ASN:HB3	1.93	0.51
1:B:45:ASN:ND2	1:B:75:ASP:OD2	2.43	0.51
2:C:80:GLU:HG3	2:C:86:LYS:HB3	1.92	0.51
3:D:59:GLU:OE1	3:D:302:ARG:NE	2.35	0.50
2:C:78:GLU:HG2	2:C:249:ARG:NH2	2.27	0.50
7:E:502:COB:N62	7:E:502:COB:H551	2.27	0.50
3:F:75:PHE:O	3:F:79:ILE:N	2.44	0.50
2:E:240:ARG:NH2	3:F:321:ASN:O	2.41	0.50
2:E:322:GLU:HG2	2:E:324:LYS:HD3	1.94	0.50
2:C:122:VAL:HG23	2:C:348:TYR:CE2	2.47	0.50
2:C:358:LYS:C	2:C:359:ILE:HD12	2.36	0.50
3:F:71:LEU:HD21	3:F:302:ARG:HD3	1.94	0.50
2:C:342:ASN:HD21	2:C:370:GLY:HA2	1.75	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:396:LEU:O	2:C:399:LYS:N	2.45	0.50
3:D:163:ASN:H	3:D:184:ILE:HB	1.76	0.50
2:E:362:TYR:C	2:E:363:LEU:HD23	2.37	0.49
3:F:288:ALA:HB1	3:F:299:LEU:HD13	1.94	0.49
2:C:55:ALA:HA	2:C:258:ARG:HH21	1.77	0.49
2:C:183:TYR:CD2	2:C:184:ALA:HB2	2.47	0.49
3:D:1:MET:SD	3:D:2:ALA:N	2.85	0.49
2:C:321:VAL:HG12	2:C:322:GLU:N	2.26	0.49
3:F:206:LEU:HD12	3:F:207:PRO:HD2	1.95	0.49
2:C:138:ASP:N	2:C:138:ASP:OD1	2.45	0.49
3:F:1:MET:SD	3:F:2:ALA:N	2.86	0.49
2:C:135:HIS:HD2	2:C:143:PHE:HB2	1.78	0.49
2:C:353:GLU:HG3	2:C:433:ALA:O	2.12	0.49
3:D:113:SER:HB3	3:D:116:GLN:HG3	1.94	0.49
1:B:96:ASN:HB2	1:B:120:ILE:HD12	1.94	0.49
2:C:242:ILE:HG23	2:C:286:LYS:HG3	1.93	0.49
2:E:161:MET:HG2	2:E:183:TYR:HB3	1.95	0.49
1:B:46:VAL:HB	1:B:50:VAL:HG11	1.94	0.48
2:C:303:PRO:HG2	3:D:282:LEU:HB3	1.95	0.48
2:C:395:ASP:O	2:C:395:ASP:OD2	2.30	0.48
7:E:502:COB:H252	7:E:502:COB:H601	1.95	0.48
1:A:187:ALA:HB3	1:A:191:PRO:HD3	1.95	0.48
2:C:321:VAL:HG12	2:C:322:GLU:H	1.79	0.48
2:E:98:VAL:HG12	2:E:110:LYS:HD3	1.95	0.48
7:C:502:COB:H252	7:C:502:COB:H601	1.95	0.48
2:E:270:ALA:O	2:E:294:ARG:NH2	2.43	0.48
2:C:3:LEU:HD12	2:C:8:ILE:HG13	1.95	0.48
2:C:337:VAL:C	2:C:338:TYR:HD1	2.22	0.48
7:C:502:COB:N62	7:C:502:COB:H551	2.28	0.48
2:C:334:ASN:O	2:C:334:ASN:ND2	2.42	0.48
2:C:97:GLN:HA	2:C:132:ALA:HB3	1.96	0.48
7:C:502:COB:H531	7:C:502:COB:H543	1.94	0.48
3:F:247:MET:SD	3:F:247:MET:N	2.87	0.48
1:A:96:ASN:OD1	4:A:300:C2F:NA2	2.39	0.47
2:E:366:VAL:CB	2:E:382:PHE:HE1	2.27	0.47
1:B:167:ASN:OD1	1:B:168:VAL:N	2.45	0.47
1:B:169:ALA:HB1	1:B:172:HIS:CD2	2.49	0.47
2:E:250:ARG:HD3	3:F:6:LEU:HD22	1.95	0.47
2:E:80:GLU:O	2:E:249:ARG:NH2	2.43	0.47
3:D:42:PRO:HD3	3:D:235:ARG:HG2	1.97	0.47
3:D:213:ILE:HG13	3:D:247:MET:HB2	1.96	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:60:PRO:HB3	2:E:253:ILE:HA	1.95	0.47
2:E:183:TYR:HA	2:E:184:ALA:HA	1.67	0.47
1:A:40:ARG:HA	1:A:70:LEU:HD22	1.95	0.47
1:B:197:LEU:HB3	1:B:228:ALA:HB2	1.97	0.47
2:C:120:ASP:OD1	2:C:125:HIS:ND1	2.43	0.47
2:E:320:ARG:HG2	2:E:370:GLY:HA3	1.96	0.47
7:E:502:COB:H543	7:E:502:COB:C53	2.44	0.47
2:C:122:VAL:HG23	2:C:348:TYR:HE2	1.80	0.47
1:B:10:GLY:HA3	1:B:47:GLY:HA3	1.97	0.46
2:C:183:TYR:HA	2:C:205:ALA:HB3	1.97	0.46
2:E:132:ALA:HB1	2:E:161:MET:HE2	1.97	0.46
2:E:362:TYR:C	2:E:363:LEU:CD2	2.88	0.46
2:E:166:ASP:OD1	2:E:166:ASP:N	2.48	0.46
2:E:168:LEU:HD21	2:E:182:LEU:HD22	1.98	0.46
2:C:117:LEU:HB2	2:C:128:ILE:HD13	1.97	0.46
2:E:362:TYR:O	2:E:363:LEU:HD22	2.15	0.46
1:B:7:ARG:NH2	1:B:14:ASP:OD2	2.49	0.46
2:C:271:ALA:HA	2:C:294:ARG:HH22	1.81	0.46
2:E:99:SER:HB3	2:E:102:LEU:HD13	1.98	0.46
2:C:160:LEU:HB3	2:C:168:LEU:HD11	1.97	0.46
2:C:268:THR:HG21	2:C:293:LEU:HD23	1.98	0.46
7:C:502:COB:H531	7:C:502:COB:H552	1.98	0.46
3:D:166:GLN:HA	3:D:197:LEU:HD13	1.98	0.46
3:F:176:CYS:HA	3:F:181:HIS:HB2	1.97	0.46
1:A:96:ASN:HA	1:A:97:SER:HA	1.56	0.46
1:B:137:LEU:HD23	2:E:30:MET:HE1	1.98	0.45
2:C:135:HIS:CD2	2:C:143:PHE:HB2	2.51	0.45
2:E:183:TYR:HA	2:E:205:ALA:HB3	1.98	0.45
1:B:4:ILE:HG12	1:B:41:ALA:HB3	1.98	0.45
3:D:187:SER:HA	3:D:188:PRO:HD3	1.82	0.45
2:E:323:GLU:O	2:E:324:LYS:CB	2.64	0.45
1:A:152:LEU:HD12	1:A:153:PRO:HD2	1.97	0.45
2:C:178:ARG:HE	2:C:179:LYS:HE2	1.82	0.45
3:D:135:VAL:HG12	3:D:162:GLY:HA3	1.98	0.45
2:C:342:ASN:HD21	2:C:370:GLY:CA	2.30	0.45
2:C:162:ALA:HB3	2:C:168:LEU:HD13	1.98	0.45
2:E:320:ARG:HB3	2:E:342:ASN:ND2	2.32	0.45
2:C:172:LEU:O	2:C:176:ALA:N	2.50	0.45
3:F:265:ALA:O	3:F:279:ARG:NH2	2.42	0.45
3:D:158:ASN:OD1	3:D:182:ASN:ND2	2.50	0.44
2:E:309:GLN:O	2:E:313:THR:HG23	2.17	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:D:87:GLN:HG3	3:D:127:ALA:HB1	1.99	0.44
2:E:365:SER:O	2:E:365:SER:OG	2.35	0.44
3:D:100:LEU:HB3	3:D:134:VAL:HG22	2.00	0.44
2:E:8:ILE:HG21	2:E:32:LEU:HD12	1.99	0.44
3:F:56:ILE:HD12	3:F:311:LYS:HG3	1.99	0.44
2:C:347:TYR:CE1	2:C:351:GLU:HB2	2.49	0.44
2:E:130:ALA:HB2	2:E:157:ASN:HB2	1.99	0.44
2:E:324:LYS:HE3	2:E:324:LYS:HB2	1.49	0.44
2:E:363:LEU:CD2	2:E:363:LEU:N	2.80	0.44
3:F:262:GLU:O	3:F:279:ARG:NH1	2.51	0.44
1:A:237:GLU:HB3	1:B:209:LEU:HD21	1.99	0.44
3:F:191:ILE:HB	3:F:230:ILE:HG23	2.00	0.44
3:D:177:MET:HG2	3:D:206:LEU:HD13	1.99	0.43
2:E:363:LEU:HD23	2:E:363:LEU:N	2.33	0.43
3:D:111:ASN:O	3:D:111:ASN:ND2	2.51	0.43
3:F:213:ILE:HG13	3:F:247:MET:HB2	1.99	0.43
2:E:133:ILE:HD11	2:E:150:VAL:HG11	2.01	0.43
2:E:183:TYR:CG	2:E:184:ALA:HB2	2.53	0.43
2:C:57:ALA:HB1	2:E:37:ALA:HA	1.99	0.43
2:C:172:LEU:HG	2:C:176:ALA:HB2	1.99	0.43
3:F:225:GLU:H	3:F:225:GLU:HG3	1.57	0.43
1:B:180:LEU:HD11	1:B:195:LEU:HD11	2.00	0.43
2:C:182:LEU:HD12	2:C:197:ALA:HB2	2.01	0.43
2:C:431:ARG:O	7:C:502:COB:H1R	2.18	0.43
7:E:502:COB:N29	7:E:502:COB:H3	2.34	0.43
7:E:502:COB:H203	7:E:502:COB:H301	2.00	0.43
2:C:309:GLN:O	2:C:313:THR:HG23	2.18	0.43
2:E:378:ALA:HB2	7:E:502:COB:H302	2.01	0.43
1:B:96:ASN:HA	1:B:97:SER:HA	1.63	0.43
2:C:373:VAL:O	2:C:377:TYR:N	2.41	0.43
2:C:183:TYR:CG	2:C:184:ALA:HB2	2.54	0.43
2:E:350:VAL:CG1	2:E:363:LEU:HD11	2.38	0.43
7:E:502:COB:H3	7:E:502:COB:H291	1.84	0.42
3:F:152:GLU:HG2	3:F:179:HIS:CE1	2.54	0.42
2:C:240:ARG:NH2	3:D:321:ASN:O	2.51	0.42
2:C:338:TYR:HB3	7:C:502:COB:HM52	2.01	0.42
2:E:42:CYS:HA	2:E:43:PRO:HD3	1.81	0.42
2:E:242:ILE:HG12	2:E:286:LYS:HG3	2.02	0.42
1:A:167:ASN:HD21	1:A:203:ASN:HB3	1.84	0.42
2:C:179:LYS:N	2:C:180:PRO:HD2	2.35	0.42
1:B:154:MET:HG2	1:B:189:PRO:O	2.19	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:331:VAL:O	2:C:332:ASN:CG	2.63	0.42
2:E:84:HIS:HB3	3:F:229:SER:OG	2.20	0.42
2:E:110:LYS:O	2:E:114:ILE:HG13	2.19	0.42
1:A:208:PRO:O	1:A:212:ARG:HG2	2.20	0.42
2:E:216:GLU:O	2:E:220:LYS:HG2	2.20	0.42
2:C:286:LYS:HD3	2:C:286:LYS:HA	1.90	0.41
3:D:267:VAL:HB	3:D:275:LYS:HA	2.01	0.41
2:E:163:ASP:O	2:E:189:ASN:ND2	2.53	0.41
2:C:316:GLN:O	2:C:318:PRO:HD3	2.20	0.41
2:C:374:LEU:HD23	2:C:374:LEU:HA	1.86	0.41
2:C:397:ASP:O	2:C:403:HIS:CE1	2.73	0.41
1:A:74:LEU:H	1:A:74:LEU:HD22	1.86	0.41
2:C:158:LEU:HB2	2:C:180:PRO:HG3	2.02	0.41
2:E:147:VAL:HG11	2:E:171:ALA:HB1	2.01	0.41
1:B:183:ILE:O	1:B:186:LEU:HG	2.20	0.41
2:C:183:TYR:HA	2:C:184:ALA:HA	1.69	0.41
3:D:67:TRP:HB3	3:D:71:LEU:HD23	2.03	0.41
1:A:46:VAL:HB	1:A:50:VAL:HG11	2.01	0.41
2:C:379:ASP:CG	7:C:502:COB:H422	2.46	0.41
7:C:502:COB:H543	7:C:502:COB:C53	2.50	0.41
2:E:394:VAL:O	2:E:395:ASP:CB	2.69	0.41
7:C:502:COB:O39	7:C:502:COB:H8	2.20	0.41
2:C:318:PRO:HB3	2:C:343:PHE:CE1	2.56	0.41
1:A:22:ARG:HD2	1:A:59:TRP:CD1	2.56	0.41
1:B:14:ASP:OD1	1:B:15:ILE:N	2.53	0.41
2:C:139:ASP:OD1	2:C:139:ASP:N	2.54	0.41
2:C:198:LYS:HE3	2:C:198:LYS:HB2	1.95	0.41
2:E:97:GLN:HA	2:E:132:ALA:HB3	2.02	0.41
2:E:132:ALA:HA	2:E:159:VAL:HG13	2.02	0.41
2:E:185:ALA:N	2:E:205:ALA:O	2.46	0.41
2:C:126:TYR:HB3	2:C:305:LEU:HD23	2.04	0.40
7:E:502:COB:H531	7:E:502:COB:H552	2.02	0.40
1:A:180:LEU:HD11	1:A:195:LEU:HD11	2.04	0.40
1:B:102:ARG:HA	1:B:105:VAL:HB	2.04	0.40
2:E:3:LEU:HD12	2:E:3:LEU:HA	1.89	0.40
2:E:17:CYS:N	6:E:501:SF4:S3	2.93	0.40
1:A:253:ASP:HB3	1:B:205:GLN:NE2	2.36	0.40
1:B:62:GLU:HG3	1:B:88:LYS:HD3	2.02	0.40
2:C:186:THR:C	2:C:188:ALA:H	2.30	0.40
2:E:13:PRO:HB2	2:E:14:LYS:H	1.59	0.40
3:F:232:GLU:O	3:F:236:LEU:HB2	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 X-ray entries followed by that with respect to entries of similar resolution.

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	260/262 (99%)	251 (96%)	8 (3%)	1 (0%)	30	61
1	B	260/262 (99%)	250 (96%)	9 (4%)	1 (0%)	30	61
2	C	439/446 (98%)	421 (96%)	14 (3%)	4 (1%)	14	44
2	E	439/446 (98%)	420 (96%)	15 (3%)	4 (1%)	14	44
3	D	321/323 (99%)	302 (94%)	18 (6%)	1 (0%)	36	67
3	F	321/323 (99%)	310 (97%)	11 (3%)	0	100	100
All	All	2040/2062 (99%)	1954 (96%)	75 (4%)	11 (0%)	24	57

All (11) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	C	45	VAL
2	C	180	PRO
2	E	13	PRO
2	E	45	VAL
2	E	324	LYS
1	A	162	LEU
2	C	332	ASN
2	C	331	VAL
2	E	14	LYS
1	B	162	LEU
3	D	163	ASN

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 X-ray entries followed by that with respect to entries of similar resolution.

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	214/214 (100%)	207 (97%)	7 (3%)	33	64
1	B	214/214 (100%)	212 (99%)	2 (1%)	70	82
2	C	286/356 (80%)	254 (89%)	32 (11%)	6	22
2	E	261/356 (73%)	248 (95%)	13 (5%)	22	53
3	D	261/261 (100%)	248 (95%)	13 (5%)	22	53
3	F	261/261 (100%)	254 (97%)	7 (3%)	39	68
All	All	1497/1662 (90%)	1423 (95%)	74 (5%)	22	53

All (74) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	17	ARG
1	A	33	ARG
1	A	74	LEU
1	A	137	LEU
1	A	141	MET
1	A	168	VAL
1	A	183	ILE
1	B	103	GLU
1	B	206	ASN
2	C	3	LEU
2	C	4	THR
2	C	6	LEU
2	C	7	GLU
2	C	11	GLN
2	C	17	CYS
2	C	64	VAL
2	C	138	ASP
2	C	159	VAL
2	C	177	ASP
2	C	179	LYS
2	C	209	ASN
2	C	240	ARG
2	C	249	ARG
2	C	304	LEU
2	C	316	GLN
2	C	323	GLU
2	C	332	ASN

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Mol	Chain	Res	Type
2	C	334	ASN
2	C	338	TYR
2	C	342	ASN
2	C	346	THR
2	C	347	TYR
2	C	349	SER
2	C	351	GLU
2	C	353	GLU
2	C	359	ILE
2	C	363	LEU
2	C	364	LEU
2	C	386	LYS
2	C	392	LYS
2	C	395	ASP
3	D	1	MET
3	D	4	GLN
3	D	14	VAL
3	D	80	ASN
3	D	81	GLU
3	D	92	GLU
3	D	135	VAL
3	D	170	LYS
3	D	209	ASP
3	D	225	GLU
3	D	236	LEU
3	D	276	GLU
3	D	282	LEU
2	E	3	LEU
2	E	4	THR
2	E	78	GLU
2	E	83	ARG
2	E	87	ARG
2	E	159	VAL
2	E	240	ARG
2	E	316	GLN
2	E	323	GLU
2	E	324	LYS
2	E	351	GLU
2	E	363	LEU
2	E	381	LYS
3	F	1	MET
3	F	14	VAL

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Mol	Chain	Res	Type
3	F	135	VAL
3	F	140	VAL
3	F	217	ILE
3	F	225	GLU
3	F	229	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (32) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	199	ASN
1	A	203	ASN
1	A	211	ASN
1	B	20	GLN
1	B	99	ASN
1	B	199	ASN
1	B	205	GLN
1	B	211	ASN
2	C	124	GLN
2	C	135	HIS
2	C	282	ASN
2	C	316	GLN
3	D	15	GLN
3	D	61	GLN
3	D	80	ASN
3	D	112	HIS
3	D	126	GLN
3	D	179	HIS
3	D	192	ASN
3	D	210	HIS
3	D	313	ASN
3	D	316	GLN
2	E	84	HIS
2	E	115	ASN
2	E	124	GLN
2	E	135	HIS
2	E	316	GLN
3	F	15	GLN
3	F	116	GLN
3	F	126	GLN
3	F	179	HIS
3	F	202	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 8 ligands modelled in this entry, 2 are monoatomic - leaving 6 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	$\# Z > 2$
4	C2F	B	300	-	32,34,35	2.50	8 (25%)	39,47,49	1.49	6 (15%)
6	SF4	E	501	2	0,12,12	-	-	-		
7	COB	C	502	-	89,102,102	1.16	6 (6%)	137,170,170	1.49	21 (15%)
7	COB	E	502	-	89,102,102	1.15	6 (6%)	137,170,170	1.53	25 (18%)
6	SF4	C	501	2	0,12,12	-	-	-		
4	C2F	A	300	-	32,34,35	2.49	9 (28%)	39,47,49	1.50	6 (15%)

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
4	C2F	B	300	-	-	3/22/31/35	0/3/3/3
7	COB	C	502	-	-	18/56/231/231	0/3/11/11
6	SF4	E	501	2	-	-	0/6/5/5

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
7	COB	E	502	-	-	16/56/231/231	0/3/11/11
6	SF4	C	501	2	-	-	0/6/5/5
4	C2F	A	300	-	-	2/22/31/35	0/3/3/3

All (29) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	300	C2F	O4-C4	7.97	1.38	1.23
4	B	300	C2F	O4-C4	7.94	1.38	1.23
4	B	300	C2F	C2-NA2	7.32	1.51	1.34
4	A	300	C2F	C2-NA2	7.32	1.51	1.34
4	B	300	C2F	C-N	5.04	1.45	1.34
4	A	300	C2F	C-N	4.96	1.45	1.34
7	E	502	COB	C1-C19	4.52	1.56	1.51
7	C	502	COB	C1-C19	4.47	1.56	1.51
4	A	300	C2F	C15-N10	3.21	1.47	1.38
4	B	300	C2F	C15-N10	3.18	1.47	1.38
4	B	300	C2F	C7-N8	-2.92	1.43	1.46
4	B	300	C2F	C6-N5	-2.79	1.43	1.47
4	A	300	C2F	C6-N5	-2.77	1.43	1.47
7	C	502	COB	C35-C5	2.75	1.56	1.50
4	A	300	C2F	C7-N8	-2.71	1.43	1.46
7	E	502	COB	C16-C15	2.68	1.43	1.36
7	E	502	COB	C35-C5	2.66	1.56	1.50
4	A	300	C2F	C4A-N5	2.65	1.44	1.37
7	C	502	COB	C54-C17	2.64	1.58	1.54
4	B	300	C2F	C4A-N5	2.61	1.44	1.37
7	C	502	COB	C16-C15	2.58	1.43	1.36
7	E	502	COB	C54-C17	2.53	1.58	1.54
7	C	502	COB	C2B-N1B	-2.26	1.33	1.37
7	E	502	COB	C2B-N1B	-2.23	1.33	1.37
7	E	502	COB	C30-C3	2.08	1.59	1.54
4	B	300	C2F	C4-N3	-2.06	1.35	1.38
4	A	300	C2F	C4-N3	-2.05	1.35	1.38
7	C	502	COB	C30-C3	2.04	1.59	1.54
4	A	300	C2F	O1-CT	2.01	1.28	1.22

All (58) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	C	502	COB	C1P-N59-C57	-4.73	112.55	122.69
7	E	502	COB	C1P-N59-C57	-4.69	112.62	122.69

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	C	502	COB	C16-C15-C14	-4.46	113.59	121.55
7	E	502	COB	C16-C15-C14	-4.40	113.71	121.55
7	C	502	COB	C54-C17-C16	-3.93	92.05	112.41
4	A	300	C2F	C2-N1-C8A	3.92	120.28	113.36
7	E	502	COB	C18-C19-N24	-3.89	105.77	114.49
7	E	502	COB	C54-C17-C16	-3.89	92.26	112.41
4	B	300	C2F	C2-N1-C8A	3.87	120.19	113.36
7	C	502	COB	C18-C19-N24	-3.83	105.91	114.49
7	E	502	COB	C18-C60-C61	3.10	116.76	111.35
4	B	300	C2F	O4-C4-C4A	-3.04	119.92	127.26
7	E	502	COB	C9B-C8B-N1B	3.02	106.64	105.30
7	E	502	COB	C55-C17-C18	2.98	117.23	111.13
4	A	300	C2F	O4-C4-C4A	-2.97	120.11	127.26
7	E	502	COB	C7B-C8B-C9B	2.91	125.96	122.47
4	B	300	C2F	CG-CB-CA	2.89	118.50	113.16
7	C	502	COB	C18-C60-C61	2.87	116.36	111.35
7	E	502	COB	C54-C17-C18	-2.81	106.85	112.05
7	E	502	COB	C5M-C5B-C6B	-2.79	115.05	120.76
4	A	300	C2F	C4A-C4-N3	2.78	119.76	112.13
4	B	300	C2F	C4A-C4-N3	2.77	119.74	112.13
4	B	300	C2F	C2-N3-C4	-2.77	120.09	125.11
7	C	502	COB	C5M-C5B-C6B	-2.76	115.13	120.76
7	C	502	COB	C18-C17-C16	2.75	105.59	100.92
7	C	502	COB	C55-C17-C18	2.73	116.72	111.13
4	A	300	C2F	C6-C9-N10	2.72	118.25	110.24
7	E	502	COB	C55-C17-C16	2.72	121.91	116.59
4	A	300	C2F	CG-CB-CA	2.70	118.14	113.16
4	A	300	C2F	C2-N3-C4	-2.69	120.24	125.11
7	C	502	COB	C9B-C8B-N1B	2.66	106.48	105.30
7	C	502	COB	C7B-C8B-C9B	2.62	125.62	122.47
7	C	502	COB	C54-C17-C18	-2.55	107.34	112.05
7	E	502	COB	C18-C17-C16	2.51	105.18	100.92
7	E	502	COB	O28-C27-N29	-2.50	115.87	122.53
7	E	502	COB	C4B-C5B-C6B	2.45	123.28	119.69
7	C	502	COB	C55-C17-C16	2.45	121.38	116.59
7	C	502	COB	O28-C27-N29	-2.43	116.04	122.53
7	C	502	COB	O2-C3R-C2R	2.41	120.32	111.68
7	E	502	COB	C2P-C1P-N59	-2.38	109.42	112.92
7	C	502	COB	C2P-C1P-N59	-2.36	109.45	112.92
7	C	502	COB	C4B-C5B-C6B	2.34	123.12	119.69
7	E	502	COB	C13-C14-C15	-2.32	119.94	123.82
7	C	502	COB	C15-C16-N24	2.30	127.36	123.88

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	E	502	COB	C20-C1-C19	-2.30	106.58	109.42
7	E	502	COB	O2-C3R-C2R	2.29	119.89	111.68
7	E	502	COB	C17-C16-C15	-2.26	124.54	128.07
7	C	502	COB	C17-C16-C15	-2.23	124.58	128.07
4	B	300	C2F	C6-C9-N10	2.23	116.79	110.24
7	E	502	COB	C8B-C9B-N3B	-2.20	107.62	110.00
7	C	502	COB	C8B-C9B-N3B	-2.19	107.63	110.00
7	E	502	COB	C15-C16-N24	2.16	127.15	123.88
7	E	502	COB	C53-C15-C16	2.16	125.89	122.41
7	E	502	COB	C41-C8-C9	-2.14	107.44	111.19
7	E	502	COB	C31-C32-N33	2.13	123.33	116.49
7	C	502	COB	C31-C32-N33	2.09	123.19	116.49
7	C	502	COB	O5-P-O4	2.06	122.02	112.44
7	E	502	COB	C7B-C8B-N1B	-2.02	127.40	131.39

There are no chirality outliers.

All (39) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
7	C	502	COB	C1P-C2P-O3-P
4	A	300	C2F	N-CA-CB-CG
7	C	502	COB	C14-C13-C48-C49
4	B	300	C2F	N-CA-CB-CG
4	A	300	C2F	CT-CA-CB-CG
4	B	300	C2F	CT-CA-CB-CG
7	C	502	COB	O6R-C1R-N1B-C8B
7	E	502	COB	C2R-C1R-N1B-C8B
7	E	502	COB	O6R-C1R-N1B-C8B
7	C	502	COB	C3-C30-C31-C32
7	E	502	COB	C3-C30-C31-C32
7	C	502	COB	C3P-C2P-O3-P
7	E	502	COB	C1P-C2P-O3-P
7	E	502	COB	C3P-C2P-O3-P
7	C	502	COB	C30-C31-C32-O34
7	E	502	COB	C30-C31-C32-O34
7	C	502	COB	C30-C31-C32-N33
7	E	502	COB	C30-C31-C32-N33
7	E	502	COB	C41-C42-C43-O44
7	C	502	COB	C41-C42-C43-O44
7	E	502	COB	C41-C42-C43-N45
7	C	502	COB	C2R-C1R-N1B-C8B
7	C	502	COB	C41-C42-C43-N45

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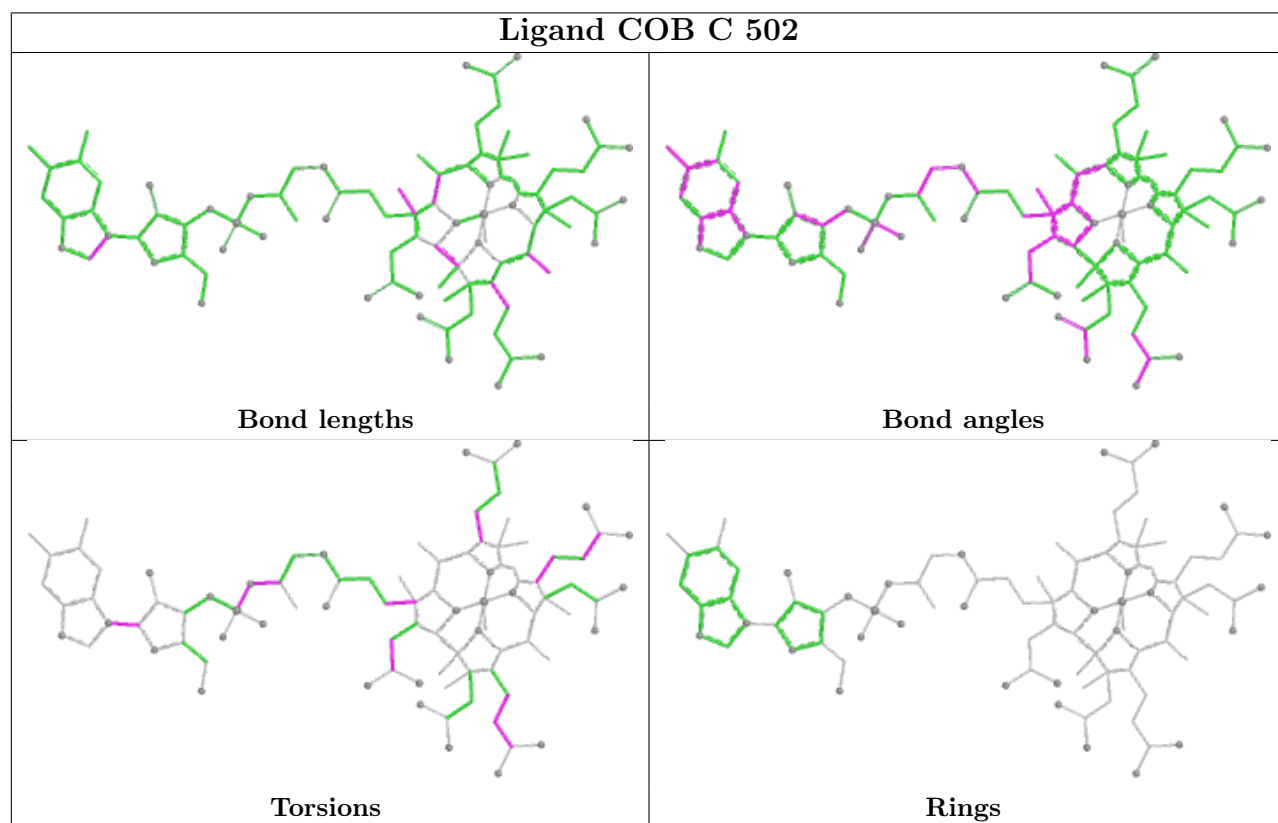
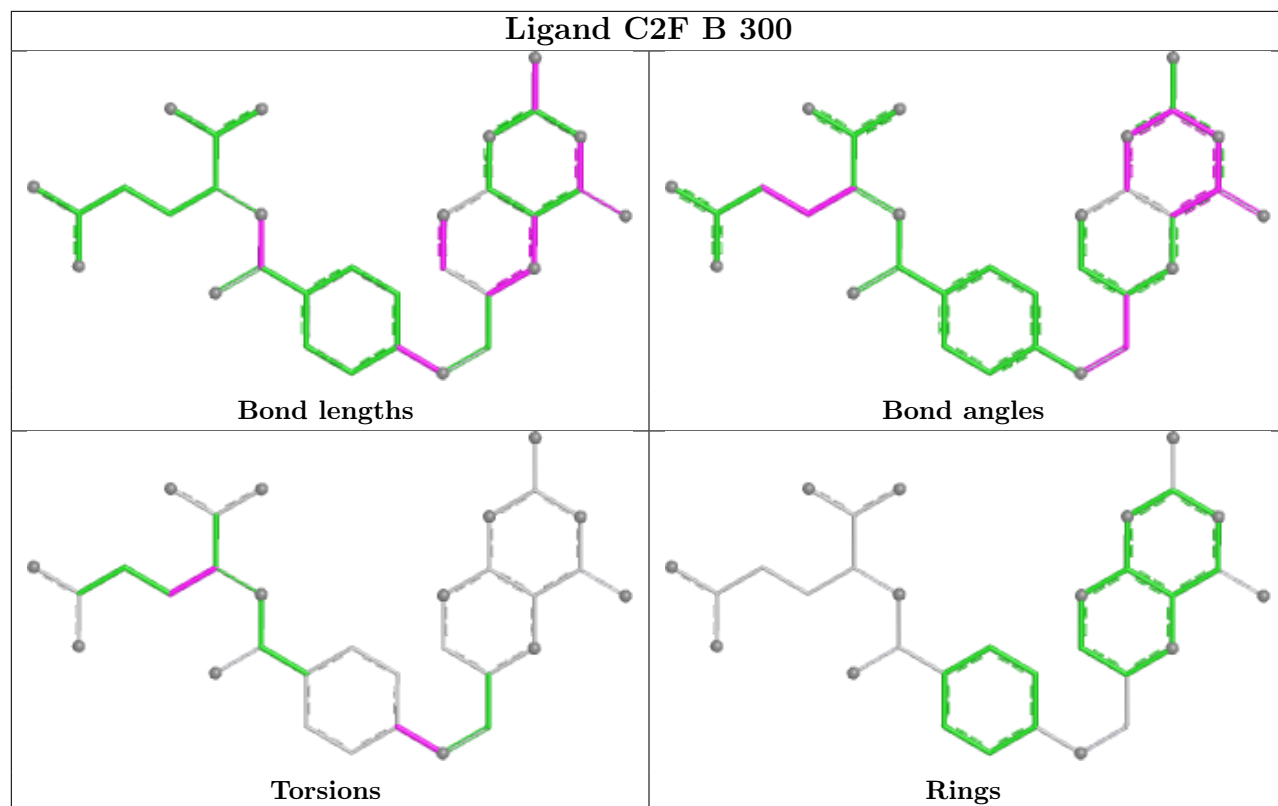
Mol	Chain	Res	Type	Atoms
7	E	502	COB	C14-C13-C48-C49
7	E	502	COB	C38-C37-C7-C36
7	C	502	COB	C18-C60-C61-O63
7	C	502	COB	C18-C60-C61-N62
7	E	502	COB	C18-C60-C61-O63
7	E	502	COB	C18-C60-C61-N62
7	C	502	COB	C12-C13-C48-C49
7	E	502	COB	C38-C37-C7-C8
7	C	502	COB	C18-C17-C55-C56
7	C	502	COB	C54-C17-C55-C56
7	E	502	COB	C54-C17-C55-C56
4	B	300	C2F	C14-C15-N10-C9
7	C	502	COB	C2R-C1R-N1B-C2B
7	E	502	COB	C18-C17-C55-C56
7	C	502	COB	C42-C41-C8-C7
7	C	502	COB	C2P-O3-P-O5

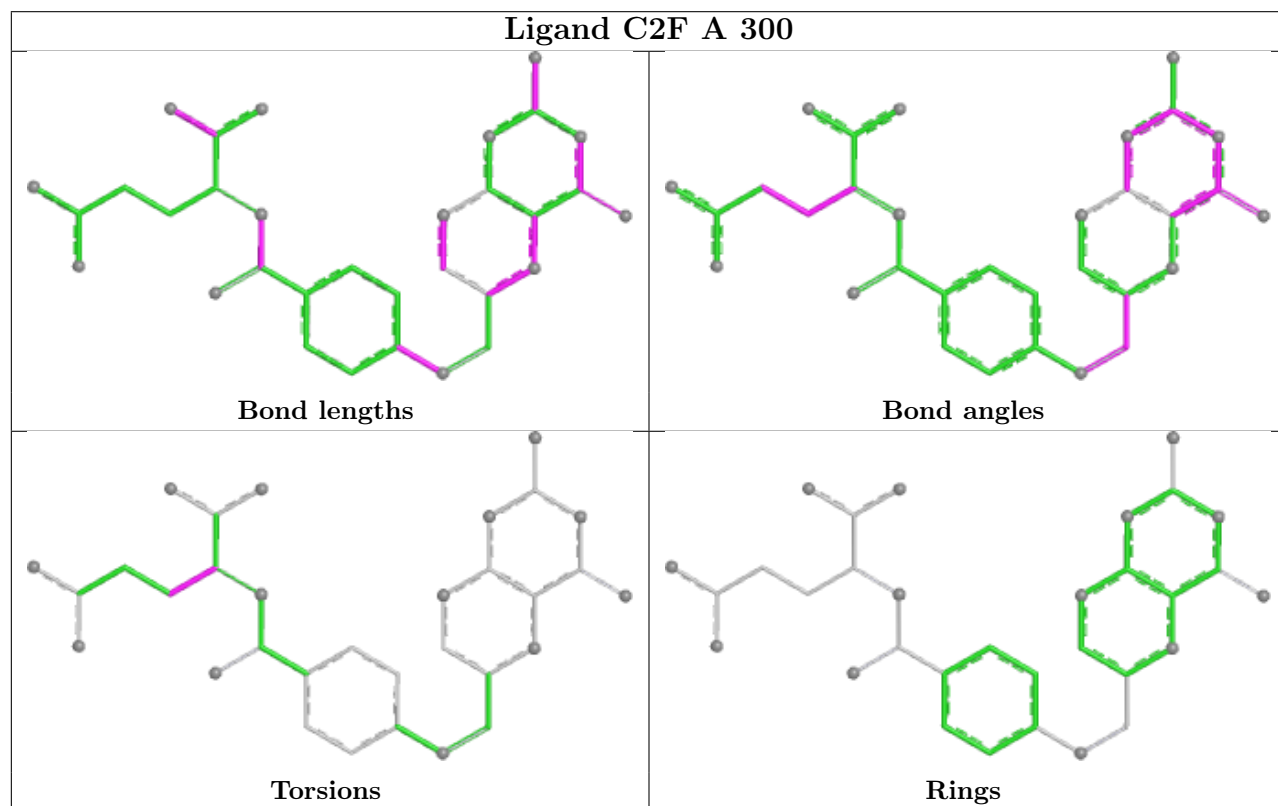
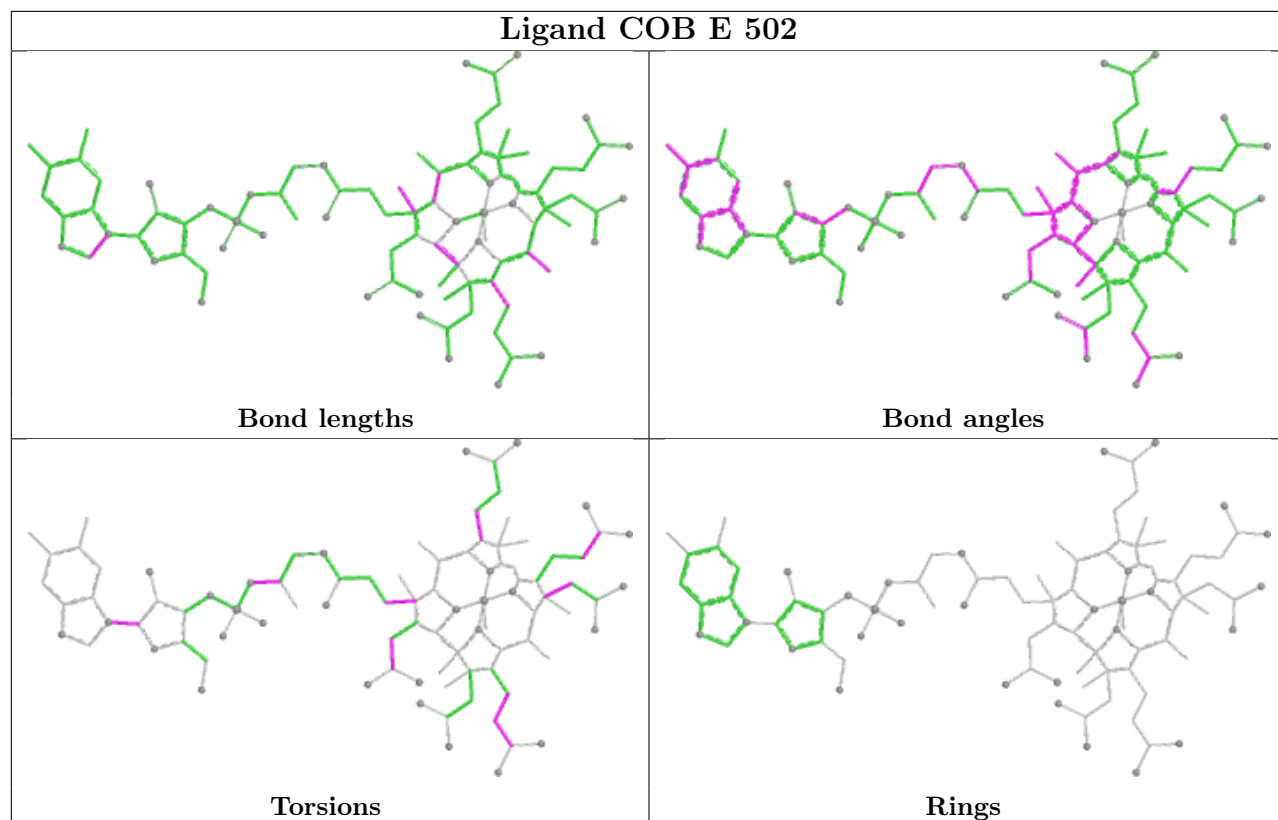
There are no ring outliers.

5 monomers are involved in 35 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	B	300	C2F	1	0
6	E	501	SF4	1	0
7	C	502	COB	18	0
7	E	502	COB	14	0
4	A	300	C2F	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 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 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q < 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å²)	Q<0.9
1	A	262/262 (100%)	0.20	2 (0%)	82	63	46, 84, 131, 174	0
1	B	262/262 (100%)	0.46	7 (2%)	56	32	54, 112, 182, 260	0
2	C	441/446 (98%)	0.59	23 (5%)	33	16	55, 130, 212, 321	3 (0%)
2	E	441/446 (98%)	0.64	29 (6%)	24	12	68, 139, 259, 371	3 (0%)
3	D	323/323 (100%)	0.06	1 (0%)	90	79	41, 72, 110, 188	0
3	F	323/323 (100%)	0.16	3 (0%)	81	60	37, 81, 125, 207	1 (0%)
All	All	2052/2062 (99%)	0.38	65 (3%)	50	28	37, 101, 202, 371	7 (0%)

All (65) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	E	339	VAL	7.0
2	E	436	ILE	6.8
2	E	57	ALA	4.4
2	C	436	ILE	4.1
2	E	60	PRO	3.7
2	E	5	GLY	3.7
2	C	433	ALA	3.6
2	C	338	TYR	3.5
2	C	382	PHE	3.4
2	E	56	ALA	3.4
1	B	187	ALA	3.3
2	E	344	SER	3.3
3	F	226	TYR	3.2
2	E	4	THR	3.1
2	E	382	PHE	3.0
2	C	365	SER	3.0
2	E	433	ALA	3.0
2	E	340	THR	3.0
2	E	184	ALA	3.0

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Mol	Chain	Res	Type	RSRZ
2	C	56	ALA	2.9
1	B	162	LEU	2.8
2	C	432	GLU	2.7
2	E	33	ALA	2.7
2	C	222	VAL	2.7
2	E	6	LEU	2.7
2	E	336	PRO	2.6
2	C	347	TYR	2.5
2	C	348	TYR	2.5
2	E	3	LEU	2.5
2	C	364	LEU	2.5
2	E	267	LEU	2.5
2	E	96	ILE	2.4
3	F	71	LEU	2.4
2	E	32	LEU	2.3
2	C	38	SER	2.3
1	B	186	LEU	2.3
1	A	93	ALA	2.3
2	C	34	SER	2.3
2	E	319	ILE	2.3
2	E	440	ALA	2.3
1	B	183	ILE	2.3
2	E	396	LEU	2.3
2	E	328	ILE	2.3
2	C	218	VAL	2.3
2	C	102	LEU	2.2
2	C	122	VAL	2.2
2	C	3	LEU	2.2
2	E	300	HIS	2.2
2	E	406	ILE	2.2
3	F	263	ALA	2.2
2	E	329	GLY	2.2
2	E	388	ALA	2.1
1	A	222	GLY	2.1
2	C	437	VAL	2.1
1	B	74	LEU	2.1
1	B	112	ALA	2.1
2	C	12	LEU	2.1
1	B	185	MET	2.1
2	C	373	VAL	2.1
3	D	62	ASP	2.1
2	C	337	VAL	2.0

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Mol	Chain	Res	Type	RSRZ
2	C	180	PRO	2.0
2	E	405	ILE	2.0
2	E	327	GLU	2.0
2	C	325	LEU	2.0

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

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

6.3 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

6.4 Ligands [i](#)

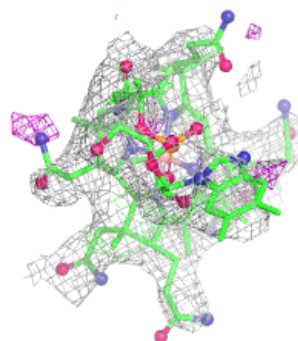
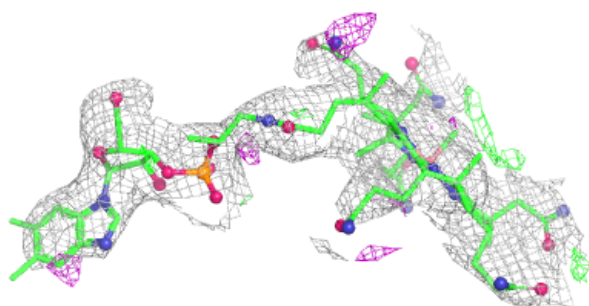
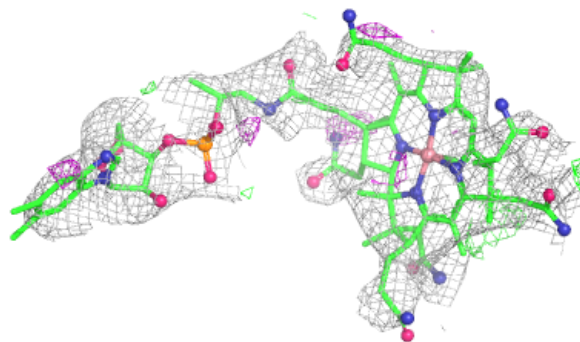
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
5	CA	A	301	1/1	0.62	0.11	30,30,30,30	0
5	CA	B	301	1/1	0.81	0.10	30,30,30,30	0
7	COB	E	502	92/92	0.85	0.15	138,138,138,138	0
4	C2F	B	300	32/33	0.88	0.12	91,91,91,91	0
4	C2F	A	300	32/33	0.88	0.14	86,86,86,86	0
7	COB	C	502	92/92	0.89	0.14	120,120,120,120	0
6	SF4	E	501	8/8	0.89	0.09	160,160,160,160	0
6	SF4	C	501	8/8	0.94	0.06	148,148,148,148	0

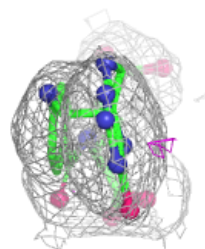
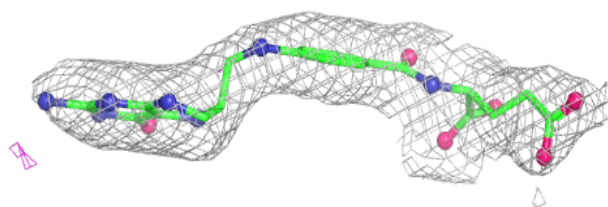
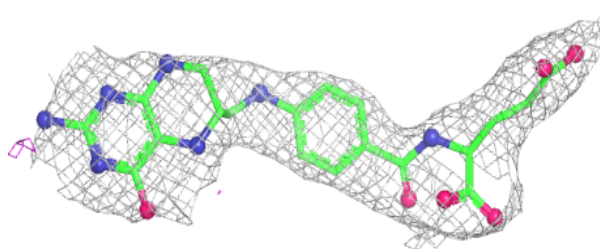
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

Electron density around COB E 502:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

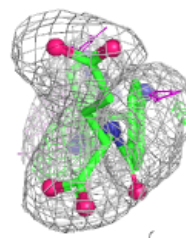
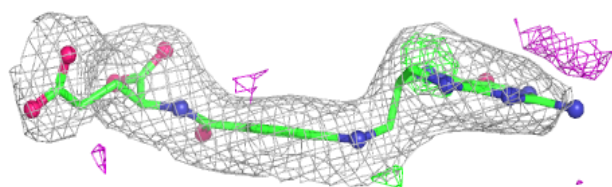
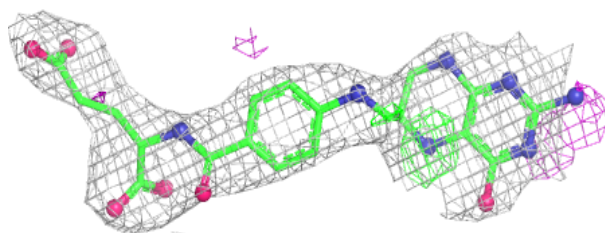
**Electron density around C2F B 300:**

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

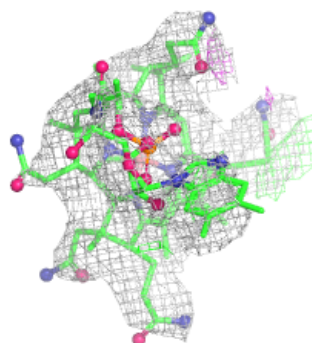
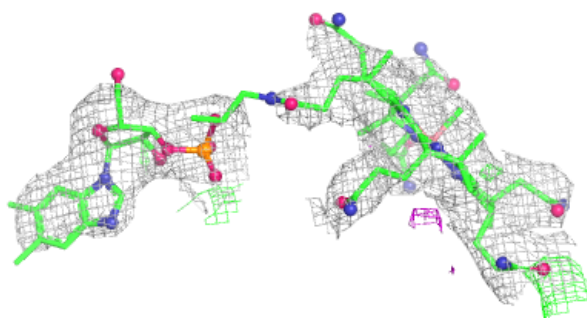
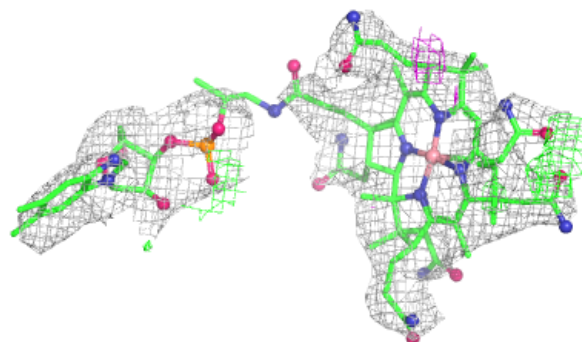


Electron density around C2F A 300:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

**Electron density around COB C 502:**

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



6.5 Other polymers [i](#)

There are no such residues in this entry.