Full wwPDB X-ray Structure Validation Report (i)

Aug 15, 2023 – 08:24 PM EDT

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 (i) 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 (i)) were used in the production of this report:
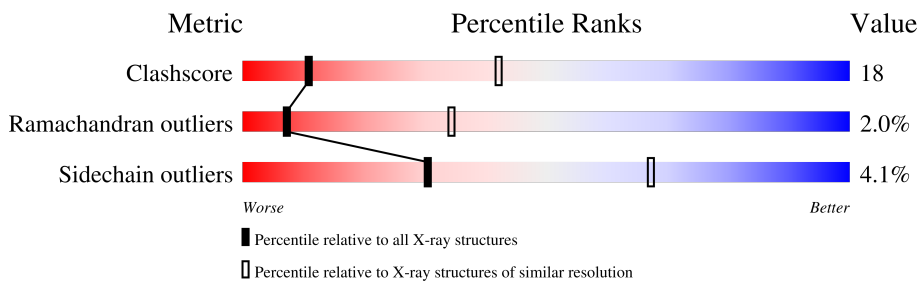
1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 3.00 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	Percentile Ranks	Value
Clashscore		18
Ramachandran outliers		2.0%
Sidechain outliers		4.1%

Worse   *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
Clashscore	141614	2416 (3.00-3.00)
Ramachandran outliers	138981	2333 (3.00-3.00)
Sidechain outliers	138945	2336 (3.00-3.00)

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 <=5%

Mol	Chain	Length	Quality of chain
1	A	496	64% 32% •
1	B	496	66% 31% •

2 Entry composition ⓘ

There are 4 unique types of molecules in this entry. The entry contains 8024 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 Alpha-amylase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	496	Total 3945	C 2493	N 696	O 735	S 21	0	0	0
1	B	496	Total 3945	C 2493	N 696	O 735	S 21	0	0	0

- Molecule 2 is CALCIUM ION (three-letter code: CA) (formula: Ca).

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

- Molecule 3 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	1	Total 1	Cl 1	0	0
3	B	1	Total 1	Cl 1	0	0

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	69	Total 69	O 69	0	0
4	B	61	Total 61	O 61	0	0

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. 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. 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: Alpha-amylase

Chain A:

- Molecule 1: Alpha-amylase

Chain B:
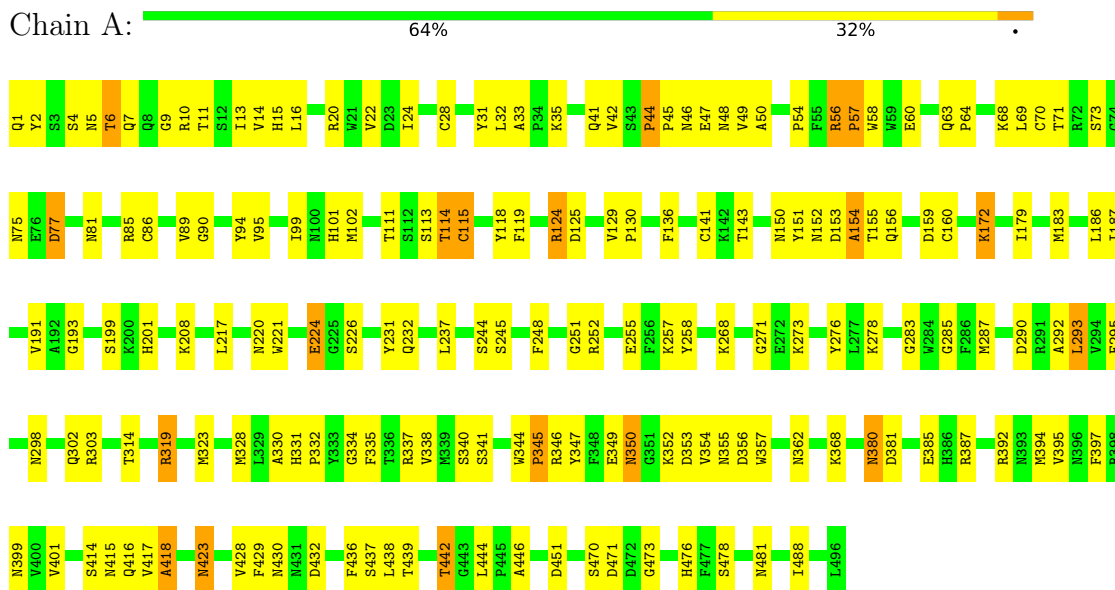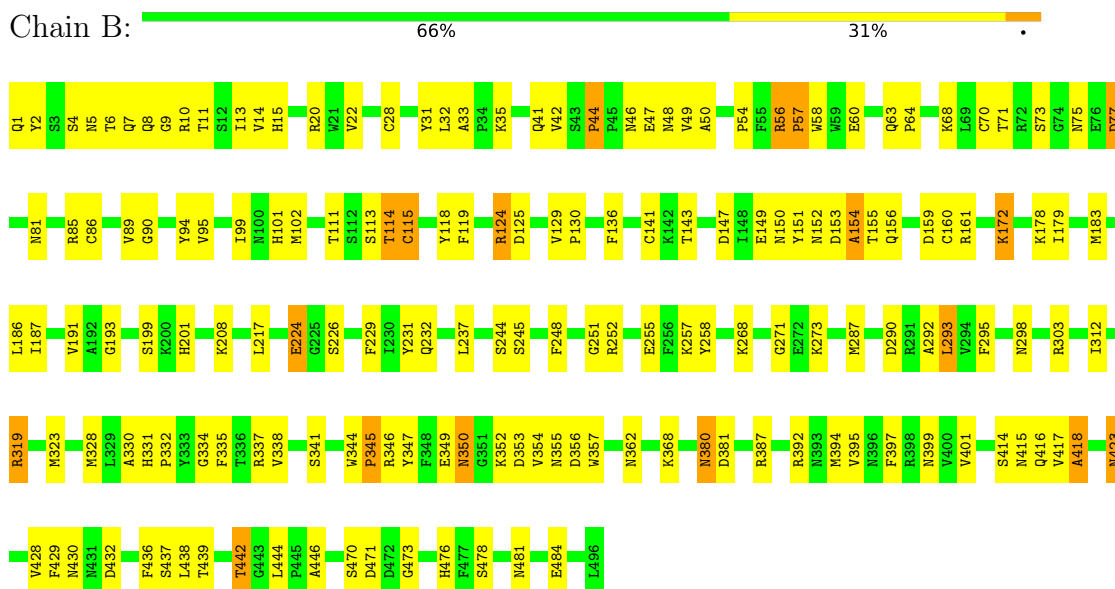
4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	150.81Å 72.27Å 91.11Å 90.00° 102.80° 90.00°	Depositor
Resolution (Å)	20.00 – 3.00 19.88 – 3.00	Depositor EDS
% Data completeness (in resolution range)	(Not available) (20.00-3.00) 96.3 (19.88-3.00)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.15	Depositor
$< I/\sigma(I) >$ [1]	1.46 (at 2.98Å)	Xtriage
Refinement program	CNS	Depositor
R, R_{free}	0.228 , 0.271 0.280 , (Not available)	Depositor DCC
R_{free} test set	No test flags present.	wwPDB-VP
Wilson B-factor (Å^2)	19.3	Xtriage
Anisotropy	0.173	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.29 , 17.0	EDS
L-test for twinning[2]	$< |L| > = 0.46, < L^2 > = 0.28$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.78	EDS
Total number of atoms	8024	wwPDB-VP
Average B, all atoms (Å^2)	20.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.86% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1]Intensities estimated from amplitudes.
[2]Theoretical values of $< |L| >$, $< L^2 >$ 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, CL, PCA

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	0.42	0/4052	0.66	1/5502 (0.0%)
1	B	0.42	0/4052	0.66	1/5502 (0.0%)
All	All	0.42	0/8104	0.66	2/11004 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	57	PRO	CA-N-CD	-5.08	104.39	111.50
1	B	57	PRO	CA-N-CD	-5.04	104.45	111.50

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	3945	0	3707	145	4
1	B	3945	0	3707	142	4
2	A	1	0	0	0	0
2	B	1	0	0	0	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
4	A	69	0	0	5	1

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	B	61	0	0	5	1
All	All	8024	0	7414	279	5

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 18.

All (279) 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:56:ARG:HG3	1:A:56:ARG:HH11	1.16	1.09
1:B:56:ARG:HH11	1:B:56:ARG:HG3	1.16	1.06
1:B:56:ARG:HH11	1:B:56:ARG:CG	1.76	0.97
1:A:56:ARG:HH11	1:A:56:ARG:CG	1.76	0.96
1:B:56:ARG:HG3	1:B:56:ARG:NH1	1.76	0.92
1:A:319:ARG:HG2	1:A:319:ARG:HH11	1.37	0.90
1:B:7:GLN:OE1	1:B:90:GLY:HA2	1.73	0.89
1:B:319:ARG:HG2	1:B:319:ARG:HH11	1.37	0.89
1:B:7:GLN:O	1:B:10:ARG:HG3	1.74	0.88
1:A:7:GLN:OE1	1:A:90:GLY:HA2	1.73	0.87
1:A:7:GLN:O	1:A:10:ARG:HG3	1.74	0.87
1:A:285:GLY:HA3	1:B:152:ASN:ND2	1.90	0.87
1:A:56:ARG:HG3	1:A:56:ARG:NH1	1.76	0.86
1:A:276:TYR:CD1	1:B:149:GLU:HG2	2.13	0.84
1:B:349:GLU:O	1:B:350:ASN:ND2	2.17	0.77
1:A:217:LEU:HD12	1:A:226:SER:HB3	1.67	0.77
1:B:217:LEU:HD12	1:B:226:SER:HB3	1.67	0.77
1:A:285:GLY:CA	1:B:152:ASN:ND2	2.50	0.74
1:A:35:LYS:HD2	1:A:392:ARG:HD3	1.70	0.74
1:B:28:CYS:HA	1:B:32:LEU:HB2	1.69	0.74
1:B:397:PHE:O	1:B:401:VAL:HG22	1.88	0.74
1:A:349:GLU:O	1:A:350:ASN:ND2	2.17	0.74
1:A:397:PHE:O	1:A:401:VAL:HG22	1.88	0.73
1:A:418:ALA:HB2	1:A:428:VAL:HG13	1.71	0.73
1:A:349:GLU:C	1:A:350:ASN:HD22	1.91	0.72
1:B:35:LYS:HD2	1:B:392:ARG:HD3	1.70	0.72
1:B:349:GLU:C	1:B:350:ASN:HD22	1.91	0.72
1:A:28:CYS:HA	1:A:32:LEU:HB2	1.69	0.72
1:B:418:ALA:HB2	1:B:428:VAL:HG13	1.71	0.71
1:A:99:ILE:HB	1:A:179:ILE:HD13	1.73	0.70
1:B:99:ILE:HB	1:B:179:ILE:HD13	1.73	0.70
1:B:319:ARG:HG2	1:B:319:ARG:NH1	2.06	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:4:SER:O	1:A:5:ASN:HB2	1.94	0.66
1:B:4:SER:O	1:B:5:ASN:HB2	1.94	0.66
1:A:319:ARG:HG2	1:A:319:ARG:NH1	2.06	0.66
1:B:380:ASN:O	1:B:381:ASP:HB2	1.96	0.65
1:A:380:ASN:O	1:A:381:ASP:HB2	1.96	0.65
1:A:56:ARG:HD2	1:A:60:GLU:OE1	1.98	0.63
1:B:237:LEU:HD22	1:B:257:LYS:HG2	1.80	0.63
1:B:56:ARG:HD2	1:B:60:GLU:OE1	1.98	0.63
1:B:172:LYS:NZ	1:B:172:LYS:HB3	2.14	0.62
1:A:237:LEU:HD22	1:A:257:LYS:HG2	1.80	0.62
1:B:258:TYR:CE1	1:B:328:MET:HG3	2.35	0.62
1:A:258:TYR:CE1	1:A:328:MET:HG3	2.35	0.61
1:B:11:THR:H	1:B:399:ASN:HD21	1.49	0.61
1:A:172:LYS:NZ	1:A:172:LYS:HB3	2.14	0.61
1:A:293:LEU:HD23	1:A:335:PHE:O	2.01	0.61
1:A:153:ASP:HB3	1:A:156:GLN:HG2	1.83	0.60
1:B:293:LEU:HD23	1:B:335:PHE:O	2.01	0.60
1:B:153:ASP:HB3	1:B:156:GLN:HG2	1.83	0.60
1:B:199:SER:OG	1:B:232:GLN:HB3	2.01	0.60
1:A:224:GLU:HA	1:A:224:GLU:OE1	2.02	0.60
1:A:186:LEU:HB3	1:A:191:VAL:HG21	1.83	0.60
1:A:331:HIS:CG	1:A:332:PRO:HD2	2.37	0.59
1:B:186:LEU:HB3	1:B:191:VAL:HG21	1.83	0.59
1:A:199:SER:OG	1:A:232:GLN:HB3	2.01	0.59
1:A:11:THR:H	1:A:399:ASN:HD21	1.49	0.59
1:A:11:THR:H	1:A:399:ASN:ND2	2.01	0.59
1:A:268:LYS:HD3	1:A:415:ASN:ND2	2.18	0.59
1:B:268:LYS:HD3	1:B:415:ASN:ND2	2.18	0.59
1:B:201:HIS:HB3	4:B:513:HOH:O	2.03	0.59
1:B:15:HIS:HD2	1:B:41:GLN:O	1.85	0.59
1:B:224:GLU:OE1	1:B:224:GLU:HA	2.02	0.59
1:B:331:HIS:CG	1:B:332:PRO:HD2	2.37	0.58
1:A:15:HIS:HD2	1:A:41:GLN:O	1.85	0.58
1:A:201:HIS:HB3	4:A:510:HOH:O	2.03	0.58
1:B:11:THR:H	1:B:399:ASN:ND2	2.01	0.58
1:B:75:ASN:OD1	1:B:77:ASP:HB2	2.05	0.57
1:A:101:HIS:HD2	1:A:102:MET:O	1.88	0.57
1:B:141:CYS:HB2	1:B:159:ASP:O	2.05	0.57
1:A:75:ASN:OD1	1:A:77:ASP:HB2	2.05	0.57
1:A:141:CYS:HB2	1:A:159:ASP:O	2.05	0.57
1:B:101:HIS:HD2	1:B:102:MET:O	1.88	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:31:TYR:OH	1:B:387:ARG:HA	2.06	0.56
1:B:303:ARG:HG3	1:B:303:ARG:HH11	1.71	0.56
1:A:303:ARG:HG3	1:A:303:ARG:HH11	1.71	0.56
1:B:417:VAL:HG22	1:B:429:PHE:HB2	1.88	0.56
1:B:58:TRP:NE1	1:B:356:ASP:O	2.39	0.56
1:A:46:ASN:O	1:A:71:THR:HG22	2.06	0.56
1:A:349:GLU:C	1:A:350:ASN:ND2	2.57	0.55
1:B:46:ASN:O	1:B:71:THR:HG22	2.06	0.55
1:A:58:TRP:NE1	1:A:356:ASP:O	2.39	0.55
1:A:231:TYR:CD2	1:A:293:LEU:HD12	2.41	0.55
1:B:349:GLU:C	1:B:350:ASN:ND2	2.57	0.55
1:B:231:TYR:CD2	1:B:293:LEU:HD12	2.41	0.55
1:A:31:TYR:OH	1:A:387:ARG:HA	2.06	0.55
1:A:54:PRO:HG2	1:A:57:PRO:HG3	1.89	0.55
1:A:417:VAL:HG22	1:A:429:PHE:HB2	1.88	0.55
1:B:54:PRO:HG2	1:B:57:PRO:HG3	1.89	0.54
1:A:217:LEU:HB2	1:A:226:SER:HB2	1.91	0.53
1:B:217:LEU:HB2	1:B:226:SER:HB2	1.91	0.53
1:B:111:THR:O	1:B:113:SER:N	2.42	0.52
1:A:56:ARG:NH2	4:A:535:HOH:O	2.25	0.52
1:A:111:THR:O	1:A:113:SER:N	2.42	0.52
1:A:330:ALA:HB2	1:A:394:MET:CE	2.41	0.51
1:A:470:SER:O	1:A:473:GLY:N	2.35	0.51
1:B:330:ALA:HB2	1:B:394:MET:CE	2.41	0.51
1:A:129:VAL:H	1:A:130:PRO:HA	1.75	0.51
1:A:278:LYS:HE2	1:B:149:GLU:OE1	2.11	0.51
1:B:2:TYR:CE1	1:B:251:GLY:HA2	2.46	0.51
1:B:470:SER:O	1:B:473:GLY:N	2.36	0.51
1:A:2:TYR:CE1	1:A:251:GLY:HA2	2.46	0.51
1:A:153:ASP:OD1	1:A:155:THR:HG22	2.11	0.51
1:B:54:PRO:HB2	1:B:357:TRP:CZ3	2.46	0.51
1:B:129:VAL:H	1:B:130:PRO:HA	1.76	0.51
1:B:153:ASP:OD1	1:B:155:THR:HG22	2.11	0.51
1:A:258:TYR:CZ	1:A:328:MET:HG3	2.46	0.51
1:A:54:PRO:HB2	1:A:357:TRP:CZ3	2.46	0.51
1:A:81:ASN:OD1	1:A:85:ARG:HD3	2.11	0.51
1:A:423:ASN:C	1:A:423:ASN:HD22	2.14	0.50
1:A:95:VAL:HG11	1:A:186:LEU:HD13	1.92	0.50
1:B:81:ASN:OD1	1:B:85:ARG:HD3	2.11	0.50
1:B:423:ASN:C	1:B:423:ASN:HD22	2.14	0.50
1:A:330:ALA:HB2	1:A:394:MET:HE1	1.94	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:191:VAL:HG12	1:B:193:GLY:H	1.77	0.50
1:A:362:ASN:HA	1:A:368:LYS:HG3	1.94	0.49
1:B:258:TYR:CZ	1:B:328:MET:HG3	2.46	0.49
1:B:353:ASP:HB3	1:B:356:ASP:HB3	1.94	0.49
1:B:362:ASN:HA	1:B:368:LYS:HG3	1.94	0.49
1:A:353:ASP:HB3	1:A:356:ASP:HB3	1.94	0.49
1:B:95:VAL:HG11	1:B:186:LEU:HD13	1.92	0.49
1:A:191:VAL:HG12	1:A:193:GLY:H	1.77	0.49
1:B:63:GLN:N	1:B:64:PRO:CD	2.75	0.49
1:A:63:GLN:N	1:A:64:PRO:CD	2.75	0.49
1:A:439:THR:HA	1:A:476:HIS:HA	1.95	0.49
1:B:20:ARG:HD2	4:B:504:HOH:O	2.12	0.49
1:B:49:VAL:HG12	1:B:50:ALA:N	2.27	0.49
1:B:56:ARG:CG	1:B:56:ARG:NH1	2.45	0.49
1:B:208:LYS:HG3	4:B:546:HOH:O	2.13	0.49
1:B:28:CYS:HA	1:B:32:LEU:HD12	1.95	0.49
1:B:129:VAL:HB	1:B:130:PRO:HA	1.94	0.49
1:A:208:LYS:HG3	4:A:545:HOH:O	2.13	0.48
1:A:436:PHE:O	1:A:478:SER:HA	2.13	0.48
1:A:437:SER:O	1:A:438:LEU:HB2	2.13	0.48
1:A:49:VAL:HG12	1:A:50:ALA:N	2.27	0.48
1:B:437:SER:O	1:B:438:LEU:HB2	2.13	0.48
1:B:330:ALA:HB2	1:B:394:MET:HE1	1.95	0.48
1:A:28:CYS:HA	1:A:32:LEU:HD12	1.95	0.48
1:A:293:LEU:C	1:A:293:LEU:HD22	2.33	0.48
1:B:439:THR:HA	1:B:476:HIS:HA	1.95	0.48
1:A:129:VAL:HB	1:A:130:PRO:HA	1.94	0.48
1:B:63:GLN:N	1:B:64:PRO:HD3	2.29	0.48
1:B:436:PHE:O	1:B:478:SER:HA	2.13	0.48
1:B:31:TYR:CE1	1:B:35:LYS:HG3	2.49	0.48
1:A:20:ARG:HD2	4:A:501:HOH:O	2.12	0.47
1:A:346:ARG:HG3	1:A:353:ASP:OD2	2.14	0.47
1:B:124:ARG:HG2	1:B:136:PHE:CD1	2.50	0.47
1:B:346:ARG:HG3	1:B:353:ASP:OD2	2.14	0.47
1:A:319:ARG:NH1	1:A:319:ARG:CG	2.76	0.47
1:B:293:LEU:C	1:B:293:LEU:HD22	2.34	0.47
1:A:63:GLN:N	1:A:64:PRO:HD3	2.29	0.47
1:A:31:TYR:CE1	1:A:35:LYS:HG3	2.49	0.47
1:A:124:ARG:HG2	1:A:136:PHE:CD1	2.50	0.47
1:A:285:GLY:CA	1:B:152:ASN:HD21	2.27	0.46
1:B:56:ARG:NH2	4:B:537:HOH:O	2.26	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:352:LYS:HG2	1:B:353:ASP:N	2.30	0.46
1:A:150:ASN:C	1:A:152:ASN:H	2.19	0.46
1:A:352:LYS:HG2	1:A:353:ASP:N	2.30	0.46
1:A:442:THR:OG1	1:A:444:LEU:HB2	2.15	0.46
1:A:143:THR:HG23	1:A:160:CYS:SG	2.55	0.46
1:B:143:THR:HG23	1:B:160:CYS:SG	2.55	0.46
1:A:56:ARG:HD2	1:A:56:ARG:HA	1.59	0.46
1:A:129:VAL:HB	1:A:130:PRO:CA	2.45	0.46
1:B:183:MET:O	1:B:187:ILE:HG13	2.16	0.46
1:A:183:MET:O	1:A:187:ILE:HG13	2.16	0.46
1:A:295:PHE:CE2	1:A:298:ASN:HB3	2.51	0.46
1:B:129:VAL:HB	1:B:130:PRO:CA	2.45	0.46
1:A:42:VAL:HG22	1:A:94:TYR:O	2.16	0.45
1:B:150:ASN:C	1:B:152:ASN:H	2.19	0.45
1:B:442:THR:OG1	1:B:444:LEU:HB2	2.15	0.45
1:B:42:VAL:HG22	1:B:94:TYR:O	2.16	0.45
1:A:417:VAL:O	1:A:418:ALA:HB2	2.17	0.45
1:B:295:PHE:CE2	1:B:298:ASN:HB3	2.51	0.45
1:B:417:VAL:O	1:B:418:ALA:HB2	2.17	0.45
1:A:153:ASP:O	1:A:155:THR:N	2.50	0.45
1:B:33:ALA:CB	1:B:89:VAL:HB	2.47	0.45
1:A:56:ARG:CG	1:A:56:ARG:NH1	2.45	0.45
1:B:7:GLN:OE1	1:B:90:GLY:CA	2.56	0.45
1:B:153:ASP:O	1:B:155:THR:N	2.50	0.45
1:A:20:ARG:HG2	1:A:73:SER:HA	1.98	0.45
1:A:33:ALA:CB	1:A:89:VAL:HB	2.47	0.45
1:A:255:GLU:OE1	1:A:257:LYS:HG3	2.17	0.45
1:A:344:TRP:O	1:A:346:ARG:N	2.50	0.45
1:A:44:PRO:O	1:A:71:THR:HG21	2.17	0.45
1:A:276:TYR:CE1	1:B:149:GLU:HG2	2.51	0.45
1:B:56:ARG:HD2	1:B:56:ARG:HA	1.59	0.45
1:A:338:VAL:HG13	4:A:537:HOH:O	2.17	0.45
1:B:20:ARG:HG2	1:B:73:SER:HA	1.98	0.45
1:B:338:VAL:HG13	4:B:539:HOH:O	2.17	0.44
1:B:344:TRP:O	1:B:346:ARG:N	2.50	0.44
1:B:44:PRO:O	1:B:71:THR:HG21	2.17	0.44
1:A:42:VAL:CG2	1:A:95:VAL:HA	2.47	0.44
1:A:268:LYS:CD	1:A:415:ASN:ND2	2.80	0.44
1:B:49:VAL:HG23	1:B:63:GLN:O	2.18	0.44
1:A:49:VAL:HG23	1:A:63:GLN:O	2.18	0.44
1:B:287:MET:HG3	1:B:292:ALA:HB2	1.99	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:287:MET:HG3	1:A:292:ALA:HB2	1.99	0.44
1:B:42:VAL:CG2	1:B:95:VAL:HA	2.48	0.43
1:B:258:TYR:OH	1:B:328:MET:HG3	2.18	0.43
1:A:47:GLU:OE2	1:A:115:CYS:HB3	2.18	0.43
1:B:95:VAL:HG11	1:B:186:LEU:CD1	2.48	0.43
1:B:153:ASP:O	1:B:154:ALA:C	2.57	0.43
1:A:4:SER:O	1:A:5:ASN:CB	2.62	0.43
1:B:255:GLU:OE1	1:B:257:LYS:HG3	2.17	0.43
1:A:153:ASP:O	1:A:154:ALA:C	2.57	0.43
1:A:258:TYR:OH	1:A:328:MET:HG3	2.18	0.43
1:B:252:ARG:NH1	1:B:292:ALA:O	2.50	0.43
1:A:276:TYR:OH	1:B:147:ASP:HB3	2.18	0.43
1:A:283:GLY:O	1:B:150:ASN:ND2	2.48	0.43
1:A:11:THR:OG1	1:A:399:ASN:ND2	2.52	0.43
1:A:252:ARG:NH1	1:A:292:ALA:O	2.50	0.43
1:A:344:TRP:HB2	1:A:345:PRO:HD2	2.00	0.43
1:B:11:THR:OG1	1:B:399:ASN:ND2	2.52	0.43
1:B:430:ASN:HD21	1:B:481:ASN:HA	1.84	0.43
1:B:13:ILE:O	1:B:337:ARG:HA	2.19	0.43
1:A:95:VAL:HG11	1:A:186:LEU:CD1	2.48	0.43
1:B:312:ILE:HD13	1:B:312:ILE:HA	1.82	0.43
1:A:48:ASN:OD1	1:A:114:THR:HG21	2.19	0.42
1:A:64:PRO:HB2	1:A:102:MET:HA	2.01	0.42
1:A:423:ASN:C	1:A:423:ASN:ND2	2.72	0.42
1:B:268:LYS:CD	1:B:415:ASN:ND2	2.80	0.42
1:B:178:LYS:HD3	1:B:178:LYS:HA	1.84	0.42
1:B:414:SER:HB3	1:B:432:ASP:OD2	2.19	0.42
1:A:237:LEU:CD2	1:A:257:LYS:HG2	2.47	0.42
1:B:47:GLU:OE2	1:B:115:CYS:HB3	2.18	0.42
1:A:245:SER:HA	1:A:248:PHE:CE2	2.54	0.42
1:A:414:SER:HB3	1:A:432:ASP:OD2	2.19	0.42
1:B:245:SER:HA	1:B:248:PHE:CE2	2.54	0.42
1:A:13:ILE:O	1:A:337:ARG:HA	2.19	0.42
1:A:9:GLY:O	1:A:11:THR:HG23	2.19	0.42
1:A:118:TYR:CG	1:A:119:PHE:N	2.88	0.42
1:A:244:SER:HB3	1:A:287:MET:HE1	2.02	0.42
1:A:446:ALA:HB2	1:A:471:ASP:N	2.35	0.42
1:B:344:TRP:HB2	1:B:345:PRO:HD2	2.00	0.42
1:B:423:ASN:C	1:B:423:ASN:ND2	2.72	0.42
1:B:86:CYS:O	1:B:89:VAL:HG23	2.20	0.42
1:B:9:GLY:O	1:B:11:THR:HG23	2.19	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:86:CYS:O	1:A:89:VAL:HG23	2.20	0.41
1:B:64:PRO:HB2	1:B:102:MET:HA	2.01	0.41
1:B:244:SER:HB3	1:B:287:MET:HE1	2.02	0.41
1:B:48:ASN:OD1	1:B:114:THR:HG21	2.19	0.41
1:A:355:ASN:C	1:A:357:TRP:H	2.24	0.41
1:A:430:ASN:HD21	1:A:481:ASN:HA	1.84	0.41
1:B:4:SER:O	1:B:5:ASN:CB	2.62	0.41
1:B:33:ALA:HB2	1:B:89:VAL:HB	2.02	0.41
1:B:237:LEU:CD2	1:B:257:LYS:HG2	2.47	0.41
1:B:273:LYS:HB2	1:B:415:ASN:OD1	2.21	0.41
1:A:416:GLN:HG3	1:A:432:ASP:OD2	2.21	0.41
1:B:68:LYS:O	1:B:70:CYS:N	2.54	0.41
1:A:14:VAL:HG22	1:A:15:HIS:N	2.36	0.41
1:A:13:ILE:HG23	1:A:335:PHE:CE1	2.56	0.41
1:A:68:LYS:O	1:A:70:CYS:N	2.54	0.41
1:A:347:TYR:O	1:A:354:VAL:HG22	2.20	0.41
1:B:13:ILE:HG23	1:B:335:PHE:CE1	2.56	0.41
1:B:161:ARG:HE	1:B:161:ARG:HB2	1.68	0.41
1:B:446:ALA:HB2	1:B:471:ASP:N	2.35	0.41
1:A:44:PRO:HA	1:A:45:PRO:HD2	2.00	0.41
1:A:45:PRO:O	1:A:69:LEU:HA	2.21	0.41
1:B:118:TYR:CG	1:B:119:PHE:N	2.88	0.41
1:B:150:ASN:ND2	1:B:152:ASN:HB3	2.36	0.41
1:B:319:ARG:NH1	1:B:319:ARG:CG	2.76	0.40
1:A:172:LYS:HB3	1:A:172:LYS:HZ2	1.85	0.40
1:B:347:TYR:O	1:B:354:VAL:HG22	2.20	0.40
1:A:58:TRP:HD1	1:A:357:TRP:O	2.04	0.40
1:A:340:SER:HA	1:A:385:GLU:OE1	2.22	0.40
1:A:4:SER:OG	1:A:6:THR:HG23	2.22	0.40
1:A:451:ASP:OD1	1:A:488:ILE:HG23	2.21	0.40
1:B:229:PHE:CE1	1:B:252:ARG:HD2	2.57	0.40
1:B:355:ASN:C	1:B:357:TRP:H	2.24	0.40
1:B:416:GLN:HG3	1:B:432:ASP:OD2	2.21	0.40
1:A:7:GLN:OE1	1:A:90:GLY:CA	2.56	0.40
1:A:16:LEU:HD12	1:A:24:ILE:HG23	2.04	0.40
1:A:33:ALA:HB2	1:A:89:VAL:HB	2.02	0.40
1:A:129:VAL:N	1:A:130:PRO:HA	2.34	0.40
1:A:273:LYS:HB2	1:A:415:ASN:OD1	2.21	0.40
1:A:302:GLN:HB2	1:A:314:THR:CG2	2.52	0.40
1:B:8:GLN:OE1	1:B:8:GLN:HA	2.22	0.40
1:B:14:VAL:HG22	1:B:15:HIS:N	2.36	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:430:ASN:ND2	1:B:481:ASN:HA	2.37	0.40

All (5) 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)
1:A:220:ASN:O	1:B:8:GLN:OE1[3_445]	1.35	0.85
4:A:499:HOH:O	4:B:547:HOH:O[3_445]	1.62	0.58
1:A:111:THR:OG1	1:B:484:GLU:OE2[2_655]	2.04	0.16
1:A:220:ASN:O	1:B:8:GLN:CD[3_445]	2.13	0.07
1:A:221:TRP:CA	1:B:8:GLN:NE2[3_445]	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	494/496 (100%)	427 (86%)	57 (12%)	10 (2%)	7	34
1	B	494/496 (100%)	428 (87%)	56 (11%)	10 (2%)	7	34
All	All	988/992 (100%)	855 (86%)	113 (11%)	20 (2%)	7	34

All (20) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	154	ALA
1	A	380	ASN
1	B	154	ALA
1	B	380	ASN
1	A	6	THR
1	A	114	THR
1	B	6	THR
1	B	114	THR

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Mol	Chain	Res	Type
1	A	418	ALA
1	B	418	ALA
1	A	44	PRO
1	A	334	GLY
1	B	44	PRO
1	B	334	GLY
1	A	151	TYR
1	A	345	PRO
1	B	151	TYR
1	B	345	PRO
1	A	271	GLY
1	B	271	GLY

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	418/418 (100%)	401 (96%)	17 (4%)	30	67
1	B	418/418 (100%)	401 (96%)	17 (4%)	30	67
All	All	836/836 (100%)	802 (96%)	34 (4%)	30	67

All (34) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	22	VAL
1	A	56	ARG
1	A	77	ASP
1	A	115	CYS
1	A	124	ARG
1	A	125	ASP
1	A	172	LYS
1	A	224	GLU
1	A	290	ASP
1	A	293	LEU
1	A	319	ARG

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Mol	Chain	Res	Type
1	A	323	MET
1	A	341	SER
1	A	350	ASN
1	A	395	VAL
1	A	423	ASN
1	A	442	THR
1	B	22	VAL
1	B	56	ARG
1	B	77	ASP
1	B	115	CYS
1	B	124	ARG
1	B	125	ASP
1	B	172	LYS
1	B	224	GLU
1	B	290	ASP
1	B	293	LEU
1	B	319	ARG
1	B	323	MET
1	B	341	SER
1	B	350	ASN
1	B	395	VAL
1	B	423	ASN
1	B	442	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (21) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	15	HIS
1	A	185	HIS
1	A	216	ASN
1	A	270	ASN
1	A	350	ASN
1	A	399	ASN
1	A	408	ASN
1	A	423	ASN
1	A	459	ASN
1	A	476	HIS
1	B	15	HIS
1	B	152	ASN
1	B	185	HIS
1	B	216	ASN
1	B	270	ASN

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Mol	Chain	Res	Type
1	B	350	ASN
1	B	399	ASN
1	B	408	ASN
1	B	423	ASN
1	B	459	ASN
1	B	476	HIS

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

2 non-standard protein/DNA/RNA residues are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#|Z| > 2$	Counts	RMSZ	$\#|Z| > 2$
1	PCA	A	1	1	7,8,9	2.29	2 (28%)	9,10,12	2.35	4 (44%)
1	PCA	B	1	1	7,8,9	2.28	2 (28%)	9,10,12	2.35	4 (44%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
1	PCA	A	1	1	-	0/0/11/13	0/1/1/1
1	PCA	B	1	1	-	0/0/11/13	0/1/1/1

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	1	PCA	CD-N	4.49	1.46	1.34

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	1	PCA	CD-N	4.47	1.46	1.34
1	A	1	PCA	CA-N	3.88	1.51	1.46
1	B	1	PCA	CA-N	3.85	1.51	1.46

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	1	PCA	CB-CA-C	-4.31	106.77	112.70
1	B	1	PCA	CB-CA-C	-4.30	106.78	112.70
1	A	1	PCA	OE-CD-CG	-3.25	121.08	126.76
1	B	1	PCA	OE-CD-CG	-3.25	121.10	126.76
1	B	1	PCA	CA-N-CD	-2.99	103.34	113.58
1	A	1	PCA	CA-N-CD	-2.98	103.37	113.58
1	A	1	PCA	CG-CD-N	2.06	113.72	108.39
1	B	1	PCA	CG-CD-N	2.05	113.70	108.39

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 4 ligands modelled in this entry, 4 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 ⓘ

6.1 Protein, DNA and RNA chains ⓘ

Unable to reproduce the depositors R factor - this section is therefore empty.

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

Unable to reproduce the depositors R factor - this section is therefore empty.

6.3 Carbohydrates ⓘ

Unable to reproduce the depositors R factor - this section is therefore empty.

6.4 Ligands ⓘ

Unable to reproduce the depositors R factor - this section is therefore empty.

6.5 Other polymers ⓘ

Unable to reproduce the depositors R factor - this section is therefore empty.