



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 4, 2026 – 07:41 PM UTC

PDB ID : 2WYL / pdb_00002wyl
Title : Apo structure of a metallo- β -lactamase
Authors : Garces, F.; Fernandez, F.J.; Penya-Soler, E.; Aguilar, J.; Baldoma, L.; Coll, M.; Badia, J.; Vega, M.C.
Deposited on : 2009-11-16
Resolution : 2.59 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
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

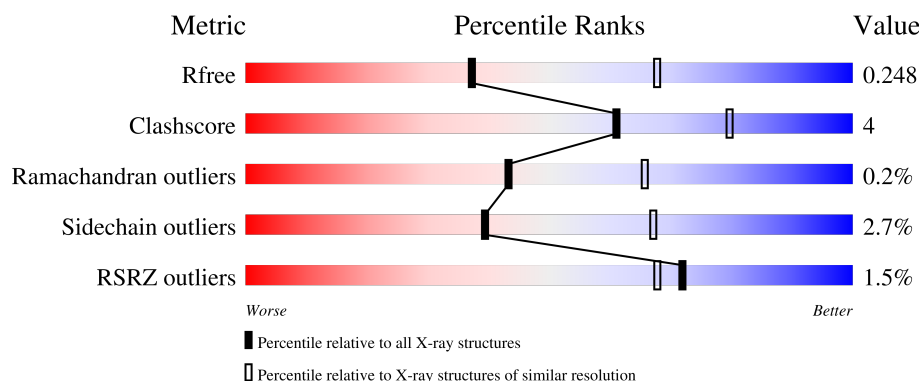
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.59 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	4008 (2.60-2.60)
Clashscore	190562	4347 (2.60-2.60)
Ramachandran outliers	187476	4277 (2.60-2.60)
Sidechain outliers	187428	4277 (2.60-2.60)
RSRZ outliers	180081	4008 (2.60-2.60)

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 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	360	% 73% 11% 16%
1	B	360	2% 79% . 16%
1	C	360	% 72% 10% . 17%
1	D	360	% 74% 9% . 17%
1	E	360	2% 73% 11% 16%

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Mol	Chain	Length	Quality of chain
1	F	360	% 74% 10% 16%

2 Entry composition [i](#)

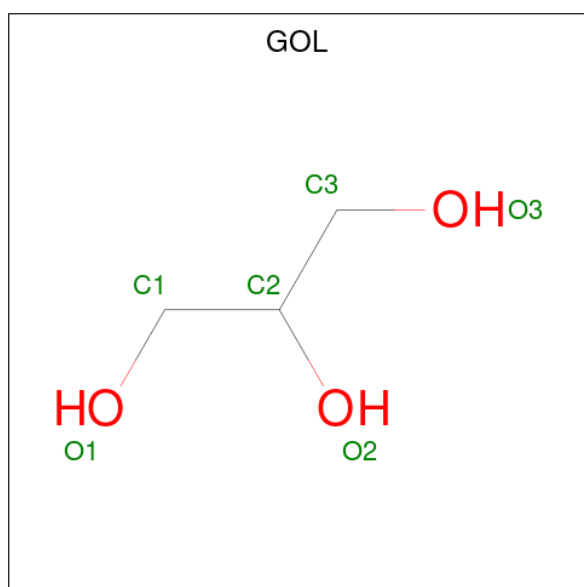
There are 4 unique types of molecules in this entry. The entry contains 15043 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 L-ASCORBATE-6-PHOSPHATE LACTONASE ULAG.

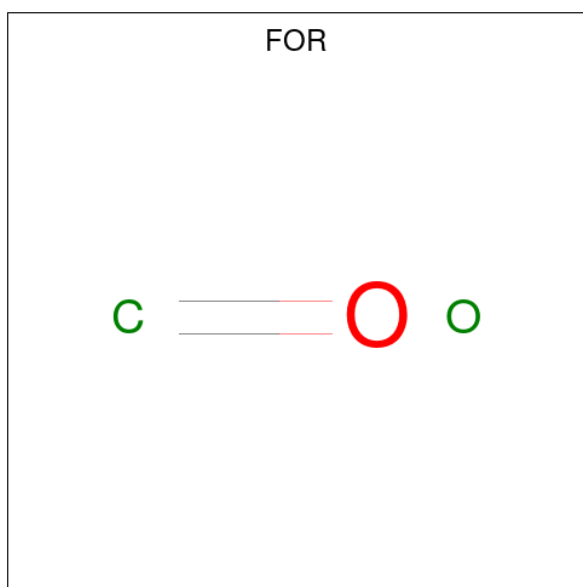
Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	304	Total	C	N	O	S	Se	0	0	0
			2438	1564	417	443	6	8			
1	B	302	Total	C	N	O	S	Se	0	1	0
			2425	1555	414	442	6	8			
1	C	299	Total	C	N	O	S	Se	0	1	0
			2403	1541	411	437	6	8			
1	D	300	Total	C	N	O	S	Se	0	0	0
			2406	1545	409	438	6	8			
1	E	302	Total	C	N	O	S	Se	0	1	0
			2435	1566	415	440	6	8			
1	F	302	Total	C	N	O	S	Se	0	0	0
			2430	1561	415	440	6	8			

- Molecule 2 is GLYCEROL (CCD ID: GOL) (formula: $C_3H_8O_3$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total C O 6 3 3	0	0
2	A	1	Total C O 6 3 3	0	0
2	A	1	Total C O 6 3 3	0	0
2	B	1	Total C O 6 3 3	0	0
2	B	1	Total C O 6 3 3	0	0
2	C	1	Total C O 6 3 3	0	0
2	C	1	Total C O 6 3 3	0	0
2	C	1	Total C O 6 3 3	0	0
2	C	1	Total C O 6 3 3	0	0
2	D	1	Total C O 6 3 3	0	0
2	D	1	Total C O 6 3 3	0	0
2	D	1	Total C O 6 3 3	0	0
2	D	1	Total C O 6 3 3	0	0
2	E	1	Total C O 6 3 3	0	0
2	E	1	Total C O 6 3 3	0	0
2	E	1	Total C O 6 3 3	0	0
2	E	1	Total C O 6 3 3	0	0
2	F	1	Total C O 6 3 3	0	0
2	F	1	Total C O 6 3 3	0	0
2	F	1	Total C O 6 3 3	0	0

- Molecule 3 is FORMYL GROUP (CCD ID: FOR) (formula: CH₂O).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	C	1	Total	C	O	0	0
			2	1	1		
3	F	1	Total	C	O	0	0
			2	1	1		

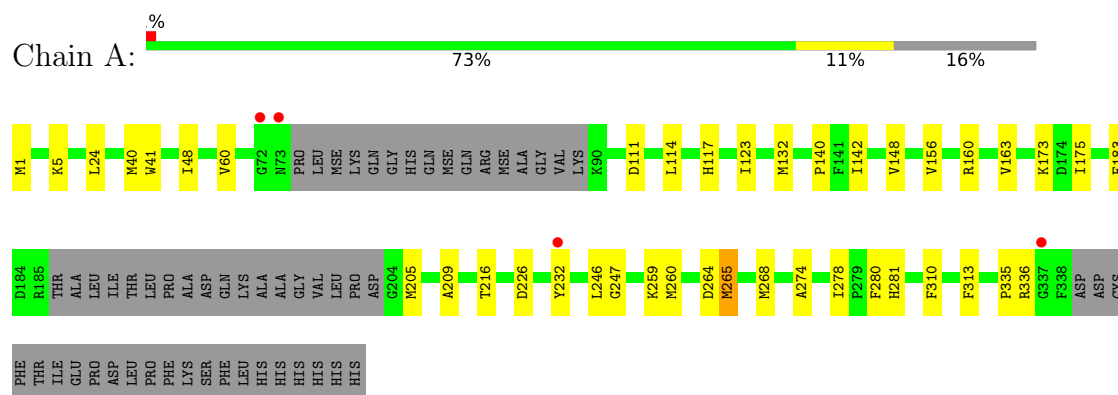
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	71	Total	O	0	0
			71	71		
4	B	59	Total	O	0	0
			59	59		
4	C	72	Total	O	0	0
			72	72		
4	D	86	Total	O	0	0
			86	86		
4	E	49	Total	O	0	0
			49	49		
4	F	45	Total	O	0	0
			45	45		

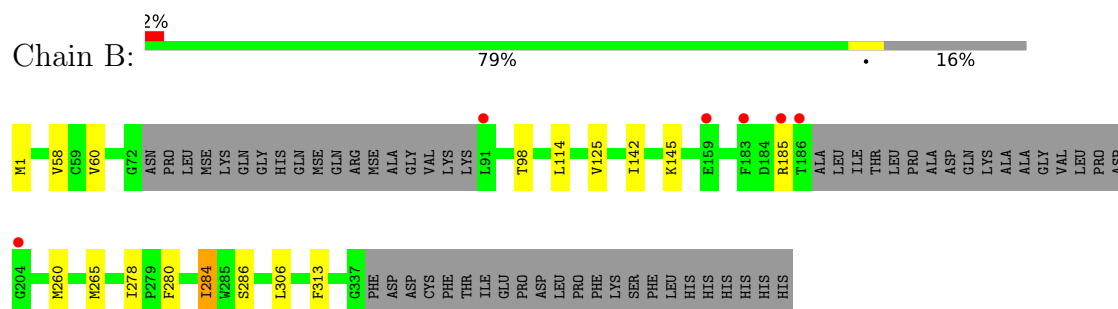
3 Residue-property plots [i](#)

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

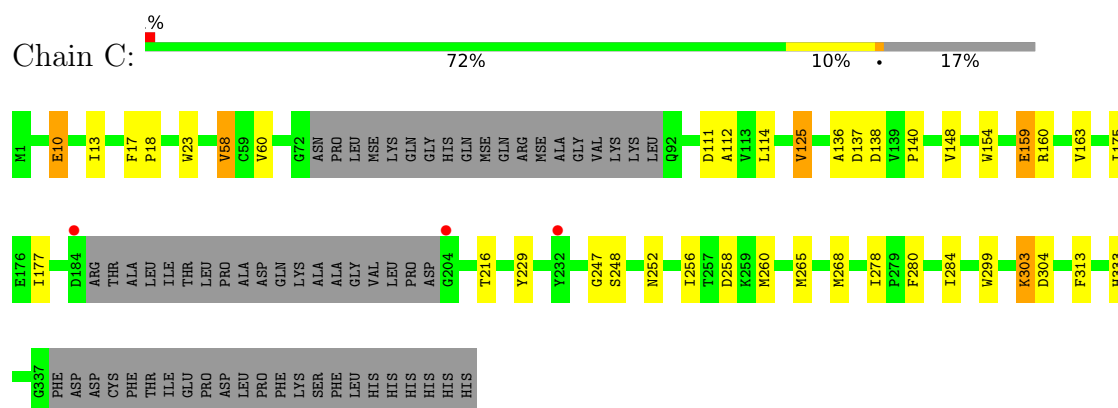
• Molecule 1: L-ASCORBATE-6-PHOSPHATE LACTONASE ULAG



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4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	103.61Å 178.56Å 112.42Å 90.00° 103.82° 90.00°	Depositor
Resolution (Å)	14.94 – 2.59 14.94 – 2.59	Depositor EDS
% Data completeness (in resolution range)	98.5 (14.94-2.59) 97.9 (14.94-2.59)	Depositor EDS
R_{merge}	0.16	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	12.57 (at 2.58Å)	Xtriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.198 , 0.248 0.200 , 0.248	Depositor DCC
R_{free} test set	3037 reflections (4.99%)	wwPDB-VP
Wilson B-factor (Å ²)	31.1	Xtriage
Anisotropy	0.154	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.40 , 45.5	EDS
L-test for twinning ²	$\langle L \rangle = 0.44$, $\langle L^2 \rangle = 0.27$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	15043	wwPDB-VP
Average B, all atoms (Å ²)	30.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.56% 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, FOR

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	0.49	0/2506	0.75	0/3393
1	B	0.42	0/2495	0.74	1/3380 (0.0%)
1	C	0.46	0/2473	0.72	1/3348 (0.0%)
1	D	0.47	0/2474	0.74	0/3350
1	E	0.41	0/2507	0.71	0/3395
1	F	0.43	0/2499	0.72	1/3384 (0.0%)
All	All	0.45	0/14954	0.73	3/20250 (0.0%)

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	284	ILE	N-CA-C	5.25	115.92	110.82
1	F	284	ILE	N-CA-C	5.07	116.52	111.00
1	B	284	ILE	N-CA-C	5.03	116.48	111.00

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	2438	0	2325	27	0
1	B	2425	0	2322	7	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	C	2403	0	2297	29	0
1	D	2406	0	2293	18	0
1	E	2435	0	2338	22	0
1	F	2430	0	2327	23	0
2	A	18	0	24	2	0
2	B	12	0	16	0	0
2	C	24	0	32	1	0
2	D	24	0	32	0	0
2	E	24	0	32	0	0
2	F	18	0	24	1	0
3	C	2	0	0	0	0
3	F	2	0	0	0	0
4	A	71	0	0	0	0
4	B	59	0	0	0	0
4	C	72	0	0	0	0
4	D	86	0	0	0	0
4	E	49	0	0	0	0
4	F	45	0	0	0	0
All	All	15043	0	14062	120	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 4.

All (120) 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:A:40:MSE:HE1	1:A:246:LEU:HD11	1.64	0.80
1:A:247:GLY:HA3	1:A:265:MSE:HE1	1.62	0.80
1:C:23:TRP:HE1	2:C:1339:GOL:H12	1.48	0.78
1:C:265:MSE:HA	1:C:265:MSE:HE2	1.66	0.77
1:A:40:MSE:CE	1:A:246:LEU:HD11	2.17	0.74
1:D:98:THR:CG2	1:D:284:ILE:HD12	2.20	0.72
1:C:260:MSE:SE	1:C:265:MSE:HE3	2.40	0.72
1:C:229:TYR:HD1	1:C:260:MSE:CE	2.07	0.67
1:F:247:GLY:HA3	1:F:265:MSE:HE1	1.78	0.64
1:F:265:MSE:HA	1:F:265:MSE:HE2	1.80	0.64
1:F:278:ILE:HG12	1:F:313:PHE:HB3	1.79	0.64
1:E:148:VAL:HG21	1:E:163:VAL:HG22	1.80	0.63
1:C:247:GLY:HA3	1:C:265:MSE:HE1	1.82	0.62
1:F:40:MSE:HG2	1:F:315:TRP:HH2	1.65	0.61
1:A:175:ILE:HG12	1:A:216:THR:HG22	1.84	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:98:THR:HG23	1:D:284:ILE:HD12	1.84	0.60
1:A:265:MSE:HA	1:A:265:MSE:HE2	1.83	0.59
1:B:278:ILE:HG12	1:B:313:PHE:HB3	1.84	0.59
1:D:98:THR:HG22	1:D:284:ILE:HA	1.85	0.58
1:A:117:HIS:HE1	1:A:226:ASP:H	1.51	0.57
1:E:175:ILE:HG12	1:E:216:THR:HG22	1.86	0.57
1:E:229:TYR:HD1	1:E:260:MSE:HE3	1.69	0.57
1:C:229:TYR:HD1	1:C:260:MSE:HE3	1.69	0.57
1:C:303:LYS:HG2	1:C:304:ASP:N	2.19	0.57
1:E:229:TYR:HD1	1:E:260:MSE:CE	2.16	0.57
1:D:132:MSE:HE3	1:D:156:VAL:HG22	1.86	0.57
1:D:259:LYS:HE3	1:D:281:HIS:CD2	2.41	0.56
1:D:114:LEU:HG	1:D:142:ILE:HB	1.89	0.55
1:F:175:ILE:HG12	1:F:216:THR:HG22	1.89	0.55
1:E:132:MSE:CE	1:E:156:VAL:HG22	2.38	0.54
1:C:260:MSE:SE	1:C:265:MSE:CE	3.06	0.54
1:F:124:ASP:H	2:F:1339:GOL:H2	1.74	0.53
1:D:132:MSE:CE	1:D:156:VAL:HG22	2.39	0.53
1:F:260:MSE:SE	1:F:265:MSE:HE3	2.59	0.52
1:F:260:MSE:HE2	1:F:264:ASP:HB3	1.91	0.52
1:E:278:ILE:HG12	1:E:313:PHE:HB3	1.92	0.51
1:C:278:ILE:HG12	1:C:313:PHE:HB3	1.93	0.51
1:C:299:TRP:O	1:C:303:LYS:HB3	2.10	0.51
1:B:1:MSE:HA	1:B:1:MSE:HE2	1.94	0.50
1:D:136:ALA:C	1:D:138:ASP:H	2.20	0.50
1:F:114:LEU:HD21	1:F:177:ILE:HD13	1.93	0.49
1:D:183:PHE:HB2	1:D:230:SER:HB2	1.95	0.49
1:E:114:LEU:HG	1:E:142:ILE:HB	1.94	0.49
1:E:183:PHE:CE1	1:E:232:TYR:HB2	2.47	0.49
1:F:40:MSE:HG2	1:F:315:TRP:CH2	2.47	0.49
1:A:114:LEU:HG	1:A:142:ILE:HB	1.95	0.49
1:B:114:LEU:HG	1:B:142:ILE:HB	1.94	0.49
1:F:58:VAL:HG22	1:F:112:ALA:HB3	1.95	0.49
1:F:260:MSE:HE1	1:F:268:MSE:HB2	1.95	0.49
1:A:274:ALA:O	1:A:310:PHE:HB3	2.13	0.48
1:C:10:GLU:H	1:C:10:GLU:CD	2.21	0.48
1:F:148:VAL:HG21	1:F:163:VAL:HG22	1.94	0.48
1:C:175:ILE:HG12	1:C:216:THR:HG22	1.95	0.48
1:C:136:ALA:C	1:C:138:ASP:H	2.21	0.48
1:A:40:MSE:HE2	1:A:48:ILE:HD12	1.96	0.48
1:B:260:MSE:HE2	1:B:265:MSE:SE	2.64	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:205:MSE:HE1	1:A:209:ALA:HB3	1.97	0.47
1:A:111:ASP:O	1:A:140:PRO:HD2	2.13	0.47
1:C:148:VAL:HG21	1:C:163:VAL:HG22	1.95	0.47
1:F:229:TYR:HD1	1:F:260:MSE:HE3	1.80	0.47
1:E:58:VAL:HG22	1:E:112:ALA:HB3	1.97	0.47
1:E:229:TYR:CD1	1:E:260:MSE:HE3	2.50	0.47
1:D:260:MSE:SE	1:D:265:MSE:HE2	2.66	0.46
1:A:260:MSE:HE2	1:A:264:ASP:HB3	1.97	0.46
1:C:248:SER:O	1:C:260:MSE:HB2	2.17	0.45
1:C:265:MSE:HA	1:C:265:MSE:CE	2.41	0.45
1:E:40:MSE:HG2	1:E:315:TRP:HH2	1.81	0.45
1:C:260:MSE:HE1	1:C:268:MSE:HB2	1.97	0.45
1:E:205:MSE:CG	1:E:206:ASP:H	2.29	0.45
1:E:270:GLU:OE2	1:F:336:ARG:NH2	2.44	0.45
1:A:183:PHE:CE1	1:A:232:TYR:HB2	2.52	0.45
1:A:117:HIS:HB3	1:A:209:ALA:HB2	1.98	0.45
1:D:278:ILE:HG12	1:D:313:PHE:HB3	1.98	0.45
1:F:40:MSE:HE2	1:F:321:PHE:HB3	1.98	0.45
1:A:24:LEU:HD11	1:A:41:TRP:CD1	2.52	0.45
1:A:278:ILE:HG12	1:A:313:PHE:HB3	1.99	0.45
1:C:17:PHE:HA	1:C:18:PRO:C	2.42	0.45
1:E:132:MSE:HE1	1:E:156:VAL:HG22	1.97	0.45
1:E:117:HIS:CE1	1:E:119:HIS:HB3	2.52	0.45
1:A:259:LYS:HE3	1:A:281:HIS:CE1	2.52	0.44
1:A:260:MSE:HE1	1:A:268:MSE:HB2	1.99	0.44
1:C:252:ASN:HB3	1:C:256:ILE:O	2.17	0.44
1:F:117:HIS:HD1	1:F:119:HIS:HB2	1.83	0.44
1:A:335:PRO:HD2	2:A:1339:GOL:H31	2.00	0.44
1:B:98[A]:THR:OG1	1:B:284:ILE:HD12	2.18	0.44
1:C:229:TYR:CD1	1:C:260:MSE:HE3	2.50	0.44
1:C:111:ASP:O	1:C:140:PRO:HD2	2.16	0.44
1:C:159:GLU:H	1:C:159:GLU:HG3	1.32	0.44
1:F:98:THR:HG22	1:F:284:ILE:HD12	2.00	0.44
1:E:260:MSE:HE1	1:E:268:MSE:HB2	2.00	0.43
1:C:125:VAL:HG22	1:C:154:TRP:CZ2	2.54	0.43
1:A:132:MSE:HE3	1:A:156:VAL:HG22	2.00	0.43
1:C:58:VAL:HG22	1:C:112:ALA:HB3	2.00	0.43
1:A:336:ARG:NH2	1:D:270:GLU:OE2	2.42	0.43
1:E:146:THR:CG2	1:E:208:ARG:HA	2.49	0.43
1:D:110:ILE:HG23	1:D:139:VAL:HG21	2.01	0.43
1:F:98:THR:CG2	1:F:284:ILE:HD12	2.49	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:114:LEU:HG	1:F:142:ILE:HB	2.00	0.42
1:E:205:MSE:HG2	1:E:206:ASP:H	1.84	0.42
1:F:111:ASP:O	1:F:140:PRO:HD2	2.19	0.42
1:A:260:MSE:SE	1:A:265:MSE:HE3	2.70	0.42
1:C:13:ILE:HG22	1:D:13:ILE:HG22	2.01	0.42
1:D:176:GLU:HB3	1:D:215:LYS:HB2	2.01	0.42
1:C:333:HIS:HB2	1:F:305:ARG:HG2	2.01	0.42
1:E:59:CYS:SG	1:E:62:PHE:HB2	2.60	0.42
1:B:58:VAL:HG13	1:B:114:LEU:HD13	2.01	0.41
1:C:17:PHE:CD2	1:D:17:PHE:CD2	3.07	0.41
1:C:114:LEU:HD21	1:C:177:ILE:HD13	2.01	0.41
1:E:132:MSE:HE3	1:E:156:VAL:HG22	2.03	0.41
1:A:160:ARG:HE	1:A:160:ARG:HB3	1.74	0.41
1:A:132:MSE:CE	1:A:156:VAL:HG22	2.51	0.41
1:A:1:MSE:HE2	1:A:5:LYS:HG2	2.03	0.41
1:B:286:SER:HB2	1:E:334:TYR:CG	2.56	0.41
1:C:137:ASP:HA	1:C:160:ARG:NH1	2.36	0.41
1:D:4:VAL:HG23	1:D:5:LYS:HD2	2.02	0.41
1:A:148:VAL:HG21	1:A:163:VAL:HG22	2.03	0.41
1:D:146:THR:HG22	1:D:207:ASP:O	2.20	0.41
1:F:183:PHE:CE1	1:F:232:TYR:HB2	2.56	0.41
1:A:123:ILE:HG13	2:A:1340:GOL:H32	2.03	0.40
1:E:98:THR:CG2	1:E:284:ILE:HD12	2.51	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	A	298/360 (83%)	289 (97%)	8 (3%)	1 (0%)	36 58
1	B	297/360 (82%)	289 (97%)	8 (3%)	0	100 100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	C	294/360 (82%)	284 (97%)	10 (3%)	0	100	100
1	D	294/360 (82%)	284 (97%)	9 (3%)	1 (0%)	36	58
1	E	297/360 (82%)	284 (96%)	13 (4%)	0	100	100
1	F	296/360 (82%)	288 (97%)	7 (2%)	1 (0%)	36	58
All	All	1776/2160 (82%)	1718 (97%)	55 (3%)	3 (0%)	43	66

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	173	LYS
1	D	137	ASP
1	F	91	LEU

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	259/297 (87%)	256 (99%)	3 (1%)	63	83
1	B	259/297 (87%)	253 (98%)	6 (2%)	44	71
1	C	256/297 (86%)	248 (97%)	8 (3%)	35	63
1	D	256/297 (86%)	247 (96%)	9 (4%)	32	59
1	E	260/297 (88%)	250 (96%)	10 (4%)	29	56
1	F	259/297 (87%)	254 (98%)	5 (2%)	50	75
All	All	1549/1782 (87%)	1508 (97%)	41 (3%)	39	68

All (41) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	60	VAL
1	A	265	MSE
1	A	280	PHE
1	B	60	VAL

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Mol	Chain	Res	Type
1	B	125	VAL
1	B	145	LYS
1	B	185	ARG
1	B	280	PHE
1	B	306	LEU
1	C	10	GLU
1	C	58	VAL
1	C	60	VAL
1	C	125	VAL
1	C	159	GLU
1	C	258	ASP
1	C	280	PHE
1	C	303	LYS
1	D	98	THR
1	D	125	VAL
1	D	138	ASP
1	D	158	LYS
1	D	159	GLU
1	D	248	SER
1	D	275	LYS
1	D	280	PHE
1	D	338	PHE
1	E	4	VAL
1	E	14	LEU
1	E	60	VAL
1	E	91	LEU
1	E	125	VAL
1	E	259	LYS
1	E	260	MSE
1	E	280	PHE
1	E	306	LEU
1	E	322	THR
1	F	10	GLU
1	F	60	VAL
1	F	125	VAL
1	F	181	ASP
1	F	280	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (11) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	117	HIS

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Mol	Chain	Res	Type
1	C	117	HIS
1	D	126	ASN
1	D	211	ASN
1	D	240	HIS
1	D	273	ASN
1	E	32	GLN
1	E	119	HIS
1	F	109	GLN
1	F	231	ASN
1	F	273	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

22 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	GOL	F	1340	-	5,5,5	0.38	0	5,5,5	0.30	0
2	GOL	D	1341	-	5,5,5	0.38	0	5,5,5	0.36	0
2	GOL	C	1341	-	5,5,5	0.37	0	5,5,5	0.30	0
2	GOL	D	1340	-	5,5,5	0.37	0	5,5,5	0.31	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	GOL	D	1342	-	5,5,5	0.40	0	5,5,5	0.34	0
2	GOL	F	1341	-	5,5,5	0.38	0	5,5,5	0.30	0
2	GOL	C	1339	-	5,5,5	0.37	0	5,5,5	0.24	0
2	GOL	E	1339	-	5,5,5	0.37	0	5,5,5	0.42	0
2	GOL	C	1338	-	5,5,5	0.38	0	5,5,5	0.38	0
2	GOL	C	1340	-	5,5,5	0.41	0	5,5,5	0.30	0
2	GOL	E	1340	-	5,5,5	0.36	0	5,5,5	0.34	0
2	GOL	B	1339	-	5,5,5	0.39	0	5,5,5	0.30	0
2	GOL	F	1339	-	5,5,5	0.39	0	5,5,5	0.24	0
2	GOL	A	1339	-	5,5,5	0.38	0	5,5,5	0.27	0
2	GOL	D	1343	-	5,5,5	0.43	0	5,5,5	0.28	0
3	FOR	F	1338	-	0,1,1	-	-	-	-	-
2	GOL	E	1341	-	5,5,5	0.36	0	5,5,5	0.35	0
3	FOR	C	1337	-	0,1,1	-	-	-	-	-
2	GOL	B	1338	-	5,5,5	0.38	0	5,5,5	0.32	0
2	GOL	A	1341	-	5,5,5	0.37	0	5,5,5	0.31	0
2	GOL	A	1340	-	5,5,5	0.40	0	5,5,5	0.27	0
2	GOL	E	1342	-	5,5,5	0.39	0	5,5,5	0.20	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	GOL	F	1340	-	-	2/4/4/4	-
2	GOL	D	1341	-	-	4/4/4/4	-
2	GOL	C	1341	-	-	3/4/4/4	-
2	GOL	D	1340	-	-	1/4/4/4	-
2	GOL	D	1342	-	-	3/4/4/4	-
2	GOL	F	1341	-	-	2/4/4/4	-
2	GOL	C	1339	-	-	2/4/4/4	-
2	GOL	E	1339	-	-	3/4/4/4	-
2	GOL	C	1338	-	-	2/4/4/4	-
2	GOL	C	1340	-	-	0/4/4/4	-
2	GOL	E	1340	-	-	0/4/4/4	-
2	GOL	B	1339	-	-	2/4/4/4	-
2	GOL	F	1339	-	-	4/4/4/4	-
2	GOL	A	1339	-	-	2/4/4/4	-
2	GOL	D	1343	-	-	2/4/4/4	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	GOL	E	1341	-	-	0/4/4/4	-
2	GOL	B	1338	-	-	0/4/4/4	-
2	GOL	A	1341	-	-	1/4/4/4	-
2	GOL	A	1340	-	-	0/4/4/4	-
2	GOL	E	1342	-	-	0/4/4/4	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (33) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	1339	GOL	O1-C1-C2-C3
2	C	1338	GOL	O1-C1-C2-C3
2	C	1339	GOL	C1-C2-C3-O3
2	D	1341	GOL	C1-C2-C3-O3
2	D	1342	GOL	C1-C2-C3-O3
2	E	1339	GOL	O1-C1-C2-O2
2	E	1339	GOL	O1-C1-C2-C3
2	A	1339	GOL	O1-C1-C2-O2
2	D	1341	GOL	O2-C2-C3-O3
2	A	1341	GOL	C1-C2-C3-O3
2	B	1339	GOL	C1-C2-C3-O3
2	C	1341	GOL	C1-C2-C3-O3
2	D	1341	GOL	O1-C1-C2-C3
2	D	1343	GOL	C1-C2-C3-O3
2	F	1339	GOL	O1-C1-C2-C3
2	F	1339	GOL	C1-C2-C3-O3
2	F	1340	GOL	C1-C2-C3-O3
2	F	1341	GOL	C1-C2-C3-O3
2	C	1338	GOL	O1-C1-C2-O2
2	C	1339	GOL	O2-C2-C3-O3
2	C	1341	GOL	O2-C2-C3-O3
2	D	1343	GOL	O2-C2-C3-O3
2	F	1341	GOL	O2-C2-C3-O3
2	F	1339	GOL	O1-C1-C2-O2
2	C	1341	GOL	O1-C1-C2-C3
2	D	1341	GOL	O1-C1-C2-O2
2	D	1342	GOL	O2-C2-C3-O3
2	B	1339	GOL	O2-C2-C3-O3
2	E	1339	GOL	O2-C2-C3-O3

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Mol	Chain	Res	Type	Atoms
2	D	1340	GOL	C1-C2-C3-O3
2	F	1339	GOL	O2-C2-C3-O3
2	F	1340	GOL	O2-C2-C3-O3
2	D	1342	GOL	O1-C1-C2-C3

There are no ring outliers.

4 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	1339	GOL	1	0
2	F	1339	GOL	1	0
2	A	1339	GOL	1	0
2	A	1340	GOL	1	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	296/360 (82%)	-0.16	4 (1%) 73 69	16, 30, 41, 59	0
1	B	294/360 (81%)	-0.11	6 (2%) 65 60	18, 31, 44, 58	1 (0%)
1	C	291/360 (80%)	-0.24	3 (1%) 79 76	13, 26, 40, 54	1 (0%)
1	D	292/360 (81%)	-0.30	5 (1%) 69 64	14, 25, 37, 56	0
1	E	294/360 (81%)	0.00	7 (2%) 59 54	16, 35, 49, 54	1 (0%)
1	F	294/360 (81%)	-0.08	2 (0%) 84 82	19, 31, 45, 54	0
All	All	1761/2160 (81%)	-0.15	27 (1%) 72 68	13, 30, 46, 59	3 (0%)

All (27) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	F	338	PHE	4.4
1	D	338	PHE	3.8
1	A	72	GLY	3.6
1	B	159	GLU	3.5
1	E	159	GLU	3.2
1	D	232	TYR	3.1
1	B	186	THR	3.0
1	D	183	PHE	3.0
1	E	91	LEU	2.9
1	A	232	TYR	2.7
1	E	232	TYR	2.7
1	B	91	LEU	2.6
1	C	184	ASP	2.6
1	E	338	PHE	2.5
1	A	337	GLY	2.4
1	C	204	GLY	2.4
1	C	232	TYR	2.3
1	B	185	ARG	2.3
1	D	138	ASP	2.2

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Mol	Chain	Res	Type	RSRZ
1	E	183	PHE	2.1
1	B	183	PHE	2.1
1	D	339	ASP	2.1
1	E	137	ASP	2.1
1	F	184	ASP	2.1
1	E	185	ARG	2.0
1	A	73	ASN	2.0
1	B	204	GLY	2.0

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

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

6.3 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

6.4 Ligands [i](#)

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
2	GOL	E	1342	6/6	0.75	0.15	58,58,58,58	0
2	GOL	A	1341	6/6	0.77	0.14	44,44,44,45	0
2	GOL	C	1339	6/6	0.80	0.14	46,46,46,46	0
2	GOL	F	1341	6/6	0.80	0.17	68,68,68,68	0
2	GOL	C	1341	6/6	0.81	0.13	46,46,46,46	0
2	GOL	E	1340	6/6	0.82	0.11	45,46,46,46	0
2	GOL	F	1340	6/6	0.84	0.10	52,53,53,53	0
3	FOR	C	1337	2/2	0.84	0.16	35,35,35,35	0
2	GOL	E	1339	6/6	0.85	0.14	53,53,53,53	0
2	GOL	C	1338	6/6	0.85	0.13	40,41,41,42	0
2	GOL	E	1341	6/6	0.86	0.12	40,40,41,41	0
2	GOL	D	1342	6/6	0.86	0.11	34,34,34,34	0
2	GOL	F	1339	6/6	0.86	0.12	36,37,37,37	0
3	FOR	F	1338	2/2	0.88	0.17	34,34,34,34	0
2	GOL	D	1340	6/6	0.89	0.11	33,33,34,34	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
2	GOL	D	1343	6/6	0.90	0.09	26,27,27,27	0
2	GOL	A	1340	6/6	0.90	0.11	31,32,32,32	0
2	GOL	D	1341	6/6	0.91	0.07	38,38,38,38	0
2	GOL	B	1339	6/6	0.91	0.09	40,41,41,41	0
2	GOL	A	1339	6/6	0.92	0.09	34,34,34,34	0
2	GOL	B	1338	6/6	0.95	0.07	33,34,34,34	0
2	GOL	C	1340	6/6	0.96	0.07	34,34,34,34	0

6.5 Other polymers [i](#)

There are no such residues in this entry.