Full wwPDB EM Validation Report ⓘ

Mar 24, 2025 – 02:20 PM JST

PDB ID	:	9J35
EMDB ID	:	EMD-61106
Title	:	Cryo-EM structure of Arabidopsis CNGC5 in nanodisc
Authors	:	Wang, J.P.; Zhang, X.; Zhang, P.
Deposited on	:	2024-08-07
Resolution	:	2.71 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:

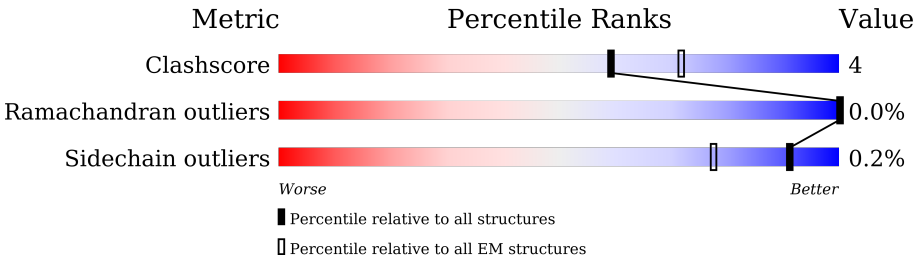
EMDB validation analysis	:	FAILED
MolProbity	:	4.02b-467
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	FAILED
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.41.2

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 2.71 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 <=5%

Mol	Chain	Length	Quality of chain
1	A	726	65% 7% 28%
1	B	726	65% 6% • 28%
1	C	726	65% 6% 28%
1	D	726	63% 9% 28%

2 Entry composition (i)

There is only 1 type of molecule in this entry. The entry contains 16960 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 Probable cyclic nucleotide-gated ion channel 5.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	523	Total 4240	C 2752	N 710	O 753	S 25	0	0
1	B	523	Total 4240	C 2752	N 710	O 753	S 25	0	0
1	C	523	Total 4240	C 2752	N 710	O 753	S 25	0	0
1	D	523	Total 4240	C 2752	N 710	O 753	S 25	0	0

There are 36 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-8	MET	-	initiating methionine	UNP Q8RWS9
A	-7	ASP	-	expression tag	UNP Q8RWS9
A	-6	TYR	-	expression tag	UNP Q8RWS9
A	-5	LYS	-	expression tag	UNP Q8RWS9
A	-4	ASP	-	expression tag	UNP Q8RWS9
A	-3	ASP	-	expression tag	UNP Q8RWS9
A	-2	ASP	-	expression tag	UNP Q8RWS9
A	-1	ASP	-	expression tag	UNP Q8RWS9
A	0	LYS	-	expression tag	UNP Q8RWS9
B	-8	MET	-	initiating methionine	UNP Q8RWS9
B	-7	ASP	-	expression tag	UNP Q8RWS9
B	-6	TYR	-	expression tag	UNP Q8RWS9
B	-5	LYS	-	expression tag	UNP Q8RWS9
B	-4	ASP	-	expression tag	UNP Q8RWS9
B	-3	ASP	-	expression tag	UNP Q8RWS9
B	-2	ASP	-	expression tag	UNP Q8RWS9
B	-1	ASP	-	expression tag	UNP Q8RWS9
B	0	LYS	-	expression tag	UNP Q8RWS9
C	-8	MET	-	initiating methionine	UNP Q8RWS9
C	-7	ASP	-	expression tag	UNP Q8RWS9
C	-6	TYR	-	expression tag	UNP Q8RWS9
C	-5	LYS	-	expression tag	UNP Q8RWS9

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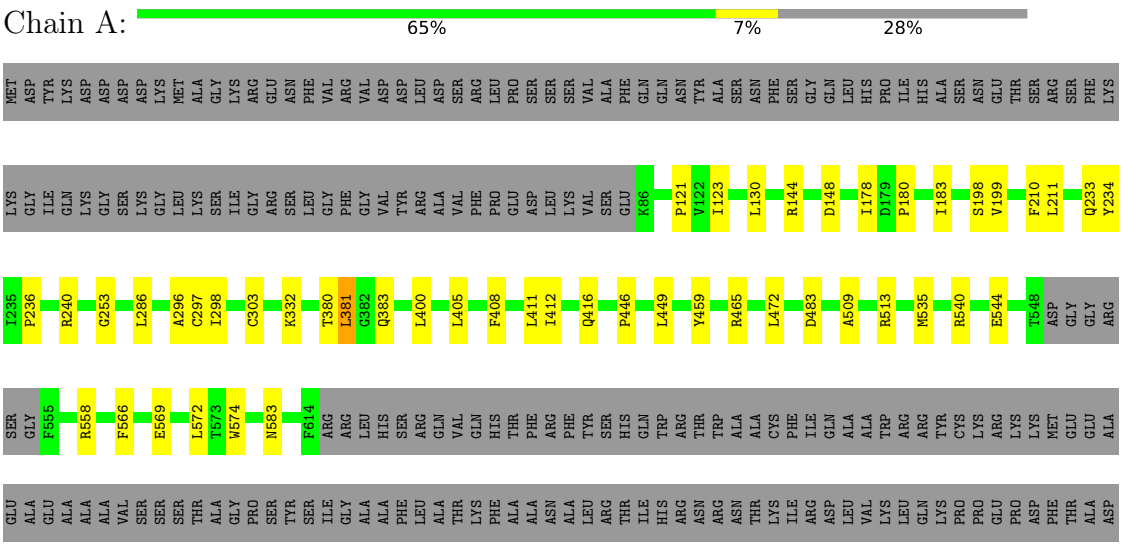
Chain	Residue	Modelled	Actual	Comment	Reference
C	-4	ASP	-	expression tag	UNP Q8RWS9
C	-3	ASP	-	expression tag	UNP Q8RWS9
C	-2	ASP	-	expression tag	UNP Q8RWS9
C	-1	ASP	-	expression tag	UNP Q8RWS9
C	0	LYS	-	expression tag	UNP Q8RWS9
D	-8	MET	-	initiating methionine	UNP Q8RWS9
D	-7	ASP	-	expression tag	UNP Q8RWS9
D	-6	TYR	-	expression tag	UNP Q8RWS9
D	-5	LYS	-	expression tag	UNP Q8RWS9
D	-4	ASP	-	expression tag	UNP Q8RWS9
D	-3	ASP	-	expression tag	UNP Q8RWS9
D	-2	ASP	-	expression tag	UNP Q8RWS9
D	-1	ASP	-	expression tag	UNP Q8RWS9
D	0	LYS	-	expression tag	UNP Q8RWS9

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.

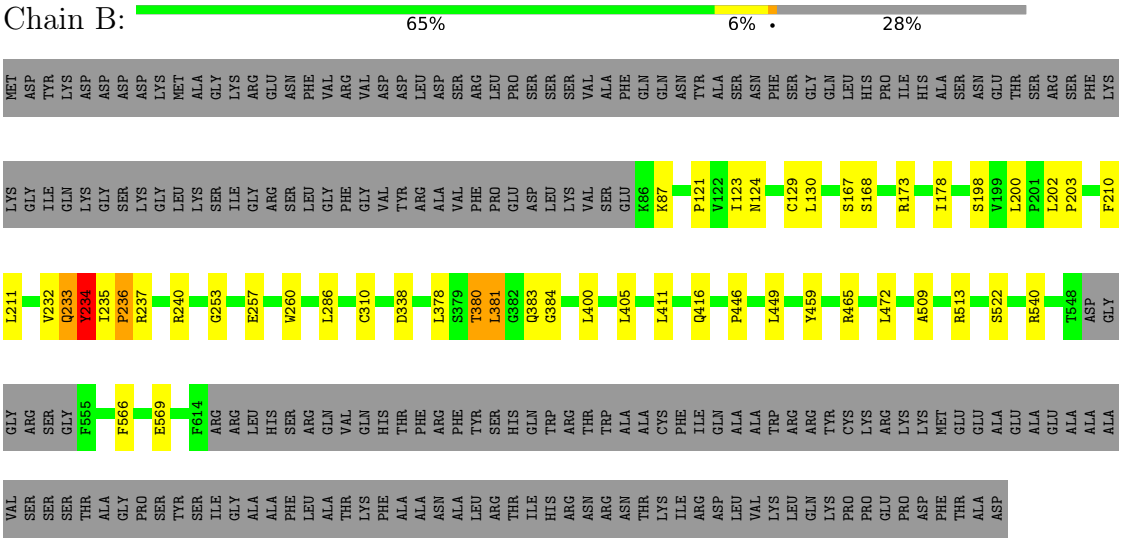
• Molecule 1: Probable cyclic nucleotide-gated ion channel 5

Chain A:



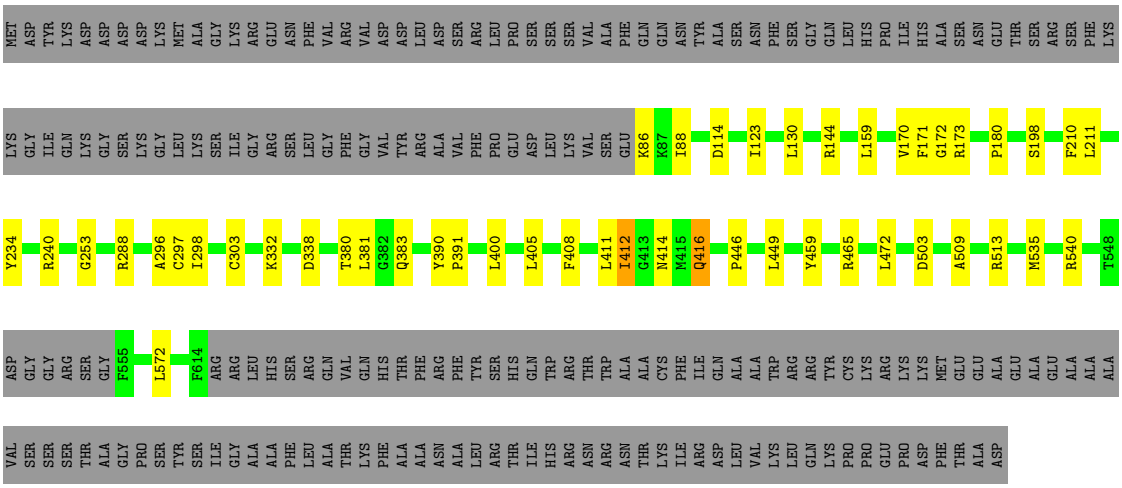
• Molecule 1: Probable cyclic nucleotide-gated ion channel 5

Chain B:



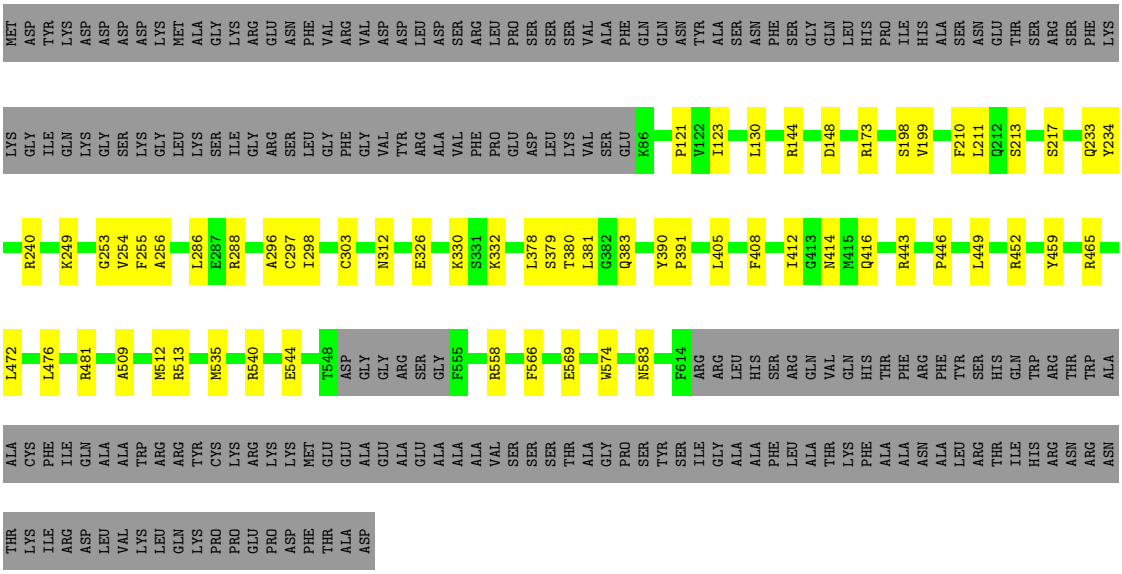
• Molecule 1: Probable cyclic nucleotide-gated ion channel 5

Chain C:



• Molecule 1: Probable cyclic nucleotide-gated ion channel 5

Chain D:



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	195793	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	50	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	1800	Depositor
Magnification	Not provided	
Image detector	FEI FALCON IV (4k x 4k)	Depositor

5 Model quality

5.1 Standard geometry

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	0.55	1/4337 (0.0%)	0.69	5/5877 (0.1%)
1	B	0.64	5/4337 (0.1%)	0.76	11/5877 (0.2%)
1	C	0.53	2/4337 (0.0%)	0.70	5/5877 (0.1%)
1	D	0.53	2/4337 (0.0%)	0.74	5/5877 (0.1%)
All	All	0.56	10/17348 (0.1%)	0.72	26/23508 (0.1%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	D	0	1

All (10) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	236	PRO	N-CD	-17.62	1.23	1.47
1	A	411	LEU	C-N	10.96	1.59	1.34
1	D	512	MET	C-N	10.03	1.57	1.34
1	B	378	LEU	C-N	10.02	1.57	1.34
1	B	411	LEU	C-N	8.90	1.54	1.34
1	B	384	GLY	C-N	8.00	1.52	1.34
1	D	379	SER	C-N	-5.45	1.21	1.34
1	C	412	ILE	C-N	-5.30	1.23	1.33
1	B	380	THR	C-N	-5.15	1.22	1.34
1	C	411	LEU	C-N	-5.14	1.22	1.34

All (26) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	D	378	LEU	O-C-N	-15.83	97.37	122.70
1	B	378	LEU	O-C-N	-11.86	103.72	122.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	D	378	LEU	CA-C-N	11.61	142.73	117.20
1	D	378	LEU	C-N-CA	10.99	149.18	121.70
1	B	234	TYR	CB-CA-C	-9.16	92.09	110.40
1	B	378	LEU	CA-C-N	8.98	136.95	117.20
1	B	378	LEU	C-N-CA	8.05	141.84	121.70
1	B	381	LEU	CA-CB-CG	7.03	131.47	115.30
1	A	381	LEU	CA-CB-CG	7.01	131.43	115.30
1	B	400	LEU	CA-CB-CG	6.74	130.80	115.30
1	B	380	THR	O-C-N	6.62	133.30	122.70
1	A	411	LEU	O-C-N	-6.53	112.25	122.70
1	C	414	ASN	O-C-N	-6.49	112.32	122.70
1	B	411	LEU	O-C-N	-5.96	113.17	122.70
1	C	400	LEU	CA-CB-CG	5.86	128.77	115.30
1	A	400	LEU	CA-CB-CG	5.75	128.52	115.30
1	D	512	MET	O-C-N	-5.54	113.83	122.70
1	A	472	LEU	CA-CB-CG	5.29	127.47	115.30
1	B	472	LEU	CA-CB-CG	5.22	127.32	115.30
1	C	472	LEU	CA-CB-CG	5.21	127.29	115.30
1	D	472	LEU	CA-CB-CG	5.19	127.24	115.30
1	B	178	ILE	CG1-CB-CG2	-5.15	100.08	111.40
1	A	178	ILE	CG1-CB-CG2	-5.11	100.16	111.40
1	C	414	ASN	CA-C-N	5.09	128.41	117.20
1	C	416	GLN	N-CA-CB	-5.06	101.50	110.60
1	B	233	GLN	CB-CA-C	-5.03	100.33	110.40

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	D	414	ASN	Mainchain

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	4240	0	4285	42	0
1	B	4240	0	4283	45	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	C	4240	0	4285	41	0
1	D	4240	0	4283	52	0
All	All	16960	0	17136	150	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 4.

All (150) 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:D:297:CYS:SG	1:D:303:CYS:SG	1.46	1.36
1:C:297:CYS:SG	1:C:303:CYS:SG	1.34	1.34
1:A:297:CYS:SG	1:A:303:CYS:SG	1.34	1.33
1:A:297:CYS:SG	1:A:303:CYS:CB	2.44	1.06
1:B:235:ILE:N	1:B:236:PRO:HD2	1.68	1.06
1:C:297:CYS:SG	1:C:303:CYS:CB	2.44	1.04
1:D:297:CYS:SG	1:D:303:CYS:CB	2.53	0.96
1:B:232:VAL:C	1:B:234:TYR:H	1.75	0.86
1:C:416:GLN:HE22	1:D:416:GLN:HG2	1.43	0.83
1:C:383:GLN:O	1:C:383:GLN:HG3	1.81	0.80
1:B:200:LEU:O	1:B:233:GLN:NE2	2.16	0.79
1:C:383:GLN:O	1:C:383:GLN:CG	2.31	0.78
1:B:416:GLN:HE22	1:C:416:GLN:HG2	1.48	0.77
1:A:416:GLN:HG2	1:D:416:GLN:HE22	1.50	0.76
1:B:465:ARG:HH12	1:C:253:GLY:HA2	1.53	0.74
1:C:416:GLN:NE2	1:D:416:GLN:HG2	2.04	0.72
1:B:202:LEU:HB2	1:B:203:PRO:HD3	1.71	0.72
1:A:465:ARG:HH12	1:B:253:GLY:HA2	1.55	0.71
1:D:408:PHE:CZ	1:D:412:ILE:HD11	2.25	0.71
1:B:198:SER:HB3	1:B:236:PRO:HB2	1.70	0.71
1:A:408:PHE:CZ	1:A:412:ILE:HD11	2.26	0.70
1:A:416:GLN:HE22	1:B:416:GLN:HG2	1.56	0.70
1:D:509:ALA:O	1:D:513:ARG:NH1	2.24	0.70
1:B:236:PRO:HG2	1:B:237:ARG:H	1.56	0.69
1:B:124:ASN:HB3	1:B:129:CYS:HB2	1.75	0.69
1:D:408:PHE:CE1	1:D:412:ILE:HD11	2.29	0.67
1:B:416:GLN:NE2	1:C:416:GLN:HG2	2.08	0.67
1:B:235:ILE:N	1:B:236:PRO:CD	2.54	0.65
1:D:383:GLN:O	1:D:383:GLN:HG3	1.98	0.64
1:B:232:VAL:C	1:B:234:TYR:N	2.47	0.63
1:B:257:GLU:HG2	1:B:260:TRP:HB3	1.81	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:297:CYS:SG	1:C:303:CYS:HB3	2.39	0.63
1:A:253:GLY:HA2	1:D:465:ARG:HH12	1.63	0.62
1:C:465:ARG:HH12	1:D:253:GLY:HA2	1.64	0.62
1:A:416:GLN:HG2	1:D:416:GLN:NE2	2.14	0.62
1:D:381:LEU:CD2	1:D:405:LEU:HG	2.29	0.62
1:D:217:SER:HB2	1:D:312:ASN:HD21	1.66	0.61
1:A:416:GLN:NE2	1:B:416:GLN:HG2	2.14	0.61
1:A:408:PHE:CE1	1:A:412:ILE:HD11	2.36	0.60
1:C:380:THR:HG21	1:D:383:GLN:HB2	1.84	0.60
1:B:233:GLN:O	1:B:233:GLN:HG2	2.02	0.60
1:A:381:LEU:HD21	1:A:405:LEU:HG	1.85	0.59
1:B:236:PRO:HG2	1:B:237:ARG:HG2	1.85	0.58
1:A:297:CYS:SG	1:A:303:CYS:HB3	2.39	0.58
1:D:459:TYR:OH	1:D:540:ARG:NH2	2.37	0.57
1:D:408:PHE:CE1	1:D:412:ILE:CD1	2.87	0.57
1:A:148:ASP:HB3	1:A:199:VAL:HG13	1.86	0.56
1:A:459:TYR:OH	1:A:540:ARG:NH2	2.39	0.56
1:B:383:GLN:HG2	1:C:383:GLN:HE22	1.71	0.56
1:D:198:SER:OG	1:D:240:ARG:NH1	2.37	0.56
1:A:121:PRO:HB2	1:A:286:LEU:HD13	1.87	0.56
1:D:121:PRO:HB2	1:D:286:LEU:HD13	1.87	0.56
1:A:198:SER:OG	1:A:240:ARG:NH1	2.39	0.55
1:D:255:PHE:CG	1:D:256:ALA:N	2.75	0.55
1:D:381:LEU:HD23	1:D:405:LEU:HG	1.88	0.55
1:B:198:SER:OG	1:B:240:ARG:NH1	2.39	0.55
1:B:198:SER:CB	1:B:236:PRO:HB2	2.37	0.54
1:C:381:LEU:HD21	1:C:405:LEU:HG	1.89	0.54
1:D:297:CYS:SG	1:D:303:CYS:HB3	2.46	0.54
1:C:172:GLY:O	1:C:173:ARG:NH1	2.41	0.54
1:C:509:ALA:O	1:C:513:ARG:NH1	2.39	0.53
1:B:459:TYR:OH	1:B:540:ARG:NH2	2.41	0.53
1:A:509:ALA:O	1:A:513:ARG:NH1	2.41	0.53
1:B:416:GLN:HE22	1:C:416:GLN:CG	2.20	0.53
1:D:144:ARG:NH2	1:D:233:GLN:OE1	2.38	0.52
1:D:326:GLU:O	1:D:330:LYS:NZ	2.40	0.52
1:A:383:GLN:HB2	1:D:380:THR:HG21	1.91	0.52
1:C:446:PRO:HD2	1:C:449:LEU:HD12	1.90	0.52
1:C:383:GLN:HG2	1:D:383:GLN:HE22	1.75	0.52
1:B:121:PRO:HB2	1:B:286:LEU:HD13	1.91	0.52
1:C:535:MET:HE1	1:C:572:LEU:HD13	1.90	0.52
1:D:446:PRO:HD2	1:D:449:LEU:HD12	1.92	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:148:ASP:HB3	1:D:199:VAL:HG13	1.93	0.51
1:B:167:SER:OG	1:B:168:SER:O	2.28	0.51
1:C:459:TYR:OH	1:C:540:ARG:NH2	2.43	0.51
1:A:383:GLN:HE22	1:D:383:GLN:CD	2.14	0.51
1:A:483:ASP:OD2	1:D:452:ARG:NH2	2.42	0.50
1:A:383:GLN:HE22	1:D:383:GLN:HG2	1.77	0.50
1:A:408:PHE:CE1	1:A:412:ILE:CD1	2.94	0.50
1:C:170:VAL:HG23	1:C:171:PHE:N	2.27	0.49
1:C:503:ASP:OD1	1:C:503:ASP:N	2.44	0.49
1:C:159:LEU:HD13	1:C:180:PRO:HB3	1.94	0.49
1:B:236:PRO:CG	1:B:237:ARG:H	2.26	0.49
1:D:381:LEU:HD21	1:D:405:LEU:HG	1.92	0.49
1:A:416:GLN:HE22	1:B:416:GLN:CG	2.25	0.49
1:B:380:THR:HG21	1:C:383:GLN:HB2	1.94	0.49
1:D:544:GLU:OE1	1:D:558:ARG:NH2	2.46	0.49
1:A:535:MET:HE1	1:A:572:LEU:HD13	1.93	0.49
1:B:509:ALA:O	1:B:513:ARG:NH1	2.46	0.48
1:A:544:GLU:OE1	1:A:558:ARG:NH2	2.46	0.48
1:C:416:GLN:HE22	1:D:416:GLN:CG	2.18	0.48
1:B:173:ARG:HD2	1:D:443:ARG:HD2	1.94	0.48
1:B:235:ILE:H	1:B:236:PRO:HD2	1.68	0.48
1:B:210:PHE:HD1	1:B:211:LEU:HD12	1.79	0.47
1:A:574:TRP:NE1	1:A:583:ASN:O	2.47	0.47
1:D:476:LEU:O	1:D:481:ARG:NH1	2.47	0.47
1:D:574:TRP:NE1	1:D:583:ASN:O	2.48	0.47
1:A:383:GLN:CD	1:B:383:GLN:HE22	2.18	0.47
1:A:210:PHE:HD1	1:A:211:LEU:HD12	1.79	0.47
1:A:383:GLN:NE2	1:D:383:GLN:HG2	2.29	0.47
1:D:210:PHE:HD1	1:D:211:LEU:HD12	1.81	0.46
1:C:338:ASP:OD1	1:C:338:ASP:N	2.49	0.46
1:C:210:PHE:HD1	1:C:211:LEU:HD12	1.81	0.46
1:A:380:THR:HG21	1:B:383:GLN:HB2	1.97	0.45
1:D:249:LYS:HD2	1:D:254:VAL:HG13	1.99	0.45
1:A:446:PRO:HD2	1:A:449:LEU:HD12	1.99	0.45
1:B:522:SER:O	1:B:522:SER:OG	2.31	0.45
1:C:86:LYS:HB3	1:C:88:ILE:HG13	1.98	0.45
1:B:233:GLN:O	1:B:237:ARG:HG3	2.17	0.45
1:B:446:PRO:HD2	1:B:449:LEU:HD12	1.99	0.45
1:C:572:LEU:HD12	1:C:572:LEU:HA	1.86	0.45
1:C:298:ILE:HG22	1:C:298:ILE:O	2.17	0.45
1:C:416:GLN:O	1:C:416:GLN:HG3	2.17	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:298:ILE:O	1:A:298:ILE:HG22	2.18	0.44
1:D:210:PHE:O	1:D:213:SER:OG	2.35	0.44
1:A:144:ARG:NH2	1:A:233:GLN:OE1	2.41	0.44
1:A:416:GLN:CG	1:D:416:GLN:HE22	2.27	0.44
1:B:383:GLN:O	1:B:383:GLN:HG3	2.18	0.44
1:A:296:ALA:HB1	1:A:332:LYS:HD3	2.00	0.44
1:C:381:LEU:CD2	1:C:405:LEU:HG	2.47	0.43
1:C:383:GLN:O	1:C:383:GLN:HG2	2.11	0.43
1:C:408:PHE:CZ	1:C:412:ILE:HD11	2.53	0.43
1:A:383:GLN:HE22	1:D:383:GLN:CG	2.32	0.43
1:A:381:LEU:HD21	1:A:405:LEU:CD2	2.49	0.43
1:D:298:ILE:HG22	1:D:298:ILE:O	2.18	0.43
1:D:416:GLN:O	1:D:416:GLN:HG3	2.18	0.43
1:B:129:CYS:HB3	1:B:310:CYS:HB2	1.86	0.42
1:C:288:ARG:HA	1:C:288:ARG:HD2	1.85	0.42
1:A:566:PHE:HE1	1:A:569:GLU:HB3	1.85	0.42
1:B:381:LEU:HD21	1:B:405:LEU:HG	2.02	0.42
1:B:566:PHE:HE1	1:B:569:GLU:HB3	1.84	0.42
1:D:288:ARG:HA	1:D:288:ARG:HD2	1.89	0.42
1:D:390:TYR:HA	1:D:391:PRO:HD3	1.94	0.42
1:B:123:ILE:HG12	1:B:130:LEU:HD23	2.02	0.41
1:A:572:LEU:HD12	1:A:572:LEU:HA	1.87	0.41
1:C:114:ASP:OD1	1:C:144:ARG:NH1	2.53	0.41
1:D:535:MET:HE2	1:D:535:MET:HB2	1.93	0.41
1:C:198:SER:OG	1:C:240:ARG:NH1	2.52	0.41
1:A:123:ILE:HG12	1:A:130:LEU:HD23	2.03	0.41
1:D:123:ILE:HG12	1:D:130:LEU:HD23	2.03	0.41
1:D:296:ALA:HB1	1:D:332:LYS:HD3	2.02	0.41
1:B:338:ASP:OD1	1:B:338:ASP:N	2.51	0.41
1:C:123:ILE:HG12	1:C:130:LEU:HD23	2.03	0.41
1:D:566:PHE:HE1	1:D:569:GLU:HB3	1.85	0.41
1:A:383:GLN:CG	1:B:383:GLN:HE22	2.34	0.41
1:C:390:TYR:HA	1:C:391:PRO:HD3	1.95	0.41
1:B:87:LYS:HA	1:B:87:LYS:HD2	1.86	0.40
1:C:296:ALA:HB1	1:C:332:LYS:HD3	2.02	0.40
1:D:173:ARG:HA	1:D:173:ARG:HD3	1.96	0.40
1:A:180:PRO:HA	1:A:183:ILE:HG12	2.04	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	519/726 (72%)	480 (92%)	38 (7%)	1 (0%)	44 67
1	B	519/726 (72%)	477 (92%)	42 (8%)	0	100 100
1	C	519/726 (72%)	476 (92%)	43 (8%)	0	100 100
1	D	519/726 (72%)	488 (94%)	31 (6%)	0	100 100
All	All	2076/2904 (72%)	1921 (92%)	154 (7%)	1 (0%)	100 100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	236	PRO

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	463/631 (73%)	462 (100%)	1 (0%)	92 98
1	B	463/631 (73%)	462 (100%)	1 (0%)	92 98
1	C	463/631 (73%)	462 (100%)	1 (0%)	92 98
1	D	463/631 (73%)	462 (100%)	1 (0%)	92 98
All	All	1852/2524 (73%)	1848 (100%)	4 (0%)	91 98

All (4) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	234	TYR
1	B	234	TYR
1	C	234	TYR
1	D	234	TYR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (10) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	383	GLN
1	A	416	GLN
1	B	275	HIS
1	B	383	GLN
1	B	416	GLN
1	C	383	GLN
1	C	416	GLN
1	D	215	ASN
1	D	383	GLN
1	D	416	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.