



Full wwPDB X-ray Structure Validation Report ⓘ

Apr 25, 2026 – 03:46 PM EDT

PDB ID : 4JA3 / pdb_00004ja3
Title : Partially occluded inward open conformation of the xylose transporter Xyle from *E. coli*
Authors : Quistgaard, E.M.; Low, C.; Moberg, P.; Tresaugues, L.; Nordlund, P.
Deposited on : 2013-02-18
Resolution : 3.80 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

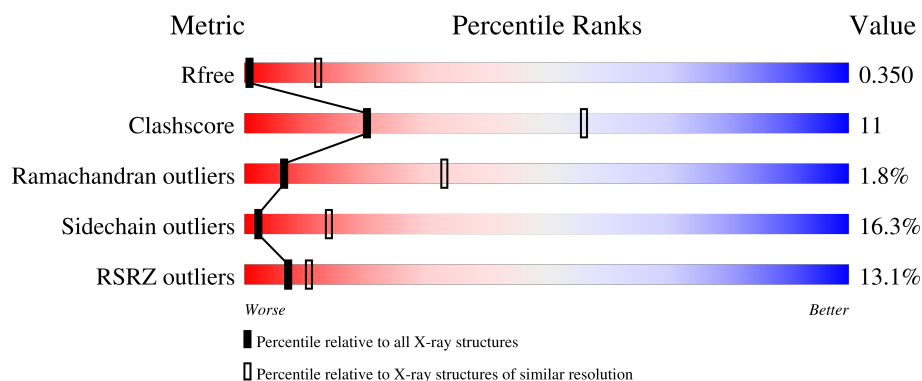
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.80 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	1065 (3.96-3.64)
Clashscore	190562	1012 (3.94-3.66)
Ramachandran outliers	187476	1048 (3.96-3.64)
Sidechain outliers	187428	1043 (3.96-3.64)
RSRZ outliers	180081	1064 (3.96-3.64)

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	485	11% 58% 25% 6% 12%
1	B	485	12% 61% 25% 5% 9%

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 6626 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 D-xylose-proton symporter.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	426	Total	C	N	O	S	0	0	0
			3262	2156	517	566	23			
1	B	439	Total	C	N	O	S	0	0	0
			3359	2220	533	583	23			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1	GLY	-	expression tag	UNP P0AGF4
B	1	GLY	-	expression tag	UNP P0AGF4

- Molecule 2 is CADMIUM ION (CCD ID: CD) (formula: Cd).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	1	Total	Cd	0	0
			1	1		

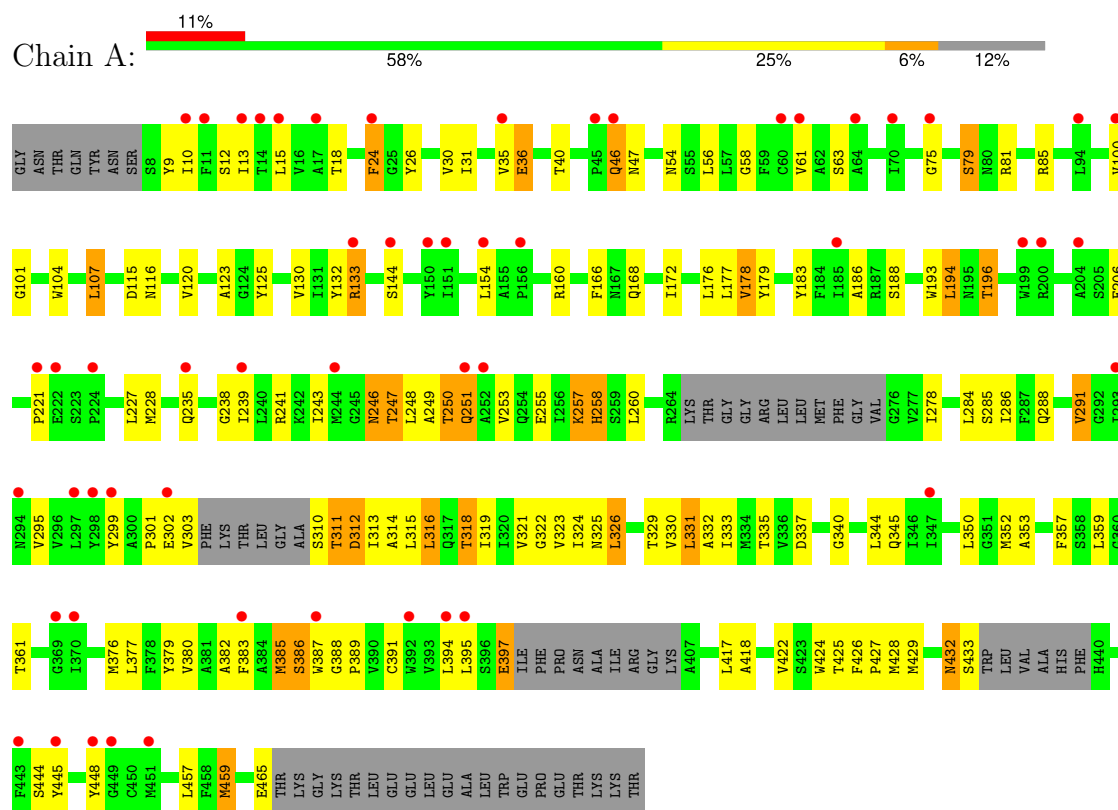
- Molecule 3 is LUTETIUM (III) ION (CCD ID: LU) (formula: Lu).

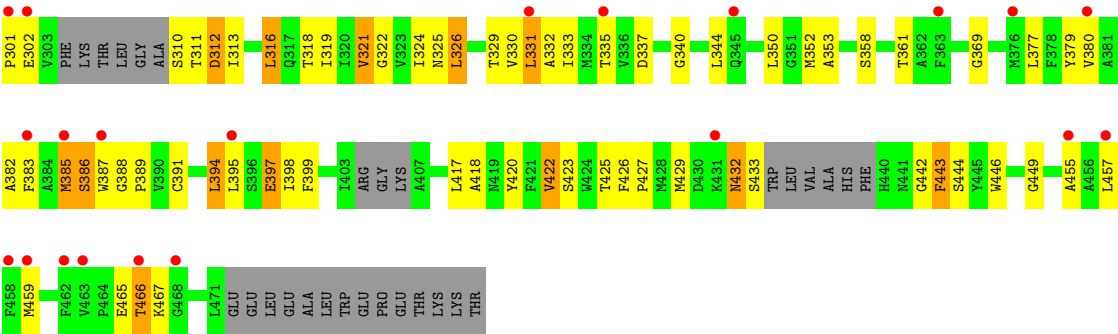
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	2	Total	Lu	0	0
			2	2		
3	B	2	Total	Lu	0	0
			2	2		

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: D-xylose-proton symporter





4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	246.88Å 74.38Å 131.11Å 90.00° 117.71° 90.00°	Depositor
Resolution (Å)	25.26 – 3.80 25.26 – 3.80	Depositor EDS
% Data completeness (in resolution range)	82.3 (25.26-3.80) 82.0 (25.26-3.80)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.05	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.04 (at 3.77Å)	Xtriage
Refinement program	BUSTER 2.11.4	Depositor
R, R_{free}	0.285 , 0.315 0.317 , 0.350	Depositor DCC
R_{free} test set	1348 reflections (6.39%)	wwPDB-VP
Wilson B-factor (Å ²)	154.0	Xtriage
Anisotropy	0.915	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.19 , 129.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.42$, $\langle L^2 \rangle = 0.24$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.88	EDS
Total number of atoms	6626	wwPDB-VP
Average B, all atoms (Å ²)	232.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.48% 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: LU, CD

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	0.70	0/3343	1.27	12/4547 (0.3%)
1	B	0.77	0/3442	1.43	24/4681 (0.5%)
All	All	0.74	0/6785	1.35	36/9228 (0.4%)

There are no bond length outliers.

All (36) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	295	VAL	N-CA-C	-8.85	102.10	110.42
1	B	443	PHE	N-CA-C	-7.97	103.35	113.72
1	A	432	ASN	CA-CB-CG	7.57	120.17	112.60
1	B	432	ASN	CA-CB-CG	7.55	120.15	112.60
1	B	432	ASN	CA-C-N	7.34	134.92	121.70
1	B	432	ASN	C-N-CA	7.34	134.92	121.70
1	B	449	GLY	CA-C-N	7.25	130.00	120.28
1	B	449	GLY	C-N-CA	7.25	130.00	120.28
1	A	432	ASN	CA-C-N	7.04	134.38	121.70
1	A	432	ASN	C-N-CA	7.04	134.38	121.70
1	B	256	ILE	N-CA-C	-6.72	106.46	111.90
1	A	312	ASP	CA-CB-CG	6.66	119.25	112.60
1	B	255	GLU	CA-C-N	6.44	128.91	122.66
1	B	255	GLU	C-N-CA	6.44	128.91	122.66
1	A	353	ALA	N-CA-C	-5.78	104.90	111.14
1	B	115	ASP	CA-C-N	5.49	132.02	121.54
1	B	115	ASP	C-N-CA	5.49	132.02	121.54
1	B	444	SER	N-CA-C	-5.47	105.41	111.71
1	B	125	TYR	CA-C-N	5.46	124.70	120.33
1	B	125	TYR	C-N-CA	5.46	124.70	120.33
1	B	312	ASP	CA-CB-CG	5.45	118.05	112.60
1	A	115	ASP	CA-C-N	5.43	131.91	121.54

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	115	ASP	C-N-CA	5.43	131.91	121.54
1	B	312	ASP	CA-C-N	5.43	129.04	120.47
1	B	312	ASP	C-N-CA	5.43	129.04	120.47
1	B	353	ALA	CA-C-N	5.32	127.75	120.46
1	B	353	ALA	C-N-CA	5.32	127.75	120.46
1	A	251	GLN	N-CA-C	-5.29	105.20	110.97
1	B	316	LEU	CA-C-N	5.17	127.16	120.44
1	B	316	LEU	C-N-CA	5.17	127.16	120.44
1	B	237	GLU	CA-C-N	5.10	125.60	119.94
1	B	237	GLU	C-N-CA	5.10	125.60	119.94
1	A	125	TYR	CA-C-N	5.06	124.38	120.33
1	A	125	TYR	C-N-CA	5.06	124.38	120.33
1	A	46	GLN	CA-C-N	-5.05	115.06	122.19
1	A	46	GLN	C-N-CA	-5.05	115.06	122.19

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3262	0	3303	84	0
1	B	3359	0	3411	67	0
2	A	1	0	0	0	0
3	A	2	0	0	0	0
3	B	2	0	0	0	0
All	All	6626	0	6714	151	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 (151) 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:332:ALA:HB1	1:B:389:PRO:HG3	1.32	1.10

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:332:ALA:HB1	1:A:389:PRO:HG3	1.33	1.08
1:A:249:ALA:O	1:A:253:VAL:HG23	1.71	0.90
1:A:58:GLY:HA2	1:A:427:PRO:HG2	1.51	0.89
1:A:183:TYR:HA	1:A:315:LEU:HD13	1.56	0.85
1:A:30:VAL:CG1	1:A:178:VAL:HG11	2.08	0.84
1:B:30:VAL:CG1	1:B:178:VAL:HG11	2.09	0.82
1:A:10:ILE:HB	1:A:243:ILE:HG12	1.62	0.81
1:B:10:ILE:HB	1:B:243:ILE:HG12	1.64	0.80
1:A:332:ALA:CB	1:A:389:PRO:HG3	2.12	0.79
1:A:58:GLY:CA	1:A:427:PRO:HG2	2.13	0.79
1:B:332:ALA:CB	1:B:389:PRO:HG3	2.13	0.74
1:A:30:VAL:HG12	1:A:178:VAL:HG11	1.68	0.74
1:B:30:VAL:HG12	1:B:178:VAL:HG11	1.67	0.73
1:A:284:LEU:O	1:A:288:GLN:HG3	1.88	0.73
1:B:284:LEU:O	1:B:288:GLN:HG3	1.89	0.71
1:A:179:TYR:HB3	1:A:319:ILE:HG12	1.73	0.71
1:A:352:MET:HE1	1:A:383:PHE:CD2	2.26	0.70
1:A:352:MET:HE1	1:A:383:PHE:HD2	1.56	0.69
1:A:176:LEU:HD21	1:A:322:GLY:O	1.93	0.68
1:A:30:VAL:HG13	1:A:178:VAL:HG11	1.75	0.67
1:B:352:MET:HE1	1:B:383:PHE:CD2	2.29	0.67
1:A:321:VAL:HG13	1:A:380:VAL:HG21	1.76	0.67
1:B:352:MET:HE1	1:B:383:PHE:HD2	1.60	0.67
1:B:394:LEU:HA	1:B:398:ILE:HD13	1.78	0.66
1:B:30:VAL:HG13	1:B:178:VAL:HG11	1.77	0.65
1:A:352:MET:HB2	1:A:379:TYR:CD2	2.32	0.64
1:A:176:LEU:HD21	1:A:322:GLY:C	2.23	0.64
1:B:288:GLN:HG2	1:B:387:TRP:HE1	1.63	0.64
1:A:324:ILE:HG13	1:A:377:LEU:HD22	1.79	0.63
1:B:285:SER:HA	1:B:288:GLN:CD	2.24	0.63
1:A:288:GLN:HG2	1:A:387:TRP:HE1	1.63	0.63
1:B:352:MET:HB2	1:B:379:TYR:CD2	2.34	0.62
1:A:285:SER:HA	1:A:288:GLN:CD	2.23	0.62
1:B:9:TYR:HB3	1:B:243:ILE:HD13	1.82	0.62
1:A:228:MET:CE	1:A:257:LYS:HG2	2.30	0.61
1:A:9:TYR:HB3	1:A:243:ILE:HD13	1.81	0.61
1:B:258:HIS:HA	1:B:261:ASP:HB3	1.83	0.61
1:A:172:ILE:HG22	1:A:326:LEU:HD12	1.83	0.60
1:A:24:PHE:HE1	1:A:144:SER:HB2	1.66	0.60
1:B:24:PHE:HE1	1:B:144:SER:HB2	1.66	0.59
1:B:172:ILE:HG22	1:B:326:LEU:HD12	1.84	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:324:ILE:HG13	1:B:377:LEU:HD22	1.83	0.59
1:A:310:SER:HB3	1:A:313:ILE:HB	1.83	0.58
1:B:321:VAL:HG23	1:B:377:LEU:HD23	1.85	0.58
1:A:18:THR:HG21	1:A:166:PHE:HD1	1.69	0.57
1:A:30:VAL:HG12	1:A:178:VAL:CG1	2.34	0.57
1:A:291:VAL:CG1	1:A:352:MET:HE2	2.33	0.57
1:A:61:VAL:HG21	1:A:299:TYR:OH	2.04	0.57
1:A:345:GLN:HB2	1:A:459:MET:SD	2.44	0.57
1:B:18:THR:HG21	1:B:166:PHE:HD1	1.70	0.57
1:A:291:VAL:HG11	1:A:352:MET:HE2	1.87	0.57
1:A:101:GLY:HA3	1:A:132:TYR:CD2	2.40	0.57
1:B:101:GLY:HA3	1:B:132:TYR:CD2	2.40	0.56
1:B:30:VAL:HG12	1:B:178:VAL:CG1	2.34	0.56
1:A:228:MET:HE1	1:A:257:LYS:HG2	1.88	0.56
1:B:291:VAL:HG11	1:B:352:MET:HE2	1.88	0.56
1:B:291:VAL:CG1	1:B:352:MET:HE2	2.37	0.55
1:A:303:VAL:HG11	1:A:445:TYR:OH	2.06	0.55
1:B:58:GLY:HA2	1:B:427:PRO:HG2	1.89	0.54
1:B:394:LEU:O	1:B:398:ILE:HB	2.07	0.54
1:A:160:ARG:HH21	1:A:397:GLU:HB3	1.73	0.54
1:A:238:GLY:HA2	1:A:241:ARG:HE	1.74	0.53
1:B:61:VAL:HG21	1:B:299:TYR:OH	2.09	0.53
1:B:193:TRP:HA	1:B:196:THR:HG22	1.89	0.52
1:A:193:TRP:HA	1:A:196:THR:HG22	1.90	0.52
1:A:301:PRO:HG3	1:A:318:THR:HG21	1.90	0.52
1:B:221:PRO:HB2	1:B:239:ILE:HD13	1.92	0.51
1:B:466:THR:O	1:B:467:LYS:HB3	2.10	0.51
1:A:313:ILE:O	1:A:316:LEU:HB3	2.10	0.51
1:A:26:TYR:CZ	1:A:178:VAL:HG13	2.47	0.50
1:A:321:VAL:CG1	1:A:380:VAL:HG21	2.41	0.50
1:B:160:ARG:HH21	1:B:397:GLU:HB3	1.76	0.50
1:B:238:GLY:HA2	1:B:241:ARG:HE	1.77	0.50
1:B:455:ALA:O	1:B:459:MET:HG3	2.11	0.50
1:A:221:PRO:HB2	1:A:239:ILE:HD13	1.92	0.50
1:B:176:LEU:HD21	1:B:322:GLY:O	2.12	0.50
1:B:288:GLN:HG2	1:B:387:TRP:NE1	2.26	0.49
1:B:382:ALA:O	1:B:386:SER:HB3	2.12	0.49
1:A:9:TYR:CE2	1:A:13:ILE:HD11	2.48	0.49
1:B:46:GLN:HG2	1:B:123:ALA:HB1	1.95	0.49
1:A:228:MET:HE1	1:A:257:LYS:CG	2.43	0.49
1:A:330:VAL:O	1:A:333:ILE:HG12	2.13	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:332:ALA:HB1	1:B:389:PRO:CG	2.23	0.49
1:A:332:ALA:HB1	1:A:389:PRO:CG	2.23	0.48
1:A:286:ILE:HG22	1:A:418:ALA:HB2	1.95	0.48
1:A:288:GLN:HG2	1:A:387:TRP:NE1	2.26	0.48
1:B:9:TYR:CE2	1:B:13:ILE:HD11	2.48	0.48
1:B:361:THR:HG23	1:B:446:TRP:HE1	1.78	0.48
1:B:286:ILE:HG22	1:B:418:ALA:HB2	1.95	0.48
1:A:179:TYR:HB3	1:A:319:ILE:CG1	2.43	0.48
1:B:26:TYR:CZ	1:B:178:VAL:HG13	2.48	0.48
1:A:382:ALA:O	1:A:386:SER:HB3	2.13	0.48
1:B:330:VAL:O	1:B:333:ILE:HG12	2.13	0.48
1:A:63:SER:HB2	1:A:130:VAL:HG13	1.96	0.48
1:B:176:LEU:HD21	1:B:322:GLY:C	2.39	0.48
1:B:133:ARG:HD2	1:B:133:ARG:HA	1.53	0.47
1:B:255:GLU:HA	1:B:258:HIS:CE1	2.50	0.47
1:A:46:GLN:HG2	1:A:123:ALA:HB1	1.96	0.47
1:A:75:GLY:O	1:A:79:SER:HB2	2.14	0.47
1:B:426:PHE:HB3	1:B:427:PRO:HD3	1.96	0.47
1:A:314:ALA:O	1:A:318:THR:HG23	2.15	0.46
1:A:310:SER:O	1:A:314:ALA:N	2.38	0.46
1:A:246:ASN:O	1:A:250:THR:OG1	2.31	0.46
1:A:183:TYR:HA	1:A:315:LEU:CD1	2.35	0.46
1:A:295:VAL:HG21	1:A:448:TYR:OH	2.16	0.46
1:B:63:SER:HB2	1:B:130:VAL:HG13	1.97	0.46
1:A:345:GLN:CB	1:A:459:MET:SD	3.03	0.46
1:A:299:TYR:CD2	1:A:426:PHE:CD2	3.05	0.45
1:A:331:LEU:HB3	1:A:385:MET:HE3	1.98	0.45
1:A:422:VAL:HA	1:A:425:THR:HG22	1.99	0.44
1:B:301:PRO:HG3	1:B:318:THR:HG21	1.99	0.44
1:A:258:HIS:ND1	1:A:258:HIS:C	2.76	0.44
1:A:310:SER:O	1:A:311:THR:C	2.59	0.44
1:A:359:LEU:HD22	1:A:376:MET:HG2	1.99	0.44
1:A:357:PHE:O	1:A:361:THR:HG23	2.17	0.44
1:B:321:VAL:HG22	1:B:380:VAL:HG21	1.99	0.44
1:B:331:LEU:HB3	1:B:385:MET:HE3	1.99	0.44
1:A:352:MET:HB2	1:A:379:TYR:CE2	2.53	0.44
1:A:172:ILE:HD13	1:A:329:THR:HG21	1.98	0.44
1:A:288:GLN:CG	1:A:387:TRP:HE1	2.30	0.43
1:B:255:GLU:HA	1:B:258:HIS:HE1	1.81	0.43
1:B:179:TYR:HB3	1:B:319:ILE:HG12	2.00	0.43
1:B:106:GLU:HB3	1:B:122:LEU:HD21	1.99	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:172:ILE:HD13	1:B:329:THR:HG21	2.01	0.43
1:B:422:VAL:HA	1:B:425:THR:HG22	2.01	0.43
1:A:104:TRP:O	1:A:107:LEU:HB2	2.19	0.43
1:A:228:MET:HE3	1:A:228:MET:HB3	1.94	0.43
1:A:36:GLU:O	1:A:40:THR:HG23	2.19	0.43
1:A:247:THR:OG1	1:A:248:LEU:N	2.51	0.43
1:A:332:ALA:HB2	1:A:385:MET:HA	2.01	0.43
1:B:186:ALA:HA	1:B:194:LEU:HD11	2.00	0.42
1:B:288:GLN:CG	1:B:387:TRP:HE1	2.31	0.42
1:B:284:LEU:HD21	1:B:459:MET:HE3	2.02	0.42
1:A:186:ALA:HA	1:A:194:LEU:HD11	2.00	0.42
1:A:315:LEU:O	1:A:316:LEU:C	2.62	0.42
1:B:104:TRP:O	1:B:107:LEU:HB2	2.20	0.42
1:B:310:SER:HB2	1:B:313:ILE:HB	2.01	0.42
1:B:26:TYR:HE1	1:B:177:LEU:HD22	1.86	0.41
1:B:332:ALA:HB2	1:B:385:MET:HA	2.01	0.41
1:A:299:TYR:CE2	1:A:426:PHE:CD2	3.08	0.41
1:A:424:TRP:O	1:A:427:PRO:HD2	2.20	0.41
1:A:54:ASN:HB3	1:A:428:MET:HA	2.02	0.41
1:B:352:MET:HB2	1:B:379:TYR:CE2	2.56	0.41
1:A:133:ARG:HA	1:A:133:ARG:HD2	1.55	0.41
1:A:176:LEU:HD11	1:A:323:VAL:N	2.36	0.41
1:B:24:PHE:CD2	1:B:24:PHE:C	2.99	0.41
1:A:9:TYR:O	1:A:13:ILE:HG13	2.21	0.41
1:B:59:PHE:HD1	1:B:420:TYR:HH	1.67	0.40
1:A:26:TYR:CE2	1:A:206:GLU:HB2	2.56	0.40
1:B:24:PHE:CE1	1:B:144:SER:HB2	2.52	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	416/485 (86%)	387 (93%)	22 (5%)	7 (2%)	7	34
1	B	429/485 (88%)	398 (93%)	23 (5%)	8 (2%)	6	32
All	All	845/970 (87%)	785 (93%)	45 (5%)	15 (2%)	6	33

All (15) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	107	LEU
1	B	107	LEU
1	A	116	ASN
1	B	116	ASN
1	A	247	THR
1	B	35	VAL
1	A	35	VAL
1	A	120	VAL
1	B	120	VAL
1	A	340	GLY
1	B	388	GLY
1	A	388	GLY
1	B	340	GLY
1	B	369	GLY
1	B	442	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	342/390 (88%)	286 (84%)	56 (16%)	2	14
1	B	353/390 (90%)	296 (84%)	57 (16%)	2	14
All	All	695/780 (89%)	582 (84%)	113 (16%)	2	14

All (113) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	12	SER

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Mol	Chain	Res	Type
1	A	15	LEU
1	A	24	PHE
1	A	31	ILE
1	A	36	GLU
1	A	47	ASN
1	A	56	LEU
1	A	79	SER
1	A	81	ARG
1	A	85	ARG
1	A	100	VAL
1	A	133	ARG
1	A	154	LEU
1	A	168	GLN
1	A	177	LEU
1	A	178	VAL
1	A	188	SER
1	A	194	LEU
1	A	196	THR
1	A	227	LEU
1	A	235	GLN
1	A	246	ASN
1	A	250	THR
1	A	251	GLN
1	A	255	GLU
1	A	257	LYS
1	A	258	HIS
1	A	260	LEU
1	A	278	ILE
1	A	291	VAL
1	A	302	GLU
1	A	311	THR
1	A	312	ASP
1	A	316	LEU
1	A	318	THR
1	A	325	ASN
1	A	326	LEU
1	A	331	LEU
1	A	335	THR
1	A	337	ASP
1	A	344	LEU
1	A	350	LEU
1	A	385	MET

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Mol	Chain	Res	Type
1	A	386	SER
1	A	391	CYS
1	A	394	LEU
1	A	395	LEU
1	A	397	GLU
1	A	417	LEU
1	A	429	MET
1	A	432	ASN
1	A	433	SER
1	A	444	SER
1	A	457	LEU
1	A	459	MET
1	A	465	GLU
1	B	12	SER
1	B	15	LEU
1	B	24	PHE
1	B	31	ILE
1	B	36	GLU
1	B	47	ASN
1	B	56	LEU
1	B	79	SER
1	B	85	ARG
1	B	100	VAL
1	B	133	ARG
1	B	154	LEU
1	B	168	GLN
1	B	177	LEU
1	B	178	VAL
1	B	188	SER
1	B	194	LEU
1	B	196	THR
1	B	227	LEU
1	B	235	GLN
1	B	240	LEU
1	B	246	ASN
1	B	251	GLN
1	B	253	VAL
1	B	260	LEU
1	B	278	ILE
1	B	291	VAL
1	B	302	GLU
1	B	311	THR

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Mol	Chain	Res	Type
1	B	312	ASP
1	B	316	LEU
1	B	321	VAL
1	B	325	ASN
1	B	326	LEU
1	B	331	LEU
1	B	335	THR
1	B	337	ASP
1	B	344	LEU
1	B	350	LEU
1	B	358	SER
1	B	385	MET
1	B	386	SER
1	B	391	CYS
1	B	394	LEU
1	B	395	LEU
1	B	397	GLU
1	B	399	PHE
1	B	417	LEU
1	B	422	VAL
1	B	423	SER
1	B	429	MET
1	B	432	ASN
1	B	433	SER
1	B	443	PHE
1	B	457	LEU
1	B	465	GLU
1	B	466	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (12) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	39	ASN
1	A	168	GLN
1	A	233	GLN
1	A	262	HIS
1	A	325	ASN
1	A	366	GLN
1	B	39	ASN
1	B	233	GLN
1	B	317	GLN
1	B	325	ASN

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Mol	Chain	Res	Type
1	B	366	GLN
1	B	419	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 5 ligands modelled in this entry, 5 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 [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	426/485 (87%)	0.84	54 (12%)	8 11	166, 229, 268, 275	0
1	B	439/485 (90%)	0.71	59 (13%)	7 10	170, 235, 271, 284	0
All	All	865/970 (89%)	0.77	113 (13%)	7 11	166, 231, 270, 284	0

All (113) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	149	MET	13.7
1	A	14	THR	13.4
1	B	201	TYR	11.0
1	B	150	TYR	10.5
1	B	153	GLU	10.3
1	B	331	LEU	9.5
1	B	335	THR	7.2
1	A	235	GLN	6.6
1	B	84	ARG	6.6
1	B	459	MET	6.4
1	B	302	GLU	6.3
1	B	35	VAL	6.2
1	A	17	ALA	6.0
1	B	148	PRO	5.9
1	B	458	PHE	5.8
1	A	298	TYR	5.6
1	A	297	LEU	5.6
1	A	395	LEU	5.6
1	A	150	TYR	5.6
1	A	221	PRO	5.4
1	A	387	TRP	5.2
1	B	223	SER	5.0
1	B	24	PHE	4.9
1	B	387	TRP	4.9

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Mol	Chain	Res	Type	RSRZ
1	A	299	TYR	4.8
1	B	146	LEU	4.6
1	B	28	THR	4.5
1	A	60	CYS	4.5
1	A	154	LEU	4.5
1	B	298	TYR	4.4
1	B	31	ILE	4.4
1	A	13	ILE	4.4
1	A	35	VAL	4.4
1	B	127	PRO	4.4
1	A	383	PHE	4.3
1	A	10	ILE	4.3
1	B	197	ASP	4.1
1	A	200	ARG	4.1
1	A	392	TRP	3.9
1	B	33	GLY	3.9
1	A	448	TYR	3.8
1	B	147	SER	3.8
1	A	151	ILE	3.7
1	A	199	TRP	3.7
1	A	445	TYR	3.7
1	B	293	ILE	3.5
1	B	48	LEU	3.5
1	A	369	GLY	3.5
1	B	284	LEU	3.4
1	B	383	PHE	3.4
1	B	216	LEU	3.4
1	A	347	ILE	3.4
1	B	152	ALA	3.4
1	B	32	SER	3.4
1	B	395	LEU	3.4
1	A	24	PHE	3.3
1	B	238	GLY	3.3
1	A	133	ARG	3.3
1	A	244	MET	3.3
1	B	363	PHE	3.3
1	B	468	GLY	3.3
1	B	299	TYR	3.2
1	A	302	GLU	3.2
1	A	75	GLY	3.2
1	B	431	LYS	3.1
1	B	385	MET	3.1

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Mol	Chain	Res	Type	RSRZ
1	A	11	PHE	3.0
1	A	144	SER	3.0
1	A	252	ALA	3.0
1	A	222	GLU	3.0
1	A	204	ALA	3.0
1	A	70	ILE	2.9
1	B	239	ILE	2.8
1	B	466	THR	2.8
1	A	61	VAL	2.7
1	A	251	GLN	2.7
1	A	443	PHE	2.7
1	B	463	VAL	2.7
1	B	462	PHE	2.7
1	A	394	LEU	2.7
1	A	64	ALA	2.6
1	B	128	GLU	2.6
1	A	100	VAL	2.6
1	A	239	ILE	2.6
1	B	301	PRO	2.6
1	B	115	ASP	2.6
1	B	455	ALA	2.6
1	B	154	LEU	2.5
1	B	113	ASN	2.4
1	A	370	ILE	2.4
1	B	291	VAL	2.3
1	A	46	GLN	2.3
1	B	60	CYS	2.2
1	B	376	MET	2.2
1	B	380	VAL	2.2
1	B	114	PRO	2.2
1	A	15	LEU	2.2
1	B	300	ALA	2.2
1	A	449	GLY	2.2
1	B	112	ILE	2.1
1	A	156	PRO	2.1
1	A	224	PRO	2.1
1	A	294	ASN	2.1
1	B	243	ILE	2.1
1	A	94	LEU	2.1
1	B	34	THR	2.1
1	B	457	LEU	2.1
1	A	451	MET	2.0

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Mol	Chain	Res	Type	RSRZ
1	B	283	MET	2.0
1	A	293	ILE	2.0
1	B	345	GLN	2.0
1	A	45	PRO	2.0
1	A	185	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 oligosaccharides in this entry.

6.4 Ligands [i](#)

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
2	CD	A	501	1/1	0.82	0.13	300,300,300,300	0
3	LU	B	501	1/1	0.96	0.04	300,300,300,300	0
3	LU	A	502	1/1	0.97	0.03	300,300,300,300	0
3	LU	B	502	1/1	0.97	0.03	300,300,300,300	0
3	LU	A	503	1/1	0.98	0.06	295,295,295,295	0

6.5 Other polymers [i](#)

There are no such residues in this entry.