



Full wwPDB EM Validation Report ⓘ

Nov 13, 2024 – 10:14 AM JST

PDB ID : 8KFZ
EMDB ID : EMD-37209
Title : Gi bound CCR8 in ligand free state
Authors : Jiang, S.; Lin, X.; Wu, L.J.; Xu, F.
Deposited on : 2023-08-16
Resolution : 3.30 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

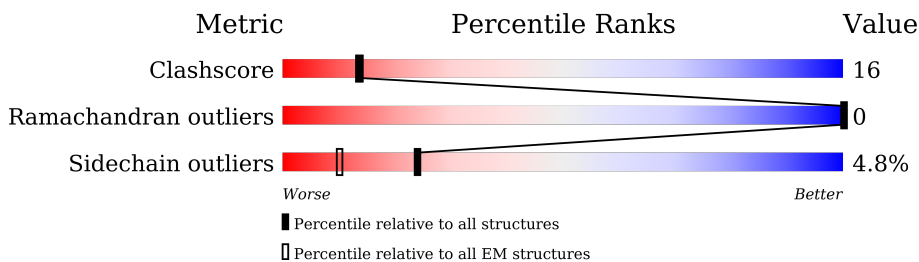
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.30 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	575	30% 19% . 50%
2	A	354	42% 20% . 36%
3	B	366	59% 31% . 8%
4	C	71	63% 15% 21%
5	S	297	58% 19% . 22%

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 8966 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 C-C chemokine receptor type 8,LgBiT fusion protein,Recombinant Human Rhinovirus.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	R	288	2342	1578	364	382	18	0	0

There are 27 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
R	-26	MET	-	initiating methionine	UNP P51685
R	-25	LYS	-	expression tag	UNP P51685
R	-24	THR	-	expression tag	UNP P51685
R	-23	ILE	-	expression tag	UNP P51685
R	-22	ILE	-	expression tag	UNP P51685
R	-21	ALA	-	expression tag	UNP P51685
R	-20	LEU	-	expression tag	UNP P51685
R	-19	SER	-	expression tag	UNP P51685
R	-18	TYR	-	expression tag	UNP P51685
R	-17	ILE	-	expression tag	UNP P51685
R	-16	PHE	-	expression tag	UNP P51685
R	-15	CYS	-	expression tag	UNP P51685
R	-14	LEU	-	expression tag	UNP P51685
R	-13	VAL	-	expression tag	UNP P51685
R	-12	PHE	-	expression tag	UNP P51685
R	-11	ALA	-	expression tag	UNP P51685
R	-10	ASP	-	expression tag	UNP P51685
R	-9	TYR	-	expression tag	UNP P51685
R	-8	LYS	-	expression tag	UNP P51685
R	-7	ASP	-	expression tag	UNP P51685
R	-6	ASP	-	expression tag	UNP P51685
R	-5	ASP	-	expression tag	UNP P51685
R	-4	ASP	-	expression tag	UNP P51685
R	-3	ALA	-	expression tag	UNP P51685
R	-2	GLY	-	expression tag	UNP P51685
R	-1	ARG	-	expression tag	UNP P51685
R	0	ALA	-	expression tag	UNP P51685

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	A	225	1812	1151	301	346	14	0	0

There are 3 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	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
			Total	C	N	O	S		
3	B	338	2600	1604	467	508	21	0	0

There are 26 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	341	GLY	-	expression tag	UNP P62873
B	342	SER	-	expression tag	UNP P62873
B	343	SER	-	expression tag	UNP P62873
B	344	GLY	-	expression tag	UNP P62873
B	345	GLY	-	expression tag	UNP P62873
B	346	GLY	-	expression tag	UNP P62873
B	347	GLY	-	expression tag	UNP P62873
B	348	SER	-	expression tag	UNP P62873
B	349	GLY	-	expression tag	UNP P62873
B	350	GLY	-	expression tag	UNP P62873
B	351	GLY	-	expression tag	UNP P62873
B	352	GLY	-	expression tag	UNP P62873
B	353	SER	-	expression tag	UNP P62873
B	354	SER	-	expression tag	UNP P62873
B	355	GLY	-	expression tag	UNP P62873
B	356	VAL	-	expression tag	UNP P62873
B	357	SER	-	expression tag	UNP P62873
B	358	GLY	-	expression tag	UNP P62873
B	359	TRP	-	expression tag	UNP P62873
B	360	ARG	-	expression tag	UNP P62873
B	361	LEU	-	expression tag	UNP P62873

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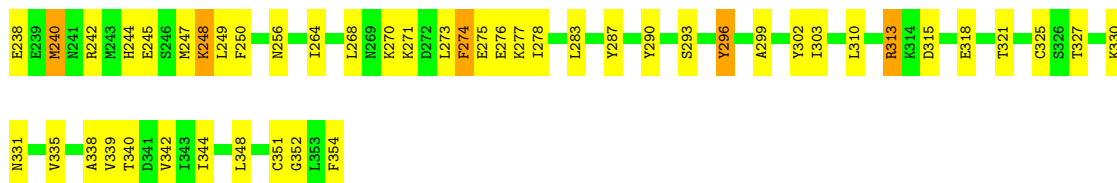
Chain	Residue	Modelled	Actual	Comment	Reference
B	362	PHE	-	expression tag	UNP P62873
B	363	LYS	-	expression tag	UNP P62873
B	364	LYS	-	expression tag	UNP P62873
B	365	ILE	-	expression tag	UNP P62873
B	366	SER	-	expression tag	UNP P62873

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

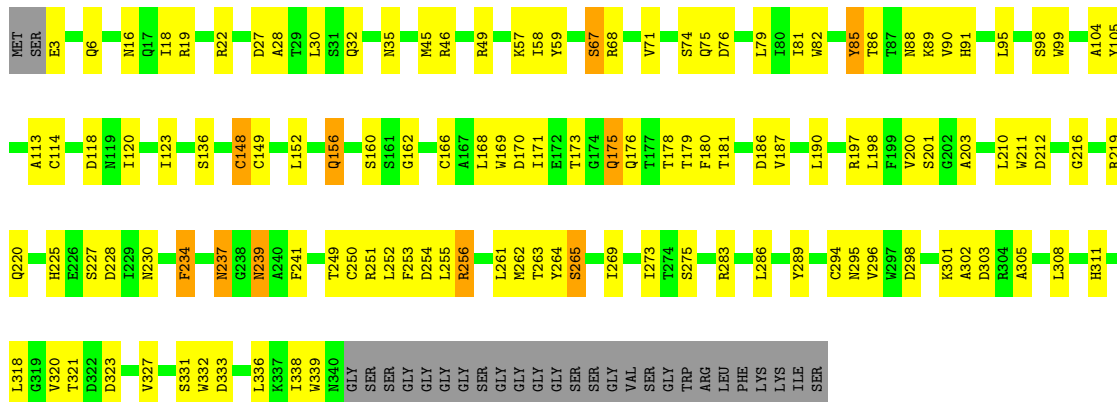
Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	C	56	429	269	76	81	3	0	0

- Molecule 5 is a protein called scFv16.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	S	232	1783	1131	295	347	10	0	0



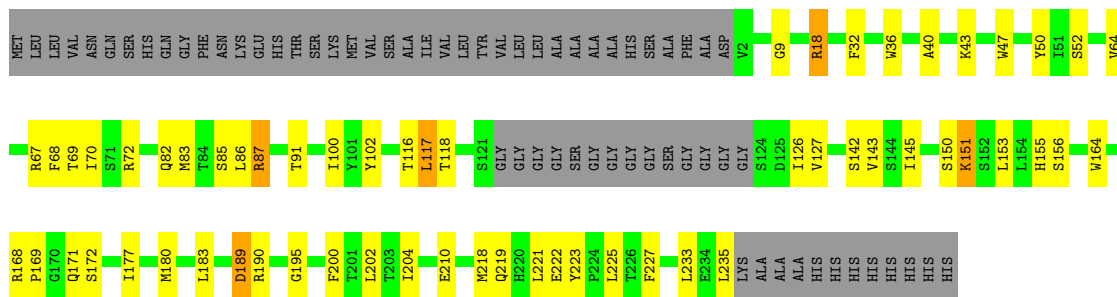
• Molecule 3: Guanine nucleotide-binding protein G(I)/G(S)/G(T) subunit beta-1



• Molecule 4: Guanine nucleotide-binding protein G(I)/G(S)/G(O) subunit gamma-2



• Molecule 5: scFv16



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	27420	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)	700	Depositor
Maximum defocus (nm)	2200	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k 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	R	0.27	0/2403	0.48	1/3265 (0.0%)
2	A	0.28	0/1842	0.52	0/2472
3	B	0.29	0/2647	0.56	0/3589
4	C	0.26	0/435	0.49	0/587
5	S	0.31	0/1827	0.53	0/2477
All	All	0.28	0/9154	0.52	1/12390 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed($^{\circ}$)	Ideal($^{\circ}$)
1	R	159	LEU	CA-CB-CG	5.79	128.61	115.30

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	R	2342	0	2443	92	0
2	A	1812	0	1798	60	0
3	B	2600	0	2505	84	0
4	C	429	0	441	10	0
5	S	1783	0	1717	48	0
All	All	8966	0	8904	281	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 16.

All (281) 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:247:SER:O	1:R:251:TRP:HB2	1.52	1.08
5:S:18:ARG:O	5:S:83:MET:HB2	1.69	0.91
5:S:142:SER:HA	5:S:204:ILE:O	1.71	0.89
2:A:227:LEU:HB3	2:A:274:PHE:HD2	1.43	0.83
2:A:227:LEU:HD22	2:A:303:ILE:HD12	1.61	0.80
1:R:250:PHE:HD1	1:R:251:TRP:HD1	1.31	0.79
5:S:68:PHE:HE1	5:S:83:MET:HG2	1.49	0.76
3:B:58:ILE:HD13	3:B:336:LEU:HD12	1.65	0.76
1:R:83:LEU:HA	1:R:86:PHE:CE2	2.23	0.73
5:S:85:SER:O	5:S:87:ARG:NH1	2.21	0.73
2:A:227:LEU:HD21	2:A:268:LEU:HD12	1.69	0.73
1:R:126:LEU:HD21	1:R:153:LEU:HB3	1.68	0.73
2:A:244:HIS:HA	2:A:247:MET:HE3	1.72	0.72
1:R:69:ILE:HD12	1:R:69:ILE:H	1.53	0.72
1:R:225:LEU:HD23	1:R:237:ILE:HG13	1.70	0.72
2:A:48:THR:HA	2:A:51:LYS:HD3	1.70	0.72
1:R:298:VAL:HG23	1:R:302:PHE:HD2	1.55	0.71
2:A:233:VAL:HG21	2:A:238:GLU:HG2	1.72	0.70
1:R:187:TYR:HD1	1:R:191:THR:HG22	1.57	0.70
3:B:71:VAL:HG22	3:B:81:ILE:HG12	1.73	0.69
2:A:227:LEU:CD2	2:A:268:LEU:HD12	2.22	0.69
5:S:91:THR:HG23	5:S:118:THR:HA	1.75	0.69
3:B:82:TRP:HZ3	3:B:336:LEU:HD13	1.58	0.68
5:S:68:PHE:CE1	5:S:83:MET:HG2	2.27	0.68
1:R:306:LYS:O	1:R:310:HIS:ND1	2.26	0.68
2:A:229:ASP:HB3	2:A:242:ARG:HB3	1.77	0.67
1:R:81:ASP:O	1:R:85:VAL:HG13	1.95	0.66
5:S:9:GLY:O	5:S:18:ARG:NH2	2.28	0.66
2:A:273:LEU:O	2:A:277:LYS:HB3	1.96	0.65
3:B:45:MET:HB3	3:B:339:TRP:HB3	1.77	0.65
3:B:237:ASN:OD1	3:B:239:ASN:ND2	2.30	0.65
2:A:227:LEU:HD22	2:A:303:ILE:CD1	2.26	0.65
5:S:155:HIS:HD2	5:S:156:SER:H	1.44	0.64
1:R:111:GLY:O	1:R:115:ILE:HG23	1.98	0.64
1:R:85:VAL:HA	1:R:88:PHE:CE2	2.33	0.64
5:S:64:VAL:HB	5:S:68:PHE:HD2	1.62	0.64
3:B:212:ASP:OD1	3:B:216:GLY:N	2.29	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:R:187:TYR:HD1	1:R:191:THR:CG2	2.11	0.64
5:S:168:ARG:HG2	5:S:169:PRO:HD2	1.79	0.63
2:A:33:GLU:HG2	2:A:195:HIS:HB2	1.80	0.62
2:A:338:ALA:O	2:A:342:VAL:HG23	2.00	0.62
2:A:227:LEU:HB3	2:A:274:PHE:CD2	2.31	0.62
2:A:299:ALA:O	2:A:303:ILE:HG13	1.99	0.62
5:S:9:GLY:CA	5:S:116:THR:O	2.49	0.61
3:B:85:TYR:CE1	4:C:60:PRO:HB2	2.35	0.61
3:B:311:HIS:ND1	3:B:331:SER:OG	2.23	0.61
1:R:76:ASN:HB3	1:R:123:PHE:CZ	2.36	0.60
1:R:80:SER:HB2	1:R:119:SER:HB2	1.83	0.60
2:A:335:VAL:O	2:A:339:VAL:HG22	2.01	0.60
3:B:227:SER:OG	3:B:228:ASP:N	2.34	0.60
3:B:249:THR:HG22	3:B:265:SER:HB2	1.83	0.60
2:A:240:MET:SD	2:A:240:MET:N	2.74	0.60
1:R:117:PHE:CZ	1:R:202:MET:HB3	2.37	0.59
4:C:11:GLN:HA	4:C:14:LYS:HE2	1.84	0.59
3:B:68:ARG:HD2	3:B:85:TYR:HE2	1.67	0.59
3:B:81:ILE:HB	3:B:91:HIS:HB2	1.85	0.59
5:S:40:ALA:HB3	5:S:43:LYS:HB2	1.85	0.59
5:S:171:GLN:OE1	5:S:172:SER:N	2.36	0.59
5:S:155:HIS:HD2	5:S:156:SER:N	2.01	0.58
3:B:220:GLN:NE2	3:B:255:LEU:O	2.37	0.58
3:B:252:LEU:HD22	3:B:261:LEU:HD22	1.84	0.58
5:S:195:GLY:HA3	5:S:200:PHE:HD1	1.69	0.58
1:R:187:TYR:CD1	1:R:191:THR:HG22	2.38	0.58
4:C:29:LYS:HD3	4:C:30:VAL:H	1.69	0.57
1:R:250:PHE:CD1	1:R:251:TRP:HD1	2.19	0.57
3:B:30:LEU:HD22	3:B:261:LEU:HD21	1.87	0.57
3:B:104:ALA:HB3	3:B:113:ALA:HB3	1.86	0.57
1:R:43:CYS:O	1:R:47:VAL:HG22	2.05	0.57
1:R:155:LEU:O	1:R:159:LEU:HD12	2.04	0.57
2:A:270:LYS:HD3	2:A:270:LYS:N	2.20	0.57
5:S:87:ARG:HG2	5:S:87:ARG:HH11	1.70	0.57
2:A:268:LEU:HD23	2:A:321:THR:HG23	1.86	0.57
3:B:148:CYS:SG	3:B:149:CYS:N	2.77	0.57
3:B:201:SER:HG	3:B:211:TRP:HE1	1.53	0.57
1:R:75:LEU:O	1:R:79:LEU:HG	2.05	0.57
3:B:262:MET:HG3	3:B:263:THR:N	2.20	0.56
2:A:223:PHE:HZ	2:A:249:LEU:HG	1.70	0.56
2:A:290:TYR:HB2	2:A:302:TYR:HE2	1.70	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:313:ARG:HH11	2:A:313:ARG:HG2	1.69	0.56
3:B:180:PHE:HB3	3:B:211:TRP:CE3	2.40	0.56
1:R:218:TYR:HH	1:R:300:TYR:HH	1.52	0.56
3:B:269:ILE:HD12	3:B:269:ILE:H	1.70	0.55
1:R:104:VAL:HG13	1:R:105:MET:SD	2.47	0.55
1:R:252:VAL:HG23	1:R:255:ASN:HD21	1.72	0.55
5:S:218:MET:HE1	5:S:225:LEU:HD13	1.89	0.54
1:R:254:PHE:HB2	1:R:289:SER:HB3	1.90	0.54
3:B:249:THR:HA	3:B:264:TYR:O	2.07	0.54
1:R:31:GLN:HB2	1:R:280:TYR:CZ	2.43	0.54
3:B:331:SER:OG	3:B:333:ASP:OD1	2.26	0.54
5:S:190:ARG:NH2	5:S:210:GLU:OE1	2.40	0.54
2:A:340:THR:O	2:A:344:ILE:HG13	2.08	0.54
1:R:271:GLY:O	1:R:275:SER:N	2.40	0.53
3:B:49:ARG:HB2	3:B:338:ILE:HD12	1.89	0.53
2:A:29:LYS:HG2	2:A:32:ARG:HH21	1.72	0.53
2:A:247:MET:HB3	2:A:310:LEU:HD11	1.90	0.53
3:B:18:ILE:O	3:B:22:ARG:HG2	2.09	0.53
3:B:286:LEU:HD22	3:B:327:VAL:HG11	1.89	0.53
5:S:9:GLY:HA3	5:S:116:THR:O	2.08	0.53
3:B:225:HIS:CE1	3:B:251:ARG:HE	2.25	0.53
1:R:166:ILE:HA	1:R:169:LEU:HB2	1.91	0.53
2:A:274:PHE:CE1	2:A:278:ILE:HB	2.44	0.53
1:R:291:THR:O	1:R:295:VAL:HG12	2.10	0.52
2:A:47:ASN:O	2:A:51:LYS:HG3	2.10	0.52
3:B:254:ASP:OD1	3:B:255:LEU:N	2.42	0.52
1:R:41:PHE:O	1:R:45:LEU:HB2	2.09	0.52
1:R:70:THR:HG21	2:A:351:CYS:HA	1.91	0.52
3:B:27:ASP:CG	4:C:29:LYS:HD2	2.30	0.52
3:B:198:LEU:HB3	3:B:210:LEU:HD11	1.92	0.52
1:R:281:ALA:HA	1:R:284:VAL:HG22	1.90	0.52
2:A:46:LYS:NZ	2:A:200:ASP:OD2	2.26	0.52
2:A:271:LYS:HB2	2:A:296:TYR:OH	2.10	0.51
3:B:160:SER:HB3	3:B:190:LEU:HD23	1.92	0.51
1:R:252:VAL:HA	1:R:255:ASN:ND2	2.25	0.51
2:A:33:GLU:OE1	2:A:197:LYS:HE2	2.10	0.51
5:S:155:HIS:CD2	5:S:156:SER:N	2.79	0.51
1:R:57:ILE:O	1:R:61:VAL:HG12	2.10	0.51
1:R:228:CYS:SG	1:R:229:GLN:N	2.84	0.51
1:R:306:LYS:NZ	2:A:352:GLY:HA2	2.25	0.51
5:S:83:MET:SD	5:S:86:LEU:HD21	2.51	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:196:PHE:HE1	2:A:339:VAL:HG21	1.74	0.51
5:S:36:TRP:HD1	5:S:70:ILE:HD12	1.76	0.51
3:B:173:THR:O	3:B:175:GLN:NE2	2.44	0.50
5:S:180:MET:O	5:S:180:MET:HG2	2.10	0.50
5:S:64:VAL:HG12	5:S:67:ARG:NH2	2.25	0.50
2:A:290:TYR:OH	2:A:293:SER:O	2.29	0.50
3:B:273:ILE:HG12	3:B:289:TYR:CE2	2.46	0.50
1:R:196:ILE:HD11	1:R:265:SER:HB2	1.94	0.50
1:R:82:LEU:HA	1:R:85:VAL:HG22	1.93	0.49
1:R:191:THR:HG22	1:R:191:THR:O	2.12	0.49
2:A:313:ARG:O	2:A:313:ARG:HG3	2.13	0.49
5:S:83:MET:HE1	5:S:117:LEU:HD11	1.94	0.49
3:B:296:VAL:O	3:B:305:ALA:N	2.42	0.49
5:S:145:ILE:HD11	5:S:233:LEU:HD21	1.93	0.49
1:R:252:VAL:O	1:R:256:VAL:HG22	2.13	0.49
1:R:165:THR:HG22	1:R:169:LEU:HG	1.93	0.49
2:A:15:ARG:HA	2:A:18:MET:HE2	1.93	0.49
3:B:67:SER:OG	3:B:323:ASP:OD2	2.27	0.49
3:B:219:ARG:HG2	3:B:219:ARG:HH11	1.77	0.49
3:B:283:ARG:HH21	3:B:298:ASP:CG	2.15	0.49
1:R:230:ASN:O	1:R:233:LYS:HG2	2.13	0.48
2:A:38:LEU:HD21	2:A:46:LYS:HG2	1.94	0.48
3:B:294:CYS:SG	3:B:318:LEU:HD11	2.53	0.48
5:S:155:HIS:CD2	5:S:156:SER:H	2.29	0.48
1:R:215:MET:O	1:R:219:ILE:HG13	2.14	0.48
2:A:245:GLU:HA	2:A:248:LYS:HG3	1.94	0.48
1:R:295:VAL:O	1:R:298:VAL:HG12	2.14	0.48
3:B:311:HIS:CG	3:B:331:SER:HG	2.26	0.48
1:R:120:SER:HB3	1:R:251:TRP:CZ2	2.48	0.48
1:R:114:TYR:HB2	1:R:165:THR:HG23	1.96	0.47
1:R:225:LEU:HD21	1:R:236:ALA:HB3	1.95	0.47
1:R:132:TYR:HB2	1:R:217:CYS:HB3	1.95	0.47
1:R:250:PHE:HD1	1:R:251:TRP:CD1	2.22	0.47
3:B:79:LEU:HB2	3:B:95:LEU:HD21	1.97	0.47
3:B:169:TRP:HA	3:B:176:GLN:HA	1.96	0.47
4:C:46:LYS:HB2	4:C:46:LYS:HE2	1.71	0.47
2:A:223:PHE:CZ	2:A:249:LEU:HG	2.50	0.47
3:B:210:LEU:HD22	3:B:255:LEU:HD22	1.97	0.47
1:R:120:SER:HB3	1:R:251:TRP:HZ2	1.79	0.47
3:B:123:ILE:O	3:B:136:SER:N	2.47	0.47
1:R:74:LEU:HD21	1:R:300:TYR:HB3	1.97	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:R:207:LEU:C	1:R:210:PRO:HD2	2.35	0.47
2:A:231:ASP:HB2	2:A:277:LYS:HZ1	1.80	0.47
5:S:64:VAL:HB	5:S:68:PHE:CD2	2.47	0.47
5:S:127:VAL:HB	5:S:150:SER:HB3	1.95	0.47
1:R:255:ASN:OD1	1:R:256:VAL:N	2.48	0.47
1:R:90:PHE:CD2	1:R:109:VAL:HG22	2.50	0.47
1:R:65:LYS:HE3	1:R:67:ARG:HE	1.80	0.46
1:R:230:ASN:HA	2:A:318:GLU:OE1	2.16	0.46
1:R:246:ALA:HB1	1:R:250:PHE:CE2	2.50	0.46
2:A:315:ASP:OD1	2:A:315:ASP:N	2.49	0.46
1:R:52:GLY:O	1:R:56:VAL:HG23	2.15	0.46
1:R:204:ILE:HA	1:R:208:LEU:HD12	1.96	0.46
3:B:320:VAL:HG22	3:B:327:VAL:HG22	1.97	0.46
3:B:67:SER:HB2	3:B:321:THR:HB	1.98	0.46
3:B:90:VAL:HG23	5:S:102:TYR:HB2	1.97	0.46
2:A:213:HIS:H	2:A:213:HIS:CD2	2.34	0.46
1:R:121:MET:SD	1:R:251:TRP:CZ3	3.09	0.46
5:S:9:GLY:HA2	5:S:116:THR:O	2.16	0.46
5:S:32:PHE:CD1	5:S:100:ILE:HB	2.51	0.46
3:B:123:ILE:HG13	3:B:171:ILE:HD13	1.96	0.45
3:B:275:SER:OG	3:B:318:LEU:HB2	2.16	0.45
1:R:125:THR:O	1:R:129:VAL:HG23	2.16	0.45
5:S:168:ARG:NH1	5:S:210:GLU:HG2	2.31	0.45
1:R:143:LYS:HB2	1:R:143:LYS:HE3	1.82	0.45
2:A:325:CYS:HG	2:A:327:THR:HG1	1.64	0.45
5:S:69:THR:OG1	5:S:82:GLN:HB3	2.16	0.45
1:R:86:PHE:O	1:R:89:PRO:HD2	2.17	0.45
3:B:27:ASP:OD1	3:B:28:ALA:N	2.49	0.45
3:B:162:GLY:HA2	3:B:186:ASP:HB3	1.98	0.45
1:R:204:ILE:HA	1:R:208:LEU:HB2	1.98	0.45
2:A:331:ASN:O	2:A:335:VAL:HG23	2.17	0.45
3:B:68:ARG:HD2	3:B:85:TYR:CE2	2.50	0.45
3:B:250:CYS:SG	3:B:273:ILE:HD13	2.56	0.45
2:A:231:ASP:HB2	2:A:277:LYS:NZ	2.31	0.45
3:B:3:GLU:HB3	3:B:6:GLN:HB2	1.99	0.45
4:C:29:LYS:HD3	4:C:30:VAL:N	2.31	0.45
1:R:105:MET:O	1:R:109:VAL:HG23	2.17	0.44
3:B:74:SER:OG	3:B:76:ASP:OD1	2.36	0.44
3:B:166:CYS:HB2	3:B:180:PHE:HB2	2.00	0.44
1:R:42:TYR:HD2	1:R:92:THR:HG23	1.83	0.44
1:R:188:ASN:H	1:R:191:THR:HB	1.83	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:S:177:ILE:HD13	5:S:183:LEU:HA	2.00	0.44
3:B:57:LYS:HG2	3:B:332:TRP:HB3	2.00	0.44
5:S:153:LEU:HA	5:S:221:LEU:HD12	1.99	0.44
1:R:61:VAL:HG13	1:R:62:VAL:HG23	2.00	0.44
2:A:227:LEU:HD21	2:A:268:LEU:CD1	2.43	0.44
1:R:140:TYR:O	1:R:143:LYS:HG2	2.18	0.44
5:S:47:TRP:HZ2	5:S:50:TYR:HB3	1.83	0.44
5:S:126:ILE:HG12	5:S:151:LYS:HG2	1.99	0.44
1:R:117:PHE:HE2	1:R:254:PHE:HE2	1.66	0.43
1:R:193:LYS:HE2	1:R:193:LYS:HB3	1.91	0.43
3:B:200:VAL:HG22	3:B:234:PHE:CE2	2.52	0.43
5:S:219:GLN:HE22	5:S:222:GLU:HG2	1.83	0.43
3:B:86:THR:O	3:B:88:ASN:N	2.46	0.43
1:R:298:VAL:HG23	1:R:302:PHE:CD2	2.44	0.43
3:B:82:TRP:HE1	3:B:89:LYS:HE3	1.83	0.43
5:S:180:MET:HE2	5:S:180:MET:HB3	1.79	0.43
1:R:292:HIS:HA	1:R:295:VAL:CG1	2.48	0.43
2:A:230:TYR:CE2	2:A:283:LEU:HA	2.52	0.43
2:A:275:GLU:HB2	2:A:296:TYR:HD2	1.83	0.43
5:S:189:ASP:OD1	5:S:189:ASP:N	2.51	0.43
1:R:64:LYS:HG3	1:R:310:HIS:CD2	2.54	0.43
3:B:289:TYR:HE1	3:B:295:ASN:HB2	1.82	0.43
3:B:294:CYS:HB3	3:B:308:LEU:HB2	2.01	0.43
3:B:298:ASP:HB3	3:B:301:LYS:O	2.19	0.43
3:B:179:THR:HG22	3:B:181:THR:HG23	1.99	0.43
3:B:241:PHE:CE1	3:B:253:PHE:HB2	2.54	0.43
1:R:117:PHE:HE2	1:R:254:PHE:CE2	2.36	0.43
4:C:10:ALA:O	4:C:14:LYS:HG3	2.19	0.43
1:R:232:ASN:HB3	2:A:354:PHE:O	2.18	0.42
3:B:225:HIS:CE1	3:B:251:ARG:HB2	2.53	0.42
5:S:47:TRP:CD1	5:S:225:LEU:HD12	2.54	0.42
1:R:80:SER:HB2	1:R:119:SER:CB	2.48	0.42
2:A:184:ILE:HD13	3:B:99:TRP:CD1	2.54	0.42
5:S:86:LEU:HD13	5:S:117:LEU:HD21	2.01	0.42
1:R:35:LYS:HA	1:R:38:LEU:HG	2.00	0.42
1:R:198:THR:HA	1:R:201:LYS:HE3	2.00	0.42
3:B:75:GLN:O	3:B:98:SER:HB2	2.20	0.42
3:B:152:LEU:HD23	3:B:152:LEU:HA	1.92	0.42
3:B:118:ASP:O	3:B:120:ILE:HG12	2.18	0.42
1:R:248:LEU:O	1:R:252:VAL:HG12	2.20	0.42
5:S:143:VAL:HG22	5:S:204:ILE:HB	2.02	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:262:MET:SD	3:B:302:ALA:HB2	2.59	0.42
3:B:82:TRP:HD1	3:B:89:LYS:HA	1.84	0.42
3:B:152:LEU:HB2	3:B:156:GLN:HB2	2.01	0.42
5:S:52:SER:O	5:S:72:ARG:NH1	2.53	0.42
2:A:44:SER:O	2:A:224:CYS:HB3	2.20	0.41
3:B:46:ARG:O	3:B:339:TRP:HA	2.19	0.41
2:A:274:PHE:HE1	2:A:278:ILE:HD13	1.85	0.41
3:B:58:ILE:HD13	3:B:336:LEU:CD1	2.43	0.41
2:A:6:SER:N	5:S:155:HIS:HE1	2.19	0.41
3:B:256:ARG:NH2	4:C:36:ASP:OD2	2.53	0.41
2:A:250:PHE:HE1	2:A:264:ILE:HD13	1.84	0.41
3:B:251:ARG:HG3	3:B:263:THR:HG22	2.03	0.41
3:B:256:ARG:HB3	4:C:28:ILE:CD1	2.50	0.41
5:S:219:GLN:HE22	5:S:222:GLU:CG	2.33	0.41
1:R:241:LEU:HA	1:R:244:VAL:HG12	2.02	0.41
2:A:313:ARG:HG2	2:A:313:ARG:NH1	2.31	0.41
3:B:32:GLN:HA	3:B:35:ASN:ND2	2.36	0.41
1:R:98:GLN:HB3	1:R:180:VAL:HG13	2.02	0.41
1:R:122:PHE:HB3	1:R:157:VAL:HG22	2.02	0.41
1:R:288:ILE:O	1:R:291:THR:HG22	2.21	0.41
3:B:82:TRP:CD1	3:B:89:LYS:HG2	2.56	0.41
3:B:187:VAL:HA	3:B:203:ALA:HA	2.02	0.41
1:R:286:GLU:HB3	1:R:290:PHE:CE2	2.56	0.41
1:R:225:LEU:HD11	2:A:348:LEU:HD21	2.02	0.40
2:A:274:PHE:CD1	2:A:278:ILE:HB	2.56	0.40
3:B:168:LEU:HB3	3:B:178:THR:HB	2.03	0.40
3:B:255:LEU:HD23	3:B:255:LEU:HA	1.93	0.40
3:B:256:ARG:HB3	4:C:28:ILE:HD12	2.03	0.40
1:R:69:ILE:H	1:R:69:ILE:CD1	2.27	0.40
1:R:105:MET:SD	1:R:105:MET:N	2.94	0.40
1:R:201:LYS:HE3	1:R:201:LYS:HB3	1.76	0.40
2:A:5:LEU:HD23	2:A:5:LEU:HA	1.90	0.40
3:B:16:ASN:OD1	3:B:19:ARG:NH2	2.55	0.40
1:R:122:PHE:HB2	1:R:157:VAL:HG13	2.03	0.40
5:S:164:TRP:CG	5:S:202:LEU:HD12	2.56	0.40
1:R:141:ALA:HA	1:R:144:VAL:HG22	2.04	0.40
1:R:287:ILE:HA	1:R:290:PHE:CE1	2.56	0.40
2:A:234:LEU:HA	2:A:234:LEU:HD23	1.80	0.40
2:A:296:TYR:CD1	2:A:296:TYR:C	2.95	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	R	286/575 (50%)	277 (97%)	9 (3%)	0	100	100
2	A	221/354 (62%)	215 (97%)	6 (3%)	0	100	100
3	B	336/366 (92%)	321 (96%)	15 (4%)	0	100	100
4	C	54/71 (76%)	53 (98%)	1 (2%)	0	100	100
5	S	228/297 (77%)	217 (95%)	11 (5%)	0	100	100
All	All	1125/1663 (68%)	1083 (96%)	42 (4%)	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	R	265/514 (52%)	255 (96%)	10 (4%)	28	56
2	A	200/306 (65%)	190 (95%)	10 (5%)	20	48
3	B	281/298 (94%)	264 (94%)	17 (6%)	16	42
4	C	45/58 (78%)	43 (96%)	2 (4%)	24	52
5	S	197/239 (82%)	189 (96%)	8 (4%)	26	54
All	All	988/1415 (70%)	941 (95%)	47 (5%)	24	50

All (47) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	R	80	SER
1	R	90	PHE
1	R	106	CYS
1	R	123	PHE
1	R	155	LEU
1	R	183	CYS
1	R	228	CYS
1	R	259	PHE
1	R	290	PHE
1	R	300	TYR
2	A	191	PHE
2	A	240	MET
2	A	248	LYS
2	A	256	ASN
2	A	274	PHE
2	A	276	GLU
2	A	287	TYR
2	A	296	TYR
2	A	313	ARG
2	A	330	LYS
3	B	59	TYR
3	B	67	SER
3	B	85	TYR
3	B	105	TYR
3	B	114	CYS
3	B	148	CYS
3	B	156	GLN
3	B	170	ASP
3	B	175	GLN
3	B	197	ARG
3	B	230	ASN
3	B	234	PHE
3	B	237	ASN
3	B	239	ASN
3	B	256	ARG
3	B	265	SER
3	B	303	ASP
4	C	21	MET
4	C	38	MET
5	S	18	ARG
5	S	87	ARG
5	S	117	LEU
5	S	151	LYS

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Mol	Chain	Res	Type
5	S	189	ASP
5	S	223	TYR
5	S	227	PHE
5	S	235	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	R	232	ASN
3	B	175	GLN
3	B	239	ASN
5	S	155	HIS

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.