



Full wwPDB X-ray Structure Validation Report ⓘ

Sep 11, 2023 – 08:54 AM EDT

PDB ID : 4LX4
Title : Crystal Structure Determination of Pseudomonas stutzeri endoglucanase Cel5A using a Twinned Data Set
Authors : Dutoit, R.; Delsaute, M.; Berlemont, R.; Van Elder, D.; Galleni, M.; Bauvois, C.
Deposited on : 2013-07-29
Resolution : 1.56 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 : 4.02b-467
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.35.1
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.35.1

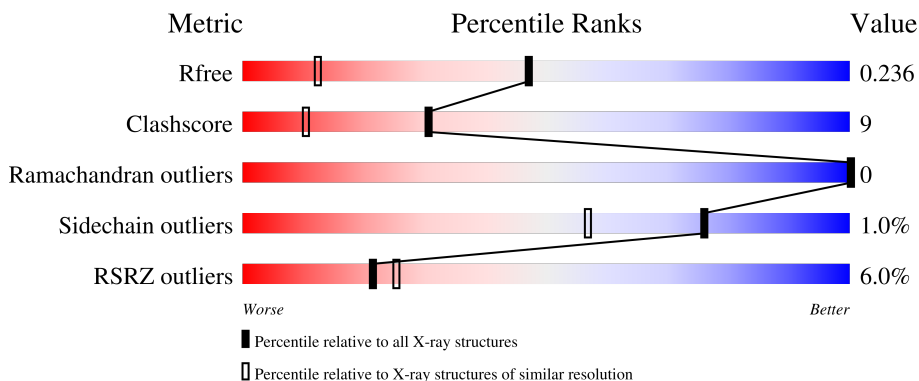
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.56 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}	130704	1483 (1.56-1.56)
Clashscore	141614	1529 (1.56-1.56)
Ramachandran outliers	138981	1498 (1.56-1.56)
Sidechain outliers	138945	1495 (1.56-1.56)
RSRZ outliers	127900	1465 (1.56-1.56)

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	330	
1	B	330	
1	C	330	
1	D	330	

2 Entry composition [i](#)

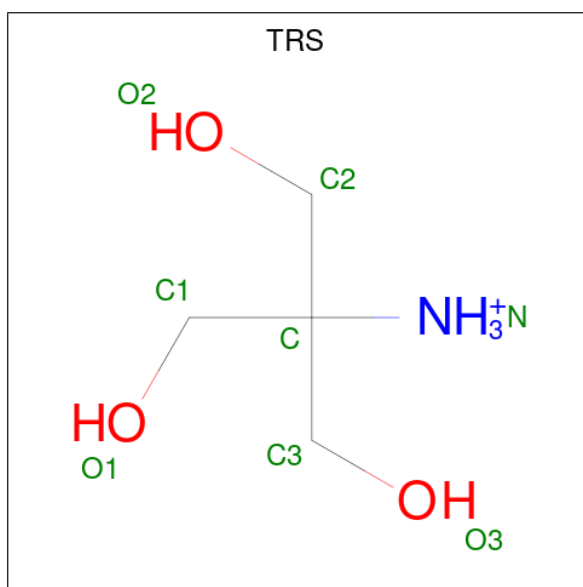
There are 3 unique types of molecules in this entry. The entry contains 21329 atoms, of which 9851 are hydrogens and 0 are deuteriums.

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 Endoglucanase(Endo-1,4-beta-glucanase)protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace	
			Total	C	H	N	O				S
1	A	322	Total 5019	C 1651	H 2444	N 448	O 467	S 9	0	0	0
1	B	328	Total 5113	C 1678	H 2494	N 456	O 476	S 9	0	0	0
1	C	321	Total 5022	C 1651	H 2451	N 447	O 464	S 9	0	0	0
1	D	319	Total 4964	C 1637	H 2414	N 440	O 464	S 9	0	0	0

- Molecule 2 is 2-AMINO-2-HYDROXYMETHYL-PROPANE-1,3-DIOL (three-letter code: TRS) (formula: $C_4H_{12}NO_3$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	H	N	O		
2	A	1	Total 20	C 4	H 12	N 1	O 3	0	0
2	B	1	Total 20	C 4	H 12	N 1	O 3	0	0

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	C	1	Total	C	H	N	O	0	0
			20	4	12	1	3		
2	D	1	Total	C	H	N	O	0	0
			20	4	12	1	3		

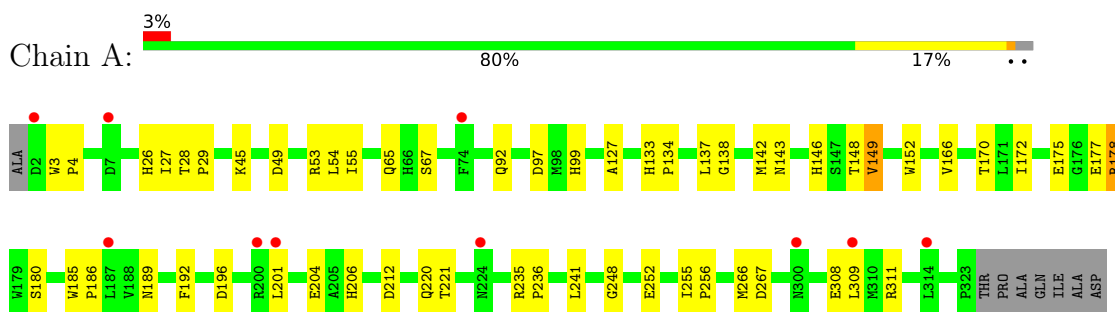
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	258	Total	O	0	0
			258	258		
3	B	312	Total	O	0	0
			312	312		
3	C	276	Total	O	0	0
			276	276		
3	D	285	Total	O	0	0
			285	285		

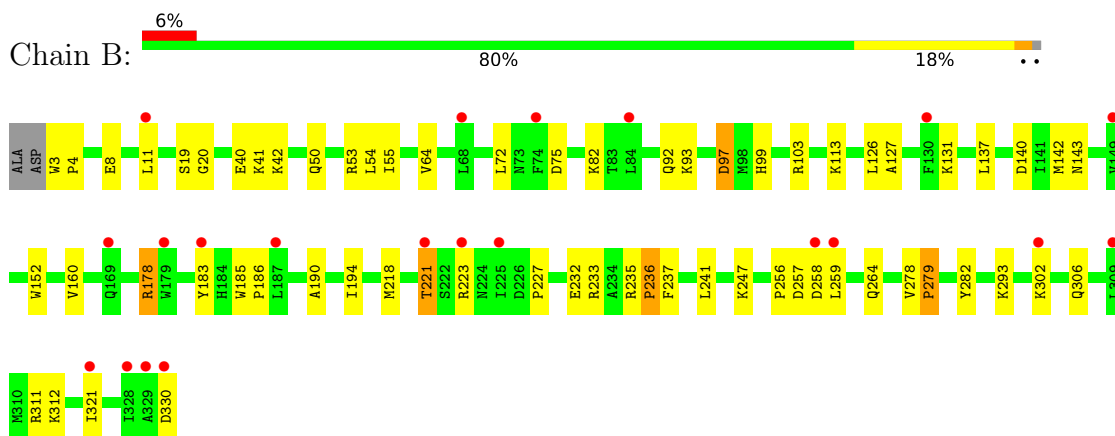
3 Residue-property plots [i](#)

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.

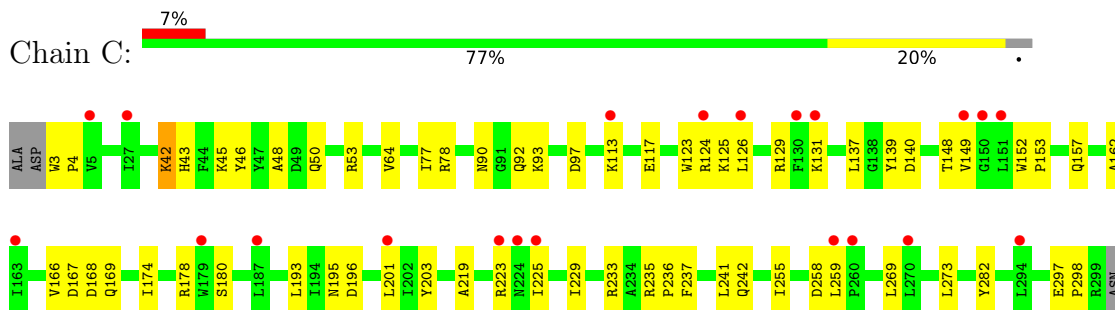
- Molecule 1: Endoglucanase(Endo-1,4-beta-glucanase)protein

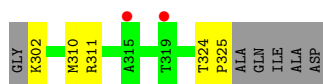


- Molecule 1: Endoglucanase(Endo-1,4-beta-glucanase)protein

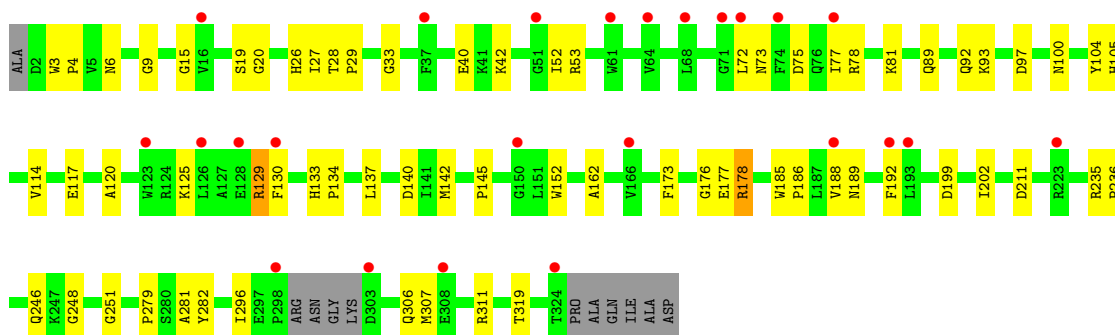
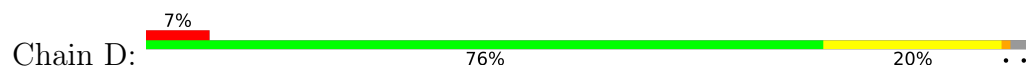


- Molecule 1: Endoglucanase(Endo-1,4-beta-glucanase)protein





● Molecule 1: Endoglucanase(Endo-1,4-beta-glucanase)protein



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	70.39Å 82.90Å 104.74Å 90.00° 92.08° 90.00°	Depositor
Resolution (Å)	48.28 – 1.56 48.28 – 1.56	Depositor EDS
% Data completeness (in resolution range)	91.6 (48.28-1.56) 82.3 (48.28-1.56)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	0.07	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.41 (at 1.55Å)	Xtrriage
Refinement program	PHENIX (phenix.refine: 1.8.2_1309)	Depositor
R, R_{free}	0.220 , 0.237 0.224 , 0.236	Depositor DCC
R_{free} test set	7883 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å ²)	12.4	Xtrriage
Anisotropy	0.273	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.41 , 23.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.71$, $\langle L^2 \rangle = 0.60$	Xtrriage
Estimated twinning fraction	0.126 for h,-k,-l	Xtrriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	21329	wwPDB-VP
Average B, all atoms (Å ²)	12.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 11.79% 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: TRS

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.43	2/2655 (0.1%)	0.60	2/3607 (0.1%)
1	B	0.41	2/2700 (0.1%)	0.56	2/3668 (0.1%)
1	C	0.40	1/2651 (0.0%)	0.58	2/3601 (0.1%)
1	D	0.38	1/2629 (0.0%)	0.56	1/3573 (0.0%)
All	All	0.40	6/10635 (0.1%)	0.57	7/14449 (0.0%)

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	279	PRO	N-CD	5.51	1.55	1.47
1	D	134	PRO	N-CD	5.36	1.55	1.47
1	C	153	PRO	N-CD	5.25	1.55	1.47
1	B	236	PRO	N-CD	5.16	1.55	1.47
1	A	256	PRO	N-CD	5.09	1.54	1.47
1	A	134	PRO	N-CD	5.03	1.54	1.47

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	255	ILE	C-N-CD	5.81	140.60	128.40
1	A	255	ILE	C-N-CD	5.76	140.50	128.40
1	A	133	HIS	C-N-CD	5.70	140.38	128.40
1	B	235	ARG	C-N-CD	5.64	140.24	128.40
1	C	152	TRP	C-N-CD	5.50	139.96	128.40
1	D	133	HIS	C-N-CD	5.46	139.86	128.40
1	B	278	VAL	C-N-CD	5.34	139.61	128.40

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	2575	2444	2457	38	1
1	B	2619	2494	2507	53	0
1	C	2571	2451	2464	52	0
1	D	2550	2414	2428	47	1
2	A	8	12	12	0	0
2	B	8	12	12	0	0
2	C	8	12	12	0	0
2	D	8	12	12	0	0
3	A	258	0	0	6	0
3	B	312	0	0	13	1
3	C	276	0	0	11	2
3	D	285	0	0	10	2
All	All	11478	9851	9904	186	4

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 9.

All (186) 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:D:246:GLN:HA	3:D:742:HOH:O	1.78	0.82
1:B:256:PRO:HG2	1:B:259:LEU:HG	1.62	0.82
1:A:172:ILE:HB	1:A:201:LEU:CD2	2.11	0.81
1:B:113:LYS:HB3	3:B:789:HOH:O	1.79	0.80
1:A:220:GLN:HB3	3:A:690:HOH:O	1.82	0.79
1:A:172:ILE:HB	1:A:201:LEU:HD23	1.64	0.79
1:C:45:LYS:HA	3:C:728:HOH:O	1.81	0.79
1:B:183:TYR:HB2	1:B:233:ARG:HG2	1.67	0.77
1:C:53:ARG:HA	1:C:92:GLN:HG2	1.67	0.75
1:D:81:LYS:HG3	1:D:130:PHE:HE1	1.53	0.74
1:C:229:ILE:O	1:C:233:ARG:HG3	1.89	0.73
1:B:293:LYS:HD3	3:B:658:HOH:O	1.92	0.70
1:C:282:TYR:HB2	1:C:310:MET:CE	2.21	0.69
1:D:177:GLU:HG3	1:D:178:ARG:H	1.58	0.69
1:B:40:GLU:HB3	3:B:803:HOH:O	1.92	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:266:MET:SD	1:A:309:LEU:HD23	2.33	0.68
1:C:258:ASP:O	1:C:259:LEU:HD23	1.95	0.66
1:A:267:ASP:CG	1:A:309:LEU:HD11	2.16	0.65
1:B:233:ARG:O	1:B:236:PRO:HD2	1.96	0.65
1:B:312:LYS:HE3	1:D:89:GLN:O	1.97	0.65
1:D:72:LEU:O	3:D:676:HOH:O	2.14	0.64
1:D:211:ASP:OD2	3:D:674:HOH:O	2.15	0.64
1:B:258:ASP:C	1:B:259:LEU:HD23	2.18	0.63
1:A:146:HIS:HA	1:A:177:GLU:OE2	1.99	0.63
1:B:64:VAL:HG11	1:B:126:LEU:HD21	1.80	0.62
1:B:64:VAL:HG12	1:B:72:LEU:HD22	1.80	0.62
1:A:138:GLY:HA2	1:A:170:THR:CG2	2.30	0.61
1:C:3:TRP:CG	1:C:4:PRO:HD2	2.35	0.61
1:C:90:ASN:HB3	3:C:728:HOH:O	2.00	0.61
1:A:53:ARG:HA	1:A:92:GLN:HG2	1.81	0.61
1:D:185:TRP:HB3	1:D:186:PRO:HD3	1.82	0.61
1:D:125:LYS:O	1:D:129:ARG:HG3	2.01	0.61
1:A:185:TRP:HB3	1:A:186:PRO:HD3	1.83	0.60
1:C:50:GLN:O	1:C:311:ARG:NH1	2.35	0.60
1:B:53:ARG:HA	1:B:92:GLN:HG2	1.84	0.60
1:C:3:TRP:CD1	1:C:4:PRO:HD2	2.37	0.60
1:C:125:LYS:O	1:C:129:ARG:HG2	2.02	0.59
1:B:321:ILE:HG12	3:B:718:HOH:O	2.02	0.59
1:B:259:LEU:HD23	1:B:259:LEU:N	2.16	0.58
1:C:282:TYR:HB2	1:C:310:MET:HE2	1.85	0.58
1:D:251:GLY:O	1:D:281:ALA:HB3	2.04	0.58
1:D:75:ASP:HB3	3:D:692:HOH:O	2.03	0.58
1:B:64:VAL:CG1	1:B:72:LEU:HD22	2.34	0.57
1:C:311:ARG:HH11	1:C:311:ARG:HG2	1.69	0.57
1:B:50:GLN:O	1:B:311:ARG:NH1	2.38	0.56
1:C:148:THR:O	1:C:149:VAL:HG22	2.05	0.56
1:C:195:ASN:HD22	1:D:33:GLY:HA2	1.70	0.56
1:C:229:ILE:HD13	3:C:650:HOH:O	2.06	0.56
1:C:48:ALA:HB3	3:C:728:HOH:O	2.03	0.56
1:B:11:LEU:HD13	1:B:321:ILE:HD13	1.87	0.56
1:C:123:TRP:CZ3	1:C:139:TYR:HB3	2.42	0.55
1:B:330:ASP:HB3	3:B:812:HOH:O	2.07	0.54
1:B:232:GLU:O	1:B:236:PRO:HD3	2.07	0.54
1:A:204:GLU:HG2	3:A:658:HOH:O	2.07	0.53
1:D:26:HIS:CD2	1:D:27:ILE:HG13	2.44	0.53
1:D:73:ASN:O	1:D:77:ILE:HG12	2.09	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:131:LYS:HE3	1:C:167:ASP:HA	1.90	0.53
1:A:142:MET:HB3	1:A:152:TRP:CH2	2.44	0.53
1:B:237:PHE:O	1:B:241:LEU:HG	2.09	0.53
1:A:54:LEU:O	1:A:55:ILE:HD13	2.09	0.52
1:C:42:LYS:HG3	1:C:43:HIS:N	2.24	0.52
1:D:145:PRO:HG2	1:D:176:GLY:O	2.08	0.52
1:A:29:PRO:HD3	3:A:575:HOH:O	2.08	0.52
1:A:189:ASN:HB3	1:A:192:PHE:HB2	1.90	0.52
1:C:201:LEU:HD22	1:C:203:TYR:CE1	2.44	0.52
1:C:225:ILE:O	3:C:692:HOH:O	2.19	0.51
1:B:40:GLU:HG3	1:B:42:LYS:HG2	1.91	0.51
1:D:189:ASN:HB3	1:D:192:PHE:HB2	1.93	0.51
1:C:282:TYR:CB	1:C:310:MET:HE1	2.41	0.51
1:D:248:GLY:O	1:D:279:PRO:HD2	2.11	0.50
1:D:311:ARG:HG2	1:D:311:ARG:HH11	1.76	0.50
1:B:311:ARG:HH11	1:B:311:ARG:HG2	1.77	0.50
1:B:160:VAL:HG21	1:B:194:ILE:HG21	1.93	0.50
1:A:189:ASN:HB3	1:A:192:PHE:CB	2.41	0.50
1:B:282:TYR:OH	1:B:306:GLN:HG2	2.12	0.50
1:D:189:ASN:HB3	1:D:192:PHE:CB	2.42	0.50
1:C:124:ARG:NH1	3:C:662:HOH:O	2.44	0.50
1:B:257:ASP:OD1	1:B:293:LYS:HD2	2.11	0.50
1:C:113:LYS:HG3	3:C:686:HOH:O	2.11	0.50
1:D:42:LYS:HE2	3:D:723:HOH:O	2.11	0.50
1:A:3:TRP:CG	1:A:4:PRO:HD2	2.47	0.50
1:B:99:HIS:HA	1:B:143:ASN:HB3	1.94	0.50
1:A:28:THR:HA	1:A:29:PRO:C	2.31	0.49
1:B:247:LYS:HD3	1:B:321:ILE:HB	1.94	0.49
1:D:117:GLU:HG3	3:D:660:HOH:O	2.13	0.49
1:A:311:ARG:CZ	1:A:311:ARG:HB2	2.43	0.48
1:C:46:TYR:O	1:C:50:GLN:HG2	2.13	0.48
1:C:282:TYR:HB2	1:C:310:MET:HE1	1.95	0.48
1:B:53:ARG:HG3	3:B:601:HOH:O	2.12	0.48
1:A:177:GLU:HG3	1:A:178:ARG:N	2.28	0.48
1:D:142:MET:HB3	1:D:152:TRP:CH2	2.49	0.47
1:D:282:TYR:OH	1:D:306:GLN:HG2	2.14	0.47
1:A:212:ASP:O	3:A:550:HOH:O	2.20	0.47
1:C:168:ASP:OD1	1:C:169:GLN:HG2	2.14	0.47
1:D:28:THR:HA	1:D:29:PRO:C	2.35	0.47
1:D:78:ARG:NH2	3:D:692:HOH:O	2.47	0.47
1:D:42:LYS:NZ	3:D:636:HOH:O	2.47	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:186:PRO:O	1:B:190:ALA:HB2	2.14	0.47
1:B:293:LYS:CD	3:B:658:HOH:O	2.57	0.47
1:A:186:PRO:HD2	3:A:743:HOH:O	2.14	0.47
1:C:242:GLN:HG2	1:C:324:THR:O	2.15	0.47
1:C:78:ARG:NH1	3:C:665:HOH:O	2.46	0.46
1:D:15:GLY:HA2	1:D:52:ILE:HG23	1.98	0.46
1:C:117:GLU:OE2	3:C:645:HOH:O	2.21	0.46
1:D:3:TRP:CG	1:D:4:PRO:HD2	2.51	0.46
1:B:279:PRO:HD3	1:B:321:ILE:HG23	1.97	0.46
1:A:45:LYS:NZ	1:A:49:ASP:OD2	2.48	0.46
1:B:218:MET:HB2	1:B:221:THR:OG1	2.16	0.46
1:D:93:LYS:HB3	1:D:137:LEU:HB2	1.97	0.46
1:D:235:ARG:HB3	1:D:236:PRO:HD3	1.97	0.46
1:C:64:VAL:HG13	1:C:77:ILE:HD11	1.97	0.46
1:B:8:GLU:HB2	3:B:686:HOH:O	2.16	0.46
1:D:19:SER:HB2	1:D:20:GLY:CA	2.47	0.46
1:C:64:VAL:HG11	1:C:126:LEU:HD21	1.98	0.45
1:C:97:ASP:HA	1:C:140:ASP:HB3	1.98	0.45
1:C:131:LYS:HE3	1:C:166:VAL:O	2.17	0.45
1:C:311:ARG:NH1	1:C:311:ARG:HG2	2.31	0.45
1:A:97:ASP:OD1	1:A:143:ASN:HB2	2.17	0.44
1:A:241:LEU:CD1	1:A:248:GLY:HA3	2.47	0.44
1:C:219:ALA:O	1:C:223:ARG:HG3	2.17	0.44
1:C:233:ARG:O	1:C:236:PRO:HD2	2.17	0.44
1:A:3:TRP:CZ3	1:A:137:LEU:HD21	2.53	0.44
1:B:311:ARG:NH1	1:B:311:ARG:HG2	2.32	0.44
1:D:188:VAL:HG23	1:D:189:ASN:CG	2.38	0.44
1:A:241:LEU:HD13	1:A:248:GLY:HA3	2.00	0.44
1:C:174:ILE:HG13	1:C:201:LEU:HD21	1.99	0.44
1:B:19:SER:HB2	1:B:20:GLY:CA	2.47	0.44
1:B:103:ARG:NE	3:B:689:HOH:O	2.43	0.43
1:B:142:MET:HB3	1:B:152:TRP:CH2	2.53	0.43
1:D:3:TRP:CD1	1:D:4:PRO:HD2	2.53	0.43
1:A:148:THR:O	1:A:149:VAL:HG23	2.18	0.43
1:C:124:ARG:HE	1:C:162:ALA:HB1	1.82	0.43
1:C:297:GLU:CD	1:C:298:PRO:HD2	2.38	0.43
1:A:127:ALA:HB3	1:A:166:VAL:HG21	2.00	0.43
1:A:206:HIS:CG	1:A:252:GLU:HB2	2.53	0.43
1:B:178:ARG:HG3	3:B:800:HOH:O	2.18	0.43
1:C:269:LEU:O	1:C:273:LEU:HG	2.18	0.43
1:A:235:ARG:N	1:A:236:PRO:CD	2.82	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:308:GLU:HA	1:A:311:ARG:HE	1.83	0.43
1:D:6:ASN:HB2	1:D:9:GLY:O	2.19	0.43
1:D:40:GLU:HG3	1:D:42:LYS:HG2	2.00	0.43
1:C:93:LYS:HB3	1:C:137:LEU:HB2	2.01	0.43
1:D:177:GLU:HG3	1:D:178:ARG:N	2.29	0.43
1:A:99:HIS:HA	1:A:143:ASN:HB3	2.01	0.43
1:B:302:LYS:HB3	1:B:302:LYS:HE3	1.61	0.43
1:B:127:ALA:O	1:B:131:LYS:HB2	2.19	0.42
1:B:227:PRO:HB3	1:B:264:GLN:HG3	2.01	0.42
1:C:235:ARG:N	1:C:236:PRO:CD	2.81	0.42
1:C:157:GLN:HG2	1:D:40:GLU:OE2	2.19	0.42
1:C:193:LEU:HD21	1:D:33:GLY:HA3	2.02	0.42
1:D:104:TYR:HB3	1:D:114:VAL:HG21	2.01	0.42
1:C:324:THR:HA	1:C:325:PRO:HD3	1.91	0.42
1:D:53:ARG:HA	1:D:92:GLN:HG2	2.01	0.42
1:A:175:GLU:HG2	3:A:658:HOH:O	2.19	0.42
1:B:93:LYS:HB3	1:B:137:LEU:HB2	2.02	0.42
1:B:223:ARG:NH1	3:B:797:HOH:O	2.53	0.42
1:C:78:ARG:NH2	3:C:765:HOH:O	2.52	0.42
1:A:3:TRP:CD1	1:A:4:PRO:HD2	2.55	0.42
1:D:105:HIS:HA	3:D:679:HOH:O	2.20	0.42
1:B:97:ASP:HA	1:B:140:ASP:HB3	2.02	0.42
1:A:220:GLN:HG2	1:A:221:THR:HG23	2.02	0.41
1:C:196:ASP:HB2	1:C:201:LEU:HD12	2.01	0.41
1:D:296:ILE:HD11	1:D:307:MET:HA	2.03	0.41
1:D:100:ASN:HB2	1:D:142:MET:SD	2.61	0.41
1:B:237:PHE:CZ	1:B:241:LEU:HD11	2.56	0.41
1:B:54:LEU:O	1:B:55:ILE:HD13	2.21	0.41
1:B:82:LYS:HD3	3:B:584:HOH:O	2.21	0.41
1:D:173:PHE:HA	1:D:202:ILE:O	2.21	0.41
1:B:41:LYS:HB2	1:B:41:LYS:HE3	1.92	0.41
1:C:196:ASP:CB	1:C:201:LEU:HD12	2.51	0.41
1:C:237:PHE:CZ	1:C:241:LEU:HD11	2.56	0.41
1:D:97:ASP:HA	1:D:140:ASP:HB3	2.03	0.41
1:D:120:ALA:HB1	1:D:162:ALA:HB2	2.03	0.41
1:D:199:ASP:HA	3:D:538:HOH:O	2.21	0.41
1:C:282:TYR:CB	1:C:310:MET:CE	2.94	0.41
1:A:65:GLN:HG2	1:A:67:SER:O	2.21	0.40
1:A:196:ASP:HB2	1:A:201:LEU:HD11	2.03	0.40
1:D:125:LYS:O	1:D:129:ARG:CG	2.68	0.40
1:A:26:HIS:CD2	1:A:27:ILE:HG13	2.56	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:75:ASP:OD2	3:B:725:HOH:O	2.22	0.40
1:B:185:TRP:N	1:B:186:PRO:HD2	2.36	0.40
1:B:223:ARG:HE	1:B:223:ARG:HB2	1.70	0.40
1:B:3:TRP:CG	1:B:4:PRO:HD2	2.56	0.40
1:B:11:LEU:HD13	1:B:321:ILE:CD1	2.50	0.40
1:B:99:HIS:HA	1:B:143:ASN:CB	2.51	0.40
1:C:302:LYS:N	3:C:703:HOH:O	2.54	0.40

All (4) 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:177:GLU:HG2	1:D:319:THR:HG1[2_556]	1.32	0.28
3:C:776:HOH:O	3:D:748:HOH:O[1_565]	2.03	0.17
3:C:765:HOH:O	3:D:780:HOH:O[1_565]	2.07	0.13
3:B:586:HOH:O	3:B:608:HOH:O[2_557]	2.19	0.01

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	320/330 (97%)	317 (99%)	3 (1%)	0	100	100
1	B	326/330 (99%)	321 (98%)	5 (2%)	0	100	100
1	C	317/330 (96%)	311 (98%)	6 (2%)	0	100	100
1	D	315/330 (96%)	312 (99%)	3 (1%)	0	100	100
All	All	1278/1320 (97%)	1261 (99%)	17 (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	261/267 (98%)	258 (99%)	3 (1%)	73	53
1	B	266/267 (100%)	263 (99%)	3 (1%)	73	53
1	C	262/267 (98%)	259 (99%)	3 (1%)	73	53
1	D	259/267 (97%)	257 (99%)	2 (1%)	81	66
All	All	1048/1068 (98%)	1037 (99%)	11 (1%)	76	57

All (11) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	149	VAL
1	A	178	ARG
1	A	180	SER
1	B	97	ASP
1	B	178	ARG
1	B	221	THR
1	C	42	LYS
1	C	178	ARG
1	C	180	SER
1	D	129	ARG
1	D	178	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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 monosaccharides in this entry.

5.6 Ligand geometry [i](#)

4 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	TRS	B	401	-	7,7,7	0.35	0	9,9,9	0.76	0
2	TRS	D	401	-	7,7,7	0.28	0	9,9,9	0.31	0
2	TRS	C	401	-	7,7,7	0.26	0	9,9,9	0.32	0
2	TRS	A	401	-	7,7,7	0.29	0	9,9,9	0.46	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	TRS	B	401	-	-	3/9/9/9	-
2	TRS	D	401	-	-	3/9/9/9	-
2	TRS	C	401	-	-	5/9/9/9	-
2	TRS	A	401	-	-	3/9/9/9	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (14) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	B	401	TRS	C1-C-C3-O3
2	B	401	TRS	C2-C-C3-O3

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Mol	Chain	Res	Type	Atoms
2	C	401	TRS	N-C-C2-O2
2	C	401	TRS	C1-C-C2-O2
2	A	401	TRS	C1-C-C3-O3
2	A	401	TRS	C2-C-C3-O3
2	B	401	TRS	N-C-C3-O3
2	C	401	TRS	C2-C-C1-O1
2	C	401	TRS	C3-C-C1-O1
2	D	401	TRS	N-C-C2-O2
2	D	401	TRS	C1-C-C2-O2
2	D	401	TRS	C3-C-C2-O2
2	A	401	TRS	N-C-C3-O3
2	C	401	TRS	N-C-C1-O1

There are no ring outliers.

No monomer is involved in short contacts.

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	322/330 (97%)	0.68	10 (3%) 49 57	6, 11, 18, 25	0
1	B	328/330 (99%)	0.82	21 (6%) 19 23	6, 11, 18, 24	0
1	C	321/330 (97%)	0.89	23 (7%) 15 18	6, 12, 20, 26	0
1	D	319/330 (96%)	0.88	24 (7%) 14 17	5, 12, 19, 28	0
All	All	1290/1320 (97%)	0.82	78 (6%) 21 25	5, 11, 19, 28	0

All (78) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	259	LEU	5.8
1	B	329	ALA	5.4
1	D	74	PHE	4.5
1	B	328	ILE	4.0
1	C	225	ILE	4.0
1	D	72	LEU	3.7
1	C	201	LEU	3.4
1	A	201	LEU	3.3
1	C	151	LEU	3.1
1	D	71	GLY	3.0
1	C	150	GLY	3.0
1	D	64	VAL	3.0
1	B	179	TRP	3.0
1	C	179	TRP	3.0
1	C	315	ALA	2.9
1	C	224	ASN	2.9
1	B	74	PHE	2.9
1	D	324	THR	2.9
1	D	298	PRO	2.8
1	B	11	LEU	2.8
1	B	223	ARG	2.7

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Mol	Chain	Res	Type	RSRZ
1	B	169	GLN	2.7
1	C	187	LEU	2.6
1	C	5	VAL	2.6
1	C	126	LEU	2.6
1	D	166	VAL	2.6
1	A	7	ASP	2.5
1	D	193	LEU	2.5
1	C	270	LEU	2.5
1	A	2	ASP	2.5
1	B	330	ASP	2.5
1	D	130	PHE	2.5
1	C	131	LYS	2.4
1	B	221	THR	2.4
1	C	113	LYS	2.4
1	C	259	LEU	2.4
1	A	74	PHE	2.4
1	D	37	PHE	2.4
1	A	200	ARG	2.4
1	B	68	LEU	2.4
1	D	223	ARG	2.3
1	A	224	ASN	2.3
1	B	225	ILE	2.3
1	D	126	LEU	2.3
1	A	300	ASN	2.3
1	D	16	VAL	2.3
1	D	150	GLY	2.3
1	D	303	ASP	2.2
1	B	321	ILE	2.2
1	C	294	LEU	2.2
1	B	183	TYR	2.2
1	B	130	PHE	2.2
1	A	309	LEU	2.2
1	B	309	LEU	2.2
1	C	163	ILE	2.2
1	D	77	ILE	2.2
1	C	149	VAL	2.2
1	D	61	TRP	2.2
1	D	51	GLY	2.1
1	D	308	GLU	2.1
1	C	223	ARG	2.1
1	D	123	TRP	2.1
1	C	130	PHE	2.1

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Mol	Chain	Res	Type	RSRZ
1	A	187	LEU	2.1
1	B	302	LYS	2.1
1	D	188	VAL	2.1
1	C	260	PRO	2.1
1	D	192	PHE	2.1
1	B	187	LEU	2.1
1	C	124	ARG	2.1
1	B	149	VAL	2.1
1	B	84	LEU	2.1
1	C	319	THR	2.0
1	A	314	LEU	2.0
1	B	258	ASP	2.0
1	D	68	LEU	2.0
1	D	128	GLU	2.0
1	C	27	ILE	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 monosaccharides 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	TRS	A	401	8/8	0.83	0.20	8,16,24,29	0
2	TRS	C	401	8/8	0.85	0.14	8,12,15,19	0
2	TRS	B	401	8/8	0.87	0.14	8,12,16,18	0
2	TRS	D	401	8/8	0.91	0.12	9,12,15,16	0

6.5 Other polymers [i](#)

There are no such residues in this entry.