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wwPDB

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

Full wwPDB EM Validation Report ⓘ

Nov 13, 2024 – 10:35 AM JST

PDB ID	:	8J6R
EMDB ID	:	EMD-36012
Title	:	Cryo-EM structure of the MK-6892-bound human HCAR2-Gi1 complex
Authors	:	Mao, C.; Gao, M.; Zang, S.; Zhu, Y.; Ma, X.; Zhang, Y.
Deposited on	:	2023-04-26
Resolution	:	2.76 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:

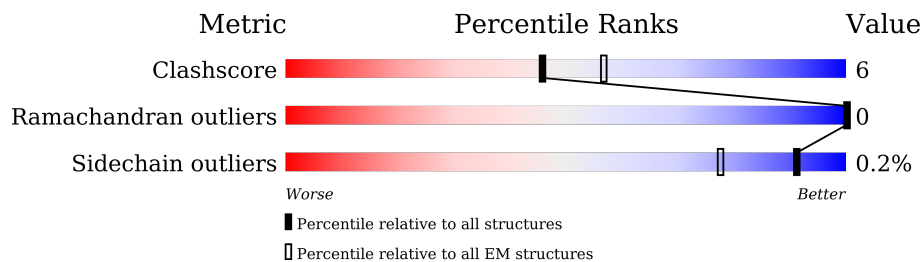|		
EMDB validation analysis	:	FAILED
Mogul	:	1.8.5 (274361), CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	FAILED
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (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 2.76 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		0.2%

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	A	352	58% 6% 36%
2	B	339	89% 11%
3	G	58	97% .
4	S	250	83% 10% 6%
5	R	295	75% 25%

2 Entry composition ⓘ

There are 8 unique types of molecules in this entry. The entry contains 9120 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) subunit alpha-1.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	225	Total 1811	C 1150	N 301	O 346	S 14	0	0

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

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

- 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
3	G	58	Total 444	C 277	N 79	O 85	S 3	0	0

- Molecule 4 is a protein called single Fab chain (scFv16).

Mol	Chain	Residues	Atoms					AltConf	Trace
4	S	234	Total 1795	C 1137	N 297	O 351	S 10	0	0

- Molecule 5 is a protein called Hydroxycarboxylic acid receptor 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	R	295	Total 2420	C 1613	N 404	O 382	S 21	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
R	302	ASN	-	expression tag	UNP Q8TDS4

- Molecule 6 is 2-[[2,2-dimethyl-3-[3-(5-oxidanylpyridin-2-yl)-1,2,4-oxadiazol-5-yl]propanoyl]amino]cyclohexene-1-carboxylic acid (three-letter code: FI7) (formula: $C_{19}H_{22}N_4O_5$) (labeled as "Ligand of Interest" by depositor).
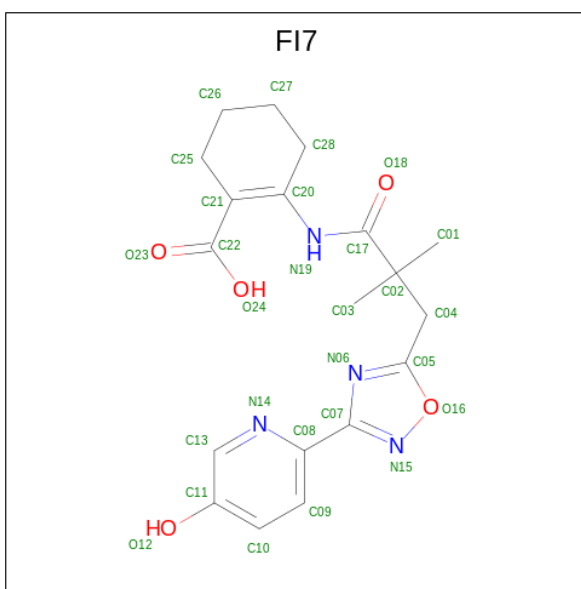
Mol	Chain	Residues	Atoms				AltConf
6	R	1	Total 28	C 19	N 4	O 5	0

- Molecule 7 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).

NAG

Mol	Chain	Residues	Atoms				AltConf
7	R	1	Total	C	N	O	0
			14	8	1	5	

- Molecule 8 is water.

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

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.
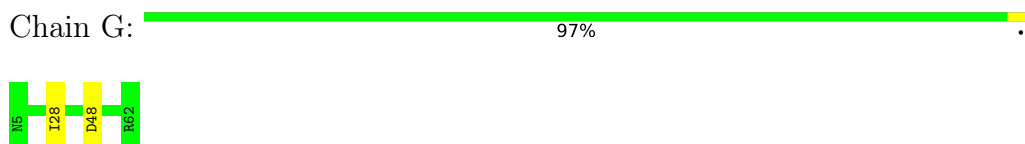
• Molecule 1: Guanine nucleotide-binding protein G(i) subunit alpha-1
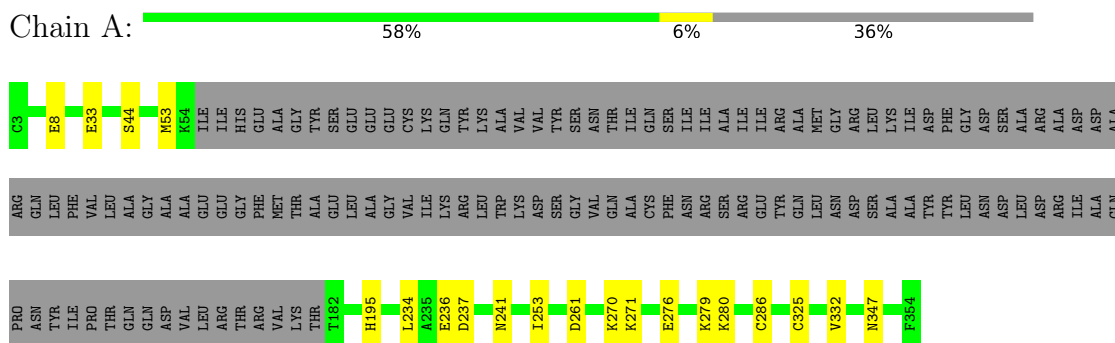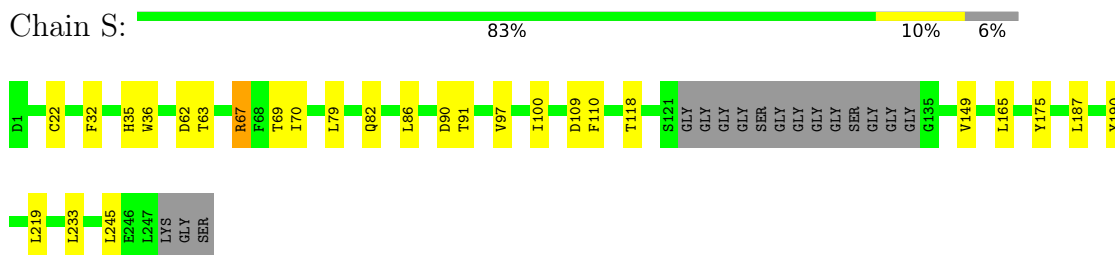
Chain A:

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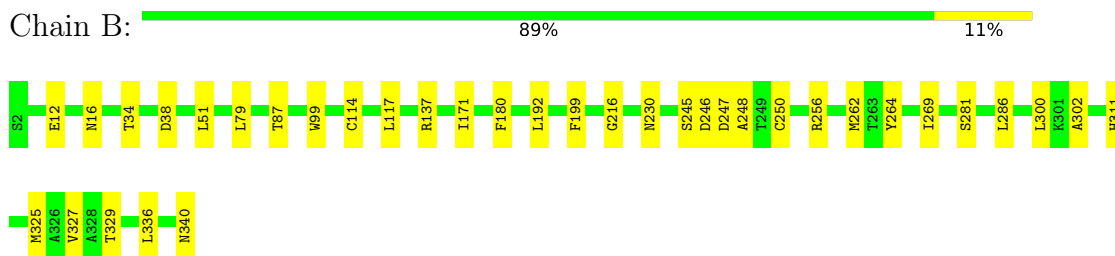
Chain B:

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

Chain G:

• Molecule 4: single Fab chain (scFv16)

Chain S:

• Molecule 5: Hydroxycarboxylic acid receptor 2

Chain R:

75%   25%

D8 D14 K15 K16 N17 C18 F25 V29 L30 L34 E37 G41 N45 G46 L47 I51 F52 H55 W59 K60 S61 S62 R63 I64 F65 L66 F67 N68 F74 I77 F82 L83 M84 Y87 V88 R89 D92 W93 D97 M109 N110 R111

I115 R128 R142 T143 A144 A145 I146 T155 I156 T159 V160 M167 P168 I182 C183 E190 A191 M192 F193 L194 L195 E196 P200 S208 I212 L215 D221 I226 I230 T231 F232 I238 I242 C243 F244 V248 R251 I252 R253 I254 L258

N286 S287 M288 Y295 F296 S297 N302

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	413723	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 $(e^-/\text{Å}^2)$	40	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (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: FI7, NAG

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\#|Z|>5$	RMSZ	$\#|Z|>5$
1	A	0.25	0/1841	0.47	0/2471
2	B	0.25	0/2654	0.53	0/3597
3	G	0.23	0/450	0.42	0/608
4	S	0.26	0/1839	0.50	0/2493
5	R	0.28	0/2491	0.52	0/3377
All	All	0.26	0/9275	0.50	0/12546

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	A	1811	0	1799	12	0
2	B	2607	0	2510	20	0
3	G	444	0	454	2	0
4	S	1795	0	1727	16	0
5	R	2420	0	2476	62	0
6	R	28	0	0	2	0
7	R	14	0	13	1	0
8	R	1	0	0	0	0
All	All	9120	0	8979	108	0

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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 (108) 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)
5:R:64:ILE:HD11	5:R:144:ALA:HB3	1.39	1.00
5:R:64:ILE:HD11	5:R:144:ALA:CB	1.92	1.00
5:R:196:GLU:O	5:R:200:PRO:CG	2.12	0.97
5:R:196:GLU:O	5:R:200:PRO:CD	2.13	0.97
5:R:196:GLU:O	5:R:200:PRO:HG3	1.73	0.88
5:R:59:TRP:HB2	5:R:63:ARG:CB	2.07	0.84
5:R:59:TRP:HB2	5:R:63:ARG:HB3	1.59	0.83
5:R:15:LYS:O	7:R:402:NAG:H82	1.84	0.77
5:R:60:LYS:O	5:R:63:ARG:N	2.23	0.72
5:R:59:TRP:HB2	5:R:63:ARG:CG	2.21	0.71
5:R:193:PHE:O	5:R:196:GLU:HG2	1.91	0.68
5:R:196:GLU:O	5:R:200:PRO:HD2	1.93	0.68
5:R:64:ILE:HD11	5:R:144:ALA:HB1	1.76	0.67
4:S:149:VAL:HG21	4:S:219:LEU:HD13	1.80	0.64
4:S:67:ARG:NH2	4:S:90:ASP:OD2	2.32	0.63
5:R:212:ILE:HD12	5:R:230:ILE:HG23	1.83	0.61
1:A:234:LEU:HD23	1:A:237:ASP:HB2	1.84	0.60
5:R:64:ILE:CD1	5:R:144:ALA:HB3	2.25	0.60
4:S:187:LEU:HD21	4:S:190:TYR:HB3	1.83	0.59
2:B:245:SER:OG	2:B:247:ASP:OD1	2.21	0.59
5:R:208:SER:O	5:R:212:ILE:HG12	2.04	0.58
2:B:99:TRP:HB3	2:B:117:LEU:HD13	1.85	0.57
5:R:18:CYS:HB3	5:R:183:CYS:HA	1.87	0.57
4:S:63:THR:O	4:S:67:ARG:NH1	2.38	0.56
1:A:276:GLU:O	1:A:279:LYS:NZ	2.35	0.56
2:B:137:ARG:NE	2:B:171:ILE:O	2.39	0.56
5:R:61:SER:HA	5:R:64:ILE:HG12	1.87	0.55
1:A:44:SER:O	1:A:270:LYS:NZ	2.39	0.55
5:R:59:TRP:HB2	5:R:63:ARG:HG2	1.87	0.55
5:R:156:ILE:O	5:R:160:VAL:HG23	2.07	0.55
5:R:111:ARG:NH2	6:R:401:FI7:O24	2.36	0.55
5:R:194:LEU:HD22	5:R:248:VAL:HG13	1.89	0.53
2:B:250:CYS:HB2	2:B:264:TYR:HB2	1.89	0.53
5:R:190:GLU:OE2	5:R:251:ARG:NH1	2.41	0.53
5:R:109:MET:HB2	5:R:159:THR:HG21	1.90	0.53
2:B:325:MET:O	2:B:340:ASN:ND2	2.42	0.53
2:B:286:LEU:HD22	2:B:327:VAL:HG21	1.92	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:R:167:MET:SD	5:R:168:PRO:HA	2.51	0.51
5:R:59:TRP:CB	5:R:63:ARG:HG2	2.42	0.50
2:B:51:LEU:HD23	2:B:87:THR:HG23	1.92	0.50
1:A:33:GLU:HG2	1:A:195:HIS:HB2	1.93	0.50
1:A:271:LYS:HG2	1:A:325:CYS:HB3	1.93	0.50
2:B:256:ARG:HB3	3:G:28:ILE:HG12	1.93	0.49
4:S:35:HIS:HB2	4:S:97:VAL:HB	1.94	0.49
4:S:165:LEU:HA	4:S:233:LEU:HD22	1.94	0.48
5:R:41:GLY:O	5:R:45:ASN:ND2	2.47	0.48
1:A:8:GLU:OE2	4:S:175:TYR:OH	2.30	0.48
5:R:25:PHE:O	5:R:29:VAL:HG22	2.12	0.48
2:B:34:THR:HG21	2:B:300:LEU:HB3	1.94	0.48
5:R:182:ILE:HB	5:R:258:LEU:HD11	1.96	0.48
2:B:311:HIS:NE2	2:B:329:THR:OG1	2.38	0.48
5:R:52:PHE:HE1	5:R:63:ARG:HD2	1.79	0.47
2:B:51:LEU:HB2	2:B:336:LEU:HB2	1.97	0.47
4:S:62:ASP:N	4:S:62:ASP:OD1	2.47	0.47
2:B:12:GLU:OE2	2:B:16:ASN:ND2	2.47	0.47
5:R:83:LEU:O	5:R:87:TYR:HD1	1.97	0.47
5:R:232:PHE:CZ	5:R:297:SER:HB2	2.51	0.46
2:B:262:MET:SD	2:B:302:ALA:HB2	2.56	0.46
5:R:226:ILE:O	5:R:230:ILE:HG12	2.15	0.46
4:S:86:LEU:HD23	4:S:86:LEU:HA	1.82	0.46
4:S:36:TRP:HD1	4:S:70:ILE:HD12	1.80	0.46
2:B:38:ASP:OD1	2:B:38:ASP:N	2.49	0.46
4:S:91:THR:HG23	4:S:118:THR:HA	1.98	0.46
1:A:347:ASN:HB3	5:R:128:ARG:HB3	1.98	0.46
4:S:22:CYS:HB3	4:S:79:LEU:HB3	1.97	0.46
2:B:248:ALA:HB1	2:B:269:ILE:HG22	1.97	0.45
4:S:109:ASP:OD1	4:S:110:PHE:N	2.50	0.45
4:S:69:THR:HB	4:S:82:GLN:HB3	1.99	0.45
5:R:51:ILE:HG23	5:R:55:HIS:HB2	1.98	0.45
2:B:192:LEU:HD23	2:B:199:PHE:HB3	1.98	0.45
5:R:66:LEU:HD22	5:R:295:TYR:CE1	2.52	0.45
5:R:82:PHE:HB3	5:R:93:TRP:HH2	1.82	0.45
5:R:29:VAL:HG23	5:R:30:LEU:HD22	1.99	0.45
5:R:61:SER:O	5:R:64:ILE:HG12	2.17	0.45
5:R:89:ARG:HB3	5:R:92:ASP:HB3	1.98	0.44
5:R:215:LEU:HD13	5:R:226:ILE:HG23	1.99	0.44
5:R:34:LEU:HB3	5:R:84:MET:SD	2.57	0.44
5:R:66:LEU:HD22	5:R:295:TYR:HE1	1.83	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:R:142:ARG:O	5:R:146:ILE:HD12	2.17	0.44
5:R:182:ILE:HG21	5:R:254:ILE:HG21	2.00	0.44
5:R:243:CYS:HB3	5:R:286:ASN:HB2	1.99	0.44
2:B:79:LEU:HD11	2:B:114:CYS:HB3	2.00	0.43
4:S:219:LEU:HD11	4:S:245:LEU:HD13	2.00	0.43
5:R:192:MET:SD	6:R:401:FI7:O12	2.77	0.42
5:R:14:ASP:HB3	5:R:16:LYS:HG2	2.00	0.42
5:R:221:ASP:OD1	5:R:221:ASP:N	2.49	0.42
1:A:241:ASN:ND2	1:A:286:CYS:SG	2.92	0.42
5:R:109:MET:HG2	5:R:155:THR:HG22	2.01	0.42
1:A:53:MET:HG2	1:A:332:VAL:HG22	2.01	0.42
5:R:238:ILE:O	5:R:242:ILE:HG12	2.19	0.42
1:A:261:ASP:OD1	1:A:261:ASP:N	2.53	0.41
5:R:74:PHE:HA	5:R:77:ILE:HG22	2.02	0.41
5:R:63:ARG:HD3	5:R:63:ARG:HA	1.80	0.41
5:R:61:SER:O	5:R:64:ILE:CG1	2.68	0.41
5:R:47:LEU:O	5:R:51:ILE:HD12	2.21	0.41
5:R:59:TRP:CB	5:R:63:ARG:CG	2.96	0.41
5:R:64:ILE:O	5:R:68:ASN:ND2	2.51	0.41
2:B:180:PHE:CE1	2:B:216:GLY:HA2	2.55	0.41
2:B:230:ASN:ND2	2:B:246:ASP:OD1	2.43	0.41
4:S:32:PHE:CD1	4:S:100:ILE:HB	2.55	0.41
5:R:60:LYS:O	5:R:61:SER:C	2.60	0.41
2:B:281:SER:OG	3:G:48:ASP:OD2	2.32	0.41
5:R:37:GLU:HA	5:R:288:MET:SD	2.61	0.41
5:R:97:ASP:N	5:R:97:ASP:OD1	2.44	0.41
5:R:115:ILE:HD11	5:R:244:PHE:CZ	2.56	0.40
5:R:248:VAL:O	5:R:252:ILE:HD12	2.22	0.40
1:A:234:LEU:O	1:A:236:GLU:N	2.55	0.40
1:A:253:ILE:HD13	1:A:253:ILE:HA	1.92	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	A	221/352 (63%)	215 (97%)	6 (3%)	0	100	100
2	B	337/339 (99%)	330 (98%)	7 (2%)	0	100	100
3	G	56/58 (97%)	56 (100%)	0	0	100	100
4	S	230/250 (92%)	225 (98%)	5 (2%)	0	100	100
5	R	293/295 (99%)	281 (96%)	12 (4%)	0	100	100
All	All	1137/1294 (88%)	1107 (97%)	30 (3%)	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	A	200/304 (66%)	199 (100%)	1 (0%)	86	92
2	B	282/282 (100%)	282 (100%)	0	100	100
3	G	47/47 (100%)	47 (100%)	0	100	100
4	S	198/202 (98%)	197 (100%)	1 (0%)	86	92
5	R	268/268 (100%)	268 (100%)	0	100	100
All	All	995/1103 (90%)	993 (100%)	2 (0%)	91	96

All (2) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	280	LYS
4	S	67	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 ⓘ

2 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#|Z| > 2$	Counts	RMSZ	$\#|Z| > 2$
7	NAG	R	402	5	14,14,15	0.28	0	17,19,21	0.61	0
6	FI7	R	401	-	25,30,30	3.57	9 (36%)	30,43,43	1.81	9 (30%)

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	NAG	R	402	5	-	6/6/23/26	0/1/1/1
6	FI7	R	401	-	-	2/21/34/34	0/3/3/3

All (9) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	R	401	FI7	C04-C05	11.51	1.56	1.49

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	R	401	FI7	C20-N19	8.39	1.49	1.35
6	R	401	FI7	C07-N06	6.06	1.43	1.35
6	R	401	FI7	C22-C21	5.78	1.56	1.47
6	R	401	FI7	C17-N19	2.74	1.42	1.37
6	R	401	FI7	C28-C20	2.49	1.53	1.49
6	R	401	FI7	C02-C17	2.14	1.59	1.53
6	R	401	FI7	O23-C22	2.13	1.28	1.22
6	R	401	FI7	C08-C07	2.13	1.55	1.48

All (9) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
6	R	401	FI7	C28-C20-C21	-3.51	118.78	122.99
6	R	401	FI7	C09-C08-N14	-3.33	117.31	122.26
6	R	401	FI7	C07-N06-C05	3.13	106.22	102.02
6	R	401	FI7	C07-C08-N14	3.04	120.22	116.75
6	R	401	FI7	O18-C17-C02	-2.84	115.31	120.98
6	R	401	FI7	C13-N14-C08	2.67	121.42	117.90
6	R	401	FI7	C01-C02-C04	-2.33	106.40	109.78
6	R	401	FI7	C08-C07-N06	2.33	126.90	122.27
6	R	401	FI7	C27-C28-C20	2.31	115.98	110.96

There are no chirality outliers.

All (8) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	R	401	FI7	C28-C20-N19-C17
7	R	402	NAG	C3-C2-N2-C7
7	R	402	NAG	C8-C7-N2-C2
7	R	402	NAG	O7-C7-N2-C2
7	R	402	NAG	O5-C5-C6-O6
7	R	402	NAG	C4-C5-C6-O6
6	R	401	FI7	N15-C07-C08-N14
7	R	402	NAG	C1-C2-N2-C7

There are no ring outliers.

2 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	R	402	NAG	1	0
6	R	401	FI7	2	0

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 FI7 R 401

Bond lengths

Bond angles

Torsions

Rings
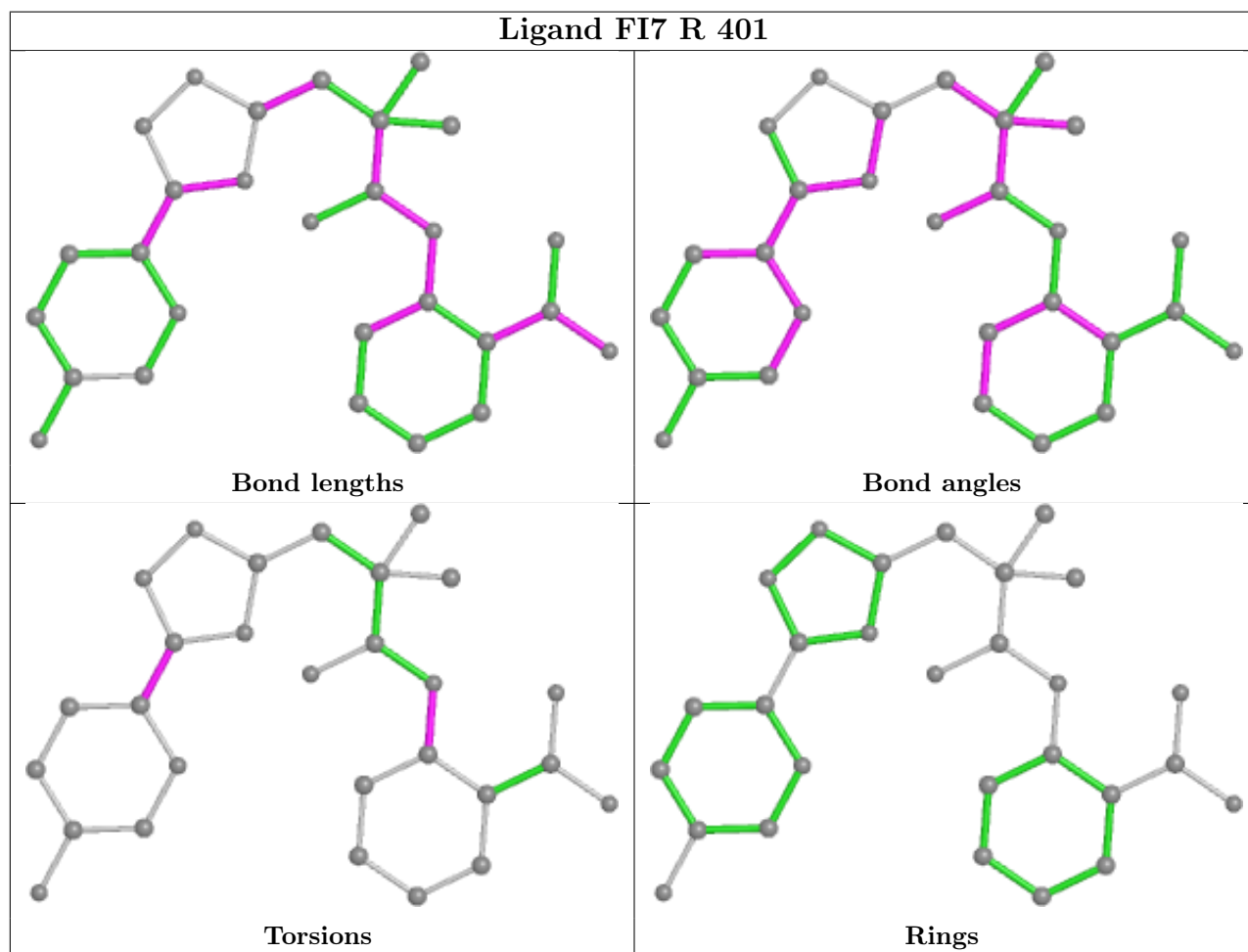
5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8　Polymer linkage issues　ⓘ

There are no chain breaks in this entry.