



Full wwPDB EM Validation Report ⓘ

Oct 22, 2024 – 12:35 AM JST

PDB ID : 8XVI
EMDB ID : EMD-38705
Title : Cryo-EM structure of ETAR bound with Endothelin1
Authors : Hou, J.Y.; Liu, S.H.; Wu, L.J.; Liu, Z.J.; Hua, T.
Deposited on : 2024-01-15
Resolution : 3.32 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**
MolProbity : 4.02b-467
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) : 2.39

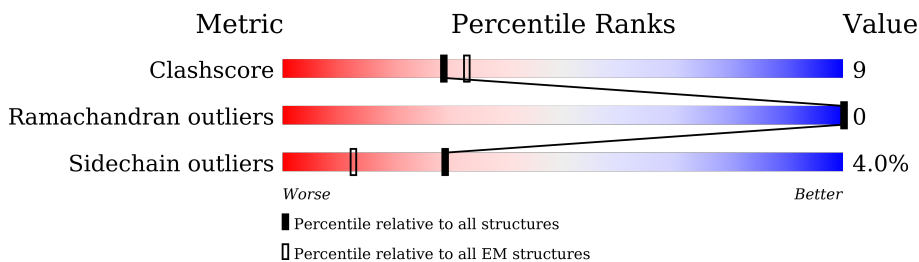
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.32 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	A	261	
2	B	346	
3	G	71	
4	N	157	
5	R	683	
6	T	21	

2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 8587 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 Isoform Gnas-2 of Guanine nucleotide-binding protein G(s) subunit alpha isoforms short.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	234	1943	1227	349	360	7	0	0

- Molecule 2 is a protein called Guanine nucleotide-binding protein G(I)/G(S)/G(T) subunit beta-1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	338	2600	1604	467	508	21	0	0

There are 7 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	-5	ILE	-	expression tag	UNP P62873
B	-4	GLY	-	expression tag	UNP P62873
B	-3	ARG	-	expression tag	UNP P62873
B	-2	ALA	-	expression tag	UNP P62873
B	-1	ARG	-	expression tag	UNP P62873
B	0	GLY	-	expression tag	UNP P62873
B	1	PHE	-	expression tag	UNP P62873

- Molecule 3 is a protein called Guanine nucleotide-binding protein G(I)/G(S)/G(O) subunit gamma-2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	G	57	436	273	77	83	3	0	0

- Molecule 4 is a protein called Nanobody 35.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	N	126	961	599	168	188	6	0	0

- Molecule 5 is a protein called Endoglucanase H,Endothelin-1 receptor.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	R	308	2476	1637	398	416	25	0	0

There are 49 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
R	-259	MET	-	initiating methionine	UNP P16218
R	-258	LYS	-	expression tag	UNP P16218
R	-257	THR	-	expression tag	UNP P16218
R	-256	ILE	-	expression tag	UNP P16218
R	-255	ILE	-	expression tag	UNP P16218
R	-254	ALA	-	expression tag	UNP P16218
R	-253	LEU	-	expression tag	UNP P16218
R	-252	SER	-	expression tag	UNP P16218
R	-251	TYR	-	expression tag	UNP P16218
R	-250	ILE	-	expression tag	UNP P16218
R	-249	PHE	-	expression tag	UNP P16218
R	-248	CYS	-	expression tag	UNP P16218
R	-247	LEU	-	expression tag	UNP P16218
R	-246	VAL	-	expression tag	UNP P16218
R	-245	PHE	-	expression tag	UNP P16218
R	-244	ALA	-	expression tag	UNP P16218
R	-243	ASP	-	expression tag	UNP P16218
R	-242	TYR	-	expression tag	UNP P16218
R	-241	LYS	-	expression tag	UNP P16218
R	-240	ASP	-	expression tag	UNP P16218
R	-239	ASP	-	expression tag	UNP P16218
R	-238	ASP	-	expression tag	UNP P16218
R	-237	ASP	-	expression tag	UNP P16218
R	-236	ALA	-	expression tag	UNP P16218
R	-235	GLY	-	expression tag	UNP P16218
R	-234	ARG	-	expression tag	UNP P16218
R	-233	ALA	-	expression tag	UNP P16218
R	-232	MET	-	expression tag	UNP P16218
R	-231	ALA	-	expression tag	UNP P16218
R	-230	SER	-	expression tag	UNP P16218
R	-124	ALA	GLU	conflict	UNP P16218

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Chain	Residue	Modelled	Actual	Comment	Reference
R	406	LEU	-	expression tag	UNP P25101
R	407	GLU	-	expression tag	UNP P25101
R	408	VAL	-	expression tag	UNP P25101
R	409	LEU	-	expression tag	UNP P25101
R	410	PHE	-	expression tag	UNP P25101
R	411	GLN	-	expression tag	UNP P25101
R	412	GLY	-	expression tag	UNP P25101
R	413	PRO	-	expression tag	UNP P25101
R	414	HIS	-	expression tag	UNP P25101
R	415	HIS	-	expression tag	UNP P25101
R	416	HIS	-	expression tag	UNP P25101
R	417	HIS	-	expression tag	UNP P25101
R	418	HIS	-	expression tag	UNP P25101
R	419	HIS	-	expression tag	UNP P25101
R	420	HIS	-	expression tag	UNP P25101
R	421	HIS	-	expression tag	UNP P25101
R	422	HIS	-	expression tag	UNP P25101
R	423	HIS	-	expression tag	UNP P25101

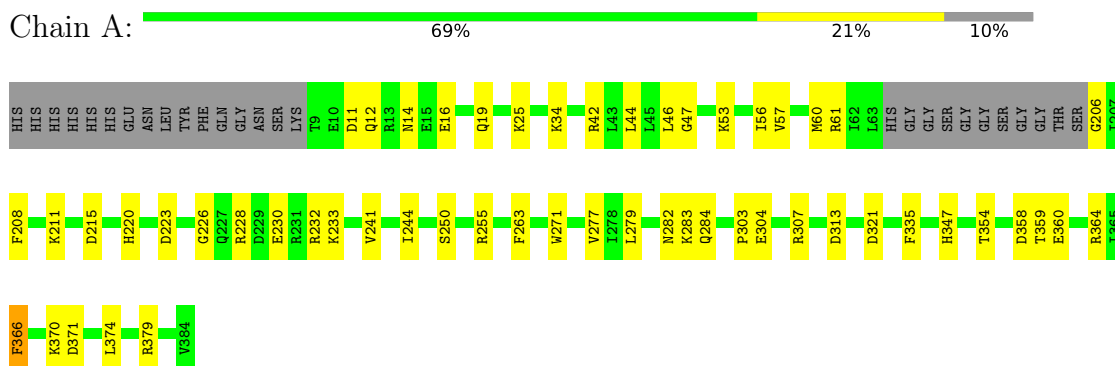
- Molecule 6 is a protein called Endothelin-1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	T	21	171	109	25	32	5	0	0

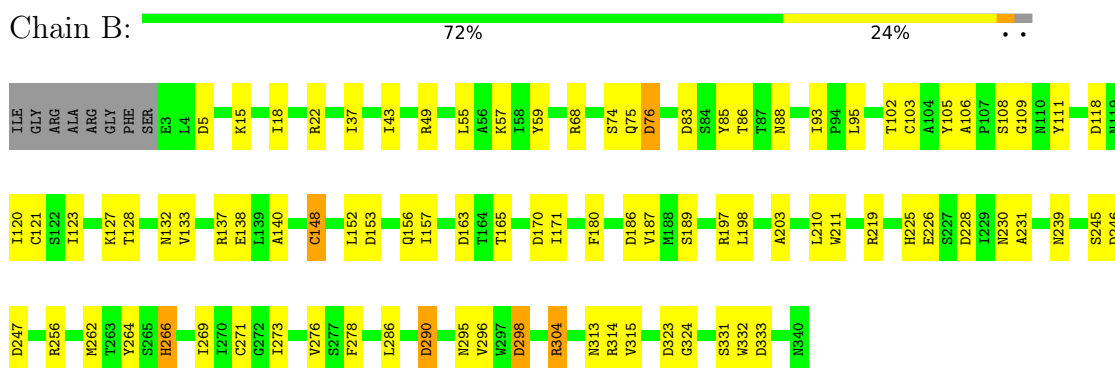
3 Residue-property plots

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. 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. 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.

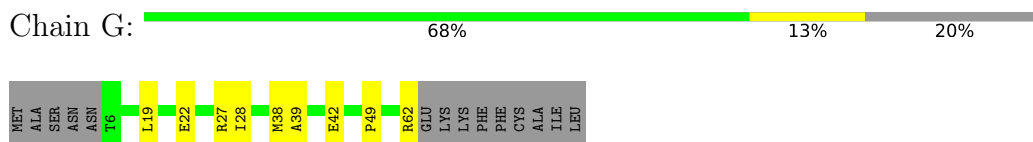
- Molecule 1: Isoform Gnas-2 of Guanine nucleotide-binding protein G(s) subunit alpha isoforms short



- Molecule 2: Guanine nucleotide-binding protein G(I)/G(S)/G(T) subunit beta-1

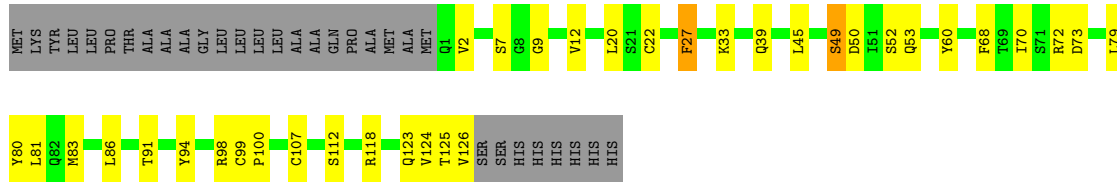


- Molecule 3: Guanine nucleotide-binding protein G(I)/G(S)/G(O) subunit gamma-2

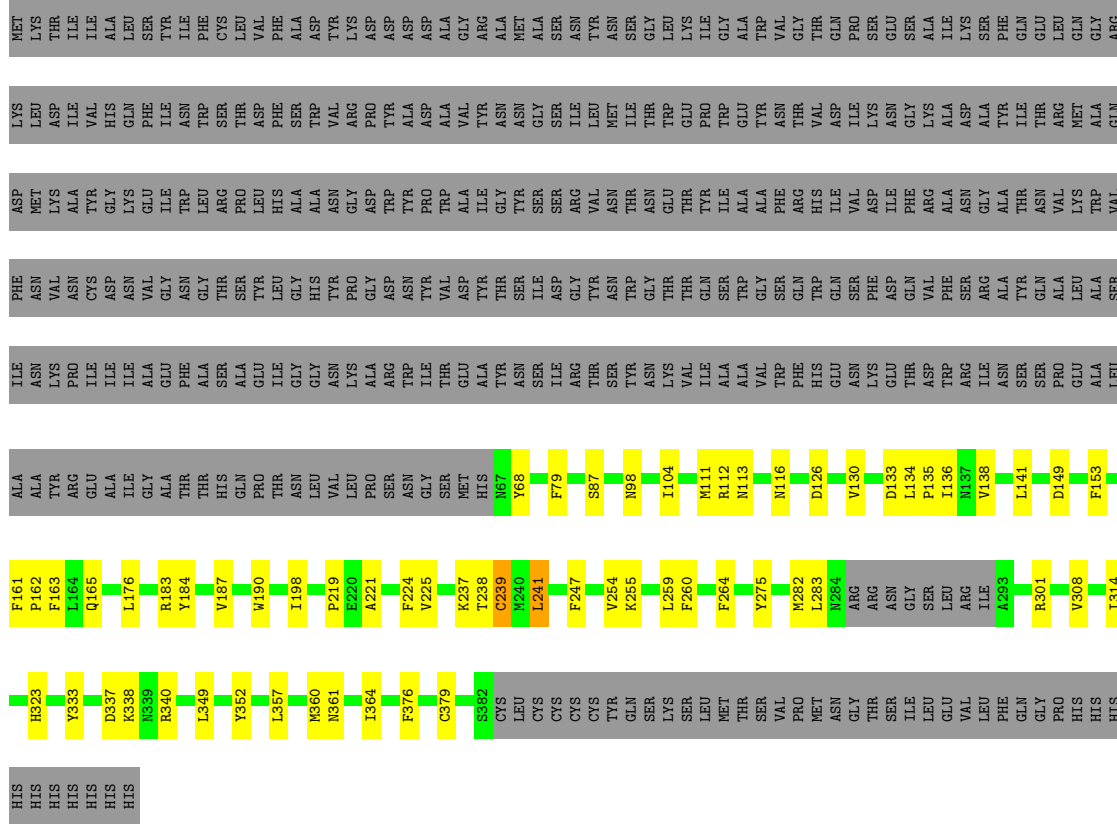
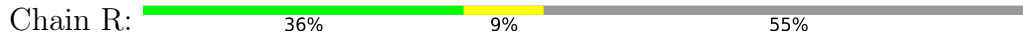


- Molecule 4: Nanobody 35

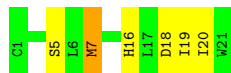




• Molecule 5: Endoglucanase H,Endothelin-1 receptor



• Molecule 6: Endothelin-1



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	114666	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	60	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 i

5.1 Standard geometry i

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	0/1979	0.54	1/2663 (0.0%)
2	B	0.26	0/2647	0.56	1/3589 (0.0%)
3	G	0.24	0/442	0.44	0/597
4	N	0.30	0/981	0.57	0/1329
5	R	0.29	0/2537	0.47	0/3440
6	T	0.26	0/175	0.58	0/234
All	All	0.28	0/8761	0.53	2/11852 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	298	ASP	CB-CG-OD2	5.48	123.23	118.30
1	A	371	ASP	CB-CG-OD1	5.15	122.94	118.30

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts i

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1943	0	1926	36	0
2	B	2600	0	2505	62	0
3	G	436	0	448	7	0
4	N	961	0	928	23	0
5	R	2476	0	2541	39	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
6	T	171	0	157	5	0
All	All	8587	0	8505	158	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 9.

All (158) 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)
4:N:70:ILE:HG22	4:N:81:LEU:HD13	1.62	0.79
4:N:9:GLY:HA2	4:N:124:VAL:HG12	1.68	0.74
1:A:279:LEU:HD11	1:A:335:PHE:HD2	1.53	0.72
2:B:49:ARG:NH1	2:B:85:TYR:O	2.23	0.71
5:R:111:MET:O	5:R:116:ASN:ND2	2.22	0.71
6:T:18:ASP:OD1	6:T:19:ILE:N	2.24	0.70
5:R:104:ILE:HD13	5:R:379:CYS:HB3	1.75	0.68
2:B:93:ILE:HG12	2:B:133:VAL:HG21	1.77	0.67
2:B:286:LEU:HG	2:B:296:VAL:HG22	1.75	0.67
4:N:91:THR:HG23	4:N:125:THR:HA	1.79	0.65
5:R:133:ASP:OD2	5:R:165:GLN:NE2	2.30	0.65
2:B:105:TYR:HE1	2:B:109:GLY:HA2	1.62	0.64
5:R:126:ASP:O	5:R:130:VAL:HG23	1.99	0.62
5:R:357:LEU:O	5:R:360:MET:HB2	2.00	0.61
4:N:83:MET:HB3	4:N:86:LEU:HD11	1.82	0.61
4:N:112:SER:O	4:N:118:ARG:NH2	2.31	0.61
5:R:112:ARG:HE	5:R:198:ILE:HG13	1.66	0.60
2:B:226:GLU:HG2	4:N:27:PHE:HB3	1.83	0.59
6:T:7:MET:SD	6:T:7:MET:N	2.62	0.59
2:B:163:ASP:OD1	2:B:165:THR:OG1	2.20	0.59
1:A:230:GLU:OE1	1:A:232:ARG:NH2	2.35	0.59
2:B:106:ALA:HB2	2:B:111:TYR:HB2	1.85	0.58
5:R:98:ASN:HD21	5:R:126:ASP:HB2	1.70	0.57
2:B:247:ASP:OD1	2:B:247:ASP:N	2.36	0.57
1:A:374:LEU:HD22	5:R:301:ARG:HH21	1.70	0.56
2:B:256:ARG:HG2	3:G:28:ILE:HB	1.87	0.56
2:B:315:VAL:HA	2:B:331:SER:HA	1.87	0.56
1:A:11:ASP:HA	1:A:14:ASN:HD21	1.71	0.55
1:A:44:LEU:HB3	1:A:244:ILE:HG23	1.88	0.55
4:N:12:VAL:HB	4:N:126:VAL:HG22	1.88	0.55
2:B:5:ASP:N	2:B:5:ASP:OD1	2.40	0.54
4:N:2:VAL:HG13	4:N:27:PHE:HE1	1.74	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:R:333:TYR:OH	5:R:340:ARG:NH1	2.41	0.53
1:A:321:ASP:N	1:A:321:ASP:OD1	2.42	0.52
5:R:333:TYR:HE1	5:R:340:ARG:HD2	1.74	0.52
6:T:5:SER:OG	6:T:7:MET:SD	2.60	0.52
1:A:56:ILE:O	1:A:60:MET:HG3	2.10	0.52
5:R:255:LYS:HG3	5:R:259:LEU:HD23	1.92	0.52
2:B:128:THR:HG21	2:B:132:ASN:H	1.74	0.52
2:B:86:THR:OG1	2:B:88:ASN:OD1	2.20	0.52
1:A:208:PHE:HB3	1:A:223:ASP:OD2	2.10	0.51
1:A:11:ASP:N	1:A:11:ASP:OD1	2.43	0.51
5:R:162:PRO:HD3	6:T:20:ILE:HD11	1.92	0.51
5:R:254:VAL:O	5:R:254:VAL:HG23	2.11	0.51
4:N:52:SER:OG	4:N:53:GLN:N	2.42	0.51
5:R:149:ASP:N	5:R:149:ASP:OD1	2.43	0.51
2:B:225:HIS:ND1	2:B:245:SER:OG	2.41	0.51
5:R:162:PRO:HG3	5:R:224:PHE:CE2	2.47	0.50
2:B:57:LYS:HZ3	2:B:75:GLN:HG3	1.76	0.50
2:B:225:HIS:HD1	2:B:245:SER:CB	2.25	0.50
1:A:211:LYS:HE2	1:A:220:HIS:CD2	2.46	0.49
2:B:137:ARG:NH1	2:B:171:ILE:O	2.46	0.49
5:R:282:MET:HG3	5:R:301:ARG:HG2	1.95	0.49
4:N:39:GLN:HB2	4:N:45:LEU:HD23	1.94	0.48
1:A:233:LYS:NZ	2:B:228:ASP:OD1	2.35	0.48
2:B:105:TYR:CE1	2:B:109:GLY:HA2	2.47	0.48
1:A:282:ASN:OD1	1:A:283:LYS:N	2.45	0.48
5:R:238:THR:HG22	6:T:16:HIS:ND1	2.29	0.48
1:A:206:GLY:HA2	1:A:226:GLY:HA3	1.96	0.48
1:A:228:ARG:NH2	2:B:186:ASP:OD1	2.48	0.47
5:R:163:PHE:CD1	5:R:221:ALA:HB2	2.50	0.47
1:A:303:PRO:O	1:A:307:ARG:NH2	2.48	0.47
2:B:68:ARG:NH1	2:B:85:TYR:HB2	2.30	0.47
2:B:187:VAL:HA	2:B:203:ALA:HA	1.97	0.47
2:B:230:ASN:N	2:B:230:ASN:OD1	2.47	0.47
2:B:271:CYS:HB3	2:B:290:ASP:HB3	1.95	0.47
2:B:118:ASP:OD1	2:B:118:ASP:N	2.47	0.47
4:N:98:ARG:HG2	4:N:98:ARG:HH11	1.79	0.47
1:A:271:TRP:CH2	2:B:314:ARG:HD3	2.50	0.47
2:B:120:ILE:HG13	2:B:140:ALA:HB2	1.96	0.47
1:A:46:LEU:HD23	1:A:46:LEU:HA	1.77	0.46
4:N:68:PHE:CE1	4:N:83:MET:HG2	2.50	0.46
1:A:304:GLU:O	1:A:304:GLU:HG3	2.15	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:N:22:CYS:SG	4:N:79:LEU:HB3	2.55	0.46
5:R:79:PHE:HZ	5:R:352:TYR:HB2	1.80	0.46
5:R:176:LEU:HD23	5:R:176:LEU:HA	1.83	0.46
5:R:219:PRO:HG3	5:R:247:PHE:HZ	1.80	0.46
5:R:314:ILE:HD13	5:R:364:ILE:HD13	1.97	0.46
2:B:37:ILE:HD11	3:G:38:MET:HG2	1.98	0.46
5:R:224:PHE:CE1	5:R:241:LEU:HB2	2.51	0.46
2:B:266:HIS:HB3	2:B:269:ILE:HG13	1.97	0.46
5:R:237:LYS:HD3	5:R:237:LYS:HA	1.66	0.46
2:B:295:ASN:ND2	2:B:304:ARG:HH11	2.14	0.45
1:A:11:ASP:HA	1:A:14:ASN:ND2	2.31	0.45
4:N:73:ASP:HB2	4:N:80:TYR:HE1	1.81	0.45
1:A:34:LYS:HA	2:B:55:LEU:HD21	1.98	0.45
2:B:127:LYS:HD3	2:B:127:LYS:HA	1.72	0.45
4:N:49:SER:HB3	4:N:70:ILE:HG21	1.96	0.45
4:N:99:CYS:HB3	4:N:107:CYS:HB3	1.64	0.45
5:R:113:ASN:N	5:R:113:ASN:OD1	2.50	0.45
5:R:260:PHE:HA	5:R:323:HIS:CD2	2.51	0.45
1:A:47:GLY:HA3	1:A:53:LYS:HD2	1.98	0.45
1:A:57:VAL:O	1:A:61:ARG:HB2	2.16	0.45
5:R:79:PHE:CD2	5:R:349:LEU:HD12	2.51	0.45
2:B:15:LYS:HG3	3:G:19:LEU:HD21	1.99	0.45
1:A:57:VAL:HA	1:A:60:MET:HE2	1.99	0.45
2:B:331:SER:OG	2:B:333:ASP:OD1	2.35	0.45
2:B:180:PHE:HB3	2:B:211:TRP:CZ3	2.52	0.45
2:B:68:ARG:HH11	2:B:68:ARG:HG2	1.82	0.44
2:B:290:ASP:HA	2:B:314:ARG:HG3	1.98	0.44
1:A:215:ASP:HB2	1:A:366:PHE:HE2	1.83	0.44
5:R:283:LEU:HD23	5:R:283:LEU:HA	1.82	0.44
1:A:360:GLU:O	1:A:364:ARG:NH1	2.50	0.44
1:A:12:GLN:O	1:A:16:GLU:HG2	2.17	0.44
4:N:12:VAL:HG11	4:N:86:LEU:HD22	1.98	0.44
2:B:15:LYS:O	2:B:18:ILE:HG22	2.18	0.44
2:B:59:TYR:HE2	2:B:75:GLN:HE21	1.66	0.44
2:B:324:GLY:O	3:G:49:PRO:HG2	2.17	0.44
2:B:76:ASP:N	2:B:76:ASP:OD1	2.50	0.44
4:N:33:LYS:HG2	4:N:99:CYS:SG	2.57	0.44
4:N:2:VAL:HG22	4:N:27:PHE:HD1	1.83	0.44
4:N:20:LEU:HD22	4:N:94:TYR:HD2	1.83	0.43
5:R:141:LEU:HA	5:R:141:LEU:HD23	1.67	0.43
1:A:42:ARG:O	1:A:241:VAL:HG13	2.19	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:250:SER:OG	1:A:282:ASN:O	2.26	0.43
2:B:18:ILE:HD11	3:G:22:GLU:OE1	2.19	0.42
2:B:132:ASN:N	2:B:132:ASN:OD1	2.52	0.42
5:R:136:ILE:HD12	5:R:161:PHE:CD2	2.54	0.42
2:B:43:ILE:O	2:B:43:ILE:HG22	2.20	0.42
1:A:370:LYS:HA	1:A:370:LYS:HD2	1.76	0.42
5:R:87:SER:HB3	5:R:134:LEU:HD12	2.01	0.42
5:R:337:ASP:HB3	5:R:340:ARG:HB3	2.00	0.42
2:B:245:SER:O	2:B:273:ILE:HD12	2.19	0.42
5:R:184:TYR:HA	5:R:187:VAL:HG12	2.01	0.42
1:A:25:LYS:HB2	1:A:25:LYS:NZ	2.34	0.42
2:B:57:LYS:HB2	2:B:332:TRP:CD1	2.55	0.42
2:B:187:VAL:HG12	2:B:203:ALA:HB2	2.00	0.42
2:B:262:MET:HG2	2:B:264:TYR:CE1	2.55	0.42
3:G:39:ALA:O	3:G:42:GLU:HG3	2.20	0.42
5:R:183:ARG:NH1	5:R:275:TYR:OH	2.52	0.42
2:B:197:ARG:HG3	2:B:198:LEU:HD12	2.02	0.41
2:B:239:ASN:HB3	2:B:256:ARG:HH12	1.85	0.41
2:B:152:LEU:HB2	2:B:156:GLN:HB2	2.02	0.41
4:N:7:SER:O	4:N:20:LEU:HD12	2.20	0.41
4:N:100:PRO:HD2	4:N:107:CYS:HB2	2.02	0.41
5:R:79:PHE:CG	5:R:349:LEU:HD12	2.55	0.41
5:R:135:PRO:O	5:R:138:VAL:HG12	2.21	0.41
2:B:197:ARG:HA	2:B:197:ARG:HD2	1.89	0.41
2:B:198:LEU:HD23	2:B:210:LEU:HD21	2.02	0.41
1:A:358:ASP:OD1	1:A:359:THR:N	2.54	0.41
2:B:121:CYS:O	2:B:138:GLU:HA	2.20	0.41
2:B:231:ALA:HB1	2:B:276:VAL:HG22	2.02	0.41
2:B:313:ASN:HB3	2:B:332:TRP:HB2	2.03	0.41
5:R:225:VAL:O	5:R:239:CYS:HA	2.21	0.41
2:B:95:LEU:HD23	2:B:95:LEU:HA	1.85	0.41
2:B:102:THR:HG21	2:B:148:CYS:N	2.36	0.41
3:G:22:GLU:O	3:G:27:ARG:NH2	2.54	0.41
2:B:153:ASP:OD1	2:B:156:GLN:HG2	2.21	0.40
2:B:123:ILE:HD11	2:B:157:ILE:HD13	2.02	0.40
1:A:284:GLN:HG2	1:A:354:THR:O	2.21	0.40
2:B:219:ARG:HA	2:B:219:ARG:HD3	1.86	0.40
1:A:53:LYS:HB2	1:A:53:LYS:HE2	1.81	0.40
1:A:263:PHE:HE1	1:A:277:VAL:HG11	1.87	0.40
2:B:256:ARG:NH1	2:B:256:ARG:HB2	2.36	0.40
1:A:44:LEU:HD12	1:A:44:LEU:HA	1.97	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:366:PHE:CE1	5:R:190:TRP:HZ2	2.39	0.40
4:N:33:LYS:HE2	4:N:33:LYS:HB2	1.89	0.40
5:R:275:TYR:CE1	5:R:308:VAL:HB	2.56	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 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	A	230/261 (88%)	223 (97%)	7 (3%)	0	100	100
2	B	336/346 (97%)	312 (93%)	24 (7%)	0	100	100
3	G	55/71 (78%)	54 (98%)	1 (2%)	0	100	100
4	N	124/157 (79%)	119 (96%)	5 (4%)	0	100	100
5	R	304/683 (44%)	289 (95%)	15 (5%)	0	100	100
6	T	19/21 (90%)	18 (95%)	1 (5%)	0	100	100
All	All	1068/1539 (69%)	1015 (95%)	53 (5%)	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 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	A	211/231 (91%)	205 (97%)	6 (3%)	38	64
2	B	281/286 (98%)	265 (94%)	16 (6%)	17	45
3	G	46/58 (79%)	45 (98%)	1 (2%)	47	70
4	N	104/127 (82%)	98 (94%)	6 (6%)	17	44
5	R	276/591 (47%)	268 (97%)	8 (3%)	37	64
6	T	21/21 (100%)	20 (95%)	1 (5%)	21	50
All	All	939/1314 (72%)	901 (96%)	38 (4%)	29	54

All (38) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	19	GLN
1	A	255	ARG
1	A	313	ASP
1	A	347	HIS
1	A	366	PHE
1	A	379	ARG
2	B	22	ARG
2	B	74	SER
2	B	76	ASP
2	B	83	ASP
2	B	103	CYS
2	B	108	SER
2	B	148	CYS
2	B	170	ASP
2	B	189	SER
2	B	246	ASP
2	B	266	HIS
2	B	278	PHE
2	B	290	ASP
2	B	298	ASP
2	B	304	ARG
2	B	323	ASP
3	G	62	ARG
4	N	27	PHE
4	N	49	SER
4	N	50	ASP
4	N	60	TYR
4	N	72	ARG
4	N	123	GLN
5	R	68	TYR

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Mol	Chain	Res	Type
5	R	153	PHE
5	R	239	CYS
5	R	241	LEU
5	R	264	PHE
5	R	338	LYS
5	R	361	ASN
5	R	376	PHE
6	T	7	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
2	B	220	GLN
5	R	165	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

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.