



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2026 – 11:53 AM UTC

PDB ID : 6BAV / pdb_00006bav
Title : Crystal Structure of GltPh R397C in complex with S-Benzyl-L-Cysteine
Authors : Font, J.; Scopelliti, A.J.; Vandenberg, R.J.; Boudker, O.; Ryan, R.M.
Deposited on : 2017-10-16
Resolution : 3.70 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
Mogul : 2022.3.0, CSD as543be (2022)
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

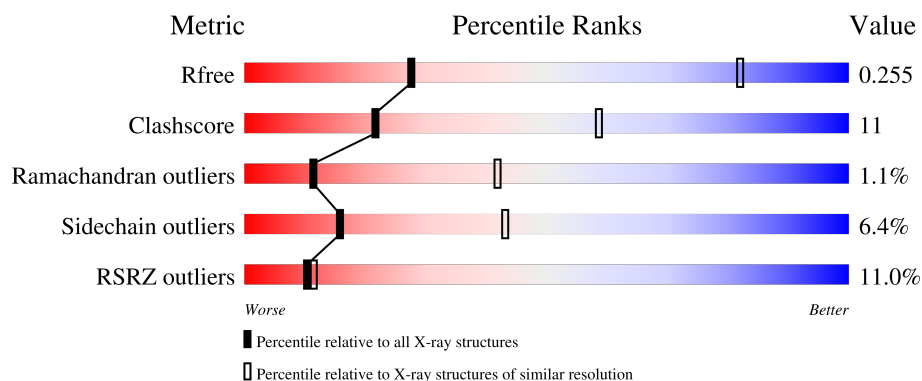
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.70 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	1131 (3.80-3.60)
Clashscore	190562	1171 (3.80-3.60)
Ramachandran outliers	187476	1129 (3.80-3.60)
Sidechain outliers	187428	1126 (3.80-3.60)
RSRZ outliers	180081	1130 (3.80-3.60)

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	420	9% 70% 24% • •
1	B	420	8% 72% 23% • •
1	C	420	15% 74% 21% • •

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 9030 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 Glutamate transporter homolog.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	409	Total	C	N	O	S	0	0	0
			2995	1972	471	534	18			
1	B	409	Total	C	N	O	S	0	0	0
			2995	1972	471	534	18			
1	C	409	Total	C	N	O	S	0	0	0
			2995	1972	471	534	18			

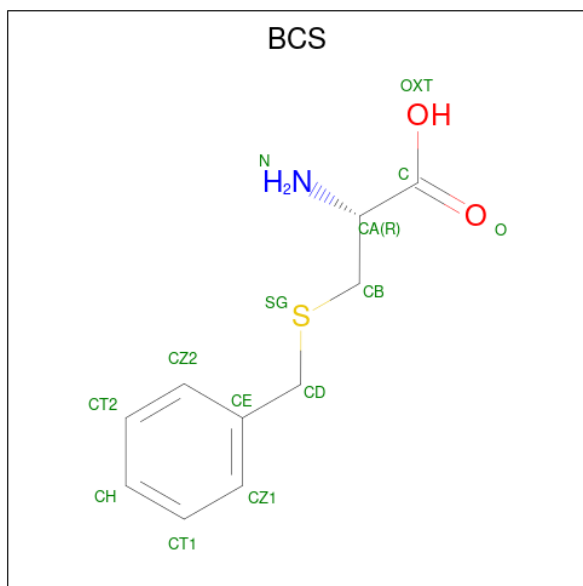
There are 12 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	397	CYS	ARG	engineered mutation	UNP O59010
A	418	THR	-	expression tag	UNP O59010
A	419	LEU	-	expression tag	UNP O59010
A	420	VAL	-	expression tag	UNP O59010
B	397	CYS	ARG	engineered mutation	UNP O59010
B	418	THR	-	expression tag	UNP O59010
B	419	LEU	-	expression tag	UNP O59010
B	420	VAL	-	expression tag	UNP O59010
C	397	CYS	ARG	engineered mutation	UNP O59010
C	418	THR	-	expression tag	UNP O59010
C	419	LEU	-	expression tag	UNP O59010
C	420	VAL	-	expression tag	UNP O59010

- Molecule 2 is SODIUM ION (CCD ID: NA) (formula: Na).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	1	Total	Na	0	0
			1	1		
2	B	1	Total	Na	0	0
			1	1		
2	C	1	Total	Na	0	0
			1	1		

- Molecule 3 is BENZYLCYSTEINE (CCD ID: BCS) (formula: $C_{10}H_{13}NO_2S$).

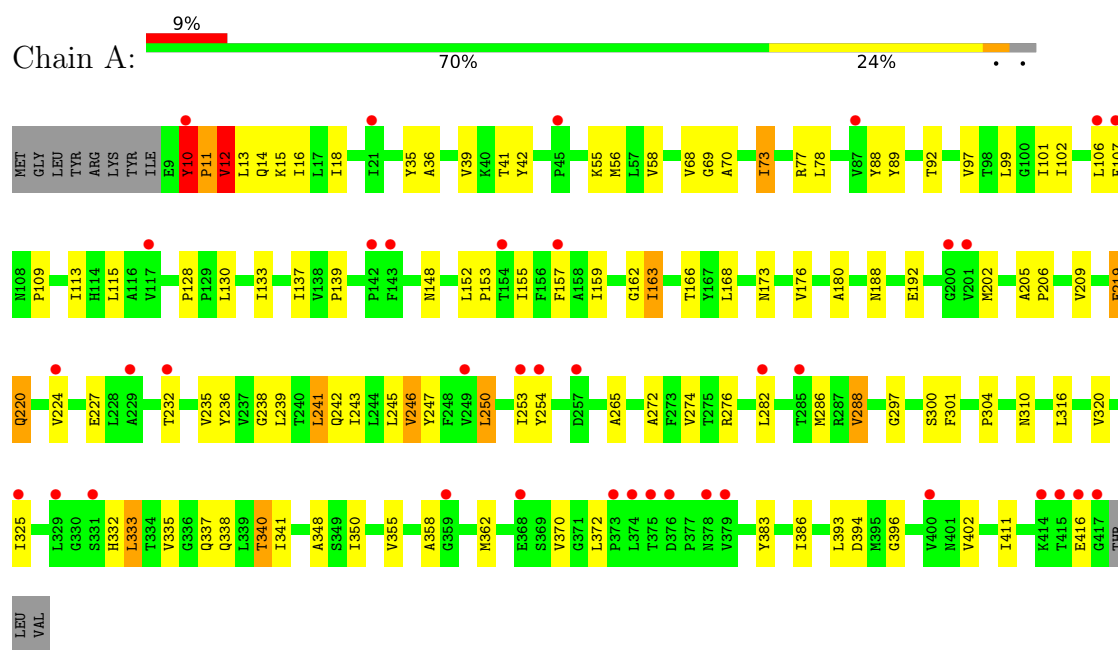


Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	N	O	S	0	0
			14	10	1	2	1		
3	B	1	Total	C	N	O	S	0	0
			14	10	1	2	1		
3	C	1	Total	C	N	O	S	0	0
			14	10	1	2	1		

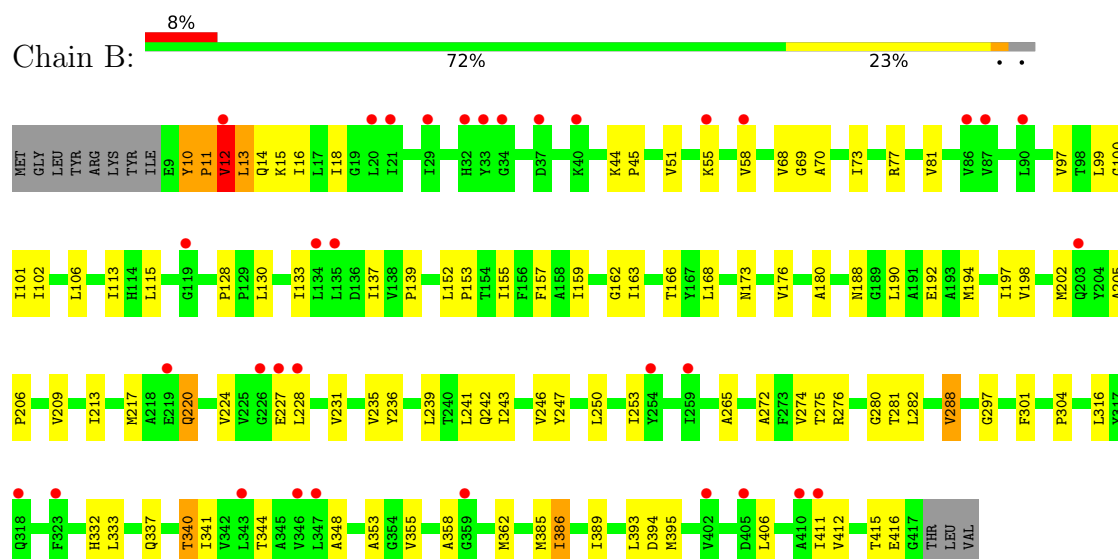
3 Residue-property plots

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.

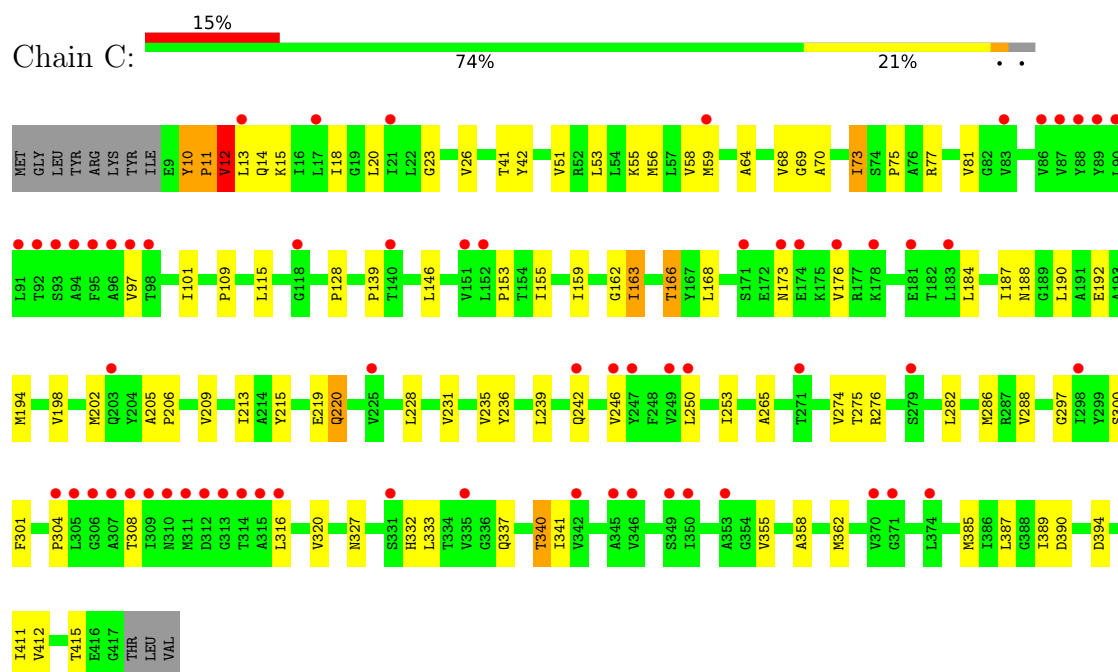
• Molecule 1: Glutamate transporter homolog



• Molecule 1: Glutamate transporter homolog



● Molecule 1: Glutamate transporter homolog



4 Data and refinement statistics

Property	Value	Source
Space group	P 61	Depositor
Cell constants a, b, c, α , β , γ	114.66Å 114.66Å 321.45Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	40.00 – 3.70 40.00 – 3.70	Depositor EDS
% Data completeness (in resolution range)	97.4 (40.00-3.70) 97.3 (40.00-3.70)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.13 (at 3.66Å)	Xtriage
Refinement program	REFMAC 5.5.0109	Depositor
R, R_{free}	0.247 , 0.259 0.250 , 0.255	Depositor DCC
R_{free} test set	1266 reflections (4.98%)	wwPDB-VP
Wilson B-factor (Å ²)	145.9	Xtriage
Anisotropy	0.047	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.22 , 71.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.40$, $\langle L^2 \rangle = 0.23$	Xtriage
Estimated twinning fraction	0.148 for h,-h-k,-l	Xtriage
F_o, F_c correlation	0.90	EDS
Total number of atoms	9030	wwPDB-VP
Average B, all atoms (Å ²)	185.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.68% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: BCS, NA

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	0.48	0/3047	0.89	3/4156 (0.1%)
1	B	0.49	0/3047	0.89	0/4156
1	C	0.50	0/3047	0.89	0/4156
All	All	0.49	0/9141	0.89	3/12468 (0.0%)

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	10	TYR	CA-C-N	5.25	126.40	119.84
1	A	10	TYR	C-N-CA	5.25	126.40	119.84
1	A	148	ASN	N-CA-C	5.03	116.81	107.60

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	2995	0	3171	78	0
1	B	2995	0	3171	64	0
1	C	2995	0	3171	63	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	C	1	0	0	0	0
3	A	14	0	12	1	0
3	B	14	0	12	0	0
3	C	14	0	12	1	0
All	All	9030	0	9549	200	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 (200) 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:11:PRO:HA	1:C:12:VAL:HG12	1.29	1.13
1:A:10:TYR:HB2	1:A:11:PRO:CD	1.84	1.07
1:C:10:TYR:HB2	1:C:11:PRO:HD2	1.10	1.06
1:A:11:PRO:HA	1:A:12:VAL:HG12	1.30	1.05
1:B:11:PRO:HA	1:B:12:VAL:HG12	1.39	1.05
1:A:10:TYR:CB	1:A:11:PRO:HD2	1.89	1.02
1:B:10:TYR:HB2	1:B:11:PRO:HD2	1.03	1.02
1:B:10:TYR:HB2	1:B:11:PRO:CD	1.88	1.02
1:C:10:TYR:HB2	1:C:11:PRO:CD	1.96	0.96
1:B:12:VAL:HG13	1:B:13:LEU:H	1.26	0.95
1:A:10:TYR:HB2	1:A:11:PRO:HD2	0.96	0.94
1:B:10:TYR:CB	1:B:11:PRO:HD2	1.97	0.92
1:A:12:VAL:HG13	1:A:13:LEU:H	1.36	0.89
1:C:12:VAL:HG13	1:C:13:LEU:H	1.36	0.88
1:A:11:PRO:HA	1:A:12:VAL:CG1	2.10	0.81
1:A:235:VAL:HG22	1:A:320:VAL:HG11	1.61	0.80
1:A:11:PRO:HB3	1:A:14:GLN:H	1.46	0.77
1:A:155:ILE:HD11	1:A:304:PRO:HB2	1.67	0.75
1:C:10:TYR:CB	1:C:11:PRO:HD2	2.03	0.73
1:B:276:ARG:HD2	1:B:394:ASP:HB3	1.72	0.70
1:C:11:PRO:HA	1:C:12:VAL:CG1	2.14	0.70
1:A:70:ALA:HB3	1:A:162:GLY:HA3	1.73	0.69
1:C:155:ILE:HD11	1:C:304:PRO:HB2	1.74	0.69
1:A:168:LEU:HD21	1:C:192:GLU:HB2	1.75	0.69
1:B:192:GLU:HB2	1:C:168:LEU:HD21	1.75	0.67
1:C:209:VAL:HG13	1:C:274:VAL:HG11	1.76	0.67
1:C:209:VAL:HG22	1:C:274:VAL:HG21	1.78	0.66
1:C:235:VAL:HG22	1:C:320:VAL:HG11	1.78	0.66
1:B:11:PRO:HB3	1:B:14:GLN:H	1.63	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:12:VAL:HG13	1:B:13:LEU:N	2.07	0.64
1:C:188:ASN:O	1:C:192:GLU:HG2	1.97	0.64
1:C:70:ALA:HB3	1:C:162:GLY:HA3	1.81	0.63
1:A:348:ALA:HB1	1:A:362:MET:HG3	1.81	0.63
1:A:70:ALA:HB1	1:A:163:ILE:HD12	1.80	0.63
1:C:11:PRO:HB3	1:C:14:GLN:H	1.64	0.62
1:B:70:ALA:HB3	1:B:162:GLY:HA3	1.82	0.62
1:A:113:ILE:HG13	1:A:227:GLU:HG3	1.80	0.62
1:B:55:LYS:O	1:B:58:VAL:HG12	1.99	0.62
1:B:155:ILE:HD11	1:B:304:PRO:HB2	1.81	0.62
1:B:11:PRO:HA	1:B:12:VAL:CG1	2.22	0.62
1:B:128:PRO:HG2	1:B:355:VAL:HG21	1.81	0.61
1:A:202:MET:HA	1:A:202:MET:HE2	1.82	0.61
1:B:358:ALA:O	1:B:362:MET:HB2	2.00	0.61
1:A:246:VAL:O	1:A:250:LEU:HB2	2.01	0.60
1:A:97:VAL:O	1:A:101:ILE:HG12	2.01	0.60
1:A:235:VAL:HG22	1:A:320:VAL:CG1	2.30	0.60
1:B:337:GLN:O	1:B:340:THR:HG22	2.02	0.60
1:A:11:PRO:HB2	1:A:15:LYS:H	1.68	0.59
1:B:202:MET:HA	1:B:202:MET:HE2	1.84	0.59
1:A:15:LYS:HA	1:A:18:ILE:HD12	1.85	0.59
1:A:209:VAL:HG13	1:A:274:VAL:HG11	1.85	0.58
1:C:128:PRO:HG2	1:C:355:VAL:HG21	1.86	0.58
1:B:16:ILE:HG23	1:B:209:VAL:HG21	1.84	0.58
1:C:286:MET:HE3	1:C:304:PRO:HG3	1.86	0.58
1:B:209:VAL:HG13	1:B:274:VAL:HG11	1.87	0.57
1:C:202:MET:HE2	1:C:202:MET:HA	1.86	0.56
1:A:192:GLU:HB2	1:B:168:LEU:HD21	1.87	0.56
1:A:68:VAL:HG11	1:A:188:ASN:HB2	1.89	0.55
1:B:12:VAL:CG1	1:B:13:LEU:H	2.08	0.55
1:C:228:LEU:HD21	1:C:385:MET:HG2	1.89	0.55
1:A:41:THR:O	1:A:42:TYR:HB2	2.06	0.55
1:A:325:ILE:HG22	1:A:372:LEU:HD13	1.89	0.55
1:A:11:PRO:HG2	1:A:14:GLN:HB3	1.88	0.54
1:A:253:ILE:HG23	1:A:254:TYR:HD2	1.72	0.54
1:C:12:VAL:HG13	1:C:13:LEU:N	2.16	0.54
1:C:51:VAL:HG22	1:C:275:THR:HG23	1.90	0.54
1:C:239:LEU:HD23	1:C:316:LEU:HD23	1.90	0.53
1:A:56:MET:HE2	1:B:157:PHE:HD1	1.72	0.53
1:A:159:ILE:HD11	1:A:301:PHE:HD1	1.73	0.53
1:A:337:GLN:O	1:A:340:THR:HG22	2.08	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:250:LEU:HA	1:B:253:ILE:HG22	1.88	0.53
1:C:236:TYR:HA	1:C:239:LEU:HD12	1.91	0.53
1:A:12:VAL:HG13	1:A:13:LEU:N	2.16	0.53
1:B:231:VAL:HG11	1:B:386:ILE:HD11	1.90	0.53
1:B:272:ALA:HA	1:B:281:THR:HG21	1.91	0.53
1:A:168:LEU:HD21	1:C:192:GLU:CB	2.38	0.53
1:A:209:VAL:HG22	1:A:274:VAL:HG21	1.91	0.53
1:A:11:PRO:CG	1:A:14:GLN:HB3	2.38	0.52
1:B:15:LYS:HA	1:B:18:ILE:HD12	1.91	0.52
1:A:69:GLY:O	1:A:297:GLY:HA2	2.09	0.52
1:B:69:GLY:O	1:B:297:GLY:HA2	2.09	0.52
1:C:12:VAL:CG1	1:C:13:LEU:H	2.16	0.52
1:C:41:THR:O	1:C:42:TYR:HB2	2.10	0.52
1:A:276:ARG:HD2	1:A:394:ASP:HB3	1.92	0.52
1:B:236:TYR:HA	1:B:239:LEU:HD12	1.92	0.51
1:C:250:LEU:HA	1:C:253:ILE:HG22	1.93	0.51
1:C:265:ALA:HA	1:C:288:VAL:HG11	1.92	0.51
1:C:333:LEU:HD22	1:C:341:ILE:HD11	1.92	0.51
1:A:265:ALA:HA	1:A:288:VAL:HG11	1.92	0.51
1:C:15:LYS:HA	1:C:18:ILE:HD12	1.92	0.50
1:A:173:ASN:HB3	1:A:176:VAL:HG12	1.93	0.50
1:B:55:LYS:HG2	1:B:280:GLY:HA2	1.93	0.50
1:B:81:VAL:HG13	1:B:412:VAL:HG11	1.94	0.50
1:A:55:LYS:O	1:A:58:VAL:HG12	2.12	0.50
1:A:333:LEU:HD12	1:A:333:LEU:H	1.77	0.50
1:B:173:ASN:HB3	1:B:176:VAL:HG12	1.94	0.50
1:C:276:ARG:HD2	1:C:394:ASP:HB3	1.91	0.50
1:A:272:ALA:HB2	1:A:402:VAL:HG21	1.93	0.49
1:A:338:GLN:HA	1:A:341:ILE:HD12	1.94	0.49
1:C:109:PRO:HD2	1:C:327:ASN:HD22	1.77	0.49
1:A:236:TYR:CE2	1:A:396:GLY:HA3	2.47	0.49
1:B:68:VAL:HG11	1:B:188:ASN:HB2	1.94	0.49
1:B:209:VAL:HG22	1:B:274:VAL:HG21	1.95	0.49
1:B:168:LEU:HD23	1:B:180:ALA:HB2	1.93	0.49
1:B:235:VAL:HG21	1:B:393:LEU:HD22	1.94	0.49
1:B:333:LEU:HD22	1:B:341:ILE:HD11	1.93	0.49
1:A:239:LEU:HD23	1:A:316:LEU:HD23	1.95	0.49
1:A:253:ILE:HG23	1:A:254:TYR:CD2	2.47	0.49
1:C:23:GLY:HA2	1:C:26:VAL:HG12	1.95	0.49
1:C:358:ALA:O	1:C:362:MET:HB2	2.12	0.49
1:B:139:PRO:HB3	1:B:153:PRO:HB3	1.94	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:35:TYR:O	1:A:39:VAL:HG23	2.13	0.48
1:A:56:MET:CE	1:B:157:PHE:HD1	2.26	0.48
1:A:88:TYR:CZ	1:A:92:THR:HG21	2.48	0.48
1:C:69:GLY:O	1:C:297:GLY:HA2	2.13	0.48
1:A:139:PRO:HB3	1:A:153:PRO:HB3	1.96	0.48
1:C:97:VAL:O	1:C:101:ILE:HG12	2.13	0.48
1:B:282:LEU:HD21	1:B:304:PRO:HA	1.96	0.48
1:C:286:MET:HE2	1:C:300:SER:HA	1.96	0.48
1:A:272:ALA:CB	1:A:402:VAL:HG21	2.44	0.47
1:C:55:LYS:O	1:C:58:VAL:HG12	2.13	0.47
1:B:220:GLN:HG2	1:B:389:ILE:HA	1.97	0.47
1:A:73:ILE:HG23	1:A:77:ARG:HB3	1.96	0.47
1:B:100:GLY:HA2	1:B:316:LEU:HD12	1.97	0.47
1:B:190:LEU:O	1:B:194:MET:HG2	2.15	0.47
1:A:235:VAL:CG2	1:A:320:VAL:HG11	2.37	0.47
1:A:188:ASN:O	1:A:192:GLU:HG2	2.15	0.47
1:C:337:GLN:O	1:C:340:THR:HG22	2.15	0.47
1:B:239:LEU:HD23	1:B:316:LEU:HD23	1.97	0.46
1:A:36:ALA:HB1	1:A:219:GLU:HG2	1.98	0.46
1:C:194:MET:O	1:C:198:VAL:HG23	2.15	0.46
1:B:11:PRO:HG2	1:B:14:GLN:HB3	1.97	0.46
1:C:73:ILE:HG23	1:C:77:ARG:HB3	1.98	0.46
1:A:130:LEU:HA	1:A:133:ILE:HD12	1.97	0.46
1:B:113:ILE:HG13	1:B:227:GLU:HG3	1.98	0.46
1:C:235:VAL:HG22	1:C:320:VAL:CG1	2.45	0.46
1:C:139:PRO:HB3	1:C:153:PRO:HB3	1.97	0.46
1:A:12:VAL:CG1	1:A:13:LEU:H	2.18	0.46
1:A:128:PRO:HG2	1:A:355:VAL:HG21	1.98	0.46
1:C:220:GLN:HG2	1:C:389:ILE:HA	1.98	0.46
1:B:137:ILE:O	1:B:139:PRO:HD3	2.15	0.46
1:A:282:LEU:HD21	1:A:304:PRO:HA	1.98	0.46
1:B:217:MET:HE2	1:B:395:MET:HE1	1.98	0.45
1:C:68:VAL:HG11	1:C:188:ASN:HB2	1.97	0.45
1:B:228:LEU:HD21	1:B:385:MET:HG2	1.99	0.45
1:A:137:ILE:O	1:A:153:PRO:HA	2.17	0.45
1:B:344:THR:O	1:B:348:ALA:HB2	2.16	0.45
1:C:159:ILE:HD11	1:C:301:PHE:HD1	1.81	0.45
1:A:243:ILE:HA	1:A:247:TYR:CD2	2.51	0.44
1:B:205:ALA:N	1:B:206:PRO:HD2	2.33	0.44
1:B:265:ALA:HB1	1:B:406:LEU:HD13	1.99	0.44
1:C:11:PRO:CA	1:C:12:VAL:HG12	2.22	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:75:PRO:HG3	1:C:163:ILE:HG13	1.99	0.44
1:B:44:LYS:N	1:B:45:PRO:HD2	2.33	0.44
1:B:51:VAL:HG22	1:B:275:THR:HG23	1.98	0.44
3:C:502:BCS:HD2	3:C:502:BCS:HA	1.65	0.44
1:C:163:ILE:O	1:C:166:THR:HG22	2.17	0.44
1:C:59:MET:HE2	1:C:146:LEU:HA	1.98	0.44
1:C:20:LEU:HD12	1:C:213:ILE:HG12	1.99	0.44
1:A:11:PRO:CA	1:A:12:VAL:HG12	2.22	0.43
1:C:81:VAL:HG13	1:C:412:VAL:HG11	2.00	0.43
1:A:205:ALA:N	1:A:206:PRO:HD2	2.33	0.43
1:A:286:MET:HE3	1:A:304:PRO:HG3	2.00	0.43
1:A:89:TYR:CD1	1:A:310:ASN:HB2	2.53	0.43
1:B:97:VAL:O	1:B:101:ILE:HG12	2.19	0.43
1:C:215:TYR:CE1	1:C:219:GLU:HG3	2.53	0.43
1:C:333:LEU:HD12	1:C:333:LEU:H	1.83	0.43
1:C:205:ALA:N	1:C:206:PRO:HD2	2.33	0.43
1:B:348:ALA:HB1	1:B:362:MET:HG3	2.00	0.43
1:A:286:MET:HE2	1:A:300:SER:HA	2.01	0.42
1:A:157:PHE:HD1	1:C:56:MET:CE	2.33	0.42
1:B:188:ASN:O	1:B:192:GLU:HG2	2.18	0.42
1:A:107:PHE:O	1:A:109:PRO:HD3	2.20	0.42
1:A:235:VAL:HG21	1:A:393:LEU:HD22	2.02	0.42
1:A:236:TYR:HE2	1:A:396:GLY:HA3	1.84	0.42
1:B:265:ALA:HA	1:B:288:VAL:HG11	2.01	0.42
1:C:53:LEU:O	1:C:56:MET:HB3	2.20	0.42
1:C:173:ASN:HB3	1:C:176:VAL:HG12	2.01	0.42
1:C:231:VAL:O	1:C:235:VAL:HG23	2.20	0.42
1:A:159:ILE:HD11	1:A:301:PHE:CD1	2.51	0.42
1:B:194:MET:O	1:B:198:VAL:HG23	2.19	0.42
1:B:194:MET:HA	1:B:197:ILE:HD12	2.02	0.42
1:A:16:ILE:HG23	1:A:209:VAL:HG21	2.02	0.42
1:B:159:ILE:HD11	1:B:301:PHE:HD1	1.85	0.42
1:B:213:ILE:HG22	1:B:395:MET:SD	2.60	0.41
1:C:190:LEU:O	1:C:194:MET:HG2	2.20	0.41
1:A:168:LEU:HD23	1:A:180:ALA:HB2	2.02	0.41
1:A:333:LEU:HD23	1:A:370:VAL:HG21	2.03	0.41
1:B:73:ILE:HG23	1:B:77:ARG:HB3	2.03	0.41
1:B:243:ILE:HA	1:B:247:TYR:CD2	2.56	0.41
1:A:358:ALA:O	1:A:362:MET:HB2	2.21	0.41
1:C:64:ALA:HB1	1:C:187:ILE:O	2.21	0.41
1:A:238:GLY:C	1:A:316:LEU:HD21	2.45	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:282:LEU:HD21	1:C:304:PRO:HA	2.03	0.41
3:A:502:BCS:HD2	3:A:502:BCS:HA	1.72	0.40
1:B:130:LEU:HA	1:B:133:ILE:HD12	2.03	0.40
1:A:89:TYR:CG	1:A:310:ASN:HB2	2.56	0.40
1:A:241:LEU:O	1:A:245:LEU:HB2	2.21	0.40
1:A:325:ILE:HD11	1:A:383:TYR:HB2	2.04	0.40
1:C:387:LEU:HA	1:C:390:ASP:HB2	2.02	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	407/420 (97%)	384 (94%)	18 (4%)	5 (1%)	10	40
1	B	407/420 (97%)	387 (95%)	15 (4%)	5 (1%)	10	40
1	C	407/420 (97%)	386 (95%)	18 (4%)	3 (1%)	18	50
All	All	1221/1260 (97%)	1157 (95%)	51 (4%)	13 (1%)	11	42

All (13) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	10	TYR
1	A	11	PRO
1	A	416	GLU
1	B	10	TYR
1	B	12	VAL
1	C	10	TYR
1	C	12	VAL
1	A	12	VAL
1	B	11	PRO
1	C	11	PRO

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Mol	Chain	Res	Type
1	A	220	GLN
1	B	353	ALA
1	B	416	GLU

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	314/328 (96%)	288 (92%)	26 (8%)	10	35
1	B	314/328 (96%)	294 (94%)	20 (6%)	16	43
1	C	314/328 (96%)	300 (96%)	14 (4%)	24	49
All	All	942/984 (96%)	882 (94%)	60 (6%)	16	43

All (60) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	12	VAL
1	A	73	ILE
1	A	78	LEU
1	A	99	LEU
1	A	102	ILE
1	A	106	LEU
1	A	115	LEU
1	A	152	LEU
1	A	163	ILE
1	A	166	THR
1	A	219	GLU
1	A	220	GLN
1	A	224	VAL
1	A	232	THR
1	A	241	LEU
1	A	242	GLN
1	A	246	VAL
1	A	250	LEU
1	A	288	VAL

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Mol	Chain	Res	Type
1	A	332	HIS
1	A	333	LEU
1	A	335	VAL
1	A	340	THR
1	A	350	ILE
1	A	386	ILE
1	A	411	ILE
1	B	12	VAL
1	B	13	LEU
1	B	99	LEU
1	B	102	ILE
1	B	106	LEU
1	B	115	LEU
1	B	152	LEU
1	B	163	ILE
1	B	166	THR
1	B	220	GLN
1	B	224	VAL
1	B	241	LEU
1	B	242	GLN
1	B	246	VAL
1	B	288	VAL
1	B	332	HIS
1	B	340	THR
1	B	386	ILE
1	B	411	ILE
1	B	415	THR
1	C	12	VAL
1	C	73	ILE
1	C	115	LEU
1	C	163	ILE
1	C	166	THR
1	C	184	LEU
1	C	220	GLN
1	C	242	GLN
1	C	246	VAL
1	C	308	THR
1	C	332	HIS
1	C	340	THR
1	C	411	ILE
1	C	415	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (14)

such sidechains are listed below:

Mol	Chain	Res	Type
1	A	120	GLN
1	A	121	GLN
1	A	148	ASN
1	A	338	GLN
1	B	14	GLN
1	B	32	HIS
1	B	121	GLN
1	B	148	ASN
1	C	32	HIS
1	C	148	ASN
1	C	150	GLN
1	C	199	ASN
1	C	327	ASN
1	C	337	GLN

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 6 ligands modelled in this entry, 3 are monoatomic - leaving 3 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	BCS	B	502	-	13,14,14	0.81	0	13,17,17	0.39	0
3	BCS	A	502	-	13,14,14	0.88	0	13,17,17	0.69	0
3	BCS	C	502	-	13,14,14	0.80	0	13,17,17	0.61	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	BCS	B	502	-	-	6/10/10/10	0/1/1/1
3	BCS	A	502	-	-	5/10/10/10	0/1/1/1
3	BCS	C	502	-	-	4/10/10/10	0/1/1/1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (15) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	502	BCS	N-CA-CB-SG
3	A	502	BCS	C-CA-CB-SG
3	A	502	BCS	CA-CB-SG-CD
3	B	502	BCS	N-CA-CB-SG
3	B	502	BCS	CA-CB-SG-CD
3	C	502	BCS	N-CA-CB-SG
3	C	502	BCS	C-CA-CB-SG
3	C	502	BCS	CA-CB-SG-CD
3	C	502	BCS	CE-CD-SG-CB
3	B	502	BCS	C-CA-CB-SG
3	B	502	BCS	CE-CD-SG-CB
3	A	502	BCS	CE-CD-SG-CB
3	B	502	BCS	SG-CD-CE-CZ2
3	B	502	BCS	SG-CD-CE-CZ1
3	A	502	BCS	OXT-C-CA-N

There are no ring outliers.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	502	BCS	1	0
3	C	502	BCS	1	0

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	409/420 (97%)	0.35	38 (9%)	14 13	121, 147, 181, 217	0
1	B	409/420 (97%)	0.27	34 (8%)	17 14	137, 196, 254, 279	0
1	C	409/420 (97%)	0.86	63 (15%)	5 7	153, 201, 273, 312	0
All	All	1227/1260 (97%)	0.49	135 (11%)	10 11	121, 178, 256, 312	0

All (135) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	95	PHE	13.4
1	C	308	THR	13.0
1	C	93	SER	10.9
1	C	346	VAL	8.8
1	C	174	GLU	8.7
1	C	91	LEU	8.3
1	C	307	ALA	8.0
1	C	94	ALA	7.5
1	C	309	ILE	7.5
1	C	90	LEU	7.4
1	C	315	ALA	7.0
1	C	311	MET	6.9
1	C	96	ALA	6.6
1	C	86	VAL	6.4
1	B	259	ILE	6.3
1	C	89	TYR	6.1
1	B	33	TYR	5.7
1	B	29	ILE	5.7
1	C	312	ASP	5.6
1	C	97	VAL	5.4
1	C	92	THR	5.2
1	A	329	LEU	4.9
1	C	246	VAL	4.9

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Mol	Chain	Res	Type	RSRZ
1	C	87	VAL	4.8
1	C	350	ILE	4.8
1	C	305	LEU	4.7
1	C	310	ASN	4.5
1	C	17	LEU	4.5
1	C	151	VAL	4.4
1	C	140	THR	4.4
1	A	331	SER	4.3
1	C	371	GLY	4.2
1	A	414	LYS	4.1
1	B	135	LEU	4.1
1	A	416	GLU	4.0
1	B	34	GLY	4.0
1	B	86	VAL	3.9
1	C	313	GLY	3.9
1	A	378	ASN	3.8
1	C	178	LYS	3.7
1	C	249	VAL	3.7
1	B	254	TYR	3.7
1	C	349	SER	3.6
1	C	181	GLU	3.6
1	C	250	LEU	3.6
1	C	306	GLY	3.6
1	B	55	LYS	3.4
1	C	316	LEU	3.4
1	B	411	ILE	3.4
1	A	200	GLY	3.3
1	C	242	GLN	3.3
1	C	173	ASN	3.3
1	B	12	VAL	3.3
1	B	134	LEU	3.2
1	A	224	VAL	3.2
1	C	203	GLN	3.2
1	C	83	VAL	3.2
1	B	226	GLY	3.2
1	C	98	THR	3.1
1	B	227	GLU	3.1
1	B	402	VAL	3.1
1	C	370	VAL	3.1
1	C	331	SER	3.0
1	A	374	LEU	3.0
1	A	229	ALA	3.0

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Mol	Chain	Res	Type	RSRZ
1	A	254	TYR	2.9
1	C	176	VAL	2.9
1	B	32	HIS	2.9
1	C	314	THR	2.8
1	A	107	PHE	2.8
1	A	143	PHE	2.8
1	B	203	GLN	2.8
1	C	298	ILE	2.8
1	C	304	PRO	2.8
1	A	106	LEU	2.8
1	A	87	VAL	2.8
1	B	346	VAL	2.8
1	A	400	VAL	2.7
1	B	410	ALA	2.7
1	C	345	ALA	2.7
1	A	285	THR	2.6
1	B	58	VAL	2.6
1	A	375	THR	2.6
1	A	45	PRO	2.6
1	A	368	GLU	2.6
1	C	247	TYR	2.5
1	A	325	ILE	2.5
1	A	232	THR	2.5
1	B	40	LYS	2.5
1	C	152	LEU	2.5
1	C	21	ILE	2.5
1	C	183	LEU	2.4
1	A	415	THR	2.4
1	A	157	PHE	2.4
1	C	353	ALA	2.4
1	A	359	GLY	2.3
1	B	119	GLY	2.3
1	C	279	SER	2.3
1	A	117	VAL	2.3
1	B	228	LEU	2.3
1	C	171	SER	2.3
1	A	154	THR	2.3
1	A	417	GLY	2.3
1	A	249	VAL	2.3
1	C	225	VAL	2.3
1	B	323	PHE	2.3
1	A	142	PRO	2.3

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Mol	Chain	Res	Type	RSRZ
1	B	37	ASP	2.3
1	B	405	ASP	2.3
1	B	20	LEU	2.3
1	A	201	VAL	2.3
1	A	379	VAL	2.3
1	B	219	GLU	2.2
1	B	347	LEU	2.2
1	A	253	ILE	2.2
1	A	282	LEU	2.2
1	A	373	PRO	2.2
1	B	359	GLY	2.2
1	A	257	ASP	2.2
1	C	118	GLY	2.2
1	A	376	ASP	2.2
1	C	271	THR	2.2
1	B	90	LEU	2.2
1	B	318	GLN	2.1
1	C	335	VAL	2.1
1	C	342	VAL	2.1
1	A	21	ILE	2.1
1	A	10	TYR	2.1
1	B	21	ILE	2.1
1	B	343	LEU	2.1
1	B	87	VAL	2.0
1	C	88	TYR	2.0
1	C	13	LEU	2.0
1	C	59	MET	2.0
1	C	374	LEU	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	NA	B	501	1/1	0.61	0.28	172,172,172,172	0
2	NA	C	501	1/1	0.70	0.31	186,186,186,186	0
3	BCS	C	502	14/14	0.77	0.13	176,189,197,197	0
2	NA	A	501	1/1	0.85	0.21	125,125,125,125	0
3	BCS	B	502	14/14	0.87	0.14	168,177,186,187	0
3	BCS	A	502	14/14	0.94	0.07	121,126,128,129	0

6.5 Other polymers [i](#)

There are no such residues in this entry.