



Full wwPDB EM Validation Report ⓘ

Jul 15, 2025 – 10:01 PM JST

PDB ID : 8IF6 / pdb_00008if6
EMDB ID : EMD-35402
Title : Conformational Dynamics of the D53-D3-D14 Complex in Strigolactone Signaling
Authors : Liu, S.M.; Wang, J.
Deposited on : 2023-02-17
Resolution : 7.09 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 : 4-5-2 with Phenix2.0rc1
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) : 2.44

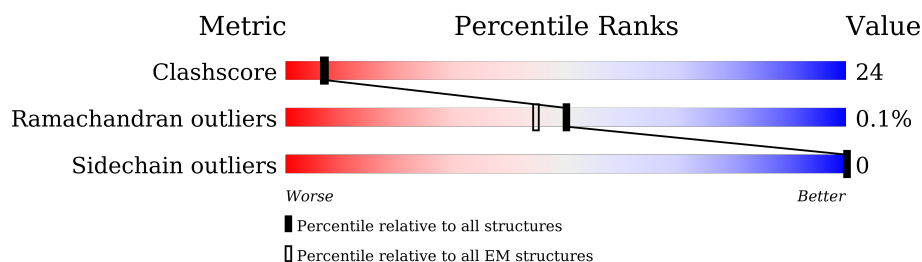
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

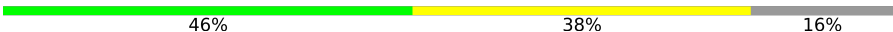
The reported resolution of this entry is 7.09 Å.

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	A	720	
2	C	318	
3	B	175	

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 8690 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 F-box/LRR-repeat MAX2 homolog.

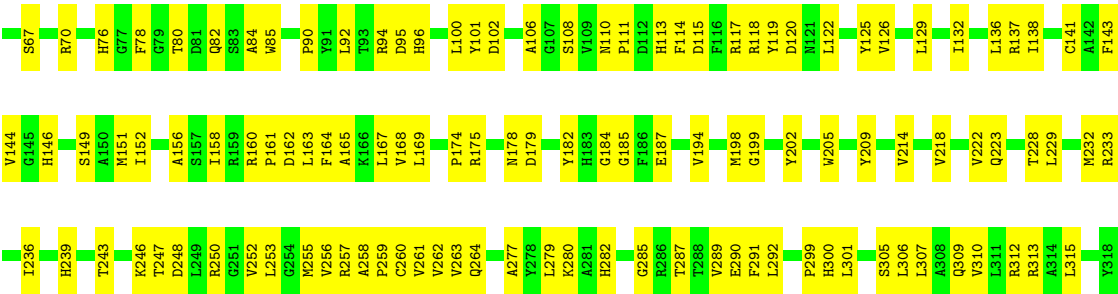
Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	684	Total	C	N	O	S	0	0
			5286	3349	925	976	36		

- Molecule 2 is a protein called Strigolactone esterase D14.

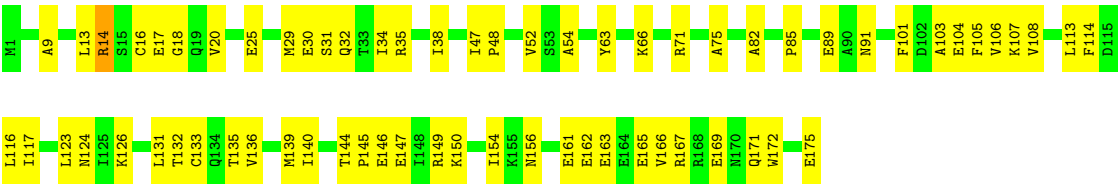
Mol	Chain	Residues	Atoms					AltConf	Trace
2	C	267	Total	C	N	O	S	0	0
			2061	1313	369	371	8		

- Molecule 3 is a protein called SKP1-like protein 20.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	B	175	Total	C	N	O	S	0	0
			1343	838	223	273	9		



● Molecule 3: SKP1-like protein 20



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	42499	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING ONLY	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	700	Depositor
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k 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	A	0.18	0/5410	0.44	2/7358 (0.0%)
2	C	0.17	0/2106	0.40	0/2866
3	B	0.23	0/1361	0.46	0/1838
All	All	0.19	0/8877	0.43	2/12062 (0.0%)

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
3	B	0	1

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	2	ALA	CA-C-N	8.18	136.42	121.70
1	A	2	ALA	C-N-CA	8.18	136.42	121.70

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
3	B	14	ARG	Sidechain

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	5286	0	5257	273	0
2	C	2061	0	2068	103	0
3	B	1343	0	1327	64	0
All	All	8690	0	8652	418	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 24.

All (418) 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:A:217:VAL:HA	1:A:252:ILE:HD11	1.50	0.90
1:A:657:ARG:HD2	3:B:175:GLU:HA	1.58	0.85
1:A:656:LEU:HD13	1:A:659:LEU:HD21	1.59	0.85
1:A:29:LEU:HG	1:A:48:MET:HE1	1.57	0.84
1:A:113:SER:OG	2:C:137:ARG:NH2	2.10	0.82
1:A:637:VAL:HG12	1:A:639:HIS:H	1.46	0.80
1:A:66:ARG:NH1	1:A:91:SER:O	2.15	0.80
1:A:44:ALA:HA	3:B:145:PRO:HB3	1.63	0.80
2:C:106:ALA:HA	2:C:232:MET:HE1	1.64	0.79
1:A:680:ARG:HA	1:A:713:LEU:HD21	1.64	0.79
2:C:161:PRO:O	2:C:257:ARG:NH2	2.14	0.78
2:C:70:ARG:NH1	2:C:315:LEU:O	2.16	0.78
1:A:152:TYR:OH	1:A:179:HIS:ND1	2.17	0.78
1:A:649:LEU:HD23	1:A:652:ARG:HH12	1.49	0.77
1:A:470:ASN:HA	1:A:528:TRP:HB2	1.67	0.76
1:A:219:ALA:O	1:A:223:HIS:ND1	2.17	0.76
1:A:64:ASP:OD1	1:A:66:ARG:NH1	2.17	0.76
1:A:612:ARG:HA	1:A:649:LEU:HD11	1.68	0.76
1:A:148:SER:OG	1:A:174:LYS:NZ	2.19	0.76
1:A:228:ALA:HA	1:A:257:PRO:HD2	1.67	0.76
3:B:149:ARG:O	3:B:154:ILE:N	2.19	0.75
1:A:553:SER:HB2	1:A:587:LYS:HE2	1.67	0.75
2:C:179:ASP:HB2	2:C:182:TYR:HB3	1.68	0.75
1:A:699:THR:HG22	2:C:108:SER:HB3	1.69	0.74
2:C:122:LEU:HA	2:C:125:TYR:HD2	1.54	0.73
1:A:629:TYR:O	1:A:662:HIS:ND1	2.17	0.73
1:A:597:ALA:HA	1:A:607:LEU:HB2	1.70	0.72
2:C:61:ASN:ND2	2:C:102:ASP:OD2	2.23	0.71
3:B:47:ILE:HD12	3:B:48:PRO:HD2	1.72	0.71

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:202:TYR:OH	2:C:229:LEU:O	2.07	0.71
2:C:95:ASP:OD2	2:C:312:ARG:NH2	2.23	0.71
1:A:221:THR:HG21	1:A:251:PRO:HB2	1.73	0.70
1:A:258:ASN:OD1	1:A:290:ARG:NH1	2.26	0.69
1:A:269:ASN:HD22	1:A:337:HIS:HE1	1.41	0.69
1:A:657:ARG:HH11	3:B:175:GLU:HG2	1.57	0.69
1:A:369:LYS:NZ	1:A:394:ASP:O	2.26	0.68
3:B:144:THR:OG1	3:B:147:GLU:OE1	2.11	0.68
1:A:35:VAL:HB	1:A:39:HIS:HE1	1.58	0.68
1:A:253:ALA:HB2	1:A:284:LEU:HD13	1.74	0.68
1:A:434:ARG:NE	1:A:459:PRO:O	2.27	0.68
2:C:169:LEU:N	2:C:261:VAL:O	2.21	0.68
1:A:228:ALA:O	1:A:258:ASN:ND2	2.21	0.67
1:A:35:VAL:O	1:A:39:HIS:ND1	2.27	0.67
1:A:435:PRO:HG2	3:B:85:PRO:HB3	1.77	0.66
1:A:676:ILE:HB	1:A:679:LEU:HD22	1.76	0.66
1:A:171:ARG:HA	1:A:201:LEU:HA	1.78	0.66
1:A:631:PRO:HB2	1:A:640:ARG:HB3	1.79	0.65
2:C:60:LEU:HD12	2:C:132:ILE:HD11	1.78	0.65
1:A:65:PRO:HD3	1:A:90:VAL:HB	1.78	0.65
3:B:104:GLU:N	3:B:104:GLU:OE1	2.29	0.65
1:A:220:LEU:HD22	1:A:252:ILE:HA	1.78	0.65
1:A:98:LEU:HD22	1:A:132:ASN:HA	1.77	0.65
1:A:651:GLN:HA	1:A:676:ILE:HD11	1.78	0.65
3:B:149:ARG:HH22	3:B:167:ARG:HH22	1.42	0.65
3:B:25:GLU:O	3:B:29:MET:N	2.30	0.64
3:B:29:MET:O	3:B:35:ARG:NE	2.31	0.64
1:A:680:ARG:NH1	3:B:172:TRP:HB3	2.13	0.64
1:A:295:ARG:HA	1:A:332:THR:HB	1.80	0.64
1:A:155:ASP:OD1	1:A:157:THR:OG1	2.15	0.63
1:A:682:MET:HE3	1:A:683:GLN:N	2.13	0.63
1:A:201:LEU:O	1:A:202:ARG:NH1	2.25	0.63
1:A:315:VAL:HG11	1:A:344:PRO:HG2	1.78	0.63
1:A:591:SER:HB3	1:A:630:TRP:HB3	1.80	0.63
2:C:262:VAL:HB	2:C:289:VAL:HG22	1.81	0.62
2:C:253:LEU:HB2	2:C:282:HIS:ND1	2.14	0.62
2:C:144:VAL:HG22	2:C:168:VAL:HB	1.80	0.62
1:A:17:ILE:HD12	3:B:136:VAL:HG11	1.81	0.62
1:A:619:GLU:HB3	1:A:652:ARG:HG3	1.81	0.62
1:A:434:ARG:HA	1:A:460:ILE:HG22	1.81	0.61
2:C:126:VAL:HG22	2:C:152:ILE:HG23	1.83	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:98:LEU:O	1:A:161:ASN:ND2	2.31	0.61
1:A:147:THR:HG22	1:A:169:SER:HB2	1.83	0.61
3:B:116:LEU:HB3	3:B:132:THR:HG21	1.83	0.60
3:B:149:ARG:HA	3:B:154:ILE:HB	1.83	0.60
1:A:391:ASN:N	1:A:416:HIS:O	2.34	0.60
1:A:607:LEU:HA	1:A:610:TRP:HB2	1.84	0.60
3:B:149:ARG:NH2	3:B:167:ARG:HH22	2.00	0.60
1:A:35:VAL:HB	1:A:39:HIS:CE1	2.36	0.59
1:A:278:ASP:HA	1:A:281:LEU:HD12	1.84	0.59
1:A:325:LEU:HB3	1:A:328:LEU:HD23	1.83	0.59
3:B:35:ARG:HA	3:B:38:ILE:HD12	1.85	0.59
3:B:131:LEU:O	3:B:135:THR:OG1	2.17	0.59
1:A:366:GLY:HA2	1:A:369:LYS:HE3	1.83	0.59
2:C:174:PRO:HD3	2:C:279:LEU:HD21	1.85	0.59
2:C:175:ARG:O	2:C:182:TYR:OH	2.20	0.59
1:A:152:TYR:HA	1:A:176:VAL:HB	1.83	0.59
3:B:9:ALA:O	3:B:25:GLU:N	2.31	0.59
1:A:220:LEU:HD13	1:A:252:ILE:HG23	1.84	0.59
1:A:422:THR:HA	1:A:447:LEU:HD22	1.82	0.59
2:C:194:VAL:HG13	2:C:205:TRP:HE1	1.68	0.58
2:C:262:VAL:O	2:C:290:GLU:N	2.30	0.58
1:A:227:THR:HB	1:A:256:CYS:SG	2.44	0.58
2:C:178:ASN:OD1	2:C:185:GLY:N	2.36	0.58
1:A:50:ALA:HA	1:A:53:ARG:HE	1.69	0.57
2:C:119:TYR:O	2:C:125:TYR:OH	2.14	0.57
1:A:363:SER:HA	1:A:391:ASN:HB3	1.85	0.57
1:A:2:ALA:N	1:A:3:GLU:HB2	2.20	0.57
2:C:178:ASN:OD1	2:C:184:GLY:N	2.36	0.57
1:A:38:ARG:NH2	1:A:55:THR:OG1	2.33	0.57
1:A:654:VAL:O	1:A:678:ASN:ND2	2.37	0.57
1:A:333:MET:HE3	1:A:335:LEU:HD21	1.87	0.57
1:A:653:CYS:HB2	1:A:656:LEU:HD12	1.87	0.57
2:C:90:PRO:O	2:C:94:ARG:NH1	2.37	0.57
2:C:158:ILE:HG23	2:C:255:MET:HG2	1.86	0.57
3:B:32:GLN:OE1	3:B:35:ARG:NH1	2.37	0.57
1:A:368:CYS:HB2	1:A:378:VAL:HG22	1.87	0.56
3:B:14:ARG:HD3	3:B:18:GLY:HA2	1.86	0.56
1:A:570:THR:HG22	1:A:613:PHE:HE1	1.69	0.56
1:A:615:LEU:HB2	1:A:649:LEU:HD13	1.87	0.56
2:C:70:ARG:NH2	2:C:95:ASP:HB3	2.20	0.56
2:C:84:ALA:HB1	2:C:300:HIS:CD2	2.40	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:38:ARG:NE	1:A:52:GLU:OE2	2.38	0.56
1:A:535:LEU:HD21	1:A:577:LEU:HD11	1.87	0.56
1:A:683:GLN:HB3	1:A:685:ARG:CZ	2.36	0.56
1:A:244:PHE:N	1:A:266:CYS:HA	2.20	0.55
1:A:362:GLY:HA2	1:A:390:LYS:HB3	1.88	0.55
3:B:144:THR:N	3:B:147:GLU:OE2	2.30	0.55
1:A:649:LEU:HA	1:A:652:ARG:NH1	2.21	0.55
1:A:113:SER:HG	2:C:137:ARG:HH22	1.45	0.55
2:C:214:VAL:HG21	2:C:222:VAL:HA	1.88	0.55
1:A:291:LEU:HD13	1:A:294:LEU:HD21	1.88	0.55
1:A:718:ILE:HD13	3:B:171:GLN:HG3	1.89	0.55
1:A:59:LEU:HB3	1:A:82:LEU:HD11	1.89	0.55
1:A:82:LEU:HD13	1:A:143:PHE:CD1	2.42	0.55
1:A:444:HIS:H	1:A:470:ASN:CG	2.15	0.55
2:C:95:ASP:HB2	2:C:96:HIS:CE1	2.41	0.55
3:B:63:TYR:HB2	3:B:105:PHE:CZ	2.42	0.55
1:A:213:THR:OG1	1:A:248:GLU:OE2	2.22	0.55
1:A:519:TRP:HB3	1:A:522:LEU:HB3	1.89	0.55
2:C:78:PHE:HE2	2:C:209:TYR:CE2	2.26	0.54
1:A:21:PRO:HD2	1:A:24:LEU:HD12	1.89	0.54
1:A:92:PRO:HB2	1:A:95:HIS:CE1	2.42	0.54
1:A:527:LEU:HD12	1:A:554:ILE:HG12	1.90	0.54
1:A:647:VAL:HG13	1:A:673:PHE:CZ	2.43	0.54
1:A:712:GLN:O	1:A:715:SER:OG	2.19	0.54
2:C:82:GLN:HE21	2:C:102:ASP:CG	2.16	0.54
2:C:120:ASP:O	2:C:246:LYS:NZ	2.23	0.53
2:C:175:ARG:NE	2:C:179:ASP:OD1	2.41	0.53
1:A:683:GLN:O	1:A:685:ARG:NH1	2.41	0.53
1:A:71:LEU:HD21	1:A:135:ILE:HG12	1.90	0.53
1:A:629:TYR:C	1:A:662:HIS:HD1	2.14	0.53
1:A:649:LEU:HD23	1:A:652:ARG:NH1	2.22	0.53
1:A:22:GLU:CD	1:A:22:GLU:H	2.15	0.53
1:A:587:LYS:HG2	1:A:628:ASP:HB2	1.90	0.53
2:C:115:ASP:OD1	2:C:117:ARG:HD3	2.09	0.53
1:A:266:CYS:HB2	1:A:268:PHE:CE2	2.44	0.53
2:C:160:ARG:NH2	2:C:162:ASP:OD2	2.33	0.53
2:C:122:LEU:HA	2:C:125:TYR:CD2	2.40	0.52
3:B:124:ASN:OD1	3:B:126:LYS:HE3	2.09	0.52
1:A:18:LEU:HG	1:A:47:ARG:HH11	1.73	0.52
1:A:78:ARG:HH22	1:A:144:PRO:HG3	1.74	0.52
1:A:463:ARG:HH22	3:B:89:GLU:CD	2.17	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:607:LEU:HD13	1:A:632:PRO:HB2	1.90	0.52
2:C:179:ASP:OD1	2:C:250:ARG:NH2	2.42	0.52
1:A:18:LEU:O	1:A:47:ARG:NH1	2.41	0.52
1:A:263:VAL:HG22	1:A:295:ARG:HB2	1.91	0.52
3:B:147:GLU:HA	3:B:150:LYS:HE2	1.92	0.52
1:A:97:LEU:O	1:A:158:THR:OG1	2.21	0.51
2:C:253:LEU:HD12	2:C:282:HIS:HB3	1.92	0.51
3:B:75:ALA:N	3:B:91:ASN:OD1	2.34	0.51
1:A:224:PRO:HA	1:A:227:THR:OG1	2.10	0.51
1:A:28:ILE:HG12	3:B:133:CYS:SG	2.51	0.51
2:C:111:PRO:HB2	2:C:233:ARG:HH11	1.76	0.51
1:A:57:SER:O	1:A:83:GLU:N	2.42	0.51
1:A:358:PHE:HA	1:A:386:SER:HB3	1.91	0.51
1:A:385:GLU:HA	1:A:410:LEU:HA	1.92	0.51
1:A:285:ALA:HB2	1:A:321:PHE:CD1	2.46	0.51
2:C:256:VAL:O	2:C:285:GLY:N	2.44	0.51
3:B:149:ARG:HD3	3:B:156:ASN:HB2	1.93	0.51
2:C:149:SER:HA	2:C:152:ILE:HD12	1.93	0.51
2:C:194:VAL:HG13	2:C:205:TRP:NE1	2.26	0.51
1:A:410:LEU:HB3	1:A:433:LEU:HD13	1.92	0.50
1:A:597:ALA:HB3	2:C:223:GLN:HE21	1.76	0.50
1:A:435:PRO:HA	1:A:463:ARG:NH1	2.25	0.50
1:A:364:PHE:HB2	1:A:389:MET:HE1	1.94	0.50
1:A:546:CYS:HB3	1:A:549:LEU:HB2	1.94	0.50
2:C:168:VAL:HA	2:C:261:VAL:HB	1.92	0.50
1:A:68:PRO:HA	1:A:71:LEU:HB2	1.93	0.50
3:B:30:GLU:O	3:B:32:GLN:NE2	2.45	0.50
3:B:156:ASN:ND2	3:B:163:GLU:OE1	2.38	0.50
1:A:175:LEU:O	1:A:209:PHE:HB2	2.12	0.50
1:A:584:ALA:O	1:A:625:TYR:N	2.37	0.50
3:B:30:GLU:HA	3:B:35:ARG:HH21	1.75	0.50
3:B:106:VAL:HB	3:B:135:THR:HG21	1.92	0.50
1:A:83:GLU:OE2	1:A:147:THR:OG1	2.29	0.50
1:A:621:LEU:HB2	1:A:624:LEU:HB2	1.93	0.50
1:A:207:SER:HA	1:A:236:GLY:H	1.77	0.50
3:B:136:VAL:HA	3:B:139:MET:HG3	1.94	0.50
2:C:94:ARG:HH21	2:C:312:ARG:NH1	2.10	0.49
1:A:110:GLY:HA3	2:C:67:SER:HB3	1.93	0.49
2:C:158:ILE:HG12	2:C:255:MET:HB3	1.95	0.49
1:A:220:LEU:HD21	1:A:256:CYS:SG	2.52	0.49
2:C:57:LEU:HD22	2:C:62:VAL:HG11	1.95	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:32:GLN:HG2	3:B:124:ASN:O	2.12	0.49
1:A:350:ALA:HB2	1:A:381:CYS:SG	2.52	0.49
1:A:394:ASP:HA	1:A:420:LEU:HD12	1.94	0.49
1:A:471:CYS:C	1:A:533:GLN:HE22	2.20	0.49
1:A:397:ASP:OD2	1:A:422:THR:OG1	2.26	0.49
1:A:586:MET:N	1:A:626:GLU:O	2.40	0.49
2:C:115:ASP:HB3	2:C:118:ARG:HG2	1.95	0.49
1:A:615:LEU:HD22	1:A:650:ILE:HD11	1.94	0.49
1:A:266:CYS:HB3	1:A:276:VAL:HG21	1.95	0.49
1:A:367:LEU:O	1:A:377:GLY:HA3	2.13	0.49
1:A:389:MET:HE2	1:A:392:CYS:HB2	1.94	0.49
1:A:714:ASN:HA	3:B:171:GLN:HE22	1.77	0.49
2:C:138:ILE:HG22	2:C:163:LEU:HD11	1.95	0.49
2:C:292:LEU:HD22	2:C:306:LEU:HB3	1.95	0.49
1:A:280:ALA:O	1:A:284:LEU:HD23	2.12	0.48
1:A:409:ARG:N	1:A:409:ARG:HD2	2.29	0.48
1:A:182:PRO:HB2	1:A:185:LEU:HG	1.95	0.48
1:A:555:LYS:HZ2	1:A:589:ASP:C	2.22	0.48
1:A:680:ARG:CZ	3:B:172:TRP:HB3	2.43	0.48
1:A:333:MET:HB3	1:A:361:LEU:HD23	1.95	0.48
1:A:379:ALA:O	1:A:406:GLY:HA3	2.14	0.48
1:A:172:ARG:HG3	1:A:203:GLU:HB2	1.95	0.48
2:C:141:CYS:N	2:C:163:LEU:O	2.42	0.48
1:A:172:ARG:HA	1:A:203:GLU:O	2.15	0.47
1:A:463:ARG:HA	1:A:521:MET:SD	2.53	0.47
1:A:633:GLN:HB2	1:A:640:ARG:HG2	1.97	0.47
1:A:659:LEU:O	1:A:682:MET:HA	2.14	0.47
1:A:285:ALA:HB2	1:A:321:PHE:CE1	2.49	0.47
1:A:392:CYS:SG	1:A:395:LEU:HB2	2.54	0.47
1:A:641:SER:OG	1:A:700:GLU:OE2	2.30	0.47
2:C:70:ARG:HH22	2:C:95:ASP:HB3	1.78	0.47
1:A:167:GLN:HA	1:A:198:CYS:SG	2.54	0.47
1:A:714:ASN:HA	3:B:171:GLN:NE2	2.29	0.47
2:C:310:VAL:HG22	2:C:313:ARG:NH2	2.28	0.47
2:C:158:ILE:HD13	2:C:252:VAL:HB	1.96	0.47
1:A:207:SER:O	1:A:238:ALA:N	2.41	0.47
1:A:291:LEU:O	1:A:328:LEU:HD22	2.15	0.47
1:A:627:LEU:HB3	1:A:659:LEU:HD23	1.95	0.47
3:B:31:SER:HB3	3:B:34:ILE:HD12	1.96	0.47
1:A:363:SER:N	1:A:390:LYS:O	2.34	0.47
1:A:670:MET:HE1	1:A:701:MET:HE1	1.96	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:299:PRO:HG2	2:C:307:LEU:HD22	1.95	0.47
1:A:473:TRP:NE1	1:A:534:LEU:O	2.48	0.47
1:A:622:GLN:HG2	1:A:623:THR:N	2.30	0.47
2:C:141:CYS:O	2:C:164:PHE:HA	2.15	0.47
1:A:331:PHE:CZ	1:A:333:MET:HB2	2.49	0.47
1:A:683:GLN:HA	1:A:706:TRP:CH2	2.49	0.47
2:C:243:THR:O	2:C:246:LYS:HG2	2.14	0.47
1:A:29:LEU:CG	1:A:48:MET:HE1	2.37	0.47
1:A:62:ARG:HD3	1:A:680:ARG:NH1	2.30	0.47
1:A:221:THR:HG23	1:A:252:ILE:HD13	1.97	0.47
1:A:235:LEU:N	1:A:263:VAL:O	2.46	0.47
1:A:235:LEU:O	1:A:265:PRO:HD2	2.15	0.46
1:A:539:ILE:H	1:A:539:ILE:HD12	1.79	0.46
1:A:128:ILE:HD13	1:A:131:GLN:HE22	1.80	0.46
2:C:114:PHE:HZ	2:C:239:HIS:CD2	2.34	0.46
1:A:171:ARG:HH12	1:A:172:ARG:NH2	2.13	0.46
1:A:539:ILE:HG23	1:A:544:ASP:HA	1.96	0.46
2:C:85:TRP:HH2	2:C:146:HIS:HB2	1.79	0.46
3:B:30:GLU:OE2	3:B:71:ARG:NH2	2.48	0.46
1:A:128:ILE:HA	1:A:131:GLN:OE1	2.16	0.46
1:A:322:PHE:HE2	1:A:345:ALA:HB1	1.81	0.46
1:A:461:ARG:HG3	1:A:519:TRP:CZ3	2.50	0.46
1:A:677:PRO:C	1:A:716:ARG:HH12	2.24	0.46
2:C:164:PHE:HB3	2:C:167:LEU:HD21	1.97	0.46
1:A:38:ARG:O	1:A:52:GLU:HG3	2.16	0.46
1:A:93:TRP:O	1:A:95:HIS:ND1	2.49	0.46
1:A:50:ALA:HB2	1:A:53:ARG:HH21	1.81	0.46
1:A:58:GLU:HA	1:A:84:HIS:O	2.16	0.46
1:A:378:VAL:HG23	1:A:403:ILE:HG12	1.98	0.46
1:A:583:LEU:HD23	1:A:621:LEU:HD22	1.97	0.46
3:B:114:PHE:HA	3:B:117:ILE:HD12	1.97	0.46
1:A:223:HIS:O	1:A:227:THR:HG23	2.16	0.45
2:C:122:LEU:O	2:C:126:VAL:HG23	2.16	0.45
1:A:461:ARG:CZ	1:A:516:LEU:HD22	2.46	0.45
1:A:607:LEU:O	1:A:611:GLU:HG3	2.16	0.45
3:B:30:GLU:HA	3:B:35:ARG:NH2	2.32	0.45
1:A:36:ARG:HH22	1:A:657:ARG:NH2	2.15	0.45
1:A:152:TYR:CE1	1:A:177:ARG:HA	2.52	0.45
1:A:261:LYS:HG3	1:A:293:VAL:HB	1.99	0.45
2:C:300:HIS:CD2	2:C:301:LEU:HG	2.51	0.45
1:A:79:PHE:O	1:A:144:PRO:HD2	2.17	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:332:THR:HG23	1:A:360:THR:HB	1.98	0.45
1:A:461:ARG:NH1	1:A:516:LEU:HB3	2.32	0.45
1:A:584:ALA:HB1	1:A:625:TYR:HB3	1.99	0.45
3:B:161:GLU:OE2	3:B:162:GLU:HG3	2.16	0.45
1:A:207:SER:HA	1:A:236:GLY:N	2.31	0.45
1:A:693:GLU:H	1:A:693:GLU:CD	2.25	0.45
1:A:34:ASP:OD2	1:A:36:ARG:HB3	2.16	0.45
1:A:124:HIS:O	1:A:128:ILE:HG12	2.17	0.45
1:A:171:ARG:O	1:A:202:ARG:N	2.29	0.45
1:A:679:LEU:HD23	1:A:679:LEU:H	1.81	0.45
1:A:265:PRO:HB2	1:A:299:PRO:HG3	1.98	0.45
3:B:17:GLU:OE2	3:B:54:ALA:HB2	2.17	0.45
1:A:220:LEU:HG	1:A:227:THR:CG2	2.48	0.44
1:A:34:ASP:O	1:A:38:ARG:HG3	2.17	0.44
1:A:147:THR:HA	1:A:170:LEU:HA	2.00	0.44
1:A:202:ARG:O	1:A:231:THR:OG1	2.29	0.44
1:A:519:TRP:HB3	1:A:522:LEU:CB	2.46	0.44
3:B:13:LEU:O	3:B:20:VAL:HA	2.16	0.44
1:A:388:TYR:HD1	1:A:414:GLY:HA3	1.81	0.44
2:C:56:LEU:HD23	2:C:132:ILE:HG13	1.98	0.44
2:C:305:SER:O	2:C:309:GLN:HG3	2.18	0.44
3:B:146:GLU:O	3:B:149:ARG:HB2	2.17	0.44
1:A:624:LEU:HG	1:A:656:LEU:HD21	2.00	0.44
2:C:151:MET:HE1	2:C:247:THR:HB	2.00	0.44
2:C:257:ARG:HD2	2:C:258:ALA:N	2.33	0.44
1:A:300:PHE:HB3	1:A:336:GLN:HG3	1.99	0.44
2:C:114:PHE:CD2	2:C:236:ILE:HG12	2.52	0.44
2:C:178:ASN:ND2	2:C:187:GLU:OE2	2.29	0.44
3:B:103:ALA:O	3:B:107:LYS:HG3	2.16	0.44
1:A:278:ASP:CG	1:A:317:GLY:HA3	2.43	0.44
1:A:390:LYS:NZ	1:A:391:ASN:HB2	2.33	0.44
1:A:621:LEU:CB	1:A:624:LEU:HB2	2.48	0.44
2:C:198:MET:SD	2:C:199:GLY:N	2.91	0.44
1:A:127:ALA:O	1:A:131:GLN:OE1	2.35	0.44
1:A:409:ARG:HE	3:B:82:ALA:HB3	1.83	0.44
1:A:419:ASP:CG	1:A:446:ARG:HD3	2.42	0.43
1:A:434:ARG:HB3	1:A:435:PRO:HD3	2.00	0.43
1:A:392:CYS:HB3	1:A:418:CYS:SG	2.58	0.43
1:A:594:VAL:HG13	1:A:633:GLN:O	2.18	0.43
1:A:18:LEU:HG	1:A:47:ARG:NH1	2.33	0.43
1:A:266:CYS:HB2	1:A:268:PHE:CZ	2.54	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:166:TRP:O	1:A:170:LEU:HB2	2.19	0.43
1:A:597:ALA:HB2	1:A:634:ASP:HB2	2.01	0.43
1:A:159:LEU:HA	1:A:162:LEU:HG	2.00	0.43
1:A:678:ASN:OD1	1:A:678:ASN:N	2.49	0.43
1:A:625:TYR:CZ	1:A:657:ARG:HG2	2.53	0.43
1:A:437:LEU:HD23	1:A:460:ILE:HD13	2.00	0.43
2:C:310:VAL:HG22	2:C:313:ARG:HH22	1.84	0.43
3:B:104:GLU:HA	3:B:107:LYS:HD2	2.00	0.43
1:A:234:ASP:CG	1:A:263:VAL:HB	2.44	0.42
1:A:454:LEU:O	1:A:461:ARG:NH2	2.43	0.42
2:C:115:ASP:OD1	2:C:118:ARG:N	2.28	0.42
2:C:165:ALA:O	2:C:259:PRO:HD2	2.19	0.42
2:C:277:ALA:HA	2:C:280:LYS:HG2	2.01	0.42
1:A:38:ARG:HH22	1:A:55:THR:HG1	1.61	0.42
1:A:156:PRO:HD3	1:A:190:ASP:OD1	2.19	0.42
1:A:463:ARG:NH2	3:B:89:GLU:OE1	2.43	0.42
2:C:61:ASN:HD22	2:C:102:ASP:CG	2.24	0.42
2:C:164:PHE:O	2:C:257:ARG:NH2	2.52	0.42
2:C:260:CYS:HB2	2:C:287:THR:HG23	2.01	0.42
1:A:189:ALA:HA	1:A:192:GLU:CD	2.44	0.42
1:A:291:LEU:HD22	1:A:294:LEU:HD21	2.02	0.42
1:A:523:ARG:HA	1:A:549:LEU:HA	2.01	0.42
2:C:101:TYR:CZ	2:C:129:LEU:HD13	2.54	0.42
2:C:110:ASN:HB3	2:C:113:HIS:ND1	2.33	0.42
2:C:169:LEU:O	2:C:263:VAL:N	2.38	0.42
2:C:182:TYR:CE1	2:C:250:ARG:HD3	2.53	0.42
3:B:104:GLU:OE2	3:B:107:LYS:NZ	2.52	0.42
1:A:156:PRO:HB3	1:A:190:ASP:HA	2.00	0.42
1:A:208:GLU:HA	1:A:238:ALA:HA	2.01	0.42
1:A:261:LYS:HA	1:A:293:VAL:O	2.19	0.42
1:A:171:ARG:C	1:A:201:LEU:HD12	2.44	0.42
1:A:244:PHE:H	1:A:266:CYS:HA	1.82	0.42
1:A:278:ASP:OD1	1:A:313:ILE:HG23	2.18	0.42
1:A:561:ARG:NH2	1:A:634:ASP:OD1	2.52	0.42
1:A:555:LYS:HA	1:A:555:LYS:HD2	1.64	0.42
1:A:683:GLN:HA	1:A:706:TRP:CZ2	2.55	0.42
2:C:151:MET:SD	2:C:174:PRO:HA	2.60	0.42
2:C:143:PHE:HB2	2:C:164:PHE:CD1	2.55	0.42
1:A:227:THR:OG1	1:A:255:SER:HB3	2.20	0.42
1:A:327:ALA:HA	1:A:355:ARG:NH2	2.35	0.42
2:C:92:LEU:CD2	2:C:312:ARG:HG2	2.50	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:262:VAL:HB	2:C:289:VAL:HA	2.02	0.42
1:A:82:LEU:HD13	1:A:143:PHE:HD1	1.83	0.42
1:A:83:GLU:O	1:A:146:VAL:HA	2.19	0.42
1:A:622:GLN:OE1	1:A:622:GLN:N	2.45	0.42
3:B:149:ARG:HH22	3:B:167:ARG:NH2	2.15	0.42
1:A:85:LEU:O	1:A:149:LEU:HD12	2.20	0.41
2:C:126:VAL:HG13	2:C:156:ALA:HB2	2.01	0.41
2:C:264:GLN:HB3	2:C:291:PHE:CD1	2.55	0.41
1:A:315:VAL:HG13	1:A:345:ALA:HB2	2.01	0.41
1:A:554:ILE:HD13	1:A:572:PHE:HE2	1.85	0.41
2:C:146:HIS:H	2:C:149:SER:HB2	1.85	0.41
2:C:264:GLN:O	2:C:291:PHE:HA	2.19	0.41
3:B:66:LYS:HG2	3:B:101:PHE:CD2	2.56	0.41
1:A:32:LEU:HD12	1:A:32:LEU:HA	1.87	0.41
1:A:625:TYR:CE2	1:A:658:LYS:HE3	2.55	0.41
2:C:122:LEU:HD12	2:C:247:THR:HG21	2.01	0.41
3:B:162:GLU:O	3:B:166:VAL:HG23	2.21	0.41
1:A:152:TYR:OH	1:A:154:ARG:HD3	2.20	0.41
1:A:561:ARG:HD3	1:A:596:TYR:CZ	2.55	0.41
1:A:657:ARG:HD3	1:A:678:ASN:O	2.20	0.41
1:A:591:SER:HB2	1:A:640:ARG:CZ	2.51	0.41
2:C:175:ARG:NH2	2:C:179:ASP:OD2	2.53	0.41
1:A:589:ASP:HA	1:A:630:TRP:HB2	2.01	0.41
2:C:76:HIS:HA	2:C:85:TRP:HZ2	1.86	0.41
2:C:119:TYR:HB3	2:C:125:TYR:OH	2.21	0.41
1:A:149:LEU:HB2	1:A:170:LEU:HD11	2.03	0.41
1:A:281:LEU:HD11	1:A:313:ILE:HG12	2.03	0.41
1:A:289:PRO:HA	1:A:325:LEU:CD2	2.51	0.41
1:A:518:SER:O	1:A:520:GLU:HG2	2.20	0.41
2:C:84:ALA:HB1	2:C:300:HIS:HD2	1.83	0.41
2:C:175:ARG:HD2	2:C:248:ASP:OD2	2.20	0.41
3:B:108:VAL:HG23	3:B:113:LEU:HB2	2.02	0.41
1:A:338:ASN:OD1	1:A:365:GLN:NE2	2.54	0.41
1:A:680:ARG:HB2	3:B:175:GLU:HB3	2.03	0.41
1:A:687:ASP:OD1	1:A:687:ASP:N	2.50	0.41
1:A:22:GLU:N	1:A:23:PRO:HD2	2.36	0.41
1:A:39:HIS:O	1:A:43:LEU:HG	2.21	0.41
1:A:64:ASP:HB3	1:A:67:SER:HB3	2.03	0.41
1:A:649:LEU:HA	1:A:652:ARG:CZ	2.51	0.41
2:C:53:GLY:O	2:C:57:LEU:HG	2.21	0.41
2:C:82:GLN:HB2	2:C:100:LEU:HB3	2.03	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:31:SER:OG	3:B:123:LEU:O	2.22	0.41
3:B:165:GLU:O	3:B:169:GLU:HG3	2.20	0.41
2:C:144:VAL:HA	2:C:168:VAL:O	2.21	0.41
1:A:333:MET:O	1:A:361:LEU:HA	2.21	0.40
1:A:527:LEU:HB3	1:A:529:PHE:CE2	2.56	0.40
3:B:139:MET:SD	3:B:140:ILE:HG13	2.61	0.40
1:A:27:HIS:O	1:A:30:SER:OG	2.23	0.40
1:A:597:ALA:HA	1:A:607:LEU:CB	2.46	0.40
3:B:16:CYS:N	3:B:52:VAL:O	2.47	0.40
3:B:149:ARG:HB3	3:B:154:ILE:O	2.21	0.40
1:A:16:ALA:HB3	3:B:114:PHE:HB3	2.03	0.40
1:A:585:LYS:HE3	1:A:626:GLU:OE2	2.20	0.40
1:A:680:ARG:HB2	3:B:175:GLU:OE1	2.22	0.40
2:C:76:HIS:O	2:C:149:SER:OG	2.29	0.40
2:C:80:THR:HA	2:C:228:THR:HB	2.03	0.40
1:A:152:TYR:CE2	1:A:154:ARG:HG2	2.56	0.40
1:A:171:ARG:NH1	1:A:203:GLU:OE2	2.54	0.40
1:A:213:THR:HG1	1:A:248:GLU:CD	2.26	0.40
2:C:136:LEU:C	2:C:137:ARG:HG3	2.46	0.40
2:C:218:VAL:O	2:C:222:VAL:HG23	2.21	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	680/720 (94%)	643 (95%)	36 (5%)	1 (0%)	48	83
2	C	265/318 (83%)	260 (98%)	5 (2%)	0	100	100
3	B	173/175 (99%)	166 (96%)	7 (4%)	0	100	100
All	All	1118/1213 (92%)	1069 (96%)	48 (4%)	1 (0%)	50	83

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	306	ILE

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	571/602 (95%)	571 (100%)	0	100	100
2	C	219/250 (88%)	219 (100%)	0	100	100
3	B	142/142 (100%)	142 (100%)	0	100	100
All	All	932/994 (94%)	932 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	180	GLN
1	A	269	ASN
1	A	307	GLN
1	A	374	HIS
2	C	300	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.