



Full wwPDB EM Validation Report ⓘ

Jul 15, 2025 – 10:43 AM JST

PDB ID : 8XZJ / pdb_00008xzj
EMDB ID : EMD-38798
Title : Cryo-EM structure of the WN353-bound human APLNR-Gi complex
Authors : Wang, W.; Ji, S.; Zhang, Y.
Deposited on : 2024-01-21
Resolution : 3.00 Å(reported)

This is a Full wwPDB EM 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/EMValidationReportHelp>

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:

EMDB validation analysis : **FAILED**
Mogul : 1.8.5 (274361), CSD as541be (2020)
MolProbity : 4-5-2 with Phenix2.0rc1
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : **FAILED**
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.44

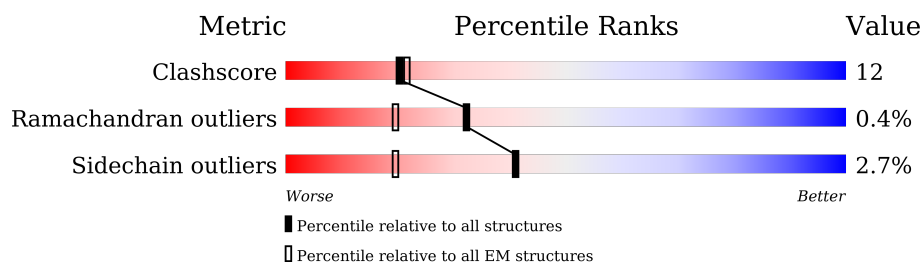
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.00 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)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the 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 $\leq 5\%$.

Mol	Chain	Length	Quality of chain
1	R	380	
2	A	354	
3	B	339	
4	G	71	
5	S	250	
6	L	13	

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
6	NAL	L	11	-	-	X	-

2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 9106 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, 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 Apelin receptor.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	R	303	Total	C	N	O	S	0	0
			2410	1600	379	408	23		

- Molecule 2 is a protein called Guanine nucleotide-binding protein G(i) subunit alpha-1.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	A	218	Total	C	N	O	S	0	0
			1756	1117	294	331	14		

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	47	ASN	SER	conflict	UNP P63096
A	203	ALA	GLY	conflict	UNP P63096
A	245	ALA	GLU	conflict	UNP P63096
A	326	SER	ALA	conflict	UNP P63096

- Molecule 3 is a protein called Guanine nucleotide-binding protein G(I)/G(S)/G(T) subunit beta-1.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	B	339	Total	C	N	O	S	0	0
			2607	1607	468	511	21		

- Molecule 4 is a protein called Guanine nucleotide-binding protein G(I)/G(S)/G(O) subunit gamma-2.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	G	58	Total	C	N	O	S	0	0
			444	277	79	85	3		

- Molecule 5 is a protein called scFv16.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	S	231	Total 1777	C 1128	N 294	O 345	S 10	0	0

- Molecule 6 is a protein called WN353.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	L	13	Total 112	C 75	N 22	O 13	S 2	0	0

Chain G:

79%

18%



● Molecule 5: scFv16

Chain S:

92%

8%



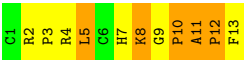
● Molecule 6: WN353

Chain L:

15%

46%

38%



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	91754	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	52	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	FEI FALCON IV (4k x 4k)	Depositor

5 Model quality

5.1 Standard geometry

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

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	R	0.71	0/2479	0.91	4/3385 (0.1%)
2	A	0.59	0/1785	0.54	0/2393
3	B	0.62	0/2654	0.61	1/3597 (0.0%)
4	G	0.58	0/450	0.54	0/608
5	S	0.54	0/1821	0.52	0/2469
6	L	0.80	0/100	1.11	0/131
All	All	0.63	0/9289	0.68	5/12583 (0.0%)

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	R	0	1

There are no bond length outliers.

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	76	ASP	N-CA-C	-7.82	103.54	113.23
1	R	313	ASP	CA-C-N	6.38	126.59	119.32
1	R	313	ASP	C-N-CA	6.38	126.59	119.32
1	R	266	LEU	N-CA-C	-5.11	107.43	113.97
1	R	226	GLN	N-CA-C	-5.07	107.48	113.97

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	R	91	ARG	Sidechain

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	R	2410	0	2418	188	0
2	A	1756	0	1751	10	0
3	B	2607	0	2510	7	0
4	G	444	0	454	1	0
5	S	1777	0	1712	1	0
6	L	112	0	110	35	0
All	All	9106	0	8955	217	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 12.

All (217) 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:R:93:TYR:CE2	6:L:8:LYS:HB2	1.76	1.20
1:R:202:GLY:HA3	1:R:272:MET:HE1	1.29	1.14
1:R:78:PHE:HB2	1:R:112:ASN:CB	1.81	1.09
1:R:71:LEU:HD11	1:R:305:ASN:HD21	1.07	1.08
1:R:110:PHE:HE2	1:R:161:ALA:HA	1.13	1.07
1:R:88:TYR:CE1	1:R:93:TYR:HA	1.89	1.07
1:R:71:LEU:HD11	1:R:305:ASN:ND2	1.69	1.05
1:R:161:ALA:O	1:R:164:VAL:HG22	1.58	1.04
1:R:110:PHE:CE2	1:R:161:ALA:HA	1.92	1.04
1:R:78:PHE:HB2	1:R:112:ASN:HB2	1.41	1.01
1:R:168:ARG:HH11	6:L:12:PRO:HB3	1.25	1.01
1:R:93:TYR:CZ	6:L:8:LYS:HD3	1.96	1.00
1:R:202:GLY:CA	1:R:272:MET:HE1	1.96	0.94
1:R:202:GLY:HA3	1:R:272:MET:CE	2.00	0.92
6:L:10:PRO:HD2	6:L:11:NAL:C1	2.01	0.91
6:L:10:PRO:HD2	6:L:11:NAL:H1	1.52	0.91
1:R:106:SER:OG	6:L:12:PRO:HG3	1.74	0.86

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:R:168:ARG:NH1	6:L:12:PRO:HB3	1.90	0.86
1:R:123:LEU:HD13	1:R:309:TYR:CD2	2.11	0.85
1:R:85:TRP:CE2	6:L:10:PRO:HB3	2.11	0.84
1:R:78:PHE:CB	1:R:112:ASN:CB	2.55	0.84
1:R:78:PHE:HA	1:R:112:ASN:HD22	1.42	0.84
1:R:168:ARG:HE	1:R:181:CYS:HB3	1.41	0.84
1:R:231:HIS:CE1	2:A:344:ILE:HD12	2.13	0.83
1:R:68:ILE:CD1	1:R:309:TYR:O	2.25	0.83
1:R:123:LEU:HD13	1:R:309:TYR:HD2	1.41	0.83
1:R:73:VAL:O	1:R:77:THR:HG22	1.79	0.83
1:R:88:TYR:HE1	1:R:93:TYR:CA	1.91	0.83
1:R:50:LEU:O	1:R:54:PHE:HB2	1.79	0.83
1:R:46:ASN:OD1	1:R:306:PRO:HG3	1.78	0.82
1:R:93:TYR:CD2	6:L:8:LYS:HB2	2.14	0.82
1:R:110:PHE:HD2	1:R:161:ALA:HB1	1.45	0.81
1:R:46:ASN:HB3	1:R:76:LEU:HB2	1.61	0.81
1:R:88:TYR:CE1	1:R:93:TYR:CA	2.62	0.81
1:R:78:PHE:CA	1:R:112:ASN:HD22	1.94	0.81
1:R:128:TYR:N	1:R:224:ILE:HD11	1.96	0.81
1:R:78:PHE:CB	1:R:112:ASN:HB3	2.11	0.80
1:R:85:TRP:CE3	1:R:88:TYR:HD2	1.99	0.79
1:R:220:CYS:O	1:R:224:ILE:HG13	1.83	0.79
3:B:250:CYS:SG	3:B:285:LEU:HD21	2.23	0.78
1:R:93:TYR:OH	6:L:8:LYS:HD3	1.85	0.78
1:R:127:ARG:NH1	2:A:353:LEU:HD21	2.00	0.76
1:R:88:TYR:CD1	1:R:93:TYR:HA	2.20	0.76
3:B:37:ILE:O	3:B:38:ASP:HB2	1.84	0.76
1:R:110:PHE:CD2	1:R:161:ALA:CB	2.69	0.76
1:R:271:TYR:OH	6:L:4:ARG:HB2	1.86	0.75
1:R:68:ILE:HD12	1:R:309:TYR:O	1.86	0.75
1:R:71:LEU:CD1	1:R:305:ASN:ND2	2.48	0.74
1:R:72:ALA:O	1:R:76:LEU:HB3	1.87	0.74
1:R:310:ALA:O	1:R:316:PHE:CD2	2.40	0.74
1:R:85:TRP:CZ3	1:R:88:TYR:HD2	2.07	0.72
1:R:110:PHE:HD2	1:R:161:ALA:CB	2.03	0.72
1:R:228:ILE:CD1	1:R:246:LEU:HB3	2.20	0.71
1:R:228:ILE:HD13	1:R:246:LEU:HB3	1.72	0.70
1:R:46:ASN:HD22	1:R:76:LEU:N	1.88	0.69
1:R:68:ILE:HD11	1:R:309:TYR:O	1.91	0.69
1:R:127:ARG:NH1	2:A:353:LEU:CD2	2.57	0.68
1:R:260:CYS:O	1:R:297:ILE:CG2	2.42	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:R:72:ALA:O	1:R:76:LEU:CB	2.41	0.67
1:R:46:ASN:ND2	1:R:75:ASP:C	2.52	0.67
1:R:280:PRO:O	1:R:282:ASP:N	2.27	0.67
6:L:8:LYS:HG3	6:L:8:LYS:O	1.95	0.67
1:R:110:PHE:CE2	1:R:161:ALA:CA	2.75	0.67
1:R:75:ASP:HB3	1:R:302:SER:OG	1.96	0.66
1:R:85:TRP:CZ3	1:R:88:TYR:CD2	2.83	0.65
1:R:35:TYR:HE1	1:R:299:TYR:HE1	1.43	0.65
1:R:46:ASN:OD1	1:R:306:PRO:CG	2.44	0.65
1:R:78:PHE:HB3	1:R:112:ASN:HB3	1.77	0.64
1:R:307:PHE:HA	1:R:311:PHE:HB2	1.79	0.64
1:R:75:ASP:O	1:R:79:VAL:HG12	1.97	0.63
1:R:77:THR:O	1:R:80:VAL:HG12	1.99	0.63
1:R:218:LEU:HD12	1:R:218:LEU:O	1.99	0.63
1:R:210:PHE:CE1	1:R:257:PHE:CE2	2.87	0.62
1:R:313:ASP:OD2	1:R:316:PHE:HB3	1.98	0.62
1:R:75:ASP:OD2	1:R:305:ASN:ND2	2.33	0.62
1:R:46:ASN:HD22	1:R:75:ASP:C	2.06	0.62
1:R:78:PHE:CA	1:R:112:ASN:ND2	2.62	0.61
1:R:46:ASN:CB	1:R:76:LEU:HB2	2.29	0.61
6:L:8:LYS:O	6:L:11:NAL:C6	2.49	0.60
1:R:93:TYR:CD2	6:L:8:LYS:CB	2.85	0.60
1:R:207:THR:HA	1:R:211:VAL:HG13	1.82	0.60
1:R:23:ASP:OD1	6:L:8:LYS:NZ	2.29	0.60
1:R:75:ASP:CB	1:R:302:SER:OG	2.49	0.59
1:R:88:TYR:HE1	1:R:93:TYR:C	2.11	0.59
6:L:5:LEU:HG	6:L:11:NAL:H5	1.86	0.58
6:L:11:NAL:C	6:L:13:PHE:H	2.16	0.57
1:R:210:PHE:CE1	1:R:257:PHE:HE2	2.22	0.57
6:L:5:LEU:CG	6:L:11:NAL:H5	2.35	0.56
1:R:228:ILE:HD13	1:R:246:LEU:CB	2.35	0.56
1:R:128:TYR:CA	1:R:224:ILE:HD11	2.36	0.55
1:R:123:LEU:CD1	1:R:309:TYR:CD2	2.88	0.55
1:R:227:THR:HG23	1:R:231:HIS:CD2	2.41	0.55
1:R:127:ARG:C	1:R:224:ILE:HD11	2.31	0.55
1:R:127:ARG:HH12	2:A:353:LEU:CD2	2.19	0.55
1:R:127:ARG:HD2	1:R:221:TYR:OH	2.07	0.55
1:R:85:TRP:NE1	6:L:10:PRO:HB3	2.21	0.55
6:L:5:LEU:HD12	6:L:7:HIS:O	2.07	0.55
1:R:127:ARG:HH11	2:A:353:LEU:HD21	1.72	0.55
1:R:78:PHE:CB	1:R:112:ASN:HD22	2.19	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:R:264:TYR:C	1:R:264:TYR:CD2	2.85	0.54
1:R:68:ILE:CG2	1:R:310:ALA:HB2	2.38	0.54
1:R:85:TRP:CE3	1:R:88:TYR:CD2	2.89	0.54
1:R:38:VAL:HG23	1:R:82:LEU:HD12	1.89	0.53
1:R:91:ARG:O	1:R:92:ASP:HB2	2.07	0.53
1:R:85:TRP:HZ3	1:R:88:TYR:CD2	2.25	0.53
1:R:93:TYR:CE2	6:L:8:LYS:CB	2.70	0.52
1:R:93:TYR:HH	6:L:8:LYS:HD3	1.74	0.52
1:R:294:CYS:O	1:R:297:ILE:HB	2.09	0.52
1:R:128:TYR:C	1:R:128:TYR:CD1	2.85	0.52
1:R:88:TYR:CD1	1:R:88:TYR:C	2.85	0.52
1:R:77:THR:C	1:R:80:VAL:HG12	2.35	0.52
1:R:35:TYR:HE1	1:R:299:TYR:CE1	2.25	0.52
1:R:128:TYR:CE1	1:R:132:VAL:HB	2.45	0.52
1:R:76:LEU:HD12	1:R:76:LEU:O	2.10	0.52
3:B:292:PHE:CD1	3:B:292:PHE:N	2.77	0.52
1:R:258:ALA:O	1:R:262:MET:HB2	2.10	0.51
6:L:10:PRO:O	6:L:12:PRO:HD3	2.09	0.51
1:R:81:THR:CG2	1:R:109:ILE:HG13	2.41	0.51
3:B:2:SER:OG	3:B:3:GLU:N	2.43	0.51
1:R:62:ARG:NH2	1:R:313:ASP:OD1	2.44	0.51
1:R:127:ARG:HB3	1:R:224:ILE:HD13	1.92	0.51
1:R:131:ILE:HD12	1:R:224:ILE:HD13	1.91	0.51
1:R:110:PHE:CZ	1:R:114:TYR:CE1	2.99	0.51
1:R:39:PHE:C	1:R:39:PHE:CD2	2.89	0.51
1:R:212:VAL:HB	1:R:213:PRO:HD3	1.93	0.51
1:R:310:ALA:O	1:R:316:PHE:CE2	2.63	0.50
1:R:79:VAL:HG23	1:R:82:LEU:HD12	1.93	0.50
1:R:68:ILE:HG21	1:R:310:ALA:HB2	1.93	0.50
1:R:209:GLY:O	1:R:213:PRO:HG2	2.11	0.50
1:R:91:ARG:O	1:R:92:ASP:CB	2.60	0.50
1:R:111:VAL:HG23	1:R:157:ALA:C	2.37	0.49
1:R:258:ALA:O	1:R:262:MET:CB	2.60	0.49
1:R:35:TYR:O	1:R:38:VAL:HG22	2.12	0.49
1:R:110:PHE:CZ	1:R:114:TYR:HE1	2.31	0.49
1:R:78:PHE:CB	1:R:112:ASN:ND2	2.76	0.49
1:R:42:GLY:N	1:R:303:CYS:SG	2.86	0.49
1:R:46:ASN:HD22	1:R:76:LEU:CA	2.25	0.49
1:R:88:TYR:CE1	1:R:93:TYR:C	2.89	0.49
1:R:287:LEU:O	1:R:291:PHE:HB2	2.13	0.49
1:R:132:VAL:HG22	1:R:223:PHE:O	2.12	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:R:88:TYR:HD1	1:R:88:TYR:O	1.96	0.48
1:R:78:PHE:HB2	1:R:112:ASN:HD22	1.79	0.48
2:A:276:GLU:OE2	2:A:280:LYS:NZ	2.47	0.48
1:R:216:ILE:HG22	1:R:216:ILE:O	2.12	0.48
5:S:223:TYR:HA	5:S:224:PRO:C	2.39	0.48
1:R:85:TRP:HZ3	1:R:88:TYR:CE2	2.32	0.48
1:R:110:PHE:CE2	1:R:114:TYR:HE1	2.31	0.47
1:R:39:PHE:HA	1:R:79:VAL:HG22	1.95	0.47
6:L:11:NAL:O	6:L:11:NAL:H3	2.15	0.47
2:A:353:LEU:O	2:A:354:PHE:C	2.58	0.47
1:R:288:MET:O	1:R:292:PRO:HD3	2.15	0.47
6:L:5:LEU:HD21	6:L:11:NAL:H5	1.98	0.46
1:R:82:LEU:HD23	1:R:109:ILE:HD11	1.98	0.46
6:L:10:PRO:O	6:L:12:PRO:CD	2.64	0.46
1:R:124:SER:O	1:R:220:CYS:HB3	2.16	0.46
1:R:134:PRO:HG2	2:A:344:ILE:HG12	1.98	0.46
1:R:128:TYR:HA	1:R:224:ILE:HD11	1.96	0.46
1:R:120:LEU:HD22	1:R:309:TYR:CZ	2.51	0.46
1:R:207:THR:HA	1:R:211:VAL:CG1	2.46	0.46
1:R:271:TYR:OH	6:L:4:ARG:CB	2.62	0.46
1:R:39:PHE:CD1	1:R:83:PRO:HD3	2.52	0.45
1:R:77:THR:HG23	1:R:112:ASN:ND2	2.31	0.45
1:R:168:ARG:NH1	6:L:12:PRO:CB	2.70	0.45
1:R:110:PHE:CD2	1:R:161:ALA:HB2	2.51	0.45
1:R:78:PHE:HB2	1:R:112:ASN:ND2	2.32	0.44
1:R:85:TRP:HE3	1:R:88:TYR:HD2	1.59	0.44
1:R:35:TYR:O	1:R:38:VAL:CG2	2.64	0.44
3:B:61:MET:SD	3:B:61:MET:C	3.00	0.44
1:R:75:ASP:HB3	1:R:302:SER:CB	2.47	0.44
1:R:128:TYR:CD1	1:R:128:TYR:O	2.70	0.44
1:R:222:PHE:O	1:R:222:PHE:CD1	2.70	0.44
1:R:125:PHE:HA	1:R:220:CYS:SG	2.58	0.44
1:R:291:PHE:O	1:R:291:PHE:CD1	2.70	0.44
1:R:110:PHE:CD2	1:R:161:ALA:CA	3.01	0.44
6:L:5:LEU:CD2	6:L:11:NAL:H5	2.48	0.44
1:R:127:ARG:HH12	2:A:353:LEU:HD21	1.77	0.44
1:R:88:TYR:CD1	1:R:88:TYR:O	2.71	0.43
1:R:46:ASN:HD21	1:R:75:ASP:CB	2.31	0.43
1:R:82:LEU:HD21	1:R:299:TYR:CZ	2.53	0.43
1:R:229:ALA:O	1:R:243:ARG:NH2	2.51	0.43
4:G:61:PHE:O	4:G:62:ARG:C	2.61	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:R:35:TYR:C	1:R:38:VAL:HG22	2.43	0.43
1:R:110:PHE:CD2	1:R:161:ALA:HA	2.48	0.43
1:R:231:HIS:CE1	2:A:344:ILE:CD1	2.94	0.43
1:R:262:MET:HB3	1:R:263:PRO:HD3	2.00	0.43
6:L:5:LEU:HD11	6:L:8:LYS:HG3	2.01	0.43
1:R:110:PHE:CD2	1:R:161:ALA:HB1	2.31	0.43
1:R:210:PHE:C	1:R:213:PRO:HD2	2.43	0.43
1:R:78:PHE:HA	1:R:112:ASN:ND2	2.22	0.42
1:R:110:PHE:O	1:R:113:MET:HB3	2.19	0.42
1:R:113:MET:HE1	1:R:205:SER:OG	2.19	0.42
1:R:78:PHE:O	1:R:109:ILE:HG12	2.19	0.42
1:R:128:TYR:HD1	1:R:132:VAL:CG2	2.32	0.42
3:B:163:ASP:C	3:B:164:THR:HG23	2.45	0.42
1:R:37:LEU:HG	1:R:41:LEU:HD12	2.01	0.42
1:R:71:LEU:CG	1:R:305:ASN:ND2	2.82	0.42
1:R:62:ARG:NH1	1:R:62:ARG:HB2	2.34	0.42
6:L:5:LEU:HD12	6:L:5:LEU:O	2.20	0.42
1:R:207:THR:O	1:R:212:VAL:HG23	2.19	0.42
1:R:207:THR:HA	1:R:211:VAL:HG22	2.02	0.41
1:R:260:CYS:O	1:R:297:ILE:HG23	2.20	0.41
1:R:75:ASP:OD1	1:R:116:SER:OG	2.39	0.41
1:R:95:TRP:N	1:R:179:VAL:O	2.53	0.41
1:R:77:THR:HA	1:R:80:VAL:CG1	2.51	0.41
3:B:163:ASP:C	3:B:163:ASP:OD1	2.64	0.41
6:L:2:ARG:HB3	6:L:3:PRO:HD3	2.02	0.41
1:R:67:PHE:HZ	1:R:149:ALA:HB3	1.85	0.41
1:R:313:ASP:HA	1:R:314:PRO:HD3	1.96	0.41
6:L:5:LEU:HD12	6:L:5:LEU:C	2.46	0.41
1:R:128:TYR:CD1	1:R:132:VAL:CG2	3.04	0.41
1:R:168:ARG:NH2	6:L:9:GLY:O	2.54	0.41
1:R:108:LEU:O	1:R:112:ASN:CG	2.64	0.40
1:R:78:PHE:HB2	1:R:112:ASN:CG	2.41	0.40
1:R:79:VAL:HG23	1:R:82:LEU:CD1	2.51	0.40
6:L:10:PRO:C	6:L:12:PRO:HD3	2.46	0.40
1:R:111:VAL:HG23	1:R:157:ALA:O	2.21	0.40
1:R:128:TYR:CD1	1:R:132:VAL:HG21	2.57	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 PDB entries followed by that with respect to all EM entries.

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	R	299/380 (79%)	291 (97%)	7 (2%)	1 (0%)	37	70
2	A	212/354 (60%)	208 (98%)	4 (2%)	0	100	100
3	B	337/339 (99%)	326 (97%)	9 (3%)	2 (1%)	22	57
4	G	56/71 (79%)	56 (100%)	0	0	100	100
5	S	227/250 (91%)	226 (100%)	1 (0%)	0	100	100
6	L	10/13 (77%)	8 (80%)	0	2 (20%)	0	0
All	All	1141/1407 (81%)	1115 (98%)	21 (2%)	5 (0%)	32	66

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	R	281	CYS
3	B	38	ASP
3	B	39	PRO
6	L	10	PRO
6	L	12	PRO

5.3.2 Protein sidechains

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

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	R	262/327 (80%)	237 (90%)	25 (10%)	7	28
2	A	194/305 (64%)	194 (100%)	0	100	100
3	B	282/282 (100%)	282 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
4	G	47/58 (81%)	47 (100%)	0	100	100
5	S	196/202 (97%)	196 (100%)	0	100	100
6	L	11/11 (100%)	9 (82%)	2 (18%)	1	7
All	All	992/1185 (84%)	965 (97%)	27 (3%)	41	71

All (27) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	R	30	LEU
1	R	36	MET
1	R	37	LEU
1	R	48	LEU
1	R	54	PHE
1	R	65	ASP
1	R	78	PHE
1	R	92	ASP
1	R	108	LEU
1	R	109	ILE
1	R	165	MET
1	R	211	VAL
1	R	215	THR
1	R	216	ILE
1	R	219	THR
1	R	226	GLN
1	R	227	THR
1	R	228	ILE
1	R	264	TYR
1	R	266	LEU
1	R	268	LYS
1	R	297	ILE
1	R	300	VAL
1	R	301	ASN
1	R	302	SER
6	L	5	LEU
6	L	8	LYS

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

Mol	Chain	Res	Type
1	R	46	ASN

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Mol	Chain	Res	Type
1	R	112	ASN
1	R	180	GLN
1	R	231	HIS
2	A	52	GLN
2	A	304	GLN
2	A	322	HIS
3	B	91	HIS

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

1 non-standard protein/DNA/RNA residue is 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	$\# Z > 2$
6	NAL	L	11	6	15,16,17	1.23	1 (6%)	18,21,23	0.68	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	NAL	L	11	6	-	1/5/6/8	0/2/2/2

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	L	11	NAL	C8A-C4A	2.70	1.48	1.42

There are no bond angle outliers.

There are no chirality outliers.

All (1) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	L	11	NAL	C2-C9-CA-N

There are no ring outliers.

1 monomer is involved in 9 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	L	11	NAL	9	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.