



Full wwPDB X-ray Structure Validation Report ⓘ

Jun 20, 2016 – 01:49 AM EDT

PDB ID : 5EJA
Title : EcMenD-ThDP-Mn²⁺ complex soaked with 2-ketoglutarate for 2 min and soaked with isochorismate for 7 min
Authors : Song, H.G.; Dong, C.; Chen, Y.Z.; Sun, Y.R.; Guo, Z.H.
Deposited on : 2015-11-01
Resolution : 1.60 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
<http://wwpdb.org/validation/2016/XrayValidationReportHelp>
with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467
Mogul : 1.7.1 (RC1), CSD as537be (2016)
Xtriage (Phenix) : 1.9-1692
EDS : rb-20027790
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)
Refmac : 5.8.0135
CCP4 : 6.5.0
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : rb-20027790

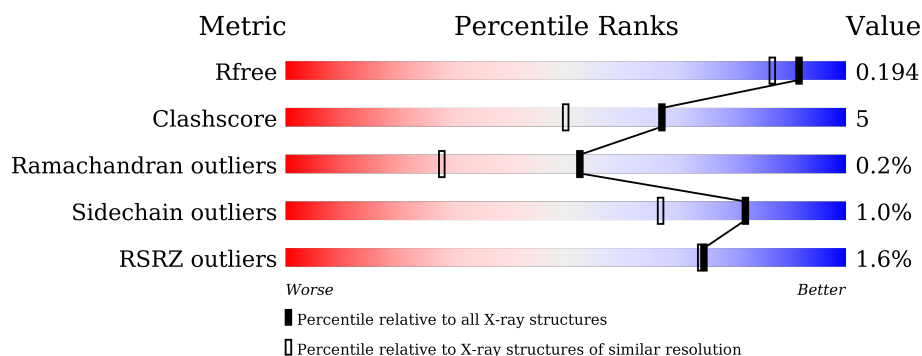
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.60 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.



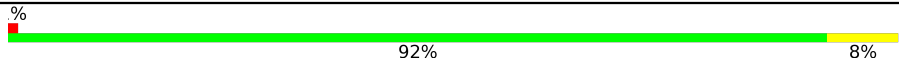
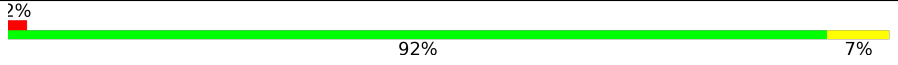
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	91344	2475 (1.60-1.60)
Clashscore	102246	2732 (1.60-1.60)
Ramachandran outliers	100387	2654 (1.60-1.60)
Sidechain outliers	100360	2653 (1.60-1.60)
RSRZ outliers	91569	2479 (1.60-1.60)

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 on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. 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	556	<div> <div>2%</div> <div> <div></div> <div>90%</div> <div>10%</div> </div> </div>
1	B	556	<div> <div>%</div> <div> <div></div> <div>94%</div> <div>6%</div> </div> </div>
1	C	556	<div> <div>%</div> <div> <div></div> <div>90%</div> <div>9%</div> </div> </div>
1	D	556	<div> <div>3%</div> <div> <div></div> <div>89%</div> <div>11%</div> </div> </div>
1	E	556	<div> <div>2%</div> <div> <div></div> <div>90%</div> <div>10%</div> </div> </div>
1	F	556	<div> <div>%</div> <div> <div></div> <div>92%</div> <div>8%</div> </div> </div>

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Mol	Chain	Length	Quality of chain
1	G	556	 92% 8%
1	H	556	 92% 7%

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
2	TD6	A	601	-	-	-	X
2	TD6	B	601	-	-	-	X
2	TD6	C	601	-	-	-	X
2	TD6	D	601	-	-	-	X
2	TD6	E	601	-	-	-	X
2	TD6	H	601	-	-	-	X
4	GOL	A	603	-	-	-	X
4	GOL	E	603	-	-	-	X
4	GOL	H	603	-	-	-	X

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 40819 atoms, of which 224 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 2-succinyl-5-enolpyruvyl-6-hydroxy-3-cyclohexene-1-carboxylate synthase.

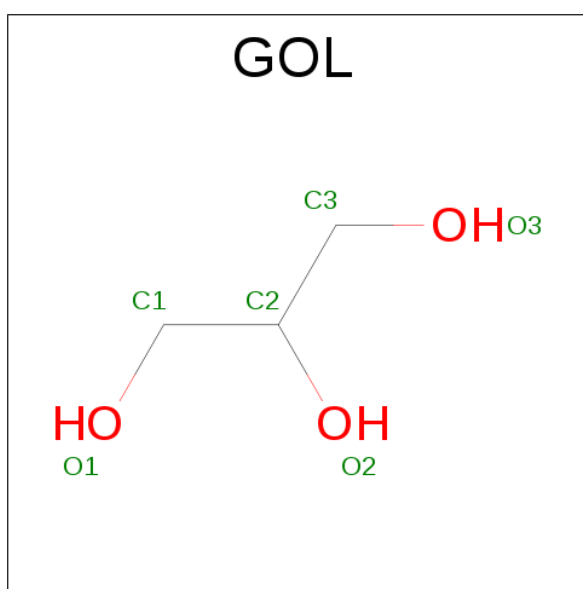
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	556	Total	C	N	O	S	0	8	0
			4370	2773	789	793	15			
1	B	556	Total	C	N	O	S	0	4	0
			4335	2752	777	791	15			
1	C	556	Total	C	N	O	S	0	7	0
			4367	2770	789	793	15			
1	D	556	Total	C	N	O	S	0	3	0
			4309	2738	770	787	14			
1	E	556	Total	C	N	O	S	0	10	0
			4387	2782	789	802	14			
1	F	556	Total	C	N	O	S	0	7	0
			4370	2769	786	801	14			
1	G	556	Total	C	N	O	S	0	7	0
			4352	2762	782	794	14			
1	H	556	Total	C	N	O	S	0	6	0
			4336	2756	777	789	14			

- Molecule 2 is (4S)-4-{3-[(4-amino-2-methylpyrimidin-5-yl)methyl]-5-(2-{[(S)-hydroxy(phosphonooxy)phosphoryl]oxy}ethyl)-4-methyl-1,3lambda 5 -thiazol-2-yl}-4-hydroxybutanoic acid (three-letter code: TD6) (formula: C₁₆H₂₅N₄O₁₀P₂S).

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	B	1	Total 1	Mn 1	0	0
3	C	1	Total 1	Mn 1	0	0
3	A	1	Total 1	Mn 1	0	0
3	F	1	Total 1	Mn 1	0	0

- Molecule 4 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	1	Total 14	C 3	H 8	O 3	0	0
4	B	1	Total 14	C 3	H 8	O 3	0	0
4	C	1	Total 14	C 3	H 8	O 3	0	0
4	D	1	Total 14	C 3	H 8	O 3	0	0
4	E	1	Total 14	C 3	H 8	O 3	0	0
4	F	1	Total 14	C 3	H 8	O 3	0	0
4	G	1	Total 14	C 3	H 8	O 3	0	0

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	H	1	Total	C	H	O	0	0
			14	3	8	3		

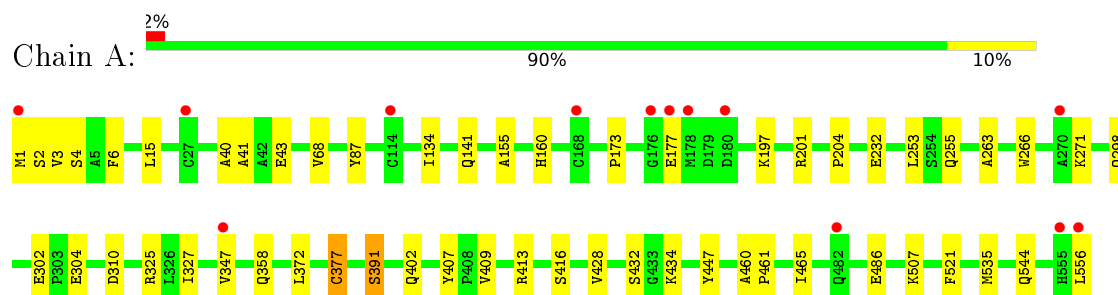
- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	722	Total	O	0	0
			722	722		
5	B	743	Total	O	0	0
			743	743		
5	C	679	Total	O	0	0
			679	679		
5	D	586	Total	O	0	0
			586	586		
5	E	748	Total	O	0	0
			748	748		
5	F	688	Total	O	0	0
			688	688		
5	G	685	Total	O	0	0
			685	685		
5	H	598	Total	O	0	0
			598	598		

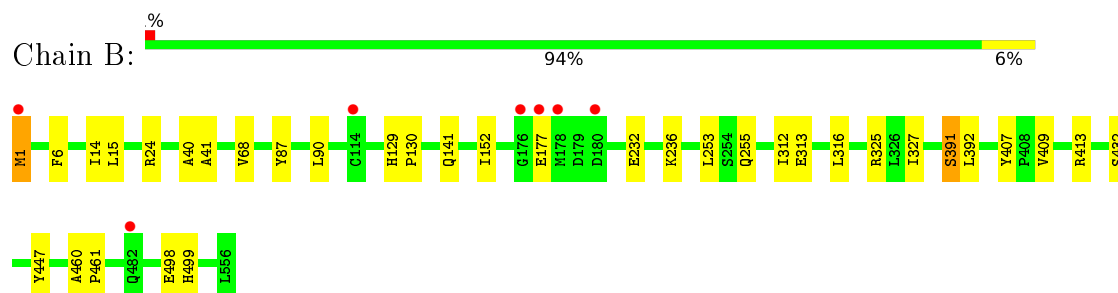
3 Residue-property plots

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors 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.

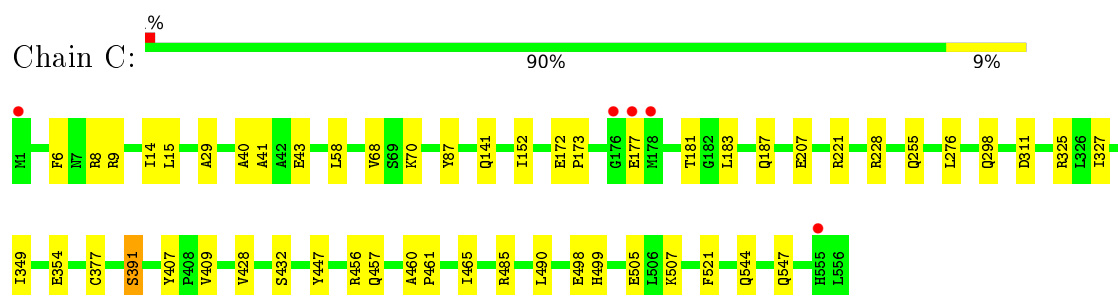
- Molecule 1: 2-succinyl-5-enolpyruvyl-6-hydroxy-3-cyclohexene-1-carboxylate synthase



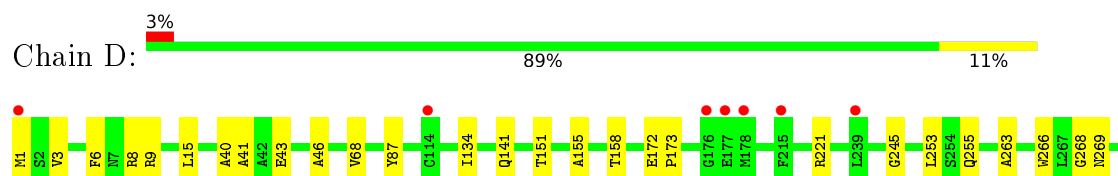
- Molecule 1: 2-succinyl-5-enolpyruvyl-6-hydroxy-3-cyclohexene-1-carboxylate synthase

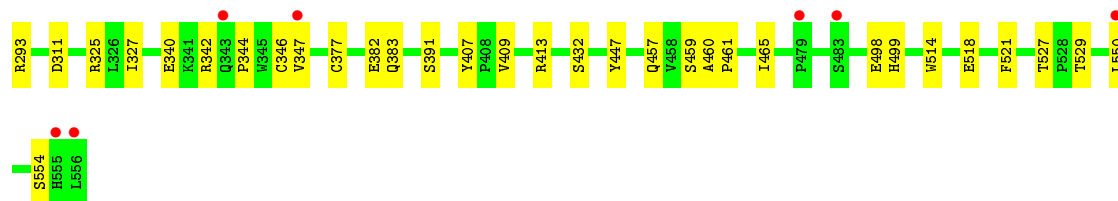


- Molecule 1: 2-succinyl-5-enolpyruvyl-6-hydroxy-3-cyclohexene-1-carboxylate synthase

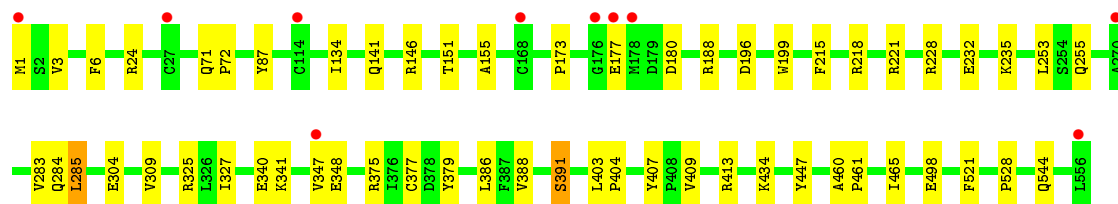
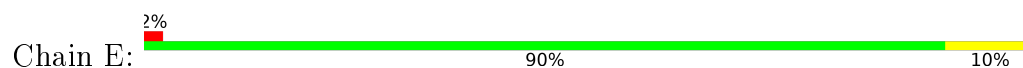


- Molecule 1: 2-succinyl-5-enolpyruvyl-6-hydroxy-3-cyclohexene-1-carboxylate synthase

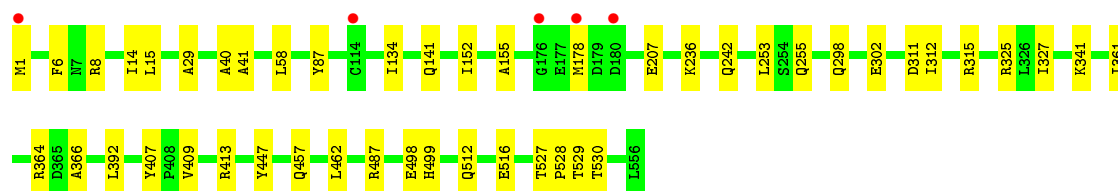
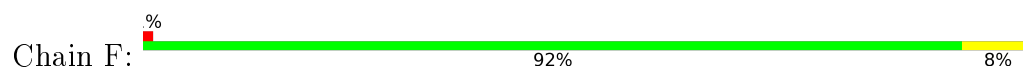




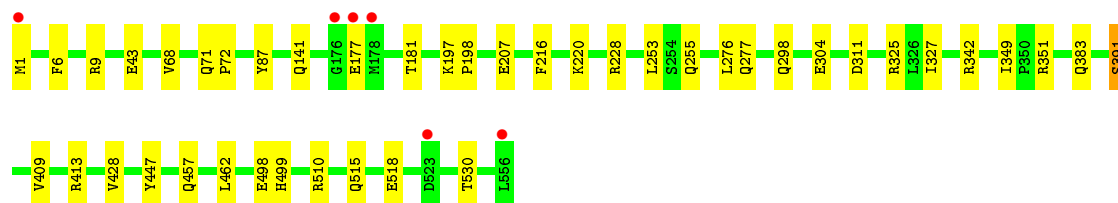
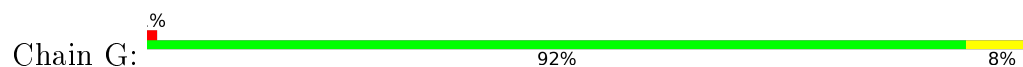
- Molecule 1: 2-succinyl-5-enolpyruvyl-6-hydroxy-3-cyclohexene-1-carboxylate synthase



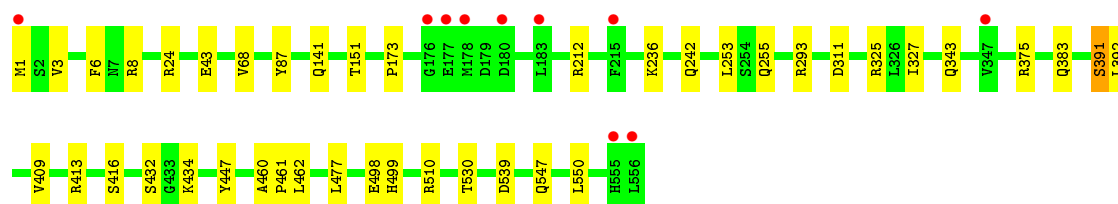
- Molecule 1: 2-succinyl-5-enolpyruvyl-6-hydroxy-3-cyclohexene-1-carboxylate synthase



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4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α , β , γ	90.61Å 90.66Å 169.46Å 76.03° 83.39° 64.41°	Depositor
Resolution (Å)	50.52 – 1.60 50.52 – 1.60	Depositor EDS
% Data completeness (in resolution range)	93.6 (50.52-1.60) 84.1 (50.52-1.60)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.71 (at 1.60Å)	Xtriage
Refinement program	PHENIX (1.10_2152: ???)	Depositor
R, R_{free}	0.170 , 0.193 0.170 , 0.194	Depositor DCC
R_{free} test set	28311 reflections (5.01%)	DCC
Wilson B-factor (Å ²)	13.6	Xtriage
Anisotropy	0.096	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.36 , 47.3	EDS
L-test for twinning ²	$\langle L \rangle = 0.45$, $\langle L^2 \rangle = 0.27$	Xtriage
Estimated twinning fraction	0.034 for -h,-k,-k+l	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	40819	wwPDB-VP
Average B, all atoms (Å ²)	17.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.64% 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 [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: GOL, MN, TD6

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	0.43	1/4480 (0.0%)	0.62	0/6113
1	B	0.41	0/4444	0.60	0/6065
1	C	0.41	0/4477	0.60	1/6108 (0.0%)
1	D	0.40	0/4418	0.59	0/6034
1	E	0.41	0/4495	0.62	1/6136 (0.0%)
1	F	0.41	0/4478	0.61	0/6111
1	G	0.41	0/4461	0.61	1/6090 (0.0%)
1	H	0.38	0/4445	0.59	0/6069
All	All	0.41	1/35698 (0.0%)	0.61	3/48726 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	377	CYS	CB-SG	-5.98	1.72	1.81

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	G	228	ARG	NE-CZ-NH1	-5.68	117.46	120.30
1	E	228	ARG	NE-CZ-NH1	-5.49	117.56	120.30
1	C	228	ARG	NE-CZ-NH2	-5.12	117.74	120.30

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen

atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	4370	0	4312	46	0
1	B	4335	0	4275	28	0
1	C	4367	0	4310	44	0
1	D	4309	0	4235	49	0
1	E	4387	0	4327	53	0
1	F	4370	0	4303	41	1
1	G	4352	0	4284	30	0
1	H	4336	0	4263	30	0
2	A	33	20	21	3	0
2	B	33	20	21	3	0
2	C	33	20	21	2	0
2	D	33	20	21	2	0
2	E	33	20	21	2	0
2	F	33	20	21	3	0
2	G	33	20	21	2	0
2	H	33	20	21	3	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
3	C	1	0	0	0	0
3	D	1	0	0	0	0
3	E	1	0	0	0	0
3	F	1	0	0	0	0
3	G	1	0	0	0	0
3	H	1	0	0	0	0
4	A	6	8	8	0	0
4	B	6	8	8	0	0
4	C	6	8	8	0	0
4	D	6	8	8	0	0
4	E	6	8	8	0	0
4	F	6	8	8	0	0
4	G	6	8	8	0	0
4	H	6	8	8	0	0
5	A	722	0	0	17	0
5	B	743	0	0	5	0
5	C	679	0	0	17	0
5	D	586	0	0	21	0
5	E	748	0	0	22	2
5	F	688	0	0	16	5
5	G	685	0	0	13	4
5	H	598	0	0	13	0
All	All	40595	224	34541	336	6

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 5.

All (336) 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:E:285[A]:LEU:HD12	1:E:309:VAL:HB	1.48	0.95
1:A:15[A]:LEU:HD12	1:A:40:ALA:HB3	1.55	0.89
2:D:601:TD6:HN4A	2:D:601:TD6:H11	1.39	0.88
1:D:255:GLN:HE21	1:D:409:VAL:H	1.21	0.88
1:G:518:GLU:HG3	5:G:719:HOH:O	1.73	0.87
2:E:601:TD6:H11	2:E:601:TD6:HN4A	1.38	0.86
1:A:177:GLU:O	5:A:701:HOH:O	1.94	0.85
1:A:347:VAL:O	5:A:702:HOH:O	1.95	0.85
1:F:255:GLN:HE21	1:F:409:VAL:H	1.23	0.83
1:E:304:GLU:OE1	5:E:701:HOH:O	1.97	0.83
1:E:285[B]:LEU:HD22	1:E:309:VAL:HB	1.59	0.83
1:H:255:GLN:HE21	1:H:409:VAL:H	1.26	0.83
1:B:255:GLN:HE21	1:B:409:VAL:H	1.25	0.82
1:C:255:GLN:HE21	1:C:409:VAL:H	1.24	0.82
1:C:354:GLU:OE2	5:C:701:HOH:O	1.97	0.82
1:D:15[A]:LEU:HD12	1:D:40:ALA:HB3	1.61	0.82
1:D:268:GLY:O	5:D:701:HOH:O	1.96	0.81
1:E:177:GLU:O	5:E:702:HOH:O	1.97	0.81
1:C:43:GLU:OE1	5:C:702:HOH:O	1.98	0.81
1:G:177:GLU:O	5:G:701:HOH:O	1.97	0.81
1:G:255:GLN:HE21	1:G:409:VAL:H	1.26	0.80
1:H:242:GLN:NE2	5:H:701:HOH:O	2.13	0.80
1:A:255:GLN:HE21	1:A:409:VAL:H	1.29	0.80
1:F:207[B]:GLU:OE1	5:F:701:HOH:O	2.00	0.79
1:E:255:GLN:HE21	1:E:409:VAL:H	1.28	0.78
1:G:304:GLU:OE1	5:G:702:HOH:O	2.00	0.78
1:G:277:GLN:OE1	5:G:703:HOH:O	2.02	0.78
2:B:601:TD6:HN4A	2:B:601:TD6:H11	1.49	0.77
1:E:434:LYS:NZ	5:E:706:HOH:O	2.13	0.77
1:A:304:GLU:OE1	5:A:703:HOH:O	2.03	0.77
1:E:375:ARG:HD3	5:E:896:HOH:O	1.85	0.76
2:F:601:TD6:HN4A	2:F:601:TD6:H11	1.51	0.76
1:E:146[B]:ARG:NE	5:E:710:HOH:O	2.18	0.75
1:A:486:GLU:OE1	5:A:704:HOH:O	2.04	0.75
1:E:180:ASP:OD2	5:E:703:HOH:O	2.04	0.74
1:G:43:GLU:OE1	5:G:704:HOH:O	2.04	0.74
1:C:177:GLU:O	5:C:704:HOH:O	2.05	0.74

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:544:GLN:OE1	5:E:704:HOH:O	2.06	0.73
1:D:269:ASN:HA	5:D:701:HOH:O	1.89	0.72
1:A:310:ASP:OD1	5:A:706:HOH:O	2.07	0.72
1:A:358:GLN:HG2	5:A:1327:HOH:O	1.89	0.72
1:C:15[A]:LEU:HD12	1:C:40:ALA:HB3	1.71	0.72
1:F:487:ARG:HA	5:F:722:HOH:O	1.88	0.72
1:C:298[A]:GLN:NE2	5:C:703:HOH:O	2.04	0.72
1:C:547:GLN:OE1	5:C:705:HOH:O	2.08	0.72
1:F:15[A]:LEU:HD12	1:F:40:ALA:HB3	1.71	0.72
1:H:1:MET:N	5:H:706:HOH:O	2.22	0.71
1:A:544:GLN:OE1	5:A:705:HOH:O	2.07	0.71
1:D:43:GLU:HG3	5:D:874:HOH:O	1.91	0.70
1:G:216:PHE:CZ	1:G:220:LYS:HE3	2.26	0.70
1:F:528:PRO:O	5:F:702:HOH:O	2.08	0.70
1:C:544:GLN:HG2	5:C:705:HOH:O	1.89	0.70
1:G:383:GLN:NE2	5:G:707:HOH:O	2.21	0.70
1:H:383:GLN:HA	5:H:715:HOH:O	1.92	0.70
1:B:15[A]:LEU:HD12	1:B:40:ALA:HB3	1.73	0.69
1:E:498:GLU:OE1	5:E:705:HOH:O	2.10	0.69
1:D:15[A]:LEU:HD12	1:D:40:ALA:CB	2.21	0.69
1:E:284:GLN:C	1:E:285[B]:LEU:HD23	2.13	0.69
1:F:298:GLN:NE2	5:F:705:HOH:O	2.25	0.69
1:C:187:GLN:OE1	5:C:706:HOH:O	2.10	0.69
1:D:514:TRP:O	1:D:518:GLU:HG2	1.92	0.68
1:A:507:LYS:HE2	5:A:1052:HOH:O	1.94	0.68
1:G:311[A]:ASP:OD2	5:G:706:HOH:O	2.12	0.67
1:H:539:ASP:HB3	5:H:726:HOH:O	1.93	0.67
1:E:146[B]:ARG:NH2	5:E:712:HOH:O	2.27	0.67
1:D:311:ASP:OD2	5:D:704:HOH:O	2.13	0.67
1:G:457:GLN:HG3	5:G:718:HOH:O	1.94	0.66
1:D:172:GLU:OE2	5:D:703:HOH:O	2.12	0.66
1:D:377:CYS:HB2	5:D:1100:HOH:O	1.96	0.66
1:G:207[A]:GLU:HG2	5:G:1213:HOH:O	1.96	0.66
1:C:377:CYS:HB2	5:C:1100:HOH:O	1.96	0.65
1:B:6:PHE:CE1	1:B:141:GLN:HG2	2.32	0.65
1:A:271:LYS:NZ	1:A:556:LEU:O	2.28	0.65
1:F:1:MET:N	5:F:706:HOH:O	2.27	0.65
1:H:6:PHE:CE1	1:H:141:GLN:HG2	2.31	0.65
1:E:6:PHE:CE1	1:E:141:GLN:HG2	2.31	0.65
1:E:196:ASP:OD2	5:E:707:HOH:O	2.13	0.65
1:F:236:LYS:NZ	5:F:709:HOH:O	2.28	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:146[B]:ARG:HG2	1:E:199:TRP:CZ2	2.32	0.65
1:E:528:PRO:O	5:E:709:HOH:O	2.14	0.65
1:A:15[A]:LEU:HD12	1:A:40:ALA:CB	2.24	0.64
1:F:298:GLN:NE2	5:F:707:HOH:O	2.27	0.64
1:H:375:ARG:HD3	5:H:943:HOH:O	1.96	0.64
1:H:8:ARG:NH2	1:H:43:GLU:OE2	2.32	0.63
1:F:242:GLN:HG2	5:F:733:HOH:O	1.99	0.63
1:C:15[A]:LEU:HD12	1:C:40:ALA:CB	2.29	0.63
1:A:43:GLU:HG3	5:A:1093:HOH:O	1.97	0.62
1:D:6:PHE:CE1	1:D:141:GLN:HG2	2.33	0.62
1:E:151:THR:HG21	5:E:1347:HOH:O	1.99	0.62
1:C:457:GLN:HG3	5:C:734:HOH:O	1.99	0.61
1:F:527:THR:HG22	5:F:753:HOH:O	2.00	0.61
2:A:601:TD6:C11	2:A:601:TD6:HN4A	2.14	0.61
1:E:71[B]:GLN:HE21	1:E:72:PRO:HD2	1.65	0.61
1:H:434:LYS:NZ	5:H:712:HOH:O	2.33	0.61
1:D:151:THR:HG21	5:D:1204:HOH:O	2.01	0.60
1:E:146[B]:ARG:HH11	1:E:188:ARG:NH2	2.00	0.60
1:A:15[A]:LEU:HD13	1:A:41:ALA:N	2.17	0.60
1:C:181:THR:O	5:C:707:HOH:O	2.15	0.60
1:D:554:SER:O	5:D:701:HOH:O	2.16	0.59
1:F:6:PHE:CE1	1:F:141:GLN:HG2	2.37	0.59
1:A:15[B]:LEU:HD21	1:A:41:ALA:HB2	1.84	0.59
1:F:312:ILE:HG23	5:F:1195:HOH:O	2.01	0.59
1:G:298[A]:GLN:NE2	5:G:705:HOH:O	2.11	0.59
2:E:601:TD6:C11	2:E:601:TD6:HN4A	2.13	0.59
2:H:601:TD6:C11	2:H:601:TD6:HN4A	2.15	0.58
1:E:465:ILE:HD11	1:E:521:PHE:HZ	1.69	0.58
1:F:255:GLN:NE2	1:F:409:VAL:H	1.99	0.58
1:D:1:MET:N	5:D:714:HOH:O	2.35	0.58
1:A:372:LEU:HD22	1:A:535:MET:SD	2.43	0.58
1:C:456[A]:ARG:NH2	1:C:505:GLU:OE1	2.37	0.57
1:E:498:GLU:HB3	5:E:962:HOH:O	2.04	0.57
1:B:15[A]:LEU:HD12	1:B:40:ALA:CB	2.34	0.57
1:D:457:GLN:HG3	5:D:733:HOH:O	2.04	0.57
1:D:9:ARG:NE	5:D:702:HOH:O	2.11	0.56
1:C:15[B]:LEU:HD23	1:C:41:ALA:HA	1.87	0.56
1:F:15[A]:LEU:HD12	1:F:40:ALA:CB	2.34	0.56
1:G:351:ARG:NH2	1:G:351:ARG:HG2	2.19	0.56
1:D:527:THR:HG23	1:D:529:THR:OG1	2.04	0.56
1:B:15[B]:LEU:HD23	1:B:41:ALA:HA	1.87	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:1:MET:HE2	5:B:718:HOH:O	2.06	0.55
1:B:313:GLU:OE2	5:B:701:HOH:O	2.18	0.55
1:A:6:PHE:CE1	1:A:141:GLN:HG2	2.41	0.55
1:B:312:ILE:HD11	1:B:316:LEU:HD21	1.89	0.55
1:E:285[A]:LEU:HD12	1:E:309:VAL:CB	2.30	0.55
1:A:416:SER:HB3	2:A:601:TD6:H13A	1.89	0.54
1:E:377[B]:CYS:SG	1:E:404:PRO:HD3	2.47	0.54
1:E:377[B]:CYS:SG	1:E:403:LEU:HA	2.46	0.54
1:D:253:LEU:HD11	1:D:413:ARG:HG3	1.89	0.54
1:F:341:LYS:NZ	5:F:714:HOH:O	2.39	0.54
2:G:601:TD6:HN4A	2:G:601:TD6:C11	2.20	0.54
1:A:15[B]:LEU:CD2	1:A:41:ALA:HB2	2.38	0.54
1:H:498:GLU:HG2	1:H:499:HIS:N	2.22	0.54
1:C:498:GLU:HG2	1:C:499:HIS:N	2.23	0.53
1:D:255:GLN:NE2	1:D:409:VAL:H	1.98	0.53
1:G:515:GLN:NE2	5:G:723:HOH:O	2.42	0.53
1:H:253:LEU:HD11	1:H:413:ARG:HG3	1.90	0.53
1:B:177:GLU:O	5:B:702:HOH:O	2.18	0.53
1:D:382:GLU:HG3	1:D:383:GLN:HG2	1.90	0.53
1:E:253:LEU:HD11	1:E:413:ARG:HG3	1.89	0.53
1:D:158:THR:HA	5:D:853:HOH:O	2.08	0.53
1:D:342:ARG:HD3	5:D:913:HOH:O	2.09	0.53
2:B:601:TD6:C11	2:B:601:TD6:HN4A	2.18	0.52
1:D:15[A]:LEU:HD13	1:D:41:ALA:N	2.24	0.52
2:D:601:TD6:HN4A	2:D:601:TD6:C11	2.17	0.52
1:B:15[B]:LEU:HD21	1:B:41:ALA:HB2	1.90	0.52
1:C:15[B]:LEU:HD23	1:C:41:ALA:CA	2.40	0.52
1:F:15[B]:LEU:HD23	1:F:41:ALA:HA	1.92	0.52
1:E:1:MET:N	5:E:721:HOH:O	2.36	0.52
1:E:285[B]:LEU:N	1:E:285[B]:LEU:HD23	2.25	0.52
1:F:15[A]:LEU:HD13	1:F:41:ALA:N	2.24	0.52
1:E:71[B]:GLN:HB3	1:E:72:PRO:HD2	1.92	0.52
1:A:232:GLU:HG2	5:A:719:HOH:O	2.09	0.51
1:H:255:GLN:NE2	1:H:409:VAL:H	2.03	0.51
1:C:221:ARG:NH2	5:C:722:HOH:O	2.36	0.51
1:A:1:MET:HG3	1:A:2:SER:N	2.25	0.51
1:B:255:GLN:NE2	1:B:409:VAL:H	2.02	0.51
1:C:207[A]:GLU:HG2	5:C:976:HOH:O	2.11	0.51
1:B:15[A]:LEU:HD13	1:B:41:ALA:N	2.25	0.51
1:C:6:PHE:CE1	1:C:141:GLN:HG2	2.45	0.51
1:E:3:VAL:HB	1:E:173:PRO:HD2	1.92	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:366:ALA:HB1	5:F:1245:HOH:O	2.11	0.51
1:F:302:GLU:HA	5:F:1152:HOH:O	2.10	0.50
2:F:601:TD6:C11	2:F:601:TD6:HN4A	2.23	0.50
1:A:160[B]:HIS:HE1	1:A:204:PRO:O	1.94	0.50
1:A:15[B]:LEU:HD23	1:A:41:ALA:HA	1.94	0.50
1:G:1:MET:N	5:G:727:HOH:O	2.45	0.50
1:D:46:ALA:HB1	5:D:812:HOH:O	2.12	0.50
1:E:235:LYS:NZ	1:E:235:LYS:HB2	2.27	0.50
1:G:327:ILE:HD12	1:G:327:ILE:N	2.26	0.49
1:B:232:GLU:HG3	1:B:236:LYS:HE2	1.92	0.49
2:G:601:TD6:HN4A	2:G:601:TD6:H11	1.76	0.49
1:A:3:VAL:HB	1:A:173:PRO:HD2	1.94	0.49
1:D:327:ILE:N	1:D:327:ILE:HD12	2.27	0.49
1:B:15[B]:LEU:HD23	1:B:41:ALA:CA	2.43	0.49
1:E:134:ILE:HD11	1:E:155:ALA:HB2	1.95	0.49
1:F:527:THR:HG23	1:F:529:THR:OG1	2.12	0.49
1:D:15[A]:LEU:CD1	1:D:40:ALA:HB3	2.37	0.49
1:G:9:ARG:HD2	1:G:181:THR:O	2.12	0.48
1:C:15[A]:LEU:HD13	1:C:41:ALA:N	2.28	0.48
1:H:151:THR:HG21	5:H:1226:HOH:O	2.12	0.48
1:E:283:VAL:HG12	1:E:285[B]:LEU:HD21	1.95	0.48
1:A:298:GLN:NE2	5:A:732:HOH:O	2.46	0.48
1:E:340:GLU:HG3	5:E:1021:HOH:O	2.13	0.48
1:G:6:PHE:CE1	1:G:141:GLN:HG2	2.48	0.48
1:A:201:ARG:NH1	5:A:722:HOH:O	2.39	0.48
1:A:465:ILE:HD11	1:A:521:PHE:HZ	1.79	0.48
1:B:15[B]:LEU:CD2	1:B:41:ALA:HB2	2.44	0.48
1:H:293:ARG:NH2	1:H:550[A]:LEU:HD11	2.29	0.48
1:F:311[A]:ASP:OD2	5:F:703:HOH:O	2.20	0.48
1:C:29:ALA:HB2	1:C:58:LEU:HD22	1.95	0.48
1:D:554:SER:HB3	5:D:701:HOH:O	2.13	0.48
1:A:1:MET:N	5:A:721:HOH:O	2.38	0.48
1:B:15[A]:LEU:HD13	1:B:41:ALA:CA	2.43	0.48
1:C:311:ASP:OD2	5:C:708:HOH:O	2.20	0.48
2:C:601:TD6:H11	2:C:601:TD6:HN4A	1.77	0.48
1:A:434:LYS:NZ	5:A:707:HOH:O	2.15	0.47
1:H:327:ILE:HD12	1:H:327:ILE:N	2.28	0.47
1:H:24[A]:ARG:HG2	5:H:789:HOH:O	2.14	0.47
1:A:302:GLU:HA	5:A:827:HOH:O	2.13	0.47
1:C:15[B]:LEU:CD2	1:C:41:ALA:N	2.77	0.47
1:D:9:ARG:NH2	5:D:702:HOH:O	2.43	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:3:VAL:HB	1:D:173:PRO:HD2	1.97	0.47
1:D:8:ARG:NH2	1:D:43:GLU:OE2	2.41	0.47
1:H:343:GLN:OE1	5:H:704:HOH:O	2.20	0.47
1:G:253:LEU:HD11	1:G:413:ARG:HG3	1.97	0.47
1:C:15[B]:LEU:HD22	1:C:40:ALA:HB3	1.96	0.46
1:F:457:GLN:HG3	5:F:718:HOH:O	2.14	0.46
1:F:327:ILE:N	1:F:327:ILE:HD12	2.30	0.46
1:H:477:LEU:HD11	1:H:547:GLN:HE21	1.79	0.46
1:D:498:GLU:HG2	1:D:499:HIS:N	2.29	0.46
1:B:68:VAL:HG11	1:B:432:SER:HB3	1.96	0.46
1:C:15[B]:LEU:HD22	1:C:40:ALA:CB	2.45	0.46
1:C:255:GLN:NE2	1:C:409:VAL:H	2.03	0.46
1:C:8:ARG:HD2	5:C:966:HOH:O	2.15	0.46
2:A:601:TD6:H11	2:A:601:TD6:HN4A	1.79	0.46
1:B:327:ILE:N	1:B:327:ILE:HD12	2.31	0.46
1:D:460:ALA:HB1	1:D:461:PRO:HD2	1.97	0.46
1:A:134:ILE:HD11	1:A:155:ALA:HB2	1.98	0.46
1:A:15[A]:LEU:CD1	1:A:40:ALA:HB3	2.36	0.46
1:B:460:ALA:HB1	1:B:461:PRO:HD2	1.98	0.46
1:D:255:GLN:HG2	1:D:407:TYR:O	2.16	0.46
1:E:232:GLU:HA	1:E:235:LYS:HZ2	1.81	0.46
1:G:498:GLU:OE1	1:G:510:ARG:NH2	2.49	0.46
1:A:4[A]:SER:OG	1:A:173:PRO:HB2	2.16	0.45
1:C:68:VAL:HG11	1:C:432:SER:HB3	1.98	0.45
1:C:327:ILE:N	1:C:327:ILE:HD12	2.32	0.45
1:D:346:CYS:HB2	5:D:843:HOH:O	2.14	0.45
1:F:8:ARG:NH1	5:F:711:HOH:O	2.36	0.45
1:E:386:LEU:HG	1:E:388[B]:VAL:HG13	1.97	0.45
1:H:311[A]:ASP:OD2	5:H:705:HOH:O	2.20	0.45
1:C:68:VAL:HG21	1:C:428:VAL:HG13	1.99	0.45
1:F:255:GLN:HG2	1:F:407:TYR:O	2.16	0.45
1:C:460:ALA:HB1	1:C:461:PRO:HD2	1.98	0.45
1:H:477:LEU:CD1	1:H:547:GLN:HE21	2.30	0.45
1:E:379:TYR:HB3	5:E:722:HOH:O	2.17	0.45
1:F:15[B]:LEU:HD23	1:F:41:ALA:CA	2.47	0.45
1:G:68:VAL:HG21	1:G:428:VAL:HG13	1.99	0.44
1:C:9:ARG:HH12	1:C:183:LEU:HD13	1.82	0.44
1:E:146[B]:ARG:HG3	5:E:710:HOH:O	2.16	0.44
1:D:15[B]:LEU:CD2	1:D:41:ALA:HB2	2.48	0.44
1:D:465:ILE:HD11	1:D:521:PHE:HZ	1.81	0.44
1:F:15[B]:LEU:HD21	1:F:41:ALA:HB2	1.99	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:255:GLN:HE21	1:F:409:VAL:N	2.04	0.44
1:A:507:LYS:CD	5:A:1188:HOH:O	2.64	0.44
1:D:134:ILE:HD11	1:D:155:ALA:HB2	1.99	0.44
1:G:342:ARG:HD3	5:G:884:HOH:O	2.17	0.44
1:F:29:ALA:HB2	1:F:58:LEU:HD22	2.00	0.44
1:H:212:ARG:NH2	5:H:709:HOH:O	2.50	0.44
1:A:68:VAL:HG21	1:A:428:VAL:HG13	1.99	0.44
1:E:215:PHE:HD1	1:E:218:ARG:CZ	2.31	0.44
1:D:15[B]:LEU:HD21	1:D:41:ALA:HB2	1.99	0.44
1:D:263:ALA:HA	1:D:266:TRP:NE1	2.32	0.44
1:B:1:MET:N	5:B:718:HOH:O	2.42	0.44
1:E:327:ILE:HD12	1:E:327:ILE:N	2.32	0.44
1:F:392:LEU:HB2	2:F:601:TD6:O2B	2.18	0.44
1:D:15[B]:LEU:HD23	1:D:41:ALA:HA	1.99	0.44
1:A:460:ALA:HB1	1:A:461:PRO:HD2	2.00	0.43
1:F:253:LEU:HD11	1:F:413:ARG:HG3	2.00	0.43
1:C:15[A]:LEU:CD1	1:C:40:ALA:HB3	2.46	0.43
1:A:15[B]:LEU:CD2	1:A:41:ALA:CA	2.97	0.43
1:A:15[A]:LEU:HD13	1:A:41:ALA:CA	2.48	0.43
1:E:221:ARG:NH2	5:E:720:HOH:O	2.36	0.43
1:E:285[B]:LEU:HD22	1:E:309:VAL:CB	2.39	0.43
1:G:197:LYS:HB2	1:G:198:PRO:HD2	2.00	0.43
1:G:498:GLU:HG2	1:G:499:HIS:N	2.32	0.43
1:E:341:LYS:NZ	5:E:741:HOH:O	2.51	0.43
1:F:15[B]:LEU:CD2	1:F:41:ALA:HB2	2.49	0.43
1:H:392:LEU:HB2	2:H:601:TD6:O2B	2.19	0.43
1:H:460:ALA:HB1	1:H:461:PRO:HD2	2.01	0.43
1:B:129:HIS:N	1:B:130:PRO:CD	2.82	0.43
1:F:498:GLU:HG2	1:F:499:HIS:N	2.32	0.43
1:E:235:LYS:NZ	5:E:740:HOH:O	2.51	0.43
1:F:361:ILE:HG23	1:F:364[B]:ARG:NH1	2.34	0.43
1:H:3:VAL:HB	1:H:173:PRO:HD2	2.01	0.43
1:A:15[B]:LEU:HD22	1:A:41:ALA:N	2.34	0.43
1:C:14:ILE:HG12	1:C:152:ILE:HD11	2.01	0.43
1:C:255:GLN:HG2	1:C:407:TYR:O	2.19	0.43
1:D:68:VAL:HG11	1:D:432:SER:HB3	2.00	0.42
1:H:236:LYS:HD3	5:H:979:HOH:O	2.18	0.42
1:E:255:GLN:HG2	1:E:407:TYR:O	2.20	0.42
1:E:498:GLU:CB	5:E:962:HOH:O	2.65	0.42
1:B:253:LEU:HD11	1:B:413:ARG:HG3	2.01	0.42
1:E:232:GLU:CD	1:E:235:LYS:HZ1	2.22	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:512:GLN:HG2	1:F:516:GLU:CD	2.40	0.42
1:E:232:GLU:HG2	5:E:725:HOH:O	2.19	0.42
1:D:221:ARG:HD3	5:D:713:HOH:O	2.19	0.42
1:D:293:ARG:NH2	1:D:550:LEU:HD11	2.35	0.42
1:D:459:SER:O	5:D:705:HOH:O	2.22	0.42
1:E:465:ILE:HD11	1:E:521:PHE:CZ	2.53	0.42
1:F:315:ARG:HH11	1:F:315:ARG:HG3	1.84	0.42
1:H:498:GLU:OE1	1:H:510:ARG:NH2	2.53	0.42
1:A:327:ILE:HD12	1:A:327:ILE:N	2.35	0.42
1:B:392:LEU:HB2	2:B:601:TD6:O2B	2.19	0.42
1:G:276:LEU:HG	1:G:349:ILE:HD11	2.02	0.42
1:C:40:ALA:HB2	5:C:754:HOH:O	2.19	0.42
1:H:462:LEU:O	1:H:530:THR:HA	2.19	0.42
1:F:15[A]:LEU:HD13	1:F:41:ALA:CA	2.49	0.42
1:B:90:LEU:HD21	1:B:130:PRO:HG3	2.02	0.42
1:F:134:ILE:HD11	1:F:155:ALA:HB2	2.02	0.42
1:B:498:GLU:HG2	1:B:499:HIS:N	2.34	0.41
1:A:68:VAL:HG11	1:A:432:SER:HB3	2.02	0.41
1:B:255:GLN:HG2	1:B:407:TYR:O	2.19	0.41
1:C:507:LYS:HE3	1:C:507:LYS:HB2	1.80	0.41
1:A:253:LEU:HD11	1:A:413:ARG:HG3	2.02	0.41
1:C:465:ILE:HD11	1:C:521:PHE:HZ	1.83	0.41
1:C:70:LYS:NZ	5:C:729:HOH:O	2.47	0.41
1:C:172:GLU:HB3	1:C:173:PRO:HA	2.03	0.41
1:C:485:ARG:HG2	1:C:490:LEU:HG	2.03	0.41
1:D:340:GLU:HB3	5:D:729:HOH:O	2.20	0.41
1:F:462:LEU:O	1:F:530:THR:HA	2.20	0.41
1:H:416:SER:HB3	2:H:601:TD6:H13A	2.01	0.41
1:H:498:GLU:HG3	5:H:1257:HOH:O	2.20	0.41
1:G:255:GLN:NE2	1:G:409:VAL:H	2.05	0.41
1:G:462:LEU:O	1:G:530:THR:HA	2.20	0.41
1:A:197:LYS:NZ	5:A:717:HOH:O	2.33	0.41
1:D:15[B]:LEU:HD23	1:D:41:ALA:CA	2.50	0.41
1:G:351:ARG:HH21	1:G:351:ARG:HG2	1.85	0.41
1:A:255:GLN:HG2	1:A:407:TYR:O	2.21	0.41
1:E:283:VAL:HG12	1:E:285[B]:LEU:CD2	2.50	0.41
1:A:263:ALA:HA	1:A:266:TRP:NE1	2.36	0.41
1:F:14:ILE:HG12	1:F:152:ILE:HD11	2.02	0.41
1:H:68:VAL:HG11	1:H:432:SER:HB3	2.01	0.41
1:C:9:ARG:NE	5:C:707:HOH:O	2.10	0.40
1:D:255:GLN:HE21	1:D:409:VAL:N	2.02	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:460:ALA:HB1	1:E:461:PRO:HD2	2.03	0.40
1:C:276:LEU:HG	1:C:349:ILE:HD11	2.04	0.40
2:C:601:TD6:HN4A	2:C:601:TD6:C11	2.34	0.40
1:G:351:ARG:HH21	1:G:351:ARG:CG	2.34	0.40
1:A:377:CYS:SG	1:A:402:GLN:O	2.79	0.40
1:B:14:ILE:HG12	1:B:152:ILE:HD11	2.04	0.40
1:B:24:ARG:NE	5:B:703:HOH:O	2.19	0.40
1:D:245:GLY:O	1:D:344:PRO:HA	2.21	0.40
1:D:311:ASP:HB2	5:D:1029:HOH:O	2.21	0.40
1:E:347:VAL:HG23	1:E:348:GLU:HG3	2.02	0.40
1:E:284:GLN:O	1:E:285[B]:LEU:HD23	2.21	0.40
1:G:71:GLN:HB3	1:G:72:PRO:HD2	2.03	0.40

All (6) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:F:927:HOH:O	5:G:1273:HOH:O[1_465]	2.03	0.17
5:F:936:HOH:O	5:G:1375:HOH:O[1_465]	2.08	0.12
1:F:364[B]:ARG:NH2	5:E:914:HOH:O[1_455]	2.10	0.10
5:E:1424:HOH:O	5:F:1053:HOH:O[1_655]	2.11	0.09
5:F:798:HOH:O	5:G:1273:HOH:O[1_465]	2.13	0.07
5:F:729:HOH:O	5:G:1273:HOH:O[1_465]	2.16	0.04

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	562/556 (101%)	548 (98%)	13 (2%)	1 (0%)	52	28
1	B	558/556 (100%)	545 (98%)	12 (2%)	1 (0%)	52	28
1	C	561/556 (101%)	550 (98%)	10 (2%)	1 (0%)	52	28

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	D	557/556 (100%)	545 (98%)	11 (2%)	1 (0%)	52	28
1	E	564/556 (101%)	551 (98%)	12 (2%)	1 (0%)	52	28
1	F	561/556 (101%)	548 (98%)	13 (2%)	0	100	100
1	G	561/556 (101%)	548 (98%)	12 (2%)	1 (0%)	52	28
1	H	560/556 (101%)	547 (98%)	12 (2%)	1 (0%)	52	28
All	All	4484/4448 (101%)	4382 (98%)	95 (2%)	7 (0%)	52	28

All (7) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	391	SER
1	D	391	SER
1	C	391	SER
1	G	391	SER
1	H	391	SER
1	B	391	SER
1	E	391	SER

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	453/452 (100%)	449 (99%)	4 (1%)	84	71
1	B	449/452 (99%)	444 (99%)	5 (1%)	80	63
1	C	453/452 (100%)	449 (99%)	4 (1%)	84	71
1	D	444/452 (98%)	440 (99%)	4 (1%)	84	71
1	E	456/452 (101%)	449 (98%)	7 (2%)	72	50
1	F	453/452 (100%)	449 (99%)	4 (1%)	84	71
1	G	450/452 (100%)	446 (99%)	4 (1%)	84	71
1	H	445/452 (98%)	441 (99%)	4 (1%)	84	71
All	All	3603/3616 (100%)	3567 (99%)	36 (1%)	82	67

All (36) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	87	TYR
1	A	325	ARG
1	A	391	SER
1	A	447	TYR
1	B	1	MET
1	B	87	TYR
1	B	325	ARG
1	B	391	SER
1	B	447	TYR
1	C	87	TYR
1	C	325	ARG
1	C	391	SER
1	C	447	TYR
1	D	87	TYR
1	D	325	ARG
1	D	347	VAL
1	D	447	TYR
1	E	24	ARG
1	E	87	TYR
1	E	285[A]	LEU
1	E	285[B]	LEU
1	E	325	ARG
1	E	391	SER
1	E	447	TYR
1	F	87	TYR
1	F	178	MET
1	F	325	ARG
1	F	447	TYR
1	G	87	TYR
1	G	325	ARG
1	G	391	SER
1	G	447	TYR
1	H	87	TYR
1	H	325	ARG
1	H	391	SER
1	H	447	TYR

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (13) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	255	GLN

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Mol	Chain	Res	Type
1	A	512	GLN
1	B	255	GLN
1	C	255	GLN
1	D	255	GLN
1	D	383	GLN
1	E	255	GLN
1	E	555	HIS
1	F	255	GLN
1	F	277	GLN
1	G	255	GLN
1	H	255	GLN
1	H	547	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

5.6 Ligand geometry [i](#)

Of 24 ligands modelled in this entry, 8 are monoatomic - leaving 16 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	$\# Z > 2$
2	TD6	A	601	3	24,34,34	1.36	4 (16%)	32,50,50	1.87	10 (31%)
4	GOL	A	603	-	5,5,5	0.63	0	5,5,5	0.53	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	TD6	B	601	3	24,34,34	1.32	4 (16%)	32,50,50	2.27	10 (31%)
4	GOL	B	603	-	5,5,5	0.69	0	5,5,5	0.57	0
2	TD6	C	601	3	24,34,34	2.32	10 (41%)	32,50,50	2.19	13 (40%)
4	GOL	C	603	-	5,5,5	0.58	0	5,5,5	0.45	0
2	TD6	D	601	3	24,34,34	1.30	3 (12%)	32,50,50	2.20	9 (28%)
4	GOL	D	603	-	5,5,5	0.51	0	5,5,5	0.42	0
2	TD6	E	601	3	24,34,34	1.27	3 (12%)	32,50,50	2.08	8 (25%)
4	GOL	E	603	-	5,5,5	0.63	0	5,5,5	0.47	0
2	TD6	F	601	3	24,34,34	1.35	3 (12%)	32,50,50	2.38	10 (31%)
4	GOL	F	603	-	5,5,5	0.58	0	5,5,5	0.65	0
2	TD6	G	601	3	24,34,34	1.33	5 (20%)	32,50,50	1.85	8 (25%)
4	GOL	G	603	-	5,5,5	0.56	0	5,5,5	0.37	0
2	TD6	H	601	3	24,34,34	1.30	3 (12%)	32,50,50	2.20	10 (31%)
4	GOL	H	603	-	5,5,5	0.39	0	5,5,5	0.46	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
2	TD6	A	601	3	-	0/19/26/26	0/2/2/2
4	GOL	A	603	-	-	0/4/4/4	0/0/0/0
2	TD6	B	601	3	-	0/19/26/26	0/2/2/2
4	GOL	B	603	-	-	0/4/4/4	0/0/0/0
2	TD6	C	601	3	-	0/19/26/26	0/2/2/2
4	GOL	C	603	-	-	0/4/4/4	0/0/0/0
2	TD6	D	601	3	-	0/19/26/26	0/2/2/2
4	GOL	D	603	-	-	0/4/4/4	0/0/0/0
2	TD6	E	601	3	-	0/19/26/26	0/2/2/2
4	GOL	E	603	-	-	0/4/4/4	0/0/0/0
2	TD6	F	601	3	-	0/19/26/26	0/2/2/2
4	GOL	F	603	-	-	0/4/4/4	0/0/0/0
2	TD6	G	601	3	-	0/19/26/26	0/2/2/2
4	GOL	G	603	-	-	0/4/4/4	0/0/0/0
2	TD6	H	601	3	-	0/19/26/26	0/2/2/2
4	GOL	H	603	-	-	0/4/4/4	0/0/0/0

All (35) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	601	TD6	C2'-N3'	-4.81	1.25	1.34
2	C	601	TD6	PA-O2A	-4.30	1.36	1.55
2	C	601	TD6	PB-O3B	-3.73	1.41	1.54
2	C	601	TD6	PB-O1B	-3.23	1.43	1.54
2	C	601	TD6	C4-N3	-3.01	1.32	1.39
2	H	601	TD6	C5'-C4'	-2.87	1.38	1.42
2	C	601	TD6	C4'-N4'	-2.77	1.26	1.34
2	C	601	TD6	PA-O1A	-2.40	1.42	1.51
2	C	601	TD6	C5'-C4'	-2.32	1.38	1.42
2	E	601	TD6	C5'-C4'	-2.14	1.39	1.42
2	C	601	TD6	C2'-N1'	-2.08	1.31	1.34
2	G	601	TD6	C5'-C4'	-2.07	1.39	1.42
2	D	601	TD6	C7'-C5'	2.04	1.55	1.51
2	B	601	TD6	C7'-C5'	2.05	1.55	1.51
2	A	601	TD6	C7'-C5'	2.05	1.55	1.51
2	F	601	TD6	C7'-C5'	2.20	1.55	1.51
2	B	601	TD6	C6-C7	2.21	1.57	1.50
2	E	601	TD6	CM2-C2'	2.26	1.56	1.49
2	G	601	TD6	C6-C7	2.26	1.57	1.50
2	A	601	TD6	CM2-C2'	2.30	1.56	1.49
2	G	601	TD6	C7'-C5'	2.31	1.56	1.51
2	G	601	TD6	CM2-C2'	2.32	1.56	1.49
2	A	601	TD6	C6-C7	2.40	1.58	1.50
2	B	601	TD6	CM2-C2'	2.50	1.57	1.49
2	H	601	TD6	CM2-C2'	2.51	1.57	1.49
2	F	601	TD6	CM2-C2'	2.57	1.57	1.49
2	D	601	TD6	CM2-C2'	2.57	1.57	1.49
2	C	601	TD6	C7'-C5'	2.63	1.56	1.51
2	H	601	TD6	CM4-C4	2.74	1.55	1.49
2	G	601	TD6	CM4-C4	2.80	1.55	1.49
2	B	601	TD6	CM4-C4	2.96	1.56	1.49
2	D	601	TD6	CM4-C4	2.97	1.56	1.49
2	A	601	TD6	CM4-C4	3.04	1.56	1.49
2	E	601	TD6	CM4-C4	3.11	1.56	1.49
2	F	601	TD6	CM4-C4	3.33	1.56	1.49

All (78) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	F	601	TD6	C13-CLB-C11	-6.90	106.61	114.74
2	E	601	TD6	C13-CLB-C11	-5.63	108.11	114.74
2	D	601	TD6	C13-CLB-C11	-5.49	108.27	114.74
2	B	601	TD6	C13-CLB-C11	-4.61	109.31	114.74

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	H	601	TD6	CLB-C11-C2	-4.37	100.13	112.26
2	C	601	TD6	CM4-C4-C5	-3.96	120.52	128.91
2	C	601	TD6	C5'-C6'-N1'	-3.93	116.98	123.86
2	H	601	TD6	C13-CLB-C11	-3.81	110.24	114.74
2	G	601	TD6	CM4-C4-C5	-3.72	121.04	128.91
2	G	601	TD6	CLB-C11-C2	-3.64	102.15	112.26
2	B	601	TD6	OL1-C11-CLB	-3.64	100.85	109.73
2	B	601	TD6	CM4-C4-C5	-3.61	121.27	128.91
2	A	601	TD6	CLB-C11-C2	-3.56	102.37	112.26
2	H	601	TD6	CM4-C4-C5	-3.54	121.42	128.91
2	D	601	TD6	CM4-C4-C5	-3.47	121.57	128.91
2	F	601	TD6	N1'-C2'-N3'	-3.43	119.06	125.50
2	H	601	TD6	N1'-C2'-N3'	-3.40	119.12	125.50
2	F	601	TD6	CM4-C4-C5	-3.39	121.73	128.91
2	A	601	TD6	CM4-C4-C5	-3.35	121.81	128.91
2	E	601	TD6	N1'-C2'-N3'	-3.22	119.46	125.50
2	D	601	TD6	C5'-C6'-N1'	-3.18	118.31	123.86
2	E	601	TD6	CM4-C4-C5	-3.08	122.39	128.91
2	G	601	TD6	N1'-C2'-N3'	-3.06	119.76	125.50
2	B	601	TD6	C5'-C6'-N1'	-2.96	118.68	123.86
2	A	601	TD6	C5'-C6'-N1'	-2.94	118.72	123.86
2	E	601	TD6	C5'-C6'-N1'	-2.90	118.78	123.86
2	H	601	TD6	OL1-C11-CLB	-2.88	102.70	109.73
2	H	601	TD6	C5'-C6'-N1'	-2.87	118.85	123.86
2	F	601	TD6	C5'-C6'-N1'	-2.76	119.04	123.86
2	D	601	TD6	N1'-C2'-N3'	-2.70	120.43	125.50
2	C	601	TD6	N4'-C4'-N3'	-2.68	113.00	116.92
2	A	601	TD6	N1'-C2'-N3'	-2.67	120.48	125.50
2	G	601	TD6	C5'-C6'-N1'	-2.67	119.20	123.86
2	B	601	TD6	C5'-C7'-N3	-2.57	108.85	113.37
2	F	601	TD6	C7'-N3-C2	-2.53	119.72	124.42
2	B	601	TD6	N1'-C2'-N3'	-2.49	120.83	125.50
2	C	601	TD6	CLB-C11-C2	-2.34	105.76	112.26
2	D	601	TD6	OL1-C11-CLB	-2.20	104.36	109.73
2	A	601	TD6	C13-CLB-C11	-2.17	112.18	114.74
2	C	601	TD6	N1'-C2'-N3'	-2.09	121.58	125.50
2	F	601	TD6	C5'-C7'-N3	-2.06	109.75	113.37
2	A	601	TD6	C5'-C7'-N3	-2.00	109.85	113.37
2	C	601	TD6	C5'-C7'-N3	-2.00	109.85	113.37
2	C	601	TD6	OL1-C11-CLB	2.12	114.91	109.73
2	C	601	TD6	C5'-C4'-N3'	2.17	124.92	121.24
2	B	601	TD6	CM2-C2'-N1'	2.35	119.95	117.05

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	601	TD6	CM2-C2'-N1'	2.54	120.19	117.05
2	C	601	TD6	CM2-C2'-N1'	3.05	120.81	117.05
2	G	601	TD6	C6-C5-S1	3.13	124.62	120.24
2	E	601	TD6	CM2-C2'-N1'	3.13	120.92	117.05
2	D	601	TD6	CM2-C2'-N1'	3.21	121.01	117.05
2	G	601	TD6	C6'-N1'-C2'	3.24	122.08	115.92
2	G	601	TD6	CM2-C2'-N1'	3.27	121.08	117.05
2	A	601	TD6	C5-C4-N3	3.28	115.60	107.94
2	D	601	TD6	C5-C4-N3	3.29	115.62	107.94
2	F	601	TD6	CM2-C2'-N1'	3.29	121.11	117.05
2	A	601	TD6	C6'-N1'-C2'	3.33	122.25	115.92
2	B	601	TD6	C6'-N1'-C2'	3.34	122.27	115.92
2	C	601	TD6	C6-C5-C4	3.34	131.09	127.34
2	H	601	TD6	C6'-N1'-C2'	3.37	122.32	115.92
2	F	601	TD6	C5-C4-N3	3.37	115.82	107.94
2	E	601	TD6	C5-C4-N3	3.38	115.83	107.94
2	H	601	TD6	C5-C4-N3	3.40	115.89	107.94
2	D	601	TD6	C6'-N1'-C2'	3.46	122.49	115.92
2	E	601	TD6	C6'-N1'-C2'	3.56	122.69	115.92
2	C	601	TD6	C6-C5-S1	3.62	125.30	120.24
2	A	601	TD6	C6-C5-S1	3.64	125.34	120.24
2	G	601	TD6	C5-C4-N3	3.66	116.50	107.94
2	B	601	TD6	C5-C4-N3	3.76	116.73	107.94
2	F	601	TD6	C6'-N1'-C2'	3.91	123.35	115.92
2	H	601	TD6	CM2-C2'-N1'	4.31	122.37	117.05
2	C	601	TD6	C6'-N1'-C2'	4.56	124.60	115.92
2	E	601	TD6	C6-C5-S1	4.61	126.68	120.24
2	H	601	TD6	C6-C5-S1	4.86	127.04	120.24
2	C	601	TD6	C5-C4-N3	4.96	119.52	107.94
2	D	601	TD6	C6-C5-S1	5.24	127.57	120.24
2	F	601	TD6	C6-C5-S1	5.65	128.15	120.24
2	B	601	TD6	C6-C5-S1	6.28	129.02	120.24

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

8 monomers are involved in 20 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	601	TD6	3	0
2	B	601	TD6	3	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	601	TD6	2	0
2	D	601	TD6	2	0
2	E	601	TD6	2	0
2	F	601	TD6	3	0
2	G	601	TD6	2	0
2	H	601	TD6	3	0

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	556/556 (100%)	-0.26	13 (2%) 64 62	7, 12, 23, 32	0
1	B	556/556 (100%)	-0.33	7 (1%) 79 79	9, 14, 22, 33	0
1	C	556/556 (100%)	-0.23	5 (0%) 85 85	9, 14, 24, 35	0
1	D	556/556 (100%)	-0.07	14 (2%) 61 58	9, 17, 27, 33	0
1	E	556/556 (100%)	-0.24	10 (1%) 71 70	7, 13, 23, 30	0
1	F	556/556 (100%)	-0.29	5 (0%) 85 85	9, 14, 23, 33	0
1	G	556/556 (100%)	-0.24	6 (1%) 82 83	8, 14, 24, 35	0
1	H	556/556 (100%)	-0.25	10 (1%) 71 70	9, 16, 26, 33	0
All	All	4448/4448 (100%)	-0.24	70 (1%) 74 74	7, 14, 24, 35	0

All (70) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	1	MET	5.9
1	C	1	MET	5.2
1	H	1	MET	5.0
1	G	1	MET	4.7
1	D	178	MET	4.6
1	E	556	LEU	4.4
1	D	1	MET	4.4
1	B	1	MET	4.3
1	E	1	MET	4.3
1	A	177	GLU	4.2
1	G	177	GLU	4.2
1	D	555	HIS	4.1
1	H	555	HIS	3.8
1	E	178	MET	3.8
1	F	1	MET	3.8
1	B	176	GLY	3.7

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Mol	Chain	Res	Type	RSRZ
1	G	178	MET	3.6
1	D	556	LEU	3.6
1	D	347	VAL	3.6
1	A	556	LEU	3.4
1	C	178	MET	3.4
1	B	180	ASP	3.4
1	B	114	CYS	3.3
1	H	178	MET	3.3
1	D	177	GLU	3.3
1	F	176	GLY	3.3
1	A	178	MET	3.2
1	E	176	GLY	3.1
1	A	482	GLN	3.1
1	A	347	VAL	3.1
1	H	347	VAL	3.1
1	E	177	GLU	3.0
1	C	177	GLU	3.0
1	A	270	ALA	3.0
1	D	483	SER	3.0
1	B	178	MET	2.9
1	D	176	GLY	2.9
1	D	215	PHE	2.8
1	C	176	GLY	2.8
1	D	239	LEU	2.8
1	G	176	GLY	2.8
1	F	180	ASP	2.8
1	E	168	CYS	2.8
1	F	178	MET	2.7
1	F	114	CYS	2.6
1	H	180	ASP	2.5
1	D	550	LEU	2.5
1	A	168	CYS	2.5
1	B	177	GLU	2.5
1	H	177	GLU	2.5
1	D	343	GLN	2.5
1	D	114	CYS	2.5
1	H	556	LEU	2.4
1	A	555	HIS	2.4
1	H	176	GLY	2.4
1	A	27	CYS	2.3
1	E	270	ALA	2.3
1	A	180	ASP	2.2

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Mol	Chain	Res	Type	RSRZ
1	E	114	CYS	2.2
1	B	482	GLN	2.2
1	A	176	GLY	2.2
1	E	347	VAL	2.2
1	D	479	PRO	2.1
1	G	523	ASP	2.1
1	H	183	LEU	2.1
1	H	215	PHE	2.1
1	A	114	CYS	2.1
1	C	555	HIS	2.1
1	E	27	CYS	2.1
1	G	556	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 carbohydrates 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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	LLDF	B-factors(Å ²)	Q<0.9
2	TD6	D	601	33/33	0.95	0.12	3.29	21,24,33,40	0
2	TD6	B	601	33/33	0.96	0.11	3.14	17,20,34,41	0
2	TD6	H	601	33/33	0.96	0.11	3.10	20,22,34,46	0
4	GOL	E	603	6/6	0.94	0.14	2.97	12,22,27,27	0
4	GOL	A	603	6/6	0.90	0.13	2.97	14,21,26,26	0
4	GOL	H	603	6/6	0.95	0.12	2.87	16,25,30,30	0
2	TD6	A	601	33/33	0.95	0.11	2.43	16,18,31,44	0
2	TD6	E	601	33/33	0.95	0.10	2.14	17,19,33,39	0
2	TD6	C	601	33/33	0.95	0.11	2.14	19,21,32,36	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors(\AA^2)	Q<0.9
2	TD6	G	601	33/33	0.96	0.11	1.73	19,23,32,39	0
4	GOL	F	603	6/6	0.94	0.10	1.65	14,22,32,32	0
4	GOL	C	603	6/6	0.95	0.12	1.36	14,27,32,32	0
4	GOL	D	603	6/6	0.93	0.10	1.36	18,26,32,32	0
2	TD6	F	601	33/33	0.96	0.10	1.03	18,21,33,41	0
4	GOL	B	603	6/6	0.94	0.09	0.82	17,21,31,31	0
4	GOL	G	603	6/6	0.94	0.10	0.54	17,26,31,32	0
3	MN	E	602	1/1	0.99	0.05	-1.15	20,20,20,20	0
3	MN	G	602	1/1	1.00	0.05	-1.20	23,23,23,23	0
3	MN	C	602	1/1	1.00	0.06	-1.20	24,24,24,24	0
3	MN	A	602	1/1	0.99	0.04	-2.41	20,20,20,20	0
3	MN	H	602	1/1	1.00	0.05	-2.49	24,24,24,24	0
3	MN	D	602	1/1	0.99	0.05	-2.96	27,27,27,27	0
3	MN	F	602	1/1	1.00	0.05	-3.37	21,21,21,21	0
3	MN	B	602	1/1	1.00	0.04	-3.66	20,20,20,20	0

6.5 Other polymers [i](#)

There are no such residues in this entry.