



Full wwPDB X-ray Structure Validation Report ⓘ

Feb 1, 2016 – 12:52 AM GMT

PDB ID : 2BYS
Title : CRYSTAL STRUCTURE OF ACHBP FROM APLYSIA CALIFORNICA IN COMPLEX WITH LOBELINE
Authors : Hansen, S.B.; Sulzenbacher, G.; Huxford, T.; Marchot, P.; Taylor, P.; Bourne, Y.
Deposited on : 2005-08-04
Resolution : 2.05 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
<http://wwpdb.org/validation/2016/XrayValidationReportHelp>
with specific help available everywhere you see the ⓘ symbol.

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467
Mogul : 1.7 (RC4), CSD as536be (2015)
Xtriage (Phenix) : 1.9-1692
EDS : rb-20026688
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)
Refmac : 5.8.0135
CCP4 : 6.5.0
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : trunk26865

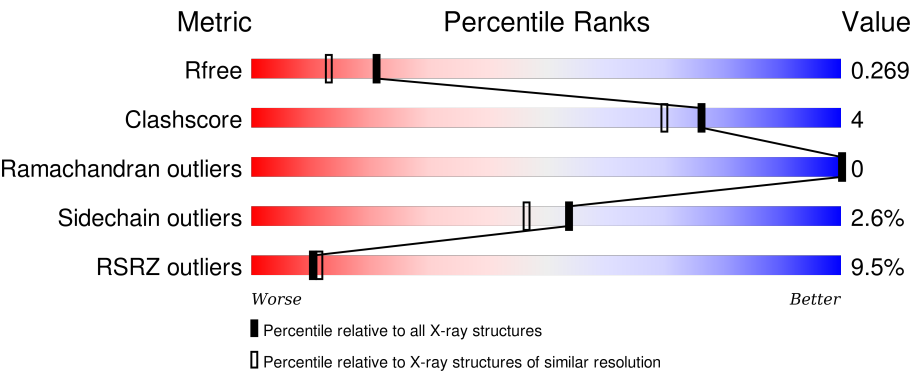
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.05 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}	91344	1192 (2.04-2.04)
Clashscore	102246	1269 (2.04-2.04)
Ramachandran outliers	100387	1258 (2.04-2.04)
Sidechain outliers	100360	1258 (2.04-2.04)
RSRZ outliers	91569	1194 (2.04-2.04)

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 on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. 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	227	<div><div>7%</div><div><div></div><div>78%</div><div>12%</div><div>•</div><div>10%</div></div></div>
1	B	227	<div><div>6%</div><div><div></div><div>82%</div><div>8%</div><div></div><div>9%</div></div></div>
1	C	227	<div><div>6%</div><div><div></div><div>79%</div><div>10%</div><div>•</div><div>11%</div></div></div>
1	D	227	<div><div>8%</div><div><div></div><div>82%</div><div>8%</div><div></div><div>10%</div></div></div>
1	E	227	<div><div>13%</div><div><div></div><div>82%</div><div>8%</div><div></div><div>9%</div></div></div>

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Mol	Chain	Length	Quality of chain
1	F	227	
1	G	227	
1	H	227	
1	I	227	
1	J	227	

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
2	LOB	D	301	-	-	-	X

2 Entry composition

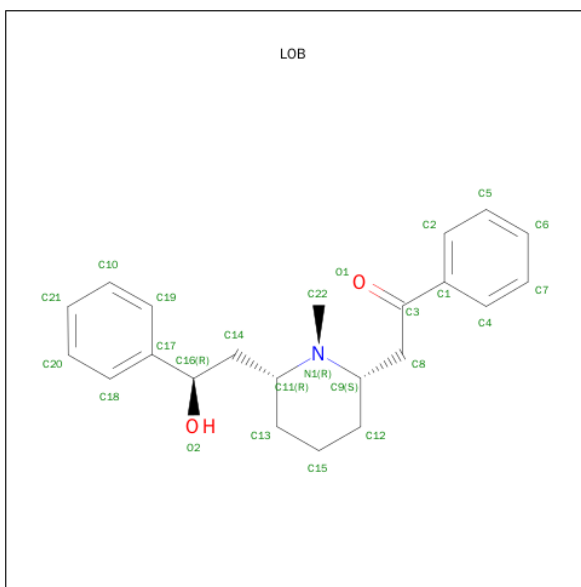
There are 3 unique types of molecules in this entry. The entry contains 18491 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 ACETYLCHOLINE-BINDING PROTEIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	205	Total	C	N	O	S	0	10	0
			1670	1054	278	330	8			
1	B	206	Total	C	N	O	S	0	7	0
			1682	1063	282	329	8			
1	C	203	Total	C	N	O	S	0	7	0
			1656	1047	274	327	8			
1	D	205	Total	C	N	O	S	0	10	0
			1689	1068	279	334	8			
1	E	206	Total	C	N	O	S	0	3	0
			1666	1054	277	327	8			
1	F	204	Total	C	N	O	S	0	8	0
			1653	1044	273	328	8			
1	G	203	Total	C	N	O	S	0	8	0
			1664	1054	276	326	8			
1	H	204	Total	C	N	O	S	0	6	0
			1663	1051	278	326	8			
1	I	206	Total	C	N	O	S	0	6	0
			1681	1062	282	329	8			
1	J	204	Total	C	N	O	S	0	4	0
			1658	1047	278	325	8			

- Molecule 2 is LOBELINE (three-letter code: LOB) (formula: $C_{22}H_{27}NO_2$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total C N O 25 22 1 2	0	0
2	B	1	Total C N O 25 22 1 2	0	0
2	C	1	Total C N O 25 22 1 2	0	0
2	D	1	Total C N O 25 22 1 2	0	0
2	E	1	Total C N O 25 22 1 2	0	0
2	F	1	Total C N O 25 22 1 2	0	0
2	G	1	Total C N O 25 22 1 2	0	0
2	H	1	Total C N O 25 22 1 2	0	0
2	I	1	Total C N O 25 22 1 2	0	0
2	J	1	Total C N O 25 22 1 2	0	0

- Molecule 3 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	164	Total O 164 164	0	0
3	B	186	Total O 186 186	0	0

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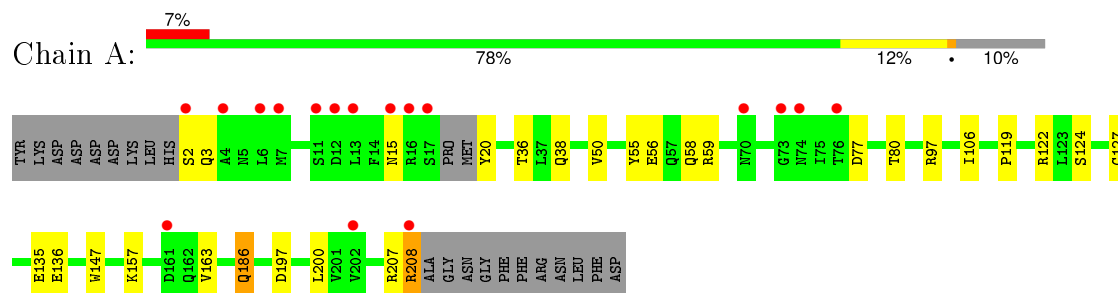
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	C	150	Total 150	O 150	0	0
3	D	181	Total 181	O 181	0	0
3	E	170	Total 170	O 170	0	0
3	F	158	Total 158	O 158	0	0
3	G	158	Total 158	O 158	0	0
3	H	104	Total 104	O 104	0	0
3	I	133	Total 133	O 133	0	0
3	J	155	Total 155	O 155	0	0

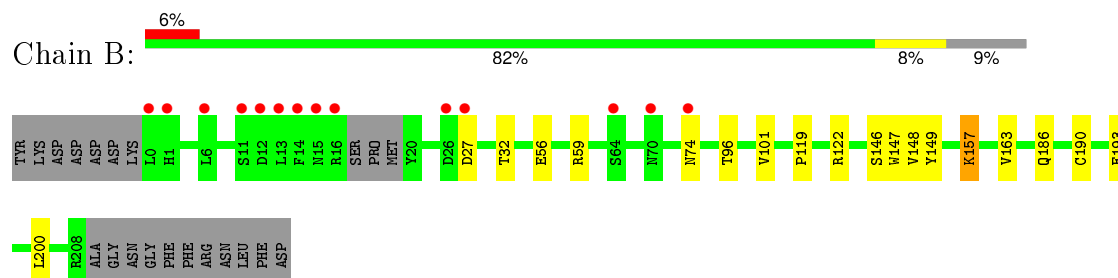
3 Residue-property plots

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors 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.

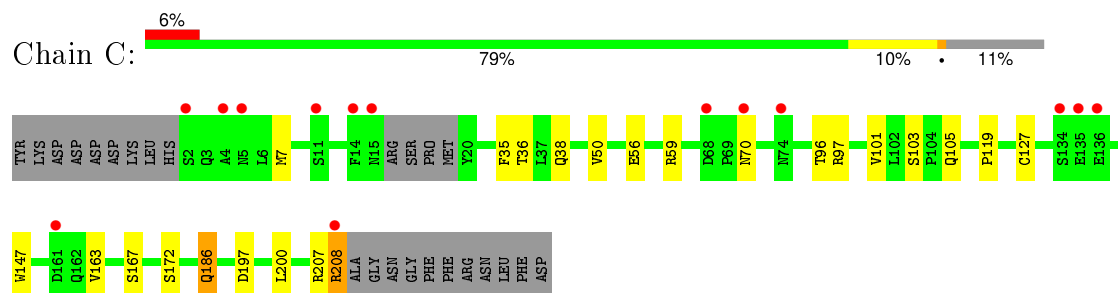
• Molecule 1: ACETYLCHOLINE-BINDING PROTEIN



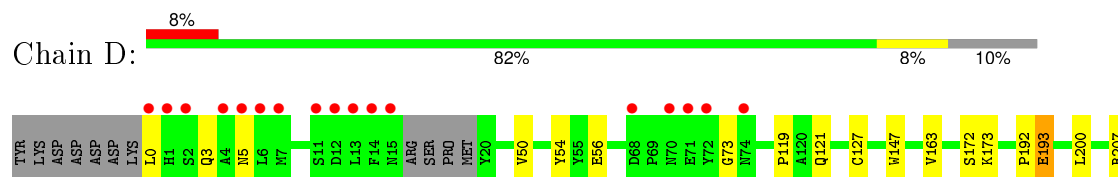
• Molecule 1: ACETYLCHOLINE-BINDING PROTEIN

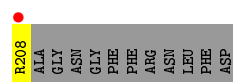


• Molecule 1: ACETYLCHOLINE-BINDING PROTEIN

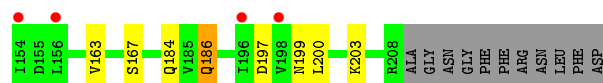
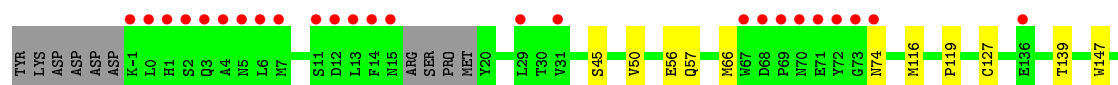
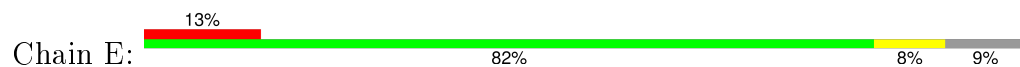


• Molecule 1: ACETYLCHOLINE-BINDING PROTEIN

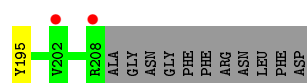
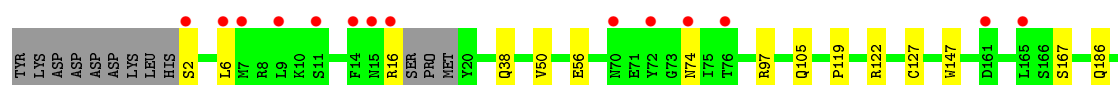
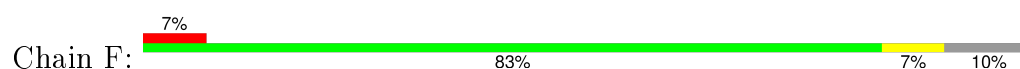




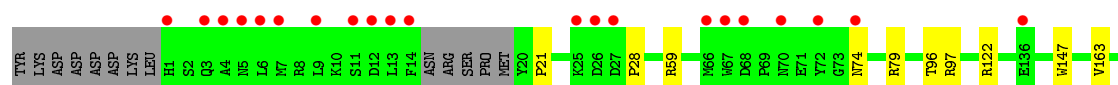
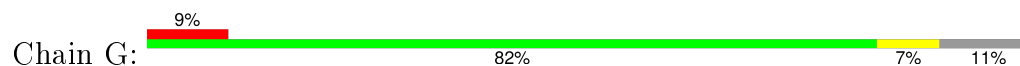
• Molecule 1: ACETYLCHOLINE-BINDING PROTEIN



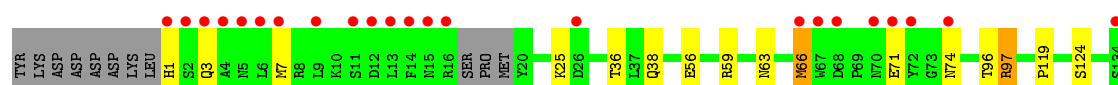
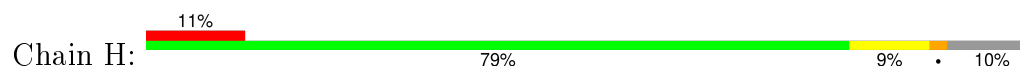
• Molecule 1: ACETYLCHOLINE-BINDING PROTEIN



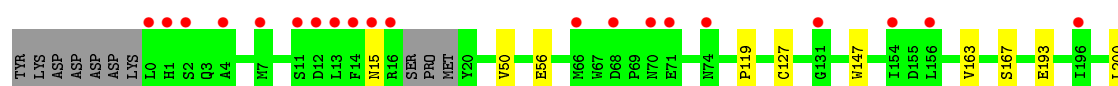
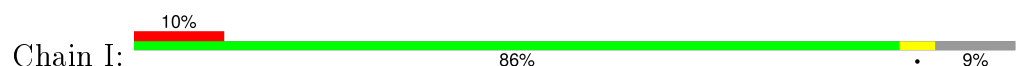
• Molecule 1: ACETYLCHOLINE-BINDING PROTEIN



• Molecule 1: ACETYLCHOLINE-BINDING PROTEIN

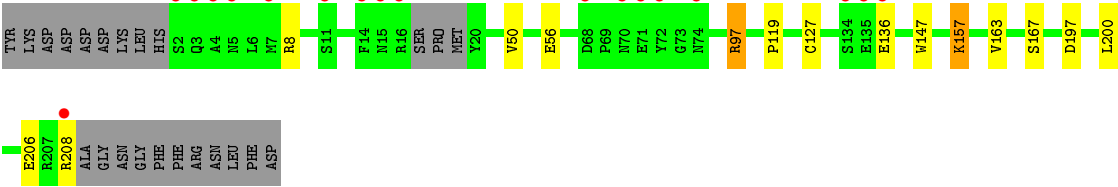
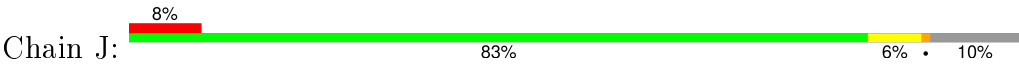


• Molecule 1: ACETYLCHOLINE-BINDING PROTEIN





● Molecule 1: ACETYLCHOLINE-BINDING PROTEIN



4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α , β , γ	75.76 Å 85.73 Å 117.32 Å 89.95° 97.33° 106.64°	Depositor
Resolution (Å)	47.73 – 2.05 34.55 – 1.97	Depositor EDS
% Data completeness (in resolution range)	94.5 (47.73-2.05) 76.3 (34.55-1.97)	Depositor EDS
R_{merge}	0.06	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.89 (at 1.97 Å)	Xtriage
Refinement program	REFMAC 5.2.0005	Depositor
R, R_{free}	0.216 , 0.258 0.230 , 0.269	Depositor DCC
R_{free} test set	4134 reflections (3.12%)	DCC
Wilson B-factor (Å ²)	21.7	Xtriage
Anisotropy	0.817	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 45.0	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning ²	$\langle L \rangle = 0.51$, $\langle L^2 \rangle = 0.34$	Xtriage
Outliers	0 of 153119 reflections	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	18491	wwPDB-VP
Average B, all atoms (Å ²)	39.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.81% 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, 0.375 respectively for untwinned datasets, and 0.333, 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: LOB

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	0/1727	0.64	0/2351
1	B	0.43	0/1736	0.61	0/2363
1	C	0.39	0/1712	0.59	0/2332
1	D	0.39	0/1756	0.60	0/2392
1	E	0.39	0/1714	0.58	0/2333
1	F	0.39	0/1703	0.59	0/2320
1	G	0.37	0/1724	0.56	0/2348
1	H	0.35	0/1716	0.57	0/2335
1	I	0.37	0/1735	0.57	0/2363
1	J	0.37	0/1708	0.61	0/2325
All	All	0.39	0/17231	0.59	0/23462

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	B	0	1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	190	CYS	Peptide

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	1670	0	1613	19	0
1	B	1682	0	1629	10	0
1	C	1656	0	1600	16	0
1	D	1689	0	1635	11	0
1	E	1666	0	1612	13	0
1	F	1653	0	1590	15	0
1	G	1664	0	1614	13	0
1	H	1663	0	1609	13	0
1	I	1681	0	1629	5	0
1	J	1658	0	1604	10	0
2	A	25	0	27	2	0
2	B	25	0	27	1	0
2	C	25	0	27	4	0
2	D	25	0	27	1	0
2	E	25	0	27	5	0
2	F	25	0	27	3	0
2	G	25	0	27	3	0
2	H	25	0	27	2	0
2	I	25	0	27	2	0
2	J	25	0	27	4	0
3	A	164	0	0	1	0
3	B	186	0	0	1	0
3	C	150	0	0	1	0
3	D	181	0	0	0	0
3	E	170	0	0	1	0
3	F	158	0	0	2	0
3	G	158	0	0	0	0
3	H	104	0	0	1	0
3	I	133	0	0	0	0
3	J	155	0	0	2	0
All	All	18491	0	16405	128	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 4.

All (128) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:38[B]:GLN:HA	1:A:38[B]:GLN:HE21	1.32	0.94
1:F:38[B]:GLN:HE22	1:F:167:SER:HB2	1.34	0.92
1:F:105[B]:GLN:HA	1:F:105[B]:GLN:HE21	1.40	0.86
1:A:38[B]:GLN:CA	1:A:38[B]:GLN:HE21	1.89	0.85
1:J:147:TRP:O	2:J:301:LOB:H8C1	1.81	0.81
1:A:147:TRP:O	2:A:301:LOB:H8C1	1.80	0.80
1:B:147:TRP:O	2:B:301:LOB:H8C1	1.82	0.78
1:C:103:SER:O	1:C:105[B]:GLN:NE2	2.18	0.77
1:F:147:TRP:O	2:F:301:LOB:H8C1	1.84	0.77
1:A:97[B]:ARG:HG3	1:A:124:SER:HB2	1.67	0.77
1:D:147:TRP:O	2:D:301:LOB:H8C1	1.84	0.76
1:I:147:TRP:O	2:I:301:LOB:H8C1	1.85	0.76
1:C:147:TRP:O	2:C:301:LOB:H8C1	1.87	0.75
1:E:147:TRP:O	2:E:301:LOB:H8C1	1.86	0.75
1:D:173:LYS:HE2	1:E:45:SER:O	1.87	0.73
1:G:147:TRP:O	2:G:301:LOB:H8C1	1.88	0.72
1:H:147:TRP:O	2:H:301:LOB:H8C1	1.89	0.72
1:F:105[B]:GLN:HA	1:F:105[B]:GLN:NE2	2.05	0.72
1:C:186[B]:GLN:NE2	1:C:197:ASP:OD1	2.24	0.70
1:J:167:SER:HB3	3:J:2123:HOH:O	1.93	0.68
1:F:105[B]:GLN:CA	1:F:105[B]:GLN:HE21	2.05	0.67
1:A:38[B]:GLN:HA	1:A:38[B]:GLN:NE2	2.06	0.67
1:C:172:SER:O	1:C:207:ARG:HD3	1.94	0.66
1:E:186:GLN:NE2	1:E:197:ASP:OD2	2.28	0.65
1:H:186[B]:GLN:NE2	1:H:197:ASP:OD1	2.29	0.65
1:H:172:SER:O	1:H:207[A]:ARG:HD3	1.97	0.64
1:G:59[B]:ARG:HH11	1:G:59[B]:ARG:HG3	1.66	0.60
1:F:97[B]:ARG:CG	1:F:97[B]:ARG:HH21	2.17	0.58
1:F:2:SER:N	3:F:2001:HOH:O	2.36	0.58
1:G:59[B]:ARG:CG	1:G:59[B]:ARG:HH11	2.17	0.58
1:C:101:VAL:CG1	1:C:105[B]:GLN:NE2	2.67	0.57
2:C:301:LOB:H221	2:C:301:LOB:H16	1.87	0.57
1:D:173:LYS:CE	1:E:45:SER:O	2.52	0.56
1:J:97[B]:ARG:HH21	1:J:97[B]:ARG:CG	2.19	0.56
1:J:56:GLU:O	1:J:119:PRO:HD2	2.05	0.56
1:A:38[B]:GLN:NE2	1:A:38[B]:GLN:CA	2.64	0.55
1:C:56:GLU:O	1:C:119:PRO:HD2	2.06	0.55
1:H:38[A]:GLN:HE22	1:H:167:SER:HB2	1.71	0.55
2:E:301:LOB:H16	2:E:301:LOB:H221	1.88	0.55
1:F:56:GLU:O	1:F:119:PRO:HD2	2.07	0.54
1:E:56:GLU:O	1:E:119:PRO:HD2	2.09	0.52
1:D:5:ASN:HD22	1:D:73:GLY:HA3	1.75	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:54:TYR:OH	1:D:121:GLN:NE2	2.43	0.52
1:I:163:VAL:HG21	1:I:200:LEU:CD1	2.40	0.52
1:E:74:ASN:CG	1:E:74:ASN:O	2.48	0.51
2:E:301:LOB:H221	2:E:301:LOB:C16	2.39	0.51
1:D:0:LEU:HA	1:D:3:GLN:HB3	1.93	0.51
1:G:97[B]:ARG:HH11	1:G:97[B]:ARG:CG	2.24	0.51
1:A:20:TYR:N	3:A:2005:HOH:O	2.43	0.51
1:A:186[B]:GLN:NE2	1:A:197:ASP:OD2	2.44	0.51
2:F:301:LOB:H16	2:F:301:LOB:H221	1.92	0.50
2:I:301:LOB:H221	2:I:301:LOB:H16	1.94	0.50
2:J:301:LOB:H221	2:J:301:LOB:H16	1.93	0.50
1:D:163:VAL:HG21	1:D:200:LEU:CD1	2.41	0.50
1:J:50:VAL:HG21	1:J:127:CYS:SG	2.52	0.49
1:C:35:PHE:CE1	1:C:56:GLU:HG3	2.47	0.49
1:E:57:GLN:NE2	1:E:116:MET:SD	2.86	0.49
1:B:101:VAL:HG13	3:B:2111:HOH:O	2.13	0.49
1:D:50:VAL:HG21	1:D:127:CYS:SG	2.53	0.48
1:B:32:THR:HG23	1:B:157:LYS:HG2	1.96	0.48
1:I:50:VAL:HG21	1:I:127:CYS:SG	2.53	0.48
1:H:163:VAL:HG21	1:H:200:LEU:CD1	2.44	0.48
1:J:157:LYS:NZ	3:J:2111:HOH:O	2.46	0.48
1:G:59[B]:ARG:NH1	1:G:59[B]:ARG:HG3	2.29	0.48
1:D:192:PRO:HD2	1:D:193:GLU:OE2	2.14	0.48
1:C:50:VAL:HG21	1:C:127:CYS:SG	2.54	0.47
1:B:32:THR:HG22	1:B:59[B]:ARG:NH2	2.29	0.47
1:E:167:SER:HB2	3:E:2129:HOH:O	2.14	0.47
1:B:146:SER:OG	1:B:149:TYR:HB2	2.14	0.47
1:C:36:THR:HG22	1:C:38:GLN:NE2	2.30	0.47
1:A:77:ASP:OD1	1:A:77:ASP:N	2.48	0.47
1:F:105[B]:GLN:OE1	3:F:2075:HOH:O	2.20	0.46
1:C:163:VAL:HG21	1:C:200:LEU:CD1	2.45	0.46
1:C:105[A]:GLN:NE2	3:C:2087:HOH:O	2.34	0.46
1:C:186[B]:GLN:HB2	1:C:186[B]:GLN:HE21	1.63	0.46
1:A:136:GLU:N	1:A:136:GLU:OE2	2.42	0.46
1:D:56:GLU:O	1:D:119:PRO:HD2	2.17	0.45
1:E:163:VAL:HG21	1:E:200:LEU:CD1	2.46	0.45
1:A:122:ARG:HD2	1:B:96:THR:O	2.16	0.45
1:J:197:ASP:HB3	2:J:301:LOB:H10	1.99	0.45
1:B:122:ARG:HD2	1:C:96:THR:O	2.17	0.45
1:E:184:GLN:NE2	1:E:199:ASN:HB2	2.32	0.44
1:H:63:ASN:O	1:H:66:MET:HG2	2.16	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:J:97[B]:ARG:HG2	1:J:97[B]:ARG:HH21	1.81	0.44
2:G:301:LOB:H16	2:G:301:LOB:H221	1.99	0.44
1:H:97[B]:ARG:HG3	1:H:124:SER:HB2	1.99	0.44
1:H:162:GLN:HG3	3:H:2077:HOH:O	2.16	0.44
1:C:197:ASP:HB3	2:C:301:LOB:H10	2.00	0.44
2:C:301:LOB:C16	2:C:301:LOB:H221	2.48	0.44
1:H:36:THR:HG22	1:H:38[A]:GLN:NE2	2.32	0.44
1:G:97[B]:ARG:HH11	1:G:97[B]:ARG:HG2	1.83	0.44
1:A:56:GLU:O	1:A:119:PRO:HD2	2.18	0.43
1:D:172:SER:O	1:D:207[B]:ARG:HD3	2.18	0.43
1:G:122:ARG:HD2	1:H:96:THR:O	2.18	0.43
1:H:197:ASP:HB3	2:H:301:LOB:H10	2.00	0.43
1:A:207:ARG:O	1:A:208:ARG:CB	2.66	0.43
2:A:301:LOB:H16	2:A:301:LOB:H221	2.01	0.43
1:F:6:LEU:HD23	1:G:21:PRO:HG2	2.00	0.43
1:A:36:THR:HG22	1:A:38[B]:GLN:HE22	1.83	0.43
1:H:56:GLU:O	1:H:119:PRO:HD2	2.19	0.42
2:E:301:LOB:H8C2	2:E:301:LOB:H4	1.95	0.42
1:J:163:VAL:HG21	1:J:200:LEU:CD1	2.49	0.42
1:E:50:VAL:HG21	1:E:127:CYS:SG	2.59	0.42
1:B:56:GLU:O	1:B:119:PRO:HD2	2.18	0.42
1:F:50:VAL:HG21	1:F:127:CYS:SG	2.60	0.42
1:I:193:GLU:H	1:I:193:GLU:CD	2.22	0.42
1:A:50:VAL:HG21	1:A:127:CYS:SG	2.59	0.42
1:G:163:VAL:HG21	1:G:200:LEU:CD1	2.50	0.42
1:A:106:ILE:HG21	1:B:148:VAL:HG21	2.01	0.42
1:F:105[B]:GLN:CA	1:F:105[B]:GLN:NE2	2.72	0.42
1:E:197:ASP:HB3	2:E:301:LOB:H10	2.01	0.41
1:C:207:ARG:O	1:C:208:ARG:C	2.59	0.41
1:G:197:ASP:HB3	2:G:301:LOB:H10	2.02	0.41
1:B:163:VAL:HG21	1:B:200:LEU:CD1	2.50	0.41
1:E:139:THR:HG23	1:E:203:LYS:HG2	2.02	0.41
1:J:206:GLU:OE1	1:J:208:ARG:NH1	2.54	0.41
1:H:3:GLN:O	1:H:7:MET:HG3	2.20	0.41
1:F:195:TYR:CE1	2:F:301:LOB:H222	2.56	0.41
1:F:97[B]:ARG:HG2	1:F:97[B]:ARG:HH21	1.86	0.41
1:A:56:GLU:OE2	1:A:58:GLN:NE2	2.53	0.41
1:I:56:GLU:O	1:I:119:PRO:HD2	2.21	0.41
1:A:163:VAL:HG21	1:A:200:LEU:CD1	2.51	0.41
2:J:301:LOB:C16	2:J:301:LOB:H221	2.51	0.40
1:G:169:TYR:CZ	1:G:171:SER:HB2	2.57	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:122:ARG:HD2	1:G:96:THR:O	2.22	0.40
1:C:101:VAL:CG1	1:C:105[B]:GLN:HE21	2.33	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	207/227 (91%)	201 (97%)	6 (3%)	0	100	100
1	B	207/227 (91%)	200 (97%)	7 (3%)	0	100	100
1	C	205/227 (90%)	202 (98%)	3 (2%)	0	100	100
1	D	210/227 (92%)	209 (100%)	1 (0%)	0	100	100
1	E	205/227 (90%)	199 (97%)	6 (3%)	0	100	100
1	F	204/227 (90%)	200 (98%)	4 (2%)	0	100	100
1	G	206/227 (91%)	203 (98%)	3 (2%)	0	100	100
1	H	204/227 (90%)	200 (98%)	4 (2%)	0	100	100
1	I	207/227 (91%)	203 (98%)	4 (2%)	0	100	100
1	J	204/227 (90%)	201 (98%)	3 (2%)	0	100	100
All	All	2059/2270 (91%)	2018 (98%)	41 (2%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	192/205 (94%)	180 (94%)	12 (6%)	22	12
1	B	192/205 (94%)	186 (97%)	6 (3%)	47	39
1	C	190/205 (93%)	179 (94%)	11 (6%)	25	14
1	D	195/205 (95%)	193 (99%)	2 (1%)	82	81
1	E	190/205 (93%)	188 (99%)	2 (1%)	80	79
1	F	189/205 (92%)	186 (98%)	3 (2%)	70	67
1	G	191/205 (93%)	185 (97%)	6 (3%)	47	39
1	H	190/205 (93%)	178 (94%)	12 (6%)	22	12
1	I	192/205 (94%)	190 (99%)	2 (1%)	82	81
1	J	189/205 (92%)	184 (97%)	5 (3%)	54	47
All	All	1910/2050 (93%)	1849 (97%)	61 (3%)	54	38

All (61) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	2	SER
1	A	3	GLN
1	A	15	ASN
1	A	55	TYR
1	A	59[A]	ARG
1	A	59[B]	ARG
1	A	80	THR
1	A	135	GLU
1	A	157	LYS
1	A	186[A]	GLN
1	A	186[B]	GLN
1	A	208	ARG
1	B	27	ASP
1	B	74	ASN
1	B	157	LYS
1	B	186[A]	GLN
1	B	186[B]	GLN
1	B	193	GLU
1	C	7	MET
1	C	59[A]	ARG
1	C	59[B]	ARG
1	C	70[A]	ASN

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Mol	Chain	Res	Type
1	C	70[B]	ASN
1	C	97[A]	ARG
1	C	97[B]	ARG
1	C	167	SER
1	C	186[A]	GLN
1	C	186[B]	GLN
1	C	208	ARG
1	D	193	GLU
1	D	208	ARG
1	E	66	MET
1	E	186	GLN
1	F	16	ARG
1	F	74[A]	ASN
1	F	186	GLN
1	G	28	PRO
1	G	74	ASN
1	G	79	ARG
1	G	186[A]	GLN
1	G	186[B]	GLN
1	G	208	ARG
1	H	1	HIS
1	H	25	LYS
1	H	59[A]	ARG
1	H	59[B]	ARG
1	H	66	MET
1	H	71	GLU
1	H	74[A]	ASN
1	H	97[A]	ARG
1	H	97[B]	ARG
1	H	167	SER
1	H	186[A]	GLN
1	H	186[B]	GLN
1	I	15	ASN
1	I	167	SER
1	J	8	ARG
1	J	97[A]	ARG
1	J	97[B]	ARG
1	J	136	GLU
1	J	157	LYS

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (12) such sidechains are listed below:

Mol	Chain	Res	Type
1	D	57	GLN
1	D	70	ASN
1	D	121	GLN
1	E	3	GLN
1	E	186	GLN
1	F	186	GLN
1	G	3	GLN
1	G	57	GLN
1	G	74	ASN
1	I	70	ASN
1	I	74	ASN
1	J	186	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 carbohydrates in this entry.

5.6 Ligand geometry [i](#)

10 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	$\# Z > 2$
2	LOB	A	301	-	27,27,27	0.80	0	30,36,36	1.36	3 (10%)
2	LOB	B	301	-	27,27,27	0.83	1 (3%)	30,36,36	1.62	7 (23%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	LOB	C	301	-	27,27,27	0.79	0	30,36,36	1.10	4 (13%)
2	LOB	D	301	-	27,27,27	0.77	0	30,36,36	1.66	6 (20%)
2	LOB	E	301	-	27,27,27	0.69	0	30,36,36	1.36	5 (16%)
2	LOB	F	301	-	27,27,27	0.76	1 (3%)	30,36,36	1.35	4 (13%)
2	LOB	G	301	-	27,27,27	0.71	0	30,36,36	1.24	4 (13%)
2	LOB	H	301	-	27,27,27	0.77	0	30,36,36	1.16	4 (13%)
2	LOB	I	301	-	27,27,27	0.68	0	30,36,36	1.44	3 (10%)
2	LOB	J	301	-	27,27,27	0.68	0	30,36,36	1.18	4 (13%)

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
2	LOB	A	301	-	-	0/16/30/30	0/3/3/3
2	LOB	B	301	-	-	0/16/30/30	0/3/3/3
2	LOB	C	301	-	-	0/16/30/30	0/3/3/3
2	LOB	D	301	-	-	0/16/30/30	0/3/3/3
2	LOB	E	301	-	-	0/16/30/30	0/3/3/3
2	LOB	F	301	-	-	0/16/30/30	0/3/3/3
2	LOB	G	301	-	-	0/16/30/30	0/3/3/3
2	LOB	H	301	-	-	0/16/30/30	0/3/3/3
2	LOB	I	301	-	-	0/16/30/30	0/3/3/3
2	LOB	J	301	-	-	0/16/30/30	0/3/3/3

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	F	301	LOB	C11-N1	2.12	1.50	1.47
2	B	301	LOB	C11-N1	2.60	1.50	1.47

All (44) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	E	301	LOB	C22-N1-C9	-3.66	110.03	113.20
2	D	301	LOB	O1-C3-C8	-3.55	116.78	120.75
2	I	301	LOB	O1-C3-C8	-3.47	116.87	120.75
2	A	301	LOB	O1-C3-C8	-2.99	117.41	120.75
2	B	301	LOB	C22-N1-C9	-2.76	110.81	113.20

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	301	LOB	C22-N1-C9	-2.71	110.86	113.20
2	B	301	LOB	O2-C16-C17	-2.61	105.35	111.20
2	B	301	LOB	O1-C3-C8	-2.59	117.85	120.75
2	D	301	LOB	C22-N1-C9	-2.45	111.08	113.20
2	E	301	LOB	C14-C11-C13	-2.39	108.48	113.10
2	E	301	LOB	C15-C12-C9	-2.38	106.49	110.86
2	I	301	LOB	C14-C11-C13	-2.38	108.50	113.10
2	F	301	LOB	O1-C3-C8	-2.36	118.11	120.75
2	D	301	LOB	C14-C11-C13	-2.35	108.56	113.10
2	B	301	LOB	C22-N1-C11	-2.34	111.18	113.20
2	E	301	LOB	C22-N1-C11	-2.33	111.18	113.20
2	H	301	LOB	C14-C11-C13	-2.31	108.62	113.10
2	F	301	LOB	C14-C11-C13	-2.30	108.65	113.10
2	H	301	LOB	O1-C3-C8	-2.13	118.36	120.75
2	F	301	LOB	C22-N1-C9	-2.13	111.36	113.20
2	J	301	LOB	C22-N1-C9	-2.09	111.39	113.20
2	J	301	LOB	C15-C12-C9	-2.04	107.12	110.86
2	C	301	LOB	C15-C12-C9	-2.03	107.14	110.86
2	G	301	LOB	C15-C12-C9	-2.02	107.16	110.86
2	C	301	LOB	C14-C11-C13	-2.01	109.22	113.10
2	D	301	LOB	C15-C13-C11	2.02	114.57	110.86
2	H	301	LOB	C14-C16-C17	2.03	115.11	111.36
2	J	301	LOB	C14-C16-C17	2.08	115.20	111.36
2	A	301	LOB	C15-C13-C11	2.13	114.77	110.86
2	C	301	LOB	C8-C3-C1	2.27	121.14	118.72
2	B	301	LOB	C15-C13-C11	2.27	115.02	110.86
2	G	301	LOB	C15-C13-C11	2.38	115.22	110.86
2	D	301	LOB	C14-C16-C17	2.39	115.79	111.36
2	E	301	LOB	C8-C3-C1	2.46	121.35	118.72
2	J	301	LOB	C8-C3-C1	2.53	121.42	118.72
2	G	301	LOB	C14-C16-C17	2.83	116.59	111.36
2	G	301	LOB	C8-C3-C1	3.24	122.17	118.72
2	H	301	LOB	C8-C3-C1	3.43	122.38	118.72
2	B	301	LOB	C14-C16-C17	3.63	118.07	111.36
2	F	301	LOB	C8-C3-C1	4.01	122.99	118.72
2	B	301	LOB	C8-C3-C1	4.05	123.04	118.72
2	I	301	LOB	C8-C3-C1	4.86	123.90	118.72
2	A	301	LOB	C8-C3-C1	4.86	123.90	118.72
2	D	301	LOB	C8-C3-C1	5.64	124.73	118.72

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

10 monomers are involved in 27 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	301	LOB	2	0
2	B	301	LOB	1	0
2	C	301	LOB	4	0
2	D	301	LOB	1	0
2	E	301	LOB	5	0
2	F	301	LOB	3	0
2	G	301	LOB	3	0
2	H	301	LOB	2	0
2	I	301	LOB	2	0
2	J	301	LOB	4	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	205/227 (90%)	0.53	17 (8%)	14 16	20, 34, 72, 88	4 (1%)
1	B	206/227 (90%)	0.35	14 (6%)	20 23	20, 34, 77, 92	2 (0%)
1	C	203/227 (89%)	0.34	14 (6%)	20 23	22, 37, 65, 74	1 (0%)
1	D	205/227 (90%)	0.47	18 (8%)	12 13	21, 32, 70, 89	1 (0%)
1	E	206/227 (90%)	0.61	29 (14%)	4 4	22, 34, 72, 94	0
1	F	204/227 (89%)	0.31	16 (7%)	16 18	24, 35, 73, 82	4 (1%)
1	G	203/227 (89%)	0.47	21 (10%)	9 9	24, 36, 83, 100	1 (0%)
1	H	204/227 (89%)	0.65	26 (12%)	5 5	27, 43, 78, 89	1 (0%)
1	I	206/227 (90%)	0.61	22 (10%)	8 9	26, 36, 71, 87	1 (0%)
1	J	204/227 (89%)	0.50	18 (8%)	12 13	25, 35, 65, 72	0
All	All	2046/2270 (90%)	0.48	195 (9%)	10 11	20, 36, 73, 100	15 (0%)

All (195) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	1	HIS	7.6
1	A	17	SER	7.5
1	I	11	SER	7.2
1	G	1	HIS	6.9
1	G	74	ASN	6.6
1	G	4	ALA	6.5
1	A	15	ASN	6.1
1	I	1	HIS	6.1
1	E	1	HIS	6.1
1	D	0	LEU	6.0
1	B	14	PHE	6.0
1	E	2	SER	5.8
1	D	11	SER	5.7

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Mol	Chain	Res	Type	RSRZ
1	E	0	LEU	5.3
1	G	12	ASP	5.3
1	H	16	ARG	5.3
1	B	0	LEU	5.2
1	E	70	ASN	5.1
1	E	14	PHE	4.8
1	A	208	ARG	4.8
1	H	1	HIS	4.8
1	G	5	ASN	4.8
1	G	6	LEU	4.7
1	E	4	ALA	4.7
1	B	11	SER	4.7
1	E	11	SER	4.6
1	G	11	SER	4.5
1	D	70	ASN	4.5
1	C	4	ALA	4.5
1	J	74	ASN	4.5
1	G	14	PHE	4.5
1	D	74	ASN	4.4
1	D	7	MET	4.4
1	C	11	SER	4.3
1	H	68	ASP	4.3
1	C	208	ARG	4.3
1	F	14	PHE	4.2
1	I	7	MET	4.1
1	H	12	ASP	4.1
1	E	74	ASN	4.1
1	I	208	ARG	4.1
1	A	16	ARG	4.1
1	I	154	ILE	4.1
1	E	15	ASN	4.0
1	E	-1	LYS	4.0
1	J	208	ARG	4.0
1	D	5	ASN	4.0
1	I	12	ASP	4.0
1	J	15	ASN	4.0
1	D	14	PHE	3.9
1	B	15	ASN	3.9
1	I	14	PHE	3.9
1	D	12	ASP	3.9
1	H	70	ASN	3.8
1	I	0	LEU	3.8

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Mol	Chain	Res	Type	RSRZ
1	H	11	SER	3.8
1	A	202[A]	VAL	3.8
1	H	14	PHE	3.8
1	C	14	PHE	3.8
1	H	4	ALA	3.8
1	H	66	MET	3.8
1	H	71	GLU	3.7
1	I	2	SER	3.7
1	E	68	ASP	3.7
1	F	202[A]	VAL	3.7
1	H	72	TYR	3.7
1	H	15	ASN	3.6
1	I	15	ASN	3.6
1	I	74	ASN	3.6
1	I	13	LEU	3.6
1	D	15	ASN	3.6
1	J	16	ARG	3.6
1	E	72	TYR	3.5
1	D	208	ARG	3.5
1	I	70	ASN	3.4
1	F	15	ASN	3.4
1	I	16	ARG	3.4
1	H	9	LEU	3.4
1	E	71	GLU	3.4
1	D	13	LEU	3.3
1	E	67	TRP	3.3
1	G	7[A]	MET	3.3
1	I	196	ILE	3.2
1	C	15	ASN	3.2
1	I	71	GLU	3.2
1	B	74	ASN	3.2
1	J	11	SER	3.2
1	G	70	ASN	3.2
1	B	1	HIS	3.2
1	J	70	ASN	3.1
1	H	3	GLN	3.1
1	B	16	ARG	3.0
1	J	136	GLU	3.0
1	E	7	MET	3.0
1	E	156	LEU	3.0
1	G	67	TRP	3.0
1	C	135	GLU	3.0

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Mol	Chain	Res	Type	RSRZ
1	E	69	PRO	3.0
1	G	136	GLU	3.0
1	E	6	LEU	2.9
1	F	11	SER	2.9
1	G	68	ASP	2.9
1	F	6	LEU	2.9
1	F	208	ARG	2.9
1	D	68	ASP	2.9
1	A	74[A]	ASN	2.8
1	H	5	ASN	2.8
1	J	68	ASP	2.8
1	H	13	LEU	2.8
1	I	156	LEU	2.8
1	F	7	MET	2.8
1	J	14	PHE	2.8
1	I	68	ASP	2.8
1	E	5	ASN	2.7
1	H	67	TRP	2.7
1	C	68	ASP	2.7
1	C	74[A]	ASN	2.7
1	F	2	SER	2.7
1	F	9	LEU	2.7
1	D	4	ALA	2.7
1	C	134	SER	2.7
1	D	2	SER	2.7
1	J	7	MET	2.7
1	C	70[A]	ASN	2.6
1	A	4	ALA	2.6
1	A	2	SER	2.6
1	E	196	ILE	2.6
1	E	31	VAL	2.6
1	A	11	SER	2.6
1	D	71	GLU	2.6
1	A	7	MET	2.6
1	D	6	LEU	2.6
1	F	16	ARG	2.6
1	A	70	ASN	2.5
1	F	74[A]	ASN	2.5
1	G	3	GLN	2.5
1	B	26	ASP	2.5
1	B	13	LEU	2.5
1	G	27	ASP	2.5

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Mol	Chain	Res	Type	RSRZ
1	H	74[A]	ASN	2.5
1	B	12	ASP	2.5
1	J	2	SER	2.5
1	E	3	GLN	2.5
1	E	154	ILE	2.4
1	J	4	ALA	2.4
1	A	6	LEU	2.4
1	C	161	ASP	2.4
1	H	136	GLU	2.4
1	H	135	GLU	2.4
1	E	136	GLU	2.4
1	E	198	VAL	2.3
1	J	135	GLU	2.3
1	E	12	ASP	2.3
1	E	13	LEU	2.3
1	H	6	LEU	2.3
1	B	70[A]	ASN	2.3
1	J	72	TYR	2.3
1	F	76	THR	2.3
1	G	25	LYS	2.3
1	I	66	MET	2.2
1	A	12	ASP	2.2
1	C	2	SER	2.2
1	G	9	LEU	2.2
1	G	13	LEU	2.2
1	D	72	TYR	2.2
1	G	66	MET	2.2
1	F	165	LEU	2.2
1	I	207[A]	ARG	2.2
1	B	27	ASP	2.2
1	A	73	GLY	2.2
1	I	131	GLY	2.2
1	G	72	TYR	2.2
1	H	26	ASP	2.2
1	H	161	ASP	2.2
1	I	4	ALA	2.2
1	A	76	THR	2.1
1	H	2	SER	2.1
1	F	70	ASN	2.1
1	A	161[A]	ASP	2.1
1	A	13	LEU	2.1
1	B	6	LEU	2.1

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Mol	Chain	Res	Type	RSRZ
1	E	29	LEU	2.1
1	J	3	GLN	2.1
1	J	134	SER	2.1
1	C	136	GLU	2.1
1	C	5	ASN	2.1
1	F	72	TYR	2.1
1	J	71	GLU	2.0
1	J	5	ASN	2.0
1	E	73	GLY	2.0
1	B	64	SER	2.0
1	H	7	MET	2.0
1	F	161[A]	ASP	2.0
1	H	134	SER	2.0
1	G	26	ASP	2.0

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

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

6.3 Carbohydrates ⓘ

There are no carbohydrates in this entry.

6.4 Ligands ⓘ

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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	LLDF	B-factors(Å ²)	Q<0.9
2	LOB	D	301	25/25	0.88	0.21	2.04	25,29,33,33	0
2	LOB	B	301	25/25	0.92	0.16	1.79	25,31,35,35	0
2	LOB	H	301	25/25	0.89	0.21	1.77	32,33,34,34	0
2	LOB	C	301	25/25	0.88	0.17	1.63	27,28,31,31	0
2	LOB	G	301	25/25	0.92	0.15	1.17	32,34,37,37	0
2	LOB	F	301	25/25	0.89	0.14	0.48	32,34,37,37	0
2	LOB	I	301	25/25	0.89	0.16	0.44	27,31,35,35	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors(\AA^2)	Q<0.9
2	LOB	J	301	25/25	0.92	0.13	0.12	27,29,31,31	0
2	LOB	A	301	25/25	0.88	0.12	-0.12	30,32,36,36	0
2	LOB	E	301	25/25	0.92	0.12	-0.13	28,30,30,31	0

6.5 Other polymers [i](#)

There are no such residues in this entry.