Full wwPDB X-ray Structure Validation Report ⓘ

Aug 15, 2023 – 06:38 PM EDT

PDB ID	:	1TJU
Title	:	Crystal Structure of T161S Duck Delta 2 Crystallin Mutant
Authors	:	Sampaleanu, L.M.; Codding, P.W.; Lobsanov, Y.D.; Tsai, M.; Smith, G.D.; Horvatin, C.; Howell, P.L.
Deposited on	:	2004-06-07
Resolution	:	2.10 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:

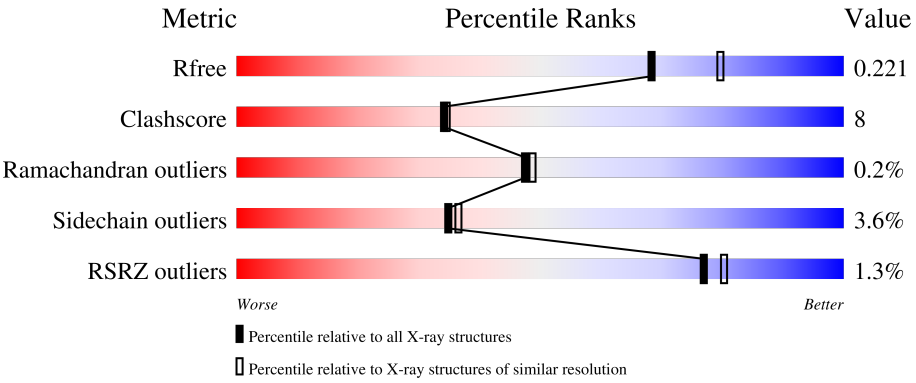
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.35
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.35

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.10 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	5197 (2.10-2.10)
Clashscore	141614	5710 (2.10-2.10)
Ramachandran outliers	138981	5647 (2.10-2.10)
Sidechain outliers	138945	5648 (2.10-2.10)
RSRZ outliers	127900	5083 (2.10-2.10)

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% 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	474	2% 76% 17% • 5%
1	B	474	% 79% 14% • 5%
1	C	474	% 77% 17% • 5%
1	D	474	76% 17% • 5%

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 14745 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 Delta crystallin II.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	448	Total	C	N	O	S	0	0	0
			3453	2187	582	672	12			
1	B	450	Total	C	N	O	S	0	0	0
			3480	2204	589	675	12			
1	C	450	Total	C	N	O	S	0	0	0
			3459	2189	586	672	12			
1	D	449	Total	C	N	O	S	0	0	0
			3460	2192	584	672	12			

There are 28 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	161	SER	THR	engineered mutation	UNP P24058
B	161	SER	THR	engineered mutation	UNP P24058
C	161	SER	THR	engineered mutation	UNP P24058
D	161	SER	THR	engineered mutation	UNP P24058
A	469	HIS	-	expression tag	UNP P24058
A	470	HIS	-	expression tag	UNP P24058
A	471	HIS	-	expression tag	UNP P24058
A	472	HIS	-	expression tag	UNP P24058
A	473	HIS	-	expression tag	UNP P24058
A	474	HIS	-	expression tag	UNP P24058
B	469	HIS	-	expression tag	UNP P24058
B	470	HIS	-	expression tag	UNP P24058
B	471	HIS	-	expression tag	UNP P24058
B	472	HIS	-	expression tag	UNP P24058
B	473	HIS	-	expression tag	UNP P24058
B	474	HIS	-	expression tag	UNP P24058
C	469	HIS	-	expression tag	UNP P24058
C	470	HIS	-	expression tag	UNP P24058
C	471	HIS	-	expression tag	UNP P24058
C	472	HIS	-	expression tag	UNP P24058
C	473	HIS	-	expression tag	UNP P24058

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Chain	Residue	Modelled	Actual	Comment	Reference
C	474	HIS	-	expression tag	UNP P24058
D	469	HIS	-	expression tag	UNP P24058
D	470	HIS	-	expression tag	UNP P24058
D	471	HIS	-	expression tag	UNP P24058
D	472	HIS	-	expression tag	UNP P24058
D	473	HIS	-	expression tag	UNP P24058
D	474	HIS	-	expression tag	UNP P24058

- Molecule 2 is water.

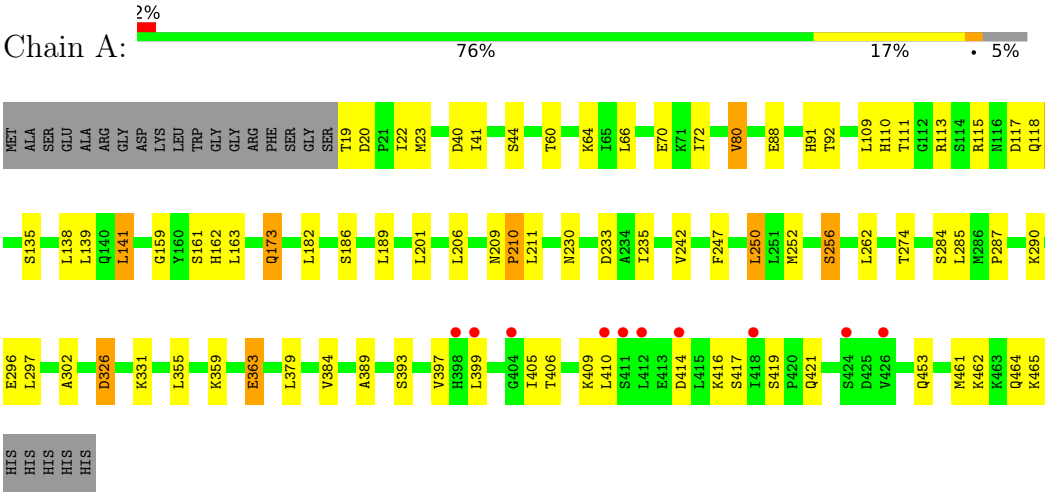
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	221	Total O 221 221	0	0
2	B	197	Total O 197 197	0	0
2	C	254	Total O 254 254	0	0
2	D	221	Total O 221 221	0	0

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.

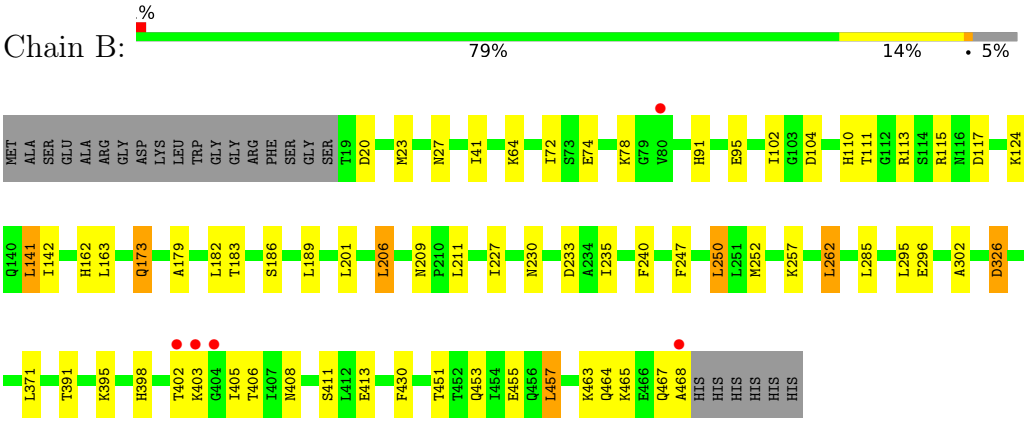
• Molecule 1: Delta crystallin II

Chain A:



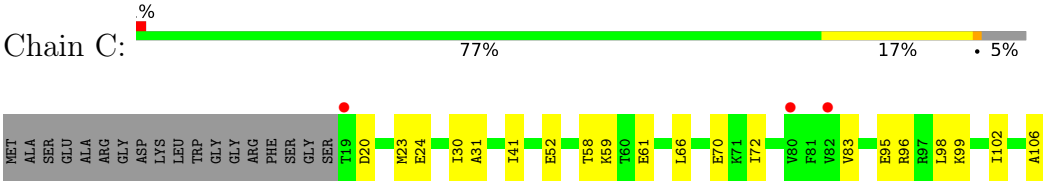
• Molecule 1: Delta crystallin II

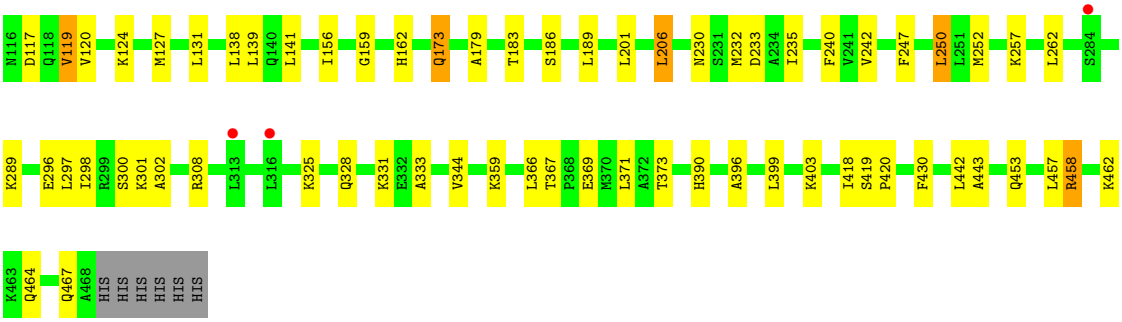
Chain B:



• Molecule 1: Delta crystallin II

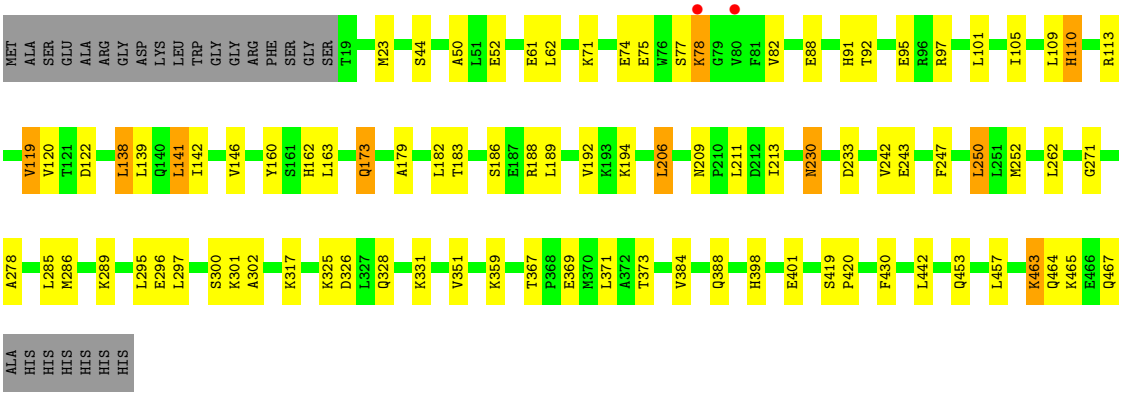
Chain C:





• Molecule 1: Delta crystallin II

Chain D:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	93.32Å 98.90Å 107.00Å 90.00° 101.53° 90.00°	Depositor
Resolution (Å)	44.70 – 2.10 44.72 – 2.00	Depositor EDS
% Data completeness (in resolution range)	95.5 (44.70-2.10) 93.2 (44.72-2.00)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.08	Depositor
$< I/\sigma(I) >$ [1]	3.60 (at 2.00Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.178 , 0.221 0.178 , 0.221	Depositor DCC
R_{free} test set	10623 reflections (8.82%)	wwPDB-VP
Wilson B-factor (Å^2)	22.3	Xtriage
Anisotropy	0.211	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.36 , 55.3	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	14745	wwPDB-VP
Average B, all atoms (Å^2)	26.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.30% of the height of the origin peak. No significant pseudotranslation is detected.*

[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

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	0.45	0/3498	0.62	1/4721 (0.0%)
1	B	0.43	0/3525	0.62	0/4755
1	C	0.43	0/3504	0.62	1/4732 (0.0%)
1	D	0.46	0/3505	0.67	3/4730 (0.1%)
All	All	0.44	0/14032	0.63	5/18938 (0.0%)

There are no bond length outliers.

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	D	160	TYR	CB-CG-CD1	8.47	126.08	121.00
1	D	160	TYR	CB-CG-CD2	-7.24	116.66	121.00
1	A	159	GLY	N-CA-C	-6.10	97.85	113.10
1	D	160	TYR	CG-CD1-CE1	-5.69	116.75	121.30
1	C	159	GLY	N-CA-C	-5.01	100.56	113.10

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	3453	0	3541	68	0
1	B	3480	0	3585	57	0
1	C	3459	0	3541	58	0
1	D	3460	0	3553	71	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	A	221	0	0	3	0
2	B	197	0	0	3	0
2	C	254	0	0	8	0
2	D	221	0	0	11	0
All	All	14745	0	14220	236	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 8.

All (236) 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:C:173:GLN:HE22	1:C:453:GLN:HE22	1.20	0.88
1:A:379:LEU:HB3	1:A:384:VAL:HG21	1.59	0.83
1:D:463:LYS:HE2	2:D:602:HOH:O	1.81	0.80
1:A:135:SER:O	1:A:139:LEU:HD23	1.81	0.80
1:B:173:GLN:HE22	1:B:453:GLN:HE22	1.29	0.80
1:A:173:GLN:HE22	1:A:453:GLN:HE22	1.29	0.79
1:D:173:GLN:HE22	1:D:453:GLN:HE22	1.29	0.79
1:B:173:GLN:HA	1:B:173:GLN:HE21	1.50	0.77
1:B:74:GLU:HG3	1:B:78:LYS:HE2	1.69	0.75
1:C:373:THR:HB	2:C:641:HOH:O	1.87	0.74
1:C:230:ASN:HD22	1:C:233:ASP:H	1.37	0.72
1:D:97:ARG:O	1:D:101:LEU:HD23	1.88	0.72
1:A:173:GLN:HA	1:A:173:GLN:HE21	1.55	0.71
1:A:110:HIS:HD2	1:A:113:ARG:HE	1.36	0.71
1:A:230:ASN:HD22	1:A:233:ASP:H	1.37	0.70
1:C:66:LEU:O	1:C:70:GLU:HG3	1.92	0.69
1:C:458:ARG:O	1:C:462:LYS:HG2	1.93	0.69
1:D:286:MET:HB3	1:D:289:LYS:HG2	1.75	0.68
1:B:209:ASN:ND2	1:B:211:LEU:H	1.91	0.68
1:A:115:ARG:HH11	1:A:118:GLN:HE22	1.41	0.68
1:B:110:HIS:HD2	1:B:113:ARG:HE	1.40	0.66
1:D:194:LYS:HE2	2:D:505:HOH:O	1.94	0.66
1:D:173:GLN:HE21	1:D:173:GLN:HA	1.59	0.66
1:B:74:GLU:CG	1:B:78:LYS:HE2	2.25	0.66
1:A:284:SER:O	1:A:287:PRO:HD3	1.96	0.66
1:A:22:ILE:HD13	2:A:624:HOH:O	1.96	0.65
1:A:384:VAL:HG23	1:A:389:ALA:HB2	1.78	0.65
1:C:52:GLU:OE1	1:C:59:LYS:HE3	1.96	0.65
1:A:141:LEU:HD13	1:A:182:LEU:HD13	1.80	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:117:ASP:HB3	1:C:235:ILE:HD11	1.81	0.63
1:B:230:ASN:HD22	1:B:233:ASP:H	1.46	0.61
1:A:110:HIS:CD2	1:A:113:ARG:HE	2.17	0.61
1:C:156:ILE:HG22	1:C:366:LEU:HD11	1.82	0.61
1:D:373:THR:HB	2:D:607:HOH:O	1.99	0.61
1:B:465:LYS:HB2	1:B:465:LYS:NZ	2.15	0.61
1:A:209:ASN:ND2	1:A:211:LEU:H	1.99	0.61
1:B:179:ALA:O	1:B:183:THR:HG23	2.01	0.61
1:A:297:LEU:HD12	1:D:23:MET:HE1	1.84	0.59
1:B:141:LEU:HD13	1:B:182:LEU:HD13	1.85	0.59
1:B:41:ILE:HD11	1:B:72:ILE:HG22	1.84	0.59
1:C:179:ALA:O	1:C:183:THR:HG23	2.03	0.59
1:D:97:ARG:CZ	1:D:101:LEU:HD21	2.32	0.59
1:D:465:LYS:O	1:D:467:GLN:HG3	2.03	0.58
1:D:61:GLU:HB3	1:D:105:ILE:HD11	1.84	0.58
1:A:379:LEU:O	1:A:384:VAL:HG22	2.03	0.58
2:B:612:HOH:O	1:D:317:LYS:HE3	2.04	0.57
1:D:82:VAL:HG13	2:D:573:HOH:O	2.04	0.57
1:D:384:VAL:CG1	1:D:388:GLN:HB2	2.34	0.57
1:D:179:ALA:O	1:D:183:THR:HG23	2.05	0.57
1:A:20:ASP:HB3	1:A:23:MET:HB2	1.87	0.57
1:D:110:HIS:HD2	1:D:113:ARG:HH21	1.52	0.57
1:D:331:LYS:HD2	2:D:618:HOH:O	2.04	0.57
1:A:297:LEU:HD12	1:D:23:MET:CE	2.35	0.57
1:C:127:MET:O	1:C:131:LEU:HD13	2.05	0.57
1:B:411:SER:OG	1:B:413:GLU:HG2	2.05	0.57
1:B:111:THR:HG22	1:B:211:LEU:HD11	1.87	0.56
1:D:359:LYS:HG3	2:D:552:HOH:O	2.04	0.56
1:A:66:LEU:O	1:A:70:GLU:HG3	2.06	0.56
1:C:296:GLU:OE1	1:D:162:HIS:HA	2.06	0.56
1:D:230:ASN:HD22	1:D:233:ASP:H	1.54	0.56
1:D:209:ASN:ND2	1:D:211:LEU:H	2.04	0.55
1:B:117:ASP:HB3	1:B:235:ILE:HD11	1.88	0.55
1:A:60:THR:HG22	1:A:64:LYS:HE2	1.88	0.55
1:A:393:SER:O	1:A:397:VAL:HG23	2.07	0.54
1:C:257:LYS:HD2	2:C:634:HOH:O	2.07	0.54
1:A:379:LEU:C	1:A:384:VAL:HG22	2.28	0.54
1:C:162:HIS:HA	1:D:296:GLU:OE1	2.08	0.54
1:B:110:HIS:CD2	1:B:113:ARG:HE	2.23	0.54
1:B:463:LYS:N	1:B:463:LYS:HD2	2.22	0.54
1:C:58:THR:HG23	1:C:61:GLU:OE2	2.08	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:367:THR:HB	1:C:369:GLU:OE1	2.06	0.54
1:C:96:ARG:HG2	1:C:96:ARG:HH11	1.73	0.54
1:C:206:LEU:C	1:C:206:LEU:HD23	2.27	0.54
1:C:189:LEU:HD23	1:C:189:LEU:C	2.28	0.54
1:A:405:ILE:HD11	1:A:410:LEU:HD23	1.90	0.53
1:A:297:LEU:HD23	2:D:675:HOH:O	2.07	0.53
1:A:274:THR:CG2	1:A:290:LYS:HD2	2.38	0.53
1:B:467:GLN:O	1:B:468:ALA:HB2	2.09	0.53
1:C:289:LYS:HE2	2:C:604:HOH:O	2.09	0.52
1:A:399:LEU:C	1:A:399:LEU:HD23	2.30	0.52
1:B:27:ASN:HD21	1:C:297:LEU:HD11	1.73	0.52
1:A:399:LEU:HD22	1:A:410:LEU:CD2	2.39	0.52
1:C:58:THR:OG1	1:C:61:GLU:HG3	2.10	0.52
1:C:442:LEU:O	1:C:443:ALA:HB3	2.09	0.52
1:D:141:LEU:HD13	1:D:182:LEU:HD13	1.91	0.52
1:C:41:ILE:HD11	1:C:72:ILE:HG22	1.90	0.52
1:D:71:LYS:O	1:D:75:GLU:HG3	2.10	0.52
1:A:115:ARG:NH1	1:A:118:GLN:HE22	2.07	0.52
1:A:416:LYS:HA	1:A:419:SER:O	2.11	0.51
1:A:359:LYS:O	1:A:363:GLU:HB2	2.11	0.51
1:D:271:GLY:HA2	2:D:579:HOH:O	2.11	0.51
1:C:230:ASN:ND2	1:C:233:ASP:H	2.07	0.51
1:C:390:HIS:CE1	1:D:285:LEU:HD13	2.46	0.51
1:B:20:ASP:HB3	1:B:23:MET:HB2	1.92	0.50
1:B:227:ILE:HD11	1:D:442:LEU:HD13	1.92	0.50
1:C:289:LYS:CE	2:C:604:HOH:O	2.59	0.50
1:A:296:GLU:OE1	1:B:162:HIS:HA	2.11	0.50
1:B:465:LYS:HB2	1:B:465:LYS:HZ2	1.76	0.50
1:D:139:LEU:HD13	1:D:465:LYS:HG2	1.93	0.50
1:D:91:HIS:O	1:D:95:GLU:HG3	2.12	0.49
1:A:111:THR:HG22	1:A:211:LEU:HD11	1.93	0.49
1:A:41:ILE:HD11	1:A:72:ILE:HG22	1.95	0.49
1:B:189:LEU:O	1:B:189:LEU:HD23	2.11	0.49
1:C:173:GLN:HA	1:C:173:GLN:HE21	1.77	0.49
1:B:326:ASP:HA	1:C:300:SER:HB3	1.95	0.49
1:D:142:ILE:O	1:D:146:VAL:HG23	2.12	0.49
1:A:44:SER:HB3	1:A:109:LEU:HD21	1.95	0.49
1:A:189:LEU:HD23	1:A:189:LEU:C	2.33	0.49
1:A:331:LYS:HD2	2:A:656:HOH:O	2.13	0.49
1:A:462:LYS:O	1:A:466:GLU:HG2	2.13	0.49
1:B:209:ASN:HD22	1:B:211:LEU:H	1.60	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:74:GLU:HA	1:D:77:SER:OG	2.13	0.49
1:A:326:ASP:HA	1:D:300:SER:HB3	1.95	0.48
1:D:189:LEU:C	1:D:189:LEU:HD23	2.33	0.48
1:D:286:MET:CE	1:D:289:LYS:HD3	2.43	0.48
1:C:124:LYS:HE2	1:C:240:PHE:CE2	2.48	0.48
1:D:192:VAL:HG22	1:D:243:GLU:HB3	1.96	0.48
1:D:286:MET:SD	1:D:289:LYS:HD3	2.54	0.48
1:C:297:LEU:O	1:C:301:LYS:HG2	2.14	0.48
1:D:97:ARG:NE	1:D:101:LEU:HD21	2.29	0.48
1:B:331:LYS:HE2	2:B:567:HOH:O	2.13	0.48
1:B:371:LEU:HD13	1:B:430:PHE:HA	1.95	0.48
1:C:396:ALA:HA	1:C:418:ILE:CD1	2.43	0.48
1:A:60:THR:CG2	1:A:64:LYS:HE2	2.44	0.47
1:D:367:THR:OG1	1:D:369:GLU:HG2	2.14	0.47
1:B:27:ASN:ND2	1:C:297:LEU:HD11	2.29	0.47
1:C:298:ILE:HG12	1:C:344:VAL:HG13	1.95	0.47
1:B:135:SER:O	1:B:139:LEU:HD23	2.15	0.47
1:C:124:LYS:HE2	1:C:240:PHE:CD2	2.50	0.47
1:D:186:SER:OG	1:D:464:GLN:NE2	2.48	0.47
1:B:173:GLN:HA	1:B:173:GLN:NE2	2.25	0.47
1:D:384:VAL:HG12	1:D:388:GLN:HB2	1.96	0.47
1:A:162:HIS:HA	1:B:296:GLU:OE1	2.15	0.47
1:B:142:ILE:HD13	1:B:183:THR:HG22	1.96	0.47
1:D:297:LEU:O	1:D:301:LYS:HG2	2.15	0.47
1:A:22:ILE:HD12	1:A:22:ILE:N	2.30	0.46
1:A:173:GLN:HA	1:A:173:GLN:NE2	2.25	0.46
1:A:189:LEU:HD23	1:A:189:LEU:O	2.15	0.46
1:A:117:ASP:HB3	1:A:235:ILE:HD11	1.97	0.46
1:B:398:HIS:O	1:B:402:THR:HG23	2.15	0.46
1:B:252:MET:HB3	1:B:302:ALA:HA	1.98	0.46
1:C:102:ILE:HD11	1:C:106:ALA:HB2	1.96	0.46
1:B:124:LYS:HE2	1:B:240:PHE:CE2	2.50	0.46
1:C:230:ASN:HD21	1:C:232:MET:HB2	1.81	0.46
1:C:186:SER:OG	1:C:464:GLN:NE2	2.48	0.46
1:C:325:LYS:HD2	1:C:328:GLN:OE1	2.16	0.46
1:D:119:VAL:CG1	1:D:120:VAL:N	2.79	0.46
1:A:465:LYS:HE2	2:A:638:HOH:O	2.16	0.45
1:B:206:LEU:C	1:B:206:LEU:HD23	2.37	0.45
1:B:250:LEU:HG	1:D:242:VAL:HG11	1.98	0.45
1:B:355:LEU:HD12	1:B:355:LEU:C	2.36	0.45
1:D:50:ALA:HB1	1:D:213:ILE:HD11	1.99	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:399:LEU:HD11	1:C:403:LYS:HE2	1.97	0.45
1:D:50:ALA:CB	1:D:213:ILE:HD11	2.47	0.45
1:D:52:GLU:HG3	1:D:62:LEU:HD22	1.99	0.45
1:D:91:HIS:HE1	1:D:122:ASP:OD2	2.00	0.45
1:C:189:LEU:HD23	1:C:189:LEU:O	2.17	0.45
1:B:189:LEU:HD23	1:B:189:LEU:C	2.38	0.45
1:A:250:LEU:HG	1:C:242:VAL:HG11	1.99	0.45
1:D:163:LEU:HD12	1:D:163:LEU:HA	1.81	0.45
1:A:115:ARG:HH11	1:A:118:GLN:NE2	2.12	0.44
1:A:119:VAL:CG1	1:A:120:VAL:N	2.80	0.44
1:A:384:VAL:CG1	1:A:421:GLN:HG2	2.47	0.44
1:A:40:ASP:OD1	1:A:91:HIS:HD2	2.00	0.44
1:B:468:ALA:HA	2:B:629:HOH:O	2.16	0.44
1:D:325:LYS:HD2	1:D:328:GLN:CD	2.37	0.44
1:D:398:HIS:O	1:D:401:GLU:HB3	2.18	0.44
1:D:289:LYS:HG3	2:D:563:HOH:O	2.16	0.44
1:B:451:THR:O	1:B:455:GLU:HG3	2.17	0.44
1:A:88:GLU:OE2	1:A:92:THR:HG21	2.18	0.44
1:D:88:GLU:OE1	1:D:92:THR:HG21	2.18	0.44
1:A:80:VAL:O	1:A:80:VAL:CG1	2.65	0.44
1:A:355:LEU:C	1:A:355:LEU:HD12	2.38	0.44
1:B:411:SER:HB2	1:B:413:GLU:OE1	2.18	0.44
1:D:173:GLN:HA	1:D:173:GLN:NE2	2.31	0.44
1:B:163:LEU:HD12	1:B:163:LEU:HA	1.87	0.44
1:B:403:LYS:O	1:B:405:ILE:HG23	2.17	0.44
1:D:206:LEU:C	1:D:206:LEU:HD23	2.38	0.44
1:A:186:SER:OG	1:A:464:GLN:NE2	2.51	0.43
1:B:257:LYS:HD2	2:D:616:HOH:O	2.18	0.43
1:A:414:ASP:O	1:A:417:SER:OG	2.33	0.43
1:B:95:GLU:CD	1:B:115:ARG:HH12	2.21	0.43
1:C:98:LEU:O	1:C:102:ILE:HG12	2.18	0.43
1:B:391:THR:O	1:B:395:LYS:HG2	2.18	0.43
1:D:74:GLU:O	1:D:78:LYS:HB2	2.18	0.43
1:A:399:LEU:HD22	1:A:410:LEU:HD22	2.00	0.43
1:A:461:MET:O	1:A:465:LYS:HB2	2.19	0.43
1:D:44:SER:HB3	1:D:109:LEU:HD21	2.01	0.43
1:D:189:LEU:HD23	1:D:189:LEU:O	2.19	0.43
1:D:325:LYS:O	1:D:328:GLN:HG3	2.18	0.43
1:D:369:GLU:HB3	2:D:543:HOH:O	2.19	0.43
1:D:465:LYS:C	1:D:467:GLN:N	2.72	0.43
1:A:141:LEU:HD13	1:A:182:LEU:CD1	2.48	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:406:THR:OG1	1:B:408:ASN:ND2	2.52	0.42
1:D:419:SER:HA	1:D:420:PRO:HD3	1.85	0.42
1:B:124:LYS:HE2	1:B:240:PHE:CD2	2.54	0.42
1:B:413:GLU:CD	1:B:413:GLU:H	2.23	0.42
1:C:371:LEU:HD13	1:C:430:PHE:HA	2.00	0.42
1:D:371:LEU:HD13	1:D:430:PHE:HA	2.01	0.42
1:A:252:MET:O	1:A:256:SER:HB2	2.20	0.42
1:B:262:LEU:HB3	1:B:295:LEU:CD1	2.50	0.42
1:A:20:ASP:O	1:A:23:MET:HB2	2.20	0.42
1:A:210:PRO:HG2	1:A:211:LEU:HG	2.02	0.42
1:A:252:MET:HB3	1:A:302:ALA:HA	2.02	0.42
1:C:96:ARG:HG2	1:C:96:ARG:NH1	2.35	0.42
1:C:173:GLN:NE2	1:C:453:GLN:HE22	2.02	0.42
1:D:252:MET:HB3	1:D:302:ALA:HA	2.02	0.42
1:A:293:ASP:HB2	1:D:325:LYS:HE2	2.01	0.41
1:B:91:HIS:O	1:B:95:GLU:HG2	2.20	0.41
1:C:20:ASP:O	1:C:24:GLU:HG3	2.20	0.41
1:C:31:ALA:CB	2:C:633:HOH:O	2.67	0.41
1:A:294:SER:HA	1:D:23:MET:HE1	2.02	0.41
1:C:20:ASP:HB3	1:C:23:MET:HB2	2.02	0.41
1:A:406:THR:OG1	1:A:409:LYS:HG2	2.20	0.41
1:B:27:ASN:HD22	1:B:27:ASN:HA	1.61	0.41
1:B:364:LYS:HE3	1:B:364:LYS:HB2	1.71	0.41
1:C:119:VAL:CG1	1:C:120:VAL:N	2.83	0.41
1:D:295:LEU:HD21	1:D:351:VAL:HG11	2.02	0.41
1:C:252:MET:HB3	1:C:302:ALA:HA	2.03	0.41
1:A:379:LEU:HB3	1:A:384:VAL:CG2	2.41	0.41
1:C:308:ARG:HD2	1:C:333:ALA:HA	2.02	0.41
1:D:138:LEU:HD13	1:D:186:SER:HB2	2.02	0.41
1:D:317:LYS:HD3	1:D:317:LYS:C	2.41	0.41
1:A:163:LEU:HD12	1:A:163:LEU:HA	1.78	0.41
1:A:242:VAL:HG11	1:C:250:LEU:HG	2.02	0.41
1:A:19:THR:HA	1:D:278:ALA:HA	2.03	0.41
1:C:30:ILE:HG12	1:C:83:VAL:HG11	2.02	0.41
1:C:419:SER:HA	1:C:420:PRO:HD3	1.87	0.41
1:C:359:LYS:HG3	2:C:638:HOH:O	2.21	0.41
1:D:188:ARG:NH2	1:D:250:LEU:HD13	2.36	0.40
1:B:64:LYS:HE3	1:B:102:ILE:HB	2.03	0.40
1:C:328:GLN:HG3	2:C:622:HOH:O	2.20	0.40
1:C:369:GLU:CD	1:C:369:GLU:H	2.24	0.40
1:B:457:LEU:HD12	1:B:457:LEU:HA	1.95	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:186:SER:OG	1:B:464:GLN:NE2	2.54	0.40
1:C:331:LYS:CE	2:C:622:HOH:O	2.69	0.40

There are no symmetry-related clashes.

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	446/474 (94%)	435 (98%)	10 (2%)	1 (0%)	47	49
1	B	448/474 (94%)	439 (98%)	8 (2%)	1 (0%)	47	49
1	C	448/474 (94%)	438 (98%)	9 (2%)	1 (0%)	47	49
1	D	447/474 (94%)	436 (98%)	10 (2%)	1 (0%)	47	49
All	All	1789/1896 (94%)	1748 (98%)	37 (2%)	4 (0%)	47	49

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	206	LEU
1	C	206	LEU
1	A	206	LEU
1	D	206	LEU

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	385/411 (94%)	369 (96%)	16 (4%)	30	30
1	B	389/411 (95%)	378 (97%)	11 (3%)	43	47
1	C	384/411 (93%)	368 (96%)	16 (4%)	30	30
1	D	386/411 (94%)	373 (97%)	13 (3%)	37	39
All	All	1544/1644 (94%)	1488 (96%)	56 (4%)	35	36

All (56) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	80	VAL
1	A	119	VAL
1	A	131	LEU
1	A	138	LEU
1	A	141	LEU
1	A	161	SER
1	A	173	GLN
1	A	201	LEU
1	A	210	PRO
1	A	247	PHE
1	A	250	LEU
1	A	256	SER
1	A	262	LEU
1	A	285	LEU
1	A	326	ASP
1	A	363	GLU
1	B	104	ASP
1	B	138	LEU
1	B	141	LEU
1	B	173	GLN
1	B	201	LEU
1	B	247	PHE
1	B	250	LEU
1	B	262	LEU
1	B	285	LEU
1	B	326	ASP
1	B	457	LEU
1	C	95	GLU
1	C	99	LYS
1	C	110	HIS
1	C	115	ARG
1	C	119	VAL
1	C	138	LEU

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Mol	Chain	Res	Type
1	C	139	LEU
1	C	141	LEU
1	C	173	GLN
1	C	201	LEU
1	C	247	PHE
1	C	250	LEU
1	C	262	LEU
1	C	457	LEU
1	C	458	ARG
1	C	467	GLN
1	D	78	LYS
1	D	110	HIS
1	D	119	VAL
1	D	138	LEU
1	D	141	LEU
1	D	173	GLN
1	D	230	ASN
1	D	247	PHE
1	D	250	LEU
1	D	262	LEU
1	D	326	ASP
1	D	457	LEU
1	D	463	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (30) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	91	HIS
1	A	110	HIS
1	A	118	GLN
1	A	173	GLN
1	A	209	ASN
1	A	230	ASN
1	A	388	GLN
1	A	464	GLN
1	B	27	ASN
1	B	42	GLN
1	B	110	HIS
1	B	173	GLN
1	B	209	ASN
1	B	230	ASN
1	B	408	ASN

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Mol	Chain	Res	Type
1	B	428	GLN
1	B	464	GLN
1	C	42	GLN
1	C	116	ASN
1	C	118	GLN
1	C	173	GLN
1	C	230	ASN
1	C	428	GLN
1	C	464	GLN
1	D	110	HIS
1	D	173	GLN
1	D	209	ASN
1	D	230	ASN
1	D	428	GLN
1	D	464	GLN

5.3.3 RNA

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates

There are no monosaccharides in this entry.

5.6 Ligand geometry

There are no ligands in this entry.

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

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, 95^{th} 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	448/474 (94%)	-0.17	10 (2%) 62 66	10, 22, 49, 61	0
1	B	450/474 (94%)	-0.22	5 (1%) 80 84	11, 25, 43, 63	0
1	C	450/474 (94%)	-0.15	6 (1%) 77 80	11, 22, 52, 59	0
1	D	449/474 (94%)	-0.34	2 (0%) 92 93	12, 24, 41, 55	0
All	All	1797/1896 (94%)	-0.22	23 (1%) 77 80	10, 23, 47, 63	0

All (23) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	80	VAL	4.1
1	D	80	VAL	4.0
1	A	404	GLY	3.5
1	C	19	THR	3.0
1	A	412	LEU	2.9
1	A	414	ASP	2.7
1	C	82	VAL	2.7
1	B	468	ALA	2.7
1	A	424	SER	2.6
1	A	426	VAL	2.6
1	B	404	GLY	2.6
1	D	78	LYS	2.6
1	A	399	LEU	2.6
1	B	402	THR	2.5
1	A	410	LEU	2.4
1	A	411	SER	2.4
1	B	80	VAL	2.3
1	A	398	HIS	2.3
1	C	316	LEU	2.3
1	C	284	SER	2.2
1	C	313	LEU	2.2

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Mol	Chain	Res	Type	RSRZ
1	A	418	ILE	2.1
1	B	403	LYS	2.1

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

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

6.3 Carbohydrates (i)

There are no monosaccharides 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.