W O R L D W I D E

wwPDB

P R O T E I N   D A T A   B A N K

Full wwPDB EM Validation Report (i)

Nov 5, 2024 – 11:14 AM JST

PDB ID	:	9IJE
EMDB ID	:	EMD-60629
Title	:	Epinephrine-activated human beta3 adrenergic receptor
Authors	:	Zheng, S.; Zhang, S.; Dai, S.; Chen, K.; Gao, K.; Lin, B.; Liu, X.
Deposited on	:	2024-06-22
Resolution	:	2.34 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 (i) 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 (i)) were used in the production of this report:

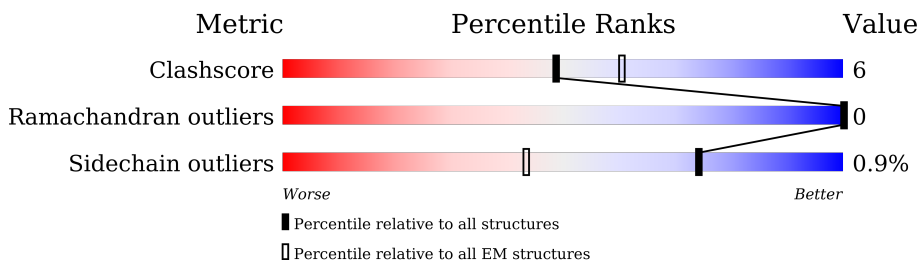|		
EMDB validation analysis	:	FAILED
Mogul	:	1.8.5 (274361), CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	FAILED
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (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 2.34 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	Percentile Ranks	Value
Clashscore		6
Ramachandran outliers		0
Sidechain outliers		0.9%

Worse   *Better*

■ Percentile relative to all structures
❙ Percentile relative to all EM structures

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 <=5%

Mol	Chain	Length	Quality of chain
1	B	340	86% 13% •
2	N	128	87% 13%
3	D	246	81% 12% 6%
4	R	321	70% 9% 21%
5	A	373	54% 6% 40%
6	C	52	94% 6%

2 Entry composition ⓘ

There are 8 unique types of molecules in this entry. The entry contains 9340 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 Guanine nucleotide-binding protein G(I)/G(S)/G(T) subunit beta-1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	B	340	2539	1574	448	496	21	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	1	GLN	-	expression tag	UNP P54311

- Molecule 2 is a protein called Camelid antibody VHH fragment.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	N	128	950	594	166	184	6	0	0

- Molecule 3 is a protein called Single-chain Fv16.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	D	231	1754	1116	293	335	10	0	0

- Molecule 4 is a protein called Beta-3 adrenergic receptor.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	R	252	1886	1247	313	312	14	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
R	126	TRP	GLU	conflict	UNP P13945

- Molecule 5 is a protein called Guanine nucleotide-binding protein G(s) subunit alpha isoforms

short.

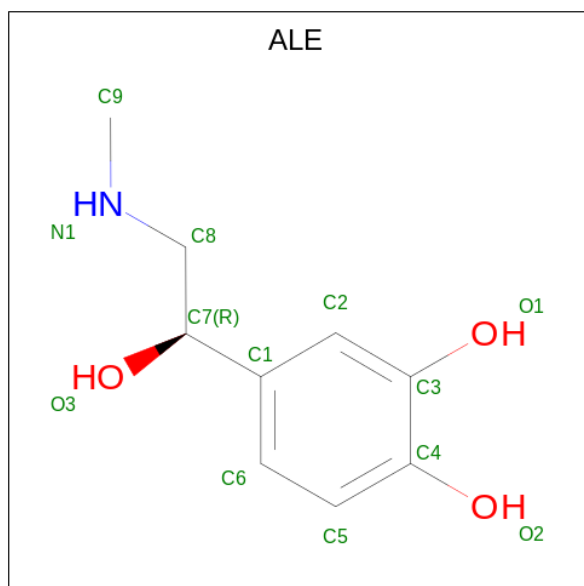| Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	A	224	1804	1143	330	324	7	0	0

There are 30 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	12	LEU	-	expression tag	UNP P04896
A	13	SER	-	expression tag	UNP P04896
A	14	ALA	-	expression tag	UNP P04896
A	15	GLU	-	expression tag	UNP P04896
A	16	ASP	-	expression tag	UNP P04896
A	17	LYS	-	expression tag	UNP P04896
A	18	ALA	-	expression tag	UNP P04896
A	19	ALA	-	expression tag	UNP P04896
A	20	VAL	-	expression tag	UNP P04896
A	21	GLU	-	expression tag	UNP P04896
A	22	ARG	-	expression tag	UNP P04896
A	23	SER	-	expression tag	UNP P04896
A	24	LYS	-	expression tag	UNP P04896
A	25	MET	-	expression tag	UNP P04896
A	49	ASP	GLY	conflict	UNP P04896
A	50	ASN	GLU	conflict	UNP P04896
A	249	ASP	ALA	conflict	UNP P04896
A	252	ASP	SER	conflict	UNP P04896
A	?	-	ASN	deletion	UNP P04896
A	?	-	MET	deletion	UNP P04896
A	?	-	VAL	deletion	UNP P04896
A	?	-	ILE	deletion	UNP P04896
A	?	-	ARG	deletion	UNP P04896
A	?	-	GLU	deletion	UNP P04896
A	?	-	ASP	deletion	UNP P04896
A	?	-	ASN	deletion	UNP P04896
A	?	-	GLN	deletion	UNP P04896
A	?	-	THR	deletion	UNP P04896
A	362	ALA	ILE	conflict	UNP P04896
A	365	ILE	VAL	conflict	UNP P04896

- Molecule 6 is a protein called Guanine nucleotide-binding protein G(I)/G(S)/G(O) subunit gamma-2.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	C	52	Total 393	C 248	N 66	O 76	S 3	0	0

- Molecule 7 is L-EPINEPHRINE (three-letter code: ALE) (formula: $C_9H_{13}NO_3$) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms				AltConf
7	R	1	Total 13	C 9	N 1	O 3	0

- Molecule 8 is water.

Mol	Chain	Residues	Atoms		AltConf
8	R	1	Total 1	O 1	0

3 Residue-property plots (i)

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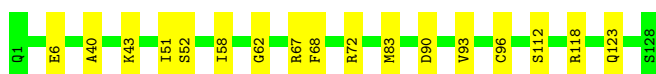
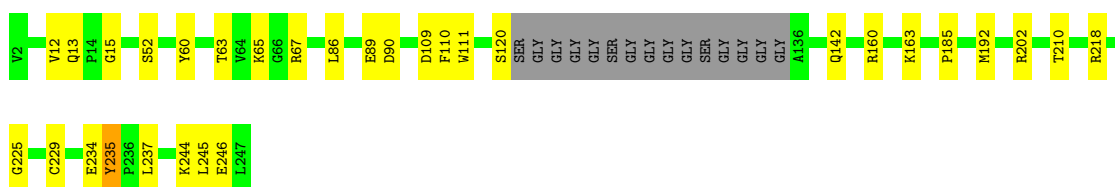• Molecule 1: Guanine nucleotide-binding protein G(I)/G(S)/G(T) subunit beta-1

Chain B:
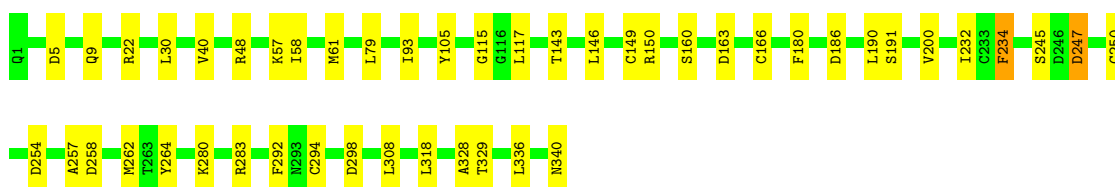
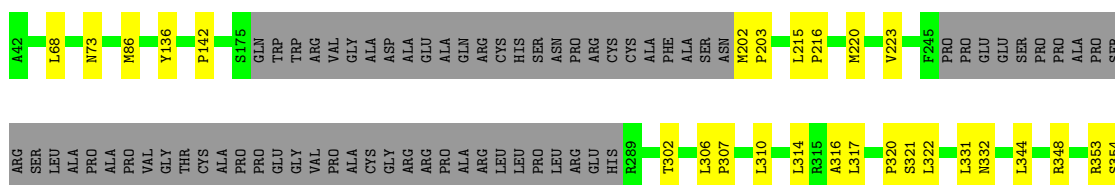• Molecule 2: Camelid antibody VHH fragment

Chain N:

• Molecule 3: Single-chain Fv16
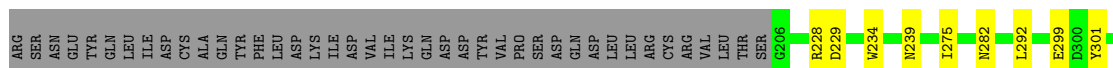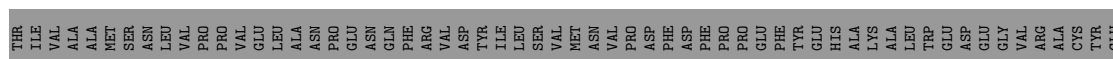
Chain D:

• Molecule 4: Beta-3 adrenergic receptor

Chain R:

R358 R362

• Molecule 5: Guanine nucleotide-binding protein G(s) subunit alpha isoforms short

Chain A: 54% 6% 40%

L12 S13 K17 E21 K34 R38 I56 VAL LYS GLN MET ARG ILE LEU HIS VAL ASN GLY PHE ASN GLY GLU GLY GLU GLU ASP PRO GLN ALA ALA ARG SER ASN SER ASP GLY LYS ALA THR LYS VAL GLN ASP ILE LYS ASN ASN LEU LYS GLU GLU ALA ILE GLU

THR ILE VAL ALA ALA MET SER ASN LEU VAL PRO PRO VAL GLU LEU ALA ASN PRO GLU ASN GLN PHE ARG VAL ASP TYR ILE LEU SER VAL MET ASN VAL PRO ASP PHE ASP PHE PRO PRO GLU PHE TYR GLU HIS ALA LYS ALA LEU TRP GLU ASP GLU GLY VAL ARG ALA CYS TYR GLU

ARG SER ASN GLU TYR GLN LEU ILE ASP CYS ALA GLN TYR PHE LEU ASP LYS ILE ASP ILE LYS GLN ASP ASP TYR VAL PRO SER ASP GLN ASP LEU LEU ARG CYS ARG VAL LEU THR SER G206 R228 D229 W234 N239 I275 N282 L292 E299 D300 Y301

E304 F305 Y308 D321 R326 R346 T354 C355 Q374 L384

• Molecule 6: Guanine nucleotide-binding protein G(I)/G(S)/G(O) subunit gamma-2

Chain C: 94% 6%

A10 L19 E47 L51 F61

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	1423878	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN	Depositor
Voltage (kV)	300	Depositor
Electron dose $(e^-/Å^2)$	50	Depositor
Minimum defocus (nm)	1100	Depositor
Maximum defocus (nm)	1500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k 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: ALE

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	B	0.31	0/2586	0.56	0/3516
2	N	0.29	0/970	0.53	0/1315
3	D	0.29	0/1798	0.54	0/2441
4	R	0.33	0/1929	0.52	0/2646
5	A	0.26	0/1840	0.52	0/2483
6	C	0.31	0/399	0.50	0/540
All	All	0.30	0/9522	0.53	0/12941

There are no bond length outliers.

There are no bond angle outliers.

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	B	2539	0	2404	42	0
2	N	950	0	897	9	0
3	D	1754	0	1680	19	0
4	R	1886	0	1972	16	0
5	A	1804	0	1759	21	0
6	C	393	0	396	3	0
7	R	13	0	13	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
8	R	1	0	0	0	0
All	All	9340	0	9121	103	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 6.

All (103) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:61:MET:HE1	1:B:328:ALA:HB3	1.26	1.11
1:B:115:GLY:HA3	1:B:146:LEU:HD23	1.27	1.08
5:A:346:ARG:HH21	5:A:346:ARG:HB3	1.24	1.03
1:B:61:MET:CE	1:B:328:ALA:HB3	2.01	0.91
1:B:115:GLY:CA	1:B:146:LEU:HD23	2.08	0.81
4:R:136:TYR:HB2	4:R:223:VAL:HG13	1.62	0.80
1:B:61:MET:CE	1:B:328:ALA:CB	2.63	0.76
1:B:61:MET:HE1	1:B:328:ALA:CB	2.11	0.76
5:A:292:LEU:HD21	5:A:321:ASP:OD2	1.88	0.74
1:B:115:GLY:HA3	1:B:146:LEU:CD2	2.12	0.73
5:A:346:ARG:HB3	5:A:346:ARG:NH2	2.05	0.69
3:D:163:LYS:NZ	3:D:234:GLU:OE1	2.27	0.65
1:B:318:LEU:HD12	1:B:329:THR:HG22	1.79	0.65
4:R:310:LEU:O	4:R:314:LEU:HG	1.96	0.65
3:D:244:LYS:NZ	3:D:246:GLU:OE2	2.31	0.63
3:D:12:VAL:HG21	3:D:86:LEU:HD13	1.80	0.63
1:B:186:ASP:OD1	5:A:228:ARG:NH1	2.32	0.62
5:A:304:GLU:OE1	5:A:304:GLU:N	2.25	0.61
1:B:57:LYS:HZ3	5:A:239:ASN:HB3	1.67	0.60
3:D:202:ARG:HG2	3:D:218:ARG:NH2	2.17	0.59
1:B:200:VAL:HG13	1:B:234:PHE:CZ	2.38	0.58
4:R:202:MET:HG2	4:R:316:ALA:HB1	1.86	0.57
1:B:79:LEU:HB2	1:B:93:ILE:HB	1.86	0.57
1:B:57:LYS:NZ	5:A:239:ASN:HB3	2.20	0.56
3:D:60:TYR:HB2	3:D:65:LYS:HD3	1.87	0.56
1:B:40:VAL:HG13	1:B:283:ARG:NH2	2.20	0.55
1:B:40:VAL:HG13	1:B:298:ASP:OD2	2.07	0.55
3:D:160:ARG:HG3	3:D:210:THR:O	2.07	0.55
6:C:47:GLU:OE1	6:C:47:GLU:N	2.40	0.55
2:N:52:SER:O	2:N:72:ARG:NH1	2.40	0.54
2:N:6:GLU:OE1	2:N:96:CYS:HB3	2.09	0.53
2:N:67:ARG:NH2	2:N:90:ASP:OD2	2.41	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:A:34:LYS:HE3	5:A:38:ARG:HD3	1.91	0.53
4:R:202:MET:HB3	4:R:203:PRO:HD3	1.91	0.52
1:B:30:LEU:HD23	1:B:262:MET:SD	2.49	0.52
5:A:292:LEU:CD2	5:A:321:ASP:OD2	2.59	0.51
5:A:354:THR:HG22	5:A:355:CYS:H	1.75	0.51
4:R:354:SER:O	4:R:358:ARG:HG3	2.10	0.50
1:B:294:CYS:HB2	1:B:308:LEU:HB2	1.93	0.50
5:A:282:ASN:HA	5:A:354:THR:HB	1.93	0.50
1:B:149:CYS:O	1:B:150:ARG:NH1	2.45	0.50
1:B:254:ASP:HB3	1:B:257:ALA:HB3	1.93	0.50
4:R:322:LEU:HD13	4:R:322:LEU:O	2.12	0.49
1:B:61:MET:HE3	1:B:328:ALA:CB	2.42	0.49
5:A:299:GLU:HG3	5:A:305:PHE:HD2	1.77	0.49
1:B:250:CYS:HB2	1:B:264:TYR:HB2	1.95	0.48
3:D:15:GLY:HA2	3:D:86:LEU:O	2.13	0.48
3:D:202:ARG:NH1	3:D:218:ARG:O	2.46	0.48
1:B:40:VAL:CG1	1:B:283:ARG:CZ	2.91	0.48
1:B:245:SER:OG	1:B:247:ASP:OD1	2.32	0.48
1:B:160:SER:HB3	1:B:190:LEU:HD23	1.95	0.48
2:N:112:SER:O	2:N:118:ARG:NH2	2.31	0.47
3:D:235:TYR:O	3:D:237:LEU:N	2.48	0.47
1:B:40:VAL:HG12	1:B:283:ARG:CZ	2.44	0.47
2:N:40:ALA:HB3	2:N:43:LYS:HE2	1.94	0.47
3:D:109:ASP:OD1	3:D:110:PHE:N	2.48	0.47
4:R:320:PRO:O	4:R:321:SER:C	2.53	0.47
1:B:245:SER:CB	1:B:247:ASP:OD1	2.63	0.47
1:B:280:LYS:HE3	1:B:280:LYS:HB2	1.63	0.47
3:D:67:ARG:NH2	3:D:90:ASP:OD2	2.47	0.47
1:B:30:LEU:HG	1:B:262:MET:SD	2.54	0.46
1:B:245:SER:HB2	1:B:247:ASP:OD1	2.16	0.46
4:R:344:LEU:O	4:R:348:ARG:HG3	2.15	0.46
4:R:216:PRO:O	4:R:220:MET:HG3	2.16	0.46
5:A:308:TYR:O	5:A:326:ARG:NH1	2.49	0.46
5:A:13:SER:O	5:A:17:LYS:HG3	2.16	0.45
3:D:52:SER:OG	5:A:21:GLU:OE2	2.30	0.45
4:R:68:LEU:O	4:R:73:ASN:ND2	2.35	0.45
1:B:166:CYS:HB2	1:B:180:PHE:HB2	1.99	0.45
1:B:48:ARG:HG3	1:B:340:ASN:HB2	1.99	0.44
3:D:142:GLN:NE2	3:D:229:CYS:SG	2.86	0.44
2:N:93:VAL:HG22	2:N:123:GLN:OE1	2.18	0.44
4:R:307:PRO:HB2	4:R:331:LEU:HD22	2.00	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:R:348:ARG:O	4:R:353:ARG:NH1	2.51	0.43
6:C:51:LEU:HD12	6:C:51:LEU:HA	1.80	0.43
3:D:63:THR:O	3:D:67:ARG:NH1	2.52	0.43
3:D:13:GLN:HA	3:D:120:SER:OG	2.19	0.43
5:A:229:ASP:N	5:A:229:ASP:OD1	2.48	0.43
1:B:30:LEU:CD2	1:B:262:MET:SD	3.07	0.42
1:B:61:MET:HE3	1:B:328:ALA:HB1	2.00	0.42
2:N:68:PHE:CZ	2:N:83:MET:HE3	2.53	0.42
3:D:111:TRP:CE3	3:D:185:PRO:HG2	2.54	0.42
4:R:142:PRO:HG3	5:A:374:GLN:HB2	2.02	0.42
1:B:117:LEU:HD21	5:A:234:TRP:HB2	2.02	0.42
1:B:5:ASP:O	1:B:9:GLN:HG3	2.20	0.41
1:B:22:ARG:NH2	1:B:258:ASP:OD1	2.41	0.41
5:A:346:ARG:HH21	5:A:346:ARG:CB	2.12	0.41
3:D:89:GLU:OE1	3:D:89:GLU:N	2.52	0.41
1:B:143:THR:O	1:B:163:ASP:HB3	2.20	0.41
1:B:191:SER:HB2	1:B:232:ILE:HG23	2.03	0.41
4:R:302:THR:O	4:R:306:LEU:HB3	2.21	0.41
5:A:239:ASN:O	5:A:275:ILE:HD11	2.20	0.41
6:C:19:LEU:HD23	6:C:19:LEU:HA	1.86	0.41
4:R:320:PRO:O	4:R:322:LEU:N	2.53	0.41
1:B:61:MET:CE	1:B:328:ALA:HB1	2.45	0.41
2:N:51:ILE:HD12	2:N:58:ILE:HG12	2.03	0.41
3:D:65:LYS:HE2	3:D:65:LYS:HB2	1.86	0.41
1:B:58:ILE:HD13	1:B:336:LEU:HG	2.03	0.41
1:B:200:VAL:HG22	1:B:234:PHE:CE2	2.57	0.40
2:N:62:GLY:HA3	5:A:301:TYR:O	2.21	0.40
3:D:225:GLY:O	3:D:245:LEU:N	2.54	0.40
4:R:215:LEU:HB2	4:R:216:PRO:HD3	2.01	0.40
1:B:292:PHE:N	1:B:292:PHE:CD1	2.90	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	B	338/340 (99%)	330 (98%)	8 (2%)	0	100	100
2	N	126/128 (98%)	126 (100%)	0	0	100	100
3	D	227/246 (92%)	216 (95%)	11 (5%)	0	100	100
4	R	246/321 (77%)	242 (98%)	4 (2%)	0	100	100
5	A	220/373 (59%)	216 (98%)	4 (2%)	0	100	100
6	C	50/52 (96%)	50 (100%)	0	0	100	100
All	All	1207/1460 (83%)	1180 (98%)	27 (2%)	0	100	100

There are no Ramachandran outliers to report.

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	B	266/283 (94%)	263 (99%)	3 (1%)	70	81
2	N	98/106 (92%)	98 (100%)	0	100	100
3	D	189/198 (96%)	187 (99%)	2 (1%)	70	81
4	R	198/258 (77%)	195 (98%)	3 (2%)	60	72
5	A	187/332 (56%)	186 (100%)	1 (0%)	86	92
6	C	41/42 (98%)	41 (100%)	0	100	100
All	All	979/1219 (80%)	970 (99%)	9 (1%)	74	85

All (9) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	105	TYR
1	B	234	PHE
1	B	247	ASP
3	D	192	MET

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Mol	Chain	Res	Type
3	D	235	TYR
4	R	86	MET
4	R	317	LEU
4	R	332	ASN
5	A	346	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

5.3.3   RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5   Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6   Ligand geometry ⓘ

1 ligand 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	$\#|Z| > 2$
7	ALE	R	401	-	12,13,13	2.80	4 (33%)	16,17,17	0.95	1 (6%)

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
7	ALE	R	401	-	-	1/7/7/7	0/1/1/1

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	R	401	ALE	O1-C3	7.17	1.51	1.36
7	R	401	ALE	C5-C4	-3.86	1.32	1.39
7	R	401	ALE	C1-C7	2.95	1.57	1.51
7	R	401	ALE	O2-C4	2.79	1.42	1.36

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
7	R	401	ALE	O3-C7-C1	-2.16	106.16	111.15

There are no chirality outliers.

All (1) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
7	R	401	ALE	O3-C7-C8-N1

There are no ring outliers.

No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

Ligand ALE R 401

Bond lengths

Bond angles

Torsions

Rings
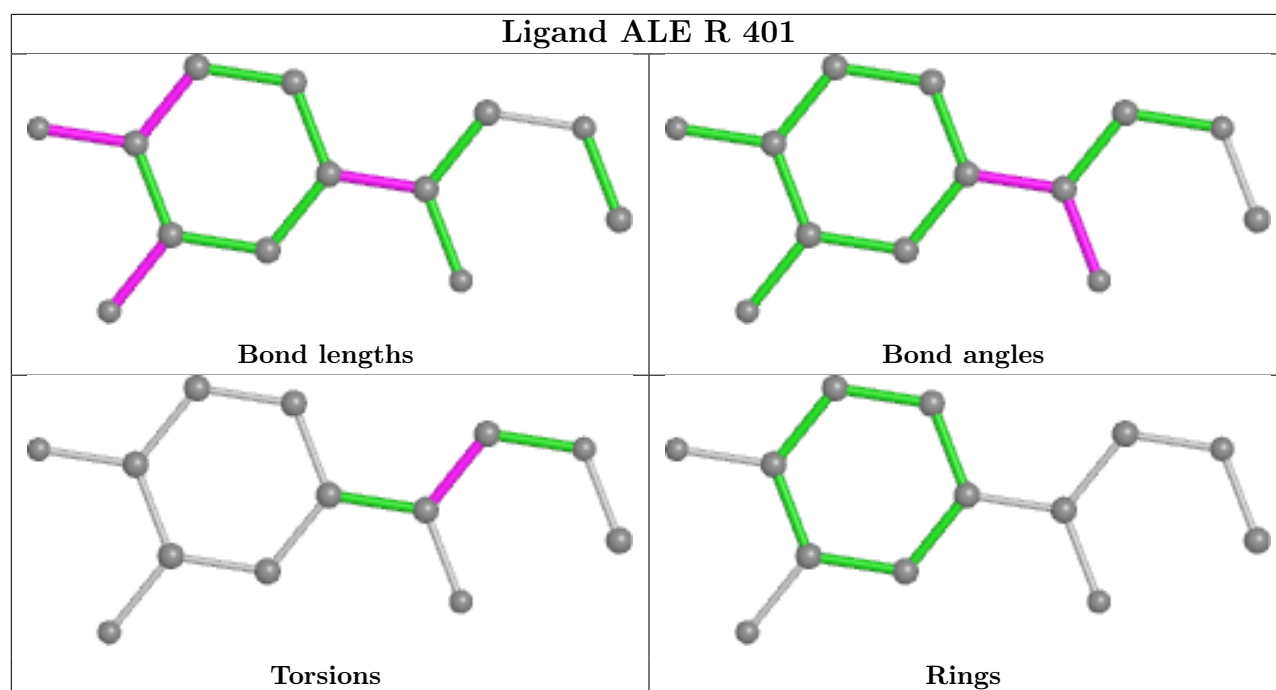
5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.