Full wwPDB X-ray Structure Validation Report ⓘ

Mar 1, 2026 – 06:11 PM JST

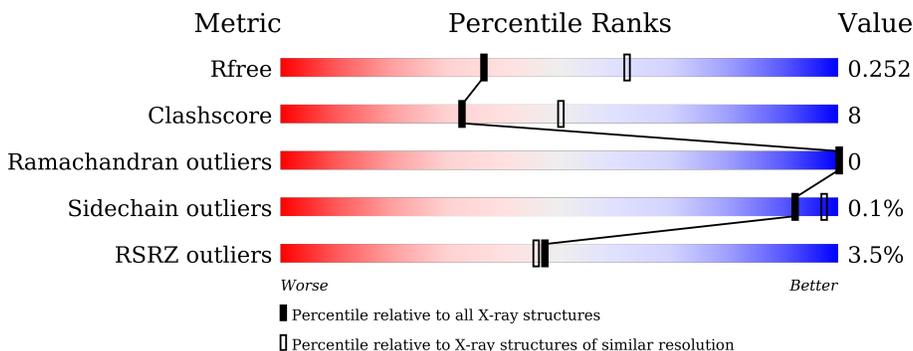|		
PDB ID	:	22OZ / pdb_000022oz
Title	:	Structural insights into HpaR-mediated recognition of hrpX and hrpG in Xanthomonas campestris pv. campestris
Authors	:	Fu, Q.; Ming, Z.
Deposited on	:	2026-01-19
Resolution	:	2.51 Å(reported)

1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.51 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
Rfree		0.252
Clashscore		8
Ramachandran outliers		0
Sidechain outliers		0.1%
RSRZ outliers		3.5%

Worse   *Better*

▌ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	6935 (2.54-2.50)
Clashscore	180529	7778 (2.54-2.50)
Ramachandran outliers	177936	7674 (2.54-2.50)
Sidechain outliers	177891	7676 (2.54-2.50)
RSRZ outliers	164620	6935 (2.54-2.50)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower 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% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	166	2% ▰ 77% 17% 6%
1	B	166	3% ▰ 86% 10% •
1	C	166	4% ▰ 72% 22% 6%
1	D	166	% ▰ 83% 16% •
1	E	166	4% ▰ 87% 8% 5%
1	F	166	2% ▰ 84% 11% 5%

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Mol	Chain	Length	Quality of chain
1	G	166	7% 67% 27% 6%
1	H	166	4% 81% 14% · ·

2 Entry composition ⓘ

There are 2 unique types of molecules in this entry. The entry contains 10021 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, 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 Transcriptional regulator marR family.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	156	Total	C	N	O	S	0	0	0
			1210	770	209	225	6			
1	B	160	Total	C	N	O	S	0	0	0
			1241	788	217	230	6			
1	C	156	Total	C	N	O	S	0	0	0
			1210	770	209	225	6			
1	D	166	Total	C	N	O	S	0	0	0
			1292	816	229	241	6			
1	E	158	Total	C	N	O	S	0	0	0
			1226	779	214	227	6			
1	F	158	Total	C	N	O	S	0	0	0
			1230	782	215	227	6			
1	G	156	Total	C	N	O	S	0	0	0
			1210	770	209	225	6			
1	H	159	Total	C	N	O	S	0	0	0
			1235	785	216	228	6			

- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	25	Total	O	0	0
			25	25		
2	B	24	Total	O	0	0
			24	24		
2	C	14	Total	O	0	0
			14	14		
2	D	17	Total	O	0	0
			17	17		
2	E	39	Total	O	0	0
			39	39		
2	F	27	Total	O	0	0
			27	27		

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	G	9	Total 9	O 9	0	0
2	H	12	Total 12	O 12	0	0

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 and electron density. 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. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 2). 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: Transcriptional regulator marR family

Chain A:

- Molecule 1: Transcriptional regulator marR family

Chain B:

- Molecule 1: Transcriptional regulator marR family

Chain C:

- Molecule 1: Transcriptional regulator marR family

Chain D:

- Molecule 1: Transcriptional regulator marR family

Chain E:

4%

87%

8% 5%

M1 K9 A26 V29 R30 K33 T66 Q69 A70 I71 V76 E82 K83 P84 I87 R102 A103 SER SER PRO ASP ASP ARG ARG LYS I112 T113 L114 R126 Q166

• Molecule 1: Transcriptional regulator marR family

Chain F:

2%

84%

11% 5%

M1 R10 L28 S53 P54 P55 E56 M62 A70 P73 V76 N86 I87 T88 R89 L90 T91 D92 Q93 L94 H95 E96 R102 ALA SER SER PRO ASP ASP ARG ARG K111 I112 T113 L114 L123 L127 A137 Q166

• Molecule 1: Transcriptional regulator marR family

Chain G:

7%

67%

27% 6%

M1 F4 D5 P6 K9 F21 P22 K33 H34 L35 R38 L39 V45 R46 L47 LYS P49 H50 G51 I52 E56 T66 Q69 A70 A77 S81 E82 K83 P84 A85 N86 I87 T88 R89 L90 T91 D92 Q93 L94 H95 E96 K97 I100 A101 ARG ALA SER SER

PRO ASP ASP ARG ARG K111 I112 L123 R126 L127 L128 P129 L135 D136 A137 E138 T139 I142 S143 E144 A145 E146 Q147 V148 R149 L150 E151 K152 L153 L154 Q166

• Molecule 1: Transcriptional regulator marR family

Chain H:

4%

81%

14% • •

M1 P25 L28 V29 L35 Y36 K37 L60 T72 P73 T74 E75 K83 P84 I87 D92 Q93 L94 H95 E96 I100 A103 SER SER PRO ASP ASP ARG ARG K111 I112 I124 K155 K156 L157 L158 A163 V164 E165 Q166

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	106.88Å 75.43Å 139.49Å 90.00° 112.36° 90.00°	Depositor
Resolution (Å)	50.13 – 2.51 50.13 – 2.51	Depositor EDS
% Data completeness (in resolution range)	99.6 (50.13-2.51) 99.6 (50.13-2.51)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.22 (at 2.51Å)	Xtriage
Refinement program	PHENIX (1.15_3459: ???)	Depositor
R, R_{free}	0.215 , 0.248 0.218 , 0.252	Depositor DCC
R_{free} test set	1998 reflections (2.83%)	wwPDB-VP
Wilson B-factor (Å^2)	49.2	Xtriage
Anisotropy	0.625	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 45.6	EDS
L-test for twinning [2]	$< |L| > = 0.50, < L^2 > = 0.33$	Xtriage
Estimated twinning fraction	0.009 for h,-k,-h-l	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	10021	wwPDB-VP
Average B, all atoms (Å^2)	61.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.55% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1] Intensities estimated from amplitudes.
[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

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	0.39	0/1232	0.57	0/1674
1	B	0.40	0/1263	0.56	0/1714
1	C	0.39	0/1232	0.56	0/1674
1	D	0.43	1/1316 (0.1%)	0.57	0/1787
1	E	0.44	0/1248	0.64	0/1695
1	F	0.41	0/1252	0.58	0/1699
1	G	0.35	0/1231	0.56	0/1670
1	H	0.48	2/1257 (0.2%)	0.62	0/1706
All	All	0.41	3/10031 (0.0%)	0.58	0/13619

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	H	96	GLU	CG-CD	-6.41	1.36	1.52
1	D	109	ARG	CD-NE	5.65	1.54	1.46
1	H	96	GLU	CB-CG	-5.34	1.36	1.52

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	1210	0	1260	22	0
1	B	1241	0	1296	11	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	C	1210	0	1260	26	0
1	D	1292	0	1343	22	1
1	E	1226	0	1278	12	0
1	F	1230	0	1286	12	0
1	G	1210	0	1260	52	0
1	H	1235	0	1291	22	1
2	A	25	0	0	3	0
2	B	24	0	0	0	0
2	C	14	0	0	0	0
2	D	17	0	0	0	0
2	E	39	0	0	1	0
2	F	27	0	0	1	0
2	G	9	0	0	1	0
2	H	12	0	0	0	0
All	All	10021	0	10274	157	1

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 8.

All (157) 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:95:HIS:HB3	1:D:102:ARG:NH2	1.63	1.11
1:G:142:ILE:HD11	1:H:157:LEU:HA	1.32	1.10
1:D:95:HIS:CB	1:D:102:ARG:NH2	2.30	0.94
1:D:95:HIS:CB	1:D:102:ARG:HH21	1.80	0.93
1:D:95:HIS:CG	1:D:102:ARG:HH21	1.87	0.93
1:G:83:LYS:HD3	1:G:85:ALA:H	1.32	0.92
1:G:52:ILE:HD12	1:G:52:ILE:O	1.73	0.87
1:E:29:VAL:O	1:E:33:LYS:HD2	1.75	0.86
1:D:95:HIS:HB3	1:D:102:ARG:HH21	1.35	0.86
1:A:100:ILE:HD12	1:A:114:LEU:HD23	1.57	0.85
1:G:47:LEU:HB3	1:G:52:ILE:CD1	2.11	0.80
1:G:83:LYS:HD2	1:G:85:ALA:HB3	1.66	0.77
1:G:83:LYS:CD	1:G:85:ALA:H	1.99	0.76
1:G:47:LEU:HB3	1:G:52:ILE:HD12	1.69	0.75
1:G:89:ARG:HA	1:G:92:ASP:HB2	1.71	0.73
1:H:95:HIS:HA	1:H:100:ILE:HG13	1.71	0.72
1:C:157:LEU:HD23	1:D:35:LEU:HD21	1.72	0.71
1:A:42:GLN:NE2	1:A:138:GLU:OE1	2.23	0.71
1:A:73:PRO:HG3	1:A:114:LEU:HD11	1.74	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:62:MET:HE1	1:A:76:VAL:HA	1.74	0.69
1:G:142:ILE:CD1	1:H:157:LEU:HA	2.17	0.69
1:C:56:GLU:HB3	1:C:94:LEU:HD21	1.74	0.68
1:F:53:SER:HB2	1:F:55:PRO:HD2	1.76	0.68
1:A:83:LYS:HD2	1:A:84:PRO:HD2	1.77	0.66
1:C:143:SER:O	1:C:147:GLN:HG3	1.96	0.66
1:G:81:SER:OG	1:H:37:LYS:HD2	1.96	0.66
1:H:72:THR:HG23	1:H:75:GLU:H	1.61	0.64
1:C:60:LEU:HB3	1:C:124:ILE:HD11	1.79	0.64
1:C:51:GLY:O	1:C:97:LYS:NZ	2.31	0.64
1:C:152:LYS:HD2	1:E:83:LYS:HZ1	1.63	0.63
1:E:69:GLN:HB2	1:E:71:ILE:HG13	1.81	0.63
1:G:135:LEU:O	1:G:139:THR:HG22	1.98	0.63
1:C:47:LEU:HD22	1:C:52:ILE:HD11	1.81	0.62
1:F:87:ILE:O	1:F:91:THR:HG23	2.00	0.61
1:D:82:GLU:HB3	1:D:86:ASN:HD21	1.66	0.61
1:F:62:MET:HE1	1:F:76:VAL:HA	1.80	0.61
1:G:77:ALA:HB2	1:G:87:ILE:HD13	1.83	0.60
1:D:66:THR:HG21	1:D:71:ILE:HD11	1.84	0.60
1:B:60:LEU:HB3	1:B:124:ILE:HD11	1.84	0.59
1:A:1:MET:N	2:A:201:HOH:O	2.17	0.58
1:D:97:LYS:HA	1:G:149:ARG:NH2	2.19	0.58
1:G:83:LYS:HD3	1:G:83:LYS:C	2.30	0.57
1:E:126:ARG:NH2	2:E:203:HOH:O	2.38	0.56
1:C:87:ILE:O	1:C:91:THR:HG23	2.05	0.56
1:D:60:LEU:HB3	1:D:124:ILE:HD11	1.89	0.55
1:A:70:ALA:HB1	1:A:113:THR:HG21	1.89	0.55
1:E:76:VAL:HG12	1:E:87:ILE:HD12	1.89	0.55
1:A:76:VAL:HG12	1:A:87:ILE:HD12	1.88	0.55
1:F:92:ASP:O	1:F:96:GLU:HG2	2.06	0.54
1:A:52:ILE:HD12	1:A:57:TYR:HB2	1.88	0.54
1:H:83:LYS:HG2	1:H:84:PRO:HD2	1.89	0.54
1:G:52:ILE:HD12	1:G:52:ILE:C	2.32	0.53
1:B:33:LYS:O	1:B:37:LYS:HG3	2.08	0.53
1:G:139:THR:HG21	1:H:25:PRO:HG3	1.91	0.53
1:G:87:ILE:O	1:G:91:THR:HG23	2.09	0.52
1:C:6:PRO:HA	1:C:9:LYS:HE3	1.91	0.52
1:C:37:LYS:O	1:C:41:THR:HG23	2.09	0.52
1:C:152:LYS:HB2	1:E:83:LYS:NZ	2.25	0.51
1:E:69:GLN:O	1:E:69:GLN:HG3	2.09	0.51
1:F:86:ASN:OD1	1:F:89:ARG:NH2	2.43	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:137:ALA:O	2:F:201:HOH:O	2.19	0.51
1:A:28:LEU:HD13	1:B:150:LEU:HD23	1.93	0.51
1:C:82:GLU:OE2	1:C:86:ASN:ND2	2.40	0.50
1:C:29:VAL:HG13	1:D:39:LEU:HD13	1.92	0.50
1:G:126:ARG:O	1:G:129:PRO:HD2	2.11	0.50
1:C:100:ILE:HD12	1:C:114:LEU:HD22	1.93	0.50
1:E:102:ARG:HG2	1:E:114:LEU:HD23	1.94	0.50
1:B:80:ALA:O	1:B:82:GLU:HG3	2.12	0.49
1:G:123:LEU:HD11	1:G:127:LEU:HD11	1.94	0.49
1:C:150:LEU:HD23	1:D:28:LEU:HD13	1.94	0.49
1:G:47:LEU:HD22	1:G:52:ILE:HD11	1.94	0.49
1:F:123:LEU:O	1:F:127:LEU:HG	2.13	0.49
1:A:165:GLU:N	2:A:203:HOH:O	2.44	0.48
1:E:66:THR:HG22	1:F:10:ARG:HG2	1.94	0.48
1:G:6:PRO:HA	1:G:9:LYS:HE3	1.96	0.48
1:G:51:GLY:O	1:G:97:LYS:NZ	2.35	0.48
1:G:146:GLU:HA	1:G:149:ARG:CG	2.44	0.48
1:G:137:ALA:HB1	1:H:164:VAL:HG22	1.95	0.48
1:G:139:THR:HA	1:G:142:ILE:HD13	1.96	0.48
1:C:72:THR:HG22	1:C:75:GLU:OE2	2.14	0.48
1:G:144:GLU:O	1:G:148:VAL:HG23	2.14	0.48
1:G:83:LYS:HD3	1:G:85:ALA:N	2.15	0.47
1:C:165:GLU:CD	1:C:165:GLU:H	2.22	0.47
1:G:56:GLU:HB3	1:G:94:LEU:HD21	1.95	0.47
1:B:95:HIS:CE1	1:B:102:ARG:HB3	2.49	0.47
1:A:83:LYS:HZ1	1:A:85:ALA:HB2	1.80	0.47
1:B:95:HIS:CE1	1:B:102:ARG:HD3	2.50	0.47
1:G:150:LEU:HD23	1:H:28:LEU:HD13	1.97	0.47
1:A:28:LEU:O	1:A:32:ILE:HG12	2.15	0.46
1:B:139:THR:HB	1:B:147:GLN:NE2	2.30	0.46
1:A:72:THR:O	1:A:76:VAL:HG23	2.15	0.46
1:H:94:LEU:C	1:H:96:GLU:H	2.23	0.46
1:G:148:VAL:O	1:G:152:LYS:HG3	2.15	0.46
1:H:92:ASP:O	1:H:96:GLU:HB2	2.14	0.46
1:C:152:LYS:HB2	1:E:83:LYS:CE	2.45	0.46
1:B:52:ILE:HD13	1:B:97:LYS:HE2	1.96	0.46
1:A:157:LEU:O	1:A:161:VAL:HG23	2.15	0.46
1:D:4:PHE:HE2	1:D:27:VAL:HG13	1.81	0.46
1:F:73:PRO:HG3	1:F:114:LEU:HD11	1.97	0.46
1:G:38:ARG:HH11	1:G:38:ARG:HG3	1.80	0.46
1:F:56:GLU:HB3	1:F:94:LEU:HD21	1.98	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:56:GLU:HB3	1:A:94:LEU:HD21	1.97	0.45
1:D:87:ILE:O	1:D:91:THR:HG23	2.16	0.45
1:G:146:GLU:HA	1:G:149:ARG:HG2	1.97	0.45
1:D:29:VAL:CG1	1:D:33:LYS:HE3	2.47	0.45
1:H:72:THR:HG22	1:H:75:GLU:OE1	2.16	0.45
1:C:28:LEU:HD23	1:C:28:LEU:HA	1.75	0.44
1:C:59:ILE:HA	1:C:62:MET:HE3	1.98	0.44
1:B:95:HIS:HE1	1:B:102:ARG:CG	2.30	0.44
1:G:126:ARG:HD2	2:G:203:HOH:O	2.18	0.44
1:G:95:HIS:HB2	1:G:100:ILE:HD11	1.99	0.43
1:A:9:LYS:HB3	1:A:9:LYS:HE3	1.82	0.43
1:H:94:LEU:C	1:H:96:GLU:N	2.74	0.43
1:G:66:THR:HG22	1:G:69:GLN:O	2.19	0.43
1:G:39:LEU:HD13	1:H:29:VAL:HG13	2.01	0.43
1:A:72:THR:OG1	1:A:75:GLU:N	2.40	0.43
1:B:70:ALA:HB1	1:B:113:THR:HG21	2.00	0.43
1:F:28:LEU:HD23	1:F:28:LEU:HA	1.81	0.43
1:G:154:LEU:HD22	1:H:35:LEU:CD2	2.49	0.43
1:G:89:ARG:O	1:G:93:GLN:N	2.51	0.43
1:G:81:SER:HG	1:H:37:LYS:HD2	1.81	0.42
1:C:38:ARG:NE	1:D:162:ASP:OD1	2.49	0.42
1:D:29:VAL:HG12	1:D:33:LYS:HE3	2.02	0.42
1:H:60:LEU:HB3	1:H:124:ILE:HD11	2.00	0.42
1:E:26:ALA:O	1:E:30:ARG:HG3	2.20	0.42
1:D:3:SER:OG	1:D:38:ARG:NH1	2.45	0.42
1:A:83:LYS:HG3	1:A:85:ALA:H	1.85	0.42
1:E:66:THR:O	1:E:66:THR:OG1	2.35	0.42
1:G:46:ARG:O	1:G:46:ARG:HG2	2.20	0.42
1:D:128:LEU:HD23	1:D:128:LEU:HA	1.78	0.42
1:G:52:ILE:CD1	1:G:52:ILE:C	2.92	0.42
1:G:84:PRO:HA	1:G:87:ILE:HG12	2.01	0.42
1:B:126:ARG:O	1:B:129:PRO:HD2	2.19	0.42
1:A:156:LYS:NZ	2:A:204:HOH:O	2.49	0.41
1:C:4:PHE:HE2	1:C:27:VAL:HG13	1.85	0.41
1:C:6:PRO:HA	1:C:9:LYS:HG2	2.00	0.41
1:G:35:LEU:HD23	1:G:35:LEU:HA	1.94	0.41
1:G:142:ILE:N	1:G:142:ILE:HD12	2.35	0.41
1:H:73:PRO:O	1:H:87:ILE:HD11	2.20	0.41
1:D:103:ALA:HB3	1:D:113:THR:HB	2.01	0.41
1:G:33:LYS:HG2	1:H:36:TYR:CE1	2.56	0.41
1:C:162:ASP:OD1	1:D:38:ARG:HD2	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:89:ARG:HE	1:F:89:ARG:HB3	1.54	0.41
1:H:37:LYS:O	1:H:37:LYS:HD3	2.20	0.41
1:H:155:LYS:HA	1:H:158:LEU:HB3	2.02	0.41
1:A:73:PRO:HG3	1:A:114:LEU:CD1	2.46	0.41
1:G:38:ARG:HG3	1:G:38:ARG:NH1	2.37	0.41
1:A:23:ARG:NH1	1:A:24:GLU:OE1	2.54	0.40
1:G:89:ARG:H	1:G:89:ARG:HD3	1.87	0.40
1:C:5:ASP:HB2	1:C:6:PRO:HD3	2.04	0.40
1:G:123:LEU:CD1	1:G:127:LEU:HD11	2.50	0.40
1:D:46:ARG:HD3	1:D:134:LEU:HD22	2.04	0.40
1:G:21:PHE:HA	1:G:22:PRO:HD3	1.95	0.40
1:G:45:VAL:HG13	1:G:46:ARG:N	2.36	0.40
1:G:146:GLU:OE2	1:H:156:LYS:NZ	2.55	0.40
1:C:29:VAL:HG12	1:C:33:LYS:HE3	2.04	0.40
1:G:83:LYS:CD	1:G:85:ALA:HB3	2.45	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:109:ARG:NH2	1:H:96:GLU:OE2[1_565]	2.09	0.11

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 X-ray entries followed by that with respect to entries of similar resolution.

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	152/166 (92%)	151 (99%)	1 (1%)	0	100	100
1	B	156/166 (94%)	153 (98%)	3 (2%)	0	100	100
1	C	152/166 (92%)	151 (99%)	1 (1%)	0	100	100
1	D	164/166 (99%)	161 (98%)	3 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	E	154/166 (93%)	152 (99%)	2 (1%)	0	100	100
1	F	154/166 (93%)	153 (99%)	1 (1%)	0	100	100
1	G	150/166 (90%)	146 (97%)	4 (3%)	0	100	100
1	H	155/166 (93%)	152 (98%)	3 (2%)	0	100	100
All	All	1237/1328 (93%)	1219 (98%)	18 (2%)	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 X-ray entries followed by that with respect to entries of similar resolution.

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	133/142 (94%)	133 (100%)	0	100	100
1	B	136/142 (96%)	136 (100%)	0	100	100
1	C	133/142 (94%)	133 (100%)	0	100	100
1	D	142/142 (100%)	141 (99%)	1 (1%)	81	92
1	E	134/142 (94%)	134 (100%)	0	100	100
1	F	135/142 (95%)	135 (100%)	0	100	100
1	G	133/142 (94%)	133 (100%)	0	100	100
1	H	135/142 (95%)	135 (100%)	0	100	100
All	All	1081/1136 (95%)	1080 (100%)	1 (0%)	92	97

All (1) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	D	48	LYS

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	42	GLN
1	A	95	HIS
1	B	86	ASN
1	B	95	HIS
1	C	95	HIS
1	E	147	GLN
1	F	13	HIS
1	G	69	GLN
1	H	93	GLN
1	H	166	GLN

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 ⓘ

There are no ligands in this entry.

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.

6 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å²)	Q<0.9
1	A	156/166 (93%)	-0.03	3 (1%)	66	64	44, 55, 90, 96	0
1	B	160/166 (96%)	-0.05	5 (3%)	51	50	45, 56, 79, 99	0
1	C	156/166 (93%)	0.12	6 (3%)	44	43	45, 59, 83, 96	0
1	D	166/166 (100%)	0.13	2 (1%)	76	74	45, 60, 83, 119	0
1	E	158/166 (95%)	-0.16	7 (4%)	39	38	40, 50, 77, 88	0
1	F	158/166 (95%)	-0.04	4 (2%)	58	56	40, 54, 83, 98	0
1	G	156/166 (93%)	0.66	11 (7%)	23	23	47, 72, 107, 115	0
1	H	159/166 (95%)	0.19	7 (4%)	39	38	41, 61, 91, 102	0
All	All	1269/1328 (95%)	0.10	45 (3%)	47	46	40, 58, 90, 119	0

All (45) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	G	1	MET	4.7
1	A	112	ILE	4.5
1	E	69	GLN	4.4
1	G	47	LEU	3.9
1	G	112	ILE	3.8
1	C	98	GLY	3.5
1	H	103	ALA	3.5
1	F	1	MET	3.5
1	H	166	GLN	3.4
1	G	49	PRO	3.3
1	A	1	MET	3.2
1	D	1	MET	3.1
1	C	112	ILE	3.0
1	G	4	PHE	3.0
1	G	101	ALA	2.9
1	B	70	ALA	2.9

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Mol	Chain	Res	Type	RSRZ
1	B	68	GLY	2.7
1	F	112	ILE	2.6
1	H	1	MET	2.6
1	G	85	ALA	2.6
1	C	1	MET	2.5
1	E	70	ALA	2.5
1	C	70	ALA	2.4
1	E	82	GLU	2.4
1	E	83	LYS	2.4
1	H	111	LYS	2.4
1	G	52	ILE	2.4
1	C	88	THR	2.4
1	B	111	LYS	2.3
1	F	102	ARG	2.3
1	B	1	MET	2.3
1	D	87	ILE	2.3
1	E	84	PRO	2.3
1	H	165	GLU	2.2
1	B	69	GLN	2.2
1	C	71	ILE	2.2
1	H	163	ALA	2.2
1	G	87	ILE	2.1
1	A	101	ALA	2.1
1	F	70	ALA	2.1
1	G	111	LYS	2.1
1	E	1	MET	2.1
1	H	112	ILE	2.1
1	G	70	ALA	2.0
1	E	9	LYS	2.0

6.2 Non-standard residues in protein, DNA, RNA chains ⓘ

There are no non-standard protein/DNA/RNA residues in this entry.

6.3 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

6.4 Ligands ⓘ

There are no ligands in this entry.

6.5 Other polymers ⓘ

There are no such residues in this entry.