

wwPDB EM Validation Summary Report (i)

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PDB ID	:	8WWI
EMDB ID	:	EMD-37889
Title	:	MCHR1-Gi complex,S3 state
Authors	:	Gong, W.; Ye, X.; Liu, G.
Deposited on	:	2023-10-25
Resolution	:	3.43 Å(reported)

This is a wwPDB EM Validation Summary 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 (1)) 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 (i)

The following experimental techniques were used to determine the structure: $ELECTRON\ MICROSCOPY$

The reported resolution of this entry is 3.43 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	$(\# {\rm Entries})$	$(\# {\rm Entries})$
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	А	354	51% 12%	37%						
2	В	376	70%	20% · 9%						
3	С	71	69%	11% 20%						
4	Е	255	76%	14% 9%						
5	R	624	38% 8%	54%						



2 Entry composition (i)

There are 5 unique types of molecules in this entry. The entry contains 8803 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		At	AltConf	Trace			
1	А	224	Total 1741	C 1108	N 290	O 330	S 13	0	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
А	47	ASN	SER	conflict	UNP P63096
А	203	ALA	GLY	conflict	UNP P63096
А	245	ALA	GLU	conflict	UNP P63096
А	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		At	oms			AltConf	Trace
2	В	342	Total 2622	C 1615	N 471	0 515	S 21	0	0

There are 37 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
В	-9	MET	-	initiating methionine	UNP P62873
В	-8	HIS	-	expression tag	UNP P62873
В	-7	HIS	- expression tag		UNP P62873
В	-6	HIS	- expression tag		UNP P62873
В	-5	HIS	-	expression tag	UNP P62873
В	-4	HIS	-	expression tag	UNP P62873
В	-3	HIS	-	expression tag	UNP P62873
В	-2	GLY	-	expression tag	UNP P62873
В	-1	SER	-	expression tag	UNP P62873
В	0	SER	-	expression tag	UNP P62873
В	1	GLY	-	expression tag	UNP P62873
B	341	GLY	_	expression tag	UNP P62873

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Chain	Residue	Modelled	Actual	Comment	Reference
В	342	SER	-	expression tag	UNP P62873
В	343	SER	_	expression tag	UNP P62873
В	344	GLY	-	expression tag	UNP P62873
В	345	GLY	-	expression tag	UNP P62873
В	346	GLY	-	expression tag	UNP P62873
В	347	GLY	-	expression tag	UNP P62873
В	348	SER	-	expression tag	UNP P62873
В	349	GLY	-	expression tag	UNP P62873
В	350	GLY	-	expression tag	UNP P62873
В	351	GLY	-	expression tag	UNP P62873
В	352	GLY	-	expression tag	UNP P62873
В	353	SER	-	expression tag	UNP P62873
В	354	SER	-	expression tag	UNP P62873
В	355	GLY	-	expression tag	UNP P62873
В	356	VAL	-	expression tag	UNP P62873
В	357	SER	-	expression tag	UNP P62873
В	358	GLY	-	expression tag	UNP P62873
В	359	TRP	-	expression tag	UNP P62873
В	360	ARG	-	expression tag	UNP P62873
В	361	LEU	-	expression tag	UNP P62873
В	362	PHE	-	expression tag	UNP P62873
В	363	LYS	-	expression tag	UNP P62873
В	364	LYS	-	expression tag	UNP P62873
В	365	ILE	-	expression tag	UNP P62873
В	366	SER	-	expression tag	UNP P62873

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- 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	С	57	Total 436	C 273	N 77	O 83	${ m S} { m 3}$	0	0

• Molecule 4 is a protein called Antibody fragment ScFv16.

Mol	Chain	Residues		At	AltConf	Trace			
4	Е	231	Total 1779	C 1129	N 294	0 346	S 10	0	0

• Molecule 5 is a protein called Fusion protein 1,Melanin-concentrating hormone receptor 1,Fusion protein 2.



Mol	Chain	Residues	Atoms					AltConf	Trace
5	R	289	Total 2225	C 1481	N 353	0 374	S 17	0	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) subunit alpha-1



R163 D1 8164 B164 1178 L165 1178 B164 1178 B164 1178 B164 1178 B164 1178 B164 1178 C22 1187 M36 1187 M36 1189 M36 1189 M36 1189 M36 1189 M36 1189 M36 1180 M36 1180 M36 1180 M40 1181 M41 1181 M41

• Molecule 5: Fusion protein 1, Melanin-concentrating hormone receptor 1, Fusion protein 2

C	hə	ir	ı I	R:								38'	%								8	8%	1										54	%												
ASP	TYS	ASP	ASP	ASP	HIS	HIS	SIH	HIS	HIS	HIS	HIS	01.N	PRO	GLY	ASN	GLY	SER	ALA DHF	TEO	LEU	ALA	PRO	AJN VIC	SER	HIS	ALA	ASP	HIS	ASN	VAL	GLN	GLN	ARG	GLU	GLU	ASN	TYR	PHE	GLN	GLY	ASP	MET	SER	VAL GLY	ALA	MET LYS
LYS	VAL	GLY	ARG	VALA VAL	GLY	LEU GI V	GLY	GLY	SER	GLY	CYS	AT.A	THR	GLU	GLU	ASP	PRO	DBU	ASN	CYS	GLY	ALA	CT3	PRO	GLY	GLN	GLY GLY	ARG	ARG	TRP	LEU	PRO	GLN	ALA	TRP	VAL	GLU	SER	SER	ALA	LEU	TRP	GLU	GLN	THR	GLY THR
GLY	MET	ASP	LEU	AL.A	SER	LEU	PRO	THR	GLY	PRO	ASN	SER	ASN	THR	SER	ASP	GLY	UXD VSD	ASN	TEU	THR	SER	ALA CI V	SER	PRO	PRO	THR	GLY	SER	ILE SFP	Y107		G123	1124	N127			V134		L140	M142		N145	D148	I149	F150 I151
1152 1152	COTN	L159	101	1011	Q171	C176		W178	H179	F180	1100	1100 T189	A190		N194		R210	A013	0170	T230		1233	C V C D	5243 1244	-	W248	P255		A260	BJEE	0071	W276		128U	F290	1001	129/ V298	R299	1300	C)Cd	M304	T305		4313 1	T326	A327
F335	0345		<mark>q348</mark>	V359		N363	V379		L383	C384	11306	Cec V	HTS	MET	GLY	SER	SER	GLY	GLY	GLY	SER	GLY	110	GLY	SER	SER	GLY VAL	PHE	THR	LEU	ASP	PHE	VAL	ASP	TRP	GLU	THR	ALA	ALA	TYR	LEU	ASP	GLN	VAL LEU	GLU	GLY
GLY	SER	SER	LEU	GI.N	ASN	LEU	VAL	SER	VAL	THR	PRO	CL.N	ARG	ILE	VAL	ARG	SER	1111 GT 11	ASN	ALA	LEU	LYS	1 LE	ILE	SIH	VAL	TLE	PRO	TYR	GLU	LEU	SER	ALA	GLN	MET	ALA	TLE	GLU	GLU	VAL	LYS	VAL	VAL	TYK PRO	VAL	ASP ASP
HIS	THE	LYS	VAL	TLEU LEU	PRO	TYR GI V	THR	LEU	VAL	ILE	ASP cr v	VAL.	THR	PRO	ASN	MET	LEU	TVP	PHE	GLY	ARG	PRO	TIR	GLY	ILE	ALA	VAL PHF.	ASP	GLY	LYS	ILE	THR	VAL	GLY	THR	LEU	ASN	GLY	ASN	LYS	ILE	ASP	GLU	LEU	ILE	THR PRO
ASP	SER	MET	LEU	ARG	VAL	THR	ASN	SER																																						



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	139367	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE	Depositor
	CORRECTION	
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose $(e^-/\text{\AA}^2)$	55	Depositor
Minimum defocus (nm)	1200	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).

Mal	Chain	Bond	lengths	Bond angles			
	Ullaili	RMSZ	# Z > 5	RMSZ	# Z > 5		
1	А	0.24	0/1771	0.42	0/2388		
2	В	0.24	0/2669	0.51	0/3618		
3	С	0.23	0/442	0.40	0/597		
4	Е	0.25	0/1823	0.48	0/2472		
5	R	0.24	0/2287	0.42	0/3137		
All	All	0.24	0/8992	0.46	0/12212		

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 (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	А	1741	0	1670	29	0
2	В	2622	0	2523	50	0
3	С	436	0	448	5	0
4	Е	1779	0	1714	22	0
5	R	2225	0	2248	35	0
All	All	8803	0	8603	125	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 7.

The worst 5 of 125 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)
2:B:271:CYS:HB2	2:B:290:ASP:HB2	1.58	0.85
2:B:152:LEU:HD11	2:B:158:VAL:HG23	1.69	0.72
2:B:53:GLY:HA2	5:R:140:LEU:HD21	1.71	0.71
1:A:254:CYS:O	1:A:317:LYS:NZ	2.24	0.69
2:B:51:LEU:HB2	2:B:336:LEU:HB2	1.74	0.68

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	Perce	entiles
1	А	220/354~(62%)	217~(99%)	3 (1%)	0	100	100
2	В	340/376~(90%)	332 (98%)	8 (2%)	0	100	100
3	С	55/71~(78%)	55 (100%)	0	0	100	100
4	Ε	227/255~(89%)	222 (98%)	5 (2%)	0	100	100
5	R	287/624~(46%)	284 (99%)	3 (1%)	0	100	100
All	All	1129/1680~(67%)	1110 (98%)	19 (2%)	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 side chain 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	А	182/305~(60%)	179~(98%)	3~(2%)	58 76

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Mol	Chain	Analysed	Rotameric	Outliers	Perce	ntiles
2	В	284/306~(93%)	278~(98%)	6~(2%)	48	71
3	С	46/58~(79%)	46 (100%)	0	100	100
4	Ε	196/208~(94%)	195 (100%)	1 (0%)	86	92
5	R	240/522~(46%)	239~(100%)	1 (0%)	89	94
All	All	948/1399~(68%)	937~(99%)	11 (1%)	66	81

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 $5~{\rm of}~11$ residues with a non-rotameric side chain are listed below:

Mol	Chain	\mathbf{Res}	Type
2	В	234	PHE
2	В	250	CYS
5	R	280	TYR
4	Е	218	ARG
2	В	105	TYR

Sometimes side chains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 13 such side chains are listed below:

Mol	Chain	Res	Type
5	R	179	HIS
5	R	194	ASN
5	R	345	GLN
5	R	281	GLN
5	R	313	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.

