



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 14, 2026 – 12:27 PM UTC

PDB ID : 1DBZ / pdb_00001dbz
Title : C153S MUTANT OF PEA FRUCTOSE-1,6-BISPHOSPHATASE
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Deposited on : 1999-11-03
Resolution : 2.65 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) : **NOT EXECUTED**
EDS : **NOT EXECUTED**
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

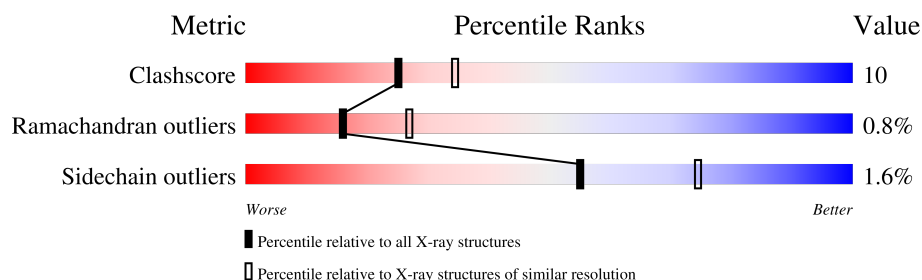
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.65 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))
Clashscore	190562	1141 (2.66-2.66)
Ramachandran outliers	187476	1126 (2.66-2.66)
Sidechain outliers	187428	1126 (2.66-2.66)

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 $\leq 5\%$.

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	357	
1	B	357	
1	C	357	
1	D	357	

2 Entry composition

There is only 1 type of molecule in this entry. The entry contains 9686 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 FRUCTOSE-1,6-BISPHOSPHATASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	317	Total	C	N	O	S	0	0	0
			2412	1537	398	469	8			
1	B	326	Total	C	N	O	S	0	0	0
			2454	1562	403	480	9			
1	C	323	Total	C	N	O	S	0	0	0
			2429	1546	399	476	8			
1	D	320	Total	C	N	O	S	0	0	0
			2391	1523	388	472	8			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	153	SER	CYS	engineered mutation	UNP P46275
B	153	SER	CYS	engineered mutation	UNP P46275
C	153	SER	CYS	engineered mutation	UNP P46275
D	153	SER	CYS	engineered mutation	UNP P46275

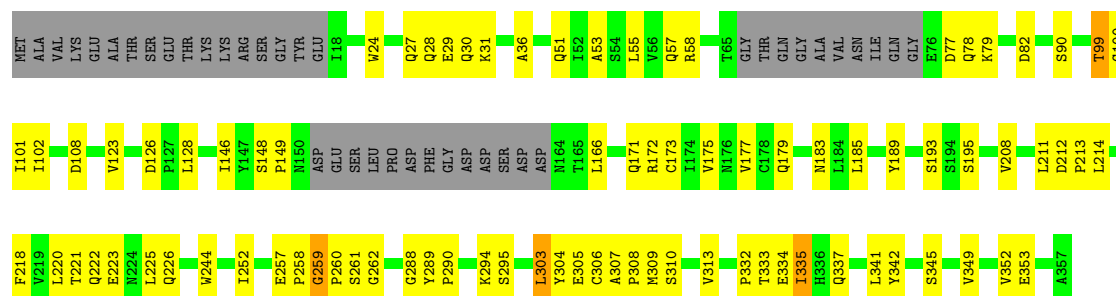
3 Residue-property plots

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

Note EDS was not executed.

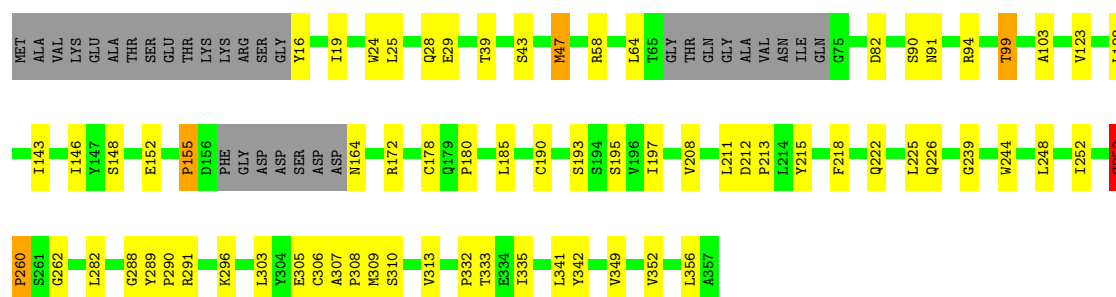
• Molecule 1: FRUCTOSE-1,6-BISPHOSPHATASE

Chain A: 



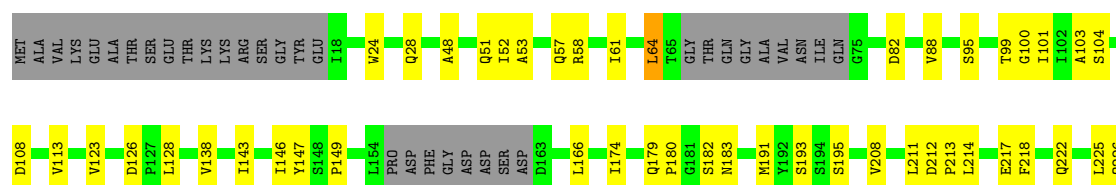
• Molecule 1: FRUCTOSE-1,6-BISPHOSPHATASE

Chain B: 



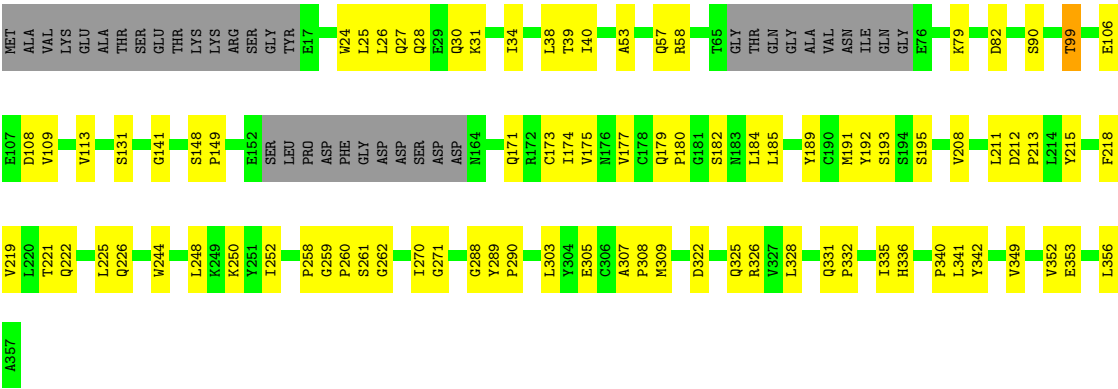
• Molecule 1: FRUCTOSE-1,6-BISPHOSPHATASE

Chain C: 





● Molecule 1: FRUCTOSE-1,6-BISPHOSPHATASE



4 Data and refinement statistics

Xtriage (Phenix) and EDS were not executed - this section is therefore incomplete.

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	78.90Å 114.50Å 94.50Å 90.00° 114.50° 90.00°	Depositor
Resolution (Å)	10.00 – 2.65	Depositor
% Data completeness (in resolution range)	(Not available) (10.00-2.65)	Depositor
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
Refinement program	X-PLOR 3.851	Depositor
R, R_{free}	0.235 , 0.291	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	9686	wwPDB-VP
Average B, all atoms (Å ²)	41.0	wwPDB-VP

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	0.61	0/2454	1.05	15/3323 (0.5%)
1	B	0.64	0/2498	1.06	13/3389 (0.4%)
1	C	0.61	0/2471	1.05	15/3351 (0.4%)
1	D	0.55	0/2433	1.04	10/3305 (0.3%)
All	All	0.60	0/9856	1.05	53/13368 (0.4%)

There are no bond length outliers.

All (53) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	335	ILE	N-CA-C	8.84	119.42	110.23
1	B	259	GLY	CA-C-N	8.07	129.93	119.84
1	B	259	GLY	C-N-CA	8.07	129.93	119.84
1	B	152	GLU	N-CA-C	7.57	121.59	109.86
1	C	103	ALA	N-CA-C	7.46	119.94	110.24
1	B	289	TYR	CA-C-N	6.98	126.92	120.21
1	B	289	TYR	C-N-CA	6.98	126.92	120.21
1	C	179	GLN	CA-C-N	6.86	128.41	119.84
1	C	179	GLN	C-N-CA	6.86	128.41	119.84
1	A	260	PRO	N-CA-CB	6.84	110.43	103.25
1	C	289	TYR	CA-C-N	6.70	126.65	120.21
1	C	289	TYR	C-N-CA	6.70	126.65	120.21
1	A	334	GLU	N-CA-C	-6.63	98.29	108.76
1	C	149	PRO	N-CA-CB	6.62	109.23	103.27
1	D	149	PRO	N-CA-CB	6.59	109.09	103.35
1	D	260	PRO	N-CA-CB	6.49	110.07	103.25
1	B	155	PRO	N-CA-CB	6.49	110.06	103.25
1	D	289	TYR	CA-C-N	6.48	126.43	120.21
1	D	289	TYR	C-N-CA	6.48	126.43	120.21
1	A	303	LEU	N-CA-C	6.39	118.33	111.36
1	A	149	PRO	N-CA-CB	6.28	108.89	103.36
1	D	212	ASP	CA-C-N	6.24	125.97	119.05
1	D	212	ASP	C-N-CA	6.24	125.97	119.05

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	289	TYR	CA-C-N	5.97	125.94	120.21
1	A	289	TYR	C-N-CA	5.97	125.94	120.21
1	A	212	ASP	CA-C-N	5.97	125.68	119.05
1	A	212	ASP	C-N-CA	5.97	125.68	119.05
1	B	306	CYS	N-CA-C	5.93	117.75	111.28
1	D	271	GLY	N-CA-C	-5.89	107.47	114.48
1	C	303	LEU	N-CA-C	5.86	117.66	111.28
1	B	239	GLY	N-CA-C	-5.76	107.19	114.16
1	B	335	ILE	N-CA-C	5.72	118.19	111.05
1	A	126	ASP	CA-C-N	5.67	126.92	119.84
1	A	126	ASP	C-N-CA	5.67	126.92	119.84
1	D	182	SER	N-CA-C	5.66	120.19	113.12
1	B	212	ASP	CA-C-N	5.63	124.83	118.97
1	B	212	ASP	C-N-CA	5.63	124.83	118.97
1	B	103	ALA	N-CA-C	5.63	117.55	110.24
1	C	212	ASP	CA-C-N	5.62	125.29	119.05
1	C	212	ASP	C-N-CA	5.62	125.29	119.05
1	C	182	SER	N-CA-C	5.51	119.55	111.34
1	C	271	GLY	N-CA-C	-5.50	107.93	114.48
1	A	306	CYS	N-CA-C	5.49	117.27	111.28
1	A	179	GLN	CA-C-N	5.37	126.55	119.84
1	A	179	GLN	C-N-CA	5.37	126.55	119.84
1	D	325	GLN	N-CA-C	5.34	117.09	109.14
1	C	306	CYS	N-CA-C	5.28	117.03	111.28
1	A	333	THR	N-CA-C	-5.14	105.36	113.02
1	B	47	MET	N-CA-C	-5.07	105.67	111.14
1	C	126	ASP	CA-C-N	5.07	126.17	119.84
1	C	126	ASP	C-N-CA	5.07	126.17	119.84
1	A	262	GLY	N-CA-C	-5.06	106.08	114.48
1	D	303	LEU	N-CA-C	5.06	116.87	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	2412	0	2362	67	0
1	B	2454	0	2374	45	0
1	C	2429	0	2356	47	0
1	D	2391	0	2283	49	0
All	All	9686	0	9375	185	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 10.

All (185) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:175:VAL:HG22	1:A:335:ILE:HG23	1.37	1.04
1:A:214:LEU:HD22	1:C:214:LEU:HD22	1.58	0.85
1:A:304:TYR:OH	1:A:335:ILE:HB	1.78	0.84
1:A:171:GLN:HB3	1:A:335:ILE:HD11	1.61	0.83
1:A:100:GLY:HA3	1:A:166:LEU:HD21	1.65	0.78
1:D:171:GLN:HB3	1:D:335:ILE:HG12	1.67	0.75
1:D:290:PRO:HB3	1:D:342:TYR:OH	1.87	0.74
1:A:36:ALA:HB3	1:D:30:GLN:HE21	1.53	0.72
1:C:296:LYS:HD2	1:C:296:LYS:H	1.54	0.71
1:A:213:PRO:HD2	1:B:58:ARG:HG2	1.73	0.70
1:A:148:SER:HB2	1:A:185:LEU:HD11	1.75	0.69
1:A:58:ARG:HG2	1:B:213:PRO:HD2	1.74	0.69
1:B:291:ARG:HD2	1:B:296:LYS:O	1.95	0.66
1:C:58:ARG:HG2	1:D:213:PRO:HD2	1.77	0.65
1:D:288:GLY:HA2	1:D:341:LEU:O	1.98	0.64
1:D:171:GLN:O	1:D:175:VAL:HG23	1.98	0.64
1:D:175:VAL:HG21	1:D:335:ILE:HG13	1.81	0.63
1:B:290:PRO:HB3	1:B:342:TYR:OH	1.99	0.63
1:A:27:GLN:O	1:A:31:LYS:HG3	2.00	0.62
1:D:148:SER:HB2	1:D:185:LEU:HD11	1.80	0.61
1:C:211:LEU:HB2	1:C:218:PHE:CE1	2.36	0.61
1:D:352:VAL:O	1:D:356:LEU:HG	2.01	0.60
1:B:303:LEU:HD13	1:B:332:PRO:HG2	1.84	0.60
1:A:307:ALA:HB3	1:A:308:PRO:HD3	1.86	0.58
1:A:290:PRO:HB3	1:A:342:TYR:OH	2.03	0.58
1:C:290:PRO:HB3	1:C:342:TYR:OH	2.04	0.57
1:B:24:TRP:O	1:B:28:GLN:HG2	2.04	0.57
1:A:102:ILE:HD13	1:A:335:ILE:HD12	1.86	0.57
1:C:288:GLY:HA2	1:C:341:LEU:O	2.03	0.57
1:D:349:VAL:O	1:D:352:VAL:HG12	2.05	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:326:ARG:NH1	1:D:328:LEU:HB2	2.20	0.57
1:B:16:TYR:N	1:C:95:SER:HB3	2.19	0.57
1:D:79:LYS:HG2	1:D:131:SER:HB2	1.87	0.57
1:C:100:GLY:HA3	1:C:166:LEU:HD21	1.85	0.56
1:D:26:LEU:O	1:D:30:GLN:HG3	2.05	0.56
1:D:24:TRP:O	1:D:28:GLN:HG2	2.04	0.56
1:C:53:ALA:O	1:C:57:GLN:HG3	2.06	0.56
1:B:215:TYR:CE2	1:C:51:GLN:HG2	2.40	0.56
1:B:43:SER:O	1:B:47:MET:HG2	2.06	0.56
1:C:147:TYR:HA	1:C:183:ASN:O	2.06	0.55
1:D:25:LEU:HB3	1:D:39:THR:HG23	1.88	0.55
1:A:221:THR:HG22	1:B:64:LEU:HD11	1.87	0.55
1:B:288:GLY:HA2	1:B:341:LEU:O	2.06	0.55
1:A:58:ARG:HG2	1:B:213:PRO:CD	2.35	0.55
1:B:178:CYS:O	1:B:180:PRO:HD3	2.07	0.55
1:A:349:VAL:O	1:A:353:GLU:HG3	2.08	0.54
1:A:53:ALA:O	1:A:57:GLN:HG3	2.06	0.54
1:C:51:GLN:HB2	1:C:88:VAL:HG11	1.90	0.54
1:C:82:ASP:OD2	1:C:128:LEU:HD12	2.07	0.54
1:A:213:PRO:CD	1:B:58:ARG:HG2	2.37	0.54
1:D:208:VAL:HG21	1:D:225:LEU:HD12	1.90	0.54
1:A:171:GLN:HB3	1:A:335:ILE:CD1	2.36	0.53
1:C:208:VAL:HB	1:C:222:GLN:HB3	1.90	0.53
1:A:36:ALA:HB3	1:D:30:GLN:NE2	2.21	0.53
1:A:77:ASP:C	1:A:79:LYS:H	2.16	0.53
1:A:101:ILE:N	1:A:166:LEU:HG	2.22	0.53
1:A:51:GLN:HG2	1:D:215:TYR:CZ	2.43	0.53
1:D:349:VAL:O	1:D:353:GLU:HG3	2.09	0.53
1:B:91:ASN:O	1:B:94:ARG:HB2	2.09	0.53
1:D:322:ASP:HA	1:D:340:PRO:O	2.10	0.52
1:C:307:ALA:HB3	1:C:308:PRO:HD3	1.92	0.52
1:B:215:TYR:CZ	1:C:51:GLN:HG2	2.45	0.52
1:B:193:SER:C	1:B:195:SER:H	2.16	0.51
1:D:307:ALA:HB3	1:D:308:PRO:HD3	1.92	0.51
1:B:16:TYR:N	1:B:19:ILE:HD11	2.25	0.51
1:B:90:SER:HA	1:B:99:THR:HG21	1.91	0.51
1:A:90:SER:HA	1:A:99:THR:HG21	1.93	0.51
1:D:82:ASP:CG	1:D:109:VAL:HG13	2.36	0.51
1:A:172:ARG:HH11	1:A:172:ARG:HG2	1.76	0.51
1:D:90:SER:HA	1:D:99:THR:HG21	1.92	0.51
1:D:225:LEU:HD23	1:D:226:GLN:N	2.27	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:24:TRP:O	1:A:28:GLN:HG2	2.11	0.50
1:A:30:GLN:NE2	1:D:40:ILE:HD12	2.26	0.50
1:A:332:PRO:HA	1:A:337:GLN:OE1	2.11	0.50
1:A:208:VAL:HG21	1:A:225:LEU:HD12	1.94	0.50
1:C:208:VAL:HG21	1:C:225:LEU:HD12	1.94	0.49
1:B:260:PRO:C	1:B:262:GLY:H	2.20	0.49
1:A:349:VAL:O	1:A:352:VAL:HG12	2.12	0.49
1:A:148:SER:HB2	1:A:185:LEU:CD1	2.42	0.49
1:D:211:LEU:HB2	1:D:218:PHE:CE1	2.47	0.49
1:A:244:TRP:CZ3	1:A:252:ILE:HG13	2.48	0.49
1:A:288:GLY:HA2	1:A:341:LEU:O	2.13	0.49
1:D:244:TRP:CZ3	1:D:252:ILE:HG13	2.48	0.49
1:A:78:GLN:O	1:A:78:GLN:HG3	2.13	0.48
1:B:29:GLU:O	1:B:29:GLU:HG2	2.12	0.48
1:B:208:VAL:HG21	1:B:225:LEU:HD12	1.94	0.48
1:A:225:LEU:HD23	1:A:226:GLN:N	2.28	0.48
1:A:213:PRO:HD2	1:B:58:ARG:CG	2.42	0.48
1:D:208:VAL:HB	1:D:222:GLN:HB3	1.95	0.48
1:C:225:LEU:HD23	1:C:226:GLN:N	2.27	0.48
1:C:123:VAL:HG22	1:C:146:ILE:HG12	1.96	0.47
1:A:303:LEU:CD2	1:A:335:ILE:HG22	2.44	0.47
1:D:335:ILE:HG22	1:D:336:HIS:ND1	2.29	0.47
1:A:189:TYR:CD1	1:A:309:MET:HE1	2.50	0.47
1:A:58:ARG:CG	1:B:213:PRO:HD2	2.43	0.47
1:B:208:VAL:HB	1:B:222:GLN:HB3	1.96	0.47
1:B:211:LEU:HB2	1:B:218:PHE:CE1	2.49	0.47
1:B:225:LEU:HD23	1:B:226:GLN:N	2.28	0.47
1:C:58:ARG:HG2	1:D:213:PRO:CD	2.44	0.47
1:D:53:ALA:O	1:D:57:GLN:HG3	2.15	0.47
1:C:143:ILE:HG23	1:C:309:MET:HE3	1.97	0.47
1:C:251:TYR:HA	1:C:355:TYR:CE2	2.50	0.47
1:B:193:SER:C	1:B:195:SER:N	2.68	0.47
1:A:193:SER:C	1:A:195:SER:N	2.72	0.46
1:C:213:PRO:HD2	1:D:58:ARG:HG2	1.96	0.46
1:A:211:LEU:HB2	1:A:218:PHE:CE1	2.51	0.46
1:C:48:ALA:O	1:C:52:ILE:HG13	2.16	0.46
1:D:141:GLY:HA2	1:D:192:TYR:CD2	2.50	0.46
1:C:24:TRP:O	1:C:28:GLN:HG2	2.14	0.46
1:D:191:MET:HE3	1:D:193:SER:OG	2.16	0.46
1:B:190:CYS:HA	1:B:197:ILE:O	2.16	0.46
1:A:259:GLY:C	1:A:261:SER:N	2.73	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:293:LYS:O	1:C:296:LYS:HE2	2.16	0.46
1:C:309:MET:HA	1:C:309:MET:HE2	1.98	0.46
1:A:214:LEU:CD2	1:C:214:LEU:HD22	2.40	0.46
1:C:58:ARG:CG	1:D:213:PRO:HD2	2.44	0.46
1:A:244:TRP:HZ3	1:A:252:ILE:HG13	1.80	0.45
1:C:349:VAL:O	1:C:352:VAL:HG12	2.16	0.45
1:A:193:SER:C	1:A:195:SER:H	2.23	0.45
1:C:61:ILE:O	1:C:64:LEU:HB2	2.16	0.45
1:B:248:LEU:HD21	1:B:290:PRO:HG3	1.99	0.45
1:C:225:LEU:HD11	1:C:282:LEU:HD23	1.99	0.45
1:C:296:LYS:HD2	1:C:296:LYS:N	2.29	0.45
1:B:349:VAL:O	1:B:352:VAL:HG12	2.18	0.44
1:D:193:SER:C	1:D:195:SER:H	2.24	0.44
1:A:101:ILE:H	1:A:166:LEU:HG	1.82	0.44
1:D:193:SER:C	1:D:195:SER:N	2.76	0.44
1:A:259:GLY:C	1:A:261:SER:H	2.25	0.44
1:A:309:MET:HA	1:A:309:MET:HE2	1.98	0.43
1:A:294:LYS:HA	1:A:294:LYS:HD3	1.92	0.43
1:B:244:TRP:HZ3	1:B:252:ILE:HG13	1.83	0.43
1:B:244:TRP:CZ3	1:B:252:ILE:HG13	2.53	0.43
1:C:291:ARG:HD2	1:C:296:LYS:O	2.17	0.43
1:A:175:VAL:HG13	1:A:332:PRO:HB2	2.00	0.43
1:C:193:SER:C	1:C:195:SER:N	2.76	0.43
1:B:25:LEU:HB3	1:B:39:THR:HG23	2.00	0.43
1:D:106:GLU:C	1:D:108:ASP:H	2.27	0.43
1:D:113:VAL:HG11	1:D:174:ILE:HD13	2.01	0.43
1:C:244:TRP:CZ3	1:C:252:ILE:HG13	2.54	0.43
1:D:173:CYS:O	1:D:177:VAL:HG23	2.18	0.43
1:B:143:ILE:HG23	1:B:309:MET:HE3	2.01	0.43
1:B:225:LEU:HD11	1:B:282:LEU:HD23	2.01	0.43
1:B:148:SER:HB2	1:B:185:LEU:HD11	2.01	0.43
1:B:260:PRO:C	1:B:262:GLY:N	2.77	0.43
1:A:214:LEU:HD22	1:C:214:LEU:HB3	2.00	0.42
1:A:335:ILE:C	1:A:337:GLN:H	2.26	0.42
1:A:214:LEU:HB3	1:C:214:LEU:HD22	2.02	0.42
1:A:220:LEU:HD21	1:A:223:GLU:HG2	2.00	0.42
1:D:189:TYR:CD1	1:D:309:MET:HE1	2.55	0.42
1:A:345:SER:O	1:A:349:VAL:HG23	2.19	0.42
1:C:113:VAL:HG11	1:C:174:ILE:HD13	2.01	0.42
1:D:331:GLN:HA	1:D:332:PRO:HD3	1.93	0.42
1:D:219:VAL:O	1:D:221:THR:HG23	2.20	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:123:VAL:HG22	1:B:146:ILE:HG12	2.01	0.42
1:C:193:SER:C	1:C:195:SER:H	2.26	0.42
1:D:34:ILE:HG22	1:D:38:LEU:HD23	2.02	0.42
1:B:307:ALA:HB3	1:B:308:PRO:HD3	2.01	0.42
1:A:259:GLY:O	1:A:261:SER:N	2.53	0.41
1:A:173:CYS:O	1:A:177:VAL:HG23	2.20	0.41
1:A:208:VAL:HB	1:A:222:GLN:HB3	2.01	0.41
1:A:208:VAL:CG2	1:A:225:LEU:HD12	2.49	0.41
1:A:257:GLU:HA	1:A:258:PRO:HD2	1.95	0.41
1:B:310:SER:O	1:B:313:VAL:HG12	2.20	0.41
1:C:101:ILE:N	1:C:166:LEU:HG	2.35	0.41
1:C:227:ILE:HG22	1:C:316:ALA:O	2.20	0.41
1:D:248:LEU:HD21	1:D:290:PRO:HG3	2.02	0.41
1:A:51:GLN:O	1:A:55:LEU:HG	2.20	0.41
1:C:191:MET:HE3	1:C:193:SER:OG	2.20	0.41
1:D:179:GLN:HA	1:D:180:PRO:HD2	1.87	0.41
1:C:104:SER:CB	1:C:108:ASP:O	2.68	0.41
1:D:27:GLN:O	1:D:31:LYS:HG3	2.20	0.41
1:D:180:PRO:HA	1:D:184:LEU:HB2	2.02	0.41
1:C:138:VAL:HG21	1:D:270:ILE:HD13	2.02	0.41
1:B:259:GLY:HA3	1:B:260:PRO:HD2	1.60	0.41
1:A:77:ASP:C	1:A:79:LYS:N	2.79	0.41
1:A:123:VAL:HG22	1:A:146:ILE:HG12	2.03	0.41
1:C:208:VAL:CG2	1:C:225:LEU:HD12	2.50	0.41
1:A:79:LYS:O	1:A:82:ASP:HB2	2.21	0.40
1:A:82:ASP:OD2	1:A:128:LEU:HD12	2.21	0.40
1:A:310:SER:O	1:A:313:VAL:HG12	2.21	0.40
1:B:172:ARG:NH2	1:B:333:THR:O	2.54	0.40
1:B:352:VAL:O	1:B:356:LEU:HG	2.22	0.40
1:C:229:LYS:HD3	1:C:229:LYS:HA	1.80	0.40
1:A:177:VAL:O	1:A:183:ASN:ND2	2.55	0.40
1:B:82:ASP:OD2	1:B:128:LEU:HD12	2.22	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	311/357 (87%)	297 (96%)	12 (4%)	2 (1%)	21	34
1	B	320/357 (90%)	299 (93%)	18 (6%)	3 (1%)	14	24
1	C	317/357 (89%)	295 (93%)	21 (7%)	1 (0%)	36	52
1	D	314/357 (88%)	298 (95%)	12 (4%)	4 (1%)	9	16
All	All	1262/1428 (88%)	1189 (94%)	63 (5%)	10 (1%)	16	27

All (10) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	108	ASP
1	B	260	PRO
1	D	261	SER
1	D	262	GLY
1	B	155	PRO
1	B	259	GLY
1	A	259	GLY
1	D	259	GLY
1	C	180	PRO
1	D	258	PRO

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	259/307 (84%)	254 (98%)	5 (2%)	50	71
1	B	261/307 (85%)	258 (99%)	3 (1%)	65	80
1	C	258/307 (84%)	253 (98%)	5 (2%)	50	71
1	D	251/307 (82%)	248 (99%)	3 (1%)	63	79
All	All	1029/1228 (84%)	1013 (98%)	16 (2%)	55	74

All (16) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	29	GLU
1	A	99	THR
1	A	295	SER
1	A	305	GLU
1	A	335	ILE
1	B	99	THR
1	B	164	ASN
1	B	305	GLU
1	C	64	LEU
1	C	99	THR
1	C	217	GLU
1	C	296	LYS
1	C	305	GLU
1	D	99	THR
1	D	250	LYS
1	D	305	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (15) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	30	GLN
1	A	164	ASN
1	A	176	ASN
1	A	240	ASN
1	A	247	ASN
1	A	325	GLN
1	B	120	ASN
1	B	247	ASN
1	B	325	GLN
1	C	30	GLN
1	C	325	GLN
1	D	30	GLN
1	D	240	ASN
1	D	247	ASN
1	D	325	GLN

5.3.3 RNA ⓘ

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

EDS was not executed - this section is therefore empty.

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

EDS was not executed - this section is therefore empty.

6.3 Carbohydrates

EDS was not executed - this section is therefore empty.

6.4 Ligands

EDS was not executed - this section is therefore empty.

6.5 Other polymers

EDS was not executed - this section is therefore empty.