



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2026 – 03:51 AM UTC

PDB ID : 2WGQ / pdb_00002wgq
Title : Zinc substituted E Coli Copper Amine Oxidase, a model for the precursor for 2,4,5-trihydroxyphenylalaninequinone formation
Authors : Moody, P.C.E.; Cooper, R.A.
Deposited on : 2009-04-23
Resolution : 2.50 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
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

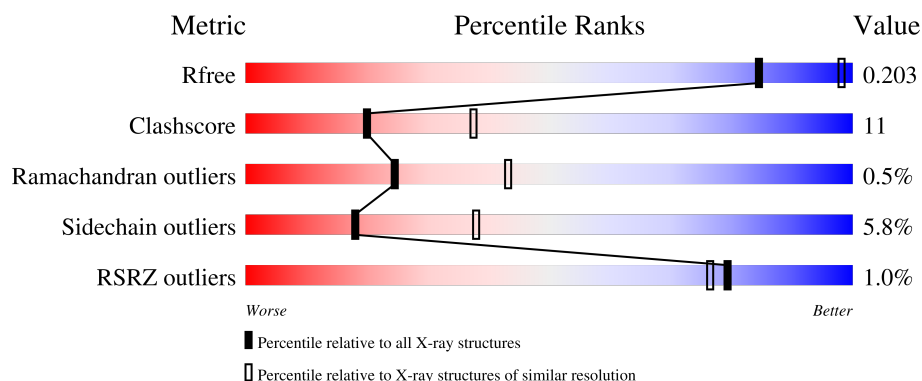
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.50 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	5829 (2.50-2.50)
Clashscore	190562	6492 (2.50-2.50)
Ramachandran outliers	187476	6378 (2.50-2.50)
Sidechain outliers	187428	6380 (2.50-2.50)
RSRZ outliers	180081	5833 (2.50-2.50)

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	727	 75% 22% ..
1	B	727	 2% 75% 21% . ..

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 11791 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 AMINE OXIDASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	720	Total	C	N	O	S	0	0	0
			5677	3611	968	1076	22			
1	B	723	Total	C	N	O	S	0	0	0
			5703	3627	973	1081	22			

- Molecule 2 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	1	Total	Zn	0	0
			1	1		
2	B	1	Total	Zn	0	0
			1	1		

- Molecule 3 is CALCIUM ION (CCD ID: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	2	Total	Ca	0	0
			2	2		
3	B	2	Total	Ca	0	0
			2	2		

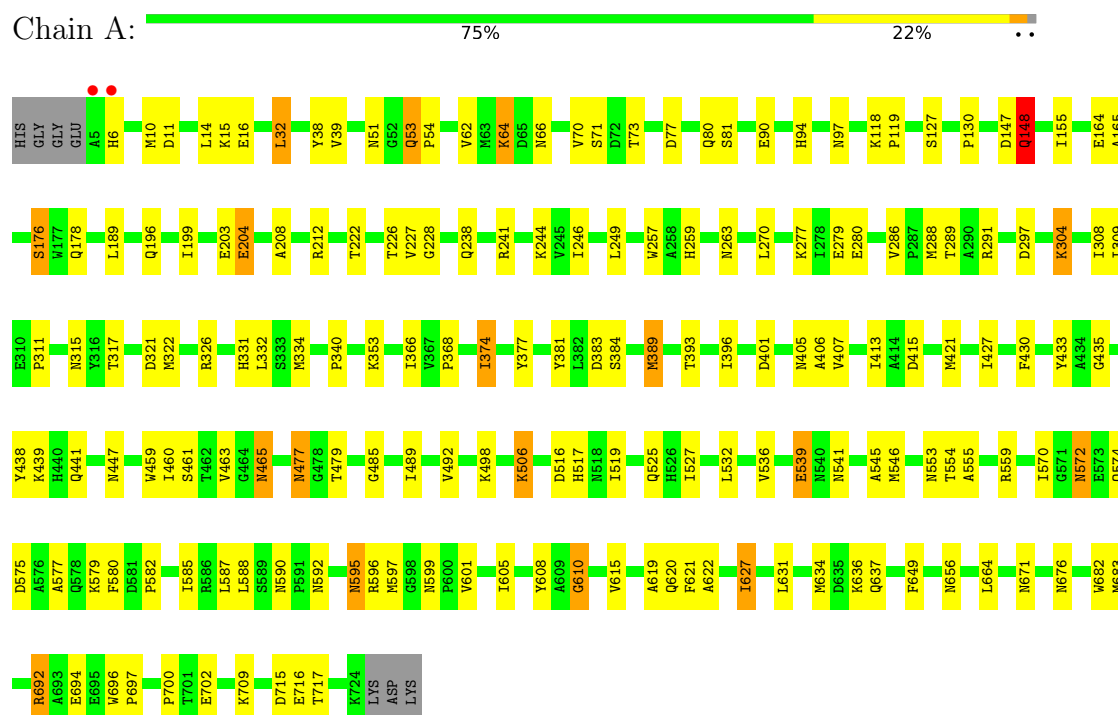
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	227	Total	O	0	0
			227	227		
4	B	178	Total	O	0	0
			178	178		

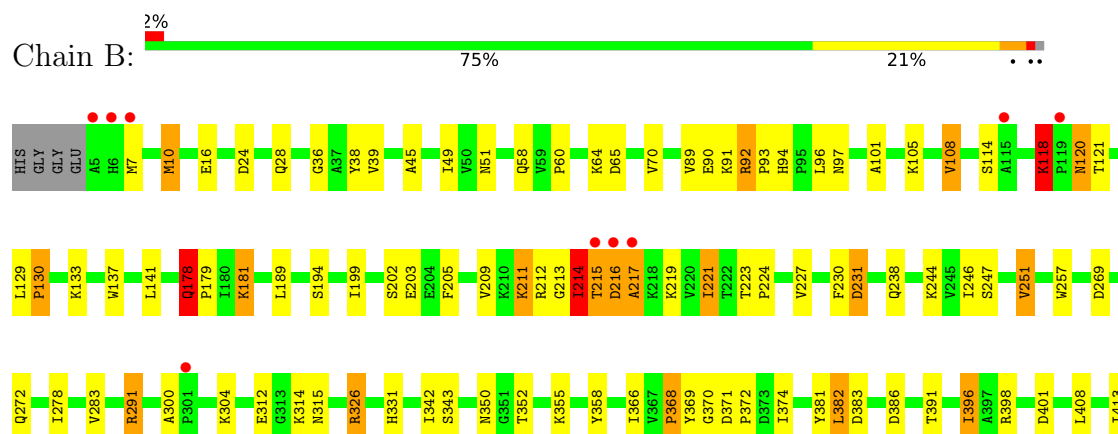
3 Residue-property plots [i](#)

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: AMINE OXIDASE



• Molecule 1: AMINE OXIDASE





4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	134.68Å 166.21Å 79.42Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	39.72 – 2.50 39.72 – 2.50	Depositor EDS
% Data completeness (in resolution range)	92.5 (39.72-2.50) 92.5 (39.72-2.50)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.68 (at 2.51Å)	Xtriage
Refinement program	REFMAC 5.5.0072	Depositor
R, R_{free}	0.204 , 0.264 0.201 , 0.203	Depositor DCC
R_{free} test set	2938 reflections (5.08%)	wwPDB-VP
Wilson B-factor (Å ²)	35.2	Xtriage
Anisotropy	0.530	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 34.4	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	11791	wwPDB-VP
Average B, all atoms (Å ²)	27.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.83% 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: CA, ZN

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	0.91	1/5823 (0.0%)	1.07	15/7929 (0.2%)
1	B	0.90	0/5849	1.06	14/7962 (0.2%)
All	All	0.91	1/11672 (0.0%)	1.07	29/15891 (0.2%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	649	PHE	CA-C	-8.08	1.46	1.52

All (29) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	709	LYS	CA-C-N	-9.41	110.35	119.76
1	A	709	LYS	C-N-CA	-9.41	110.35	119.76
1	B	178	GLN	CA-C-N	8.18	128.20	119.78
1	B	178	GLN	C-N-CA	8.18	128.20	119.78
1	B	300	ALA	CA-C-N	-8.08	111.26	119.99
1	B	300	ALA	C-N-CA	-8.08	111.26	119.99
1	B	602	SER	N-CA-C	7.66	119.31	108.74
1	A	118	LYS	CA-C-N	6.80	128.34	119.84
1	A	118	LYS	C-N-CA	6.80	128.34	119.84
1	B	118	LYS	CA-C-N	6.73	128.25	119.84
1	B	118	LYS	C-N-CA	6.73	128.25	119.84
1	B	16	GLU	N-CA-C	-6.68	103.92	111.07
1	A	130	PRO	O-C-N	6.22	124.07	121.15
1	A	610	GLY	N-CA-C	6.12	117.77	111.95
1	B	58	GLN	N-CA-C	-5.85	104.98	111.36
1	B	130	PRO	O-C-N	5.82	123.89	121.15
1	A	53	GLN	CA-C-N	5.58	125.76	119.90
1	A	53	GLN	C-N-CA	5.58	125.76	119.90

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	231	ASP	N-CA-C	-5.56	103.72	111.39
1	A	127	SER	N-CA-C	5.53	117.59	109.24
1	A	119	PRO	CA-C-N	-5.48	114.39	122.83
1	A	119	PRO	C-N-CA	-5.48	114.39	122.83
1	A	148	GLN	N-CA-C	5.29	121.51	109.81
1	B	120	ASN	N-CA-C	-5.27	106.62	113.16
1	A	389	MET	N-CA-C	5.22	116.97	111.28
1	A	622	ALA	CA-C-N	5.17	126.30	119.84
1	A	622	ALA	C-N-CA	5.17	126.30	119.84
1	B	214	ILE	N-CA-C	5.08	119.91	109.34
1	B	396	ILE	N-CA-C	5.04	116.17	109.37

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	5677	0	5553	153	0
1	B	5703	0	5583	119	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
3	A	2	0	0	0	0
3	B	2	0	0	0	0
4	A	227	0	0	3	0
4	B	178	0	0	4	0
All	All	11791	0	11136	257	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 11.

All (257) 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:B:181:LYS:H	1:B:181:LYS:HD3	1.15	1.07

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:465:ASN:HD22	1:A:465:ASN:H	1.08	0.95
1:A:559:ARG:HH22	1:B:370:GLY:HA2	1.33	0.92
1:A:304:LYS:H	1:B:315:ASN:HD21	1.17	0.89
1:A:465:ASN:H	1:A:465:ASN:ND2	1.71	0.87
1:A:580:PHE:H	1:A:637:GLN:HE21	1.26	0.82
1:A:368:PRO:HG3	1:A:634:MET:HE1	1.60	0.81
1:B:589:SER:HA	1:B:602:SER:HB3	1.61	0.80
1:A:572:ASN:ND2	1:A:575:ASP:H	1.81	0.78
1:A:553:ASN:ND2	1:A:555:ALA:H	1.83	0.76
1:A:559:ARG:NH2	1:B:370:GLY:HA2	2.02	0.74
1:B:579:LYS:HE2	1:B:635:ASP:O	1.88	0.74
1:B:94:HIS:HD2	1:B:96:LEU:H	1.35	0.73
1:B:326:ARG:HD2	4:B:2073:HOH:O	1.88	0.72
1:A:212:ARG:HH21	1:A:280:GLU:HB3	1.55	0.72
1:A:592:ASN:HD21	1:A:676:ASN:HD21	1.34	0.72
1:B:181:LYS:HD3	1:B:181:LYS:N	2.00	0.72
1:A:465:ASN:HD22	1:A:465:ASN:N	1.87	0.71
1:A:241:ARG:HG2	1:A:270:LEU:HD12	1.73	0.71
1:B:726:ASP:CG	1:B:727:LYS:H	1.99	0.70
1:A:226:THR:HG23	1:A:656:ASN:OD1	1.91	0.70
1:B:129:LEU:HD12	1:B:130:PRO:HD2	1.73	0.69
1:B:181:LYS:H	1:B:181:LYS:CD	1.97	0.69
1:A:539:GLU:HG2	4:A:2177:HOH:O	1.93	0.68
1:A:326:ARG:HG3	1:A:326:ARG:HH11	1.59	0.67
1:A:574:GLN:HB2	1:A:671:ASN:ND2	2.10	0.67
1:A:203:GLU:HG2	1:A:204:GLU:N	2.09	0.67
1:B:36:GLY:HA2	1:B:314:LYS:HE2	1.77	0.67
1:B:92:ARG:NE	4:B:2025:HOH:O	2.27	0.66
1:B:368:PRO:HG3	1:B:634:MET:CE	2.26	0.66
1:A:64:LYS:O	1:A:66:ASN:N	2.25	0.66
1:B:477:ASN:HD22	1:B:477:ASN:C	2.03	0.65
1:B:396:ILE:HG23	1:B:401:ASP:HB2	1.78	0.65
1:B:38:TYR:H	1:B:51:ASN:ND2	1.95	0.64
1:A:610:GLY:HA3	1:B:610:GLY:HA3	1.80	0.64
1:A:10:MET:HG2	1:A:14:LEU:HD12	1.80	0.63
1:A:64:LYS:C	1:A:66:ASN:H	2.07	0.63
1:A:263:ASN:HD22	1:A:374:ILE:HG22	1.63	0.63
1:A:627:ILE:HG12	1:A:631:LEU:HD12	1.80	0.63
1:A:572:ASN:HD21	1:A:575:ASP:H	1.47	0.62
1:A:249:LEU:HD23	1:A:288:MET:HE1	1.81	0.62
1:A:572:ASN:HB2	1:A:671:ASN:ND2	2.15	0.62

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:572:ASN:C	1:A:572:ASN:HD22	2.07	0.61
1:B:368:PRO:HG3	1:B:634:MET:HE3	1.81	0.61
1:A:38:TYR:H	1:A:51:ASN:ND2	1.97	0.61
1:A:308:ILE:O	1:A:405:ASN:HB3	2.01	0.61
1:A:580:PHE:H	1:A:637:GLN:NE2	1.97	0.61
1:A:366:ILE:HG12	1:A:368:PRO:HD3	1.83	0.61
1:A:527:ILE:HD13	1:A:634:MET:HE2	1.83	0.61
1:A:368:PRO:HG3	1:A:634:MET:CE	2.30	0.60
1:B:38:TYR:H	1:B:51:ASN:HD21	1.48	0.60
1:A:279:GLU:OE2	1:A:374:ILE:HD11	2.00	0.60
1:A:315:ASN:HD21	1:B:304:LYS:H	1.48	0.60
1:A:525:GLN:NE2	1:A:620:GLN:H	2.00	0.60
1:A:439:LYS:HZ2	1:A:447:ASN:HD21	1.50	0.60
1:A:203:GLU:HG2	1:A:204:GLU:H	1.65	0.60
1:B:532:LEU:HD11	1:B:683:MET:HE2	1.84	0.60
1:A:212:ARG:NH2	1:A:280:GLU:HB3	2.17	0.59
1:A:572:ASN:CG	1:A:671:ASN:HD21	2.11	0.59
1:B:371:ASP:OD1	1:B:372:PRO:HD2	2.01	0.59
1:A:553:ASN:HD22	1:A:554:THR:N	2.00	0.59
1:A:38:TYR:H	1:A:51:ASN:HD21	1.50	0.59
1:A:439:LYS:NZ	1:A:447:ASN:HD21	2.01	0.59
1:A:227:VAL:HG12	1:A:244:LYS:HG3	1.84	0.58
1:B:626:TRP:O	1:B:630:ARG:HG2	2.04	0.58
1:A:286:VAL:HB	1:A:288:MET:HE3	1.86	0.58
1:A:196:GLN:HE22	1:A:222:THR:H	1.49	0.58
1:A:692:ARG:HG3	1:A:694:GLU:OE1	2.03	0.58
1:A:577:ALA:O	1:A:636:LYS:HE2	2.04	0.58
1:B:530:PHE:O	1:B:682:TRP:HA	2.04	0.58
1:A:439:LYS:NZ	1:A:447:ASN:ND2	2.52	0.57
1:B:498:LYS:O	1:B:517:HIS:HD2	1.87	0.57
1:B:580:PHE:H	1:B:637:GLN:HE21	1.52	0.56
1:A:536:VAL:H	1:A:541:ASN:HD21	1.54	0.56
1:A:532:LEU:HD11	1:A:683:MET:HE2	1.88	0.56
1:A:286:VAL:HG12	1:A:288:MET:HE2	1.87	0.55
1:A:441:GLN:OE1	1:A:447:ASN:HB2	2.07	0.55
1:A:485:GLY:HA2	1:A:702:GLU:O	2.06	0.55
1:A:368:PRO:HB2	1:A:621:PHE:HZ	1.72	0.55
1:A:226:THR:CG2	1:A:656:ASN:OD1	2.55	0.54
1:B:383:ASP:HB3	1:B:463:VAL:HG21	1.88	0.54
1:B:698:ILE:O	1:B:700:PRO:HD3	2.07	0.54
1:A:297:ASP:HB2	1:B:725:LYS:HG2	1.88	0.54

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:582:PRO:HB2	1:B:615:VAL:HG12	1.90	0.54
1:A:546:MET:HE3	1:A:587:LEU:HD11	1.90	0.54
1:B:516:ASP:HB3	1:B:519:ILE:HB	1.88	0.54
1:A:383:ASP:HB3	1:A:463:VAL:HG21	1.90	0.54
1:B:540:ASN:HB3	1:B:676:ASN:ND2	2.23	0.54
1:A:32:LEU:HB2	1:A:39:VAL:HB	1.90	0.53
1:A:439:LYS:HZ1	1:A:447:ASN:ND2	2.06	0.53
1:A:595:ASN:HD22	1:A:595:ASN:C	2.17	0.53
1:A:608:TYR:HE2	1:B:608:TYR:HE2	1.56	0.53
1:B:291:ARG:HD2	1:B:516:ASP:OD2	2.07	0.53
1:B:238:GLN:NE2	1:B:238:GLN:HA	2.23	0.53
1:A:608:TYR:CZ	1:A:615:VAL:HG21	2.44	0.52
1:B:216:ASP:O	1:B:217:ALA:CB	2.56	0.52
1:B:137:TRP:CG	1:B:355:LYS:HE2	2.44	0.52
1:A:64:LYS:C	1:A:66:ASN:N	2.60	0.52
1:A:527:ILE:HD13	1:A:634:MET:CE	2.39	0.52
1:B:396:ILE:HD13	1:B:428:ALA:HB2	1.92	0.52
1:A:196:GLN:NE2	1:A:222:THR:H	2.08	0.51
1:A:291:ARG:NH1	1:A:516:ASP:OD1	2.43	0.51
1:B:382:LEU:O	1:B:386:ASP:HB2	2.10	0.51
1:B:536:VAL:H	1:B:541:ASN:HD21	1.58	0.51
1:A:477:ASN:C	1:A:477:ASN:HD22	2.19	0.51
1:B:94:HIS:CD2	1:B:96:LEU:H	2.22	0.51
1:B:572:ASN:HD22	1:B:574:GLN:H	1.59	0.51
1:B:212:ARG:HG2	1:B:283:VAL:HG22	1.93	0.50
1:B:217:ALA:C	1:B:219:LYS:N	2.69	0.50
1:A:574:GLN:HB2	1:A:671:ASN:CG	2.36	0.50
1:A:155:ILE:HD12	1:A:164:GLU:HG2	1.93	0.50
1:A:546:MET:HE3	1:A:587:LEU:CD1	2.42	0.50
1:A:77:ASP:O	1:A:81:SER:HB3	2.11	0.50
1:B:475:HIS:N	1:B:475:HIS:CD2	2.80	0.49
1:A:545:ALA:HB2	1:A:570:ILE:HD11	1.94	0.49
1:A:572:ASN:ND2	1:A:671:ASN:HD21	2.10	0.49
1:B:642:ARG:HD2	1:B:677:THR:HG21	1.95	0.49
1:B:475:HIS:CD2	1:B:475:HIS:H	2.31	0.49
1:A:553:ASN:ND2	1:A:554:THR:N	2.60	0.48
1:A:592:ASN:HD21	1:A:676:ASN:ND2	2.07	0.48
1:A:465:ASN:HB2	1:A:489:ILE:O	2.13	0.48
1:A:498:LYS:HG2	1:A:517:HIS:HB3	1.96	0.48
1:B:141:LEU:HD11	1:B:355:LYS:HE3	1.95	0.48
1:A:90:GLU:OE2	1:A:322:MET:HE2	2.13	0.48

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:45:ALA:O	1:B:60:PRO:HB3	2.13	0.48
1:A:525:GLN:HE22	1:A:619:ALA:HA	1.79	0.48
1:B:595:ASN:C	1:B:595:ASN:ND2	2.71	0.48
1:A:340:PRO:HD3	1:A:459:TRP:CD2	2.49	0.48
1:A:572:ASN:HD22	1:A:574:GLN:H	1.62	0.47
1:A:53:GLN:HA	1:A:54:PRO:HD3	1.71	0.47
1:A:696:TRP:CD2	1:A:697:PRO:HA	2.49	0.47
1:A:286:VAL:HG12	1:A:288:MET:CE	2.44	0.47
1:A:366:ILE:HD11	1:A:627:ILE:HD11	1.96	0.47
1:B:492:VAL:HG11	1:B:696:TRP:CZ3	2.49	0.47
1:B:595:ASN:C	1:B:595:ASN:HD22	2.21	0.47
1:A:413:ILE:HG13	1:A:421:MET:HG3	1.96	0.47
1:A:212:ARG:HD3	4:A:2066:HOH:O	2.15	0.47
1:A:396:ILE:HG23	1:A:401:ASP:HB2	1.97	0.47
1:A:527:ILE:CD1	1:A:634:MET:HE2	2.45	0.47
1:A:588:LEU:HB2	1:A:605:ILE:HD11	1.97	0.47
1:B:398:ARG:HG3	1:B:408:LEU:HD11	1.97	0.47
1:A:286:VAL:CG1	1:A:288:MET:CE	2.92	0.47
1:B:269:ASP:HB3	1:B:272:GLN:HB2	1.97	0.47
1:A:97:ASN:ND2	1:A:331:HIS:NE2	2.63	0.47
1:B:10:MET:HG3	1:B:70:VAL:HG13	1.97	0.47
1:A:165:ALA:HA	1:A:176:SER:O	2.15	0.47
1:A:516:ASP:HB3	1:A:519:ILE:HB	1.96	0.47
1:B:589:SER:CA	1:B:602:SER:HB3	2.41	0.47
1:B:717:THR:HB	1:B:720:LEU:HG	1.97	0.47
1:A:10:MET:HG3	1:A:70:VAL:CG1	2.45	0.46
1:A:226:THR:HG22	1:A:228:GLY:H	1.80	0.46
1:B:366:ILE:HD11	1:B:627:ILE:HD11	1.97	0.46
1:B:133:LYS:HB2	1:B:358:TYR:CZ	2.49	0.46
1:B:709:LYS:NZ	4:B:2173:HOH:O	2.30	0.46
1:A:377:TYR:CE1	1:B:558:PRO:HG2	2.51	0.46
1:A:492:VAL:HB	1:A:519:ILE:HG23	1.97	0.46
1:A:66:ASN:CG	1:A:66:ASN:O	2.58	0.46
1:A:309:ILE:HD12	1:A:311:PRO:HG3	1.96	0.46
1:A:368:PRO:HB2	1:A:621:PHE:CZ	2.50	0.46
1:B:466:TYR:CE1	1:B:526:HIS:HE1	2.34	0.46
1:B:101:ALA:O	1:B:105:LYS:HG3	2.16	0.46
1:B:477:ASN:C	1:B:477:ASN:ND2	2.74	0.46
1:A:506:LYS:HA	1:A:506:LYS:HD3	1.75	0.45
1:B:178:GLN:HA	1:B:179:PRO:HD3	1.74	0.45
1:B:223:THR:HA	1:B:224:PRO:HD3	1.81	0.45

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:580:PHE:H	1:B:637:GLN:NE2	2.13	0.45
1:B:7:MET:HE3	1:B:70:VAL:C	2.42	0.45
1:B:529:ASN:HA	1:B:683:MET:O	2.16	0.45
1:A:257:TRP:HB2	1:A:489:ILE:HG21	1.99	0.45
1:B:178:GLN:HE21	1:B:178:GLN:HB3	1.45	0.45
1:A:595:ASN:C	1:A:595:ASN:ND2	2.74	0.45
1:B:39:VAL:HA	1:B:49:ILE:O	2.16	0.45
1:B:391:THR:HA	1:B:413:ILE:HD11	1.97	0.45
1:A:406:ALA:HA	1:A:430:PHE:HB3	1.99	0.45
1:A:10:MET:HG3	1:A:70:VAL:HG11	1.98	0.45
1:A:595:ASN:HD21	1:A:599:ASN:H	1.64	0.45
1:A:716:GLU:O	1:A:717:THR:C	2.59	0.45
1:A:595:ASN:HB2	1:A:715:ASP:OD1	2.17	0.45
1:A:94:HIS:HB2	1:A:322:MET:HE2	1.98	0.44
1:B:543:LEU:HD22	1:B:640:VAL:HG21	1.98	0.44
1:B:211:LYS:HE3	1:B:211:LYS:HB3	1.67	0.44
1:B:664:LEU:HD21	1:B:682:TRP:CD2	2.53	0.44
1:B:369:TYR:CD2	1:B:524:HIS:HB3	2.52	0.44
1:B:217:ALA:C	1:B:219:LYS:H	2.26	0.44
1:B:221:ILE:N	1:B:221:ILE:CD1	2.80	0.44
1:B:572:ASN:ND2	1:B:575:ASP:H	2.16	0.44
1:A:595:ASN:ND2	1:A:599:ASN:H	2.16	0.43
1:B:527:ILE:HD12	1:B:634:MET:HG2	2.00	0.43
1:A:366:ILE:CD1	1:A:631:LEU:HD13	2.48	0.43
1:B:202:SER:HB3	1:B:205:PHE:HB3	2.00	0.43
1:A:477:ASN:HD22	1:A:479:THR:H	1.65	0.43
1:B:251:VAL:O	1:B:251:VAL:CG1	2.67	0.43
1:B:371:ASP:OD1	1:B:372:PRO:CD	2.65	0.43
1:B:227:VAL:HG12	1:B:244:LYS:HG3	2.01	0.43
1:A:366:ILE:HA	1:A:381:TYR:O	2.18	0.43
1:B:504:THR:HB	1:B:508:ASP:OD2	2.19	0.43
1:B:696:TRP:HD1	4:B:2130:HOH:O	2.01	0.43
1:A:433:TYR:CZ	1:A:435:GLY:HA2	2.54	0.42
1:A:553:ASN:HD22	1:A:554:THR:H	1.65	0.42
1:B:546:MET:HE2	1:B:567:GLN:NE2	2.34	0.42
1:B:526:HIS:O	1:B:686:GLY:HA2	2.19	0.42
1:A:249:LEU:CD2	1:A:288:MET:HE1	2.49	0.42
1:B:97:ASN:ND2	1:B:331:HIS:NE2	2.68	0.42
1:B:437:GLU:HA	1:B:437:GLU:OE1	2.19	0.42
1:B:214:ILE:HG22	1:B:215:THR:N	2.35	0.42
1:B:398:ARG:CZ	1:B:408:LEU:HD12	2.49	0.42

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:726:ASP:CG	1:B:727:LYS:N	2.72	0.42
1:A:208:ALA:O	1:A:212:ARG:HG3	2.19	0.42
1:B:408:LEU:CD1	1:B:425:ARG:HD2	2.49	0.42
1:B:108:VAL:HG21	1:B:418:GLY:HA3	2.00	0.42
1:A:203:GLU:CG	1:A:204:GLU:H	2.32	0.42
1:A:384:SER:HA	1:A:389:MET:HG3	2.01	0.42
1:A:572:ASN:CB	1:A:671:ASN:HD21	2.33	0.42
1:A:664:LEU:HD21	1:A:682:TRP:CD2	2.55	0.42
1:A:334:MET:HE1	1:A:393:THR:OG1	2.19	0.42
1:B:476:GLU:H	1:B:476:GLU:HG2	1.70	0.42
1:B:581:ASP:C	1:B:581:ASP:OD1	2.61	0.42
1:A:366:ILE:HD13	1:A:631:LEU:HD13	2.02	0.42
1:B:636:LYS:O	1:B:684:THR:HB	2.19	0.41
1:A:203:GLU:CG	1:A:204:GLU:N	2.81	0.41
1:A:546:MET:HB2	1:A:585:ILE:HB	2.02	0.41
1:B:90:GLU:OE1	1:B:93:PRO:HA	2.20	0.41
1:A:517:HIS:CE1	1:B:596:ARG:HG2	2.56	0.41
1:B:439:LYS:HA	1:B:448:VAL:O	2.20	0.41
1:B:633:PHE:HA	1:B:639:TRP:CZ2	2.55	0.41
1:B:211:LYS:C	1:B:213:GLY:H	2.28	0.41
1:B:521:GLY:O	1:B:522:THR:C	2.63	0.41
1:A:326:ARG:HG3	1:A:326:ARG:NH1	2.30	0.41
1:A:460:ILE:HG21	1:B:439:LYS:HE2	2.03	0.41
1:B:664:LEU:HD23	1:B:664:LEU:HA	1.95	0.41
1:A:438:TYR:HB2	1:B:698:ILE:HG12	2.02	0.41
1:A:572:ASN:HB2	1:A:671:ASN:HD21	1.84	0.41
1:A:71:SER:C	1:A:73:THR:H	2.28	0.41
1:A:321:ASP:HB3	1:A:332:LEU:O	2.20	0.41
1:A:259:HIS:HE1	1:A:289:THR:O	2.02	0.41
1:A:579:LYS:HA	1:A:637:GLN:NE2	2.35	0.41
1:A:415:ASP:HB3	1:A:421:MET:HE3	2.03	0.41
1:A:553:ASN:ND2	1:A:555:ALA:N	2.60	0.41
1:A:595:ASN:ND2	1:A:597:MET:H	2.18	0.41
1:A:694:GLU:O	1:B:717:THR:HA	2.21	0.41
1:A:717:THR:HG21	1:B:698:ILE:HG23	2.03	0.41
1:B:465:ASN:HD22	1:B:465:ASN:H	1.67	0.41
1:B:485:GLY:HA2	1:B:702:GLU:O	2.21	0.41
1:A:148:GLN:H	1:A:148:GLN:HE21	1.69	0.41
1:A:459:TRP:CZ2	1:A:461:SER:HB2	2.56	0.41
1:B:257:TRP:CZ3	1:B:465:ASN:HB3	2.56	0.41
1:A:10:MET:HG2	1:A:14:LEU:CD1	2.48	0.40

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:374:ILE:HD12	1:A:374:ILE:HA	1.73	0.40
1:A:553:ASN:ND2	1:A:553:ASN:C	2.79	0.40
1:A:590:ASN:HB3	1:A:601:VAL:CG2	2.51	0.40
1:B:366:ILE:HA	1:B:381:TYR:O	2.21	0.40
1:A:353:LYS:NZ	4:A:2106:HOH:O	2.53	0.40
1:A:700:PRO:HA	1:B:438:TYR:HB3	2.03	0.40
1:B:24:ASP:O	1:B:28:GLN:N	2.54	0.40
1:A:332:LEU:HD21	1:A:427:ILE:HG21	2.04	0.40
1:B:118:LYS:O	1:B:121:THR:N	2.49	0.40
1:B:230:PHE:O	1:B:231:ASP:C	2.64	0.40

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	718/727 (99%)	682 (95%)	34 (5%)	2 (0%)	36	55
1	B	721/727 (99%)	680 (94%)	36 (5%)	5 (1%)	18	34
All	All	1439/1454 (99%)	1362 (95%)	70 (5%)	7 (0%)	24	43

All (7) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	217	ALA
1	B	350	ASN
1	A	596	ARG
1	A	277	LYS
1	B	368	PRO
1	B	216	ASP
1	B	214	ILE

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	611/616 (99%)	582 (95%)	29 (5%)	23	47
1	B	614/616 (100%)	572 (93%)	42 (7%)	14	31
All	All	1225/1232 (99%)	1154 (94%)	71 (6%)	18	38

All (71) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	6	HIS
1	A	11	ASP
1	A	15	LYS
1	A	16	GLU
1	A	32	LEU
1	A	62	VAL
1	A	64	LYS
1	A	80	GLN
1	A	147	ASP
1	A	148	GLN
1	A	176	SER
1	A	178	GLN
1	A	189	LEU
1	A	199	ILE
1	A	204	GLU
1	A	238	GLN
1	A	246	ILE
1	A	304	LYS
1	A	317	THR
1	A	374	ILE
1	A	407	VAL
1	A	465	ASN
1	A	477	ASN
1	A	506	LYS
1	A	539	GLU
1	A	572	ASN
1	A	595	ASN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	627	ILE
1	A	692	ARG
1	B	10	MET
1	B	64	LYS
1	B	65	ASP
1	B	89	VAL
1	B	91	LYS
1	B	92	ARG
1	B	108	VAL
1	B	114	SER
1	B	118	LYS
1	B	120	ASN
1	B	178	GLN
1	B	181	LYS
1	B	189	LEU
1	B	194	SER
1	B	199	ILE
1	B	203	GLU
1	B	209	VAL
1	B	211	LYS
1	B	214	ILE
1	B	215	THR
1	B	221	ILE
1	B	246	ILE
1	B	247	SER
1	B	251	VAL
1	B	278	ILE
1	B	291	ARG
1	B	312	GLU
1	B	326	ARG
1	B	342	ILE
1	B	343	SER
1	B	352	THR
1	B	374	ILE
1	B	382	LEU
1	B	466	TYR
1	B	477	ASN
1	B	594	GLU
1	B	595	ASN
1	B	602	SER
1	B	630	ARG
1	B	685	THR

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	B	692	ARG
1	B	727	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (61) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	51	ASN
1	A	58	GLN
1	A	76	ASN
1	A	97	ASN
1	A	106	GLN
1	A	120	ASN
1	A	148	GLN
1	A	172	ASN
1	A	196	GLN
1	A	197	ASN
1	A	200	ASN
1	A	255	ASN
1	A	263	ASN
1	A	315	ASN
1	A	324	HIS
1	A	327	ASN
1	A	445	GLN
1	A	447	ASN
1	A	465	ASN
1	A	477	ASN
1	A	525	GLN
1	A	541	ASN
1	A	553	ASN
1	A	567	GLN
1	A	572	ASN
1	A	592	ASN
1	A	595	ASN
1	A	637	GLN
1	A	644	HIS
1	A	660	HIS
1	A	671	ASN
1	A	676	ASN
1	B	51	ASN
1	B	66	ASN
1	B	94	HIS
1	B	97	ASN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	B	143	ASN
1	B	178	GLN
1	B	197	ASN
1	B	238	GLN
1	B	263	ASN
1	B	272	GLN
1	B	315	ASN
1	B	327	ASN
1	B	350	ASN
1	B	447	ASN
1	B	465	ASN
1	B	477	ASN
1	B	517	HIS
1	B	525	GLN
1	B	529	ASN
1	B	541	ASN
1	B	553	ASN
1	B	567	GLN
1	B	572	ASN
1	B	592	ASN
1	B	595	ASN
1	B	613	HIS
1	B	637	GLN
1	B	656	ASN
1	B	676	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry

Of 6 ligands modelled in this entry, 6 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

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	720/727 (99%)	-0.47	2 (0%) 90 87	10, 24, 43, 74	0
1	B	723/727 (99%)	-0.30	12 (1%) 69 65	12, 27, 49, 80	0
All	All	1443/1454 (99%)	-0.38	14 (0%) 79 76	10, 25, 48, 80	0

All (14) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	6	HIS	5.1
1	A	5	ALA	4.7
1	B	216	ASP	3.8
1	B	5	ALA	3.7
1	B	301	PRO	3.0
1	B	215	THR	3.0
1	B	217	ALA	2.8
1	B	726	ASP	2.8
1	B	727	LYS	2.7
1	B	119	PRO	2.5
1	A	6	HIS	2.4
1	B	725	LYS	2.2
1	B	115	ALA	2.1
1	B	7	MET	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
3	CA	A	803	1/1	0.94	0.03	29,29,29,29	0
3	CA	B	803	1/1	0.95	0.04	24,24,24,24	0
3	CA	B	802	1/1	0.99	0.04	26,26,26,26	0
3	CA	A	802	1/1	0.99	0.01	23,23,23,23	0
2	ZN	A	801	1/1	1.00	0.05	25,25,25,25	0
2	ZN	B	801	1/1	1.00	0.04	23,23,23,23	0

6.5 Other polymers [i](#)

There are no such residues in this entry.