WORLDWIDE PDB

PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report (i)

Dec 18, 2023 – 07:58 am GMT

PDB ID	:	4B2O
Title	:	Crystal structure of Bacillus subtilis YmdB, a global regulator of late adaptive responses.
Authors	:	Newman, J.A.; Diethmaier, C.; Kovacs, A.T.; Rodrigues, C.; Kuipers, O.P.; Stulke, J.; Lewis, R.J.
Deposited on	:	2012-07-17
Resolution	:	1.64 Å(reported)

The following versions of software and data (see references (i)) were used in the production of this report:

|		
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
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)	:	2.36
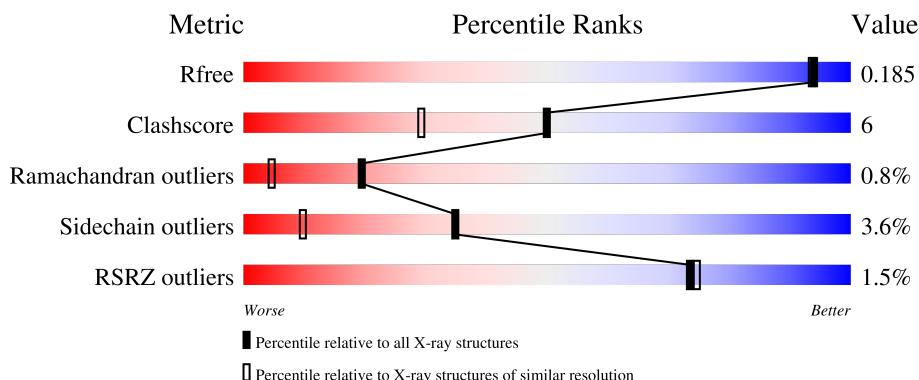
1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION
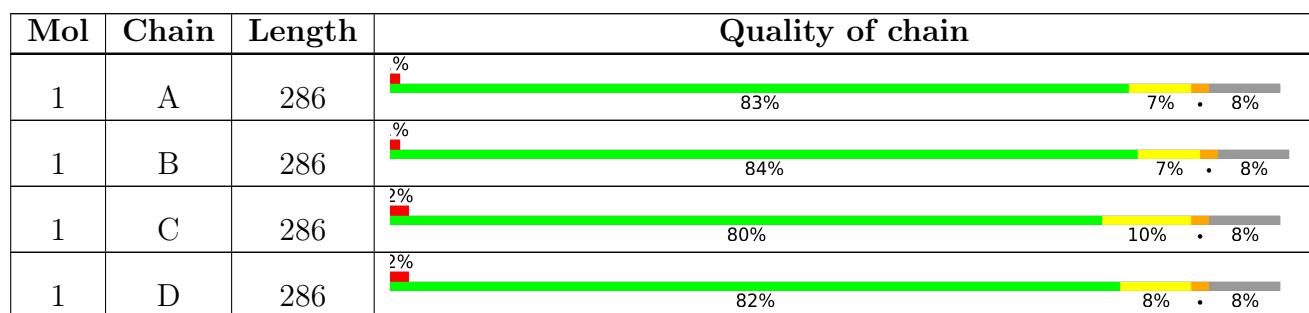
The reported resolution of this entry is 1.64 Å.

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)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	3122 (1.66-1.62)
Clashscore	141614	3268 (1.66-1.62)
Ramachandran outliers	138981	3215 (1.66-1.62)
Sidechain outliers	138945	3215 (1.66-1.62)
RSRZ outliers	127900	3079 (1.66-1.62)

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	286	.% 83% 7% · 8%
1	B	286	.% 84% 7% · 8%
1	C	286	2% 80% 10% · 8%
1	D	286	2% 82% 8% · 8%

2　Entry composition ⓘ

There are 4 unique types of molecules in this entry. The entry contains 9784 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 YMDB PHOSPHODIESTERASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	264	Total 2085	C 1337	N 351	O 392	S 5	0	4	0
1	B	264	Total 2069	C 1325	N 351	O 388	S 5	0	1	0
1	C	264	Total 2069	C 1325	N 351	O 388	S 5	0	1	0
1	D	264	Total 2063	C 1321	N 351	O 386	S 5	0	0	0

There are 88 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	265	LEU	-	expression tag	UNP O31775
A	266	ASP	-	expression tag	UNP O31775
A	267	PRO	-	expression tag	UNP O31775
A	268	ASN	-	expression tag	UNP O31775
A	269	SER	-	expression tag	UNP O31775
A	270	SER	-	expression tag	UNP O31775
A	271	SER	-	expression tag	UNP O31775
A	272	VAL	-	expression tag	UNP O31775
A	273	ASP	-	expression tag	UNP O31775
A	274	LYS	-	expression tag	UNP O31775
A	275	LEU	-	expression tag	UNP O31775
A	276	ALA	-	expression tag	UNP O31775
A	277	ALA	-	expression tag	UNP O31775
A	278	ALA	-	expression tag	UNP O31775
A	279	LEU	-	expression tag	UNP O31775
A	280	GLU	-	expression tag	UNP O31775
A	281	HIS	-	expression tag	UNP O31775
A	282	HIS	-	expression tag	UNP O31775
A	283	HIS	-	expression tag	UNP O31775
A	284	HIS	-	expression tag	UNP O31775
A	285	HIS	-	expression tag	UNP O31775

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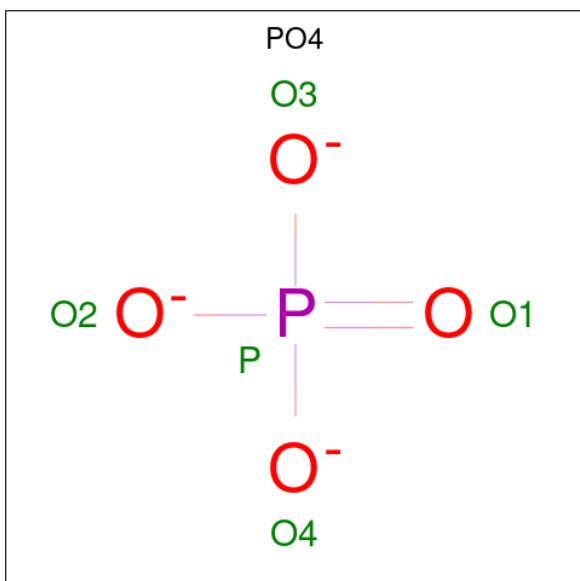
Chain	Residue	Modelled	Actual	Comment	Reference
A	286	HIS	-	expression tag	UNP O31775
B	265	LEU	-	expression tag	UNP O31775
B	266	ASP	-	expression tag	UNP O31775
B	267	PRO	-	expression tag	UNP O31775
B	268	ASN	-	expression tag	UNP O31775
B	269	SER	-	expression tag	UNP O31775
B	270	SER	-	expression tag	UNP O31775
B	271	SER	-	expression tag	UNP O31775
B	272	VAL	-	expression tag	UNP O31775
B	273	ASP	-	expression tag	UNP O31775
B	274	LYS	-	expression tag	UNP O31775
B	275	LEU	-	expression tag	UNP O31775
B	276	ALA	-	expression tag	UNP O31775
B	277	ALA	-	expression tag	UNP O31775
B	278	ALA	-	expression tag	UNP O31775
B	279	LEU	-	expression tag	UNP O31775
B	280	GLU	-	expression tag	UNP O31775
B	281	HIS	-	expression tag	UNP O31775
B	282	HIS	-	expression tag	UNP O31775
B	283	HIS	-	expression tag	UNP O31775
B	284	HIS	-	expression tag	UNP O31775
B	285	HIS	-	expression tag	UNP O31775
B	286	HIS	-	expression tag	UNP O31775
C	265	LEU	-	expression tag	UNP O31775
C	266	ASP	-	expression tag	UNP O31775
C	267	PRO	-	expression tag	UNP O31775
C	268	ASN	-	expression tag	UNP O31775
C	269	SER	-	expression tag	UNP O31775
C	270	SER	-	expression tag	UNP O31775
C	271	SER	-	expression tag	UNP O31775
C	272	VAL	-	expression tag	UNP O31775
C	273	ASP	-	expression tag	UNP O31775
C	274	LYS	-	expression tag	UNP O31775
C	275	LEU	-	expression tag	UNP O31775
C	276	ALA	-	expression tag	UNP O31775
C	277	ALA	-	expression tag	UNP O31775
C	278	ALA	-	expression tag	UNP O31775
C	279	LEU	-	expression tag	UNP O31775
C	280	GLU	-	expression tag	UNP O31775
C	281	HIS	-	expression tag	UNP O31775
C	282	HIS	-	expression tag	UNP O31775
C	283	HIS	-	expression tag	UNP O31775

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Chain	Residue	Modelled	Actual	Comment	Reference
C	284	HIS	-	expression tag	UNP O31775
C	285	HIS	-	expression tag	UNP O31775
C	286	HIS	-	expression tag	UNP O31775
D	265	LEU	-	expression tag	UNP O31775
D	266	ASP	-	expression tag	UNP O31775
D	267	PRO	-	expression tag	UNP O31775
D	268	ASN	-	expression tag	UNP O31775
D	269	SER	-	expression tag	UNP O31775
D	270	SER	-	expression tag	UNP O31775
D	271	SER	-	expression tag	UNP O31775
D	272	VAL	-	expression tag	UNP O31775
D	273	ASP	-	expression tag	UNP O31775
D	274	LYS	-	expression tag	UNP O31775
D	275	LEU	-	expression tag	UNP O31775
D	276	ALA	-	expression tag	UNP O31775
D	277	ALA	-	expression tag	UNP O31775
D	278	ALA	-	expression tag	UNP O31775
D	279	LEU	-	expression tag	UNP O31775
D	280	GLU	-	expression tag	UNP O31775
D	281	HIS	-	expression tag	UNP O31775
D	282	HIS	-	expression tag	UNP O31775
D	283	HIS	-	expression tag	UNP O31775
D	284	HIS	-	expression tag	UNP O31775
D	285	HIS	-	expression tag	UNP O31775
D	286	HIS	-	expression tag	UNP O31775

- Molecule 2 is PHOSPHATE ION (three-letter code: PO4) (formula: O_4P).

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total 5	O 4	P 1	0	0
2	B	1	Total 5	O 4	P 1	0	0
2	C	1	Total 5	O 4	P 1	0	0
2	D	1	Total 5	O 4	P 1	0	0

- Molecule 3 is FE (II) ION (three-letter code: FE2) (formula: Fe).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	2	Total 2	Fe 2	0	0
3	B	2	Total 2	Fe 2	0	0
3	C	2	Total 2	Fe 2	0	0
3	D	2	Total 2	Fe 2	0	0
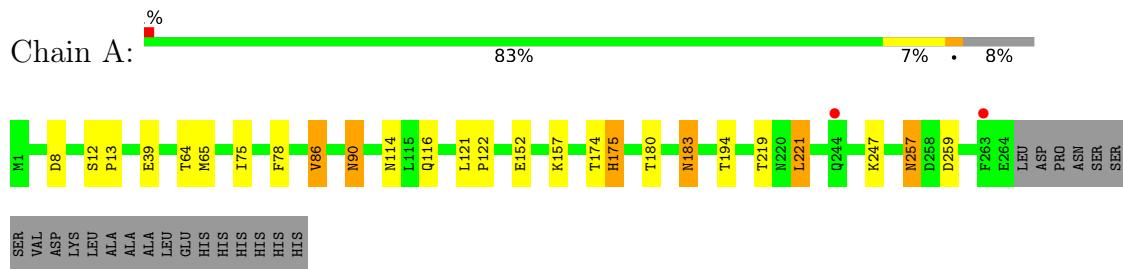
- Molecule 4 is water.

| Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	423	Total 423	O 423	0	0
4	B	362	Total 362	O 362	0	0
4	C	371	Total 371	O 371	0	0
4	D	314	Total 314	O 314	0	0
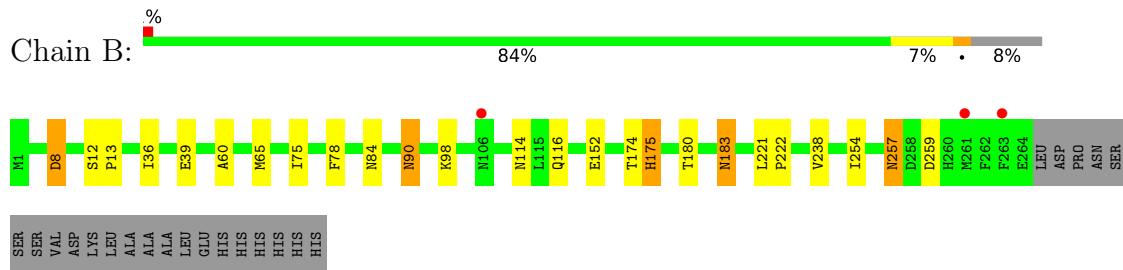
3 Residue-property plots ⓘ

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.
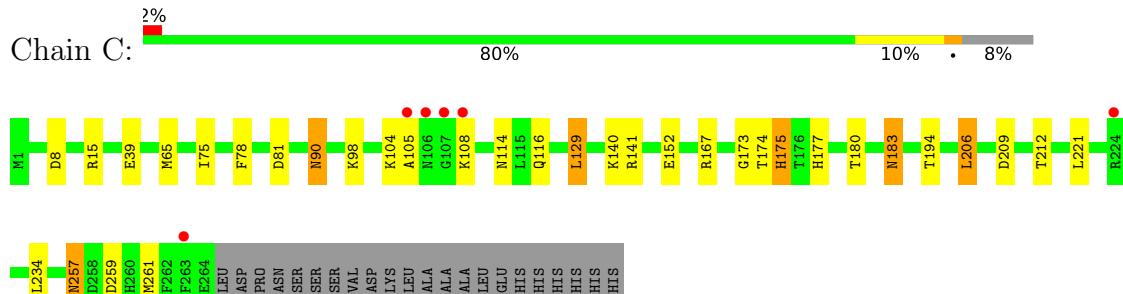
- Molecule 1: YMDB PHOSPHODIESTERASE
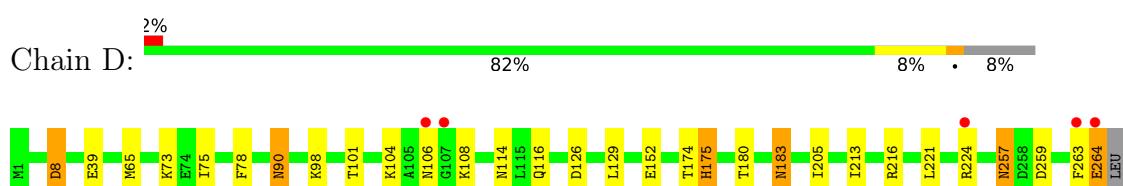
Chain A:

- Molecule 1: YMDB PHOSPHODIESTERASE

Chain B:

- Molecule 1: YMDB PHOSPHODIESTERASE

Chain C:

- Molecule 1: YMDB PHOSPHODIESTERASE

Chain D:

ASP PRO ASN SER SER VAL ASP LYS LEU ALA ALA ALA LEU GLU HIS HIS HIS HIS HIS HIS

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	73.86Å 106.00Å 77.92Å 90.00° 108.30° 90.00°	Depositor
Resolution (Å)	19.74 – 1.64 19.74 – 1.64	Depositor EDS
% Data completeness (in resolution range)	96.4 (19.74-1.64) 96.4 (19.74-1.64)	Depositor EDS
R_{merge}	0.06	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.86 (at 1.64Å)	Xtriage
Refinement program	PHENIX (PHENIX.REFINE)	Depositor
R, R_{free}	0.159 , 0.185 0.159 , 0.185	Depositor DCC
R_{free} test set	6724 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å^2)	15.8	Xtriage
Anisotropy	0.197	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 40.4	EDS
L-test for twinning[2]	$< |L| > = 0.49, < L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.97	EDS
Total number of atoms	9784	wwPDB-VP
Average B, all atoms (Å^2)	18.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.30% 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 ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: FE2, PO4

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	0.34	0/2143	0.53	0/2902
1	B	0.32	0/2118	0.53	0/2868
1	C	0.40	0/2118	0.55	0/2868
1	D	0.41	0/2109	0.53	0/2856
All	All	0.37	0/8488	0.54	0/11494

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 ⓘ

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	2085	0	2102	28	0
1	B	2069	0	2081	21	0
1	C	2069	0	2081	27	0
1	D	2063	0	2075	23	0
2	A	5	0	0	0	0
2	B	5	0	0	0	0
2	C	5	0	0	0	0
2	D	5	0	0	0	0
3	A	2	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	B	2	0	0	0	0
3	C	2	0	0	0	0
3	D	2	0	0	0	0
4	A	423	0	0	3	1
4	B	362	0	0	1	0
4	C	371	0	0	6	0
4	D	314	0	0	4	1
All	All	9784	0	8339	96	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 6.

All (96) 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:84:ASN:ND2	4:B:2174:HOH:O	1.66	0.92
1:A:90:ASN:H	1:A:90:ASN:HD22	1.24	0.85
1:C:90:ASN:HD22	1:C:90:ASN:H	1.25	0.85
1:B:90:ASN:H	1:B:90:ASN:HD22	1.24	0.83
1:B:257:ASN:HD22	1:B:259:ASP:H	1.29	0.80
1:D:126:ASP:OD2	1:D:129:LEU:HD23	1.82	0.80
1:A:90:ASN:HD21	1:A:116:GLN:H	1.28	0.79
1:D:90:ASN:HD22	1:D:90:ASN:H	1.29	0.77
1:D:90:ASN:HD21	1:D:116:GLN:H	1.32	0.77
1:B:90:ASN:HD21	1:B:116:GLN:H	1.33	0.74
1:A:257:ASN:HD22	1:A:259:ASP:H	1.36	0.73
1:D:257:ASN:HD22	1:D:259:ASP:H	1.37	0.73
1:B:183:ASN:H	1:B:183:ASN:HD22	1.38	0.72
1:C:90:ASN:HD21	1:C:116:GLN:H	1.38	0.71
1:D:183:ASN:HD22	1:D:183:ASN:H	1.36	0.71
1:A:183:ASN:H	1:A:183:ASN:HD22	1.39	0.71
1:C:183:ASN:HD22	1:C:183:ASN:H	1.40	0.70
1:C:257:ASN:HD22	1:C:259:ASP:H	1.39	0.69
1:A:64:THR:HA	1:A:86[A]:VAL:HG22	1.75	0.69
1:A:86[A]:VAL:HG23	1:A:114:ASN:HB2	1.74	0.68
4:C:2227:HOH:O	1:D:152:GLU:OE2	2.13	0.67
1:C:81:ASP:OD1	4:C:2148:HOH:O	2.13	0.66
1:C:177:HIS:HB2	1:C:206:LEU:HG	1.79	0.65
1:B:238:VAL:HG23	1:B:254:ILE:HD11	1.80	0.62
1:D:224:ARG:HD2	4:D:2269:HOH:O	2.00	0.61
1:D:264:GLU:OXT	4:D:2031:HOH:O	2.17	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:64:THR:HG22	1:A:86[B]:VAL:CG1	2.33	0.58
1:B:90:ASN:HD22	1:B:90:ASN:N	2.00	0.57
1:A:247:LYS:NZ	4:A:2391:HOH:O	2.38	0.56
1:C:167:ARG:HD2	4:C:2243:HOH:O	2.04	0.56
1:A:152:GLU:OE2	4:A:2278:HOH:O	2.18	0.56
4:A:2276:HOH:O	1:B:152:GLU:OE2	2.18	0.55
1:C:90:ASN:HD22	1:C:90:ASN:N	2.01	0.55
1:A:86[A]:VAL:CG2	1:A:114:ASN:HB2	2.37	0.54
1:D:90:ASN:H	1:D:90:ASN:ND2	2.04	0.54
1:C:90:ASN:H	1:C:90:ASN:ND2	2.00	0.53
1:A:64:THR:HG22	1:A:86[A]:VAL:CG2	2.39	0.52
1:A:90:ASN:HD22	1:A:90:ASN:N	2.00	0.52
1:C:152:GLU:OE2	4:C:2228:HOH:O	2.19	0.52
1:B:90:ASN:H	1:B:90:ASN:ND2	2.01	0.51
1:D:90:ASN:HD22	1:D:90:ASN:N	2.05	0.51
1:B:257:ASN:ND2	1:B:259:ASP:H	2.02	0.51
1:A:90:ASN:H	1:A:90:ASN:ND2	2.01	0.51
1:A:64:THR:HG22	1:A:86[B]:VAL:HG11	1.91	0.50
1:D:205:ILE:HD12	1:D:213:ILE:HB	1.94	0.50
1:B:257:ASN:HD22	1:B:259:ASP:N	2.03	0.49
1:D:257:ASN:ND2	1:D:259:ASP:H	2.08	0.49
1:A:64:THR:HG22	1:A:86[A]:VAL:HG21	1.95	0.48
1:B:238:VAL:CG2	1:B:254:ILE:HD11	2.44	0.48
1:A:75:ILE:HA	1:A:78:PHE:CE2	2.49	0.48
1:C:174:THR:O	1:C:175:HIS:HB3	2.14	0.47
1:A:257:ASN:HD22	1:A:259:ASP:N	2.09	0.47
1:C:65:MET:H	1:C:114:ASN:ND2	2.12	0.47
1:A:174:THR:O	1:A:175:HIS:HB3	2.15	0.47
1:D:183:ASN:H	1:D:183:ASN:ND2	2.08	0.46
1:A:257:ASN:ND2	1:A:259:ASP:H	2.10	0.46
1:D:263:PHE:O	1:D:264:GLU:HB2	2.14	0.46
1:B:183:ASN:H	1:B:183:ASN:ND2	2.10	0.46
1:B:12:SER:OG	1:B:13:PRO:HD3	2.16	0.46
1:C:257:ASN:ND2	1:C:259:ASP:H	2.10	0.46
1:C:104:LYS:O	1:C:105:ALA:HB2	2.14	0.46
1:D:65:MET:H	1:D:114:ASN:ND2	2.14	0.46
1:C:257:ASN:HD22	1:C:259:ASP:N	2.11	0.45
1:D:174:THR:O	1:D:175:HIS:HB3	2.17	0.45
1:B:174:THR:O	1:B:175:HIS:HB3	2.17	0.45
1:B:65:MET:H	1:B:114:ASN:ND2	2.14	0.45
1:C:15:ARG:HH11	1:C:15:ARG:HG3	1.82	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:183:ASN:H	1:A:183:ASN:ND2	2.11	0.44
1:B:222:PRO:HG2	1:D:73:LYS:NZ	2.32	0.44
1:C:257:ASN:O	1:C:261:MET:HE3	2.18	0.44
1:A:219:THR:HB	1:A:221:LEU:HD22	1.99	0.44
1:D:98:LYS:HE2	4:D:2138:HOH:O	2.16	0.44
1:A:12:SER:OG	1:A:13:PRO:HD3	2.18	0.44
1:A:64:THR:HA	1:A:86[B]:VAL:HG13	1.99	0.44
1:A:65:MET:H	1:A:114:ASN:ND2	2.16	0.44
1:D:98:LYS:HE3	1:D:101:THR:HB	2.00	0.44
1:A:174:THR:O	1:A:175:HIS:CB	2.66	0.43
1:D:257:ASN:HD22	1:D:259:ASP:N	2.10	0.43
1:B:75:ILE:HA	1:B:78:PHE:CE2	2.52	0.43
1:C:209:ASP:OD2	1:C:212:THR:HG23	2.19	0.43
1:C:234:LEU:C	1:C:234:LEU:HD23	2.39	0.43
1:C:75:ILE:HA	1:C:78:PHE:CE2	2.53	0.42
1:B:36:ILE:HD12	1:B:60:ALA:HB2	2.01	0.42
1:C:183:ASN:HD22	1:C:183:ASN:N	2.12	0.42
1:A:180:THR:HA	1:B:180:THR:HA	2.01	0.42
1:C:180:THR:HA	1:D:180:THR:HA	2.00	0.42
1:C:129:LEU:HD12	1:C:129:LEU:HA	1.88	0.42
1:C:261:MET:HA	1:C:261:MET:CE	2.50	0.41
1:D:216:ARG:HB3	4:D:2248:HOH:O	2.20	0.41
1:A:121:LEU:HB3	1:A:122:PRO:CD	2.50	0.41
1:C:140:LYS:HE2	4:C:2211:HOH:O	2.21	0.41
1:C:173:GLY:HA3	1:C:194:THR:O	2.21	0.41
1:B:174:THR:O	1:B:175:HIS:CB	2.69	0.41
1:D:75:ILE:HA	1:D:78:PHE:CE2	2.56	0.41
1:C:98:LYS:HD3	4:C:2142:HOH:O	2.21	0.40
1:A:157:LYS:HD3	1:A:194:THR:O	2.22	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)
4:A:2084:HOH:O	4:D:2116:HOH:O[1_655]	1.90	0.30

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	266/286 (93%)	260 (98%)	4 (2%)	2 (1%)	19	4
1	B	263/286 (92%)	258 (98%)	3 (1%)	2 (1%)	19	4
1	C	263/286 (92%)	257 (98%)	4 (2%)	2 (1%)	19	4
1	D	262/286 (92%)	257 (98%)	3 (1%)	2 (1%)	19	4
All	All	1054/1144 (92%)	1032 (98%)	14 (1%)	8 (1%)	19	4

All (8) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	175	HIS
1	B	175	HIS
1	C	175	HIS
1	D	175	HIS
1	D	8	ASP
1	A	8	ASP
1	B	8	ASP
1	C	8	ASP

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	224/240 (93%)	217 (97%)	7 (3%)	40	13
1	B	221/240 (92%)	214 (97%)	7 (3%)	39	12

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	C	221/240 (92%)	212 (96%)	9 (4%)	30	7
1	D	220/240 (92%)	210 (96%)	10 (4%)	27	6
All	All	886/960 (92%)	853 (96%)	33 (4%)	35	9

All (33) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	39	GLU
1	A	86[A]	VAL
1	A	86[B]	VAL
1	A	90	ASN
1	A	183	ASN
1	A	221	LEU
1	A	257	ASN
1	B	8	ASP
1	B	39	GLU
1	B	90	ASN
1	B	98	LYS
1	B	183	ASN
1	B	221	LEU
1	B	257	ASN
1	C	39	GLU
1	C	90	ASN
1	C	108	LYS
1	C	129	LEU
1	C	141	ARG
1	C	183	ASN
1	C	206	LEU
1	C	221	LEU
1	C	257	ASN
1	D	8	ASP
1	D	39	GLU
1	D	90	ASN
1	D	104	LYS
1	D	106	ASN
1	D	108	LYS
1	D	183	ASN
1	D	221	LEU
1	D	257	ASN
1	D	264	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (24) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	57	GLN
1	A	84	ASN
1	A	90	ASN
1	A	114	ASN
1	A	183	ASN
1	A	257	ASN
1	B	57	GLN
1	B	90	ASN
1	B	114	ASN
1	B	183	ASN
1	B	257	ASN
1	C	57	GLN
1	C	84	ASN
1	C	90	ASN
1	C	114	ASN
1	C	183	ASN
1	C	257	ASN
1	D	57	GLN
1	D	84	ASN
1	D	90	ASN
1	D	106	ASN
1	D	114	ASN
1	D	183	ASN
1	D	257	ASN

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 (i)

Of 12 ligands modelled in this entry, 8 are monoatomic - leaving 4 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#$|Z| > 2$	Counts	RMSZ	#$|Z| > 2$
2	PO4	B	1265	3	4,4,4	0.85	0	6,6,6	0.80	0
2	PO4	C	1265	3	4,4,4	0.89	0	6,6,6	0.38	0
2	PO4	D	1265	3	4,4,4	0.87	0	6,6,6	0.59	0
2	PO4	A	1265	3	4,4,4	0.76	0	6,6,6	0.47	0

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

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.

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(Å^2)	Q<0.9
1	A	264/286 (92%)	-0.45	2 (0%) 86	87	8, 14, 26, 36	0
1	B	264/286 (92%)	-0.36	3 (1%) 80	81	9, 15, 29, 47	0
1	C	264/286 (92%)	-0.35	6 (2%) 60	60	9, 15, 29, 47	0
1	D	264/286 (92%)	-0.31	5 (1%) 66	67	9, 15, 28, 46	0
All	All	1056/1144 (92%)	-0.37	16 (1%) 73	74	8, 15, 28, 47	0

All (16) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	263	PHE	5.6
1	D	106	ASN	5.3
1	C	106	ASN	5.0
1	D	264	GLU	4.4
1	C	105	ALA	3.6
1	D	107	GLY	3.5
1	A	263	PHE	2.9
1	C	107	GLY	2.7
1	B	106	ASN	2.7
1	C	224	ARG	2.6
1	C	108	LYS	2.5
1	B	263	PHE	2.2
1	C	263	PHE	2.2
1	B	261	MET	2.1
1	A	244	GLN	2.1
1	D	224	ARG	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 (i)

There are no monosaccharides in this entry.

6.4 Ligands (i)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	PO4	A	1265	5/5	0.97	0.16	18,22,23,24	0
2	PO4	C	1265	5/5	0.97	0.20	19,23,24,24	0
2	PO4	D	1265	5/5	0.97	0.21	15,21,23,24	0
2	PO4	B	1265	5/5	0.98	0.13	19,20,22,28	0
3	FE2	A	1266	1/1	0.99	0.05	18,18,18,18	0
3	FE2	A	1267	1/1	1.00	0.02	14,14,14,14	0
3	FE2	B	1266	1/1	1.00	0.04	19,19,19,19	0
3	FE2	B	1267	1/1	1.00	0.02	14,14,14,14	0
3	FE2	C	1266	1/1	1.00	0.02	14,14,14,14	0
3	FE2	C	1267	1/1	1.00	0.07	18,18,18,18	0
3	FE2	D	1266	1/1	1.00	0.02	13,13,13,13	0
3	FE2	D	1267	1/1	1.00	0.05	17,17,17,17	0

6.5 Other polymers (i)

There are no such residues in this entry.