



Full wwPDB X-ray Structure Validation Report ⓘ

Sep 24, 2025 – 01:41 am BST

PDB ID : 5FO9 / pdb_00005fo9
Title : Crystal Structure of Human Complement C3b in Complex with CR1 (CCP15-17)
Authors : Forneris, F.; Wu, J.; Xue, X.; Gros, P.
Deposited on : 2015-11-18
Resolution : 3.30 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 : 1.8.4, CSD as541be (2020)
Xtriage (Phenix) : 2.0
EDS : 3.0
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
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) : 2.46

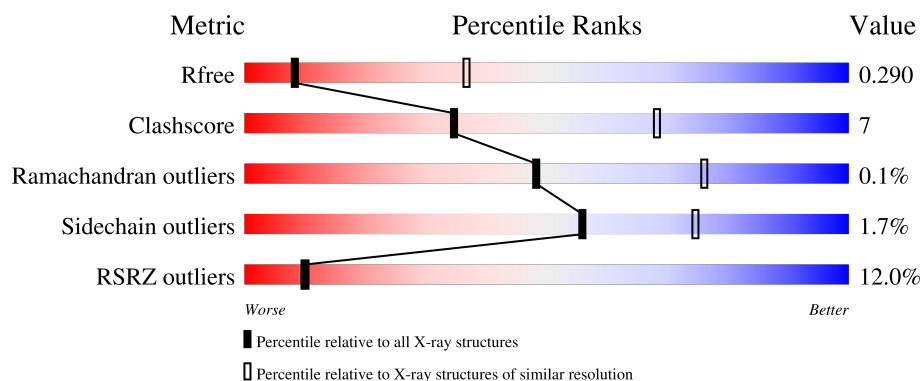
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.30 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}	164625	1085 (3.32-3.28)
Clashscore	180529	1128 (3.32-3.28)
Ramachandran outliers	177936	1125 (3.32-3.28)
Sidechain outliers	177891	1124 (3.32-3.28)
RSRZ outliers	164620	1085 (3.32-3.28)

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	645	7% 76% 22% .
1	D	645	8% 79% 20% .
2	B	915	15% 82% 17% .
2	E	915	10% 79% 19% .
3	C	196	20% 76% 22% ..

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Mol	Chain	Length	Quality of chain
3	F	196	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
4	NAG	A	1063	X	-	-	-

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 27406 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 COMPLEMENT C3 BETA CHAIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	642	Total	C	N	O	S	0	0	0
			5007	3187	848	957	15			
1	D	642	Total	C	N	O	S	0	0	0
			5007	3187	848	957	15			

- Molecule 2 is a protein called COMPLEMENT C3B ALPHA' CHAIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	903	Total	C	N	O	S	0	0	0
			7208	4568	1212	1391	37			
2	E	903	Total	C	N	O	S	0	0	0
			7208	4568	1212	1391	37			

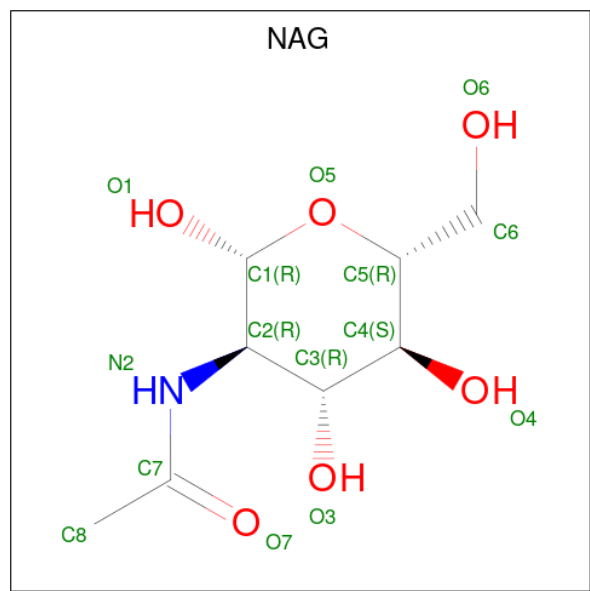
There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	1013	GLU	GLN	SEE REMARK 999	UNP P01024
E	1013	GLU	GLN	SEE REMARK 999	UNP P01024

- Molecule 3 is a protein called COMPLEMENT RECEPTOR TYPE 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	C	194	Total	C	N	O	S	0	0	1
			1474	925	258	278	13			
3	F	194	Total	C	N	O	S	0	0	1
			1474	925	258	278	13			

- Molecule 4 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula: C₈H₁₅NO₆).

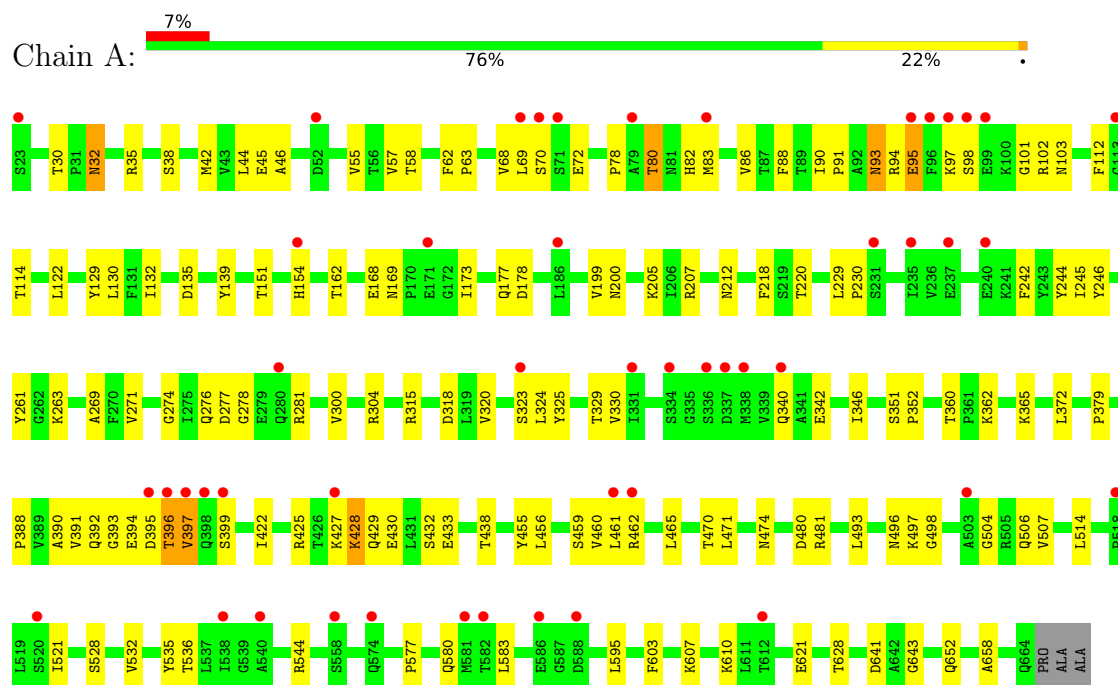


Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	1	Total	C	N	O	0	0
			14	8	1	5		
4	D	1	Total	C	N	O	0	0
			14	8	1	5		

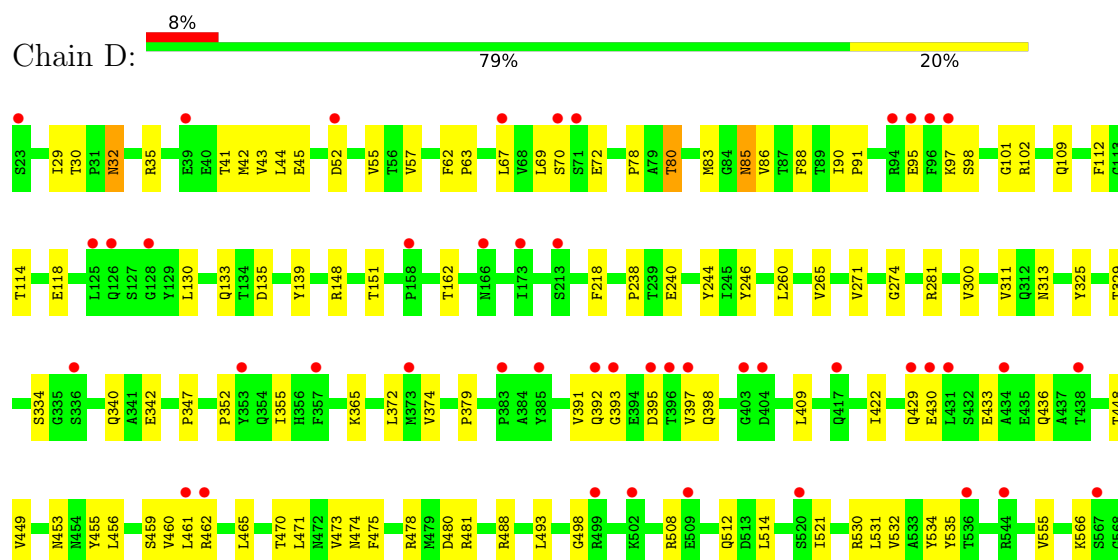
3 Residue-property plots

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: COMPLEMENT C3 BETA CHAIN

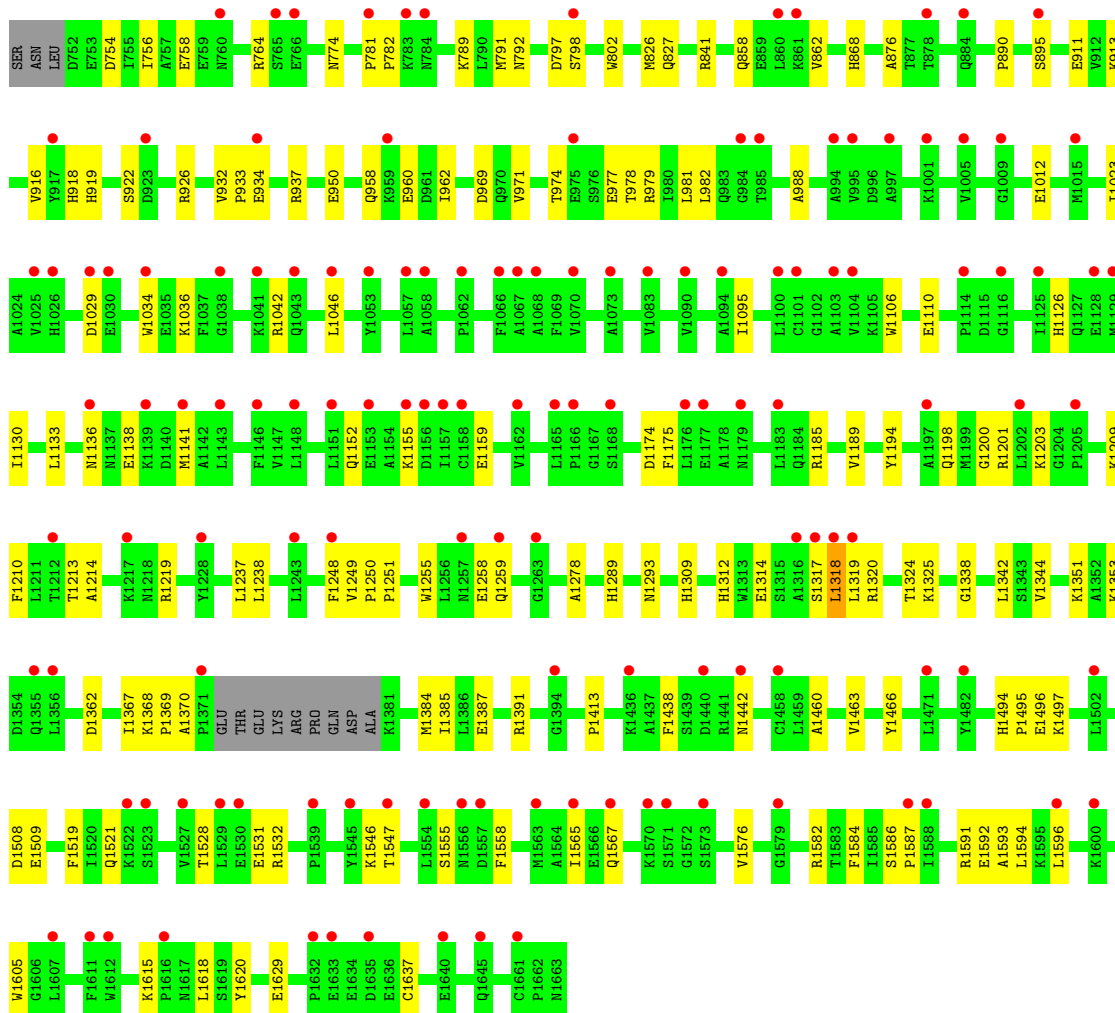
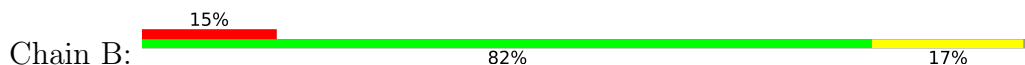


• Molecule 1: COMPLEMENT C3 BETA CHAIN

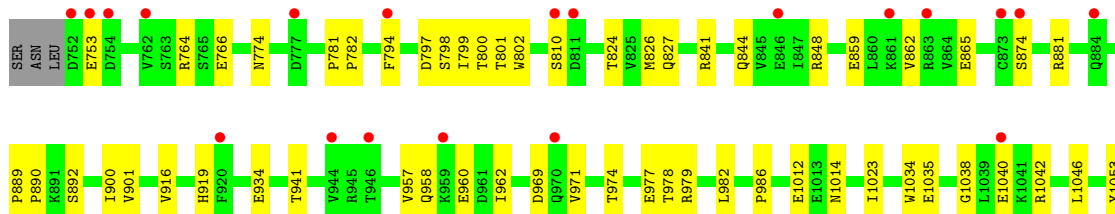
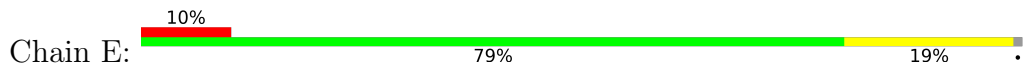


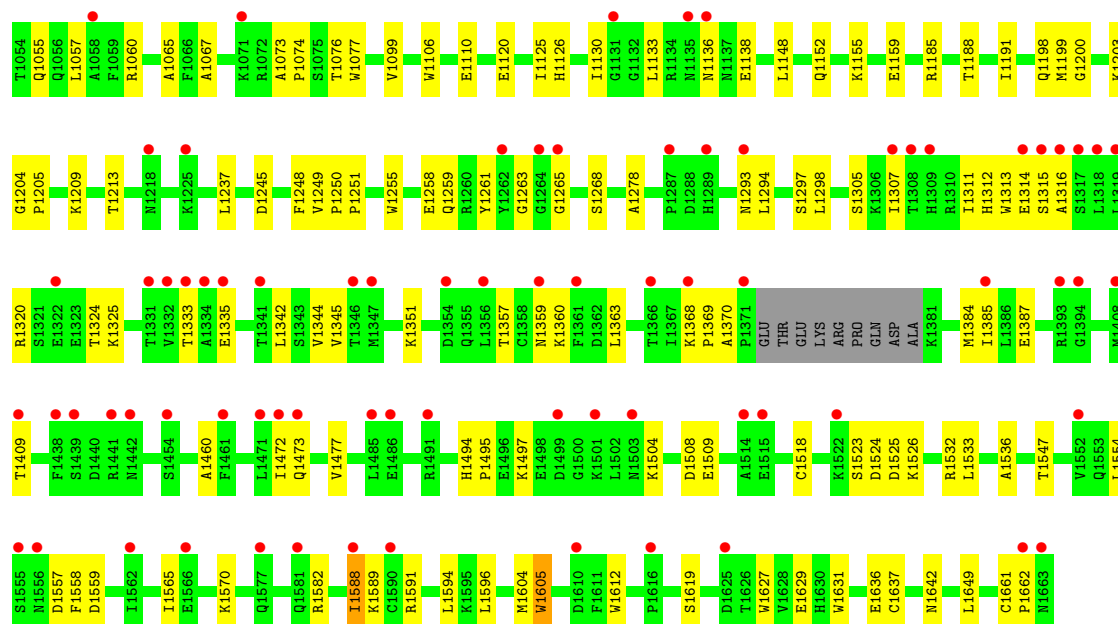


• Molecule 2: COMPLEMENT C3B ALPHA' CHAIN

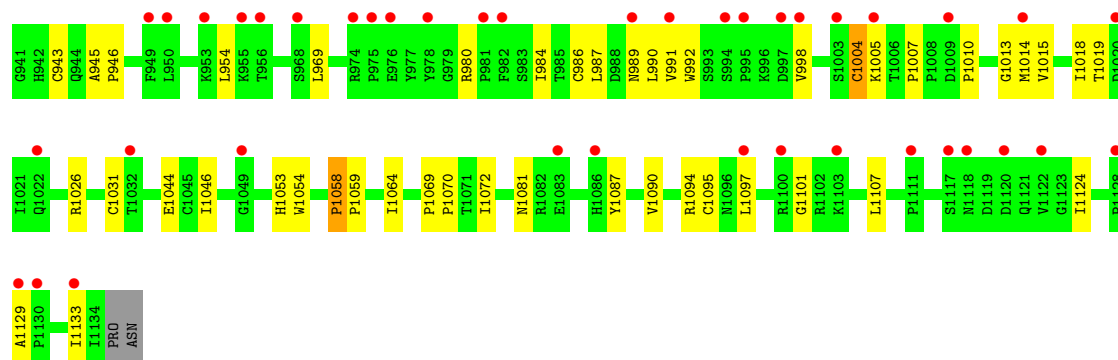
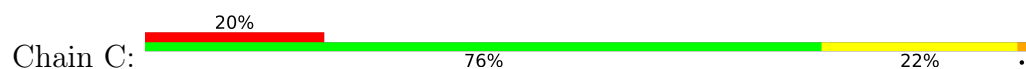


• Molecule 2: COMPLEMENT C3B ALPHA' CHAIN

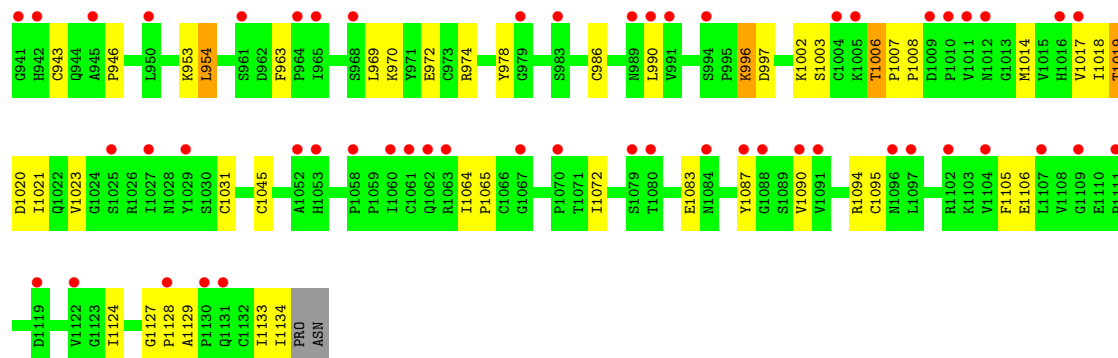
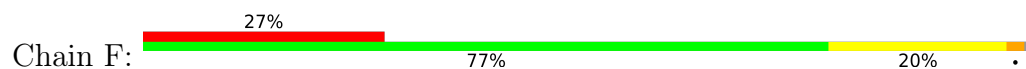




• Molecule 3: COMPLEMENT RECEPTOR TYPE 1



• Molecule 3: COMPLEMENT RECEPTOR TYPE 1



4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α , β , γ	104.32Å 113.71Å 138.52Å 82.74° 71.77° 80.95°	Depositor
Resolution (Å)	60.15 – 3.30 60.15 – 3.30	Depositor EDS
% Data completeness (in resolution range)	98.4 (60.15-3.30) 93.2 (60.15-3.30)	Depositor EDS
R_{merge}	0.16	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.23 (at 3.33Å)	Xtriage
Refinement program	PHENIX (PHENIX.REFINE)	Depositor
R, R_{free}	0.251 , 0.291 0.253 , 0.290	Depositor DCC
R_{free} test set	4424 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å ²)	62.8	Xtriage
Anisotropy	0.156	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.28 , 103.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.44$, $\langle L^2 \rangle = 0.26$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.85	EDS
Total number of atoms	27406	wwPDB-VP
Average B, all atoms (Å ²)	142.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 8.27% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

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

5 Model quality

5.1 Standard geometry

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

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	0.29	0/5108	0.80	1/6940 (0.0%)
1	D	0.29	0/5108	0.78	2/6940 (0.0%)
2	B	0.29	0/7352	0.76	5/9955 (0.1%)
2	E	0.29	0/7352	0.75	3/9955 (0.0%)
3	C	0.38	1/1515 (0.1%)	0.90	3/2066 (0.1%)
3	F	0.38	1/1515 (0.1%)	0.95	7/2066 (0.3%)
All	All	0.30	2/27950 (0.0%)	0.79	21/37922 (0.1%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	F	1133	ILE	C-N	-6.97	1.23	1.33
3	C	1133	ILE	C-N	-6.97	1.23	1.33

All (21) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	E	1588	ILE	N-CA-C	-7.50	99.83	109.80
3	C	1058	PRO	CA-C-N	7.45	127.36	120.21
3	C	1058	PRO	C-N-CA	7.45	127.36	120.21
1	D	395	ASP	N-CA-C	6.02	117.84	111.28
2	B	1593	ALA	N-CA-C	-5.98	104.70	112.23
2	B	1250	PRO	N-CA-C	5.85	117.84	110.70
1	D	80	THR	N-CA-C	-5.77	105.90	113.17
3	F	1129	ALA	N-CA-C	5.74	120.04	112.35
3	F	1019	THR	CB-CA-C	-5.62	110.11	116.63
3	F	1105	PHE	CB-CA-C	-5.54	109.20	115.79
2	E	1250	PRO	N-CA-C	5.50	117.41	110.70
2	B	1136	ASN	N-CA-C	5.46	116.97	110.19
3	F	1006	THR	CA-C-N	-5.34	114.88	120.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	F	1006	THR	C-N-CA	-5.34	114.88	120.38
2	E	1508	ASP	CB-CA-C	-5.32	110.42	116.54
2	B	1508	ASP	CB-CA-C	-5.19	110.57	116.54
3	C	1129	ALA	N-CA-C	5.17	119.28	112.35
2	B	1249	VAL	N-CA-C	5.12	118.50	112.35
1	A	80	THR	N-CA-C	-5.05	106.81	113.17
3	F	996	LYS	CA-C-N	-5.04	113.45	122.32
3	F	996	LYS	C-N-CA	-5.04	113.45	122.32

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	5007	0	5064	91	0
1	D	5007	0	5063	81	0
2	B	7208	0	7128	90	0
2	E	7208	0	7130	125	0
3	C	1474	0	1407	24	0
3	F	1474	0	1407	23	0
4	A	14	0	13	0	0
4	D	14	0	12	1	0
All	All	27406	0	27224	404	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 7.

All (404) 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)
2:E:1554:LEU:CD2	2:E:1591:ARG:HH11	1.39	1.33
2:E:1554:LEU:CD1	2:E:1591:ARG:HH12	1.49	1.24
2:E:1559:ASP:OD2	2:E:1591:ARG:CG	1.90	1.19
2:E:1554:LEU:CD1	2:E:1591:ARG:NH1	2.05	1.19

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:1559:ASP:CG	2:E:1591:ARG:HD3	1.68	1.18
2:E:1554:LEU:HD13	2:E:1591:ARG:NH1	1.57	1.17
2:E:1554:LEU:HD22	2:E:1591:ARG:HH11	1.01	1.07
2:E:1554:LEU:CD2	2:E:1591:ARG:NH1	2.17	1.07
2:E:1559:ASP:OD2	2:E:1591:ARG:HG3	1.59	1.02
2:E:1554:LEU:HD22	2:E:1591:ARG:NH1	1.74	1.02
2:E:1559:ASP:OD1	2:E:1591:ARG:HD3	1.64	0.94
2:E:1554:LEU:HD13	2:E:1591:ARG:HH12	0.76	0.91
2:E:1559:ASP:CG	2:E:1591:ARG:CD	2.44	0.90
2:E:1559:ASP:OD2	2:E:1591:ARG:CD	2.28	0.82
2:E:1559:ASP:OD2	2:E:1591:ARG:HG2	1.82	0.80
1:A:365:LYS:HD3	1:A:455:TYR:HB3	1.63	0.80
1:A:461:LEU:HB2	1:D:461:LEU:HD12	1.69	0.75
2:E:1554:LEU:HD21	2:E:1591:ARG:HH11	1.45	0.75
2:E:1559:ASP:OD2	2:E:1591:ARG:HD3	1.89	0.73
1:A:168:GLU:HB2	1:A:205:LYS:HG3	1.72	0.72
2:E:1554:LEU:CG	2:E:1591:ARG:NH1	2.52	0.72
1:A:462:ARG:NH2	1:A:470:THR:O	2.18	0.71
1:D:41:THR:HG21	4:D:1063:NAG:H82	1.73	0.70
1:D:260:LEU:HB3	2:E:800:THR:HG23	1.74	0.70
1:A:456:LEU:HB2	1:A:535:TYR:HE2	1.57	0.69
1:D:462:ARG:NH2	1:D:470:THR:O	2.23	0.69
2:E:774:ASN:ND2	3:F:1014:MET:SD	2.65	0.69
2:B:1594:LEU:HB3	2:B:1596:LEU:HG	1.75	0.68
2:E:1554:LEU:HD11	2:E:1591:ARG:NH1	2.06	0.68
1:A:480:ASP:HA	1:D:481:ARG:HH22	1.58	0.67
2:B:1155:LYS:O	2:B:1159:GLU:N	2.27	0.66
2:E:1294:LEU:HB2	2:E:1311:ILE:HB	1.78	0.66
2:B:841:ARG:HH12	2:B:1509:GLU:HB3	1.59	0.66
2:B:862:VAL:HG22	2:B:916:VAL:HG12	1.76	0.66
1:A:460:VAL:HG13	1:A:471:LEU:HD11	1.79	0.65
3:C:1004:CYS:O	3:C:1054:TRP:NE1	2.29	0.64
2:B:774:ASN:ND2	3:C:1014:MET:SD	2.70	0.64
2:E:764:ARG:HB3	2:E:797:ASP:HB3	1.80	0.64
2:E:1594:LEU:HB3	2:E:1596:LEU:HG	1.80	0.64
2:B:1528:THR:H	2:B:1531:GLU:HG3	1.63	0.63
1:A:30:THR:HG22	1:A:42:MET:HG3	1.80	0.63
2:E:1298:LEU:HB2	2:E:1307:ILE:HB	1.81	0.63
1:A:103:ASN:ND2	1:A:658:ALA:O	2.31	0.62
1:A:135:ASP:OD1	1:A:139:TYR:OH	2.12	0.62
1:A:394:GLU:HG3	1:A:397:VAL:HG12	1.82	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:1312:HIS:N	2:E:1315:SER:OG	2.31	0.62
1:D:271:VAL:HG21	1:D:300:VAL:HG11	1.81	0.61
3:C:984:ILE:HD12	3:C:992:TRP:HB3	1.81	0.61
1:A:465:LEU:HD11	1:A:521:ILE:HG13	1.82	0.60
2:E:1200:GLY:O	2:E:1203:LYS:NZ	2.33	0.60
1:A:315:ARG:NH2	1:A:318:ASP:OD1	2.34	0.60
2:B:754:ASP:H	3:C:980:ARG:HH12	1.49	0.60
2:B:1012:GLU:OE1	2:B:1126:HIS:ND1	2.25	0.60
1:A:432:SER:OG	1:A:433:GLU:N	2.27	0.59
2:E:1636:GLU:O	2:E:1642:ASN:ND2	2.35	0.59
2:E:1532:ARG:NH2	2:E:1629:GLU:OE2	2.33	0.59
1:D:448:THR:HG21	1:D:453:ASN:H	1.68	0.59
2:E:794:PHE:HE2	3:F:1006:THR:HG23	1.67	0.59
2:B:1494:HIS:HB3	2:B:1497:LYS:HB2	1.84	0.59
2:B:950:GLU:OE2	2:B:1338:GLY:N	2.31	0.59
1:A:177:GLN:NE2	2:B:1319:LEU:O	2.36	0.58
2:B:1362:ASP:OD2	2:B:1391:ARG:NH2	2.36	0.58
1:D:162:THR:HG23	3:F:1090:VAL:HG11	1.83	0.58
1:D:465:LEU:HD21	1:D:521:ILE:HG21	1.85	0.58
1:A:245:ILE:O	1:A:304:ARG:NE	2.28	0.58
2:B:971:VAL:O	2:B:974:THR:OG1	2.21	0.58
1:A:162:THR:HG23	3:C:1090:VAL:HG11	1.84	0.58
2:E:971:VAL:O	2:E:974:THR:OG1	2.22	0.57
1:D:456:LEU:HB2	1:D:535:TYR:HE2	1.69	0.57
2:B:1130:ILE:HD12	2:B:1133:LEU:HB2	1.87	0.57
1:A:178:ASP:OD1	3:C:1081:ASN:ND2	2.38	0.57
2:B:1130:ILE:HB	2:B:1133:LEU:HD12	1.86	0.57
2:E:1588:ILE:O	2:E:1589:LYS:HG2	2.05	0.56
1:D:32:ASN:HB2	1:D:643:GLY:C	2.31	0.56
2:E:1557:ASP:N	2:E:1557:ASP:OD1	2.38	0.56
1:A:83:MET:HE1	1:A:504:GLY:HA2	1.88	0.56
1:A:97:LYS:HB3	1:A:98:SER:HB3	1.88	0.56
3:C:1010:PRO:HG2	3:C:1013:GLY:HA3	1.87	0.56
1:D:45:GLU:HG2	1:D:83:MET:HG3	1.87	0.56
1:D:30:THR:HG22	1:D:42:MET:HG3	1.87	0.56
2:B:764:ARG:HB3	2:B:797:ASP:HB3	1.87	0.55
1:A:263:LYS:HE2	2:B:826:MET:HE1	1.87	0.55
2:E:1612:TRP:HB3	2:E:1619:SER:HB2	1.89	0.55
3:C:1026:ARG:HG2	3:C:1044:GLU:HG2	1.87	0.55
1:A:94:ARG:HB2	1:A:212:ASN:HA	1.87	0.54
3:C:1004:CYS:HB3	3:C:1054:TRP:CE2	2.42	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:57:VAL:HB	1:A:72:GLU:HB2	1.87	0.54
2:B:1189:VAL:HG12	2:B:1210:PHE:HD1	1.73	0.54
2:B:1370:ALA:HB2	2:B:1385:ILE:HG13	1.89	0.54
1:D:97:LYS:HE2	2:E:1313:TRP:HZ3	1.73	0.54
2:B:1141:MET:HG2	2:B:1175:PHE:HE2	1.74	0.54
1:A:528:SER:OG	1:A:621:GLU:OE2	2.25	0.53
1:D:397:VAL:O	1:D:398:GLN:HG2	2.07	0.53
3:C:1004:CYS:O	3:C:1005:LYS:HG2	2.07	0.53
2:E:986:PRO:HG3	2:E:1316:ALA:HB1	1.90	0.53
2:E:1067:ALA:HB2	2:E:1074:PRO:HA	1.90	0.53
2:B:1494:HIS:O	2:B:1496:GLU:HA	2.09	0.53
2:B:962:ILE:HD13	2:B:1344:VAL:HG21	1.90	0.53
1:D:98:SER:OG	1:D:101:GLY:O	2.23	0.53
3:F:953:LYS:N	3:F:972:GLU:O	2.22	0.53
1:A:57:VAL:HG21	1:A:86:VAL:HG21	1.91	0.53
2:B:1615:LYS:HG2	2:B:1618:LEU:HD11	1.90	0.52
2:E:957:VAL:HG22	2:E:1335:GLU:HG3	1.91	0.52
2:E:1148:LEU:HD21	2:E:1199:MET:HE3	1.91	0.52
1:A:388:PRO:HD2	1:A:428:LYS:HG2	1.90	0.52
2:B:1546:LYS:HB3	2:B:1567:GLN:HG2	1.92	0.52
2:E:1631:TRP:CD2	2:E:1649:LEU:HD13	2.44	0.52
2:B:1314:GLU:OE1	2:B:1314:GLU:N	2.42	0.52
1:D:599:ASP:OD1	2:E:800:THR:HG21	2.08	0.52
2:E:977:GLU:OE2	2:E:979:ARG:NH2	2.42	0.52
3:F:943:CYS:HB3	3:F:990:LEU:HA	1.91	0.52
2:B:934:GLU:OE2	2:B:1353:LYS:HG2	2.10	0.52
3:C:987:LEU:N	3:C:991:VAL:O	2.40	0.52
1:A:242:PHE:HB3	1:A:379:PRO:HG2	1.91	0.52
1:A:199:VAL:O	2:B:937:ARG:NH1	2.43	0.52
2:E:1130:ILE:HD12	2:E:1133:LEU:HB2	1.92	0.52
1:A:459:SER:OG	1:A:474:ASN:HB2	2.10	0.51
2:B:916:VAL:HG23	2:B:919:HIS:HB2	1.92	0.51
2:E:1305:SER:HB3	3:F:1083:GLU:OE2	2.10	0.51
1:A:456:LEU:HB2	1:A:535:TYR:CE2	2.43	0.51
1:A:595:LEU:HB2	2:B:774:ASN:HB2	1.91	0.51
2:B:754:ASP:H	3:C:980:ARG:NH1	2.09	0.51
3:C:1097:LEU:O	3:C:1101:GLY:HA2	2.10	0.51
2:E:1384:MET:HE1	2:E:1495:PRO:HB3	1.93	0.51
1:D:29:ILE:HB	1:D:43:VAL:HB	1.91	0.51
1:D:653:GLN:HE22	2:E:1040:GLU:HG2	1.76	0.51
1:A:394:GLU:HG2	1:A:396:THR:C	2.36	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:1495:PRO:HA	2:B:1496:GLU:HG2	1.92	0.51
2:E:1136:ASN:C	2:E:1138:GLU:H	2.17	0.51
1:D:97:LYS:HB3	1:D:98:SER:HB3	1.93	0.51
2:E:859:GLU:HB3	2:E:890:PRO:HD3	1.91	0.51
2:E:1076:THR:N	2:E:1120:GLU:OE1	2.43	0.51
2:B:911:GLU:HB2	2:B:926:ARG:HG3	1.93	0.50
1:A:32:ASN:HB2	1:A:643:GLY:C	2.37	0.50
2:B:1209:LYS:O	2:B:1213:THR:OG1	2.28	0.50
2:B:1387:GLU:HG3	2:B:1460:ALA:HB2	1.94	0.50
2:E:862:VAL:HG22	2:E:916:VAL:HG12	1.93	0.50
2:E:982:LEU:HB2	2:E:1320:ARG:HB2	1.93	0.50
2:E:1012:GLU:OE1	2:E:1126:HIS:ND1	2.24	0.50
2:E:1034:TRP:O	2:E:1038:GLY:N	2.43	0.50
2:E:800:THR:HG22	2:E:801:THR:N	2.27	0.50
2:B:1547:THR:HG22	2:B:1565:ILE:HG12	1.94	0.49
1:A:583:LEU:N	2:B:791:MET:O	2.42	0.49
2:B:756:ILE:HD12	2:B:922:SER:HB3	1.94	0.49
3:F:1018:ILE:HG22	3:F:1019:THR:HG23	1.94	0.49
1:D:329:THR:HG23	1:D:340:GLN:HG2	1.93	0.49
2:E:1136:ASN:OD1	2:E:1185:ARG:NH1	2.45	0.49
2:E:1209:LYS:O	2:E:1213:THR:OG1	2.31	0.49
1:D:493:LEU:HB2	1:D:532:VAL:HG22	1.95	0.49
2:E:800:THR:HG22	2:E:801:THR:H	1.78	0.49
2:E:1237:LEU:HD23	2:E:1278:ALA:HB1	1.94	0.49
3:F:953:LYS:HE3	3:F:974:ARG:HG3	1.94	0.49
2:E:1315:SER:HB2	2:E:1320:ARG:HH12	1.77	0.48
1:D:459:SER:OG	1:D:474:ASN:HB2	2.14	0.48
1:A:94:ARG:HG3	1:A:95:GLU:N	2.28	0.48
3:C:987:LEU:HD23	3:C:989:ASN:HB2	1.95	0.48
1:D:650:SER:HB2	1:D:652:GLN:OE1	2.14	0.48
1:A:101:GLY:HA3	1:A:102:ARG:HA	1.63	0.48
2:B:988:ALA:HA	2:B:1289:HIS:HA	1.94	0.48
1:D:109:GLN:HG3	1:D:118:GLU:HB3	1.95	0.48
1:D:397:VAL:HG12	1:D:409:LEU:HD22	1.96	0.48
1:D:508:ARG:NE	1:D:512:GLN:O	2.46	0.48
1:A:580:GLN:NE2	2:B:792:ASN:OD1	2.46	0.48
1:D:429:GLN:O	1:D:430:GLU:HG2	2.12	0.48
1:A:429:GLN:O	1:A:430:GLU:HG2	2.12	0.48
2:B:981:LEU:HB3	2:B:1319:LEU:HD11	1.95	0.48
1:D:372:LEU:HD21	1:D:422:ILE:HD13	1.95	0.48
2:E:874:SER:HB3	2:E:900:ILE:HG22	1.94	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:103:ASN:HB3	1:A:122:LEU:HD11	1.96	0.48
1:A:396:THR:O	1:A:397:VAL:HB	2.14	0.48
2:B:1237:LEU:HD23	2:B:1278:ALA:HB1	1.95	0.47
2:B:798:SER:HB3	2:B:802:TRP:HZ2	1.79	0.47
1:D:62:PHE:HA	1:D:63:PRO:HA	1.77	0.47
1:D:244:TYR:CE2	1:D:246:TYR:HB2	2.49	0.47
2:E:766:GLU:O	2:E:797:ASP:HB2	2.14	0.47
2:E:969:ASP:O	2:E:1351:LYS:N	2.44	0.47
2:E:1494:HIS:ND1	2:E:1495:PRO:HD2	2.30	0.47
1:D:334:SER:O	2:E:848:ARG:NH1	2.46	0.47
2:E:1314:GLU:OE1	2:E:1314:GLU:N	2.44	0.47
3:C:1064:ILE:HB	3:C:1087:TYR:HB2	1.96	0.47
1:D:69:LEU:HD13	1:D:88:PHE:HB2	1.97	0.47
1:D:566:LYS:HD2	1:D:584:LYS:HD2	1.95	0.47
1:A:35:ARG:HB2	1:A:38:SER:OG	2.15	0.47
2:B:1413:PRO:HA	2:B:1463:VAL:HG12	1.96	0.47
3:C:1046:ILE:HG12	3:C:1053:HIS:O	2.15	0.47
1:A:35:ARG:HH22	1:A:498:GLY:HA3	1.79	0.47
1:A:329:THR:HG23	1:A:340:GLN:HG2	1.96	0.47
1:D:148:ARG:NH2	1:D:595:LEU:O	2.48	0.47
1:D:577:PRO:HD2	2:E:827:GLN:HG3	1.96	0.47
1:A:425:ARG:HG2	1:A:438:THR:HG22	1.96	0.46
1:A:132:ILE:HB	1:A:220:THR:OG1	2.15	0.46
1:D:35:ARG:HH22	1:D:498:GLY:HA3	1.80	0.46
1:D:85:ASN:OD1	1:D:85:ASN:N	2.47	0.46
3:F:954:LEU:HD23	3:F:970:LYS:O	2.14	0.46
2:B:1547:THR:HG22	2:B:1565:ILE:HA	1.98	0.46
1:D:580:GLN:NE2	3:F:1019:THR:O	2.38	0.46
2:E:1014:ASN:OD1	2:E:1055:GLN:NE2	2.45	0.46
1:A:205:LYS:HD2	1:A:207:ARG:CZ	2.45	0.46
1:A:261:TYR:HB2	2:B:826:MET:HE2	1.97	0.46
2:B:841:ARG:NH1	2:B:1509:GLU:HB3	2.28	0.46
2:B:978:THR:HB	2:B:1324:THR:HG23	1.98	0.46
2:B:1138:GLU:OE2	2:B:1141:MET:HB2	2.15	0.46
1:D:72:GLU:HG3	1:D:88:PHE:HB3	1.96	0.46
1:A:45:GLU:HG2	1:A:83:MET:HG3	1.97	0.46
1:A:392:GLN:HA	1:A:393:GLY:C	2.40	0.46
1:A:628:THR:OG1	1:A:641:ASP:HB3	2.16	0.46
2:B:1532:ARG:NH2	2:B:1629:GLU:OE2	2.49	0.46
1:D:365:LYS:HD2	1:D:455:TYR:HB3	1.98	0.46
1:D:130:LEU:HB2	1:D:218:PHE:CD1	2.50	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:799:ILE:HG23	2:E:826:MET:HA	1.97	0.46
3:F:978:TYR:HD2	3:F:1002:LYS:HG2	1.80	0.46
3:F:1094:ARG:HG2	3:F:1095:CYS:H	1.79	0.46
1:A:360:THR:O	1:A:362:LYS:NZ	2.43	0.46
1:D:112:PHE:C	1:D:114:THR:H	2.22	0.46
3:F:1127:GLY:HA2	3:F:1128:PRO:HD3	1.80	0.46
2:E:844:GLN:HA	2:E:901:VAL:HG22	1.97	0.45
1:A:129:TYR:CE2	1:A:154:HIS:HA	2.51	0.45
1:D:101:GLY:HA3	1:D:102:ARG:HA	1.60	0.45
1:D:135:ASP:OD1	1:D:139:TYR:OH	2.17	0.45
1:D:591:ALA:HB2	2:E:810:SER:HB2	1.98	0.45
2:E:1554:LEU:HD21	2:E:1591:ARG:HD2	1.98	0.45
1:D:311:VAL:HG12	1:D:313:ASN:H	1.81	0.45
2:E:1077:TRP:CZ2	2:E:1130:ILE:HA	2.51	0.45
2:B:1438:PHE:HE1	2:B:1466:TYR:HB3	1.81	0.45
1:D:78:PRO:C	1:D:80:THR:H	2.24	0.45
1:D:281:ARG:NH2	1:D:342:GLU:OE2	2.47	0.45
1:D:347:PRO:HG2	1:D:379:PRO:HB2	1.97	0.45
2:E:1359:ASN:HB2	2:E:1360:LYS:HD2	1.98	0.45
1:D:281:ARG:HH22	1:D:342:GLU:CD	2.25	0.45
3:F:1064:ILE:HB	3:F:1087:TYR:HB2	1.98	0.45
3:F:1106:GLU:H	3:F:1134:ILE:N	2.14	0.45
2:B:868:HIS:ND1	2:B:876:ALA:O	2.48	0.45
2:B:1584:PHE:HA	2:B:1620:TYR:O	2.16	0.45
1:D:460:VAL:HG13	1:D:471:LEU:HD11	1.98	0.45
2:E:941:THR:HA	2:E:1345:VAL:HG22	1.98	0.45
2:B:1029:ASP:HA	2:B:1034:TRP:HE1	1.81	0.45
1:A:351:SER:HA	1:A:352:PRO:HD3	1.86	0.45
3:C:1007:PRO:HB2	3:C:1015:VAL:HG11	1.99	0.45
2:E:798:SER:HB2	2:E:802:TRP:HZ2	1.82	0.45
1:A:496:ASN:OD1	1:A:497:LYS:HE3	2.17	0.44
2:B:1565:ILE:HD12	2:B:1576:VAL:HG21	1.98	0.44
2:E:1106:TRP:CD1	2:E:1110:GLU:HG3	2.53	0.44
2:E:1524:ASP:HA	2:E:1525:ASP:C	2.42	0.44
1:A:112:PHE:C	1:A:114:THR:H	2.22	0.44
1:D:44:LEU:HD13	1:D:55:VAL:HG11	1.99	0.44
1:D:465:LEU:HD22	1:D:555:VAL:HG22	1.98	0.44
1:A:68:VAL:HG11	1:A:90:ILE:HG23	1.99	0.44
3:C:945:ALA:HA	3:C:946:PRO:HD3	1.84	0.44
1:D:52:ASP:OD1	1:D:78:PRO:HD2	2.17	0.44
2:E:841:ARG:NH1	2:E:1509:GLU:O	2.50	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:474:ASN:HB3	1:A:514:LEU:HD11	1.98	0.44
1:A:577:PRO:HD2	2:B:827:GLN:HG3	2.00	0.44
2:B:958:GLN:NE2	2:B:960:GLU:OE2	2.44	0.44
2:B:1174:ASP:OD1	2:B:1201:ARG:NH2	2.30	0.44
1:A:130:LEU:HB2	1:A:218:PHE:CD1	2.52	0.44
1:A:281:ARG:NH2	1:A:342:GLU:OE2	2.44	0.44
2:E:916:VAL:HG23	2:E:919:HIS:HB2	1.99	0.44
2:E:1523:SER:HB2	2:E:1526:LYS:HA	1.98	0.44
2:E:962:ILE:HD11	2:E:1342:LEU:HD21	1.99	0.44
2:B:1036:LYS:HB2	2:B:1036:LYS:HE2	1.82	0.44
2:B:1214:ALA:HA	2:B:1219:ARG:O	2.18	0.44
1:D:658:ALA:HB1	2:E:1035:GLU:OE2	2.17	0.44
3:F:946:PRO:HD3	3:F:963:PHE:HE2	1.82	0.44
1:A:245:ILE:HD11	1:A:320:VAL:HG22	2.00	0.43
1:A:493:LEU:HB2	1:A:532:VAL:HG22	2.00	0.43
2:B:1185:ARG:O	2:B:1189:VAL:HG23	2.17	0.43
2:B:1152:GLN:NE2	2:B:1198:GLN:OE1	2.51	0.43
2:B:1325:LYS:HE2	2:B:1325:LYS:HB3	1.82	0.43
1:D:392:GLN:HA	1:D:393:GLY:HA2	1.59	0.43
2:B:1200:GLY:O	2:B:1203:LYS:NZ	2.47	0.43
2:B:1555:SER:OG	2:B:1558:PHE:O	2.28	0.43
1:D:57:VAL:HG21	1:D:86:VAL:HG21	1.99	0.43
1:A:544:ARG:HB3	1:A:652:GLN:NE2	2.33	0.43
2:B:858:GLN:C	2:B:890:PRO:HG3	2.44	0.43
1:D:133:GLN:HB2	1:D:611:LEU:HD22	1.99	0.43
2:B:781:PRO:HA	2:B:782:PRO:HD3	1.81	0.43
3:C:1094:ARG:HG2	3:C:1095:CYS:H	1.83	0.43
1:D:628:THR:OG1	1:D:641:ASP:HB3	2.18	0.43
2:E:1604:MET:HA	2:E:1627:TRP:O	2.19	0.43
2:B:1293:ASN:OD1	2:B:1312:HIS:ND1	2.44	0.43
2:E:1536:ALA:O	2:E:1570:LYS:NZ	2.51	0.43
1:D:69:LEU:HD21	1:D:72:GLU:HG2	1.99	0.43
1:D:580:GLN:NE2	3:F:1020:ASP:HA	2.34	0.43
2:E:889:PRO:O	2:E:892:SER:OG	2.33	0.43
2:E:1255:TRP:O	2:E:1259:GLN:HG2	2.18	0.43
1:A:35:ARG:NH2	1:A:498:GLY:HA3	2.34	0.43
1:A:62:PHE:HA	1:A:63:PRO:HA	1.75	0.43
1:A:229:LEU:HA	1:A:230:PRO:HD3	1.87	0.43
1:A:244:TYR:CE2	1:A:246:TYR:HB2	2.54	0.43
1:D:32:ASN:HA	1:D:645:THR:HG23	2.00	0.43
1:D:455:TYR:HD2	1:D:478:ARG:HD3	1.84	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:969:ASP:O	2:E:1351:LYS:HB2	2.18	0.43
2:E:1533:LEU:HD23	2:E:1533:LEU:HA	1.86	0.43
1:A:372:LEU:HD21	1:A:422:ILE:HD13	2.00	0.43
2:B:969:ASP:O	2:B:1351:LYS:HB2	2.19	0.43
2:B:1368:LYS:HA	2:B:1369:PRO:HD3	1.94	0.43
3:C:943:CYS:N	3:C:990:LEU:HD22	2.34	0.43
1:D:473:VAL:HG11	1:D:531:LEU:HD21	2.01	0.43
1:D:475:PHE:O	1:D:514:LEU:HA	2.19	0.43
1:A:58:THR:HG22	1:A:70:SER:O	2.19	0.42
3:C:1058:PRO:HA	3:C:1059:PRO:HD3	1.68	0.42
2:E:1363:LEU:HD21	2:E:1477:VAL:HG12	2.01	0.42
2:E:1494:HIS:HB3	2:E:1497:LYS:HB2	2.00	0.42
2:E:1661:CYS:HA	2:E:1662:PRO:HD3	1.92	0.42
1:A:274:GLY:HA3	1:A:325:TYR:CZ	2.54	0.42
2:B:1367:ILE:HG13	2:B:1384:MET:HE2	2.00	0.42
1:D:130:LEU:HD23	1:D:151:THR:HA	2.00	0.42
2:B:1106:TRP:CD1	2:B:1110:GLU:HG3	2.54	0.42
2:B:1309:HIS:CG	2:B:1320:ARG:HG2	2.55	0.42
2:E:1073:ALA:HA	2:E:1074:PRO:HD3	1.91	0.42
2:E:1409:THR:HG22	2:E:1473:GLN:H	1.82	0.42
1:A:78:PRO:C	1:A:80:THR:H	2.28	0.42
1:A:269:ALA:HB2	1:A:330:VAL:HG22	2.00	0.42
1:A:277:ASP:HA	1:A:278:GLY:HA2	1.69	0.42
2:B:1194:TYR:CE1	2:B:1238:LEU:HB3	2.54	0.42
1:D:352:PRO:O	1:D:379:PRO:HD3	2.19	0.42
1:D:448:THR:OG1	1:D:449:VAL:N	2.51	0.42
2:E:1605:TRP:CD1	2:E:1605:TRP:C	2.97	0.42
1:A:32:ASN:HD22	1:A:32:ASN:HA	1.69	0.42
1:A:169:ASN:OD1	1:A:173:ILE:N	2.53	0.42
2:E:1261:TYR:CZ	2:E:1263:GLY:HA2	2.54	0.42
1:D:238:PRO:HB2	1:D:240:GLU:O	2.19	0.42
1:D:274:GLY:HA3	1:D:325:TYR:CZ	2.54	0.42
2:E:798:SER:HB2	2:E:802:TRP:CZ2	2.55	0.42
2:E:1504:LYS:O	2:E:1558:PHE:HZ	2.02	0.42
2:E:1042:ARG:NH1	2:E:1046:LEU:HD11	2.34	0.42
3:F:1106:GLU:N	3:F:1134:ILE:N	2.67	0.42
2:B:1519:PHE:HD1	2:B:1521:GLN:H	1.67	0.42
1:A:69:LEU:HD13	1:A:88:PHE:HB2	2.01	0.42
1:A:536:THR:OG1	1:A:544:ARG:HD2	2.19	0.42
3:C:1018:ILE:HG22	3:C:1019:THR:HG23	2.02	0.42
3:F:1003:SER:HB2	3:F:1021:ILE:HG13	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:46:ALA:HB3	1:A:82:HIS:HB3	2.01	0.42
1:A:603:PHE:O	1:A:607:LYS:HG3	2.19	0.42
2:B:1317:SER:N	2:B:1318:LEU:HA	2.35	0.42
2:B:1591:ARG:HG2	2:B:1592:GLU:N	2.35	0.42
2:E:958:GLN:NE2	2:E:960:GLU:OE2	2.41	0.42
2:E:962:ILE:HD13	2:E:1344:VAL:HG21	2.01	0.42
3:F:1007:PRO:HA	3:F:1008:PRO:HD3	1.82	0.42
2:B:895:SER:O	2:B:1442:ASN:ND2	2.53	0.41
2:E:1387:GLU:HG3	2:E:1460:ALA:HB2	2.02	0.41
3:F:1023:VAL:HA	3:F:1045:CYS:SG	2.60	0.41
3:F:1064:ILE:HA	3:F:1065:PRO:HD3	1.96	0.41
1:A:271:VAL:HG11	1:A:300:VAL:HG11	2.02	0.41
2:B:758:GLU:HG2	2:B:913:LYS:HD2	2.02	0.41
2:B:932:VAL:HG12	2:B:933:PRO:O	2.20	0.41
3:C:987:LEU:C	3:C:989:ASN:H	2.27	0.41
1:A:390:ALA:HB3	1:A:427:LYS:HE2	2.03	0.41
2:B:1042:ARG:NH1	2:B:1046:LEU:HD11	2.35	0.41
1:D:569:GLN:HE22	1:D:581:MET:HE2	1.85	0.41
2:E:978:THR:HB	2:E:1324:THR:HG23	2.02	0.41
2:E:1152:GLN:OE1	2:E:1198:GLN:NE2	2.50	0.41
1:A:68:VAL:HG12	1:A:91:PRO:HD2	2.02	0.41
2:E:826:MET:HG2	2:E:827:GLN:N	2.36	0.41
3:C:1069:PRO:HA	3:C:1070:PRO:HD3	1.95	0.41
1:A:130:LEU:HD23	1:A:151:THR:HA	2.03	0.41
1:D:433:GLU:HA	1:D:436:GLN:HG2	2.01	0.41
1:A:481:ARG:HH22	1:D:480:ASP:HB2	1.85	0.41
1:D:530:ARG:NH1	1:D:624:ASP:OD2	2.51	0.41
2:E:1053:TYR:CZ	2:E:1057:LEU:HD11	2.55	0.41
2:E:1204:GLY:HA3	2:E:1205:PRO:HD3	1.87	0.41
1:A:44:LEU:HD13	1:A:55:VAL:HG11	2.02	0.41
1:A:276:GLN:HB3	1:A:323:SER:OG	2.21	0.41
1:A:388:PRO:HA	1:A:399:SER:O	2.21	0.41
2:B:982:LEU:HD23	2:B:1342:LEU:HD13	2.03	0.41
2:B:1494:HIS:HA	2:B:1495:PRO:HD3	1.71	0.41
1:D:32:ASN:HA	1:D:32:ASN:HD22	1.62	0.41
1:D:67:LEU:HD11	1:D:70:SER:HB3	2.02	0.41
2:E:1065:ALA:HB2	2:E:1106:TRP:CD2	2.56	0.41
2:E:1265:GLY:N	2:E:1268:SER:OG	2.54	0.41
2:E:1370:ALA:HB2	2:E:1385:ILE:HG13	2.02	0.41
1:A:324:LEU:HB2	1:A:346:ILE:HB	2.02	0.41
2:E:753:GLU:H	2:E:753:GLU:CD	2.28	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:865:GLU:OE2	2:E:881:ARG:NH1	2.53	0.41
2:E:1148:LEU:HD21	2:E:1199:MET:CE	2.51	0.41
2:E:1155:LYS:O	2:E:1159:GLU:N	2.53	0.41
2:B:754:ASP:OD2	2:B:918:HIS:HA	2.20	0.40
2:B:1248:PHE:O	2:B:1251:PRO:HD2	2.21	0.40
2:B:1528:THR:OG1	2:B:1531:GLU:HG2	2.21	0.40
2:E:781:PRO:HA	2:E:782:PRO:HD3	1.90	0.40
2:E:1188:THR:HA	2:E:1191:ILE:HG22	2.03	0.40
2:B:1586:SER:HA	2:B:1587:PRO:HD3	1.95	0.40
1:D:355:ILE:HG23	1:D:374:VAL:HG13	2.02	0.40
1:D:488:ARG:HD2	1:D:488:ARG:HA	1.86	0.40
2:E:801:THR:HG22	2:E:824:THR:HA	2.04	0.40
2:E:1547:THR:HG22	2:E:1565:ILE:HG12	2.02	0.40
1:A:93:ASN:O	1:A:94:ARG:HG2	2.21	0.40
2:B:789:LYS:HE2	2:B:789:LYS:HB2	1.96	0.40
2:B:826:MET:HG2	2:B:827:GLN:N	2.36	0.40
2:E:1245:ASP:O	2:E:1249:VAL:HG23	2.21	0.40
2:E:1325:LYS:HE2	2:E:1325:LYS:HB3	1.84	0.40
2:E:1368:LYS:HA	2:E:1369:PRO:HD3	1.93	0.40
2:E:1588:ILE:O	2:E:1589:LYS:CG	2.70	0.40
1:A:506:GLN:NE2	1:A:507:VAL:O	2.52	0.40
2:B:977:GLU:OE2	2:B:979:ARG:NH2	2.54	0.40
2:B:1255:TRP:O	2:B:1259:GLN:HG2	2.21	0.40
2:E:1012:GLU:OE2	2:E:1125:ILE:HG13	2.22	0.40
2:E:1060:ARG:HD2	2:E:1099:VAL:HG13	2.04	0.40
2:E:1297:SER:OG	2:E:1333:THR:HB	2.21	0.40
1:A:352:PRO:O	1:A:379:PRO:HD3	2.21	0.40
1:D:45:GLU:OE1	1:D:534:TYR:OH	2.26	0.40
1:D:90:ILE:HA	1:D:91:PRO:HD3	1.90	0.40
2:E:1248:PHE:O	2:E:1251:PRO:HD2	2.21	0.40
3:F:946:PRO:HD3	3:F:963:PHE:CE2	2.56	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	640/645 (99%)	624 (98%)	14 (2%)	2 (0%)	37	66
1	D	640/645 (99%)	625 (98%)	15 (2%)	0	100	100
2	B	899/915 (98%)	866 (96%)	33 (4%)	0	100	100
2	E	899/915 (98%)	868 (97%)	31 (3%)	0	100	100
3	C	192/196 (98%)	175 (91%)	17 (9%)	0	100	100
3	F	192/196 (98%)	179 (93%)	13 (7%)	0	100	100
All	All	3462/3512 (99%)	3337 (96%)	123 (4%)	2 (0%)	48	76

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	396	THR
1	A	397	VAL

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	566/567 (100%)	558 (99%)	8 (1%)	62	78
1	D	566/567 (100%)	558 (99%)	8 (1%)	62	78
2	B	798/810 (98%)	791 (99%)	7 (1%)	75	85
2	E	798/810 (98%)	788 (99%)	10 (1%)	65	79
3	C	167/173 (96%)	158 (95%)	9 (5%)	18	46
3	F	167/173 (96%)	158 (95%)	9 (5%)	18	46
All	All	3062/3100 (99%)	3011 (98%)	51 (2%)	56	74

All (51) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	32	ASN
1	A	93	ASN
1	A	95	GLU
1	A	200	ASN
1	A	391	VAL
1	A	395	ASP
1	A	428	LYS
1	A	610	LYS
2	B	1023	ILE
2	B	1095	ILE
2	B	1258	GLU
2	B	1318	LEU
2	B	1582	ARG
2	B	1605	TRP
2	B	1637	CYS
3	C	954	LEU
3	C	969	LEU
3	C	986	CYS
3	C	998	VAL
3	C	1004	CYS
3	C	1031	CYS
3	C	1072	ILE
3	C	1107	LEU
3	C	1124	ILE
1	D	32	ASN
1	D	85	ASN
1	D	95	GLU
1	D	265	VAL
1	D	391	VAL
1	D	607	LYS
1	D	610	LYS
1	D	656	GLN
2	E	934	GLU
2	E	1023	ILE
2	E	1258	GLU
2	E	1293	ASN
2	E	1357	THR
2	E	1472	ILE
2	E	1518	CYS
2	E	1582	ARG
2	E	1605	TRP
2	E	1637	CYS
3	F	954	LEU

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Mol	Chain	Res	Type
3	F	969	LEU
3	F	986	CYS
3	F	996	LYS
3	F	997	ASP
3	F	1017	VAL
3	F	1031	CYS
3	F	1072	ILE
3	F	1124	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (24) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	93	ASN
1	A	185	GLN
1	A	580	GLN
1	A	589	HIS
2	B	774	ASN
2	B	1055	GLN
2	B	1152	GLN
2	B	1277	GLN
2	B	1423	ASN
2	B	1553	GLN
1	D	32	ASN
1	D	126	GLN
1	D	333	HIS
1	D	378	ASN
1	D	454	ASN
1	D	589	HIS
1	D	653	GLN
2	E	1277	GLN
2	E	1312	HIS
2	E	1503	ASN
2	E	1567	GLN
3	F	1012	ASN
3	F	1053	HIS
3	F	1086	HIS

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](#)

2 ligands 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	$\# Z > 2$
4	NAG	D	1063	1	14,14,15	0.50	0	17,19,21	0.73	0
4	NAG	A	1063	1	14,14,15	0.51	0	17,19,21	1.98	2 (11%)

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
4	NAG	D	1063	1	-	0/6/23/26	0/1/1/1
4	NAG	A	1063	1	1/1/5/7	0/6/23/26	0/1/1/1

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	1063	NAG	C1-O5-C5	5.61	119.79	112.19
4	A	1063	NAG	O5-C1-C2	4.97	119.13	111.29

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
4	A	1063	NAG	C1

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
4	D	1063	NAG	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	642/645 (99%)	0.78	48 (7%)	22 19	75, 118, 176, 230	0
1	D	642/645 (99%)	0.77	49 (7%)	21 19	69, 115, 172, 243	0
2	B	903/915 (98%)	1.16	134 (14%)	7 7	72, 154, 220, 261	0
2	E	903/915 (98%)	0.89	95 (10%)	13 13	65, 134, 196, 234	0
3	C	194/196 (98%)	1.33	40 (20%)	3 3	96, 162, 278, 346	0
3	F	194/196 (98%)	1.56	53 (27%)	2 1	111, 201, 248, 316	0
All	All	3478/3512 (99%)	0.98	419 (12%)	10 10	65, 135, 218, 346	0

All (419) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	70	SER	5.7
1	A	461	LEU	5.1
1	D	396	THR	5.1
1	A	397	VAL	4.6
2	E	1317	SER	4.6
3	C	1118	ASN	4.6
3	F	1060	ILE	4.6
2	E	1136	ASN	4.5
2	B	1611	PHE	4.5
2	B	1527	VAL	4.3
3	C	1005	LYS	4.2
2	B	1318	LEU	4.2
2	E	752	ASP	4.1
2	E	754	ASP	4.1
3	C	1083	GLU	4.1
2	E	1318	LEU	4.1
3	C	981	PRO	4.0
3	C	1117	SER	4.0
2	B	994	ALA	4.0

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Mol	Chain	Res	Type	RSRZ
3	F	1009	ASP	4.0
2	B	1155	LYS	4.0
2	B	1166	PRO	4.0
1	A	96	PHE	3.9
2	B	760	ASN	3.9
2	E	1409	THR	3.8
2	B	1176	LEU	3.8
3	F	1058	PRO	3.8
2	B	1067	ALA	3.7
3	F	941	GLY	3.7
2	B	784	ASN	3.7
2	B	1579	GLY	3.6
1	A	582	THR	3.6
2	E	1315	SER	3.6
2	B	1640	GLU	3.6
3	C	1122	VAL	3.6
2	E	1316	ALA	3.6
1	D	125	LEU	3.6
2	B	1038	GLY	3.6
1	D	71	SER	3.5
3	C	1032	THR	3.5
1	A	186	LEU	3.5
3	C	975	PRO	3.5
1	A	395	ASP	3.5
1	A	340	GLN	3.5
2	B	1317	SER	3.4
2	E	1307	ILE	3.4
2	E	1471	LEU	3.4
2	E	1562	ILE	3.4
1	A	398	GLN	3.4
1	A	97	LYS	3.4
2	E	1616	PRO	3.4
2	B	1141	MET	3.3
3	C	1020	ASP	3.3
2	B	1094	ALA	3.3
2	E	1371	PRO	3.3
1	D	438	THR	3.3
2	B	1125	ILE	3.3
1	A	79	ALA	3.2
2	E	1662	PRO	3.2
1	A	95	GLU	3.2
1	A	23	SER	3.2

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Mol	Chain	Res	Type	RSRZ
2	B	1259	GLN	3.2
3	C	994	SER	3.2
2	E	762	VAL	3.2
2	B	1114	PRO	3.2
2	E	1309	HIS	3.2
3	C	1129	ALA	3.2
1	D	393	GLY	3.1
2	B	1083	VAL	3.1
2	B	1545	TYR	3.1
2	E	1058	ALA	3.1
3	F	965	ILE	3.1
3	F	1122	VAL	3.1
2	E	1368	LYS	3.1
1	A	588	ASP	3.1
3	C	995	PRO	3.1
3	C	1133	ILE	3.1
3	C	1014	MET	3.0
2	E	1438	PHE	3.0
2	B	1588	ILE	3.0
2	E	1663	ASN	3.0
2	B	1156	ASP	3.0
3	F	945	ALA	3.0
3	C	950	LEU	3.0
1	D	403	GLY	3.0
1	A	69	LEU	3.0
2	B	1046	LEU	3.0
1	A	337	ASP	3.0
2	B	1440	ASP	3.0
1	D	520	SER	3.0
3	C	1128	PRO	2.9
2	B	1062	PRO	2.9
2	B	1148	LEU	2.9
1	D	95	GLU	2.9
2	B	934	GLU	2.9
2	E	1486	GLU	2.9
2	E	1590	CYS	2.9
3	C	953	LYS	2.9
1	A	70	SER	2.9
2	E	846	GLU	2.9
1	D	94	ARG	2.9
3	F	1130	PRO	2.9
2	B	1596	LEU	2.9

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Mol	Chain	Res	Type	RSRZ
2	E	1503	ASN	2.9
3	C	1130	PRO	2.9
3	F	964	PRO	2.9
2	B	1633	GLU	2.8
2	B	997	ALA	2.8
2	B	1058	ALA	2.8
2	B	1547	THR	2.8
1	A	427	LYS	2.8
3	F	1104	VAL	2.8
3	F	979	GLY	2.8
3	F	1010	PRO	2.8
1	D	128	GLY	2.8
2	B	1205	PRO	2.8
2	B	1571	SER	2.8
3	F	1128	PRO	2.8
2	E	1135	ASN	2.8
3	F	1084	ASN	2.8
2	B	1202	LEU	2.8
2	E	861	LYS	2.8
3	F	1011	VAL	2.8
2	B	1026	HIS	2.8
2	B	1053	TYR	2.8
2	B	1607	LEU	2.8
1	A	520	SER	2.8
1	A	558	SER	2.8
2	B	1316	ALA	2.8
2	B	1573	SER	2.8
1	D	39	GLU	2.8
1	A	399	SER	2.7
2	E	1385	ILE	2.7
2	B	1153	GLU	2.7
3	F	991	VAL	2.7
2	B	1212	THR	2.7
2	B	1151	LEU	2.7
2	E	1319	LEU	2.7
2	B	917	TYR	2.7
1	D	430	GLU	2.7
3	C	974	ARG	2.7
2	B	1355	GLN	2.7
3	C	1022	GLN	2.7
3	F	1131	GLN	2.7
3	F	1005	LYS	2.7

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Mol	Chain	Res	Type	RSRZ
2	B	1070	VAL	2.7
2	B	1458	CYS	2.7
1	D	509	GLU	2.6
3	F	1027	ILE	2.6
2	E	1333	THR	2.6
2	B	995	VAL	2.6
1	D	404	ASP	2.6
2	E	1555	SER	2.6
2	B	1529	LEU	2.6
3	F	1080	THR	2.6
3	C	1086	HIS	2.6
1	D	397	VAL	2.6
2	B	1104	VAL	2.6
2	B	1101	CYS	2.6
2	B	1502	LEU	2.6
1	D	213	SER	2.6
3	F	1090	VAL	2.6
2	B	861	LYS	2.6
2	B	1522	LYS	2.6
1	D	431	LEU	2.6
3	F	1070	PRO	2.6
2	B	1005	VAL	2.6
2	B	1090	VAL	2.6
2	B	1001	LYS	2.6
1	D	126	GLN	2.6
3	F	1062	GLN	2.6
2	E	1394	GLY	2.6
3	F	1097	LEU	2.6
3	F	1109	GLY	2.6
3	F	1052	ALA	2.6
1	A	98	SER	2.6
1	A	231	SER	2.6
1	A	334	SER	2.6
2	B	1025	VAL	2.6
2	B	1162	VAL	2.6
3	F	994	SER	2.6
1	A	574	GLN	2.5
2	B	1146	PHE	2.5
2	E	1265	GLY	2.5
3	F	1088	GLY	2.5
2	B	1041	LYS	2.5
2	B	985	THR	2.5

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Mol	Chain	Res	Type	RSRZ
2	B	1635	ASP	2.5
2	B	1136	ASN	2.5
2	B	1143	LEU	2.5
2	E	920	PHE	2.5
3	C	1049	GLY	2.5
2	E	1334	ALA	2.5
1	A	323	SER	2.5
3	F	961	SER	2.5
1	D	395	ASP	2.5
2	B	923	ASP	2.5
2	B	1248	PHE	2.5
2	E	1441	ARG	2.5
2	E	959	LYS	2.5
2	E	753	GLU	2.5
3	F	1102	ARG	2.5
2	B	1068	ALA	2.5
2	B	1139	LYS	2.5
2	B	1632	PRO	2.5
1	D	544	ARG	2.5
2	B	895	SER	2.5
2	B	1570	LYS	2.5
2	E	1442	ASN	2.5
2	E	1408	MET	2.5
2	E	1287	PRO	2.5
1	A	586	GLU	2.5
2	E	1472	ILE	2.4
2	B	1554	LEU	2.4
1	D	96	PHE	2.4
2	E	884	GLN	2.4
2	B	798	SER	2.4
2	B	1319	LEU	2.4
3	C	1100	ARG	2.4
3	F	1063	ARG	2.4
2	B	984	GLY	2.4
2	B	1103	ALA	2.4
2	B	1228	TYR	2.4
1	A	518	PRO	2.4
1	D	461	LEU	2.4
3	C	1097	LEU	2.4
2	B	1030	GLU	2.4
1	A	338	MET	2.4
2	B	1539	PRO	2.4

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Mol	Chain	Res	Type	RSRZ
1	A	462	ARG	2.4
2	B	1100	LEU	2.4
2	B	1565	ILE	2.4
2	E	1071	LYS	2.4
2	B	1128	GLU	2.4
1	A	540	ALA	2.4
1	D	499	ARG	2.4
2	E	1501	LYS	2.4
2	E	794	PHE	2.4
2	E	1515	GLU	2.4
2	E	1264	GLY	2.4
2	E	1514	ALA	2.4
2	B	884	GLN	2.4
1	D	353	TYR	2.3
2	E	1588	ILE	2.3
2	E	1361	PHE	2.3
3	F	968	SER	2.3
3	F	1079	SER	2.3
3	C	1009	ASP	2.3
3	F	1004	CYS	2.3
3	F	1067	GLY	2.3
1	A	396	THR	2.3
2	B	1183	LEU	2.3
2	B	1471	LEU	2.3
2	E	874	SER	2.3
3	C	968	SER	2.3
2	E	1354	ASP	2.3
2	E	1610	ASP	2.3
2	E	1566	GLU	2.3
2	E	946	THR	2.3
1	D	166	ASN	2.3
1	A	113	GLY	2.3
1	A	154	HIS	2.3
1	D	612	THR	2.3
3	C	998	VAL	2.3
3	F	1025	SER	2.3
1	D	586	GLU	2.3
2	E	1131	GLY	2.3
2	B	1179	ASN	2.3
2	B	1442	ASN	2.3
2	B	1556	ASN	2.3
2	E	1359	ASN	2.3

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Mol	Chain	Res	Type	RSRZ
2	B	1165	LEU	2.3
3	F	1119	ASP	2.3
2	B	878	THR	2.3
2	E	1366	THR	2.3
1	A	581	MET	2.3
2	B	1015	MET	2.3
2	B	783	LYS	2.3
2	B	1436	LYS	2.3
2	E	1552	VAL	2.3
2	E	1314	GLU	2.3
2	E	1454	SER	2.3
1	A	52	ASP	2.2
3	F	1053	HIS	2.2
2	B	1158	CYS	2.2
2	E	873	CYS	2.2
2	E	1346	THR	2.2
3	C	949	PHE	2.2
3	F	1087	TYR	2.2
1	D	462	ARG	2.2
1	D	434	ALA	2.2
2	B	1243	LEU	2.2
1	A	538	ILE	2.2
1	D	336	SER	2.2
2	B	1157	ILE	2.2
2	E	1499	ASP	2.2
3	F	989	ASN	2.2
2	B	1066	PHE	2.2
1	D	536	THR	2.2
3	C	956	THR	2.2
2	B	1661	CYS	2.2
2	B	1645	GLN	2.2
3	F	1091	VAL	2.2
1	D	67	LEU	2.2
3	F	950	LEU	2.2
2	B	1530	GLU	2.2
1	D	52	ASP	2.2
2	B	1371	PRO	2.2
2	E	811	ASP	2.2
2	B	959	LYS	2.2
2	E	1331	THR	2.2
2	E	1332	VAL	2.2
2	B	1394	GLY	2.2

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Mol	Chain	Res	Type	RSRZ
1	A	235	ILE	2.2
2	E	1322	GLU	2.2
2	E	1439	SER	2.2
3	C	982	PHE	2.2
2	B	1616	PRO	2.2
2	B	1567	GLN	2.2
2	E	970	GLN	2.2
3	C	978	TYR	2.2
1	A	237	GLU	2.2
1	A	240	GLU	2.2
1	D	659	GLU	2.2
1	D	357	PHE	2.2
3	F	1016	HIS	2.2
2	B	1600	LYS	2.2
3	C	1103	LYS	2.2
1	D	383	PRO	2.2
2	B	1612	TRP	2.2
1	D	23	SER	2.2
2	B	1168	SER	2.2
2	E	1556	ASN	2.2
2	B	1482	TYR	2.2
2	E	1577	GLN	2.2
2	B	1116	GLY	2.1
2	B	766	GLU	2.1
3	C	976	GLU	2.1
3	F	942	HIS	2.1
1	D	158	PRO	2.1
3	F	1111	PRO	2.1
1	D	373	MET	2.1
2	B	1563	MET	2.1
2	B	1523	SER	2.1
2	B	1257	ASN	2.1
2	E	1293	ASN	2.1
2	B	1557	ASP	2.1
1	D	392	GLN	2.1
2	E	863	ARG	2.1
1	D	502	LYS	2.1
2	B	1217	LYS	2.1
2	E	1461	PHE	2.1
2	B	1034	TRP	2.1
3	F	990	LEU	2.1
3	C	991	VAL	2.1

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Mol	Chain	Res	Type	RSRZ
1	A	336	SER	2.1
3	C	1003	SER	2.1
3	C	989	ASN	2.1
2	E	777	ASP	2.1
2	E	1289	HIS	2.1
2	E	1347	MET	2.1
2	E	1485	LEU	2.1
2	E	944	VAL	2.1
2	B	1073	ALA	2.1
1	A	612	THR	2.1
1	D	173	ILE	2.1
1	D	567	SER	2.1
1	D	647	THR	2.1
2	E	810	SER	2.1
2	E	1341	THR	2.1
2	B	1263	GLY	2.1
2	E	1491	ARG	2.1
1	A	280	GLN	2.1
3	C	997	ASP	2.1
3	C	1120	ASP	2.1
2	B	1057	LEU	2.1
2	E	1356	LEU	2.1
1	A	171	GLU	2.1
1	A	503	ALA	2.1
1	A	331	ILE	2.1
2	E	1393	ARG	2.1
1	A	71	SER	2.1
3	F	1029	TYR	2.1
2	E	1218	ASN	2.1
2	E	1625	ASP	2.1
2	B	1129	MET	2.1
2	B	781	PRO	2.1
2	B	975	GLU	2.1
2	E	1522	LYS	2.0
3	C	955	LYS	2.0
1	D	385	TYR	2.0
2	E	1308	THR	2.0
1	D	417	GLN	2.0
1	D	429	GLN	2.0
2	B	765	SER	2.0
2	E	1473	GLN	2.0
2	E	1581	GLN	2.0

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Mol	Chain	Res	Type	RSRZ
3	F	983	SER	2.0
2	B	860	LEU	2.0
3	F	1107	LEU	2.0
1	A	83	MET	2.0
2	B	1587	PRO	2.0
3	C	1111	PRO	2.0
3	F	1017	VAL	2.0
1	A	99	GLU	2.0
1	D	97	LYS	2.0
2	B	1177	GLU	2.0
2	E	1040	GLU	2.0
2	E	1225	LYS	2.0
2	E	1335	GLU	2.0
2	B	1197	ALA	2.0
2	E	1262	TYR	2.0
2	B	1043	GLN	2.0
2	B	1356	LEU	2.0
3	F	1012	ASN	2.0
3	F	1096	ASN	2.0
2	B	1029	ASP	2.0
2	B	1009	GLY	2.0
3	F	1061	CYS	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($\text{\AA}^2$)	Q<0.9
4	NAG	A	1063	14/15	0.68	0.20	106,127,145,146	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
4	NAG	D	1063	14/15	0.77	0.17	87,134,158,164	0

6.5 Other polymers [i](#)

There are no such residues in this entry.