



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 10, 2026 – 11:22 AM UTC

PDB ID : 5D4H / pdb_00005d4h
Title : High-resolution nitrite complex of a copper nitrite reductase determined by synchrotron radiation crystallography
Authors : Fukuda, Y.; Tse, K.M.; Nakane, T.; Nakatsu, T.; Suzuki, M.; Sugahara, M.; Inoue, S.; Masuda, T.; Yumoto, F.; Matsugaki, N.; Nango, E.; Tono, K.; Joti, Y.; Kameshima, T.; Song, C.; Hatsui, T.; Yabashi, M.; Nureki, O.; Murphy, M.E.P.; Inoue, T.; Iwata, S.; Mizohata, E.
Deposited on : 2015-08-07
Resolution : 1.30 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)

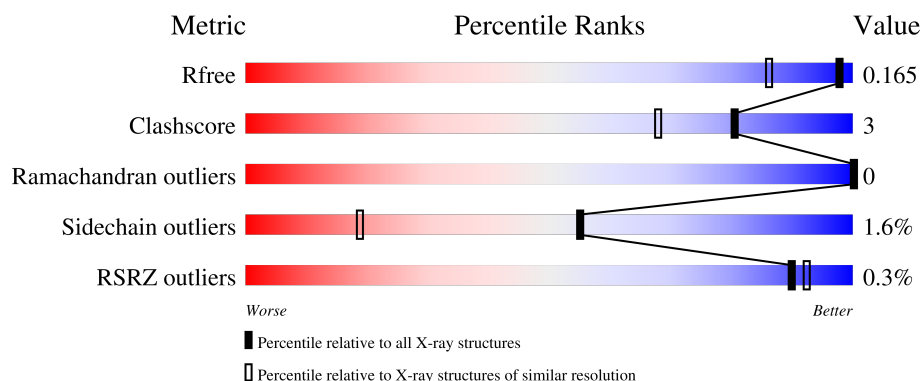
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.30 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	1553 (1.30-1.30)
Clashscore	190562	1595 (1.30-1.30)
Ramachandran outliers	187476	1551 (1.30-1.30)
Sidechain outliers	187428	1551 (1.30-1.30)
RSRZ outliers	180081	1549 (1.30-1.30)

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	342	89% 9% .
1	B	342	89% 11% .
1	C	342	% 90% 8% ..

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard

Validation Pipeline (wwPDB-VP) : 2.49

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
3	NO2	B	503[A]	-	-	X	-
4	GOL	A	515	-	X	-	-
4	GOL	C	507	-	X	X	-
4	GOL	C	508	-	X	-	-

2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 9007 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 Copper-containing nitrite reductase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	337	Total	C	N	O	S	0	4	0
			2600	1662	439	488	11			
1	B	341	Total	C	N	O	S	0	8	0
			2672	1707	452	502	11			
1	C	339	Total	C	N	O	S	0	9	0
			2661	1701	448	500	12			

There are 15 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	3	MET	-	initiating methionine	UNP P38501
A	341	LEU	-	expression tag	UNP P38501
A	342	VAL	-	expression tag	UNP P38501
A	343	PRO	-	expression tag	UNP P38501
A	344	ARG	-	expression tag	UNP P38501
B	3	MET	-	initiating methionine	UNP P38501
B	341	LEU	-	expression tag	UNP P38501
B	342	VAL	-	expression tag	UNP P38501
B	343	PRO	-	expression tag	UNP P38501
B	344	ARG	-	expression tag	UNP P38501
C	3	MET	-	initiating methionine	UNP P38501
C	341	LEU	-	expression tag	UNP P38501
C	342	VAL	-	expression tag	UNP P38501
C	343	PRO	-	expression tag	UNP P38501
C	344	ARG	-	expression tag	UNP P38501

- Molecule 2 is COPPER (II) ION (CCD ID: CU) (formula: Cu).

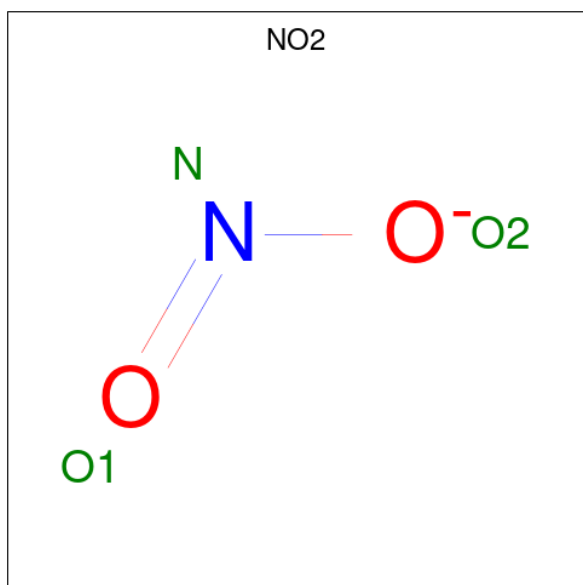
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	2	Total	Cu	0	0
			2	2		

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	B	2	Total	Cu	0	0
			2	2		
2	C	2	Total	Cu	0	0
			2	2		

- Molecule 3 is NITRITE ION (CCD ID: NO2) (formula: NO₂).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	N	O	0	0
			3	1	2		
3	A	1	Total	N	O	0	1
			3	1	2		
3	B	1	Total	N	O	0	1
			3	1	2		

- Molecule 4 is GLYCEROL (CCD ID: GOL) (formula: C₃H₈O₃).



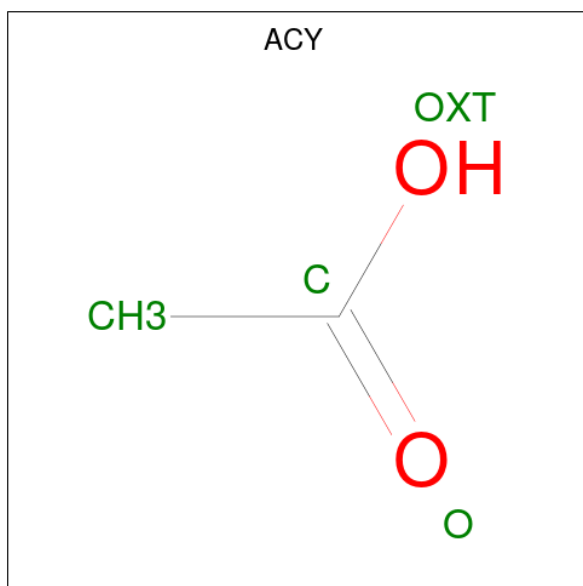
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	C	O	0	0
			6	3	3		
4	A	1	Total	C	O	0	0
			6	3	3		
4	A	1	Total	C	O	0	0
			6	3	3		
4	A	1	Total	C	O	0	0
			6	3	3		
4	A	1	Total	C	O	0	0
			6	3	3		
4	A	1	Total	C	O	0	0
			6	3	3		
4	A	1	Total	C	O	0	0
			6	3	3		
4	A	1	Total	C	O	0	0
			6	3	3		
4	B	1	Total	C	O	0	0
			6	3	3		
4	B	1	Total	C	O	0	0
			6	3	3		
4	B	1	Total	C	O	0	0
			6	3	3		

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	B	1	Total	C	O	0	1
			12	6	6		
4	C	1	Total	C	O	0	1
			12	6	6		
4	C	1	Total	C	O	0	0
			6	3	3		
4	C	1	Total	C	O	0	0
			6	3	3		
4	C	1	Total	C	O	0	1
			12	6	6		
4	C	1	Total	C	O	0	0
			6	3	3		
4	C	1	Total	C	O	0	0
			6	3	3		
4	C	1	Total	C	O	0	0
			6	3	3		

- Molecule 5 is ACETIC ACID (CCD ID: ACY) (formula: C₂H₄O₂).



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

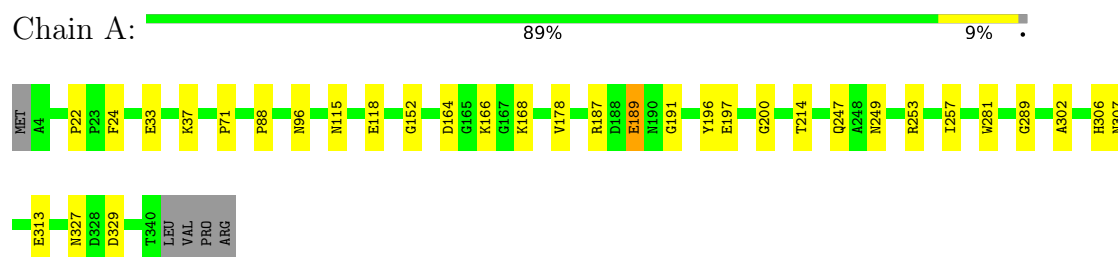
- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	314	Total 320	O 320	0	7
6	B	314	Total 315	O 315	0	3
6	C	265	Total 266	O 266	0	1

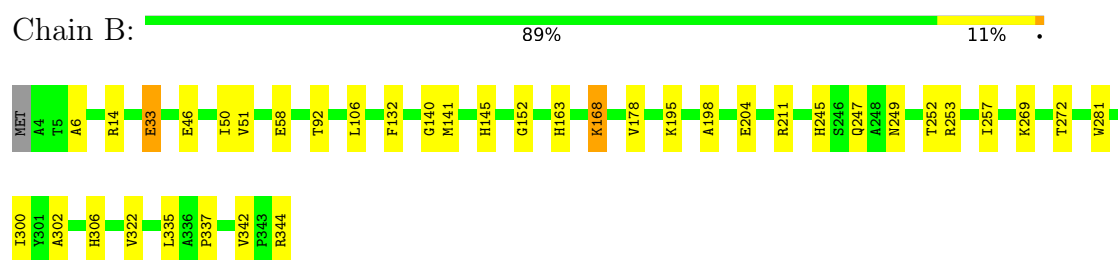
3 Residue-property plots

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.

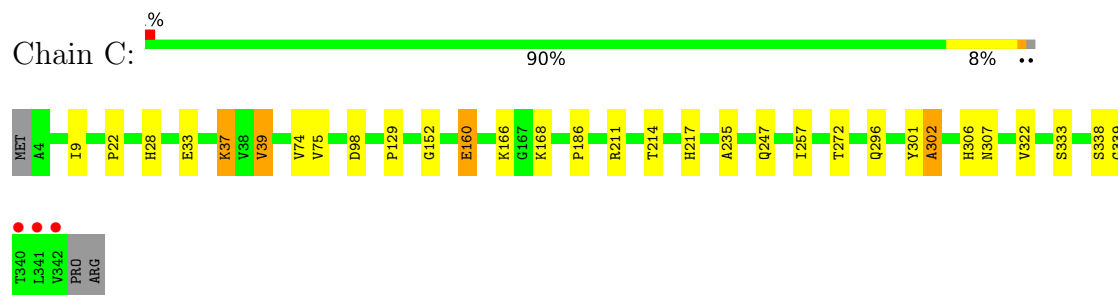
• Molecule 1: Copper-containing nitrite reductase



• Molecule 1: Copper-containing nitrite reductase



• Molecule 1: Copper-containing nitrite reductase



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	61.42Å 102.17Å 145.79Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	49.51 – 1.30 49.51 – 1.30	Depositor EDS
% Data completeness (in resolution range)	99.9 (49.51-1.30) 99.9 (49.51-1.30)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.98 (at 1.30Å)	Xtriage
Refinement program	REFMAC 5.8.0103	Depositor
R, R_{free}	0.123 , 0.165 0.123 , 0.165	Depositor DCC
R_{free} test set	11055 reflections (4.92%)	wwPDB-VP
Wilson B-factor (Å ²)	13.8	Xtriage
Anisotropy	0.072	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.40 , 51.2	EDS
L-test for twinning ²	$\langle L \rangle = 0.51$, $\langle L^2 \rangle = 0.35$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.98	EDS
Total number of atoms	9007	wwPDB-VP
Average B, all atoms (Å ²)	18.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.18% 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: GOL, CU, NO2, ACY

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	1.69	13/2671 (0.5%)	1.34	4/3640 (0.1%)
1	B	1.62	19/2744 (0.7%)	1.29	1/3736 (0.0%)
1	C	1.57	15/2732 (0.5%)	1.30	2/3720 (0.1%)
All	All	1.63	47/8147 (0.6%)	1.31	7/11096 (0.1%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1
1	B	0	1
1	C	0	1
All	All	0	3

All (47) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	198	ALA	N-CA	9.08	1.53	1.45
1	A	152	GLY	C-O	8.56	1.29	1.23
1	C	22	PRO	CA-C	8.55	1.56	1.51
1	C	214	THR	C-O	-6.68	1.18	1.24
1	A	118	GLU	N-CA	6.43	1.53	1.45
1	C	129	PRO	C-O	6.43	1.30	1.23
1	B	152	GLY	C-O	6.36	1.28	1.23
1	C	37	LYS	CA-C	-6.36	1.44	1.52
1	B	92	THR	CA-CB	6.33	1.62	1.54
1	B	342	VAL	CA-CB	6.28	1.62	1.54
1	B	168	LYS	CA-C	6.22	1.60	1.52
1	B	152	GLY	N-CA	6.17	1.51	1.45

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	71	PRO	C-O	5.90	1.30	1.23
1	B	6	ALA	C-O	5.89	1.31	1.24
1	C	333	SER	CA-CB	-5.88	1.45	1.53
1	C	338	SER	C-O	5.87	1.30	1.23
1	C	302	ALA	N-CA	5.80	1.52	1.45
1	A	164	ASP	C-O	5.76	1.31	1.23
1	B	33	GLU	N-CA	5.74	1.53	1.46
1	A	214	THR	C-O	-5.66	1.19	1.24
1	A	327	ASN	CA-C	5.59	1.60	1.53
1	B	51	VAL	C-O	-5.57	1.17	1.24
1	C	296	GLN	CA-C	-5.52	1.45	1.52
1	B	272	THR	CA-CB	5.51	1.61	1.52
1	B	252	THR	N-CA	5.51	1.53	1.45
1	A	22	PRO	CA-CB	5.40	1.58	1.53
1	A	96	ASN	CA-CB	5.30	1.60	1.53
1	B	145	HIS	C-O	-5.29	1.17	1.24
1	C	272	THR	CA-C	5.28	1.58	1.52
1	B	300	ILE	N-CA	5.26	1.52	1.46
1	A	196	TYR	N-CA	5.24	1.52	1.45
1	C	186	PRO	CA-CB	5.24	1.60	1.53
1	A	196	TYR	C-O	5.24	1.30	1.23
1	C	39	VAL	CA-CB	5.22	1.60	1.54
1	C	168	LYS	CA-C	5.21	1.59	1.52
1	A	200	GLY	CA-C	5.21	1.58	1.51
1	A	88	PRO	CA-C	-5.20	1.46	1.52
1	B	344	ARG	NE-CZ	5.18	1.38	1.33
1	C	33	GLU	C-O	5.17	1.30	1.24
1	C	152	GLY	N-CA	5.16	1.50	1.45
1	B	50	ILE	C-O	-5.15	1.18	1.23
1	B	322	VAL	CA-CB	5.13	1.60	1.54
1	A	178	VAL	CA-CB	5.10	1.59	1.53
1	B	46	GLU	CA-C	-5.06	1.46	1.52
1	C	301	TYR	CA-C	-5.04	1.46	1.52
1	B	14	ARG	CZ-NH1	5.02	1.39	1.32
1	B	335	LEU	C-O	5.00	1.29	1.23

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	200	GLY	N-CA-C	-6.66	106.40	114.66
1	A	329	ASP	N-CA-C	-6.56	104.05	111.14
1	C	339	GLY	N-CA-C	-6.35	103.62	112.13

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	9	ILE	N-CA-C	-6.29	104.37	110.72
1	A	115	ASN	N-CA-C	-6.13	103.08	110.13
1	A	289	GLY	O-C-N	-5.03	119.03	123.65
1	B	198	ALA	CA-C-O	-5.03	115.66	120.64

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	306	HIS	Peptide
1	B	306	HIS	Peptide
1	C	306	HIS	Peptide

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	2600	0	2524	10	0
1	B	2672	0	2599	13	0
1	C	2661	0	2587	14	0
2	A	2	0	0	0	0
2	B	2	0	0	0	0
2	C	2	0	0	0	0
3	A	6	0	0	1	0
3	B	3	0	0	2	0
4	A	66	0	86	4	0
4	B	30	0	39	1	0
4	C	54	0	70	10	0
5	A	4	0	3	0	0
5	B	4	0	3	1	0
6	A	320	0	0	3	0
6	B	315	0	0	4	0
6	C	266	0	0	5	0
All	All	9007	0	7911	41	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 3.

All (41) 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)
4:C:508:GOL:H12	6:C:665:HOH:O	1.48	1.10
1:A:187[B]:ARG:HD3	1:A:191:GLY:O	1.82	0.80
4:A:515:GOL:H2	6:A:847:HOH:O	1.81	0.80
1:B:163:HIS:HD2	6:B:615[A]:HOH:O	1.64	0.79
1:A:189:GLU:H	1:A:189:GLU:CD	1.98	0.71
1:B:211:ARG:NH1	6:B:601:HOH:O	2.23	0.70
1:C:257:ILE:HD12	1:C:302:ALA:HB3	1.76	0.68
4:C:505:GOL:O1	4:C:509:GOL:O2	2.04	0.66
1:C:28:HIS:CE1	4:C:506[B]:GOL:H31	2.31	0.66
4:C:506[B]:GOL:H32	6:C:756:HOH:O	1.99	0.62
1:C:74:VAL:O	4:C:507:GOL:H31	2.01	0.61
1:A:257:ILE:HD12	1:A:302:ALA:HB3	1.84	0.60
1:A:33[A]:GLU:O	1:A:37:LYS:NZ	2.34	0.52
1:C:75:VAL:HA	4:C:507:GOL:H31	1.91	0.52
1:C:160:GLU:HG2	6:C:745:HOH:O	2.08	0.52
4:A:515:GOL:C2	6:A:847:HOH:O	2.47	0.52
1:C:160:GLU:CG	6:C:745:HOH:O	2.58	0.51
1:A:24:PHE:HD1	4:A:511:GOL:H2	1.77	0.49
1:B:58[B]:GLU:HG3	1:B:195:LYS:HE3	1.93	0.49
1:B:257:ILE:HD12	1:B:302:ALA:HB3	1.94	0.49
1:B:204:GLU:HG2	6:B:818:HOH:O	2.12	0.49
4:A:510:GOL:H31	6:A:774:HOH:O	2.11	0.49
1:C:217:HIS:CD2	4:C:508:GOL:H11	2.49	0.47
1:C:39:VAL:HG21	4:C:507:GOL:H12	1.97	0.46
4:C:507:GOL:H32	6:C:615:HOH:O	2.15	0.45
1:B:257:ILE:HG12	3:B:503[A]:NO2:N	2.32	0.45
3:B:503[A]:NO2:O2	1:C:98:ASP:OD2	2.35	0.44
1:A:253:ARG:HA	1:A:281:TRP:O	2.18	0.43
1:A:307:ASN:HA	1:B:249:ASN:O	2.19	0.42
1:C:235:ALA:O	1:C:322:VAL:HA	2.19	0.42
1:B:132:PHE:CE2	1:B:269:LYS:HE3	2.55	0.42
1:B:253:ARG:HA	1:B:281:TRP:O	2.20	0.42
1:B:178:VAL:O	1:B:245:HIS:HA	2.20	0.42
1:A:257:ILE:HG22	1:B:106:LEU:HA	2.01	0.41
1:B:140:GLY:O	1:B:141:MET:HE2	2.20	0.41
1:C:28:HIS:O	4:C:506[B]:GOL:H11	2.21	0.41
1:B:163:HIS:CD2	6:B:615[A]:HOH:O	2.51	0.41
1:A:249:ASN:O	1:C:307:ASN:HA	2.20	0.40
3:A:503:NO2:N	1:C:257:ILE:HG12	2.36	0.40
4:B:507[B]:GOL:H32	1:C:211:ARG:HH12	1.85	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:313:GLU:OE1	5:B:508:ACY:H1	2.22	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	339/342 (99%)	336 (99%)	3 (1%)	0	100	100
1	B	347/342 (102%)	345 (99%)	2 (1%)	0	100	100
1	C	346/342 (101%)	344 (99%)	2 (1%)	0	100	100
All	All	1032/1026 (101%)	1025 (99%)	7 (1%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all 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	268/270 (99%)	263 (98%)	5 (2%)	50	14
1	B	277/270 (103%)	273 (99%)	4 (1%)	59	24
1	C	276/270 (102%)	272 (99%)	4 (1%)	59	24
All	All	821/810 (101%)	808 (98%)	13 (2%)	55	19

All (13) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	166	LYS
1	A	168	LYS
1	A	189	GLU
1	A	197	GLU
1	A	247	GLN
1	B	33	GLU
1	B	168	LYS
1	B	247	GLN
1	B	337	PRO
1	C	37	LYS
1	C	160	GLU
1	C	166	LYS
1	C	247	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	163	HIS
1	B	296	GLN
1	C	163	HIS
1	C	296	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 36 ligands modelled in this entry, 6 are monoatomic - leaving 30 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# $ Z > 2$	Counts	RMSZ	# $ Z > 2$
4	GOL	C	507	-	5,5,5	0.99	0	5,5,5	4.46	5 (100%)
4	GOL	A	514	-	5,5,5	0.76	0	5,5,5	1.65	1 (20%)
4	GOL	B	507[A]	-	5,5,5	1.44	1 (20%)	5,5,5	1.54	1 (20%)
4	GOL	A	507	-	5,5,5	0.62	0	5,5,5	0.22	0
4	GOL	A	506	-	5,5,5	1.88	1 (20%)	5,5,5	1.64	2 (40%)
4	GOL	A	512	-	5,5,5	1.21	1 (20%)	5,5,5	1.68	2 (40%)
4	GOL	A	513	-	5,5,5	1.05	1 (20%)	5,5,5	2.12	2 (40%)
4	GOL	A	510	-	5,5,5	1.72	1 (20%)	5,5,5	1.06	0
4	GOL	C	505	-	5,5,5	0.43	0	5,5,5	1.24	1 (20%)
4	GOL	C	503[B]	-	5,5,5	0.53	0	5,5,5	1.68	1 (20%)
4	GOL	C	506[A]	-	5,5,5	0.78	0	5,5,5	1.24	0
4	GOL	C	504	-	5,5,5	1.13	0	5,5,5	1.35	1 (20%)
5	ACY	A	516	-	3,3,3	2.01	1 (33%)	3,3,3	1.57	1 (33%)
4	GOL	B	507[B]	-	5,5,5	1.53	2 (40%)	5,5,5	1.74	2 (40%)
4	GOL	B	504	-	5,5,5	0.68	0	5,5,5	0.69	0
4	GOL	C	509	-	5,5,5	1.40	1 (20%)	5,5,5	1.36	1 (20%)
4	GOL	A	511	-	5,5,5	0.61	0	5,5,5	1.82	1 (20%)
3	NO2	A	504[A]	2	1,2,2	1.23	0	0,1,1	-	-
4	GOL	A	515	-	5,5,5	1.47	1 (20%)	5,5,5	2.46	5 (100%)
4	GOL	C	506[B]	-	5,5,5	0.80	0	5,5,5	0.98	0
5	ACY	B	508	-	3,3,3	1.45	1 (33%)	3,3,3	0.60	0
3	NO2	B	503[A]	2	1,2,2	1.64	0	0,1,1	-	-
4	GOL	B	506	-	5,5,5	0.36	0	5,5,5	0.79	0
3	NO2	A	503	2	1,2,2	0.32	0	0,1,1	-	-
4	GOL	A	508	-	5,5,5	2.04	2 (40%)	5,5,5	0.87	0
4	GOL	B	505	-	5,5,5	1.74	1 (20%)	5,5,5	1.36	0
4	GOL	A	505	-	5,5,5	1.24	1 (20%)	5,5,5	1.20	0
4	GOL	C	508	-	5,5,5	2.49	2 (40%)	5,5,5	3.64	4 (80%)
4	GOL	A	509	-	5,5,5	1.55	1 (20%)	5,5,5	1.01	1 (20%)
4	GOL	C	503[A]	-	5,5,5	0.60	0	5,5,5	1.00	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
4	GOL	C	507	-	-	1/4/4/4	-
4	GOL	A	514	-	-	4/4/4/4	-
4	GOL	B	507[A]	-	-	0/4/4/4	-
4	GOL	A	507	-	-	0/4/4/4	-
4	GOL	A	506	-	-	0/4/4/4	-
4	GOL	A	512	-	-	2/4/4/4	-
4	GOL	A	513	-	-	0/4/4/4	-
4	GOL	A	510	-	-	0/4/4/4	-
4	GOL	C	505	-	-	0/4/4/4	-
4	GOL	C	503[B]	-	-	4/4/4/4	-
4	GOL	C	506[A]	-	-	4/4/4/4	-
4	GOL	C	504	-	-	0/4/4/4	-
4	GOL	B	507[B]	-	-	0/4/4/4	-
4	GOL	B	504	-	-	0/4/4/4	-
4	GOL	C	509	-	-	3/4/4/4	-
4	GOL	A	511	-	-	1/4/4/4	-
4	GOL	A	515	-	-	4/4/4/4	-
4	GOL	C	506[B]	-	-	4/4/4/4	-
4	GOL	B	506	-	-	0/4/4/4	-
4	GOL	A	508	-	-	0/4/4/4	-
4	GOL	B	505	-	-	0/4/4/4	-
4	GOL	A	505	-	-	0/4/4/4	-
4	GOL	C	508	-	-	2/4/4/4	-
4	GOL	A	509	-	-	0/4/4/4	-
4	GOL	C	503[A]	-	-	2/4/4/4	-

All (18) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	C	508	GOL	O1-C1	-3.96	1.25	1.42
4	B	505	GOL	O2-C2	-3.80	1.32	1.43
4	C	508	GOL	O2-C2	3.71	1.54	1.43
4	A	506	GOL	O2-C2	-3.43	1.33	1.43
4	A	510	GOL	O1-C1	3.26	1.56	1.42
4	A	508	GOL	O3-C3	3.23	1.56	1.42
4	A	509	GOL	C1-C2	2.93	1.63	1.51
5	A	516	ACY	OXT-C	-2.68	1.18	1.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	505	GOL	O2-C2	2.66	1.51	1.43
4	A	508	GOL	O2-C2	2.40	1.50	1.43
4	C	509	GOL	O2-C2	-2.38	1.36	1.43
4	A	515	GOL	O1-C1	-2.29	1.32	1.42
4	A	513	GOL	O2-C2	2.18	1.49	1.43
4	B	507[A]	GOL	O1-C1	2.17	1.51	1.42
4	B	507[B]	GOL	O2-C2	-2.16	1.37	1.43
4	A	512	GOL	C3-C2	2.12	1.59	1.51
5	B	508	ACY	CH3-C	2.06	1.57	1.49
4	B	507[B]	GOL	O1-C1	2.05	1.51	1.42

All (31) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	C	507	GOL	O3-C3-C2	-6.93	79.18	110.38
4	C	508	GOL	O3-C3-C2	-5.77	84.39	110.38
4	C	507	GOL	C3-C2-C1	-4.88	93.90	111.80
4	C	508	GOL	C3-C2-C1	-3.96	97.27	111.80
4	C	507	GOL	O2-C2-C1	-3.59	94.33	109.18
4	A	513	GOL	O1-C1-C2	-3.40	95.05	110.38
4	A	514	GOL	O1-C1-C2	3.32	125.32	110.38
4	A	515	GOL	O2-C2-C3	-3.25	95.73	109.18
4	A	511	GOL	O3-C3-C2	-3.08	96.51	110.38
4	A	513	GOL	O3-C3-C2	-3.08	96.52	110.38
4	C	508	GOL	O2-C2-C3	3.07	121.89	109.18
4	C	507	GOL	O2-C2-C3	2.89	121.15	109.18
4	C	508	GOL	O1-C1-C2	-2.76	97.95	110.38
4	B	507[A]	GOL	O1-C1-C2	2.74	122.72	110.38
4	A	512	GOL	O3-C3-C2	-2.66	98.39	110.38
4	C	507	GOL	O1-C1-C2	-2.51	99.07	110.38
4	A	506	GOL	O3-C3-C2	-2.50	99.14	110.38
4	A	515	GOL	O2-C2-C1	2.43	119.26	109.18
4	B	507[B]	GOL	O2-C2-C1	-2.38	99.31	109.18
4	C	504	GOL	O2-C2-C1	2.38	119.03	109.18
4	A	512	GOL	C3-C2-C1	-2.34	103.22	111.80
4	B	507[B]	GOL	O1-C1-C2	2.22	120.37	110.38
4	A	515	GOL	O1-C1-C2	2.22	120.36	110.38
4	A	515	GOL	C3-C2-C1	-2.19	103.76	111.80
4	A	506	GOL	O2-C2-C1	-2.18	100.14	109.18
4	C	509	GOL	O3-C3-C2	2.18	120.19	110.38
4	A	509	GOL	C3-C2-C1	-2.16	103.88	111.80
4	C	503[B]	GOL	O2-C2-C3	2.14	118.04	109.18

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	C	505	GOL	C3-C2-C1	-2.07	104.21	111.80
4	A	515	GOL	O3-C3-C2	-2.04	101.20	110.38
5	A	516	ACY	OXT-C-CH3	2.04	123.60	115.05

There are no chirality outliers.

All (31) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	514	GOL	O1-C1-C2-C3
4	A	514	GOL	C1-C2-C3-O3
4	A	515	GOL	C1-C2-C3-O3
4	C	503[B]	GOL	O1-C1-C2-O2
4	C	503[B]	GOL	O1-C1-C2-C3
4	C	503[B]	GOL	C1-C2-C3-O3
4	C	506[A]	GOL	O1-C1-C2-C3
4	C	506[B]	GOL	O1-C1-C2-C3
4	C	508	GOL	C1-C2-C3-O3
4	A	515	GOL	O2-C2-C3-O3
4	C	506[A]	GOL	O1-C1-C2-O2
4	A	511	GOL	O1-C1-C2-C3
4	A	512	GOL	C1-C2-C3-O3
4	A	515	GOL	O1-C1-C2-C3
4	C	503[A]	GOL	C1-C2-C3-O3
4	C	506[A]	GOL	C1-C2-C3-O3
4	C	506[B]	GOL	C1-C2-C3-O3
4	C	509	GOL	O1-C1-C2-C3
4	A	512	GOL	O2-C2-C3-O3
4	A	514	GOL	O1-C1-C2-O2
4	A	515	GOL	O1-C1-C2-O2
4	C	503[B]	GOL	O2-C2-C3-O3
4	C	508	GOL	O2-C2-C3-O3
4	C	509	GOL	O2-C2-C3-O3
4	A	514	GOL	O2-C2-C3-O3
4	C	506[A]	GOL	O2-C2-C3-O3
4	C	506[B]	GOL	O1-C1-C2-O2
4	C	506[B]	GOL	O2-C2-C3-O3
4	C	503[A]	GOL	O2-C2-C3-O3
4	C	507	GOL	C1-C2-C3-O3
4	C	509	GOL	O1-C1-C2-O2

There are no ring outliers.

12 monomers are involved in 19 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	C	507	GOL	4	0
4	A	510	GOL	1	0
4	C	505	GOL	1	0
4	B	507[B]	GOL	1	0
4	C	509	GOL	1	0
4	A	511	GOL	1	0
4	A	515	GOL	2	0
4	C	506[B]	GOL	3	0
5	B	508	ACY	1	0
3	B	503[A]	NO2	2	0
3	A	503	NO2	1	0
4	C	508	GOL	2	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 [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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	337/342 (98%)	-0.55	0	100 100	11, 16, 32, 74	4 (1%)
1	B	341/342 (99%)	-0.64	0	100 100	8, 15, 32, 69	8 (2%)
1	C	339/342 (99%)	-0.66	3 (0%)	81 84	8, 14, 29, 56	9 (2%)
All	All	1017/1026 (99%)	-0.62	3 (0%)	90 92	8, 15, 32, 74	21 (2%)

All (3) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	341	LEU	2.2
1	C	342	VAL	2.2
1	C	340	THR	2.1

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
4	GOL	C	506[A]	6/6	0.70	0.13	25,29,34,38	6

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
4	GOL	C	506[B]	6/6	0.70	0.13	29,29,32,40	6
4	GOL	C	509	6/6	0.77	0.12	30,33,38,40	0
4	GOL	C	507	6/6	0.87	0.11	26,28,34,34	0
4	GOL	B	507[A]	6/6	0.88	0.12	17,24,29,31	6
4	GOL	B	507[B]	6/6	0.88	0.12	23,24,29,31	6
4	GOL	A	513	6/6	0.88	0.10	32,33,40,43	0
4	GOL	A	515	6/6	0.90	0.09	24,30,34,36	0
4	GOL	C	508	6/6	0.91	0.10	22,28,32,33	0
4	GOL	A	514	6/6	0.92	0.08	28,37,39,44	0
5	ACY	B	508	4/4	0.92	0.09	20,25,26,27	0
5	ACY	A	516	4/4	0.93	0.10	19,25,26,31	0
4	GOL	C	505	6/6	0.93	0.07	26,30,40,42	0
4	GOL	A	512	6/6	0.94	0.08	26,29,41,42	0
3	NO2	A	504[A]	3/3	0.94	0.09	19,19,21,21	3
4	GOL	A	509	6/6	0.94	0.07	21,23,25,25	0
4	GOL	C	504	6/6	0.94	0.08	28,32,36,36	0
4	GOL	B	506	6/6	0.95	0.07	28,29,32,43	0
4	GOL	A	510	6/6	0.96	0.07	21,24,25,28	0
4	GOL	A	511	6/6	0.96	0.07	20,28,34,51	0
3	NO2	B	503[A]	3/3	0.96	0.08	19,19,19,20	3
4	GOL	A	506	6/6	0.97	0.05	20,23,25,30	0
4	GOL	A	507	6/6	0.97	0.05	33,36,38,40	0
4	GOL	B	504	6/6	0.97	0.04	26,29,32,33	0
4	GOL	A	508	6/6	0.97	0.06	16,26,34,35	0
3	NO2	A	503	3/3	0.97	0.09	23,23,26,27	0
4	GOL	A	505	6/6	0.98	0.05	20,21,21,25	0
4	GOL	C	503[A]	6/6	0.98	0.04	14,16,18,19	6
4	GOL	C	503[B]	6/6	0.98	0.04	16,23,28,31	6
4	GOL	B	505	6/6	0.98	0.06	15,26,28,31	0
2	CU	A	501	1/1	1.00	0.01	16,16,16,16	0
2	CU	A	502	1/1	1.00	0.01	13,13,13,13	0
2	CU	B	501	1/1	1.00	0.01	13,13,13,13	0
2	CU	B	502	1/1	1.00	0.01	12,12,12,12	0
2	CU	C	501	1/1	1.00	0.01	11,11,11,11	0
2	CU	C	502	1/1	1.00	0.01	11,11,11,11	0

6.5 Other polymers

There are no such residues in this entry.