



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 15, 2026 – 01:45 PM UTC

PDB ID : 4ACA / pdb_00004aca
Title : CRYSTAL STRUCTURE OF TRANSLATION ELONGATION FACTOR
SELB FROM METHANOCOCCUS MARIPALUDIS, APO FORM
Authors : Leibundgut, M.; Frick, C.; Thanbichler, M.; Boeck, A.; Ban, N.
Deposited on : 2011-12-14
Resolution : 3.15 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

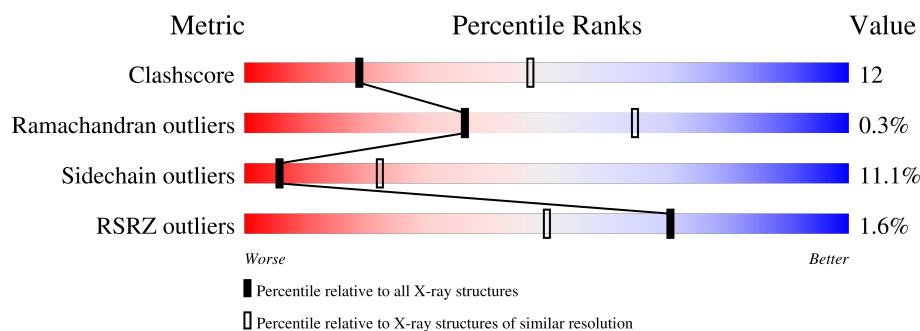
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.15 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))
Clashscore	190562	2486 (3.20-3.12)
Ramachandran outliers	187476	2405 (3.20-3.12)
Sidechain outliers	187428	2404 (3.20-3.12)
RSRZ outliers	180081	2361 (3.20-3.12)

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	482	63% 26% 7%
1	B	482	63% 27% 5%
1	C	482	70% 24%
1	D	482	62% 29% 5%

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
1	CMH	A	340	-	-	X	-
1	CMH	B	371	-	-	X	-

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 14529 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 TRANSLATION ELONGATION FACTOR SELB.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	448	Total	C	Hg	N	O	S	0	0	0
			3475	2220	4	593	644	14			
1	B	456	Total	C	Hg	N	O	S	0	0	0
			3533	2257	4	603	655	14			
1	C	471	Total	C	Hg	N	O	S	0	0	0
			3651	2327	4	627	679	14			
1	D	467	Total	C	Hg	N	O	S	0	0	0
			3615	2305	4	618	675	13			

There are 56 discrepancies between the modelled and reference sequences:

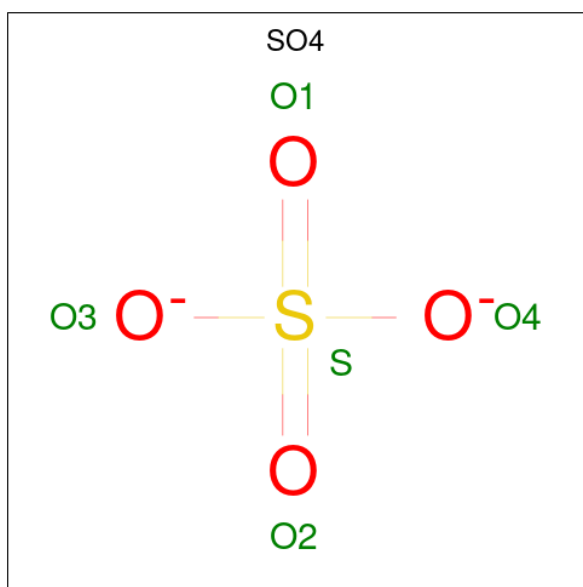
Chain	Residue	Modelled	Actual	Comment	Reference
A	-13	MET	-	expression tag	UNP Q8J307
A	-12	HIS	-	expression tag	UNP Q8J307
A	-11	HIS	-	expression tag	UNP Q8J307
A	-10	HIS	-	expression tag	UNP Q8J307
A	-9	HIS	-	expression tag	UNP Q8J307
A	-8	HIS	-	expression tag	UNP Q8J307
A	-7	HIS	-	expression tag	UNP Q8J307
A	-6	SER	-	expression tag	UNP Q8J307
A	-5	ILE	-	expression tag	UNP Q8J307
A	-4	GLU	-	expression tag	UNP Q8J307
A	-3	GLY	-	expression tag	UNP Q8J307
A	-2	ARG	-	expression tag	UNP Q8J307
A	-1	PRO	-	expression tag	UNP Q8J307
A	0	HIS	-	expression tag	UNP Q8J307
B	-13	MET	-	expression tag	UNP Q8J307
B	-12	HIS	-	expression tag	UNP Q8J307
B	-11	HIS	-	expression tag	UNP Q8J307
B	-10	HIS	-	expression tag	UNP Q8J307
B	-9	HIS	-	expression tag	UNP Q8J307
B	-8	HIS	-	expression tag	UNP Q8J307
B	-7	HIS	-	expression tag	UNP Q8J307

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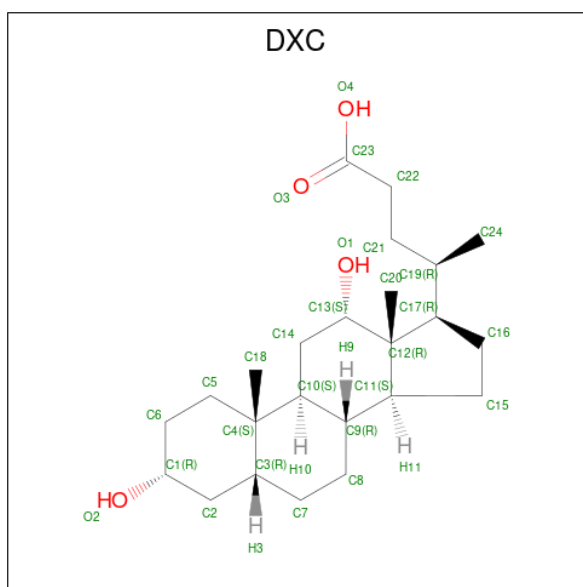
Chain	Residue	Modelled	Actual	Comment	Reference
B	-6	SER	-	expression tag	UNP Q8J307
B	-5	ILE	-	expression tag	UNP Q8J307
B	-4	GLU	-	expression tag	UNP Q8J307
B	-3	GLY	-	expression tag	UNP Q8J307
B	-2	ARG	-	expression tag	UNP Q8J307
B	-1	PRO	-	expression tag	UNP Q8J307
B	0	HIS	-	expression tag	UNP Q8J307
C	-13	MET	-	expression tag	UNP Q8J307
C	-12	HIS	-	expression tag	UNP Q8J307
C	-11	HIS	-	expression tag	UNP Q8J307
C	-10	HIS	-	expression tag	UNP Q8J307
C	-9	HIS	-	expression tag	UNP Q8J307
C	-8	HIS	-	expression tag	UNP Q8J307
C	-7	HIS	-	expression tag	UNP Q8J307
C	-6	SER	-	expression tag	UNP Q8J307
C	-5	ILE	-	expression tag	UNP Q8J307
C	-4	GLU	-	expression tag	UNP Q8J307
C	-3	GLY	-	expression tag	UNP Q8J307
C	-2	ARG	-	expression tag	UNP Q8J307
C	-1	PRO	-	expression tag	UNP Q8J307
C	0	HIS	-	expression tag	UNP Q8J307
D	-13	MET	-	expression tag	UNP Q8J307
D	-12	HIS	-	expression tag	UNP Q8J307
D	-11	HIS	-	expression tag	UNP Q8J307
D	-10	HIS	-	expression tag	UNP Q8J307
D	-9	HIS	-	expression tag	UNP Q8J307
D	-8	HIS	-	expression tag	UNP Q8J307
D	-7	HIS	-	expression tag	UNP Q8J307
D	-6	SER	-	expression tag	UNP Q8J307
D	-5	ILE	-	expression tag	UNP Q8J307
D	-4	GLU	-	expression tag	UNP Q8J307
D	-3	GLY	-	expression tag	UNP Q8J307
D	-2	ARG	-	expression tag	UNP Q8J307
D	-1	PRO	-	expression tag	UNP Q8J307
D	0	HIS	-	expression tag	UNP Q8J307

- Molecule 2 is SULFATE ION (CCD ID: SO4) (formula: O₄S).



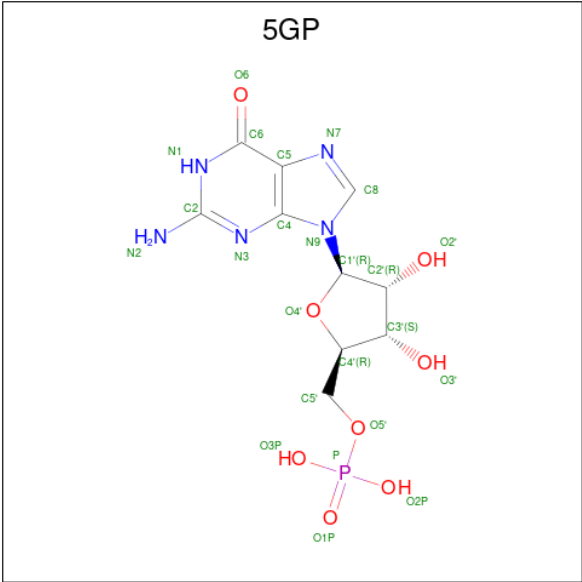
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	B	1	Total	O	S	0	0
			5	4	1		
2	B	1	Total	O	S	0	0
			5	4	1		
2	C	1	Total	O	S	0	0
			5	4	1		
2	C	1	Total	O	S	0	0
			5	4	1		
2	C	1	Total	O	S	0	0
			5	4	1		
2	C	1	Total	O	S	0	0
			5	4	1		

- Molecule 3 is (3ALPHA,5BETA,12ALPHA)-3,12-DIHYDROXYCHOLAN-24-OIC ACID (CCD ID: DXC) (formula: C₂₄H₄₀O₄).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	B	1	Total	C	O	0	0
			28	24	4		
3	C	1	Total	C	O	0	0
			28	24	4		
3	C	1	Total	C	O	0	0
			28	24	4		
3	C	1	Total	C	O	0	0
			28	24	4		
3	C	1	Total	C	O	0	0
			28	24	4		
3	C	1	Total	C	O	0	0
			28	24	4		

- Molecule 4 is GUANOSINE-5'-MONOPHOSPHATE (CCD ID: 5GP) (formula: $C_{10}H_{14}N_5O_8P$).

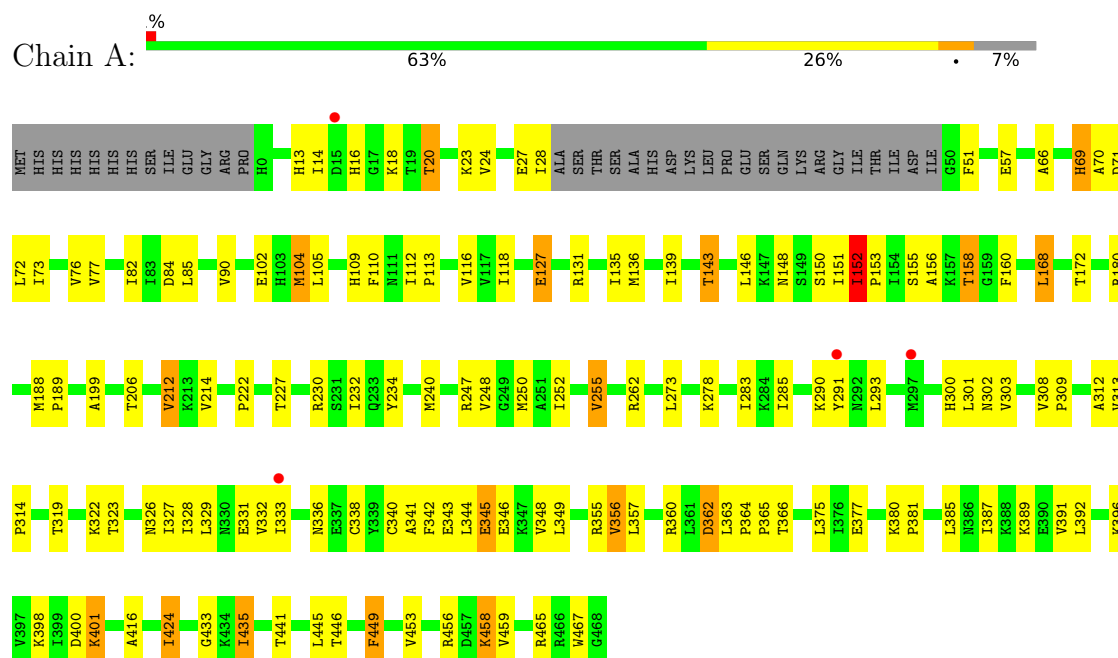


Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	B	1	Total	C	N	O	P	0	0
			24	10	5	8	1		

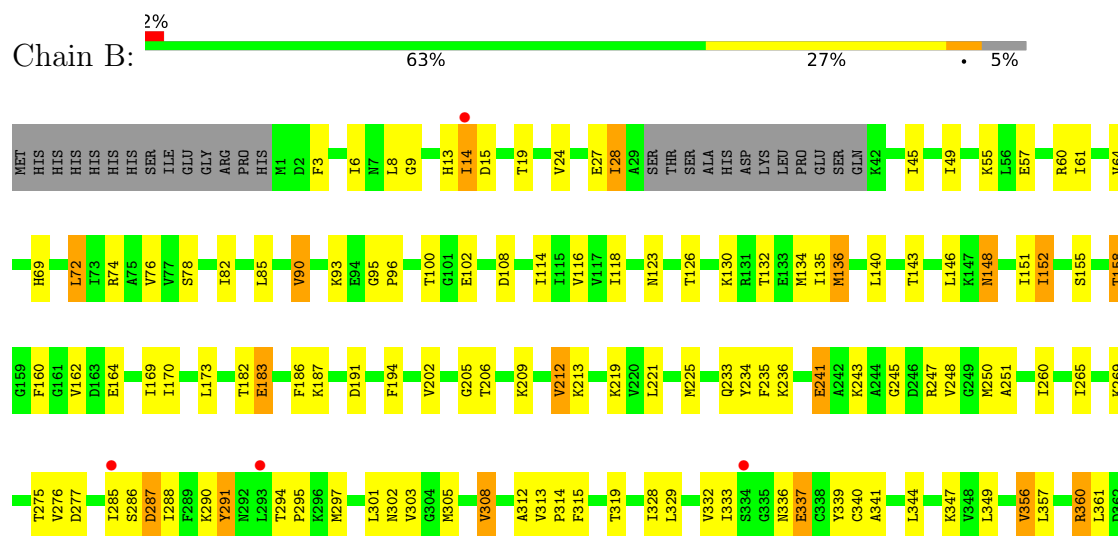
3 Residue-property plots

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 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: TRANSLATION ELONGATION FACTOR SELB

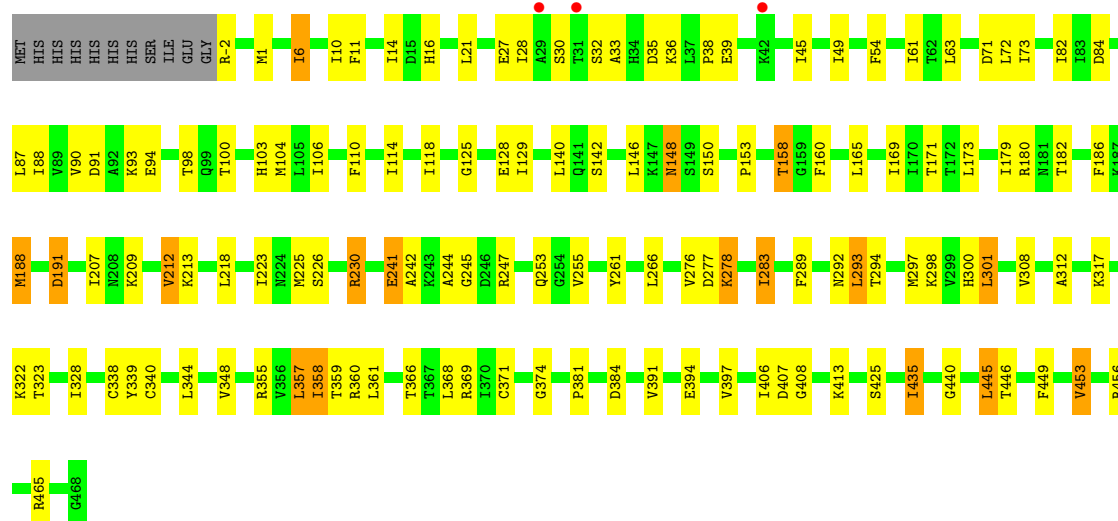


• Molecule 1: TRANSLATION ELONGATION FACTOR SELB

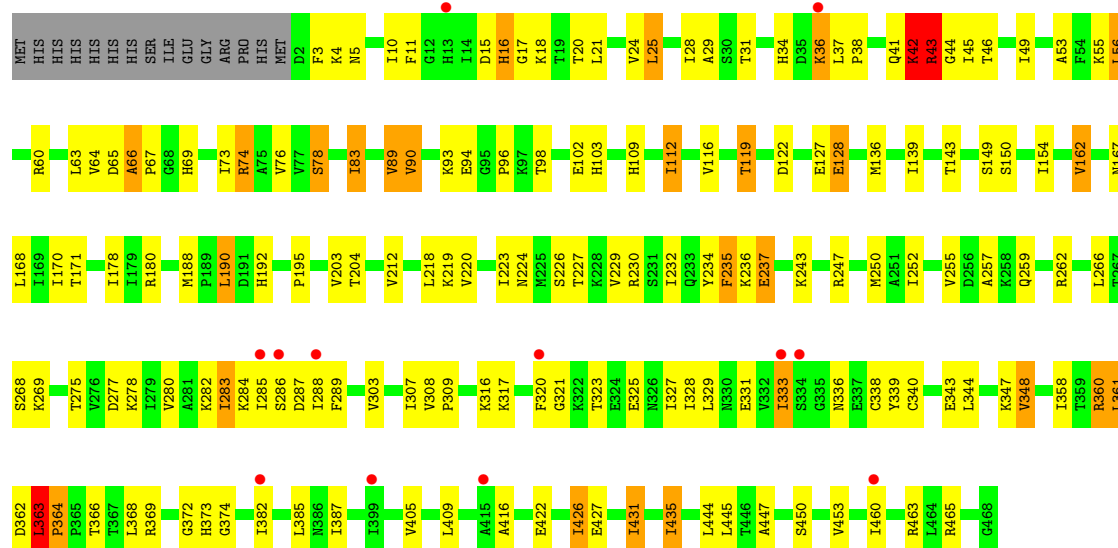




• Molecule 1: TRANSLATION ELONGATION FACTOR SELB



• Molecule 1: TRANSLATION ELONGATION FACTOR SELB



4 Data and refinement statistics

Property	Value	Source
Space group	P 31 1 2	Depositor
Cell constants a, b, c, α , β , γ	146.86Å 146.86Å 297.83Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	19.97 – 3.15 19.97 – 3.15	Depositor EDS
% Data completeness (in resolution range)	86.9 (19.97-3.15) 89.9 (19.97-3.15)	Depositor EDS
R_{merge}	0.11	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.25 (at 3.12Å)	Xtriage
Refinement program	PHENIX (PHENIX.REFINE: 1.8_1069)	Depositor
R, R_{free}	0.172 , 0.215 0.188 , (Not available)	Depositor DCC
R_{free} test set	No test flags present.	wwPDB-VP
Wilson B-factor (Å ²)	100.6	Xtriage
Anisotropy	0.418	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 133.0	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	0.034 for -h,-k,l	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	14529	wwPDB-VP
Average B, all atoms (Å ²)	169.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.41% 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: CMH, DXC, 5GP, SO4

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	0.41	0/3484	0.86	2/4684 (0.0%)
1	B	0.45	0/3541	0.91	6/4760 (0.1%)
1	C	0.52	0/3664	0.92	4/4929 (0.1%)
1	D	0.39	0/3626	0.88	13/4878 (0.3%)
All	All	0.44	0/14315	0.89	25/19251 (0.1%)

There are no bond length outliers.

All (25) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	363	LEU	CA-C-N	10.19	130.88	120.38
1	D	363	LEU	C-N-CA	10.19	130.88	120.38
1	D	364	PRO	N-CA-C	8.39	120.94	110.70
1	D	37	LEU	CA-C-N	-6.90	112.83	120.14
1	D	37	LEU	C-N-CA	-6.90	112.83	120.14
1	D	43	ARG	N-CA-C	-6.56	104.51	113.30
1	D	112	ILE	CA-C-N	6.42	126.77	119.83
1	D	112	ILE	C-N-CA	6.42	126.77	119.83
1	B	194	PHE	CA-C-N	6.07	126.98	120.13
1	B	194	PHE	C-N-CA	6.07	126.98	120.13
1	D	287	ASP	N-CA-C	5.90	117.50	110.19
1	D	66	ALA	N-CA-C	5.78	122.59	109.81
1	C	312	ALA	CA-C-N	-5.76	117.83	122.85
1	C	312	ALA	C-N-CA	-5.76	117.83	122.85
1	B	308	VAL	CB-CA-C	-5.75	104.55	110.13
1	B	308	VAL	N-CA-C	5.54	114.21	107.61
1	D	44	GLY	N-CA-C	-5.25	108.44	114.69
1	C	374	GLY	N-CA-C	5.19	117.62	110.56
1	B	221	LEU	N-CA-C	-5.18	101.13	109.58
1	D	283	ILE	N-CA-C	5.12	115.28	108.11

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	33	ALA	N-CA-C	-5.07	104.17	110.41
1	B	183	GLU	N-CA-C	5.06	117.57	111.40
1	D	288	ILE	N-CA-C	5.03	116.48	111.00
1	A	262	ARG	N-CA-C	5.00	117.38	111.33
1	A	152	ILE	CB-CA-C	-5.00	102.26	111.36

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	3475	0	3656	87	0
1	B	3533	0	3728	92	0
1	C	3651	0	3838	70	0
1	D	3615	0	3800	104	0
2	B	10	0	0	1	0
2	C	25	0	0	1	0
3	B	28	0	39	2	0
3	C	168	0	234	11	0
4	B	24	0	12	2	0
All	All	14529	0	15307	351	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 12.

All (351) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:283:ILE:HG13	1:D:340:CMH:HB3	1.21	1.15
1:C:338:CMH:HB3	1:C:340:CMH:CM	2.03	0.86
1:D:223:ILE:HG21	1:D:259:GLN:HB3	1.58	0.85
1:D:284:LYS:HG3	1:D:336:ASN:HB2	1.63	0.81
1:D:416:ALA:HB1	1:D:445:LEU:HD21	1.61	0.79
1:C:283:ILE:HG12	1:C:358:ILE:HD11	1.70	0.74

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:6:ILE:HD12	1:C:173:LEU:HD13	1.71	0.73
1:B:360:ARG:NH1	1:B:371:CMH:SG	2.61	0.73
1:D:116:VAL:HG11	1:D:136:MET:HG2	1.69	0.72
1:A:104:MET:HE1	1:A:143:THR:HG21	1.74	0.69
1:B:158:THR:HG23	1:D:363:LEU:HB3	1.75	0.69
1:D:422:GLU:H	1:D:435:ILE:HG22	1.57	0.69
1:B:302:ASN:HB2	1:B:357:LEU:HB3	1.76	0.68
1:C:158:THR:HG22	1:C:160:PHE:H	1.58	0.68
1:D:21:LEU:HD22	1:D:89:VAL:HG11	1.76	0.67
1:D:427:GLU:HG2	1:D:460:ILE:HG13	1.76	0.67
1:B:82:ILE:HG23	1:B:245:GLY:HA2	1.76	0.67
1:B:233:GLN:HE21	1:B:236:LYS:HA	1.59	0.67
1:C:283:ILE:HD13	1:C:340:CMH:HB3	1.74	0.67
1:A:104:MET:HE3	1:A:146:LEU:HD12	1.77	0.67
1:C:308:VAL:HG21	1:C:344:LEU:HD13	1.77	0.66
1:D:277:ASP:HB3	1:D:347:LYS:HE2	1.77	0.66
1:A:234:TYR:HB2	1:A:248:VAL:HG12	1.77	0.66
1:A:152:ILE:HD11	1:A:168:LEU:HD22	1.80	0.64
1:D:316:LYS:N	1:D:327:ILE:O	2.29	0.64
1:D:360:ARG:HD2	1:D:363:LEU:HD11	1.78	0.64
1:D:67:PRO:HA	1:D:78:SER:HB2	1.78	0.64
1:B:143:THR:HG21	1:B:146:LEU:HB2	1.80	0.63
1:A:118:ILE:HB	1:A:153:PRO:HA	1.81	0.63
1:B:361:LEU:HA	1:B:369:ARG:HD2	1.81	0.63
1:B:288:ILE:HB	4:B:1474:5GP:HN22	1.64	0.62
1:D:4:LYS:NZ	1:D:178:ILE:O	2.31	0.62
1:C:82:ILE:HG23	1:C:245:GLY:HA2	1.80	0.62
1:B:132:THR:HA	1:B:135:ILE:HD12	1.81	0.62
1:B:69:HIS:NE2	1:B:102:GLU:OE1	2.25	0.62
1:D:218:LEU:HD11	1:D:229:VAL:HG22	1.81	0.61
1:D:73:ILE:O	1:D:74:ARG:HG3	2.00	0.61
1:A:435:ILE:HD11	1:A:445:LEU:HD22	1.83	0.60
1:D:43:ARG:HB3	1:D:45:ILE:HG12	1.82	0.60
1:A:433:GLY:HA3	1:A:449:PHE:HB3	1.82	0.60
1:C:88:ILE:HD12	1:C:114:ILE:HD13	1.83	0.59
1:B:116:VAL:HB	1:B:151:ILE:HG12	1.85	0.59
1:C:88:ILE:HD13	1:C:104:MET:HG2	1.83	0.59
1:B:74:ARG:NH2	2:B:1471:SO4:O4	2.35	0.59
1:D:93:LYS:HA	1:D:128:GLU:HG2	1.84	0.58
1:D:109:HIS:CG	1:D:373:HIS:HE1	2.21	0.58
1:D:338:CMH:SG	1:D:339:TYR:N	2.75	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:114:ILE:HG12	1:B:146:LEU:HD22	1.86	0.58
1:C:110:PHE:CD2	1:C:355:ARG:HD2	2.37	0.58
1:D:409:LEU:HD12	1:D:445:LEU:HD12	1.85	0.58
1:C:27:GLU:HB3	1:C:32:SER:HB2	1.84	0.58
1:B:426:ILE:HB	1:B:431:ILE:HG23	1.85	0.58
1:A:362:ASP:N	1:A:362:ASP:OD1	2.32	0.57
1:B:213:LYS:HG2	1:B:241:GLU:HB2	1.86	0.57
1:D:360:ARG:HH11	1:D:363:LEU:HD21	1.67	0.57
1:C:191:ASP:OD2	1:C:247:ARG:NH1	2.31	0.57
1:B:90:VAL:HG13	1:B:118:ILE:HG12	1.87	0.57
1:C:11:PHE:HB3	1:C:103:HIS:ND1	2.20	0.57
1:C:188:MET:HG3	1:C:207:ILE:HG12	1.86	0.57
1:D:109:HIS:HB3	1:D:373:HIS:HE1	1.70	0.57
1:D:29:ALA:HB2	1:D:56:LEU:HG	1.86	0.57
1:D:83:ILE:HG22	1:D:112:ILE:HD13	1.86	0.57
1:C:125:GLY:O	1:C:129:ILE:HG13	2.05	0.57
1:C:106:ILE:HG12	1:C:357:LEU:HD21	1.87	0.56
1:D:232:ILE:HG12	1:D:250:MET:HG2	1.87	0.56
1:A:158:THR:HG22	1:A:160:PHE:H	1.69	0.56
1:D:38:PRO:HB3	1:D:42:LYS:HD2	1.88	0.56
1:A:66:ALA:HB1	1:A:71:ASP:HB3	1.88	0.56
1:C:36:LYS:HE3	1:C:38:PRO:HB3	1.87	0.56
1:C:100:THR:O	1:C:104:MET:HG3	2.06	0.56
1:A:278:LYS:HD2	1:A:343:GLU:HG2	1.88	0.56
1:D:96:PRO:HG3	1:D:136:MET:SD	2.46	0.56
1:D:109:HIS:CG	1:D:373:HIS:CE1	2.94	0.56
1:D:36:LYS:HB3	1:D:236:LYS:HD2	1.88	0.55
1:B:187:LYS:HB3	1:B:209:LYS:HG3	1.89	0.55
1:B:72:LEU:O	1:B:76:VAL:HG23	2.06	0.55
1:A:313:VAL:HG23	1:A:341:ALA:HB3	1.88	0.55
1:A:345:GLU:HG2	1:A:346:GLU:HG3	1.89	0.55
1:C:283:ILE:HG21	1:C:371:CMH:CM	2.36	0.55
1:C:11:PHE:CE2	1:C:72:LEU:HD22	2.42	0.55
1:A:24:VAL:HG21	1:A:156:ALA:HB1	1.89	0.54
1:C:165:LEU:O	1:C:169:ILE:HG13	2.08	0.54
1:B:8:LEU:HD12	1:B:85:LEU:O	2.08	0.54
1:D:74:ARG:HG2	1:D:361:LEU:HD13	1.88	0.54
1:D:102:GLU:HB2	1:D:366:THR:HG22	1.89	0.54
1:C:148:ASN:OD1	1:C:148:ASN:N	2.41	0.54
1:A:136:MET:HE2	1:A:136:MET:HA	1.90	0.53
1:B:287:ASP:OD1	1:B:287:ASP:N	2.36	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:77:VAL:HG11	1:A:302:ASN:HB3	1.90	0.53
1:B:6:ILE:HG22	1:B:61:ILE:HG23	1.89	0.53
1:D:358:ILE:HD12	1:D:372:GLY:HA3	1.90	0.53
1:A:14:ILE:HA	1:A:18:LYS:NZ	2.23	0.53
1:A:283:ILE:HD12	1:A:340:CMH:HB3	1.91	0.53
1:C:397:VAL:HG11	1:C:453:VAL:HG23	1.90	0.53
1:A:293:LEU:HD13	1:A:329:LEU:HD23	1.91	0.53
1:C:118:ILE:HB	1:C:153:PRO:HA	1.90	0.53
1:B:82:ILE:HD13	1:B:206:THR:HG22	1.91	0.52
1:B:363:LEU:HD13	1:B:364:PRO:HD2	1.91	0.52
1:A:110:PHE:HD1	1:A:355:ARG:HD2	1.73	0.52
1:B:155:SER:HB3	1:B:160:PHE:HB3	1.91	0.52
1:C:110:PHE:CE2	1:C:355:ARG:HD2	2.44	0.52
1:D:3:PHE:HE2	1:D:55:LYS:HE3	1.74	0.52
1:B:406:ILE:HD11	1:B:449:PHE:HZ	1.75	0.52
1:B:93:LYS:HE3	1:B:123:ASN:O	2.09	0.51
1:C:27:GLU:HA	1:C:30:SER:HB3	1.92	0.51
1:A:389:LYS:HB3	1:A:465:ARG:HB3	1.92	0.51
1:C:293:LEU:HD22	1:C:371:CMH:CM	2.40	0.51
1:D:34:HIS:CD2	1:D:236:LYS:HB2	2.45	0.51
1:D:69:HIS:CE1	1:D:103:HIS:CE1	2.98	0.51
1:A:300:HIS:CE1	1:A:309:PRO:HG3	2.46	0.51
1:D:282:LYS:O	1:D:374:GLY:HA2	2.11	0.51
1:C:317:LYS:HD2	1:C:339:TYR:CE2	2.46	0.50
1:D:435:ILE:HG13	1:D:447:ALA:HB2	1.93	0.50
1:B:143:THR:HG22	1:B:146:LEU:H	1.75	0.50
1:B:329:LEU:HB3	1:B:332:VAL:HB	1.93	0.50
1:D:463:ARG:HE	1:D:465:ARG:CZ	2.25	0.50
1:B:60:ARG:HD3	1:B:235:PHE:CD2	2.47	0.50
1:B:265:ILE:HG13	1:B:349:LEU:HD12	1.93	0.50
1:D:15:ASP:HA	1:D:18:LYS:HE2	1.92	0.50
1:A:285:ILE:HG12	1:A:291:TYR:CE2	2.47	0.49
1:A:336:ASN:HA	1:A:338:CMH:CM	2.42	0.49
1:B:152:ILE:HD11	1:B:164:GLU:HB2	1.94	0.49
1:C:213:LYS:HG2	1:C:241:GLU:HB2	1.94	0.49
1:B:140:LEU:O	1:B:143:THR:HB	2.11	0.49
1:A:70:ALA:HA	1:A:73:ILE:HD12	1.92	0.49
1:A:387:ILE:HG23	1:A:467:TRP:HB3	1.95	0.49
1:D:96:PRO:HG3	1:D:136:MET:HE1	1.94	0.49
1:A:398:LYS:HE2	1:A:456:ARG:NH1	2.28	0.49
1:D:109:HIS:CB	1:D:373:HIS:HE1	2.26	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:110:PHE:HE1	1:A:355:ARG:HB3	1.77	0.49
1:A:131:ARG:O	1:A:135:ILE:HG13	2.11	0.49
1:A:285:ILE:HG23	1:A:291:TYR:CD2	2.48	0.49
1:B:148:ASN:ND2	1:D:127:GLU:HB3	2.27	0.49
1:B:294:THR:HB	1:B:297:MET:HB3	1.94	0.49
1:B:377:GLU:HG2	1:B:378:GLU:HG3	1.95	0.49
1:D:56:LEU:HD22	1:D:170:ILE:HD11	1.94	0.49
1:A:338:CMH:HB2	1:A:340:CMH:CM	2.43	0.49
1:D:34:HIS:N	1:D:53:ALA:O	2.46	0.48
1:D:303:VAL:HB	1:D:348:VAL:HG11	1.94	0.48
1:B:243:LYS:HB3	1:B:243:LYS:HE2	1.62	0.48
1:C:322:LYS:HG3	1:C:323:THR:H	1.78	0.48
1:D:360:ARG:HD3	1:D:362:ASP:HB2	1.94	0.48
1:B:301:LEU:HD11	1:B:356:VAL:HG13	1.96	0.48
1:C:10:ILE:HD13	1:C:87:LEU:HB2	1.95	0.48
1:B:160:PHE:CZ	1:D:98:THR:HG23	2.48	0.48
1:D:405:VAL:CG1	1:D:444:LEU:HB3	2.44	0.48
1:B:134:MET:SD	1:D:94:GLU:HG2	2.53	0.48
1:D:405:VAL:HG11	1:D:444:LEU:HB3	1.95	0.48
1:A:136:MET:HE2	1:A:139:ILE:HD12	1.95	0.48
1:A:360:ARG:HG2	1:A:363:LEU:HG	1.96	0.48
1:B:285:ILE:HD12	1:B:371:CMH:CM	2.44	0.48
1:A:308:VAL:HG21	1:A:344:LEU:HD13	1.95	0.48
1:B:82:ILE:HG21	1:B:206:THR:HG21	1.96	0.48
1:B:186:PHE:CE1	1:B:212:VAL:HG22	2.49	0.48
1:A:355:ARG:HG2	1:A:375:LEU:HD23	1.96	0.47
1:B:405:VAL:HG11	1:B:444:LEU:HD13	1.96	0.47
1:D:167:ASN:O	1:D:171:THR:OG1	2.22	0.47
1:A:155:SER:OG	1:A:158:THR:HB	2.14	0.47
1:C:-2:ARG:HE	3:C:1476:DXC:H21	1.79	0.47
1:A:329:LEU:C	1:A:331:GLU:H	2.22	0.47
1:C:230:ARG:HD2	1:C:253:GLN:CD	2.40	0.47
1:C:16:HIS:NE2	1:C:94:GLU:OE2	2.44	0.47
1:D:278:LYS:HG2	1:D:343:GLU:HG2	1.96	0.47
1:A:110:PHE:CD1	1:A:355:ARG:HD2	2.50	0.47
1:A:301:LEU:HD11	1:A:356:VAL:HG13	1.95	0.47
1:D:43:ARG:HH12	1:D:230:ARG:HB3	1.78	0.47
1:A:424:ILE:HG13	1:A:459:VAL:HG13	1.97	0.47
1:B:78:SER:HB2	1:B:305:MET:HG2	1.96	0.47
1:D:5:ASN:OD1	1:D:234:TYR:OH	2.24	0.47
1:B:276:VAL:HG11	1:B:379:PHE:CD1	2.49	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:5:ASN:HD22	1:D:243:LYS:HE3	1.80	0.47
1:D:34:HIS:NE2	1:D:235:PHE:O	2.47	0.47
1:A:105:LEU:O	1:A:109:HIS:ND1	2.42	0.47
1:B:277:ASP:HB2	1:B:347:LYS:HE3	1.96	0.47
1:A:212:VAL:HG11	1:A:250:MET:HE1	1.97	0.46
1:B:305:MET:HB3	1:B:305:MET:HE3	1.56	0.46
1:D:28:ILE:HG22	1:D:162:VAL:HG13	1.98	0.46
1:D:42:LYS:HE2	1:D:237:GLU:HA	1.97	0.46
1:A:312:ALA:HB1	1:A:340:CMH:SG	2.55	0.46
1:B:3:PHE:CE1	1:B:55:LYS:HE3	2.51	0.46
1:D:17:GLY:HA2	1:D:119:THR:HG21	1.97	0.46
1:A:456:ARG:O	1:A:458:LYS:NZ	2.30	0.46
1:B:108:ASP:CG	1:B:143:THR:HG23	2.41	0.46
1:D:190:LEU:HG	1:D:203:VAL:HB	1.97	0.46
1:A:449:PHE:CD1	1:A:453:VAL:HG21	2.50	0.46
1:B:9:GLY:HA2	1:B:64:VAL:HB	1.98	0.46
1:C:84:ASP:CG	1:C:180:ARG:HH22	2.23	0.46
1:D:218:LEU:HD13	1:D:266:LEU:HD11	1.97	0.46
1:A:104:MET:HB3	1:A:104:MET:HE2	1.66	0.46
1:C:54:PHE:HE1	1:C:63:LEU:HD21	1.80	0.46
1:D:122:ASP:OD1	1:D:122:ASP:N	2.48	0.46
1:A:230:ARG:NH2	4:B:1474:5GP:O2'	2.49	0.46
1:A:326:ASN:HD22	1:A:385:LEU:HB3	1.80	0.46
1:B:285:ILE:HD13	1:B:291:TYR:HB3	1.96	0.46
1:C:27:GLU:C	1:C:32:SER:HB2	2.41	0.46
1:C:27:GLU:O	1:C:32:SER:N	2.48	0.46
1:A:240:MET:CE	1:B:96:PRO:HD2	2.46	0.45
1:B:424:ILE:HD12	1:B:459:VAL:HG11	1.99	0.45
1:D:268:SER:OG	1:D:269:LYS:N	2.49	0.45
1:A:20:THR:O	1:A:24:VAL:HG23	2.16	0.45
1:B:285:ILE:HG13	1:B:371:CMH:O	2.15	0.45
1:C:300:HIS:ND1	1:C:361:LEU:HD12	2.32	0.45
1:A:340:CMH:HB2	1:A:342:PHE:CE2	2.51	0.45
1:C:435:ILE:HD12	1:C:445:LEU:HD13	1.98	0.45
1:A:85:LEU:HD13	1:A:172:THR:HG21	1.98	0.45
1:A:240:MET:HE1	1:B:95:GLY:HA3	1.99	0.45
1:C:186:PHE:CE1	1:C:212:VAL:HG22	2.52	0.45
1:D:219:LYS:HE3	1:D:224:ASN:OD1	2.16	0.45
1:A:329:LEU:HD12	1:A:329:LEU:HA	1.83	0.45
1:A:227:THR:HG21	1:A:255:VAL:HG22	1.99	0.45
1:B:225:MET:HE2	1:B:225:MET:HB3	1.84	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:74:ARG:O	1:D:307:ILE:HB	2.17	0.45
1:D:96:PRO:HG3	1:D:136:MET:CE	2.47	0.45
1:B:202:VAL:HA	1:B:250:MET:O	2.16	0.45
1:B:341:ALA:HB1	1:B:382:ILE:HG12	1.99	0.45
1:A:222:PRO:HB3	1:A:349:LEU:HD21	2.00	0.44
1:D:212:VAL:HG22	1:D:232:ILE:HD11	1.99	0.44
1:B:191:ASP:OD2	1:B:247:ARG:NH1	2.47	0.44
1:B:251:ALA:HB1	1:C:1:MET:CE	2.47	0.44
1:C:93:LYS:HG3	1:C:128:GLU:OE1	2.17	0.44
1:C:140:LEU:HD22	1:C:146:LEU:O	2.17	0.44
1:C:407:ASP:OD1	1:C:408:GLY:N	2.50	0.44
1:D:227:THR:HG21	1:D:252:ILE:HD12	1.99	0.44
1:B:397:VAL:O	1:B:456:ARG:N	2.47	0.44
1:D:10:ILE:HD11	1:D:63:LEU:HD11	2.00	0.44
1:D:363:LEU:HA	1:D:364:PRO:HD3	1.66	0.44
1:A:199:ALA:HB3	1:B:290:LYS:HD2	1.99	0.44
1:A:290:LYS:HA	1:A:290:LYS:HD3	1.75	0.44
1:B:234:TYR:HB2	1:B:248:VAL:HG12	2.00	0.44
1:B:315:PHE:O	1:B:339:TYR:N	2.50	0.44
1:A:72:LEU:O	1:A:76:VAL:HG23	2.16	0.44
1:B:130:LYS:HD2	1:B:130:LYS:HA	1.77	0.44
1:A:84:ASP:OD2	1:A:180:ARG:NH2	2.51	0.44
1:A:136:MET:CE	1:A:139:ILE:HD12	2.48	0.44
1:C:158:THR:HG21	3:C:1478:DXC:O2	2.17	0.44
3:C:1479:DXC:H243	3:C:1479:DXC:H222	1.77	0.44
1:B:314:PRO:HA	1:B:339:TYR:O	2.18	0.44
1:D:283:ILE:HA	1:D:373:HIS:O	2.18	0.44
1:D:426:ILE:HB	1:D:431:ILE:HG12	1.98	0.44
1:B:364:PRO:HA	1:B:365:PRO:HD3	1.79	0.44
1:C:10:ILE:HD11	1:C:87:LEU:HD12	2.00	0.44
1:D:188:MET:HE1	1:D:250:MET:SD	2.58	0.44
1:C:10:ILE:HD12	1:C:21:LEU:HD23	1.99	0.44
1:B:82:ILE:HG21	1:B:206:THR:CG2	2.48	0.43
1:B:251:ALA:HB1	1:C:1:MET:HE2	1.99	0.43
1:C:39:GLU:H	1:C:39:GLU:HG2	1.63	0.43
1:C:406:ILE:HD11	1:C:449:PHE:CZ	2.52	0.43
1:D:329:LEU:HD22	1:D:338:CMH:CB	2.48	0.43
1:A:23:LYS:O	1:A:27:GLU:HG2	2.19	0.43
1:A:400:ASP:OD1	1:A:401:LYS:HE3	2.18	0.43
1:B:391:VAL:HB	1:B:465:ARG:HD3	2.00	0.43
1:C:1:MET:HB2	3:C:1476:DXC:H62	1.99	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:74:ARG:HH22	1:D:309:PRO:HD3	1.83	0.43
1:B:417:GLU:O	1:B:420:ILE:HG12	2.18	0.43
1:D:15:ASP:OD1	1:D:16:HIS:ND1	2.51	0.43
1:D:317:LYS:HE2	1:D:339:TYR:OH	2.18	0.43
1:C:301:LEU:CD1	1:C:358:ILE:HG23	2.48	0.43
1:D:5:ASN:OD1	1:D:60:ARG:HD3	2.18	0.43
1:D:136:MET:HB2	1:D:136:MET:HE2	1.75	0.43
1:A:116:VAL:HB	1:A:151:ILE:HG12	2.00	0.43
1:B:24:VAL:O	1:B:28:ILE:HG22	2.18	0.43
1:B:96:PRO:HG3	1:B:136:MET:SD	2.58	0.43
1:B:360:ARG:HH12	1:B:371:CMH:CB	2.31	0.43
1:B:416:ALA:O	1:B:420:ILE:HG23	2.19	0.43
1:A:51:PHE:CE2	1:A:247:ARG:HG2	2.53	0.43
1:A:391:VAL:HG21	1:A:465:ARG:HD3	2.01	0.43
1:B:6:ILE:HG12	1:B:173:LEU:HD13	2.00	0.43
1:B:130:LYS:HE3	1:B:134:MET:HE3	2.01	0.43
1:D:90:VAL:HG21	1:D:136:MET:HE1	2.01	0.43
1:D:308:VAL:HG21	1:D:344:LEU:HB3	2.00	0.43
1:A:240:MET:CE	1:B:95:GLY:HA3	2.49	0.43
1:A:314:PRO:O	1:A:328:ILE:HD12	2.19	0.43
1:B:57:GLU:HG3	1:B:170:ILE:HD13	2.00	0.43
1:C:406:ILE:HD11	1:C:449:PHE:HZ	1.83	0.43
1:C:465:ARG:HG2	2:C:1473:SO4:O1	2.19	0.43
1:A:13:HIS:O	1:A:16:HIS:HB2	2.19	0.42
1:A:84:ASP:O	1:A:113:PRO:HG2	2.19	0.42
1:B:13:HIS:H	1:B:100:THR:HG22	1.84	0.42
1:D:431:ILE:HB	1:D:450:SER:O	2.19	0.42
1:B:219:LYS:HE2	1:B:269:LYS:HA	2.01	0.42
1:B:191:ASP:OD2	1:B:205:GLY:HA2	2.20	0.42
1:D:21:LEU:O	1:D:25:LEU:HB2	2.19	0.42
1:D:192:HIS:HA	1:D:262:ARG:HD2	2.02	0.42
1:C:91:ASP:HB3	1:C:94:GLU:HG2	2.02	0.42
1:D:247:ARG:HD2	1:D:247:ARG:HA	1.77	0.42
1:C:357:LEU:HA	1:C:357:LEU:HD12	1.82	0.42
1:D:66:ALA:HB1	1:D:69:HIS:ND1	2.35	0.42
1:D:363:LEU:HD13	1:D:369:ARG:HH11	1.84	0.42
1:C:277:ASP:HB3	1:C:278:LYS:HG2	2.01	0.42
1:D:280:VAL:HG21	1:D:385:LEU:HD21	2.01	0.42
1:A:158:THR:HG22	1:A:160:PHE:N	2.35	0.42
1:A:214:VAL:HG22	1:A:232:ILE:HG13	2.01	0.42
1:A:109:HIS:HD1	1:A:109:HIS:H	1.68	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:225:MET:HE2	1:C:225:MET:HB3	1.96	0.42
3:C:1478:DXC:H22	3:C:1478:DXC:H82	1.79	0.42
1:D:73:ILE:H	1:D:73:ILE:HG13	1.58	0.42
1:A:69:HIS:CD2	1:A:70:ALA:H	2.38	0.42
1:A:112:ILE:HA	1:A:113:PRO:HD2	1.90	0.41
1:A:302:ASN:HB2	1:A:357:LEU:HB3	2.02	0.41
1:A:322:LYS:HG3	1:A:323:THR:H	1.85	0.41
1:A:380:LYS:HA	1:A:381:PRO:HD3	1.90	0.41
3:C:1479:DXC:H71	3:C:1479:DXC:H182	1.86	0.41
1:D:218:LEU:CD1	1:D:229:VAL:HG22	2.50	0.41
1:D:320:PHE:HE1	1:D:325:GLU:HG3	1.85	0.41
1:B:291:TYR:HD1	1:B:333:ILE:HG22	1.85	0.41
3:B:1473:DXC:H242	3:B:1473:DXC:H13	2.02	0.41
1:C:360:ARG:O	1:C:369:ARG:HB3	2.19	0.41
1:D:150:SER:OG	1:D:168:LEU:HD21	2.20	0.41
1:C:218:LEU:HD12	1:C:266:LEU:HD21	2.02	0.41
1:B:14:ILE:O	1:B:15:ASP:HB2	2.20	0.41
1:B:234:TYR:CD2	1:B:235:PHE:HB2	2.55	0.41
1:C:49:ILE:HD11	3:C:1475:DXC:H161	2.03	0.41
1:C:72:LEU:HD23	1:C:72:LEU:HA	1.86	0.41
1:C:381:PRO:HD2	1:C:384:ASP:HB2	2.03	0.41
1:D:11:PHE:CZ	1:D:67:PRO:HD2	2.55	0.41
1:D:43:ARG:HH22	1:D:230:ARG:HD3	1.85	0.41
1:A:105:LEU:HD23	1:A:105:LEU:HA	1.76	0.41
1:A:188:MET:HA	1:A:189:PRO:HD3	1.92	0.41
1:A:206:THR:HA	1:A:247:ARG:HA	2.03	0.41
1:B:312:ALA:HB1	1:B:340:CMH:SG	2.61	0.41
1:B:328:ILE:HG21	1:B:467:TRP:CD1	2.56	0.41
1:A:364:PRO:HA	1:A:365:PRO:HD3	1.92	0.41
1:C:1:MET:HB2	3:C:1476:DXC:C6	2.51	0.41
1:D:10:ILE:HD13	1:D:21:LEU:HD23	2.02	0.41
3:C:1480:DXC:H221	3:C:1480:DXC:H243	1.70	0.41
1:D:3:PHE:CE2	1:D:55:LYS:HE3	2.54	0.41
1:A:127:GLU:CD	1:A:127:GLU:H	2.27	0.41
1:A:158:THR:CG2	1:A:160:PHE:HB2	2.51	0.41
1:A:303:VAL:HG22	1:A:356:VAL:HG22	2.03	0.41
3:B:1473:DXC:H10	3:B:1473:DXC:H61	1.83	0.41
1:C:289:PHE:CZ	1:C:371:CMH:HB2	2.56	0.41
3:C:1479:DXC:H203	3:C:1479:DXC:H19	1.81	0.41
1:D:34:HIS:HB3	1:D:53:ALA:HB3	2.02	0.41
1:D:218:LEU:HD13	1:D:266:LEU:HD21	2.03	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:227:THR:HB	1:D:255:VAL:HG23	2.03	0.40
1:B:295:PRO:HB3	1:B:328:ILE:HD11	2.01	0.40
1:C:413:LYS:HB2	1:C:440:GLY:O	2.22	0.40
1:D:5:ASN:O	1:D:180:ARG:NH2	2.49	0.40
1:B:376:ILE:HG21	1:B:379:PHE:CE1	2.56	0.40
1:D:74:ARG:HH11	1:D:307:ILE:HG22	1.86	0.40
1:D:195:PRO:HD3	1:D:257:ALA:HB1	2.03	0.40
1:B:78:SER:CB	1:B:305:MET:HG2	2.52	0.40
1:B:114:ILE:HD13	1:B:146:LEU:HD13	2.03	0.40
1:B:336:ASN:HB3	1:B:337:GLU:CD	2.47	0.40
1:A:158:THR:HG22	1:A:160:PHE:HB2	2.02	0.40
1:A:416:ALA:HB1	1:A:445:LEU:HD21	2.04	0.40
1:C:158:THR:HG22	1:C:160:PHE:N	2.33	0.40
1:C:209:LYS:HA	1:C:244:ALA:HB2	2.02	0.40
1:C:212:VAL:HG23	1:C:242:ALA:HB3	2.04	0.40
3:C:1475:DXC:H221	3:C:1475:DXC:H243	1.73	0.40
1:D:223:ILE:HD13	1:D:259:GLN:HB3	2.02	0.40

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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	440/482 (91%)	420 (96%)	19 (4%)	1 (0%)	43	71
1	B	448/482 (93%)	430 (96%)	18 (4%)	0	100	100
1	C	465/482 (96%)	439 (94%)	26 (6%)	0	100	100
1	D	461/482 (96%)	433 (94%)	24 (5%)	4 (1%)	14	43
All	All	1814/1928 (94%)	1722 (95%)	87 (5%)	5 (0%)	36	64

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	42	LYS
1	A	69	HIS
1	D	333	ILE
1	D	321	GLY
1	D	382	ILE

5.3.2 Protein sidechains ⓘ

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	382/412 (93%)	345 (90%)	37 (10%)	8	28
1	B	388/412 (94%)	352 (91%)	36 (9%)	8	29
1	C	402/412 (98%)	352 (88%)	50 (12%)	4	19
1	D	398/412 (97%)	347 (87%)	51 (13%)	4	18
All	All	1570/1648 (95%)	1396 (89%)	174 (11%)	6	22

All (174) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	20	THR
1	A	28	ILE
1	A	57	GLU
1	A	82	ILE
1	A	90	VAL
1	A	102	GLU
1	A	104	MET
1	A	127	GLU
1	A	143	THR
1	A	148	ASN
1	A	150	SER
1	A	152	ILE
1	A	158	THR
1	A	168	LEU
1	A	212	VAL
1	A	252	ILE
1	A	255	VAL

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Mol	Chain	Res	Type
1	A	273	LEU
1	A	319	THR
1	A	327	ILE
1	A	332	VAL
1	A	333	ILE
1	A	345	GLU
1	A	348	VAL
1	A	356	VAL
1	A	362	ASP
1	A	366	THR
1	A	377	GLU
1	A	392	LEU
1	A	396	LYS
1	A	401	LYS
1	A	424	ILE
1	A	435	ILE
1	A	441	THR
1	A	446	THR
1	A	449	PHE
1	A	458	LYS
1	B	14	ILE
1	B	19	THR
1	B	27	GLU
1	B	28	ILE
1	B	45	ILE
1	B	49	ILE
1	B	72	LEU
1	B	90	VAL
1	B	126	THR
1	B	136	MET
1	B	148	ASN
1	B	152	ILE
1	B	158	THR
1	B	162	VAL
1	B	169	ILE
1	B	182	THR
1	B	183	GLU
1	B	212	VAL
1	B	241	GLU
1	B	260	ILE
1	B	275	THR
1	B	286	SER

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Mol	Chain	Res	Type
1	B	287	ASP
1	B	291	TYR
1	B	303	VAL
1	B	308	VAL
1	B	313	VAL
1	B	319	THR
1	B	337	GLU
1	B	344	LEU
1	B	356	VAL
1	B	360	ARG
1	B	363	LEU
1	B	370	ILE
1	B	412	SER
1	B	431	ILE
1	C	6	ILE
1	C	14	ILE
1	C	28	ILE
1	C	35	ASP
1	C	45	ILE
1	C	61	ILE
1	C	71	ASP
1	C	73	ILE
1	C	90	VAL
1	C	98	THR
1	C	142	SER
1	C	148	ASN
1	C	150	SER
1	C	158	THR
1	C	171	THR
1	C	179	ILE
1	C	182	THR
1	C	188	MET
1	C	191	ASP
1	C	212	VAL
1	C	223	ILE
1	C	226	SER
1	C	230	ARG
1	C	241	GLU
1	C	255	VAL
1	C	261	TYR
1	C	276	VAL
1	C	278	LYS

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Mol	Chain	Res	Type
1	C	283	ILE
1	C	292	ASN
1	C	293	LEU
1	C	294	THR
1	C	297	MET
1	C	298	LYS
1	C	301	LEU
1	C	328	ILE
1	C	348	VAL
1	C	357	LEU
1	C	358	ILE
1	C	359	THR
1	C	366	THR
1	C	368	LEU
1	C	391	VAL
1	C	394	GLU
1	C	425	SER
1	C	435	ILE
1	C	445	LEU
1	C	446	THR
1	C	453	VAL
1	C	456	ARG
1	D	16	HIS
1	D	20	THR
1	D	24	VAL
1	D	25	LEU
1	D	31	THR
1	D	36	LYS
1	D	41	GLN
1	D	42	LYS
1	D	43	ARG
1	D	46	THR
1	D	49	ILE
1	D	56	LEU
1	D	64	VAL
1	D	65	ASP
1	D	74	ARG
1	D	76	VAL
1	D	78	SER
1	D	83	ILE
1	D	89	VAL
1	D	90	VAL

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Mol	Chain	Res	Type
1	D	119	THR
1	D	128	GLU
1	D	139	ILE
1	D	143	THR
1	D	149	SER
1	D	154	ILE
1	D	162	VAL
1	D	190	LEU
1	D	204	THR
1	D	220	VAL
1	D	226	SER
1	D	235	PHE
1	D	237	GLU
1	D	275	THR
1	D	285	ILE
1	D	286	SER
1	D	289	PHE
1	D	323	THR
1	D	328	ILE
1	D	331	GLU
1	D	333	ILE
1	D	348	VAL
1	D	360	ARG
1	D	361	LEU
1	D	363	LEU
1	D	368	LEU
1	D	387	ILE
1	D	426	ILE
1	D	431	ILE
1	D	435	ILE
1	D	453	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (12) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	300	HIS
1	A	336	ASN
1	B	123	ASN
1	B	148	ASN
1	B	330	ASN
1	C	69	HIS
1	C	233	GLN

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Mol	Chain	Res	Type
1	C	302	ASN
1	D	69	HIS
1	D	274	GLN
1	D	373	HIS
1	D	455	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

16 non-standard protein/DNA/RNA residues 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	$\# Z > 2$
1	CMH	C	340	1	5,7,8	0.90	0	1,7,9	0.12	0
1	CMH	B	340	1	5,7,8	0.58	0	1,7,9	0.16	0
1	CMH	A	264	1	5,7,8	0.59	0	1,7,9	0.39	0
1	CMH	D	264	1	5,7,8	0.64	0	1,7,9	0.08	0
1	CMH	A	340	1	5,7,8	0.74	0	1,7,9	0.29	0
1	CMH	A	371	1	5,7,8	0.64	0	1,7,9	0.87	0
1	CMH	A	338	1	5,7,8	0.66	0	1,7,9	0.81	0
1	CMH	D	340	1	5,7,8	0.72	0	1,7,9	0.45	0
1	CMH	C	264	1	5,7,8	0.74	0	1,7,9	0.59	0
1	CMH	B	371	1	5,7,8	0.55	0	1,7,9	0.72	0
1	CMH	B	338	1	5,7,8	0.67	0	1,7,9	0.51	0
1	CMH	C	371	1	5,7,8	0.70	0	1,7,9	0.32	0
1	CMH	C	338	1	5,7,8	0.75	0	1,7,9	0.29	0
1	CMH	D	371	1	5,7,8	0.60	0	1,7,9	0.14	0
1	CMH	D	338	1	5,7,8	0.71	0	1,7,9	0.07	0
1	CMH	B	264	1	5,7,8	0.89	0	1,7,9	0.01	0

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
1	CMH	C	340	1	-	0/0/6/8	-
1	CMH	B	340	1	-	0/0/6/8	-
1	CMH	A	264	1	-	0/0/6/8	-
1	CMH	D	264	1	-	0/0/6/8	-
1	CMH	A	340	1	-	0/0/6/8	-
1	CMH	A	371	1	-	0/0/6/8	-
1	CMH	A	338	1	-	0/0/6/8	-
1	CMH	D	340	1	-	0/0/6/8	-
1	CMH	C	264	1	-	0/0/6/8	-
1	CMH	B	371	1	-	0/0/6/8	-
1	CMH	B	338	1	-	0/0/6/8	-
1	CMH	C	371	1	-	0/0/6/8	-
1	CMH	C	338	1	-	0/0/6/8	-
1	CMH	D	371	1	-	0/0/6/8	-
1	CMH	D	338	1	-	0/0/6/8	-
1	CMH	B	264	1	-	0/0/6/8	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

9 monomers are involved in 18 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	C	340	CMH	2	0
1	B	340	CMH	1	0
1	A	340	CMH	4	0
1	A	338	CMH	2	0
1	D	340	CMH	1	0
1	B	371	CMH	4	0
1	C	371	CMH	3	0
1	C	338	CMH	1	0
1	D	338	CMH	2	0

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

15 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
2	SO4	B	1471	-	4,4,4	0.25	0	6,6,6	0.11	0
3	DXC	C	1478	-	31,31,31	1.55	7 (22%)	49,49,49	1.92	16 (32%)
2	SO4	B	1472	-	4,4,4	0.23	0	6,6,6	0.22	0
3	DXC	B	1473	-	31,31,31	1.49	6 (19%)	49,49,49	1.69	13 (26%)
2	SO4	C	1472	-	4,4,4	0.24	0	6,6,6	0.12	0
2	SO4	C	1474	-	4,4,4	0.29	0	6,6,6	0.17	0
3	DXC	C	1479	-	31,31,31	1.57	7 (22%)	49,49,49	1.95	16 (32%)
3	DXC	C	1480	-	31,31,31	1.89	8 (25%)	49,49,49	1.76	10 (20%)
4	5GP	B	1474	-	26,26,26	0.99	1 (3%)	39,40,40	1.74	8 (20%)
3	DXC	C	1476	-	31,31,31	1.69	6 (19%)	49,49,49	1.64	9 (18%)
2	SO4	C	1481	-	4,4,4	0.25	0	6,6,6	0.07	0
3	DXC	C	1477	-	31,31,31	1.66	7 (22%)	49,49,49	1.60	12 (24%)
2	SO4	C	1471	-	4,4,4	0.24	0	6,6,6	0.34	0
2	SO4	C	1473	-	4,4,4	0.23	0	6,6,6	0.08	0
3	DXC	C	1475	-	31,31,31	1.81	8 (25%)	49,49,49	1.82	16 (32%)

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
3	DXC	C	1478	-	-	1/9/71/71	0/4/4/4
3	DXC	C	1479	-	-	7/9/71/71	0/4/4/4

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	DXC	B	1473	-	-	2/9/71/71	0/4/4/4
3	DXC	C	1480	-	-	0/9/71/71	0/4/4/4
4	5GP	B	1474	-	-	2/10/26/26	0/3/3/3
3	DXC	C	1476	-	-	4/9/71/71	0/4/4/4
3	DXC	C	1477	-	-	4/9/71/71	0/4/4/4
3	DXC	C	1475	-	-	2/9/71/71	0/4/4/4

All (50) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	1475	DXC	C12-C13	-4.76	1.47	1.54
3	C	1480	DXC	C12-C13	-4.36	1.47	1.54
3	C	1480	DXC	C18-C4	-4.15	1.47	1.54
3	C	1477	DXC	C12-C13	-4.08	1.48	1.54
3	C	1476	DXC	C12-C13	-3.65	1.49	1.54
3	C	1477	DXC	C18-C4	-3.55	1.48	1.54
3	C	1475	DXC	C20-C12	-3.45	1.48	1.54
3	C	1476	DXC	C12-C11	-3.44	1.49	1.55
3	C	1476	DXC	O1-C13	-3.35	1.38	1.43
3	C	1478	DXC	C18-C4	-3.22	1.49	1.54
3	B	1473	DXC	C12-C13	-3.20	1.49	1.54
3	C	1478	DXC	C20-C12	-3.19	1.49	1.54
3	C	1480	DXC	C5-C4	-3.17	1.48	1.54
3	C	1475	DXC	C12-C11	-3.11	1.50	1.55
3	B	1473	DXC	C20-C12	-3.04	1.49	1.54
3	C	1476	DXC	C20-C12	-3.02	1.49	1.54
3	C	1479	DXC	C18-C4	-3.00	1.49	1.54
3	C	1480	DXC	C12-C11	-2.99	1.50	1.55
3	C	1475	DXC	C18-C4	-2.98	1.49	1.54
3	C	1478	DXC	C12-C13	-2.95	1.50	1.54
3	C	1479	DXC	C12-C11	-2.95	1.50	1.55
3	C	1477	DXC	C4-C10	-2.93	1.51	1.56
3	C	1480	DXC	C4-C3	-2.92	1.50	1.55
3	C	1480	DXC	O1-C13	-2.90	1.38	1.43
3	C	1476	DXC	C18-C4	-2.89	1.49	1.54
3	C	1475	DXC	O1-C13	-2.74	1.39	1.43
3	B	1473	DXC	O1-C13	-2.70	1.39	1.43
3	C	1480	DXC	C4-C10	-2.68	1.51	1.56
3	C	1477	DXC	C12-C11	-2.67	1.51	1.55
3	B	1473	DXC	C18-C4	-2.64	1.50	1.54
4	B	1474	5GP	C6-N1	-2.63	1.33	1.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	1479	DXC	C20-C12	-2.63	1.50	1.54
3	C	1479	DXC	C12-C13	-2.58	1.50	1.54
3	C	1477	DXC	C20-C12	-2.56	1.50	1.54
3	C	1478	DXC	C2-C1	-2.48	1.47	1.52
3	C	1480	DXC	C20-C12	-2.43	1.50	1.54
3	C	1475	DXC	C12-C17	-2.42	1.51	1.55
3	C	1479	DXC	O1-C13	-2.34	1.39	1.43
3	C	1477	DXC	O1-C13	-2.33	1.39	1.43
3	B	1473	DXC	C12-C11	-2.31	1.51	1.55
3	C	1478	DXC	C12-C11	-2.31	1.51	1.55
3	C	1479	DXC	C4-C3	-2.22	1.52	1.55
3	C	1479	DXC	C4-C10	-2.09	1.52	1.56
3	C	1478	DXC	O1-C13	-2.08	1.40	1.43
3	C	1478	DXC	C5-C4	-2.07	1.50	1.54
3	C	1475	DXC	C2-C1	-2.05	1.48	1.52
3	B	1473	DXC	C4-C10	-2.05	1.52	1.56
3	C	1475	DXC	C4-C3	-2.04	1.52	1.55
3	C	1477	DXC	C12-C17	-2.03	1.52	1.55
3	C	1476	DXC	C4-C10	-2.02	1.52	1.56

All (100) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	B	1474	5GP	C5-C4-N3	-5.76	119.22	128.39
3	C	1478	DXC	C7-C8-C9	-4.96	104.25	112.16
3	C	1480	DXC	C18-C4-C5	-4.85	100.60	108.31
3	C	1476	DXC	C18-C4-C3	-4.66	102.64	110.44
3	C	1478	DXC	C10-C14-C13	-4.63	108.23	114.29
3	C	1479	DXC	C8-C9-C10	4.55	115.97	110.52
3	C	1479	DXC	C18-C4-C3	-4.47	102.97	110.44
4	B	1474	5GP	C2-N3-C4	4.30	119.71	112.30
3	B	1473	DXC	C18-C4-C3	-4.21	103.39	110.44
3	C	1480	DXC	C4-C10-C9	-3.83	108.54	112.43
3	C	1475	DXC	C18-C4-C3	-3.79	104.09	110.44
3	C	1480	DXC	C5-C4-C10	3.70	117.09	111.34
3	C	1479	DXC	C10-C14-C13	-3.67	109.49	114.29
3	C	1476	DXC	C10-C4-C3	3.66	113.60	108.51
4	B	1474	5GP	N9-C4-N3	3.64	133.24	125.95
3	C	1475	DXC	C11-C12-C13	-3.58	104.14	107.42
3	C	1475	DXC	O1-C13-C12	-3.55	105.03	111.02
3	C	1479	DXC	C11-C9-C10	-3.53	104.47	109.09
3	B	1473	DXC	C10-C14-C13	-3.49	109.72	114.29

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	1475	DXC	C10-C14-C13	-3.41	109.83	114.29
3	C	1478	DXC	C15-C11-C12	-3.29	100.35	103.54
3	C	1477	DXC	C7-C8-C9	-3.28	106.93	112.16
3	C	1479	DXC	C15-C11-C9	-3.24	113.93	119.10
3	C	1479	DXC	C6-C5-C4	-3.22	107.31	112.74
3	C	1476	DXC	C10-C14-C13	-3.19	110.12	114.29
3	C	1477	DXC	C10-C14-C13	-3.17	110.14	114.29
3	C	1476	DXC	C15-C11-C12	-3.16	100.48	103.54
3	C	1477	DXC	C10-C4-C3	3.14	112.88	108.51
3	C	1476	DXC	C8-C9-C10	3.14	114.28	110.52
3	C	1476	DXC	C4-C10-C9	-3.13	109.25	112.43
3	C	1480	DXC	C22-C21-C19	-3.09	108.68	114.46
3	C	1475	DXC	C3-C2-C1	-3.09	108.05	112.71
3	C	1477	DXC	C11-C9-C10	-3.08	105.06	109.09
3	C	1476	DXC	C7-C8-C9	-3.07	107.26	112.16
3	C	1480	DXC	C7-C8-C9	-3.07	107.27	112.16
3	C	1478	DXC	C6-C5-C4	-3.03	107.63	112.74
3	C	1479	DXC	C18-C4-C10	3.02	115.23	111.18
3	B	1473	DXC	C17-C12-C13	3.01	120.38	117.67
3	B	1473	DXC	C6-C5-C4	-3.01	107.66	112.74
3	C	1475	DXC	C18-C4-C5	-2.94	103.63	108.31
3	B	1473	DXC	C10-C4-C3	2.92	112.58	108.51
3	C	1479	DXC	C12-C17-C19	-2.90	115.97	119.48
3	B	1473	DXC	C18-C4-C10	2.90	115.08	111.18
3	B	1473	DXC	C20-C12-C17	-2.87	106.71	111.20
3	C	1478	DXC	C16-C15-C11	-2.84	99.58	105.14
3	C	1475	DXC	C7-C8-C9	-2.77	107.74	112.16
3	C	1480	DXC	C10-C4-C3	2.77	112.36	108.51
3	C	1478	DXC	C2-C1-C6	-2.75	107.26	110.62
3	C	1479	DXC	C15-C11-C12	-2.74	100.88	103.54
3	C	1480	DXC	C14-C13-C12	-2.72	108.50	111.26
3	C	1475	DXC	C24-C19-C21	-2.71	106.15	110.34
3	C	1477	DXC	C15-C11-C12	-2.70	100.92	103.54
3	C	1478	DXC	C14-C13-C12	-2.67	108.55	111.26
3	C	1477	DXC	C14-C13-C12	-2.66	108.56	111.26
3	C	1479	DXC	C5-C4-C3	2.65	111.55	107.75
3	C	1475	DXC	C20-C12-C11	2.64	115.33	111.20
3	C	1478	DXC	C10-C4-C3	2.62	112.16	108.51
3	C	1480	DXC	C15-C11-C12	-2.58	101.04	103.54
3	C	1478	DXC	C3-C2-C1	-2.57	108.83	112.71
3	C	1476	DXC	C15-C11-C9	-2.55	115.03	119.10
3	C	1478	DXC	C18-C4-C3	-2.54	106.19	110.44

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	1477	DXC	C8-C9-C10	2.54	113.56	110.52
3	B	1473	DXC	C7-C8-C9	-2.53	108.12	112.16
3	C	1480	DXC	C8-C9-C10	2.49	113.51	110.52
4	B	1474	5GP	C5-C6-N1	2.47	119.54	113.25
3	C	1478	DXC	C24-C19-C21	-2.47	106.52	110.34
3	C	1479	DXC	C2-C3-C4	-2.45	110.06	112.66
3	C	1477	DXC	C16-C15-C11	-2.42	100.41	105.14
3	C	1475	DXC	C17-C12-C13	-2.41	115.50	117.67
3	C	1478	DXC	O4-C23-C22	2.40	121.57	114.00
3	C	1478	DXC	C8-C9-C10	2.36	113.35	110.52
4	B	1474	5GP	C2-N1-C6	-2.35	120.85	125.11
4	B	1474	5GP	O6-C6-C5	-2.30	120.45	126.53
3	C	1479	DXC	C20-C12-C17	-2.29	107.61	111.20
4	B	1474	5GP	O2P-P-O5'	-2.28	100.73	106.67
3	C	1477	DXC	C17-C12-C13	-2.27	115.62	117.67
3	C	1479	DXC	C24-C19-C17	-2.27	109.48	112.88
3	C	1475	DXC	C18-C4-C10	2.26	114.22	111.18
3	B	1473	DXC	O4-C23-C22	2.22	121.00	114.00
3	C	1477	DXC	C2-C3-C7	-2.21	107.91	111.73
4	B	1474	5GP	N9-C8-N7	-2.20	109.32	113.40
3	C	1475	DXC	C11-C9-C10	-2.18	106.23	109.09
3	B	1473	DXC	C20-C12-C11	2.18	114.62	111.20
3	C	1475	DXC	C2-C3-C4	-2.17	110.35	112.66
3	C	1478	DXC	C18-C4-C5	-2.16	104.87	108.31
3	C	1478	DXC	C2-C3-C7	-2.15	108.01	111.73
3	B	1473	DXC	C15-C11-C9	-2.14	115.69	119.10
3	C	1477	DXC	C6-C5-C4	-2.13	109.14	112.74
3	C	1479	DXC	C10-C4-C3	2.12	111.46	108.51
3	C	1480	DXC	C5-C4-C3	-2.11	104.72	107.75
3	C	1477	DXC	O1-C13-C14	2.10	113.39	109.12
3	C	1476	DXC	C18-C4-C5	-2.10	104.97	108.31
3	B	1473	DXC	C12-C11-C9	2.09	116.94	114.69
3	C	1475	DXC	C5-C4-C10	2.04	114.51	111.34
3	B	1473	DXC	C4-C10-C9	-2.04	110.36	112.43
3	C	1479	DXC	C18-C4-C5	-2.03	105.08	108.31
3	C	1475	DXC	C2-C1-C6	-2.02	108.15	110.62
3	C	1475	DXC	C17-C12-C11	2.01	102.13	100.11
3	C	1479	DXC	C7-C8-C9	-2.00	108.96	112.16
3	C	1478	DXC	C8-C7-C3	-2.00	107.96	111.84

There are no chirality outliers.

All (22) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	C	1479	DXC	C16-C17-C19-C24
3	C	1479	DXC	C12-C17-C19-C24
3	C	1476	DXC	C24-C19-C21-C22
3	C	1479	DXC	C24-C19-C21-C22
3	C	1479	DXC	C12-C17-C19-C21
3	C	1477	DXC	C24-C19-C21-C22
4	B	1474	5GP	C3'-C4'-C5'-O5'
3	C	1476	DXC	C17-C19-C21-C22
3	C	1479	DXC	C16-C17-C19-C21
3	C	1477	DXC	C17-C19-C21-C22
4	B	1474	5GP	O4'-C4'-C5'-O5'
3	C	1478	DXC	C17-C19-C21-C22
3	C	1479	DXC	C17-C19-C21-C22
3	C	1479	DXC	C19-C21-C22-C23
3	B	1473	DXC	C21-C22-C23-O3
3	B	1473	DXC	C21-C22-C23-O4
3	C	1476	DXC	C21-C22-C23-O4
3	C	1475	DXC	C21-C22-C23-O4
3	C	1475	DXC	C21-C22-C23-O3
3	C	1476	DXC	C21-C22-C23-O3
3	C	1477	DXC	C21-C22-C23-O4
3	C	1477	DXC	C21-C22-C23-O3

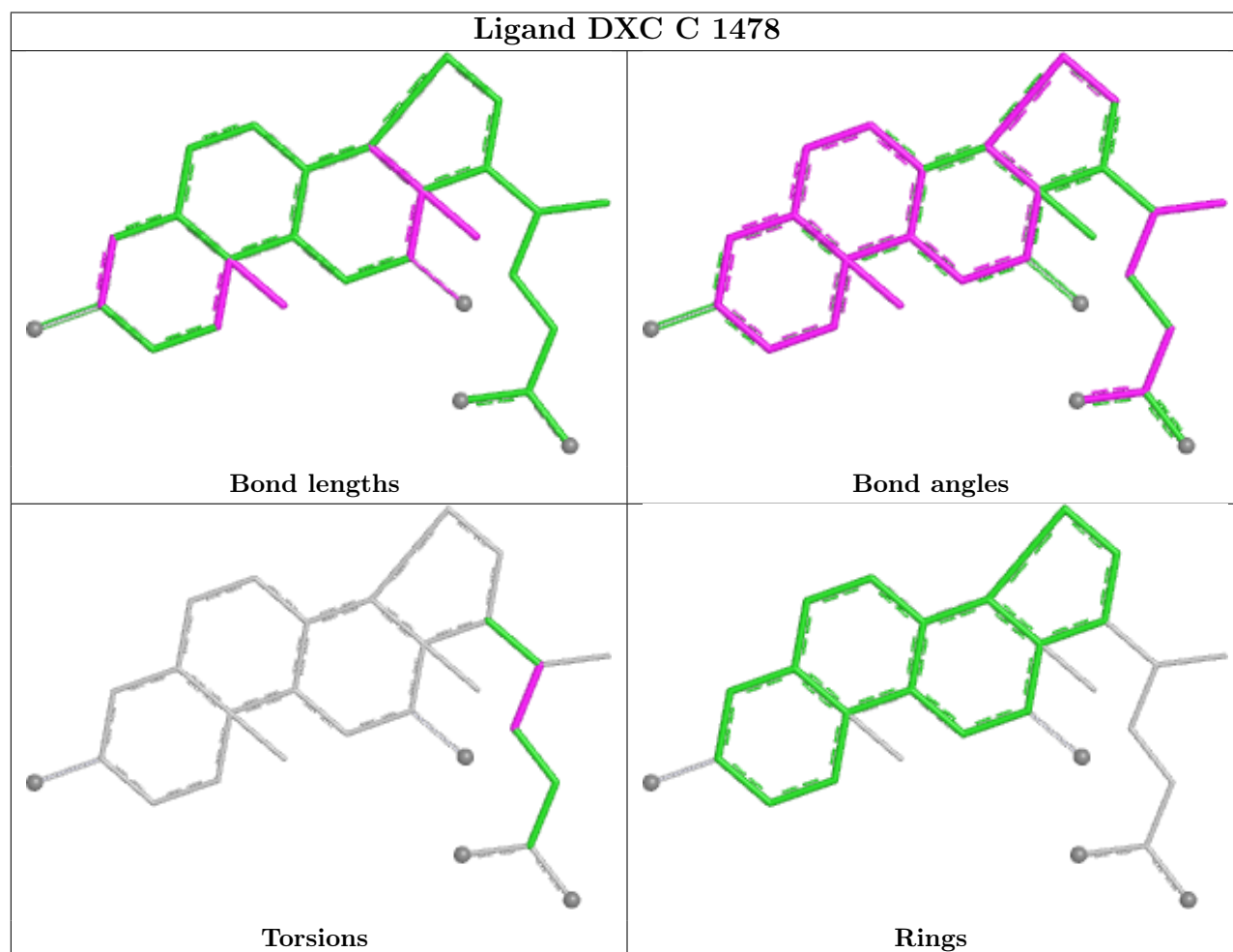
There are no ring outliers.

9 monomers are involved in 17 short contacts:

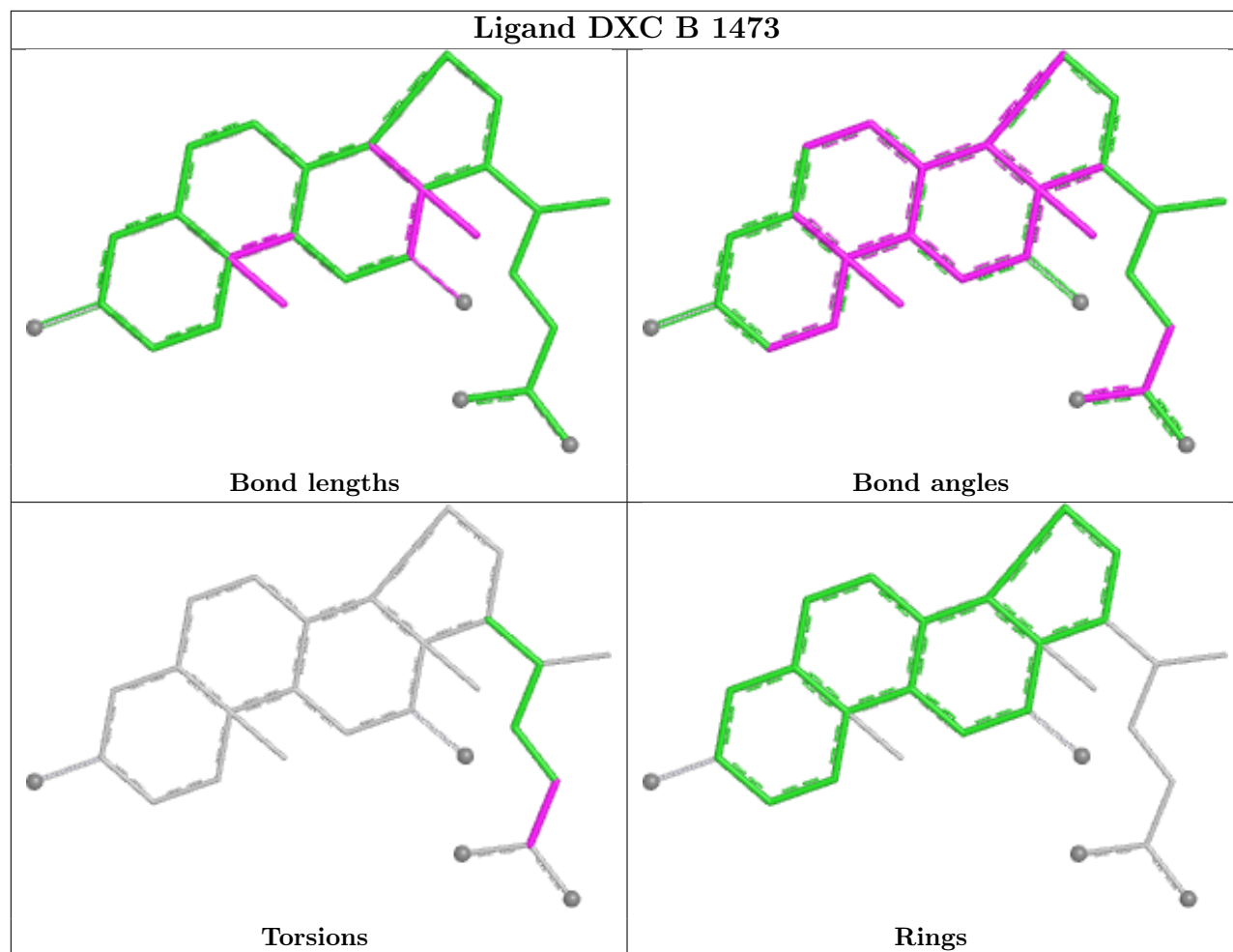
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	1471	SO4	1	0
3	C	1478	DXC	2	0
3	B	1473	DXC	2	0
3	C	1479	DXC	3	0
3	C	1480	DXC	1	0
4	B	1474	5GP	2	0
3	C	1476	DXC	3	0
2	C	1473	SO4	1	0
3	C	1475	DXC	2	0

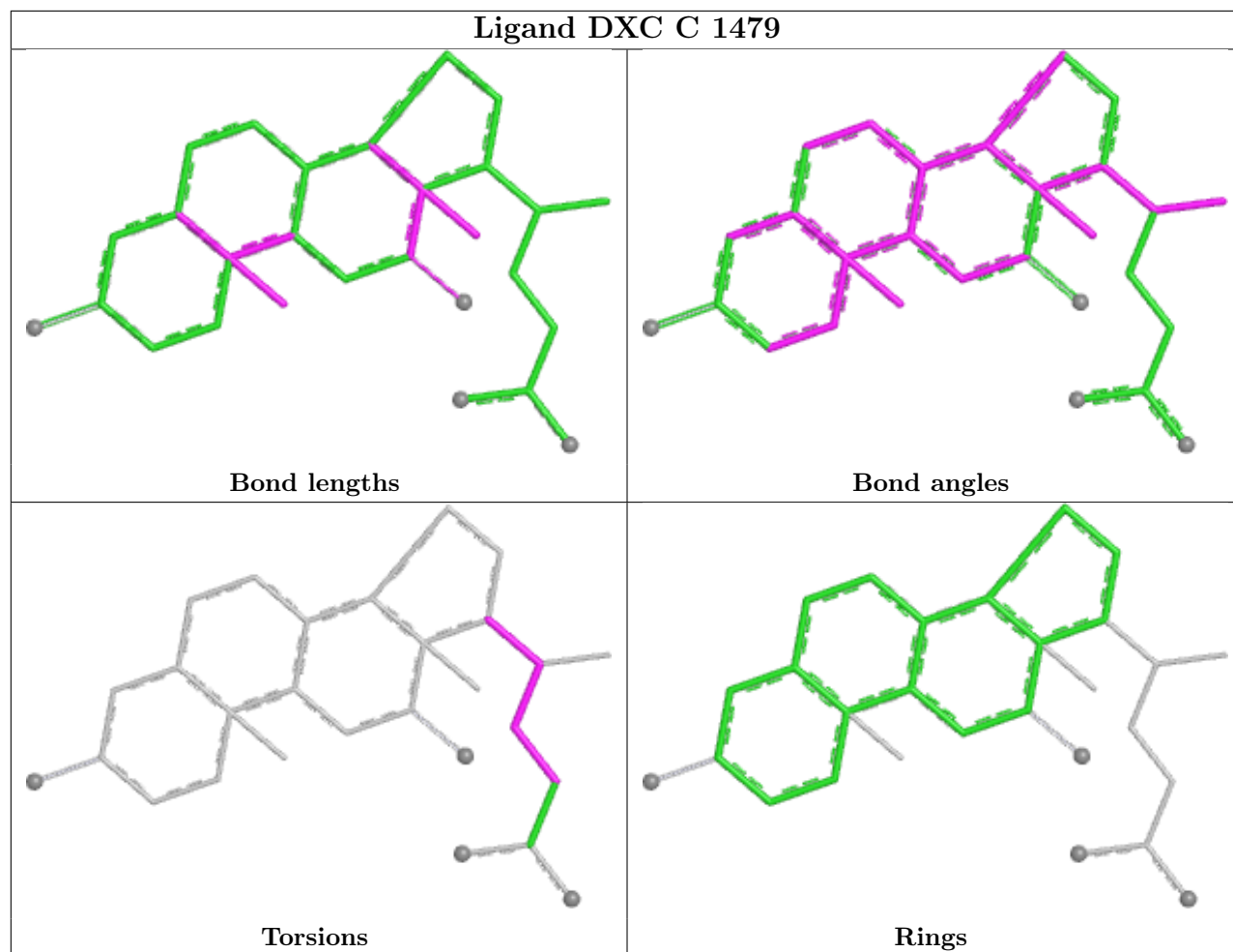
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

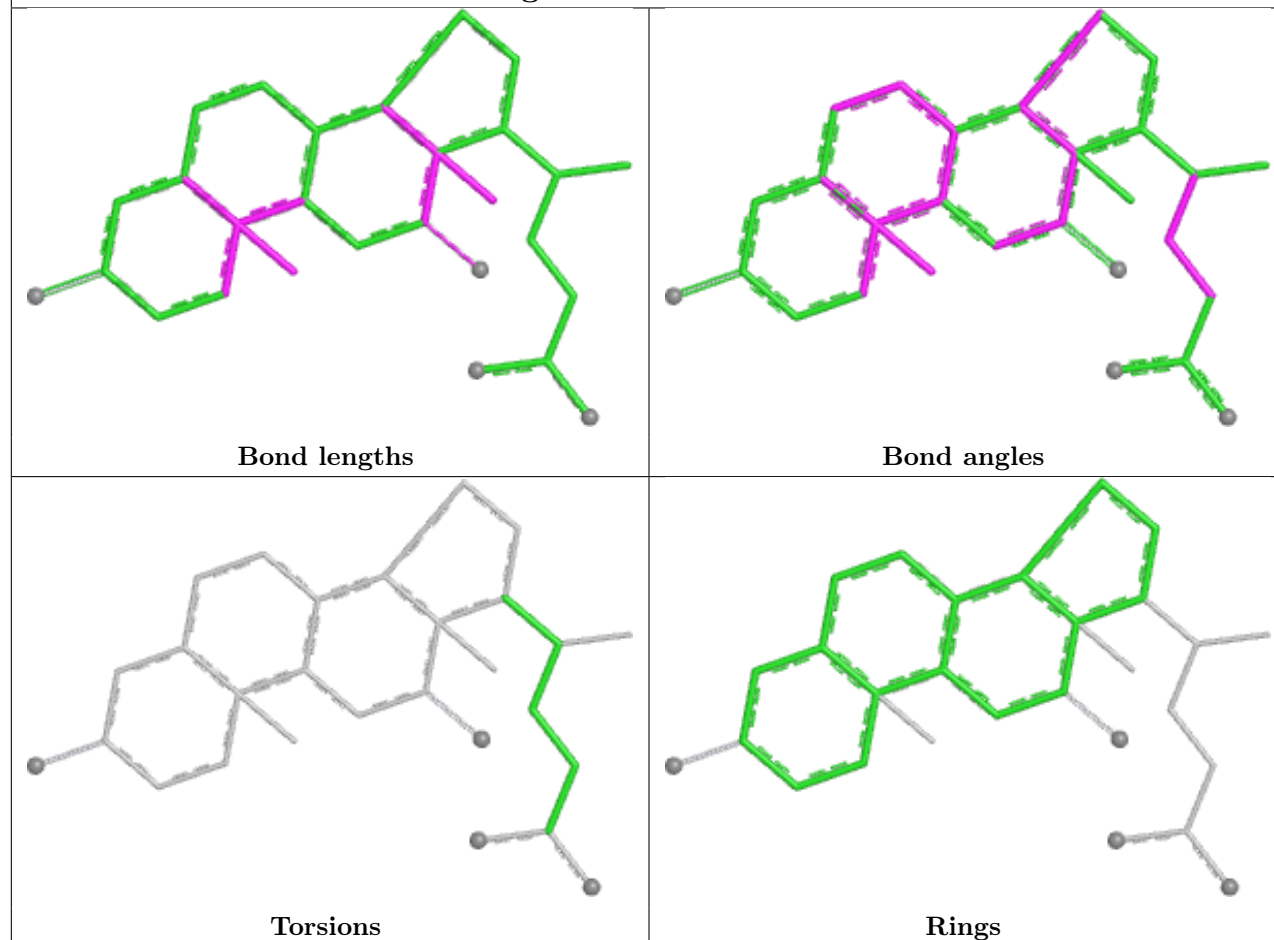


Ligand DXC B 1473

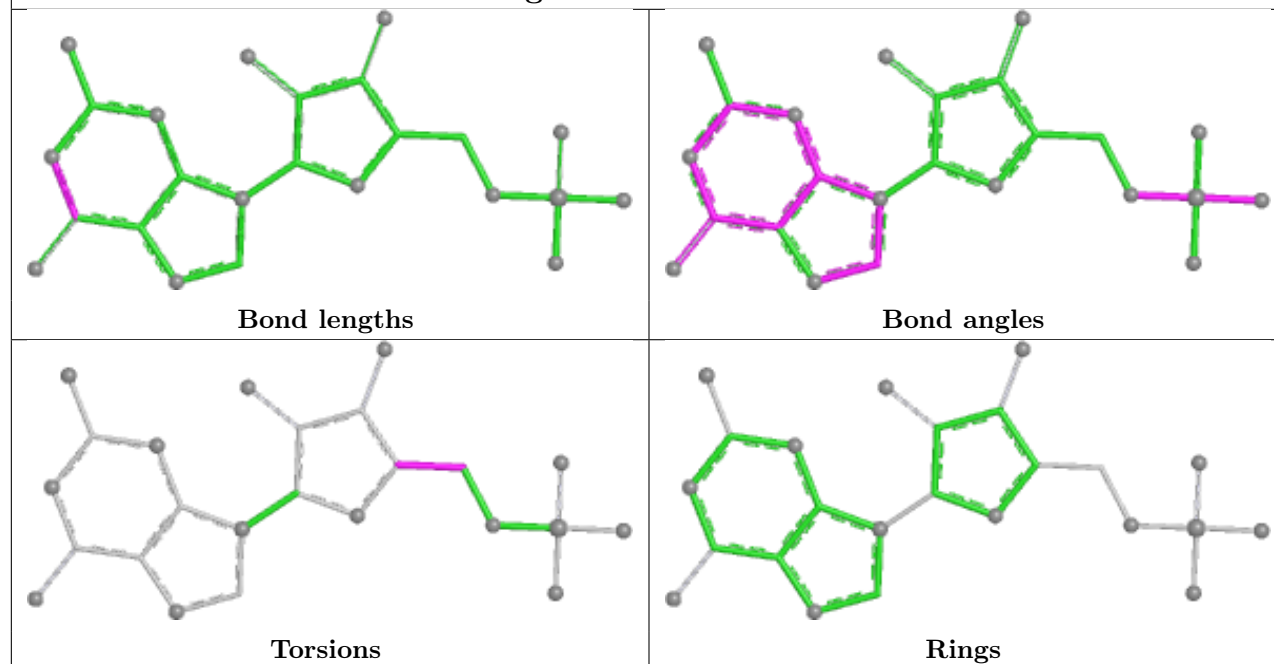


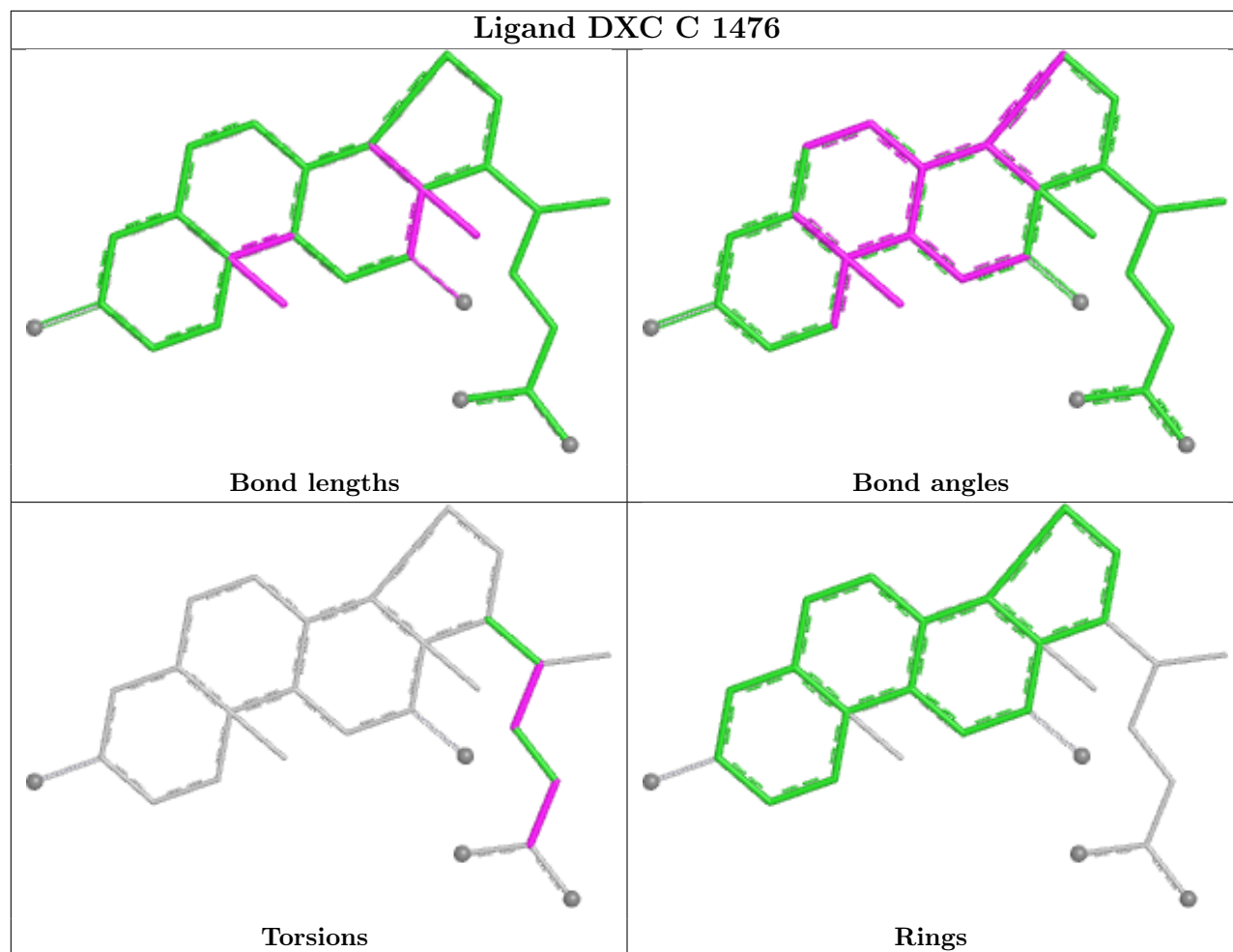


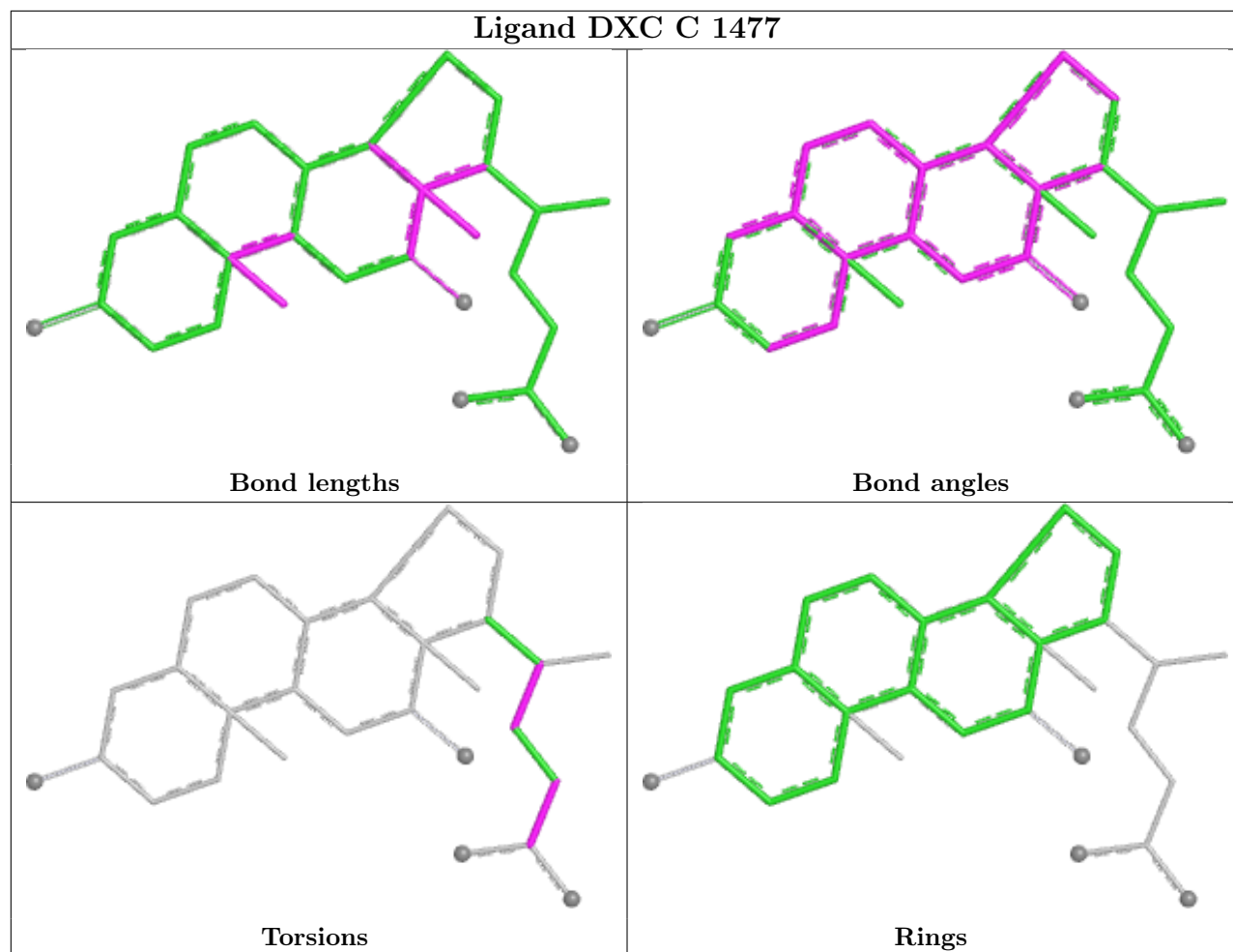
Ligand DXC C 1480

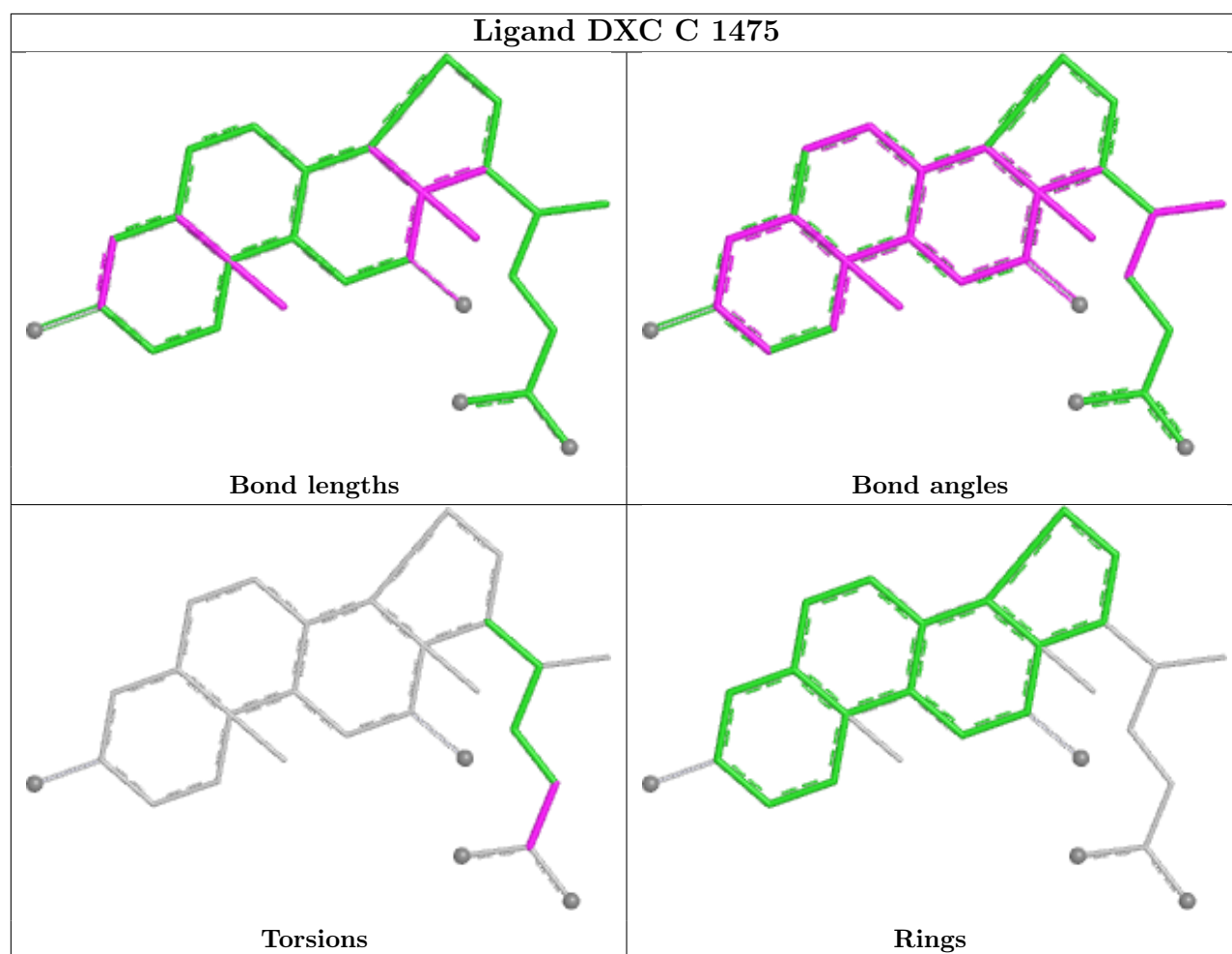


Ligand 5GP B 1474









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(Å ²)	Q<0.9
1	A	444/482 (92%)	-0.26	4 (0%) 81 64	89, 172, 246, 330	0
1	B	452/482 (93%)	-0.29	10 (2%) 62 41	67, 130, 321, 373	0
1	C	467/482 (96%)	-0.45	3 (0%) 85 72	65, 105, 204, 279	0
1	D	463/482 (96%)	0.02	12 (2%) 57 36	117, 220, 320, 374	0
All	All	1826/1928 (94%)	-0.24	29 (1%) 70 50	65, 163, 299, 374	0

All (29) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	291	TYR	3.8
1	D	399	ILE	3.7
1	B	447	ALA	3.2
1	D	333	ILE	3.0
1	D	334	SER	2.9
1	D	286	SER	2.8
1	C	31	THR	2.7
1	B	399	ILE	2.5
1	B	445	LEU	2.5
1	A	297	MET	2.5
1	A	333	ILE	2.5
1	C	42	LYS	2.4
1	B	397	VAL	2.4
1	B	293	LEU	2.3
1	D	382	ILE	2.3
1	D	460	ILE	2.3
1	D	415	ALA	2.3
1	B	404	THR	2.3
1	D	320	PHE	2.3
1	B	334	SER	2.2
1	A	15	ASP	2.2

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Mol	Chain	Res	Type	RSRZ
1	D	288	ILE	2.1
1	C	29	ALA	2.1
1	D	36	LYS	2.1
1	B	14	ILE	2.1
1	D	285	ILE	2.1
1	D	13	HIS	2.1
1	B	285	ILE	2.0
1	B	426	ILE	2.0

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

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(Å ²)	Q<0.9
1	CMH	B	338	8/9	0.68	0.23	157,190,227,235	2
1	CMH	D	338	8/9	0.70	0.16	187,264,268,302	2
1	CMH	B	371	8/9	0.83	0.13	141,161,218,263	2
1	CMH	A	371	8/9	0.88	0.14	154,165,195,202	2
1	CMH	D	371	8/9	0.94	0.15	129,151,184,191	2
1	CMH	D	340	8/9	0.95	0.12	155,269,276,276	2
1	CMH	A	338	8/9	0.95	0.13	149,179,204,211	2
1	CMH	B	340	8/9	0.97	0.12	141,161,259,276	2
1	CMH	C	340	8/9	0.97	0.08	58,87,108,131	2
1	CMH	D	264	8/9	0.97	0.07	164,180,206,220	2
1	CMH	C	338	8/9	0.98	0.09	72,94,152,200	2
1	CMH	A	264	8/9	0.98	0.08	166,181,195,201	2
1	CMH	A	340	8/9	0.98	0.10	150,189,198,212	2
1	CMH	B	264	8/9	0.99	0.06	57,72,95,100	2
1	CMH	C	371	8/9	0.99	0.07	55,102,148,154	2
1	CMH	C	264	8/9	1.00	0.05	61,95,114,120	0

6.3 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

6.4 Ligands

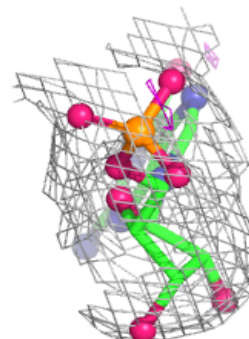
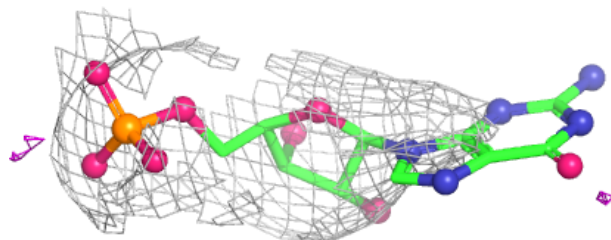
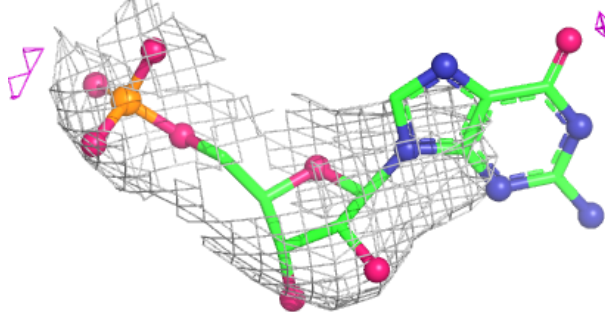
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q<0.9' lists 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
2	SO4	B	1471	5/5	0.83	0.12	172,203,237,246	0
2	SO4	C	1473	5/5	0.86	0.07	138,173,210,226	5
2	SO4	B	1472	5/5	0.87	0.11	94,222,224,320	0
2	SO4	C	1474	5/5	0.87	0.09	156,216,245,297	5
2	SO4	C	1481	5/5	0.89	0.10	157,190,196,199	5
2	SO4	C	1471	5/5	0.91	0.10	93,127,147,181	0
4	5GP	B	1474	24/24	0.91	0.14	204,243,284,292	0
2	SO4	C	1472	5/5	0.94	0.09	112,131,153,180	0
3	DXC	C	1476	28/28	0.95	0.10	139,146,204,235	0
3	DXC	C	1478	28/28	0.96	0.08	73,105,138,168	0
3	DXC	C	1477	28/28	0.96	0.07	67,90,157,199	0
3	DXC	B	1473	28/28	0.97	0.08	62,82,119,128	0
3	DXC	C	1479	28/28	0.97	0.07	72,89,173,216	28
3	DXC	C	1480	28/28	0.97	0.07	64,76,98,107	0
3	DXC	C	1475	28/28	0.97	0.07	64,79,119,144	0

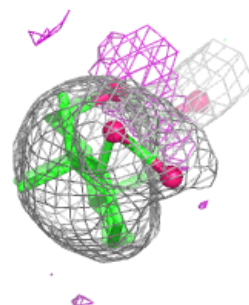
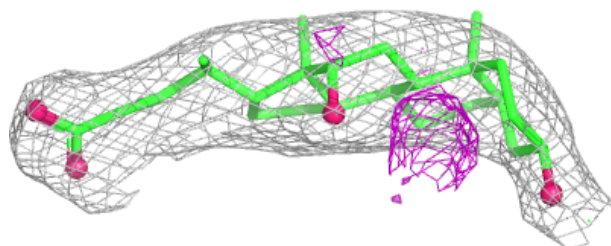
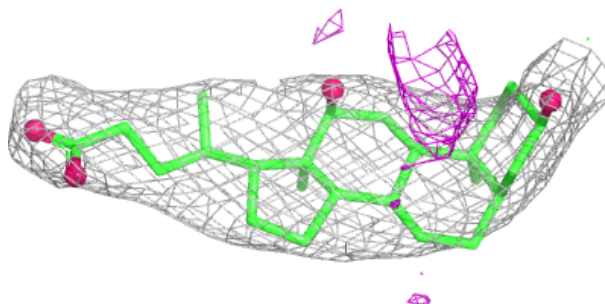
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around 5GP B 1474:

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

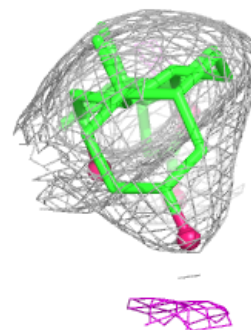
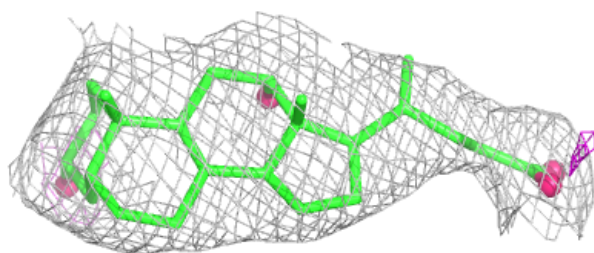
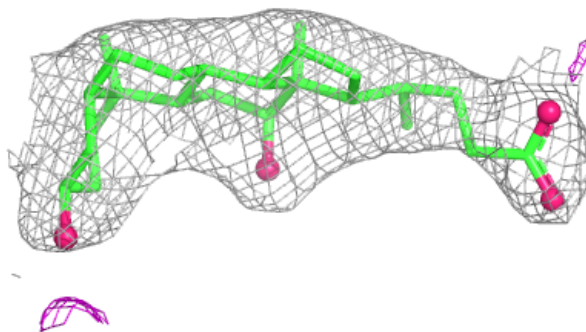
**Electron density around DXC C 1476:**

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

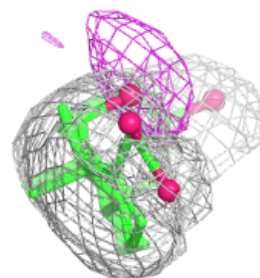
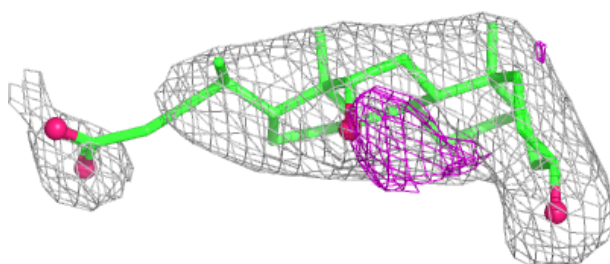
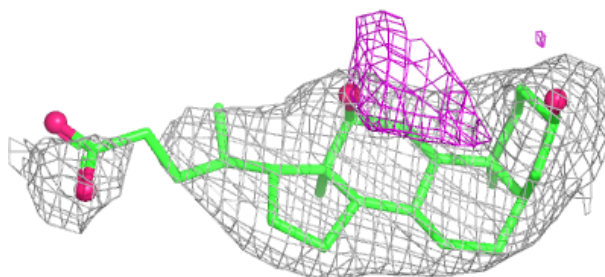


Electron density around DXC C 1478:

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

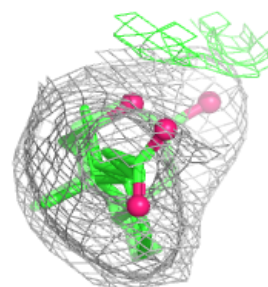
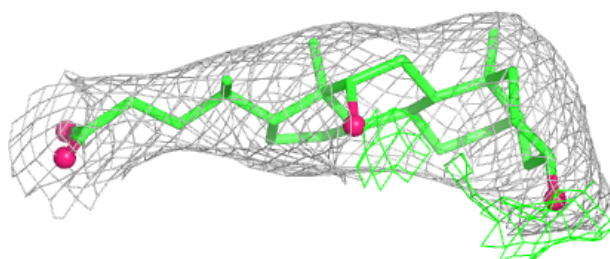
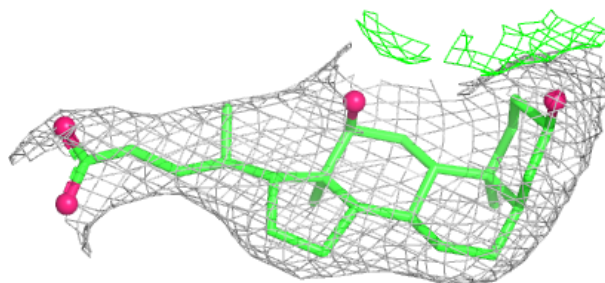
**Electron density around DXC C 1477:**

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

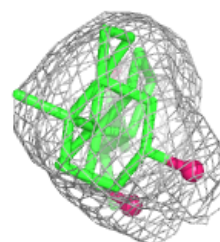
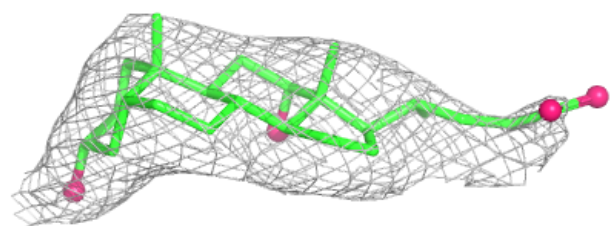
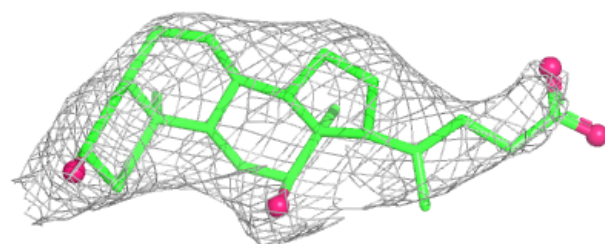


Electron density around DXC B 1473:

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

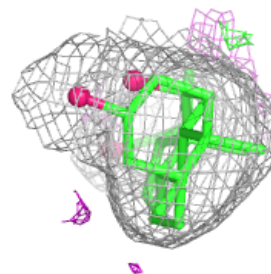
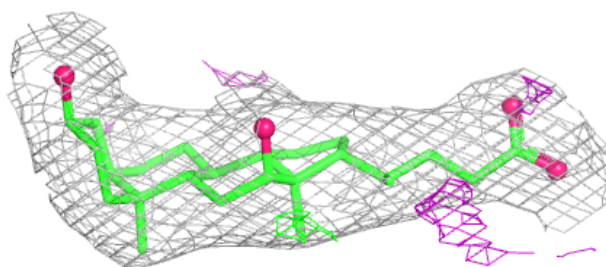
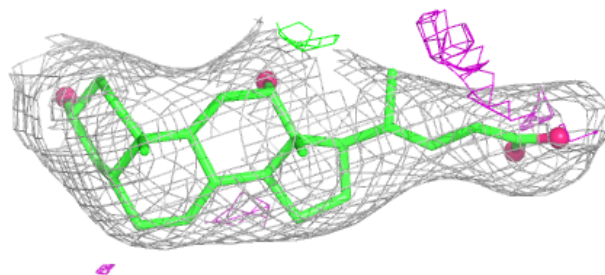
**Electron density around DXC C 1479:**

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

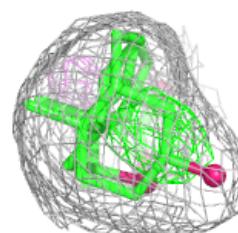
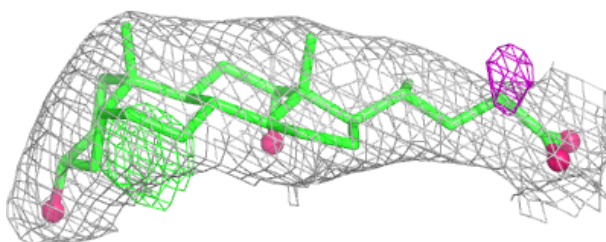
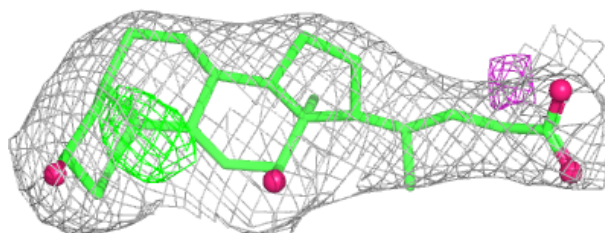


Electron density around DXC C 1480:

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

**Electron density around DXC C 1475:**

$2mF_o-DF_c$ (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.