



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 6, 2026 – 11:21 PM UTC

PDB ID : 1QLV / pdb_00001qlv
Title : Pyrone synthase (PYS) from Gerbera hybrida
Authors : Ferrer, J.-L.; Jez, J.M.; Bowman, M.E.; Schroder, J.; Noel, J.P.
Deposited on : 1999-09-16
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 : 4-5-2 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

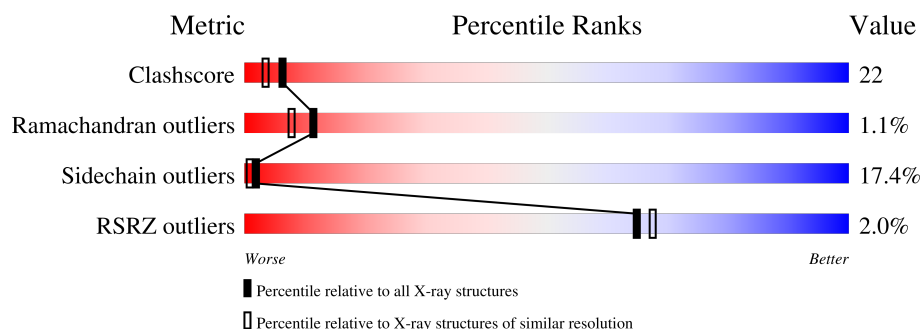
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 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))
Clashscore	190562	7164 (2.10-2.10)
Ramachandran outliers	187476	7099 (2.10-2.10)
Sidechain outliers	187428	7100 (2.10-2.10)
RSRZ outliers	180081	6662 (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 $\leq 5\%$. 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	402	2% 60% 25% 7% 6%
1	B	402	2% 53% 29% 10% 6%

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 6673 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 PYRONE SYNTHASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	378	Total	C	N	O	S	0	7	0
			2955	1876	511	549	19			
1	B	376	Total	C	N	O	S	0	7	0
			2943	1869	511	544	19			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	259	MET	VAL	cloning artifact	UNP P48391
A	169	CSD	CYS	modified residue	UNP P48391
B	259	MET	VAL	cloning artifact	UNP P48391
B	169	CSD	CYS	modified residue	UNP P48391

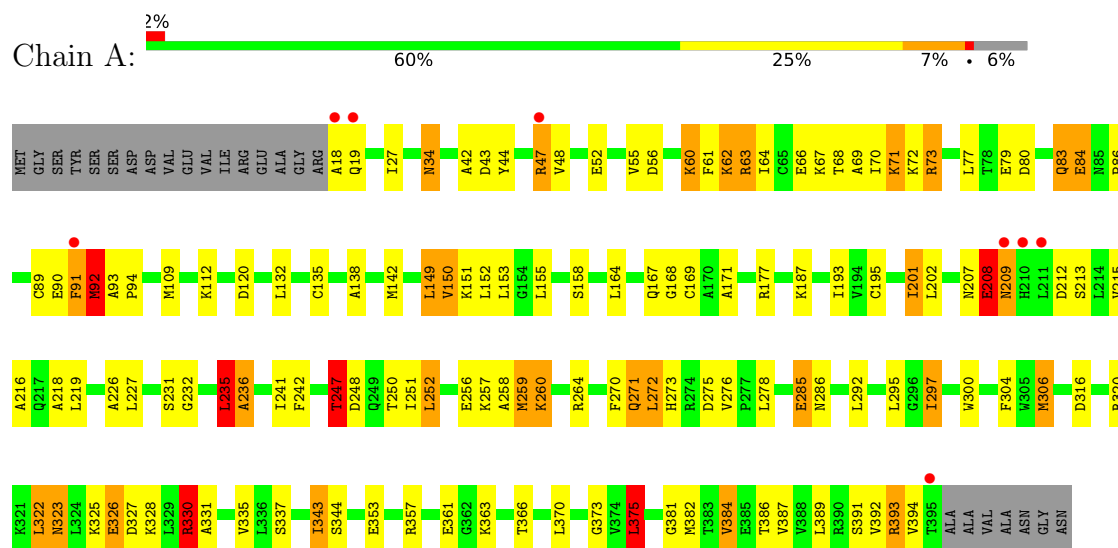
- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	366	Total	O	0	0
			366	366		
2	B	409	Total	O	0	0
			409	409		

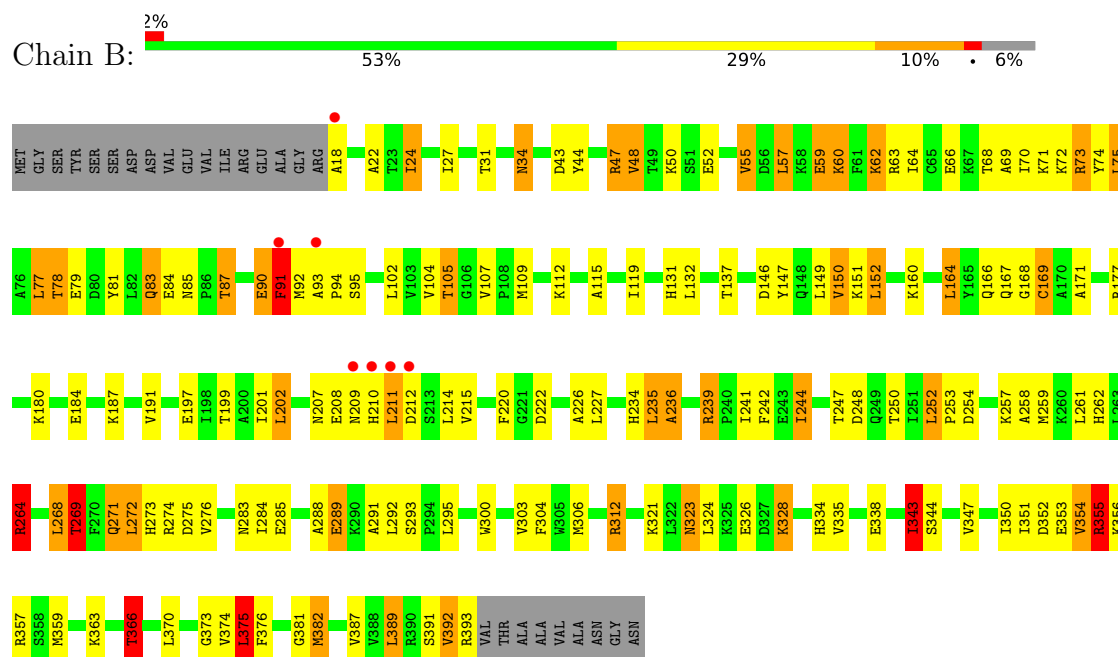
3 Residue-property plots

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: PYRONE SYNTHASE



• Molecule 1: PYRONE SYNTHASE



4 Data and refinement statistics

Property	Value	Source
Space group	P 31 2 1	Depositor
Cell constants a, b, c, α , β , γ	82.14Å 82.14Å 241.32Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	10.00 – 2.10 10.00 – 2.10	Depositor EDS
% Data completeness (in resolution range)	87.5 (10.00-2.10) 91.1 (10.00-2.10)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.08	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.93 (at 2.10Å)	Xtriage
Refinement program	SHELXL-97	Depositor
R, R_{free}	0.185 , 0.269 0.186 , (Not available)	Depositor DCC
R_{free} test set	No test flags present.	wwPDB-VP
Wilson B-factor (Å ²)	24.2	Xtriage
Anisotropy	0.465	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.43 , 137.6	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.027 for -h,-k,l	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	6673	wwPDB-VP
Average B, all atoms (Å ²)	32.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 50.21 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 6.6793e-05. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

¹Intensities estimated from amplitudes.

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

5 Model quality

5.1 Standard geometry

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

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	0.41	0/2998	1.34	19/4057 (0.5%)
1	B	0.44	0/2986	1.48	36/4041 (0.9%)
All	All	0.42	0/5984	1.42	55/8098 (0.7%)

There are no bond length outliers.

All (55) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	355	ARG	CD-NE-CZ	35.48	174.08	124.40
1	B	264	ARG	CD-NE-CZ	12.00	141.20	124.40
1	A	323	ASN	CA-CB-CG	9.04	121.64	112.60
1	A	34	ASN	CA-CB-CG	8.79	121.39	112.60
1	A	92	MET	CA-C-N	8.45	135.91	122.56
1	A	92	MET	C-N-CA	8.45	135.91	122.56
1	A	330	ARG	CD-NE-CZ	8.32	136.05	124.40
1	B	31	THR	O-C-N	8.00	126.83	121.71
1	B	47	ARG	CD-NE-CZ	7.97	135.55	124.40
1	A	73	ARG	CD-NE-CZ	7.91	135.48	124.40
1	A	322	LEU	CA-C-N	7.89	136.61	121.54
1	A	322	LEU	C-N-CA	7.89	136.61	121.54
1	B	375	LEU	CA-CB-CG	7.50	142.55	116.30
1	B	91	PHE	CA-C-N	-7.19	112.45	123.17
1	B	91	PHE	C-N-CA	-7.19	112.45	123.17
1	B	239	ARG	CD-NE-CZ	7.06	134.28	124.40
1	B	235	LEU	CA-C-N	6.89	134.71	121.54
1	B	235	LEU	C-N-CA	6.89	134.71	121.54
1	B	90	GLU	CA-C-N	-6.56	111.71	120.63
1	B	90	GLU	C-N-CA	-6.56	111.71	120.63
1	B	269	THR	O-C-N	-6.45	115.50	122.85
1	A	271	GLN	CA-C-N	6.38	131.92	122.86

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	271	GLN	C-N-CA	6.38	131.92	122.86
1	A	375	LEU	CA-CB-CG	6.36	138.57	116.30
1	B	73	ARG	CD-NE-CZ	6.26	133.17	124.40
1	B	202	LEU	CA-CB-CG	5.95	137.12	116.30
1	A	386	THR	CA-C-N	-5.92	114.90	123.06
1	A	386	THR	C-N-CA	-5.92	114.90	123.06
1	B	269	THR	N-CA-CB	-5.91	101.46	110.45
1	A	120	ASP	CA-CB-CG	-5.77	106.83	112.60
1	B	392	VAL	CA-C-N	5.72	132.00	121.70
1	B	392	VAL	C-N-CA	5.72	132.00	121.70
1	A	91	PHE	CA-C-N	5.70	132.43	121.54
1	A	91	PHE	C-N-CA	5.70	132.43	121.54
1	B	105	THR	CA-C-N	5.67	126.28	119.98
1	B	105	THR	C-N-CA	5.67	126.28	119.98
1	B	34	ASN	CA-CB-CG	5.59	118.19	112.60
1	B	47	ARG	NE-CZ-NH2	-5.51	114.24	119.20
1	B	352	ASP	CA-CB-CG	5.50	118.10	112.60
1	B	289	GLU	CB-CG-CD	5.44	121.84	112.60
1	A	247	THR	N-CA-CB	-5.43	101.70	110.71
1	B	366	THR	N-CA-CB	-5.37	100.99	110.39
1	B	77	LEU	CA-C-N	-5.34	113.47	123.03
1	B	77	LEU	C-N-CA	-5.34	113.47	123.03
1	B	85	ASN	O-C-N	5.29	125.64	121.20
1	A	326	GLU	CA-C-N	-5.26	114.30	122.67
1	A	326	GLU	C-N-CA	-5.26	114.30	122.67
1	B	334	HIS	CA-C-N	-5.26	111.24	120.29
1	B	334	HIS	C-N-CA	-5.26	111.24	120.29
1	B	234	HIS	O-C-N	5.24	129.24	122.43
1	B	353	GLU	CA-C-N	-5.20	113.03	120.42
1	B	353	GLU	C-N-CA	-5.20	113.03	120.42
1	B	107	VAL	O-C-N	-5.12	117.15	120.42
1	B	387	VAL	CA-C-N	-5.08	115.81	122.37
1	B	387	VAL	C-N-CA	-5.08	115.81	122.37

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	2955	0	3022	120	0
1	B	2943	0	3011	154	0
2	A	366	0	0	24	0
2	B	409	0	0	25	0
All	All	6673	0	6033	265	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 22.

All (265) 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:169:CSD:SG	1:B:169:CSD:OD2	1.94	1.25
1:B:211:LEU:HD12	1:B:211:LEU:O	1.10	1.24
1:B:211:LEU:HD12	1:B:211:LEU:C	1.73	1.11
1:B:211:LEU:O	1:B:211:LEU:CD1	2.02	1.07
1:B:262:HIS:H	1:B:269:THR:HG22	1.22	1.00
1:B:180:LYS:HD2	1:B:244[A]:ILE:HG12	1.46	0.97
1:B:24[A]:ILE:HD13	1:B:227:LEU:HD23	1.56	0.88
1:B:292:LEU:HD11	1:B:374:VAL:HG21	1.62	0.82
1:B:274[B]:ARG:H	1:B:274[B]:ARG:HD2	1.46	0.81
1:A:306:MET:HG3	1:A:375:LEU:HB2	1.64	0.80
1:A:142:MET:HE2	1:B:166:GLN:HE21	1.44	0.80
1:A:73:ARG:HD3	2:A:2018:HOH:O	1.83	0.78
1:A:286:ASN:HB3	2:A:2287:HOH:O	1.85	0.77
1:A:276:VAL:HG13	1:A:382:MET:HE1	1.67	0.77
1:A:241:ILE:O	1:A:366:THR:HG21	1.85	0.75
1:A:316:ASP:O	1:A:320:ARG:HG3	1.87	0.74
1:A:366:THR:HG22	1:A:392:VAL:H	1.53	0.74
1:B:355:ARG:HD3	1:B:356:LYS:HG3	1.68	0.74
1:B:60:LYS:HG2	1:B:63:ARG:NH2	2.02	0.73
1:A:79:GLU:O	1:A:83:GLN:HG2	1.88	0.73
1:B:87:THR:HG23	1:B:95:SER:HB3	1.71	0.73
1:A:47:ARG:HG3	1:A:52:GLU:OE2	1.89	0.72
1:B:241:ILE:O	1:B:366:THR:HG21	1.88	0.72
1:B:285:GLU:O	1:B:289:GLU:HG3	1.89	0.72
1:B:137:THR:OG1	1:B:343[A]:ILE:HD11	1.89	0.72
1:B:271:GLN:HG2	2:B:2292:HOH:O	1.90	0.72
1:B:73:ARG:HD3	2:B:2028:HOH:O	1.90	0.71

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:50:LYS:HE3	2:B:2055:HOH:O	1.90	0.71
1:B:250:THR:HB	2:B:2275:HOH:O	1.90	0.70
1:A:258:ALA:HB1	1:A:382:MET:HE3	1.73	0.70
1:A:71:LYS:HG3	1:A:337:SER:OG	1.91	0.70
1:A:292:LEU:HB3	1:A:297[A]:ILE:HG13	1.74	0.69
1:A:292:LEU:HD22	1:A:297[A]:ILE:HG12	1.73	0.69
1:A:150:VAL:HB	1:A:155:LEU:HB2	1.74	0.69
1:A:19:GLN:HE21	1:A:231:SER:HB2	1.58	0.68
1:B:115:ALA:O	1:B:119:ILE:HG13	1.93	0.68
1:A:168:GLY:HA2	1:A:343[A]:ILE:HD11	1.74	0.68
1:B:201:ILE:HG13	1:B:268:LEU:HB2	1.75	0.67
1:B:78:THR:HG22	2:B:2102:HOH:O	1.94	0.67
1:A:19:GLN:NE2	1:A:231:SER:HB2	2.10	0.66
1:A:34:ASN:HB3	2:A:2073:HOH:O	1.93	0.66
1:A:330:ARG:HG3	1:A:330:ARG:HH11	1.59	0.66
1:A:18:ALA:HB1	1:A:19:GLN:NE2	2.11	0.66
1:A:273:HIS:HD2	1:A:275:ASP:H	1.42	0.66
1:A:19:GLN:HE21	1:A:231:SER:CB	2.09	0.66
1:A:142:MET:HE2	1:B:166:GLN:NE2	2.11	0.66
1:A:142:MET:HE3	1:B:261:LEU:HB2	1.77	0.65
1:A:248:ASP:HB2	2:A:2241:HOH:O	1.95	0.65
1:B:211:LEU:C	1:B:211:LEU:CD1	2.46	0.64
1:B:273:HIS:O	1:B:276:VAL:HG23	1.97	0.64
1:A:138:ALA:HA	1:A:201:ILE:HG12	1.80	0.64
1:A:219:LEU:HD22	2:A:2222:HOH:O	1.97	0.64
1:B:177:ARG:HA	1:B:247:THR:HG21	1.79	0.64
1:B:146:ASP:O	1:B:150:VAL:HG12	1.99	0.63
1:A:71:LYS:HE3	1:A:337:SER:OG	2.00	0.61
1:B:91:PHE:CE2	1:B:207:ASN:HB2	2.35	0.61
1:B:55:VAL:O	1:B:59:GLU:HG2	2.00	0.61
1:B:328:LYS:HE2	2:B:2390:HOH:O	2.00	0.61
1:A:273:HIS:CD2	1:A:275:ASP:H	2.18	0.61
1:B:343[A]:ILE:HG13	1:B:344:SER:N	2.16	0.60
1:B:392:VAL:O	1:B:393:ARG:HB2	2.01	0.60
1:B:72:LYS:HE3	1:B:338:GLU:OE1	2.02	0.59
1:B:81:TYR:HB2	2:B:2101:HOH:O	2.03	0.59
1:A:285[B]:GLU:HG2	1:A:322:LEU:HD23	1.85	0.59
1:A:92:MET:HE3	2:A:2264:HOH:O	2.03	0.58
1:B:274[A]:ARG:HD3	2:B:2317:HOH:O	2.02	0.58
1:A:366:THR:CG2	1:A:392:VAL:H	2.15	0.58
1:A:306:MET:HG3	1:A:375:LEU:CB	2.33	0.58

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:75:LEU:HG	2:B:2095:HOH:O	2.03	0.58
1:B:168:GLY:HA2	1:B:343[A]:ILE:HD12	1.86	0.58
1:B:393:ARG:HD2	2:B:2408:HOH:O	2.02	0.58
1:A:93:ALA:HA	2:A:2091:HOH:O	2.03	0.58
1:B:91:PHE:CD2	1:B:207:ASN:HB2	2.38	0.58
1:B:60:LYS:NZ	1:B:211:LEU:HD22	2.18	0.58
1:A:216:ALA:HB2	1:A:270:PHE:CD2	2.37	0.57
1:B:211:LEU:HD13	1:B:214:LEU:HB3	1.84	0.57
1:B:269:THR:HG23	2:B:2292:HOH:O	2.04	0.57
1:B:147:TYR:O	1:B:150:VAL:HG13	2.04	0.57
1:B:168:GLY:HA3	2:B:2217:HOH:O	2.03	0.57
1:B:306:MET:O	1:B:375:LEU:HA	2.04	0.57
1:A:247:THR:HG22	1:B:160:LYS:NZ	2.19	0.57
1:A:142:MET:HE3	1:B:261:LEU:CB	2.33	0.57
1:A:306:MET:CE	1:A:389:LEU:HD12	2.35	0.57
1:A:56:ASP:OD1	1:A:60:LYS:HE3	2.05	0.56
1:B:137:THR:CB	1:B:343[A]:ILE:HD11	2.35	0.56
1:A:242:PHE:CE1	1:A:366:THR:HG23	2.40	0.56
1:A:366:THR:HG22	1:A:391:SER:HB2	1.86	0.56
1:A:285[A]:GLU:HB2	2:A:2284:HOH:O	2.05	0.56
1:B:84:GLU:HG3	2:B:2113:HOH:O	2.06	0.55
1:B:244[A]:ILE:HD11	1:B:247:THR:CG2	2.37	0.55
1:B:366:THR:HG22	1:B:391[A]:SER:HB2	1.89	0.55
1:A:63:ARG:HG2	1:A:63:ARG:HH11	1.72	0.55
1:A:84:GLU:HG3	2:A:2085:HOH:O	2.07	0.54
1:B:24[A]:ILE:HD11	1:B:27:ILE:HG13	1.89	0.54
1:A:61:PHE:CE1	1:A:218:ALA:HB2	2.43	0.54
1:B:24[A]:ILE:HD11	1:B:27:ILE:CG1	2.38	0.54
1:B:24[A]:ILE:HG23	1:B:242:PHE:O	2.07	0.54
1:A:177:ARG:HD3	1:A:247:THR:HG23	1.90	0.53
1:A:259:MET:HE3	1:A:382:MET:HE2	1.90	0.53
1:A:60:LYS:HD3	1:A:60:LYS:N	2.23	0.53
1:B:292:LEU:HD11	1:B:374:VAL:CG2	2.36	0.53
1:B:323:ASN:ND2	2:B:2368:HOH:O	2.41	0.53
1:A:247:THR:HG21	2:A:2200:HOH:O	2.08	0.53
1:A:80:ASP:O	1:A:84:GLU:HB2	2.09	0.52
1:B:131:HIS:HB2	1:B:191:VAL:HG22	1.90	0.52
1:A:158[B]:SER:OG	1:B:250:THR:HG23	2.10	0.52
1:B:199:THR:HG21	1:B:220:PHE:HB3	1.92	0.52
1:A:91:PHE:HB3	1:A:207:ASN:HB2	1.89	0.52
1:B:242:PHE:CE1	1:B:366:THR:HG23	2.45	0.52

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:258:ALA:CB	1:B:382:MET:HE2	2.40	0.52
1:B:284:ILE:HD11	1:B:376:PHE:CE2	2.44	0.52
1:A:42:ALA:CB	1:A:62:LYS:HG2	2.39	0.52
1:A:193:ILE:O	1:A:226:ALA:HA	2.10	0.52
1:B:34:ASN:HB3	1:B:75:LEU:O	2.09	0.52
1:A:264[A]:ARG:HD3	2:A:2265:HOH:O	2.10	0.51
1:A:19:GLN:HB2	1:A:231:SER:HB3	1.92	0.51
1:A:64:ILE:O	1:A:68:THR:HG23	2.10	0.51
1:A:306:MET:HE1	1:A:389:LEU:HD12	1.93	0.51
1:B:70:ILE:HG21	1:B:73:ARG:HD2	1.93	0.51
1:B:288:ALA:O	1:B:292:LEU:HD13	2.11	0.51
1:B:43:ASP:O	1:B:47:ARG:HB2	2.11	0.51
1:B:60:LYS:HA	1:B:63:ARG:CZ	2.40	0.50
1:A:208:GLU:OE1	1:A:209:ASN:ND2	2.45	0.50
1:B:252[B]:LEU:HD22	1:B:283:ASN:CB	2.41	0.50
1:A:258:ALA:CB	1:A:382:MET:HE3	2.41	0.50
1:A:55:VAL:HG23	2:A:2048:HOH:O	2.10	0.50
1:B:264:ARG:HG3	1:B:264:ARG:HH11	1.77	0.50
1:A:357:ARG:NH2	2:A:2337:HOH:O	2.44	0.50
1:A:323:ASN:HB2	2:A:2151:HOH:O	2.12	0.50
1:B:60:LYS:HA	1:B:63:ARG:NH2	2.27	0.49
1:B:62:LYS:HE3	2:B:2075:HOH:O	2.12	0.49
1:B:209:ASN:OD1	1:B:210:HIS:N	2.45	0.49
1:B:359:MET:HA	1:B:359:MET:HE3	1.93	0.49
1:B:276:VAL:HG13	1:B:382:MET:HE1	1.95	0.49
1:A:304:PHE:CE2	1:A:373:GLY:HA3	2.47	0.49
1:B:18:ALA:N	1:B:184:GLU:O	2.45	0.49
1:A:219:LEU:HB3	2:A:2222:HOH:O	2.12	0.49
1:B:91:PHE:HE1	2:B:2306:HOH:O	1.95	0.49
1:A:384[A]:VAL:HG23	2:A:2243:HOH:O	2.12	0.49
1:B:24[A]:ILE:HD13	1:B:227:LEU:CD2	2.36	0.48
1:B:252[A]:LEU:HG	1:B:283:ASN:CG	2.38	0.48
1:B:66:GLU:OE1	1:B:66:GLU:HA	2.12	0.48
1:B:347:VAL:HB	1:B:375:LEU:HD22	1.95	0.48
1:A:142:MET:CE	1:B:261:LEU:HD22	2.44	0.48
1:A:259:MET:CE	1:A:382:MET:HE2	2.43	0.48
1:A:247:THR:HG22	1:B:160:LYS:HZ3	1.76	0.47
1:A:257:LYS:HA	1:A:260[A]:LYS:HE2	1.95	0.47
1:A:394:VAL:HG11	2:A:2343:HOH:O	2.13	0.47
1:B:207:ASN:ND2	1:B:209:ASN:O	2.48	0.47
1:B:248:ASP:HB3	2:B:2277:HOH:O	2.13	0.47

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:47:ARG:HG3	1:A:52:GLU:CD	2.39	0.47
1:A:285[B]:GLU:CD	1:A:300:TRP:HE1	2.22	0.47
1:A:384[B]:VAL:HG13	1:A:384[B]:VAL:O	2.15	0.47
1:B:306:MET:HG2	1:B:350:ILE:HG22	1.95	0.47
1:B:350:ILE:O	1:B:354:VAL:HG13	2.15	0.47
1:A:19:GLN:HG2	1:A:232:GLY:HA3	1.97	0.46
1:B:34:ASN:O	1:B:74:TYR:HA	2.15	0.46
1:A:149:LEU:HD13	1:A:153:LEU:HD12	1.97	0.46
1:B:24[A]:ILE:O	1:B:24[A]:ILE:HG13	2.15	0.46
1:A:235:LEU:HB2	2:A:2231:HOH:O	2.14	0.46
1:B:168:GLY:HA2	1:B:343[A]:ILE:CD1	2.46	0.46
1:B:236:ALA:N	2:B:2259:HOH:O	2.49	0.46
1:B:347:VAL:O	1:B:351:ILE:HG13	2.15	0.46
1:B:211:LEU:CD1	1:B:214:LEU:HB3	2.45	0.46
1:B:252[A]:LEU:HD22	1:B:382:MET:HG2	1.97	0.46
1:A:361:GLU:OE1	1:A:363:LYS:NZ	2.49	0.46
1:A:276:VAL:HG13	1:A:382:MET:CE	2.41	0.46
1:A:292:LEU:HB3	1:A:297[A]:ILE:CG1	2.43	0.46
1:A:64:ILE:HD13	1:A:215:VAL:HG22	1.97	0.46
1:B:274[B]:ARG:NH2	2:B:2314:HOH:O	2.48	0.46
1:B:363:LYS:HA	1:B:363:LYS:HD3	1.68	0.46
1:B:47:ARG:NH2	1:B:79:GLU:OE2	2.49	0.46
1:A:70:ILE:HG21	1:A:73:ARG:HD2	1.98	0.45
1:A:93:ALA:N	2:A:2093:HOH:O	2.50	0.45
1:B:209:ASN:O	1:B:210:HIS:HB3	2.17	0.45
1:A:63:ARG:HG2	1:A:63:ARG:NH1	2.31	0.45
1:B:60:LYS:HG2	1:B:63:ARG:HH22	1.81	0.45
1:B:226:ALA:C	1:B:227:LEU:HD12	2.42	0.45
1:A:68:THR:O	1:A:69:ALA:HB3	2.16	0.45
1:B:274[A]:ARG:NH1	1:B:275:ASP:OD2	2.49	0.45
1:B:289:GLU:O	1:B:293:SER:HB2	2.17	0.45
1:B:303:VAL:O	1:B:328:LYS:NZ	2.49	0.45
1:B:60:LYS:HZ1	1:B:211:LEU:HD22	1.81	0.45
1:A:167:GLN:HB3	1:A:171:ALA:HB2	1.98	0.45
1:B:164:LEU:HB3	1:B:167:GLN:HG3	1.98	0.45
1:B:274[B]:ARG:HD3	2:B:2318:HOH:O	2.16	0.45
1:A:236:ALA:N	2:A:2232:HOH:O	2.49	0.45
1:B:356:LYS:NZ	2:B:2384:HOH:O	2.49	0.45
1:A:381:GLY:N	1:A:382:MET:HA	2.31	0.45
1:B:69:ALA:HB2	1:B:312:ARG:CZ	2.47	0.45
1:B:44:TYR:O	1:B:48:VAL:HB	2.16	0.45

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:272:LEU:CD2	1:B:276:VAL:HG21	2.47	0.45
1:A:264[A]:ARG:NH1	2:A:2265:HOH:O	2.50	0.44
1:B:252[B]:LEU:HD22	1:B:283:ASN:HB3	1.98	0.44
1:B:347:VAL:HB	1:B:375:LEU:CD2	2.48	0.44
1:A:18:ALA:HB1	1:A:19:GLN:CD	2.43	0.44
1:A:86:PRO:O	1:A:89:CYS:HB2	2.18	0.44
1:B:326:GLU:CB	2:B:2371:HOH:O	2.66	0.44
1:A:93:ALA:HB1	1:A:94:PRO:HD2	2.00	0.44
1:A:52:GLU:HB2	2:A:2044:HOH:O	2.17	0.43
1:B:22:ALA:O	1:B:244[A]:ILE:HG22	2.18	0.43
1:B:306:MET:HB2	1:B:375:LEU:HB2	1.99	0.43
1:A:213:SER:HB2	2:A:2274:HOH:O	2.18	0.43
1:B:64:ILE:O	1:B:68:THR:HG23	2.19	0.43
1:B:75:LEU:N	1:B:75:LEU:HD12	2.32	0.43
1:A:226:ALA:C	1:A:227:LEU:HD12	2.44	0.43
1:B:74:TYR:O	1:B:222:ASP:HB2	2.19	0.43
1:A:357:ARG:HD3	1:A:357:ARG:HA	1.85	0.43
1:B:258:ALA:HB1	1:B:382:MET:HE2	2.01	0.43
1:A:72:LYS:NZ	2:A:2067:HOH:O	2.49	0.43
1:A:393:ARG:HE	1:A:393:ARG:HB3	1.44	0.43
1:B:83:GLN:NE2	1:B:83:GLN:HA	2.26	0.43
1:A:256:GLU:HA	1:A:381:GLY:O	2.20	0.42
1:B:47:ARG:HH22	1:B:79:GLU:CD	2.27	0.42
1:B:60:LYS:HZ2	1:B:211:LEU:HD22	1.84	0.42
1:B:382:MET:HE2	1:B:382:MET:HB2	1.78	0.42
1:A:64:ILE:O	1:A:67:LYS:HG3	2.19	0.42
1:A:91:PHE:O	1:A:92:MET:HB2	2.20	0.42
1:A:19:GLN:HE21	1:A:231:SER:C	2.26	0.42
1:B:261:LEU:HD23	1:B:268:LEU:HD11	2.01	0.42
1:A:55:VAL:HG13	1:A:56:ASP:N	2.35	0.42
1:A:297[A]:ILE:HG13	1:A:297[A]:ILE:O	2.20	0.42
1:B:253:PRO:O	1:B:254:ASP:HB2	2.20	0.42
1:A:273:HIS:CD2	1:A:275:ASP:HB2	2.55	0.42
1:B:292:LEU:HD12	1:B:292:LEU:N	2.35	0.42
1:A:252:LEU:HD13	1:A:384[A]:VAL:HG13	2.02	0.42
1:B:197:GLU:OE2	1:B:344:SER:OG	2.29	0.42
1:B:62:LYS:HE2	1:B:62:LYS:HB3	1.89	0.41
1:A:44:TYR:O	1:A:48:VAL:HG22	2.20	0.41
1:A:330:ARG:HH11	1:A:330:ARG:CG	2.31	0.41
1:B:87:THR:OG1	1:B:93:ALA:HB1	2.21	0.41
1:B:91:PHE:HZ	2:B:2246:HOH:O	2.03	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:142:MET:CE	1:B:166:GLN:HE21	2.25	0.41
1:A:328:LYS:HA	1:A:328:LYS:HD2	1.88	0.41
1:A:43:ASP:O	1:A:47:ARG:HD2	2.21	0.41
1:A:64:ILE:HG23	1:A:67:LYS:HE3	2.03	0.41
1:A:330:ARG:HG3	1:A:330:ARG:NH1	2.29	0.41
1:A:273:HIS:HD2	1:A:275:ASP:HB2	1.84	0.41
1:A:330:ARG:NH2	1:A:353:GLU:OE2	2.50	0.41
1:B:87:THR:HG21	1:B:94:PRO:O	2.21	0.41
1:B:328:LYS:HZ3	1:B:328:LYS:HG3	1.75	0.41
1:B:44:TYR:CE1	1:B:48:VAL:HG21	2.55	0.41
1:B:57:LEU:HD11	1:B:214:LEU:HD22	2.03	0.41
1:B:291:ALA:HB3	1:B:292:LEU:HD12	2.03	0.41
1:B:152:LEU:HD12	1:B:152:LEU:HA	1.89	0.41
1:B:208:GLU:HB2	2:B:2244:HOH:O	2.21	0.41
1:A:135:CYS:O	1:A:195:CYS:HA	2.20	0.40
1:B:306:MET:HE1	1:B:389:LEU:HD23	2.03	0.40
1:B:304:PHE:O	1:B:373:GLY:HA2	2.20	0.40
1:A:343[A]:ILE:HG12	1:A:344:SER:N	2.36	0.40
1:A:272:LEU:CD2	1:A:276:VAL:HG21	2.52	0.40
1:A:330:ARG:HG3	1:A:331:ALA:N	2.37	0.40
1:B:167:GLN:HB3	1:B:171:ALA:HB2	2.03	0.40
1:B:300:TRP:O	1:B:303:VAL:HG22	2.21	0.40
1:B:250:THR:HG22	2:B:2279:HOH:O	2.21	0.40
1:B:381:GLY:N	1:B:382:MET:HA	2.36	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	382/402 (95%)	369 (97%)	7 (2%)	6 (2%)	7 4

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	380/402 (94%)	365 (96%)	11 (3%)	4 (1%)	11	8
All	All	762/804 (95%)	734 (96%)	18 (2%)	10 (1%)	11	6

All (10) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	92	MET
1	A	208	GLU
1	A	236	ALA
1	B	236	ALA
1	A	343[A]	ILE
1	A	343[B]	ILE
1	B	212	ASP
1	B	343[A]	ILE
1	B	343[B]	ILE
1	A	235	LEU

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	318/328 (97%)	265 (83%)	53 (17%)	2	1
1	B	316/328 (96%)	252 (80%)	64 (20%)	1	0
All	All	634/656 (97%)	517 (82%)	117 (18%)	2	1

All (117) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	27	ILE
1	A	47	ARG
1	A	60	LYS
1	A	62	LYS
1	A	63	ARG
1	A	66	GLU

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	71	LYS
1	A	77	LEU
1	A	83	GLN
1	A	84	GLU
1	A	90	GLU
1	A	109	MET
1	A	112	LYS
1	A	132	LEU
1	A	149	LEU
1	A	150	VAL
1	A	151	LYS
1	A	152	LEU
1	A	164	LEU
1	A	187	LYS
1	A	201	ILE
1	A	202	LEU
1	A	208	GLU
1	A	209	ASN
1	A	212	ASP
1	A	235	LEU
1	A	247	THR
1	A	250	THR
1	A	251	ILE
1	A	252	LEU
1	A	259	MET
1	A	260[A]	LYS
1	A	260[B]	LYS
1	A	271	GLN
1	A	272	LEU
1	A	278	LEU
1	A	285[A]	GLU
1	A	285[B]	GLU
1	A	295	LEU
1	A	297[A]	ILE
1	A	297[B]	ILE
1	A	306	MET
1	A	325	LYS
1	A	326	GLU
1	A	327	ASP
1	A	330	ARG
1	A	335	VAL
1	A	370	LEU

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	375	LEU
1	A	384[A]	VAL
1	A	384[B]	VAL
1	A	387	VAL
1	A	393	ARG
1	B	24[A]	ILE
1	B	24[B]	ILE
1	B	48	VAL
1	B	52	GLU
1	B	55	VAL
1	B	57	LEU
1	B	59	GLU
1	B	60	LYS
1	B	62	LYS
1	B	71	LYS
1	B	75	LEU
1	B	77	LEU
1	B	78	THR
1	B	83	GLN
1	B	87	THR
1	B	90	GLU
1	B	91	PHE
1	B	92	MET
1	B	102	LEU
1	B	104	VAL
1	B	105	THR
1	B	109	MET
1	B	112	LYS
1	B	132	LEU
1	B	149	LEU
1	B	150	VAL
1	B	151	LYS
1	B	152	LEU
1	B	164	LEU
1	B	187	LYS
1	B	202	LEU
1	B	211	LEU
1	B	215	VAL
1	B	235	LEU
1	B	239	ARG
1	B	244[A]	ILE
1	B	244[B]	ILE

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	B	252[A]	LEU
1	B	252[B]	LEU
1	B	257	LYS
1	B	259	MET
1	B	264	ARG
1	B	268	LEU
1	B	269	THR
1	B	271	GLN
1	B	272	LEU
1	B	295	LEU
1	B	312	ARG
1	B	321	LYS
1	B	323	ASN
1	B	324	LEU
1	B	328	LYS
1	B	335	VAL
1	B	343[A]	ILE
1	B	343[B]	ILE
1	B	354	VAL
1	B	355	ARG
1	B	357[A]	ARG
1	B	357[B]	ARG
1	B	366	THR
1	B	370	LEU
1	B	375	LEU
1	B	382	MET
1	B	389	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	209	ASN
1	A	273	HIS
1	B	34	ASN
1	B	83	GLN
1	B	166	GLN
1	B	271	GLN
1	B	273	HIS
1	B	286	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

2 non-standard protein/DNA/RNA residues are modelled in this entry.

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	$\# Z > 2$
1	CSD	A	169	1	4,7,8	3.78	3 (75%)	1,8,10	2.48	1 (100%)
1	CSD	B	169	1	4,7,8	5.94	3 (75%)	1,8,10	2.47	1 (100%)

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
1	CSD	A	169	1	-	0/2/6/8	-
1	CSD	B	169	1	-	0/2/6/8	-

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	169	CSD	OD1-SG	-10.00	1.38	1.47
1	B	169	CSD	CA-N	-5.83	1.31	1.48
1	A	169	CSD	CA-N	-5.20	1.33	1.48
1	A	169	CSD	OD1-SG	5.08	1.52	1.47
1	B	169	CSD	O-C	2.45	1.29	1.20
1	A	169	CSD	O-C	2.04	1.27	1.20

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	169	CSD	OD1-SG-CB	2.48	110.17	105.60

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed($^{\circ}$)	Ideal($^{\circ}$)
1	B	169	CSD	OD1-SG-CB	2.47	110.15	105.60

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	B	169	CSD	1	0

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 [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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	377/402 (93%)	-0.39	8 (2%) 63 66	8, 25, 67, 126	7 (1%)
1	B	375/402 (93%)	-0.53	7 (1%) 66 69	8, 23, 59, 135	7 (1%)
All	All	752/804 (93%)	-0.46	15 (1%) 65 67	8, 24, 64, 135	14 (1%)

All (15) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	18	ALA	6.3
1	A	91	PHE	5.6
1	B	209	ASN	5.3
1	A	19	GLN	4.9
1	B	210	HIS	3.9
1	A	209	ASN	3.8
1	B	211	LEU	3.8
1	A	210	HIS	3.4
1	A	18	ALA	3.4
1	A	47	ARG	2.6
1	A	211	LEU	2.6
1	A	395	THR	2.4
1	B	91	PHE	2.4
1	B	212	ASP	2.3
1	B	93	ALA	2.1

6.2 Non-standard residues in protein, DNA, RNA chains [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($\text{\AA}^2$)	Q<0.9
1	CSD	A	169	8/9	0.98	0.05	14,20,27,34	0
1	CSD	B	169	8/9	0.98	0.04	14,15,23,37	0

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.