



Full wwPDB X-ray Structure Validation Report ⓘ

Apr 18, 2026 – 04:50 PM UTC

PDB ID : 4IU9 / pdb_00004iu9
Title : Crystal structure of a membrane transporter
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Deposited on : 2013-01-20
Resolution : 3.00 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

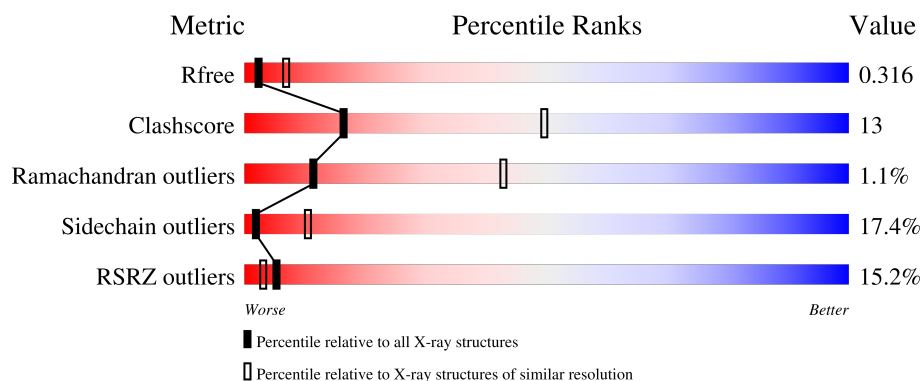
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.00 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	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	2672 (3.00-3.00)
Clashscore	190562	2977 (3.00-3.00)
Ramachandran outliers	187476	2877 (3.00-3.00)
Sidechain outliers	187428	2880 (3.00-3.00)
RSRZ outliers	180081	2671 (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 $\leq 5\%$. 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	468	13% 52% 27% 5% 15%
1	B	468	14% 59% 27% 6% 9%

2 Entry composition

There is only 1 type of molecule in this entry. The entry contains 6061 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 Nitrite extrusion protein 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	B	427	Total	C	N	O	S	0	0	0
			3129	2092	500	519	18			
1	A	396	Total	C	N	O	S	0	0	0
			2932	1966	464	484	18			

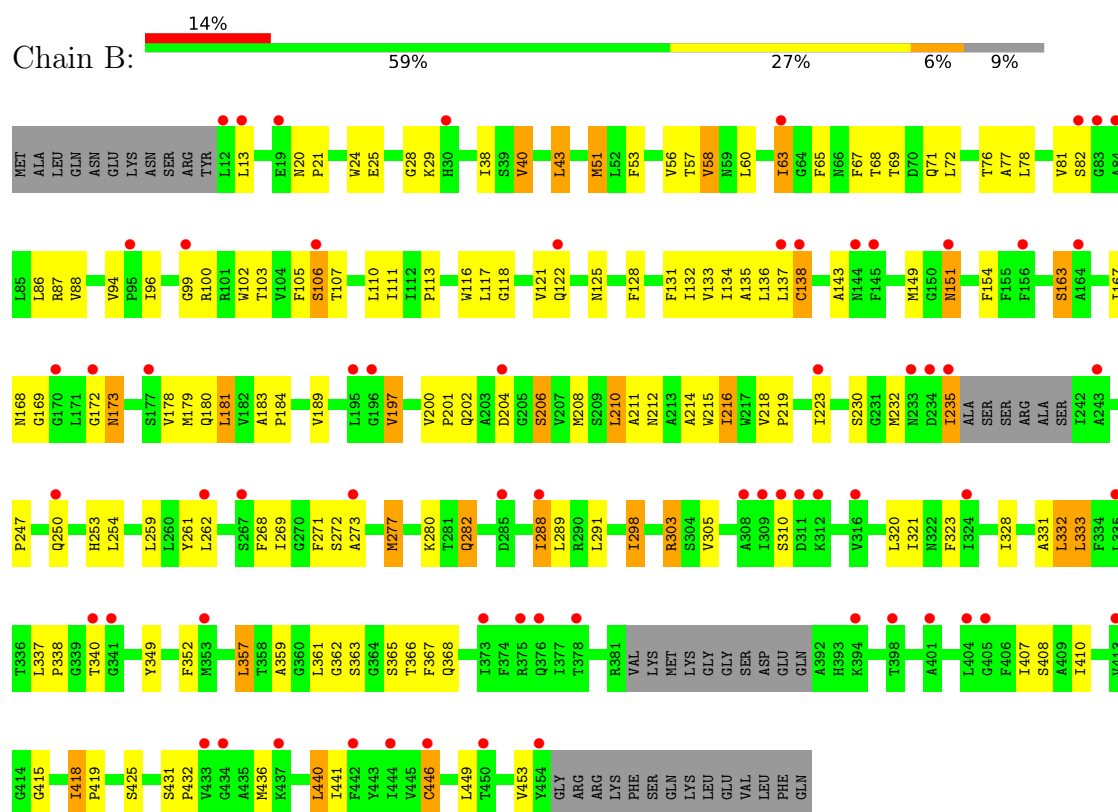
There are 12 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	463	LEU	-	expression tag	UNP P37758
B	464	GLU	-	expression tag	UNP P37758
B	465	VAL	-	expression tag	UNP P37758
B	466	LEU	-	expression tag	UNP P37758
B	467	PHE	-	expression tag	UNP P37758
B	468	GLN	-	expression tag	UNP P37758
A	463	LEU	-	expression tag	UNP P37758
A	464	GLU	-	expression tag	UNP P37758
A	465	VAL	-	expression tag	UNP P37758
A	466	LEU	-	expression tag	UNP P37758
A	467	PHE	-	expression tag	UNP P37758
A	468	GLN	-	expression tag	UNP P37758

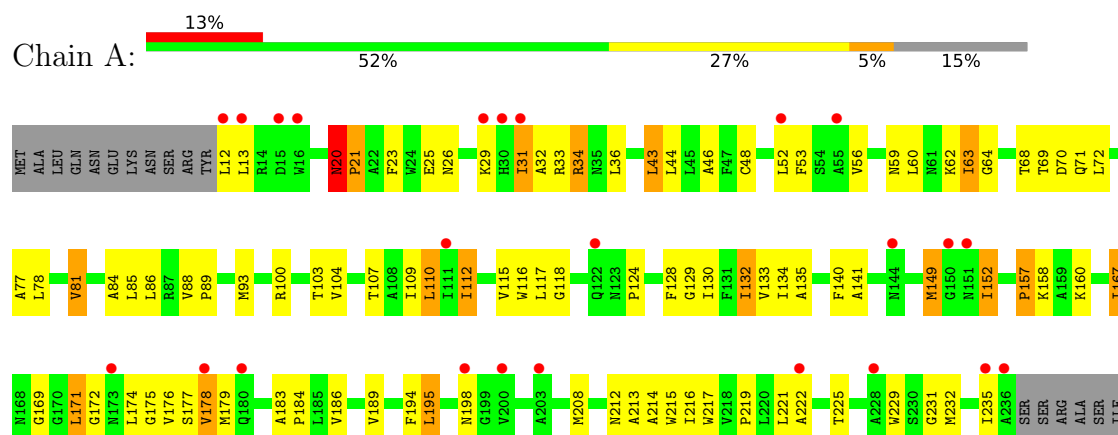
3 Residue-property plots

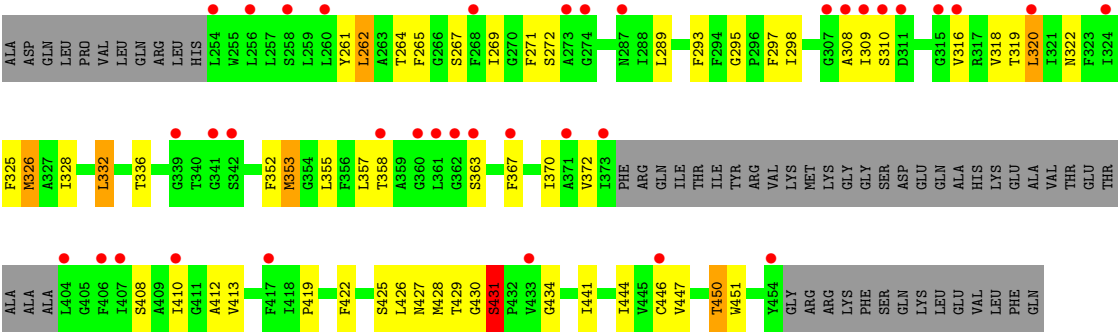
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. 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: Nitrite extrusion protein 2



• Molecule 1: Nitrite extrusion protein 2





4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	117.44Å 118.21Å 127.06Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	39.84 – 3.00 39.84 – 3.00	Depositor EDS
% Data completeness (in resolution range)	76.0 (39.84-3.00) 76.2 (39.84-3.00)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	5.22 (at 3.01Å)	Xtriage
Refinement program	PHENIX (phenix.refine: 1.7.3_928)	Depositor
R, R_{free}	0.261 , 0.316 0.266 , 0.316	Depositor DCC
R_{free} test set	1410 reflections (3.90%)	wwPDB-VP
Wilson B-factor (Å ²)	70.4	Xtriage
Anisotropy	1.362	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.27 , 93.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.46$, $\langle L^2 \rangle = 0.29$	Xtriage
Estimated twinning fraction	0.026 for k,h,-l	Xtriage
F_o, F_c correlation	0.91	EDS
Total number of atoms	6061	wwPDB-VP
Average B, all atoms (Å ²)	127.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 16.91% 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

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	0.58	1/3014 (0.0%)	0.96	7/4110 (0.2%)
1	B	0.58	0/3215	0.97	11/4388 (0.3%)
All	All	0.58	1/6229 (0.0%)	0.96	18/8498 (0.2%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	178	VAL	CA-CB	6.16	1.62	1.54

All (18) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	20	ASN	CA-C-N	8.46	130.42	119.84
1	A	20	ASN	C-N-CA	8.46	130.42	119.84
1	B	268	PHE	N-CA-C	-7.92	103.45	113.43
1	B	418	ILE	CA-C-N	-7.57	111.99	119.64
1	B	418	ILE	C-N-CA	-7.57	111.99	119.64
1	B	247	PRO	N-CA-CB	7.16	110.77	103.25
1	A	431	SER	CA-C-N	6.08	126.25	119.32
1	A	431	SER	C-N-CA	6.08	126.25	119.32
1	B	250	GLN	N-CA-C	5.70	118.26	111.71
1	A	112	ILE	CA-C-N	-5.68	112.74	119.84
1	A	112	ILE	C-N-CA	-5.68	112.74	119.84
1	B	103	THR	N-CA-C	-5.35	106.43	113.12
1	A	140	PHE	N-CA-C	-5.35	105.90	112.90
1	B	211	ALA	N-CA-C	-5.25	106.02	112.90
1	B	453	VAL	N-CA-C	5.25	115.35	110.42
1	B	183	ALA	CA-C-N	-5.12	114.76	120.45
1	B	183	ALA	C-N-CA	-5.12	114.76	120.45
1	B	151	ASN	N-CA-C	5.06	116.88	111.36

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	2932	0	2942	77	1
1	B	3129	0	3092	80	0
All	All	6061	0	6034	157	1

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 13.

All (157) 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:432:PRO:HB2	1:B:436:MET:HE3	1.61	0.80
1:B:43:LEU:HD13	1:B:172:GLY:HA3	1.67	0.77
1:B:51:MET:HE3	1:B:273:ALA:HB2	1.67	0.77
1:A:36:LEU:HD21	1:A:167:ILE:HG21	1.69	0.74
1:A:77:ALA:HB2	1:A:419:PRO:HB2	1.68	0.74
1:A:34:ARG:NH1	1:A:231:GLY:O	2.20	0.74
1:A:43:LEU:HD12	1:A:172:GLY:HA3	1.72	0.71
1:A:25:GLU:HA	1:A:29:LYS:HD3	1.74	0.69
1:A:295:GLY:HA2	1:A:353:MET:HE2	1.73	0.68
1:A:48:CYS:SG	1:A:179:MET:HB3	2.37	0.65
1:A:157:PRO:HD2	1:A:160:LYS:HB2	1.78	0.64
1:B:280:LYS:HD3	1:B:288:ILE:HD11	1.80	0.64
1:A:222:ALA:HA	1:A:225:THR:HG22	1.80	0.63
1:B:261:TYR:HE2	1:B:408:SER:HA	1.63	0.63
1:A:64:GLY:HA3	1:A:124:PRO:HB3	1.82	0.62
1:B:271:PHE:CE2	1:B:418:ILE:HD13	2.35	0.61
1:A:261:TYR:HE1	1:A:408:SER:HA	1.66	0.61
1:B:118:GLY:HA3	1:B:215:TRP:NE1	2.16	0.60
1:A:71:GLN:HB3	1:A:128:PHE:CE2	2.39	0.58
1:A:81:VAL:O	1:A:85:LEU:HB2	2.04	0.58
1:A:116:TRP:CD1	1:A:134:ILE:HD11	2.39	0.57
1:A:63:ILE:HG22	1:A:64:GLY:H	1.69	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:38:ILE:HB	1:B:232:MET:HE3	1.85	0.57
1:A:29:LYS:NZ	1:A:33:ARG:HH12	2.03	0.57
1:B:40:VAL:HG23	1:B:168:ASN:HA	1.86	0.56
1:B:60:LEU:HD21	1:B:131:PHE:CE1	2.40	0.56
1:B:111:ILE:HG23	1:B:218:VAL:HG13	1.87	0.56
1:A:68:THR:N	1:A:71:GLN:OE1	2.29	0.56
1:A:110:LEU:HB3	1:A:221:LEU:HD21	1.86	0.56
1:B:310:SER:HB2	1:B:365:SER:HA	1.88	0.55
1:B:116:TRP:CD1	1:B:134:ILE:HD11	2.42	0.55
1:A:44:LEU:HD21	1:A:178:VAL:HG11	1.89	0.55
1:B:337:LEU:HD21	1:B:436:MET:HE1	1.88	0.55
1:B:57:THR:HB	1:B:72:LEU:HD22	1.89	0.55
1:A:167:ILE:O	1:A:171:LEU:HB2	2.07	0.54
1:B:117:LEU:HD23	1:B:214:ALA:HB2	1.88	0.54
1:B:331:ALA:HB2	1:B:440:LEU:HD11	1.88	0.54
1:B:71:GLN:HB3	1:B:128:PHE:CE2	2.43	0.54
1:A:53:PHE:HE2	1:A:135:ALA:HA	1.72	0.54
1:A:264:THR:OG1	1:A:363:SER:N	2.41	0.54
1:B:106:SER:O	1:B:106:SER:OG	2.25	0.54
1:B:282:GLN:HG3	1:B:338:PRO:HD2	1.91	0.53
1:B:184:PRO:HB3	1:B:289:LEU:HB3	1.89	0.53
1:B:202:GLN:N	1:B:206:SER:O	2.41	0.53
1:B:173:ASN:OD1	1:B:303:ARG:NH1	2.42	0.53
1:A:322:ASN:O	1:A:325:PHE:N	2.38	0.53
1:A:194:PHE:CE2	1:A:195:LEU:HD13	2.45	0.52
1:A:446:CYS:O	1:A:450:THR:OG1	2.27	0.52
1:A:184:PRO:HB3	1:A:289:LEU:HD13	1.91	0.52
1:B:184:PRO:HG3	1:B:289:LEU:HD22	1.91	0.52
1:B:298:ILE:HG23	1:B:357:LEU:HD12	1.92	0.52
1:A:118:GLY:HA3	1:A:215:TRP:NE1	2.24	0.52
1:A:261:TYR:CE1	1:A:408:SER:HA	2.44	0.52
1:A:177:SER:OG	1:A:297:PHE:HB2	2.09	0.51
1:A:426:LEU:O	1:A:430:GLY:HA2	2.11	0.51
1:B:100:ARG:HD3	1:B:232:MET:O	2.10	0.51
1:B:102:TRP:O	1:B:106:SER:HB3	2.10	0.51
1:B:53:PHE:CE2	1:B:135:ALA:HA	2.46	0.51
1:A:328:ILE:O	1:A:332:LEU:HB2	2.10	0.51
1:A:183:ALA:HB1	1:A:213:ALA:HB1	1.92	0.51
1:B:113:PRO:HG3	1:B:137:LEU:HB3	1.92	0.51
1:A:149:MET:HE1	1:A:169:GLY:N	2.26	0.51
1:A:320:LEU:HG	1:A:450:THR:HB	1.92	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:154:PHE:HB3	1:B:235:ILE:HD11	1.93	0.50
1:A:422:PHE:O	1:A:426:LEU:HB2	2.12	0.50
1:B:432:PRO:O	1:B:436:MET:HG3	2.12	0.49
1:A:293:PHE:C	1:A:295:GLY:H	2.20	0.49
1:A:322:ASN:HD21	1:A:326:MET:HE2	1.77	0.49
1:A:189:VAL:O	1:A:212:ASN:ND2	2.45	0.49
1:B:269:ILE:HG22	1:B:415:GLY:HA3	1.95	0.49
1:B:362:GLY:O	1:B:366:THR:HG22	2.13	0.48
1:B:425:SER:OG	1:B:431:SER:O	2.18	0.48
1:A:100:ARG:HD3	1:A:232:MET:O	2.12	0.48
1:B:323:PHE:CE2	1:B:446:CYS:HB3	2.48	0.48
1:A:425:SER:HB2	1:A:434:GLY:HA3	1.95	0.48
1:A:308:ALA:C	1:A:310:SER:H	2.21	0.48
1:B:122:GLN:OE1	1:B:197:VAL:HA	2.12	0.48
1:B:149:MET:HE1	1:B:169:GLY:HA3	1.95	0.47
1:B:99:GLY:HA3	1:B:151:ASN:OD1	2.14	0.47
1:A:78:LEU:HD11	1:A:132:ILE:HD13	1.95	0.47
1:A:88:VAL:HB	1:A:89:PRO:HD3	1.95	0.47
1:A:214:ALA:O	1:A:215:TRP:HD1	1.97	0.47
1:A:353:MET:HA	1:A:353:MET:HE3	1.96	0.47
1:A:46:ALA:O	1:A:141:ALA:HB1	2.15	0.47
1:B:216:ILE:O	1:B:219:PRO:HD2	2.15	0.47
1:A:217:TRP:O	1:A:221:LEU:HB2	2.15	0.47
1:A:293:PHE:C	1:A:295:GLY:N	2.74	0.46
1:B:134:ILE:O	1:B:138:CYS:HB2	2.16	0.46
1:B:163:SER:O	1:B:167:ILE:HD12	2.16	0.46
1:A:186:VAL:HG11	1:A:216:ILE:HG21	1.97	0.46
1:B:359:ALA:O	1:B:363:SER:HB2	2.16	0.46
1:B:261:TYR:CE2	1:B:408:SER:HA	2.46	0.46
1:B:189:VAL:O	1:B:212:ASN:ND2	2.49	0.46
1:B:407:ILE:HA	1:B:410:ILE:HG22	1.98	0.46
1:A:216:ILE:O	1:A:219:PRO:HD2	2.15	0.45
1:B:208:MET:HE3	1:B:210:LEU:HG	1.97	0.45
1:B:303:ARG:HD3	1:B:363:SER:HB3	1.97	0.45
1:A:175:GLY:HA2	1:A:178:VAL:HG12	1.98	0.45
1:B:179:MET:C	1:B:181:LEU:H	2.24	0.45
1:A:269:ILE:HA	1:A:272:SER:HB2	1.99	0.45
1:B:76:THR:HB	1:B:273:ALA:HB1	1.99	0.45
1:A:13:LEU:HD12	1:A:235:ILE:HG12	1.98	0.45
1:B:201:PRO:O	1:B:202:GLN:HG3	2.16	0.45
1:B:261:TYR:CD2	1:B:407:ILE:HG22	2.51	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:333:LEU:HD23	1:B:333:LEU:HA	1.80	0.45
1:B:58:VAL:HG22	1:B:277:MET:HG2	1.99	0.45
1:A:36:LEU:HA	1:A:152:ILE:HD11	1.99	0.45
1:A:29:LYS:HZ2	1:A:33:ARG:HH12	1.65	0.44
1:A:56:VAL:O	1:A:60:LEU:HG	2.17	0.44
1:B:60:LEU:HD12	1:B:60:LEU:HA	1.84	0.44
1:A:129:GLY:O	1:A:132:ILE:HB	2.17	0.44
1:A:179:MET:C	1:A:179:MET:SD	3.00	0.44
1:B:20:ASN:HA	1:B:21:PRO:HD3	1.85	0.44
1:B:179:MET:HE3	1:B:179:MET:HB3	1.90	0.44
1:B:99:GLY:HA3	1:B:151:ASN:CG	2.44	0.43
1:A:271:PHE:CE2	1:A:355:LEU:HD22	2.53	0.43
1:B:128:PHE:CE1	1:B:132:ILE:HD11	2.54	0.43
1:A:12:LEU:HD23	1:A:13:LEU:N	2.33	0.43
1:B:337:LEU:HD11	1:B:436:MET:SD	2.58	0.43
1:B:77:ALA:HB2	1:B:419:PRO:HB2	2.01	0.43
1:B:102:TRP:O	1:B:102:TRP:CG	2.71	0.43
1:B:116:TRP:CG	1:B:134:ILE:HD11	2.53	0.43
1:B:25:GLU:HA	1:B:29:LYS:HD3	2.00	0.43
1:A:308:ALA:O	1:A:310:SER:N	2.51	0.43
1:A:427:ASN:HB3	1:A:428:MET:H	1.70	0.43
1:A:20:ASN:HA	1:A:21:PRO:HD2	1.81	0.42
1:B:63:ILE:HG22	1:B:65:PHE:CD2	2.54	0.42
1:A:59:ASN:HA	1:A:62:LYS:HE3	2.01	0.42
1:A:31:ILE:HG13	1:A:32:ALA:N	2.30	0.42
1:B:118:GLY:HA3	1:B:215:TRP:CD1	2.54	0.42
1:B:24:TRP:CE2	1:B:29:LYS:HB3	2.55	0.42
1:A:20:ASN:O	1:A:23:PHE:N	2.53	0.42
1:B:179:MET:C	1:B:179:MET:SD	3.03	0.42
1:A:129:GLY:O	1:A:133:VAL:HG23	2.20	0.42
1:B:441:ILE:HA	1:B:441:ILE:HD13	1.75	0.41
1:A:326:MET:HG2	1:A:358:THR:HB	2.01	0.41
1:A:104:VAL:HG21	1:A:229:TRP:CE3	2.56	0.41
1:B:67:PHE:HE1	1:B:128:PHE:HB2	1.85	0.41
1:B:105:PHE:C	1:B:107:THR:H	2.29	0.41
1:A:262:LEU:HD12	1:A:410:ILE:O	2.21	0.41
1:A:84:ALA:HB2	1:A:412:ALA:HB3	2.02	0.41
1:A:370:ILE:C	1:A:372:VAL:H	2.28	0.41
1:B:87:ARG:HG2	1:B:143:ALA:HA	2.03	0.41
1:B:291:LEU:HD13	1:B:349:TYR:CE2	2.56	0.41
1:B:328:ILE:O	1:B:332:LEU:HB2	2.21	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:117:LEU:HB2	1:A:134:ILE:HG21	2.03	0.41
1:A:208:MET:HE2	1:A:208:MET:HB3	1.73	0.41
1:A:319:THR:O	1:A:322:ASN:HB3	2.20	0.40
1:A:264:THR:HG23	1:A:265:PHE:H	1.87	0.40
1:B:43:LEU:HD23	1:B:43:LEU:HA	1.87	0.40
1:B:58:VAL:CG2	1:B:277:MET:HG2	2.52	0.40
1:B:184:PRO:HB3	1:B:289:LEU:HD13	2.02	0.40
1:B:94:VAL:C	1:B:96:ILE:H	2.29	0.40
1:B:184:PRO:CB	1:B:289:LEU:HB3	2.51	0.40
1:B:271:PHE:CD2	1:B:418:ILE:HG21	2.57	0.40
1:B:323:PHE:CD2	1:B:446:CYS:HB3	2.57	0.40
1:A:100:ARG:HG3	1:A:232:MET:HB2	2.04	0.40

All (1) 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:26:ASN:OD1	1:A:431:SER:OG[2_555]	2.04	0.16

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	390/468 (83%)	339 (87%)	45 (12%)	6 (2%)	8	35
1	B	421/468 (90%)	361 (86%)	57 (14%)	3 (1%)	18	53
All	All	811/936 (87%)	700 (86%)	102 (13%)	9 (1%)	11	43

All (9) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	28	GLY

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Mol	Chain	Res	Type
1	B	58	VAL
1	A	157	PRO
1	A	158	LYS
1	A	309	ILE
1	A	21	PRO
1	B	180	GLN
1	A	316	VAL
1	A	63	ILE

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	293/371 (79%)	246 (84%)	47 (16%)	2	12
1	B	304/371 (82%)	247 (81%)	57 (19%)	1	9
All	All	597/742 (80%)	493 (83%)	104 (17%)	2	10

All (104) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	13	LEU
1	B	40	VAL
1	B	43	LEU
1	B	51	MET
1	B	56	VAL
1	B	63	ILE
1	B	68	THR
1	B	69	THR
1	B	78	LEU
1	B	81	VAL
1	B	82	SER
1	B	86	LEU
1	B	88	VAL
1	B	106	SER
1	B	110	LEU

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Mol	Chain	Res	Type
1	B	121	VAL
1	B	125	ASN
1	B	133	VAL
1	B	136	LEU
1	B	138	CYS
1	B	163	SER
1	B	173	ASN
1	B	178	VAL
1	B	181	LEU
1	B	197	VAL
1	B	200	VAL
1	B	204	ASP
1	B	206	SER
1	B	210	LEU
1	B	216	ILE
1	B	223	ILE
1	B	230	SER
1	B	235	ILE
1	B	253	HIS
1	B	254	LEU
1	B	259	LEU
1	B	262	LEU
1	B	272	SER
1	B	277	MET
1	B	282	GLN
1	B	288	ILE
1	B	298	ILE
1	B	303	ARG
1	B	305	VAL
1	B	320	LEU
1	B	321	ILE
1	B	332	LEU
1	B	333	LEU
1	B	340	THR
1	B	352	PHE
1	B	357	LEU
1	B	361	LEU
1	B	367	PHE
1	B	368	GLN
1	B	440	LEU
1	B	446	CYS
1	B	449	LEU

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Mol	Chain	Res	Type
1	A	20	ASN
1	A	31	ILE
1	A	34	ARG
1	A	43	LEU
1	A	52	LEU
1	A	69	THR
1	A	70	ASP
1	A	72	LEU
1	A	81	VAL
1	A	86	LEU
1	A	93	MET
1	A	103	THR
1	A	107	THR
1	A	109	ILE
1	A	110	LEU
1	A	112	ILE
1	A	115	VAL
1	A	130	ILE
1	A	132	ILE
1	A	149	MET
1	A	152	ILE
1	A	167	ILE
1	A	171	LEU
1	A	174	LEU
1	A	176	VAL
1	A	195	LEU
1	A	198	ASN
1	A	262	LEU
1	A	267	SER
1	A	298	ILE
1	A	318	VAL
1	A	320	LEU
1	A	326	MET
1	A	332	LEU
1	A	336	THR
1	A	352	PHE
1	A	353	MET
1	A	357	LEU
1	A	367	PHE
1	A	413	VAL
1	A	429	THR
1	A	431	SER

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Mol	Chain	Res	Type
1	A	441	ILE
1	A	444	ILE
1	A	447	VAL
1	A	450	THR
1	A	451	TRP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	20	ASN
1	A	30	HIS
1	A	144	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](#)

There are no ligands in this entry.

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	396/468 (84%)	1.00	60 (15%) 5 3	94, 124, 174, 219	0
1	B	427/468 (91%)	1.02	65 (15%) 5 3	91, 121, 186, 290	0
All	All	823/936 (87%)	1.01	125 (15%) 5 3	91, 122, 179, 290	0

All (125) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	311	ASP	7.4
1	A	122	GLN	7.0
1	B	335	LEU	6.2
1	B	195	LEU	5.9
1	B	63	ILE	5.6
1	A	274	GLY	5.0
1	A	198	ASN	4.6
1	A	367	PHE	4.3
1	B	405	GLY	4.2
1	B	164	ALA	4.2
1	A	311	ASP	4.0
1	A	406	PHE	4.0
1	B	450	THR	3.9
1	B	308	ALA	3.8
1	B	340	THR	3.7
1	A	16	TRP	3.6
1	A	360	GLY	3.6
1	B	84	ALA	3.6
1	A	361	LEU	3.6
1	B	13	LEU	3.4
1	B	196	GLY	3.4
1	B	138	CYS	3.4
1	B	151	ASN	3.4
1	B	234	ASP	3.4

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Mol	Chain	Res	Type	RSRZ
1	A	362	GLY	3.4
1	A	203	ALA	3.3
1	A	324	ILE	3.3
1	B	444	ILE	3.3
1	A	320	LEU	3.3
1	A	404	LEU	3.3
1	B	12	LEU	3.2
1	A	363	SER	3.2
1	B	267	SER	3.2
1	B	446	CYS	3.2
1	B	401	ALA	3.2
1	A	371	ALA	3.1
1	A	260	LEU	3.0
1	A	254	LEU	3.0
1	A	417	PHE	3.0
1	B	106	SER	3.0
1	B	172	GLY	3.0
1	A	258	SER	3.0
1	A	358	THR	3.0
1	B	442	PHE	2.9
1	B	144	ASN	2.9
1	B	454	TYR	2.8
1	B	262	LEU	2.8
1	B	376	GLN	2.8
1	B	83	GLY	2.8
1	A	144	ASN	2.8
1	B	433	VAL	2.8
1	A	310	SER	2.7
1	A	55	ALA	2.7
1	A	15	ASP	2.7
1	B	394	LYS	2.7
1	A	111	ILE	2.7
1	B	156	PHE	2.7
1	A	373	ILE	2.6
1	B	341	GLY	2.6
1	A	308	ALA	2.6
1	B	434	GLY	2.6
1	A	339	GLY	2.6
1	A	433	VAL	2.6
1	B	309	ILE	2.5
1	A	52	LEU	2.5
1	B	122	GLN	2.5

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Mol	Chain	Res	Type	RSRZ
1	A	315	GLY	2.5
1	A	309	ILE	2.5
1	A	13	LEU	2.5
1	A	151	ASN	2.5
1	A	268	PHE	2.5
1	B	170	GLY	2.5
1	A	341	GLY	2.5
1	A	30	HIS	2.5
1	B	250	GLN	2.5
1	B	312	LYS	2.4
1	B	82	SER	2.4
1	B	30	HIS	2.4
1	A	12	LEU	2.4
1	B	398	THR	2.4
1	B	223	ILE	2.4
1	A	273	ALA	2.4
1	B	310	SER	2.4
1	B	378	THR	2.3
1	B	233	ASN	2.3
1	A	200	VAL	2.3
1	B	177	SER	2.3
1	B	413	VAL	2.3
1	B	285	ASP	2.3
1	B	288	ILE	2.3
1	A	342	SER	2.3
1	B	437	LYS	2.3
1	B	19	GLU	2.3
1	A	316	VAL	2.3
1	B	373	ILE	2.2
1	A	31	ILE	2.2
1	B	99	GLY	2.2
1	B	243	ALA	2.2
1	A	307	GLY	2.2
1	A	235	ILE	2.2
1	B	404	LEU	2.2
1	A	446	CYS	2.2
1	B	137	LEU	2.2
1	A	150	GLY	2.2
1	B	145	PHE	2.2
1	A	454	TYR	2.1
1	B	273	ALA	2.1
1	A	222	ALA	2.1

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Mol	Chain	Res	Type	RSRZ
1	B	235	ILE	2.1
1	B	316	VAL	2.1
1	B	324	ILE	2.1
1	A	236	ALA	2.1
1	A	410	ILE	2.1
1	A	29	LYS	2.1
1	A	173	ASN	2.1
1	A	287	ASN	2.1
1	B	375	ARG	2.1
1	B	353	MET	2.1
1	A	180	GLN	2.1
1	A	256	LEU	2.0
1	A	407	ILE	2.0
1	A	228	ALA	2.0
1	B	204	ASP	2.0
1	B	95	PRO	2.0
1	A	178	VAL	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](#)

There are no ligands in this entry.

6.5 Other polymers [i](#)

There are no such residues in this entry.