WORLDWIDE PDB
PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report ⓘ

Aug 29, 2023 – 12:21 PM EDT

PDB ID : 3N24

Title : The crystal structure of a two-component sensor domain (3rd form) from Pseudomonas aeruginosa PA01

Authors : Tan, K.; Chhor, G.; Buck, K.; Joachimiak, A.; Midwest Center for Structural Genomics (MCSG)

Deposited on : 2010-05-17

Resolution : 2.06 Å(reported)

This is a Full wwPDB X-ray Structure 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/XrayValidationReportHelp
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:

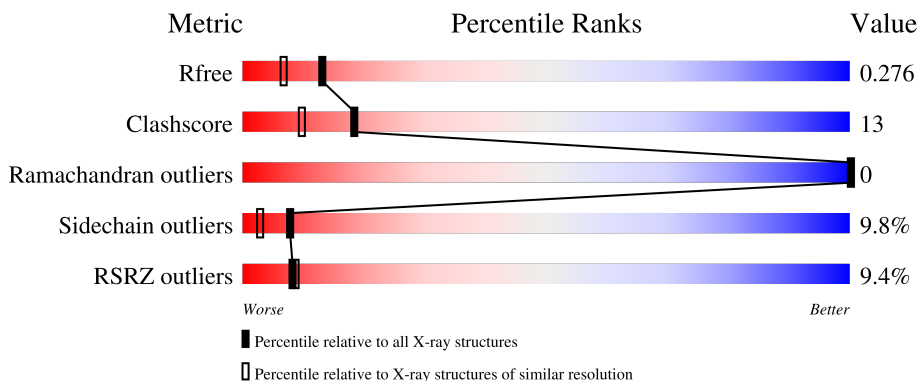|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.35
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.35

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 2.06 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.
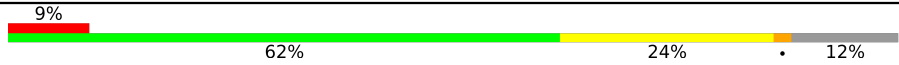
Metric	Percentile Ranks	Value
Rfree		0.276
Clashscore		13
Ramachandran outliers		0
Sidechain outliers		9.8%
RSRZ outliers		9.4%

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$_{free}$	130704	2684 (2.08-2.04)
Clashscore	141614	2801 (2.08-2.04)
Ramachandran outliers	138981	2768 (2.08-2.04)
Sidechain outliers	138945	2768 (2.08-2.04)
RSRZ outliers	127900	2646 (2.08-2.04)

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	130	2% 62% 18% 5% 16%
1	B	130	11% 56% 19% • 22%
1	C	130	9% 72% 22% • 5%
1	D	130	10% 55% 24% • 19%
1	E	130	6% 43% 32% • 22%

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Mol	Chain	Length	Quality of chain
1	F	130	9% / 62% / 24% / 12%
1	G	130	9% / 61% / 22% / 15%
1	H	130	6% / 61% / 22% / 15%

2 Entry composition ⓘ

There are 2 unique types of molecules in this entry. The entry contains 7213 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 Sensor protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	109	Total 883	C 542	N 170	O 170	Se 1	0	3	0
1	B	102	Total 807	C 495	N 149	O 163		0	1	0
1	C	123	Total 1005	C 614	N 189	O 200	Se 2	0	7	0
1	D	105	Total 834	C 510	N 158	O 166		0	1	0
1	E	102	Total 806	C 493	N 156	O 156	Se 1	0	0	0
1	F	114	Total 922	C 563	N 178	O 180	Se 1	0	3	0
1	G	110	Total 864	C 530	N 164	O 169	Se 1	0	0	0
1	H	111	Total 887	C 542	N 167	O 177	Se 1	0	2	0

There are 16 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	39	SER	-	expression tag	UNP Q9HT87
A	40	ASN	-	expression tag	UNP Q9HT87
B	39	SER	-	expression tag	UNP Q9HT87
B	40	ASN	-	expression tag	UNP Q9HT87
C	39	SER	-	expression tag	UNP Q9HT87
C	40	ASN	-	expression tag	UNP Q9HT87
D	39	SER	-	expression tag	UNP Q9HT87
D	40	ASN	-	expression tag	UNP Q9HT87
E	39	SER	-	expression tag	UNP Q9HT87
E	40	ASN	-	expression tag	UNP Q9HT87
F	39	SER	-	expression tag	UNP Q9HT87
F	40	ASN	-	expression tag	UNP Q9HT87
G	39	SER	-	expression tag	UNP Q9HT87

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Chain	Residue	Modelled	Actual	Comment	Reference
G	40	ASN	-	expression tag	UNP Q9HT87
H	39	SER	-	expression tag	UNP Q9HT87
H	40	ASN	-	expression tag	UNP Q9HT87

- Molecule 2 is water.

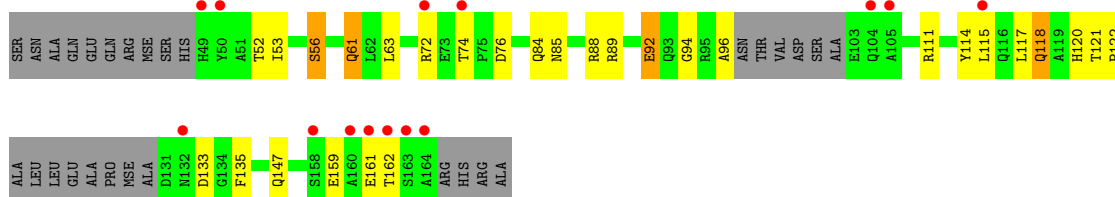| Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	30	Total 30	O 30	0	0
2	B	22	Total 22	O 22	0	0
2	C	35	Total 35	O 35	0	0
2	D	21	Total 21	O 21	0	0
2	E	20	Total 20	O 20	0	0
2	F	22	Total 22	O 22	0	0
2	G	35	Total 35	O 35	0	0
2	H	20	Total 20	O 20	0	0

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.
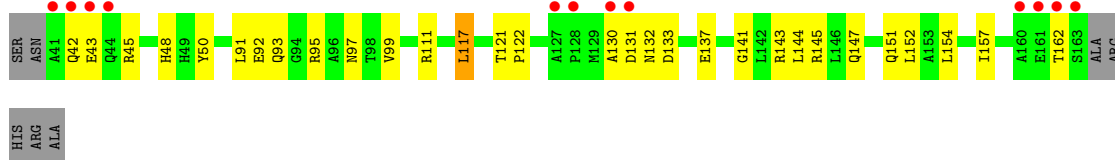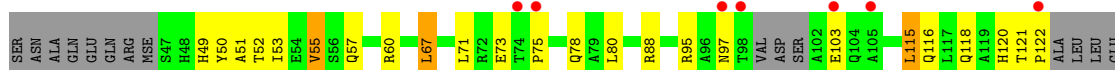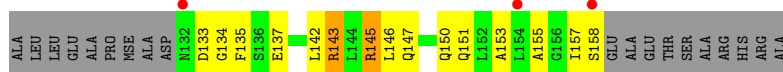
- Molecule 1: Sensor protein

- Molecule 1: Sensor protein

- Molecule 1: Sensor protein

- Molecule 1: Sensor protein

ALA PRO MSE ALA D131 N132 D133 G134 F135 L146 Q151 A155 G156 I157 S158 E159 A160 E161 T162 SER ALA ARG HIS ARG ALA

• Molecule 1: Sensor protein

6%

Chain E:

43%   32%   22%

SER ASN ALA Q42 R45 M46 H49 Y50 A51 T52 I53 E54 V55 S56 Q57 Q58 L59 R60 Q61 L62 L63 Q66 L67 L70 L71 R72 GLU THR PRO ASP G77 Q78 A79 L80 E81 D86 F87 G94 R95 T98 Q104 R111 D112 A113 Y114 L117 H120 THR PRO

ALA LEU LEU GLU ALA PRO MSE ALA ASP N132 D133 G134 F135 S136 E137 L142 R143 L144 R145 L146 Q147 Q150 Q151 L152 A153 L154 A155 G156 I157 S158 GLU GLU THR SER ALA ARG HIS ARG ALA

• Molecule 1: Sensor protein

9%

Chain F:

62%   24%   12%

SER ASN ALA Q42 E43 Q44 R45 Y50 I53 S56 R60 Q66 L67 R72 E73 T74 Q78 A79 L80 D86 R89 E92 Q93 G94 R95 G109 V110 R111 Y114 L117 Q118 A119 H120 T121 P122 A123 L124 LEU GLU ALA PRO MSE ALA ASP N132 D133

S136 E137 L142 R143 L144 R145 L146 L149 A153 L154 A160 E161 T162 SER ALA ARG HIS ARG ALA

• Molecule 1: Sensor protein

9%

Chain G:

61%   22%   15%

SER ASN A41 Q42 E43 Q44 R45 M46 I53 S56 R60 Q61 L62 L63 T74 P75 L80 Q84 N85 D86 R89 V90 L91 N97 T98 V99 D100 S101 A102 E103 R111 L117 T121 P122 A123 L124 LEU GLU ALA PRO MSE ALA ASP N132 D133 E137 R143

Q147 Q150 Q151 L152 A153 L154 I157 SER GLU ALA GLU THR SER ALA ARG HIS ARG ALA

• Molecule 1: Sensor protein

6%

Chain H:

61%   22%   15%

SER ASN ALA Q42 E43 Q44 R45 M46 S47 A51 E54 Q57 Q61 L67 L71 R72 E73 T74 P75 D76 G77 Q78 A79 R89 Q93 T121 P122 A123 LEU LEU GLU ALA PRO MSE ALA ASP ASN D133 E137 N140 G141 L142 R143 L144 R145 L146 Q147 Q150

Q151 L152 A153 I157 S158 E159 A160 E161 THR SER ALA ARG HIS ARG ALA

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	48.00Å 61.09Å 71.60Å 85.60° 70.47° 89.50°	Depositor
Resolution (Å)	36.63 – 2.06 36.63 – 2.06	Depositor EDS
% Data completeness (in resolution range)	90.3 (36.63-2.06) 96.8 (36.63-2.06)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$<I/\sigma(I)>$ [1]	1.98 (at 2.06Å)	Xtriage
Refinement program	PHENIX (phenix.refine: 1.5_2)	Depositor
R, R_{free}	0.203 , 0.282 0.207 , 0.276	Depositor DCC
R_{free} test set	2317 reflections (5.03%)	wwPDB-VP
Wilson B-factor (Å^2)	30.1	Xtriage
Anisotropy	0.449	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 60.4	EDS
L-test for twinning[2]	$<|L|> = 0.51, <L^2> = 0.34$	Xtriage
Estimated twinning fraction	0.000 for h,-k,h-l	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	7213	wwPDB-VP
Average B, all atoms (Å^2)	44.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 61.40 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 1.3166e-05. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

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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 (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	0.36	0/895	0.54	0/1202
1	B	0.35	0/816	0.47	0/1099
1	C	0.42	0/1034	0.56	0/1392
1	D	0.37	0/844	0.57	0/1137
1	E	0.37	0/810	0.56	0/1085
1	F	0.39	0/938	0.52	0/1261
1	G	0.38	0/871	0.52	0/1173
1	H	0.38	0/900	0.54	0/1211
All	All	0.38	0/7108	0.54	0/9560

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	A	883	0	878	26	0
1	B	807	0	785	26	0
1	C	1005	0	995	22	0
1	D	834	0	812	21	0
1	E	806	0	789	41	0
1	F	922	0	913	27	0
1	G	864	0	846	23	0
1	H	887	0	866	33	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	A	30	0	0	1	0
2	B	22	0	0	2	0
2	C	35	0	0	3	0
2	D	21	0	0	1	0
2	E	20	0	0	1	0
2	F	22	0	0	0	0
2	G	35	0	0	1	0
2	H	20	0	0	2	0
All	All	7213	0	6884	185	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 13.

All (185) 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:B:122:PRO:HA	2:B:177:HOH:O	1.69	0.92
1:A:123:ALA:O	1:A:124:LEU:HB2	1.73	0.88
1:A:133:ASP:O	1:A:137:GLU:HG3	1.72	0.88
1:A:45[A]:ARG:HH21	1:A:45[A]:ARG:CG	1.89	0.86
1:A:45[A]:ARG:HH21	1:A:45[A]:ARG:HG2	1.41	0.84
1:G:84:GLN:HE22	1:G:121:THR:HG21	1.42	0.84
1:E:46:MSE:HG2	1:E:50:TYR:HE2	1.45	0.82
1:H:78:GLN:HG3	1:H:79:ALA:N	1.94	0.82
1:D:155:ALA:O	1:D:159:GLU:HG2	1.81	0.80
1:B:72:ARG:HH12	1:B:76:ASP:HB2	1.46	0.79
1:H:93:GLN:HG3	2:H:171:HOH:O	1.80	0.79
1:H:76:ASP:CG	1:H:78:GLN:HG2	2.04	0.78
1:E:63:LEU:O	1:E:67:LEU:HD23	1.82	0.78
1:H:57:GLN:HE22	1:H:150:GLN:HE21	1.29	0.77
1:E:94:GLY:O	1:E:98:THR:HG23	1.86	0.76
1:H:147:GLN:O	1:H:151[B]:GLN:HG2	1.87	0.75
1:E:146:LEU:HD13	1:F:60:ARG:HG2	1.69	0.73
1:D:88:ARG:NH1	1:D:118:GLN:OE1	2.21	0.73
1:G:111:ARG:HD3	2:G:175:HOH:O	1.89	0.73
1:A:132:ASN:O	1:A:133:ASP:HB2	1.88	0.72
1:G:42:GLN:HE21	1:H:160:ALA:HB1	1.56	0.70
1:A:142:LEU:HD13	1:B:63:LEU:HD22	1.71	0.70
1:E:46:MSE:HG2	1:E:50:TYR:CE2	2.27	0.69
1:A:75:PRO:HG2	1:A:124:LEU:HD21	1.73	0.68
1:H:89:ARG:O	1:H:93:GLN:HG2	1.94	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:73:GLU:O	1:D:75:PRO:HD3	1.95	0.67
1:A:67:LEU:O	1:A:71[A]:LEU:HD13	1.95	0.66
1:A:73:GLU:HG2	1:A:74:THR:N	2.10	0.66
1:E:95:ARG:NH2	1:E:111:ARG:HD3	2.11	0.66
1:C:154:LEU:HD23	1:D:53:ILE:HD13	1.78	0.66
1:B:72:ARG:HH12	1:B:76:ASP:CB	2.08	0.65
1:E:150:GLN:HG2	1:F:56:SER:OG	1.98	0.64
1:A:95:ARG:HB3	1:A:95:ARG:NH2	2.14	0.63
1:D:95:ARG:HB3	1:D:95:ARG:NH2	2.14	0.63
1:B:85:ASN:O	1:B:89:ARG:HB2	1.99	0.63
1:C:133:ASP:O	1:C:137:GLU:HG3	1.99	0.63
1:C:117:LEU:HD21	1:D:135:PHE:CE1	2.33	0.63
1:D:51:ALA:O	1:D:55:VAL:HG13	1.98	0.63
1:E:142:LEU:HD22	1:F:117:LEU:HD22	1.81	0.62
1:E:56:SER:O	1:E:60:ARG:HG2	1.99	0.62
1:G:100:ASP:OD1	1:G:102:ALA:HB3	2.00	0.62
1:E:67:LEU:O	1:E:71:LEU:HG	2.00	0.61
1:G:63:LEU:HD22	1:H:142:LEU:HD13	1.80	0.61
1:E:111:ARG:NH1	1:E:112:ASP:OD1	2.33	0.61
1:E:150:GLN:HG3	1:F:60:ARG:HH11	1.66	0.61
1:G:84:GLN:NE2	1:G:121:THR:HG21	2.14	0.60
1:E:66:GLN:O	1:E:70:LEU:HD23	2.02	0.60
1:H:57:GLN:NE2	1:H:150:GLN:HE21	1.99	0.60
1:E:46:MSE:O	1:E:50:TYR:HD2	1.85	0.60
1:F:95:ARG:NH2	1:F:111:ARG:HD3	2.17	0.60
1:F:114:TYR:CE2	1:F:118:GLN:OE1	2.55	0.59
1:G:61:GLN:HG2	1:G:147:GLN:OE1	2.02	0.59
1:E:135:PHE:HB2	1:F:124:LEU:HD11	1.83	0.59
1:H:57:GLN:HE22	1:H:150:GLN:NE2	1.99	0.59
1:A:95:ARG:NH2	1:A:108:ASP:OD1	2.37	0.58
1:F:42:GLN:NE2	1:F:42:GLN:HA	2.18	0.58
1:G:117:LEU:HD22	1:H:142:LEU:HD12	1.84	0.58
1:B:85:ASN:OD1	1:B:88:ARG:NH1	2.36	0.58
1:H:89:ARG:HB3	1:H:89:ARG:NH1	2.18	0.58
1:A:142:LEU:HD12	1:B:117:LEU:HD22	1.85	0.57
1:C:132[B]:ASN:ND2	2:C:202:HOH:O	2.37	0.56
1:C:91:LEU:O	1:C:95:ARG:HG3	2.06	0.56
1:G:100:ASP:HB3	1:G:103:GLU:HB2	1.86	0.56
1:B:72:ARG:NH1	1:B:76:ASP:HB2	2.19	0.56
1:H:122:PRO:O	1:H:123:ALA:HB2	2.05	0.56
1:B:88:ARG:NH2	1:B:118:GLN:OE1	2.40	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:121:THR:N	1:C:122:PRO:CD	2.70	0.55
1:A:45[A]:ARG:HG2	1:A:45[A]:ARG:NH2	2.16	0.54
1:G:91:LEU:HD21	1:G:111:ARG:HA	1.89	0.54
1:C:147[A]:GLN:HG3	1:C:151:GLN:NE2	2.23	0.54
1:A:72:ARG:HD3	2:A:183:HOH:O	2.07	0.54
1:B:111:ARG:O	1:B:115:LEU:HG	2.09	0.53
1:B:61:GLN:HE22	1:B:147:GLN:NE2	2.05	0.53
1:H:147:GLN:O	1:H:151[A]:GLN:HG3	2.09	0.53
1:C:147[B]:GLN:HG2	1:D:60:ARG:NH2	2.24	0.52
1:B:84:GLN:O	1:B:88:ARG:HG2	2.10	0.52
1:H:140:ASN:O	1:H:144:LEU:HD12	2.09	0.52
1:A:50:TYR:CZ	1:A:158:SER:HB2	2.45	0.52
1:G:80:LEU:HD21	1:G:121:THR:HG23	1.92	0.51
1:F:86:ASP:OD1	1:F:89[A]:ARG:NH2	2.36	0.51
1:A:46:MSE:HE1	1:B:161:GLU:OE1	2.10	0.51
1:E:157:ILE:O	1:E:158:SER:C	2.49	0.51
1:A:45[A]:ARG:CG	1:A:45[A]:ARG:NH2	2.59	0.50
1:A:121:THR:N	1:A:122:PRO:CD	2.75	0.50
1:C:141:GLY:O	1:C:145[A]:ARG:HG3	2.12	0.50
1:A:95:ARG:HB3	1:A:95:ARG:HH21	1.75	0.49
1:G:121:THR:N	1:G:122:PRO:CD	2.75	0.49
1:H:133:ASP:O	1:H:137:GLU:HG2	2.12	0.49
1:G:46:MSE:HE3	1:H:160:ALA:HB3	1.94	0.49
1:D:95:ARG:HB3	1:D:95:ARG:HH21	1.77	0.48
1:H:78:GLN:CG	1:H:79:ALA:N	2.69	0.48
1:C:130:ALA:HB1	2:C:196:HOH:O	2.13	0.48
1:C:117:LEU:CD2	1:D:135:PHE:CE1	2.96	0.48
1:A:154:LEU:HD23	1:B:53:ILE:HD13	1.96	0.48
1:D:53:ILE:O	1:D:57:GLN:HG3	2.13	0.48
1:F:133:ASP:O	1:F:137:GLU:OE1	2.31	0.48
1:E:155:ALA:O	1:E:158:SER:HB3	2.14	0.48
1:E:151:GLN:HB3	2:E:174:HOH:O	2.13	0.48
1:C:48:HIS:CG	1:C:99:VAL:HG21	2.49	0.48
1:C:143:ARG:O	1:C:147[B]:GLN:HG3	2.13	0.48
1:F:121:THR:HB	1:F:122:PRO:HD3	1.96	0.48
1:H:76:ASP:OD2	1:H:78:GLN:HG2	2.14	0.47
1:H:51:ALA:O	1:H:54:GLU:HB3	2.14	0.47
1:C:97:ASN:HD22	1:C:97:ASN:N	2.13	0.47
1:G:121:THR:N	1:G:122:PRO:HD3	2.30	0.47
1:G:123:ALA:C	1:G:124:LEU:HD23	2.34	0.46
1:B:61:GLN:NE2	2:B:187:HOH:O	2.46	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:117:LEU:HD22	1:C:117:LEU:O	2.15	0.46
1:E:50:TYR:O	1:E:54:GLU:HG3	2.15	0.46
1:E:54:GLU:O	1:E:58:GLN:HG3	2.16	0.46
1:H:43:GLU:O	1:H:47:SER:HB2	2.15	0.46
1:H:67:LEU:O	1:H:71:LEU:HG	2.16	0.46
1:C:121:THR:N	1:C:122:PRO:HD3	2.30	0.46
1:C:42:GLN:HA	1:C:45:ARG:HG3	1.98	0.46
1:D:67:LEU:O	1:D:71:LEU:HG	2.16	0.46
1:E:49:HIS:O	1:E:52:THR:HB	2.16	0.45
1:E:111:ARG:CZ	1:E:112:ASP:OD1	2.65	0.45
1:B:61:GLN:NE2	1:B:147:GLN:NE2	2.64	0.45
1:H:159:GLU:HG3	1:H:160:ALA:N	2.28	0.45
1:G:53:ILE:HG12	1:H:153:ALA:HB1	1.98	0.45
1:H:137:GLU:HG2	1:H:137:GLU:H	1.57	0.45
1:C:92[A]:GLU:OE1	1:C:95:ARG:NH1	2.49	0.45
1:B:52:THR:O	1:B:56:SER:HB2	2.16	0.45
1:E:134:GLY:HA3	1:F:120:HIS:HD2	1.82	0.45
1:E:146:LEU:HD13	1:F:60:ARG:CG	2.44	0.45
1:B:120:HIS:O	1:B:122:PRO:HD3	2.17	0.44
1:C:137:GLU:HB3	2:C:194:HOH:O	2.17	0.44
1:E:142:LEU:CD2	1:F:117:LEU:HD22	2.47	0.44
1:E:145:ARG:NE	1:E:145:ARG:HA	2.32	0.44
1:G:42:GLN:NE2	1:H:160:ALA:HB1	2.29	0.44
1:E:53:ILE:HG13	1:F:153:ALA:HB3	1.99	0.44
1:B:61:GLN:HE22	1:B:147:GLN:HE22	1.64	0.44
1:A:121:THR:N	1:A:122:PRO:HD2	2.32	0.44
1:B:94:GLY:C	1:B:96:ALA:H	2.21	0.44
1:D:52:THR:OG1	1:D:103:GLU:OE2	2.36	0.44
1:A:45[B]:ARG:HH22	1:A:100:ASP:HB2	1.83	0.43
1:E:87:PHE:CE2	1:E:114:TYR:CD1	3.06	0.43
1:H:122:PRO:O	1:H:123:ALA:CB	2.66	0.43
1:C:50:TYR:CE2	1:D:157:ILE:HD13	2.53	0.43
1:E:147:GLN:O	1:E:151:GLN:HG3	2.18	0.43
1:H:157:ILE:O	1:H:161:GLU:HG2	2.18	0.43
1:D:115:LEU:HD23	2:D:178:HOH:O	2.18	0.43
1:E:60:ARG:HD3	1:F:146:LEU:HB3	1.99	0.43
1:D:162:THR:HG21	1:F:133:ASP:HB3	2.00	0.43
1:E:57:GLN:O	1:E:61:GLN:HG3	2.19	0.43
1:F:53:ILE:HG21	1:F:154:LEU:CD2	2.49	0.43
1:G:150:GLN:OE1	1:H:150:GLN:NE2	2.52	0.43
1:G:46:MSE:HE1	1:H:161:GLU:HB3	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:145:ARG:HA	1:H:145:ARG:NE	2.34	0.43
1:E:78:GLN:H	1:E:78:GLN:HG2	1.49	0.43
1:E:145:ARG:HA	1:E:145:ARG:HE	1.83	0.43
1:B:92[B]:GLU:HA	1:B:92[B]:GLU:OE1	2.19	0.42
1:G:74:THR:HG22	1:G:74:THR:O	2.18	0.42
1:A:95:ARG:NH1	1:A:111:ARG:HH21	2.17	0.42
1:C:50:TYR:OH	1:C:157:ILE:HG22	2.18	0.42
1:G:91:LEU:HD21	1:G:111:ARG:CA	2.49	0.42
1:B:118:GLN:HE21	1:B:118:GLN:HB2	1.56	0.42
1:E:113:ALA:HB1	1:F:142:LEU:HA	2.02	0.42
1:E:153:ALA:HB1	1:F:53:ILE:HG12	2.01	0.42
1:F:42:GLN:HA	1:F:42:GLN:HE21	1.83	0.42
1:D:146:LEU:HD23	1:D:146:LEU:HA	1.92	0.42
1:A:152:LEU:O	1:A:156:GLY:N	2.52	0.42
1:E:114:TYR:O	1:E:117:LEU:HB3	2.19	0.42
1:H:61:GLN:NE2	2:H:21:HOH:O	2.51	0.42
1:B:121:THR:HA	1:B:122:PRO:HD3	1.89	0.42
1:D:116:GLN:O	1:D:120:HIS:HD2	2.02	0.42
1:F:53:ILE:HG21	1:F:154:LEU:HD22	2.02	0.42
1:E:56:SER:HB3	1:F:149:LEU:HG	2.02	0.41
1:E:145:ARG:HG2	1:F:109:GLY:O	2.20	0.41
1:A:67:LEU:HD13	1:A:67:LEU:HA	1.85	0.41
1:F:118:GLN:O	1:F:122:PRO:HD3	2.20	0.41
1:A:117:LEU:HD21	1:B:135:PHE:CE1	2.54	0.41
1:B:72:ARG:NH1	1:B:76:ASP:CB	2.81	0.41
1:D:49:HIS:O	1:D:53:ILE:HG13	2.21	0.41
1:E:66:GLN:O	1:E:70:LEU:CD2	2.68	0.41
1:G:56:SER:O	1:G:60:ARG:HG3	2.21	0.41
1:H:121:THR:HA	1:H:122:PRO:HD3	1.58	0.41
1:C:91:LEU:HD21	1:C:111:ARG:HA	2.02	0.40
1:D:121:THR:HA	1:D:122:PRO:HD3	1.91	0.40
1:D:97:ASN:HA	1:G:41:ALA:HB2	2.02	0.40
1:E:55:VAL:O	1:E:59:LEU:HG	2.21	0.40
1:B:84:GLN:HA	1:B:114:TYR:OH	2.21	0.40
1:E:143:ARG:O	1:E:147:GLN:HG3	2.21	0.40
1:F:66:GLN:HG2	1:F:80:LEU:HD12	2.02	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 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	108/130 (83%)	105 (97%)	3 (3%)	0	100	100
1	B	97/130 (75%)	95 (98%)	2 (2%)	0	100	100
1	C	128/130 (98%)	127 (99%)	1 (1%)	0	100	100
1	D	100/130 (77%)	97 (97%)	3 (3%)	0	100	100
1	E	96/130 (74%)	95 (99%)	1 (1%)	0	100	100
1	F	113/130 (87%)	112 (99%)	1 (1%)	0	100	100
1	G	106/130 (82%)	105 (99%)	1 (1%)	0	100	100
1	H	109/130 (84%)	107 (98%)	2 (2%)	0	100	100
All	All	857/1040 (82%)	843 (98%)	14 (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	93/103 (90%)	83 (89%)	10 (11%)	6	2
1	B	84/103 (82%)	75 (89%)	9 (11%)	6	2
1	C	107/103 (104%)	99 (92%)	8 (8%)	13	6
1	D	87/103 (84%)	77 (88%)	10 (12%)	5	1
1	E	83/103 (81%)	74 (89%)	9 (11%)	6	2
1	F	97/103 (94%)	86 (89%)	11 (11%)	6	1

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	G	89/103 (86%)	79 (89%)	10 (11%)	6	1
1	H	93/103 (90%)	87 (94%)	6 (6%)	17	9
All	All	733/824 (89%)	660 (90%)	73 (10%)	8	2

All (73) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	44	GLN
1	A	45[A]	ARG
1	A	45[B]	ARG
1	A	73	GLU
1	A	81	GLU
1	A	93	GLN
1	A	117	LEU
1	A	124	LEU
1	A	142	LEU
1	A	152	LEU
1	B	56	SER
1	B	61	GLN
1	B	74	THR
1	B	92[A]	GLU
1	B	92[B]	GLU
1	B	118	GLN
1	B	133	ASP
1	B	159	GLU
1	B	162	THR
1	C	43	GLU
1	C	93	GLN
1	C	117	LEU
1	C	131[A]	ASP
1	C	131[B]	ASP
1	C	144	LEU
1	C	152	LEU
1	C	162	THR
1	D	50	TYR
1	D	55	VAL
1	D	67	LEU
1	D	78	GLN
1	D	80	LEU
1	D	115	LEU
1	D	132	ASN

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Mol	Chain	Res	Type
1	D	133	ASP
1	D	151	GLN
1	D	161	GLU
1	E	53	ILE
1	E	78	GLN
1	E	81	GLU
1	E	86	ASP
1	E	104	GLN
1	E	133	ASP
1	E	137	GLU
1	E	143	ARG
1	E	145	ARG
1	F	43	GLU
1	F	44	GLN
1	F	67	LEU
1	F	78	GLN
1	F	93	GLN
1	F	111	ARG
1	F	133	ASP
1	F	137	GLU
1	F	143	ARG
1	F	144	LEU
1	F	162	THR
1	G	53	ILE
1	G	86	ASP
1	G	89	ARG
1	G	97	ASN
1	G	99	VAL
1	G	121	THR
1	G	137	GLU
1	G	143	ARG
1	G	152	LEU
1	G	154	LEU
1	H	45	ARG
1	H	72	ARG
1	H	137	GLU
1	H	142	LEU
1	H	144	LEU
1	H	159	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (22) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	66	GLN
1	A	132	ASN
1	A	151	GLN
1	B	61	GLN
1	B	116	GLN
1	B	120	HIS
1	B	147	GLN
1	C	97	ASN
1	C	151	GLN
1	D	57	GLN
1	D	66	GLN
1	D	120	HIS
1	D	147	GLN
1	E	44	GLN
1	F	48	HIS
1	F	66	GLN
1	F	120	HIS
1	G	42	GLN
1	G	66	GLN
1	G	84	GLN
1	H	97	ASN
1	H	150	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 monosaccharides 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	108/130 (83%)	-0.12	3 (2%)	53	56	17, 34, 70, 100	1 (0%)
1	B	102/130 (78%)	0.61	14 (13%)	3	2	20, 46, 91, 127	0
1	C	121/130 (93%)	0.17	12 (9%)	7	7	14, 31, 68, 101	0
1	D	105/130 (80%)	0.41	13 (12%)	4	3	17, 37, 83, 101	2 (1%)
1	E	101/130 (77%)	0.54	8 (7%)	12	13	22, 50, 87, 104	0
1	F	113/130 (86%)	0.44	12 (10%)	6	6	18, 40, 87, 102	0
1	G	109/130 (83%)	0.39	12 (11%)	5	5	20, 37, 78, 108	0
1	H	110/130 (84%)	0.18	8 (7%)	15	15	20, 34, 79, 90	1 (0%)
All	All	869/1040 (83%)	0.32	82 (9%)	8	9	14, 38, 85, 127	4 (0%)

All (82) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	163	SER	8.6
1	G	42	GLN	5.9
1	C	41	ALA	5.9
1	D	162	THR	5.6
1	B	74	THR	5.4
1	F	122	PRO	5.3
1	F	45	ARG	5.3
1	G	41	ALA	5.2
1	H	74	THR	5.2
1	E	80	LEU	4.9
1	G	122	PRO	4.8
1	G	133	ASP	4.6
1	B	164	ALA	4.6
1	F	132	ASN	4.5
1	C	42	GLN	4.4
1	C	161	GLU	4.4

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Mol	Chain	Res	Type	RSRZ
1	C	128	PRO	4.4
1	C	163	SER	4.4
1	H	73	GLU	4.3
1	G	124	LEU	4.2
1	E	158	SER	4.2
1	E	45	ARG	4.0
1	B	161	GLU	3.9
1	H	45	ARG	3.8
1	F	42	GLN	3.8
1	E	67	LEU	3.7
1	G	123	ALA	3.6
1	G	99	VAL	3.6
1	C	162	THR	3.5
1	D	122	PRO	3.5
1	B	72	ARG	3.5
1	F	161	GLU	3.4
1	C	43	GLU	3.4
1	H	161	GLU	3.3
1	F	162	THR	3.3
1	D	131	ASP	3.2
1	E	71	LEU	3.1
1	B	49	HIS	3.1
1	E	132	ASN	3.0
1	B	162	THR	3.0
1	G	132	ASN	2.9
1	B	50	TYR	2.9
1	D	98	THR	2.9
1	E	117	LEU	2.9
1	G	74	THR	2.8
1	B	158	SER	2.8
1	F	136	SER	2.7
1	C	130	ALA	2.7
1	F	72	ARG	2.7
1	H	72	ARG	2.7
1	D	105	ALA	2.6
1	C	131[A]	ASP	2.6
1	B	115	LEU	2.6
1	D	97	ASN	2.6
1	A	48	HIS	2.5
1	D	160	ALA	2.5
1	A	43	GLU	2.5
1	G	45	ARG	2.5

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Mol	Chain	Res	Type	RSRZ
1	F	74	THR	2.5
1	G	43	GLU	2.5
1	A	50	TYR	2.5
1	H	123	ALA	2.5
1	D	74	THR	2.4
1	F	160	ALA	2.4
1	H	75	PRO	2.3
1	D	103	GLU	2.3
1	F	73	GLU	2.2
1	B	104	GLN	2.2
1	E	154	LEU	2.2
1	D	158	SER	2.2
1	C	44	GLN	2.2
1	C	127	ALA	2.2
1	G	75	PRO	2.2
1	D	132	ASN	2.1
1	B	132	ASN	2.1
1	H	159	GLU	2.1
1	B	105	ALA	2.1
1	D	75	PRO	2.1
1	F	50	TYR	2.1
1	B	160	ALA	2.0
1	D	159	GLU	2.0
1	C	160	ALA	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 monosaccharides 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.