



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 10, 2026 – 02:55 AM UTC

PDB ID : 1GXP / pdb_00001gxp
Title : PhoB effector domain in complex with pho box DNA.
Authors : Blanco, A.G.; Sola, M.; Gomis-Ruth, F.X.; Coll, M.
Deposited on : 2002-04-08
Resolution : 2.50 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 : 4-5-2 with Phenix2.0
Xtriage (Phenix) : **NOT EXECUTED**
EDS : **NOT EXECUTED**
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

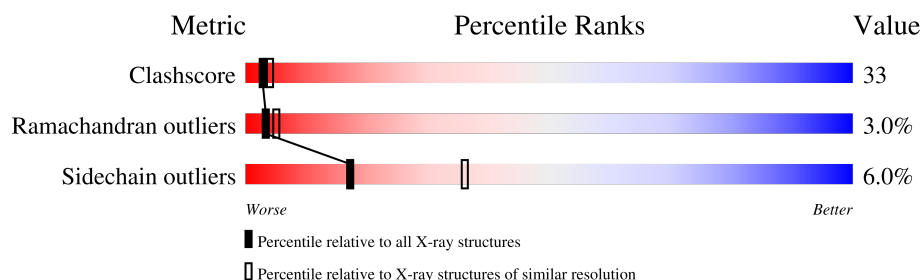
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.50 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))
Clashscore	190562	6492 (2.50-2.50)
Ramachandran outliers	187476	6378 (2.50-2.50)
Sidechain outliers	187428	6380 (2.50-2.50)

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 $\leq 5\%$.

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	106	52% 42% . .
1	B	106	46% 40% 9% 5%
1	E	106	59% 31% 5% . .
1	F	106	44% 42% 8% . .
2	C	23	. 91% .
2	G	23	13% 87%
3	D	23	9% 91%
3	H	23	9% 91%

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 5416 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 PHOSPHATE REGULON TRANSCRIPTIONAL REGULATORY PROTEIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	103	Total	C	N	O	S	19	0	0
			846	531	156	154	5			
1	B	101	Total	C	N	O	S	20	0	0
			834	523	154	152	5			
1	E	102	Total	C	N	O	S	16	0	0
			841	528	155	153	5			
1	F	102	Total	C	N	O	S	22	0	0
			841	528	155	153	5			

- Molecule 2 is a DNA chain called 5'-D(*GP*AP*GP*CP*TP*GP*TP*CP*AP*TP* AP*A P*AP*GP*TP*TP*GP*TP*CP*AP*CP*GP*G)-3'.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	C	23	Total	C	N	O	P	20	0	0
			473	226	89	136	22			
2	G	23	Total	C	N	O	P	20	0	0
			473	226	89	136	22			

- Molecule 3 is a DNA chain called 5'-D(*CP*CP*CP*GP*TP*GP*AP*CP*AP*AP* CP*T P*TP*TP*AP*TP*GP*AP*CP*AP*GP*CP*T)-3'.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	D	23	Total	C	N	O	P	5	0	0
			464	223	83	136	22			
3	H	23	Total	C	N	O	P	8	0	0
			464	223	83	136	22			

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	38	Total	O	0	0
			38	38		

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	B	31	Total 31	O 31	0	0
4	C	8	Total 8	O 8	0	0
4	D	17	Total 17	O 17	0	0
4	E	41	Total 41	O 41	0	0
4	F	30	Total 30	O 30	0	0
4	G	6	Total 6	O 6	0	0
4	H	9	Total 9	O 9	0	0

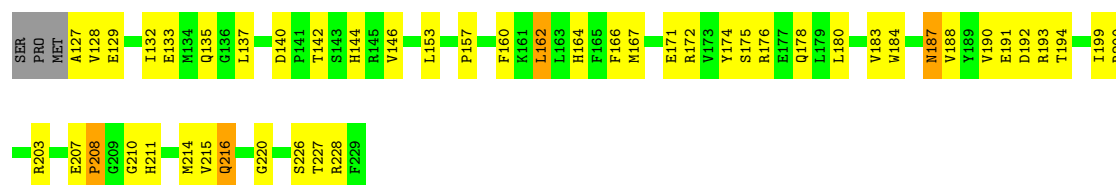
3 Residue-property plots

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. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

Note EDS was not executed.

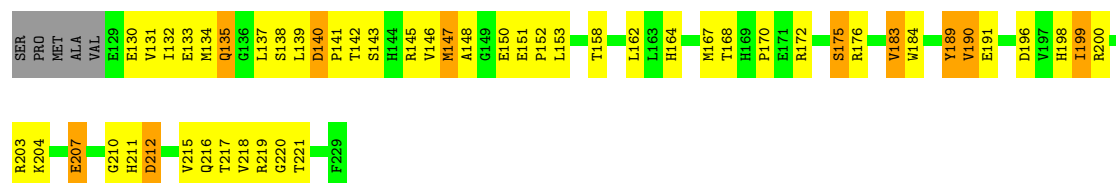
• Molecule 1: PHOSPHATE REGULON TRANSCRIPTIONAL REGULATORY PROTEIN

Chain A: 



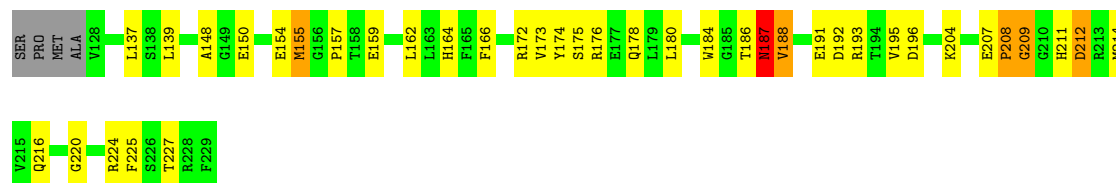
• Molecule 1: PHOSPHATE REGULON TRANSCRIPTIONAL REGULATORY PROTEIN

Chain B: 

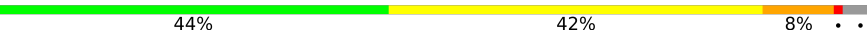


• Molecule 1: PHOSPHATE REGULON TRANSCRIPTIONAL REGULATORY PROTEIN

Chain E: 



• Molecule 1: PHOSPHATE REGULON TRANSCRIPTIONAL REGULATORY PROTEIN

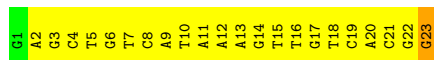
Chain F: 





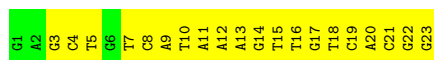
• Molecule 2: 5'-D(*GP*AP*GP*CP*TP*GP*TP*CP*AP*TP* AP*AP*AP*GP*TP*TP*GP*TP*CP*AP*CP*GP*G)-3'

Chain C: 91%



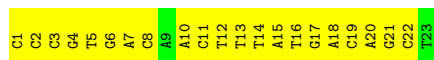
• Molecule 2: 5'-D(*GP*AP*GP*CP*TP*GP*TP*CP*AP*TP* AP*AP*AP*GP*TP*TP*GP*TP*CP*AP*CP*GP*G)-3'

Chain G: 13% 87%



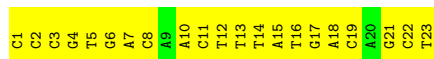
• Molecule 3: 5'-D(*CP*CP*CP*GP*TP*GP*AP*CP*AP*AP* CP*TP*TP*TP*AP*TP*GP*AP*CP*AP*GP*CP*T)-3'

Chain D: 9% 91%



• Molecule 3: 5'-D(*CP*CP*CP*GP*TP*GP*AP*CP*AP*AP* CP*TP*TP*TP*AP*TP*GP*AP*CP*AP*GP*CP*T)-3'

Chain H: 9% 91%



4 Data and refinement statistics

Xtriage (Phenix) and EDS were not executed - this section is therefore incomplete.

Property	Value	Source
Space group	P 61	Depositor
Cell constants a, b, c, α , β , γ	74.11Å 74.11Å 289.68Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	40.00 – 2.50	Depositor
% Data completeness (in resolution range)	100.0 (40.00-2.50)	Depositor
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
Refinement program	REFMAC	Depositor
R, R_{free}	0.244 , 0.289	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	5416	wwPDB-VP
Average B, all atoms (Å ²)	44.0	wwPDB-VP

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	0.52	0/866	1.06	4/1168 (0.3%)
1	B	0.52	0/854	1.07	9/1151 (0.8%)
1	E	0.49	0/861	1.04	4/1161 (0.3%)
1	F	0.52	0/861	1.10	7/1161 (0.6%)
2	C	0.31	0/531	0.76	1/819 (0.1%)
2	G	0.33	0/531	0.75	0/819
3	D	0.31	0/519	0.67	0/798
3	H	0.33	0/519	0.74	0/798
All	All	0.45	0/5542	0.94	25/7875 (0.3%)

There are no bond length outliers.

All (25) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	188	VAL	N-CA-C	8.54	121.76	111.09
1	F	130	GLU	N-CA-C	8.00	127.85	110.80
1	E	195	VAL	N-CA-C	-6.63	104.29	110.53
1	A	216	GLN	N-CA-C	6.60	119.99	109.24
1	E	216	GLN	N-CA-C	6.59	119.69	109.07
1	B	216	GLN	N-CA-C	6.47	120.38	109.76
2	C	23	DG	C4'-C3'-O3'	-6.47	100.30	110.00
1	B	145	ARG	N-CA-C	5.99	118.52	109.23
1	B	175	SER	N-CA-C	-5.97	102.49	110.55
1	F	140	ASP	CA-C-N	5.84	125.53	119.05
1	F	140	ASP	C-N-CA	5.84	125.53	119.05
1	B	140	ASP	CA-C-N	5.68	124.88	118.97
1	B	140	ASP	C-N-CA	5.68	124.88	118.97
1	B	183	VAL	N-CA-C	5.56	116.40	111.90
1	F	216	GLN	N-CA-C	5.43	118.33	109.59
1	F	145	ARG	N-CA-C	5.41	118.25	109.06
1	B	199	ILE	N-CA-C	-5.37	105.14	110.62
1	B	147	MET	N-CA-C	5.23	117.60	108.76
1	F	183	VAL	N-CA-C	5.22	116.13	111.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	207	GLU	N-CA-C	5.17	119.28	112.35
1	A	144	HIS	N-CA-C	-5.16	105.00	111.92
1	E	164	HIS	N-CA-C	-5.14	105.86	111.82
1	E	148	ALA	N-CA-C	-5.09	98.28	107.75
1	A	194	THR	N-CA-C	-5.05	105.96	111.82
1	F	201	ARG	N-CA-C	-5.01	105.71	111.07

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	846	0	825	46	0
1	B	834	0	811	50	0
1	E	841	0	820	36	0
1	F	841	0	820	53	0
2	C	473	0	261	35	0
2	G	473	0	261	33	0
3	D	464	0	261	38	0
3	H	464	0	261	37	0
4	A	38	0	0	3	0
4	B	31	0	0	4	0
4	C	8	0	0	1	0
4	D	17	0	0	5	0
4	E	41	0	0	4	0
4	F	30	0	0	3	0
4	G	6	0	0	0	0
4	H	9	0	0	2	0
All	All	5416	0	4320	305	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 33.

All (305) 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)
3:H:18:DA:H1'	3:H:19:DC:H5'	1.44	0.98
1:F:175:SER:H	1:F:178:GLN:NE2	1.61	0.97
2:C:21:DC:H1'	2:C:22:DG:H5'	1.45	0.94
1:F:175:SER:H	1:F:178:GLN:HE21	0.90	0.90
2:G:22:DG:H2''	2:G:23:DG:H5''	1.52	0.89
3:D:17:DG:H1'	3:D:18:DA:H5''	1.56	0.88
2:G:12:DA:H2''	2:G:13:DA:H5'	1.55	0.87
2:C:12:DA:H2''	2:C:13:DA:H5'	1.57	0.86
1:A:157:PRO:HG2	2:C:5:DT:OP1	1.75	0.86
1:F:175:SER:N	1:F:178:GLN:HE21	1.74	0.84
2:C:11:DA:H1'	2:C:12:DA:H5''	1.60	0.83
3:H:21:DG:H2''	3:H:22:DC:OP2	1.80	0.81
1:A:146:VAL:HG12	1:A:153:LEU:HD12	1.61	0.81
2:C:5:DT:H2''	2:C:6:DG:C8	2.17	0.80
2:G:3:DG:H1'	2:G:4:DC:H5''	1.64	0.79
3:D:7:DA:H3'	4:D:2009:HOH:O	1.82	0.79
2:G:15:DT:H2''	2:G:16:DT:H5'	1.65	0.78
2:C:18:DT:H2''	2:C:19:DC:H5'	1.66	0.77
1:F:197:VAL:HG21	2:G:18:DT:H72	1.66	0.77
3:D:10:DA:H1'	3:D:11:DC:H5'	1.66	0.77
2:G:10:DT:H2''	2:G:11:DA:OP2	1.86	0.76
1:B:146:VAL:HG12	1:B:153:LEU:HD12	1.65	0.76
3:D:18:DA:H1'	3:D:19:DC:H5'	1.67	0.76
2:C:4:DC:H2''	2:C:5:DT:H5'	1.68	0.75
2:C:3:DG:H1'	2:C:4:DC:H5''	1.67	0.75
1:B:175:SER:HB3	4:B:2028:HOH:O	1.88	0.74
2:C:7:DT:H2''	2:C:8:DC:H5'	1.70	0.73
1:F:200:ARG:NH2	3:H:6:DG:OP2	2.22	0.72
1:E:172:ARG:HD3	1:E:174:TYR:OH	1.89	0.72
1:F:131:VAL:HG13	1:F:140:ASP:HA	1.72	0.72
1:A:175:SER:H	1:A:178:GLN:HE21	1.37	0.71
1:A:175:SER:OG	1:A:178:GLN:HG3	1.91	0.70
1:B:158:THR:N	4:B:2012:HOH:O	2.23	0.70
1:A:132:ILE:CG2	1:A:167:MET:HE2	2.22	0.70
3:H:6:DG:H2''	3:H:7:DA:OP2	1.92	0.70
1:F:135:GLN:CD	1:F:227:THR:HB	2.17	0.69
1:A:129:GLU:HB3	4:A:2004:HOH:O	1.91	0.69
1:B:135:GLN:HE21	1:B:135:GLN:N	1.90	0.69
3:D:15:DA:H1'	3:D:16:DT:H5''	1.75	0.69
3:D:1:DC:H2''	3:D:2:DC:H5''	1.74	0.68
1:A:132:ILE:HG21	1:A:167:MET:HB3	1.76	0.68
1:A:132:ILE:HG22	1:A:167:MET:HE2	1.75	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:G:22:DG:C2'	2:G:23:DG:H5''	2.25	0.67
2:G:21:DC:H2''	2:G:22:DG:OP2	1.95	0.67
3:D:18:DA:H2''	3:D:19:DC:O5'	1.95	0.67
1:E:214:MET:CE	1:E:227:THR:HG22	2.25	0.66
3:H:6:DG:H1'	3:H:7:DA:H5''	1.78	0.66
2:C:18:DT:H2''	2:C:19:DC:C5'	2.26	0.66
3:D:2:DC:O5'	3:D:2:DC:H6	1.79	0.66
2:G:12:DA:C2'	2:G:13:DA:H5'	2.24	0.66
1:F:214:MET:HE3	1:F:227:THR:HA	1.77	0.65
3:H:10:DA:H5''	4:H:2004:HOH:O	1.97	0.65
1:B:147:MET:HG2	1:B:152:PRO:HA	1.79	0.65
2:G:7:DT:H2''	2:G:8:DC:H5'	1.78	0.64
3:D:20:DA:H2''	3:D:21:DG:OP2	1.97	0.64
1:F:228:ARG:NH1	4:F:2029:HOH:O	2.30	0.64
2:C:15:DT:H1'	2:C:16:DT:H5'	1.81	0.63
3:H:10:DA:H2''	3:H:11:DC:C5'	2.28	0.63
3:H:13:DT:H1'	3:H:14:DT:H5''	1.79	0.63
2:C:12:DA:H2''	2:C:13:DA:C5'	2.28	0.63
1:A:172:ARG:HG3	1:B:142:THR:HG22	1.81	0.63
1:E:207:GLU:O	1:E:209:GLY:N	2.31	0.63
2:G:18:DT:H4'	2:G:19:DC:OP1	1.99	0.62
1:F:175:SER:OG	1:F:178:GLN:HG3	2.00	0.62
1:A:132:ILE:N	1:A:132:ILE:HD12	2.15	0.62
3:H:10:DA:H1'	3:H:11:DC:H5''	1.82	0.62
3:D:2:DC:H2''	3:D:3:DC:H5'	1.82	0.61
2:C:10:DT:H2''	2:C:11:DA:OP2	2.00	0.61
1:E:137:LEU:HB2	1:E:211:HIS:CD2	2.36	0.60
1:E:212:ASP:OD2	1:E:212:ASP:N	2.33	0.60
2:C:22:DG:H1'	2:C:23:DG:H5'	1.82	0.60
1:A:228:ARG:HE	1:B:147:MET:HE1	1.67	0.60
3:H:1:DC:H2'	4:H:2001:HOH:O	2.00	0.60
3:D:5:DT:H2''	3:D:6:DG:C8	2.36	0.60
2:C:4:DC:H2'	2:C:5:DT:H71	1.84	0.59
3:D:6:DG:H2''	3:D:7:DA:OP2	2.03	0.58
3:D:7:DA:H2''	3:D:8:DC:C5'	2.33	0.58
2:C:8:DC:H5'	2:C:8:DC:H6	1.69	0.58
2:G:18:DT:H1'	2:G:19:DC:C6	2.38	0.58
1:A:199:ILE:HG23	1:A:215:VAL:HG11	1.84	0.58
2:C:16:DT:H2''	2:C:17:DG:C8	2.39	0.57
1:B:219:ARG:NH1	4:B:2026:HOH:O	2.35	0.57
1:A:183:VAL:HB	1:A:184:TRP:CE3	2.38	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:137:LEU:HB2	1:F:211:HIS:CD2	2.40	0.57
1:F:212:ASP:C	1:F:214:MET:H	2.13	0.57
1:E:214:MET:O	1:E:225:PHE:HA	2.05	0.57
1:B:212:ASP:OD2	1:B:212:ASP:N	2.38	0.56
3:D:7:DA:H1'	3:D:8:DC:H5''	1.88	0.56
3:H:7:DA:H5'	3:H:7:DA:H8	1.71	0.56
1:F:207:GLU:N	1:F:208:PRO:HD2	2.20	0.56
3:H:10:DA:H2''	3:H:11:DC:H5''	1.87	0.56
3:H:4:DG:H1'	3:H:5:DT:H5''	1.87	0.55
1:A:146:VAL:CG1	1:A:153:LEU:HD12	2.35	0.55
1:E:173:VAL:HG12	1:F:142:THR:O	2.06	0.55
1:B:139:LEU:C	1:B:139:LEU:HD23	2.32	0.55
3:H:10:DA:C2'	3:H:11:DC:H5''	2.37	0.55
3:D:7:DA:H2''	3:D:8:DC:H5''	1.90	0.54
1:E:175:SER:OG	1:E:178:GLN:HG3	2.08	0.54
3:H:18:DA:H1'	3:H:19:DC:C5'	2.30	0.54
2:G:16:DT:H2''	2:G:17:DG:C8	2.42	0.54
1:A:207:GLU:O	1:A:210:GLY:N	2.31	0.54
1:B:183:VAL:HB	1:B:184:TRP:CE3	2.42	0.54
3:D:17:DG:H2''	3:D:18:DA:OP2	2.07	0.54
3:D:17:DG:C1'	3:D:18:DA:H5''	2.34	0.54
3:D:21:DG:H5''	4:D:2017:HOH:O	2.07	0.54
3:D:21:DG:H1'	3:D:22:DC:H5''	1.89	0.54
2:C:7:DT:H2''	2:C:8:DC:C5'	2.36	0.54
2:C:17:DG:H2''	2:C:18:DT:H5''	1.90	0.53
2:C:20:DA:H1'	2:C:21:DC:H5'	1.89	0.53
1:E:172:ARG:HD3	1:E:174:TYR:CZ	2.43	0.53
1:B:140:ASP:OD2	1:B:140:ASP:C	2.51	0.53
3:D:7:DA:C2'	3:D:8:DC:H5''	2.39	0.53
3:H:5:DT:H2''	3:H:6:DG:C8	2.44	0.53
2:G:20:DA:H1'	2:G:21:DC:H5'	1.90	0.53
1:B:199:ILE:HG23	1:B:215:VAL:CG1	2.38	0.53
1:F:207:GLU:N	1:F:208:PRO:CD	2.72	0.53
1:F:182:HIS:HE1	4:F:2021:HOH:O	1.92	0.53
1:B:151:GLU:OE1	1:F:213:ARG:NH1	2.42	0.52
1:F:150:GLU:O	1:F:150:GLU:HG3	2.09	0.52
1:A:214:MET:HE3	1:A:227:THR:HG22	1.90	0.52
1:B:130:GLU:HG3	1:B:131:VAL:H	1.74	0.52
3:D:1:DC:N4	4:D:2001:HOH:O	2.42	0.52
1:E:186:THR:HG22	1:E:187:ASN:N	2.24	0.52
1:F:193:ARG:NH2	3:H:3:DC:OP2	2.31	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:204:LYS:HA	1:B:207:GLU:OE2	2.09	0.52
2:C:8:DC:H5'	2:C:8:DC:C6	2.45	0.52
3:H:7:DA:H2''	3:H:8:DC:O5'	2.10	0.52
2:G:9:DA:H1'	2:G:10:DT:H5'	1.92	0.52
1:A:175:SER:H	1:A:178:GLN:NE2	2.06	0.52
2:C:8:DC:H2''	2:C:9:DA:C8	2.45	0.51
2:C:19:DC:H2''	2:C:20:DA:C8	2.45	0.51
1:F:162:LEU:HD22	1:F:166:PHE:CE2	2.46	0.51
1:A:208:PRO:HA	4:A:2027:HOH:O	2.09	0.51
2:C:3:DG:H8	4:C:2003:HOH:O	1.92	0.51
2:G:12:DA:H1'	2:G:13:DA:C5'	2.41	0.51
2:C:17:DG:C2'	2:C:18:DT:H5''	2.40	0.50
2:G:10:DT:H1'	2:G:11:DA:C8	2.47	0.50
1:B:218:VAL:HG12	1:B:221:THR:HB	1.94	0.50
1:E:180:LEU:O	1:E:184:TRP:HB2	2.11	0.50
1:A:160:PHE:C	1:A:160:PHE:CD2	2.90	0.50
1:A:207:GLU:HB2	1:A:208:PRO:HD3	1.94	0.50
3:D:21:DG:H2''	3:D:22:DC:C5'	2.41	0.50
2:G:11:DA:H1'	2:G:12:DA:H5''	1.94	0.50
1:B:200:ARG:NH2	3:D:6:DG:OP2	2.41	0.50
1:A:228:ARG:HE	1:B:147:MET:CE	2.25	0.50
2:C:21:DC:H1'	2:C:22:DG:C5'	2.31	0.50
3:D:17:DG:H1'	3:D:18:DA:C5'	2.35	0.50
1:A:199:ILE:HG23	1:A:215:VAL:CG1	2.41	0.50
1:B:146:VAL:CG1	1:B:153:LEU:HD12	2.38	0.50
1:E:187:ASN:O	1:E:188:VAL:C	2.55	0.50
1:F:229:PHE:N	1:F:229:PHE:CD2	2.77	0.50
1:F:212:ASP:C	1:F:214:MET:N	2.70	0.49
1:A:214:MET:CE	1:A:227:THR:HG22	2.42	0.49
1:B:158:THR:HG21	1:B:198:HIS:CE1	2.48	0.49
2:C:7:DT:H6	2:C:7:DT:H5'	1.77	0.49
1:A:183:VAL:HB	1:A:184:TRP:HE3	1.76	0.49
2:C:17:DG:H2''	2:C:18:DT:C5'	2.43	0.49
3:D:13:DT:H1'	3:D:14:DT:H5''	1.94	0.49
1:F:175:SER:N	1:F:178:GLN:NE2	2.45	0.49
3:D:2:DC:H2''	3:D:3:DC:C5'	2.43	0.49
3:D:10:DA:H5''	4:D:2012:HOH:O	2.12	0.49
3:H:7:DA:H2''	3:H:8:DC:C5'	2.43	0.49
3:H:15:DA:H1'	3:H:16:DT:H5''	1.94	0.49
2:C:2:DA:H2''	2:C:3:DG:OP2	2.13	0.49
1:A:228:ARG:HH21	1:A:228:ARG:HG3	1.78	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:129:GLU:N	1:F:129:GLU:OE2	2.46	0.48
3:H:13:DT:H2''	3:H:14:DT:C5'	2.43	0.48
1:B:131:VAL:HG22	1:B:140:ASP:HB2	1.94	0.48
1:F:197:VAL:CG2	2:G:18:DT:H72	2.38	0.48
1:F:218:VAL:HG12	1:F:221:THR:HB	1.95	0.48
1:A:216:GLN:OE1	1:A:226:SER:HB3	2.14	0.48
3:H:17:DG:H2''	3:H:18:DA:OP2	2.12	0.48
1:B:147:MET:HG2	1:B:152:PRO:CA	2.44	0.48
1:F:133:GLU:C	1:F:134:MET:HG3	2.39	0.48
3:H:13:DT:H2''	3:H:14:DT:H5'	1.94	0.48
1:B:132:ILE:HG22	1:B:167:MET:HE2	1.95	0.48
3:D:16:DT:H2''	3:D:17:DG:C8	2.49	0.48
2:G:8:DC:H5'	2:G:8:DC:H6	1.78	0.48
1:E:214:MET:HE3	1:E:227:THR:HG22	1.95	0.47
1:B:175:SER:HA	1:B:221:THR:O	2.14	0.47
1:F:154:GLU:O	1:F:155:MET:HB3	2.14	0.47
1:A:187:ASN:CG	1:A:187:ASN:O	2.57	0.47
1:A:216:GLN:HG2	4:A:2031:HOH:O	2.13	0.47
2:G:14:DG:H1'	2:G:15:DT:H5''	1.96	0.47
1:B:133:GLU:C	1:B:134:MET:HG3	2.39	0.47
2:C:4:DC:C2'	2:C:5:DT:H71	2.44	0.47
1:E:155:MET:HA	4:E:2015:HOH:O	2.13	0.47
1:E:157:PRO:HA	4:E:2009:HOH:O	2.14	0.47
1:A:190:VAL:HG12	1:A:191:GLU:N	2.29	0.46
1:F:175:SER:HB2	4:F:2020:HOH:O	2.15	0.46
1:B:189:TYR:CD1	1:B:190:VAL:N	2.84	0.46
2:C:17:DG:H1'	2:C:18:DT:H5''	1.98	0.46
1:E:154:GLU:O	1:E:155:MET:HB3	2.15	0.46
1:F:157:PRO:HG2	2:G:16:DT:OP1	2.15	0.46
3:H:6:DG:H1'	3:H:7:DA:C5'	2.44	0.46
1:E:220:GLY:N	3:H:14:DT:OP1	2.48	0.46
1:F:204:LYS:O	1:F:207:GLU:HG3	2.15	0.46
1:E:150:GLU:HB3	4:E:2012:HOH:O	2.14	0.46
1:E:207:GLU:HB2	1:E:208:PRO:HD3	1.95	0.46
1:A:190:VAL:HG13	2:C:7:DT:OP2	2.15	0.46
1:E:186:THR:HG22	1:E:187:ASN:H	1.80	0.46
1:F:200:ARG:NH2	1:F:204:LYS:NZ	2.63	0.46
3:H:10:DA:H2''	3:H:11:DC:H5'	1.96	0.46
1:B:135:GLN:HE21	1:B:135:GLN:CA	2.28	0.46
1:E:207:GLU:N	1:E:208:PRO:CD	2.78	0.46
3:H:7:DA:H5'	3:H:7:DA:C8	2.51	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:H:16:DT:H2''	3:H:17:DG:C8	2.50	0.46
1:F:166:PHE:HB3	1:F:225:PHE:CB	2.46	0.45
2:G:20:DA:H1'	2:G:21:DC:C5'	2.46	0.45
1:A:228:ARG:HG2	1:B:150:GLU:OE1	2.16	0.45
1:E:207:GLU:C	1:E:209:GLY:H	2.21	0.45
2:G:4:DC:H2'	2:G:5:DT:H71	1.99	0.45
1:A:171:GLU:O	1:B:143:SER:HB3	2.16	0.45
1:B:176:ARG:HG3	1:B:176:ARG:HH11	1.82	0.45
1:B:176:ARG:NE	1:B:196:ASP:OD2	2.43	0.45
1:E:186:THR:C	1:E:188:VAL:H	2.24	0.45
1:F:203:ARG:NH1	1:F:215:VAL:O	2.45	0.45
2:G:3:DG:C1'	2:G:4:DC:H5''	2.42	0.45
1:B:135:GLN:CA	1:B:135:GLN:NE2	2.80	0.45
3:D:21:DG:H2''	3:D:22:DC:H5'	1.99	0.45
1:F:197:VAL:HG21	2:G:18:DT:C7	2.43	0.45
1:A:162:LEU:HD22	1:A:166:PHE:CE2	2.52	0.45
1:F:176:ARG:O	1:F:180:LEU:HG	2.17	0.45
3:D:4:DG:H1'	3:D:5:DT:H5''	1.99	0.44
1:B:199:ILE:HG23	1:B:215:VAL:HG11	1.99	0.44
2:G:12:DA:H1'	2:G:13:DA:H5'	2.00	0.44
1:F:140:ASP:HA	1:F:141:PRO:HD3	1.85	0.44
3:D:12:DT:H2''	3:D:13:DT:OP2	2.18	0.44
1:B:132:ILE:CG2	1:B:167:MET:HE2	2.48	0.44
1:F:180:LEU:O	1:F:184:TRP:HB2	2.18	0.44
1:F:169:HIS:N	1:F:170:PRO:CD	2.80	0.44
3:H:2:DC:H1'	3:H:3:DC:H5''	1.98	0.44
1:A:228:ARG:NE	1:B:147:MET:HE1	2.32	0.44
3:H:15:DA:H2''	3:H:16:DT:C5'	2.48	0.44
1:B:191:GLU:O	1:B:191:GLU:HG3	2.17	0.43
1:A:220:GLY:N	3:D:14:DT:OP1	2.41	0.43
1:E:176:ARG:NE	1:E:196:ASP:OD2	2.51	0.43
1:E:186:THR:O	1:E:188:VAL:N	2.51	0.43
1:F:131:VAL:HG13	1:F:140:ASP:CA	2.44	0.43
1:F:199:ILE:HG23	1:F:215:VAL:HG11	1.99	0.43
1:A:140:ASP:OD2	1:A:142:THR:HB	2.18	0.43
1:A:228:ARG:HG3	1:A:228:ARG:NH2	2.33	0.43
1:B:207:GLU:O	1:B:210:GLY:N	2.41	0.43
1:E:209:GLY:HA3	1:E:211:HIS:CE1	2.53	0.43
2:C:14:DG:H1'	2:C:15:DT:H5''	1.99	0.43
1:E:139:LEU:HD23	1:E:139:LEU:C	2.44	0.43
1:B:220:GLY:N	3:D:3:DC:OP1	2.47	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:206:LEU:C	1:F:208:PRO:HD2	2.43	0.43
1:A:137:LEU:HB2	1:A:211:HIS:CD2	2.54	0.43
1:B:203:ARG:HD3	4:D:2008:HOH:O	2.17	0.43
1:F:132:ILE:HG21	1:F:167:MET:HB3	2.01	0.43
1:A:127:ALA:HA	1:A:164:HIS:HE1	1.83	0.43
1:E:176:ARG:HG3	1:E:176:ARG:HH11	1.84	0.43
3:H:11:DC:H2'	3:H:12:DT:H72	2.01	0.43
1:F:134:MET:SD	1:F:225:PHE:HE1	2.42	0.43
3:H:15:DA:H2''	3:H:16:DT:H5'	2.01	0.42
2:C:19:DC:H5'	2:C:19:DC:H6	1.83	0.42
1:E:191:GLU:HB2	4:E:2031:HOH:O	2.18	0.42
2:G:7:DT:H2''	2:G:8:DC:C5'	2.46	0.42
3:D:2:DC:O5'	3:D:2:DC:C6	2.65	0.42
1:E:172:ARG:NH1	1:E:174:TYR:OH	2.53	0.42
1:A:132:ILE:N	1:A:132:ILE:CD1	2.82	0.42
1:B:137:LEU:HB2	1:B:211:HIS:CD2	2.53	0.42
1:B:183:VAL:HB	1:B:184:TRP:HE3	1.82	0.42
1:B:200:ARG:C	1:B:200:ARG:HD3	2.43	0.42
1:A:172:ARG:HD3	1:A:174:TYR:OH	2.19	0.42
3:D:15:DA:C1'	3:D:16:DT:H5''	2.48	0.42
1:B:132:ILE:O	1:B:138:SER:HA	2.20	0.42
1:B:148:ALA:HB2	1:B:153:LEU:HD11	2.01	0.42
1:B:217:THR:HG22	1:B:218:VAL:N	2.34	0.42
1:E:204:LYS:HB2	1:E:204:LYS:HE3	1.73	0.42
1:B:131:VAL:HG22	1:B:140:ASP:CB	2.50	0.42
1:F:166:PHE:HB3	1:F:225:PHE:HB2	2.02	0.42
2:G:8:DC:H2''	2:G:9:DA:C8	2.55	0.42
3:D:13:DT:H2''	3:D:14:DT:OP2	2.18	0.42
3:H:10:DA:C1'	3:H:11:DC:H5''	2.47	0.42
1:E:193:ARG:HA	1:E:196:ASP:OD2	2.20	0.41
1:F:214:MET:O	1:F:225:PHE:HA	2.20	0.41
2:G:19:DC:H6	2:G:19:DC:H5'	1.84	0.41
1:A:180:LEU:HD23	1:A:180:LEU:HA	1.74	0.41
1:A:203:ARG:O	1:A:207:GLU:HG3	2.20	0.41
1:B:140:ASP:HA	1:B:141:PRO:HD3	1.83	0.41
1:E:224:ARG:NH1	1:F:143:SER:O	2.46	0.41
2:G:20:DA:H2''	2:G:21:DC:OP2	2.20	0.41
1:B:170:PRO:HA	4:B:2016:HOH:O	2.20	0.41
2:C:15:DT:H2''	2:C:16:DT:O5'	2.20	0.41
1:A:200:ARG:NH1	3:D:17:DG:OP2	2.53	0.41
1:F:140:ASP:HB3	1:F:143:SER:OG	2.21	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:220:GLY:N	3:H:3:DC:OP1	2.51	0.41
1:E:166:PHE:HB3	1:E:225:PHE:CG	2.56	0.41
1:A:190:VAL:CG1	1:A:191:GLU:N	2.83	0.41
3:H:7:DA:H2''	3:H:8:DC:H5'	2.02	0.41
1:B:164:HIS:HD2	1:B:164:HIS:O	2.04	0.41
1:F:158:THR:O	1:F:161:LYS:HB2	2.20	0.41
1:F:207:GLU:HA	1:F:212:ASP:OD2	2.21	0.40
1:F:207:GLU:O	1:F:208:PRO:C	2.64	0.40
3:H:7:DA:H1'	3:H:8:DC:H5'	2.03	0.40
3:H:22:DC:H2''	3:H:23:DT:OP2	2.22	0.40
1:A:176:ARG:NH2	1:A:193:ARG:NH2	2.70	0.40
1:F:200:ARG:NH2	1:F:204:LYS:HZ1	2.18	0.40
2:G:3:DG:H1'	2:G:4:DC:C5'	2.41	0.40
1:E:176:ARG:HD3	1:E:192:ASP:HB3	2.03	0.40
2:G:21:DC:C2'	2:G:22:DG:OP2	2.68	0.40
3:D:10:DA:H2''	3:D:11:DC:OP2	2.22	0.40
1:E:166:PHE:HB3	1:E:225:PHE:CB	2.51	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	101/106 (95%)	89 (88%)	10 (10%)	2 (2%)	6	10
1	B	99/106 (93%)	90 (91%)	8 (8%)	1 (1%)	12	24
1	E	100/106 (94%)	86 (86%)	9 (9%)	5 (5%)	1	2
1	F	100/106 (94%)	87 (87%)	9 (9%)	4 (4%)	2	3
All	All	400/424 (94%)	352 (88%)	36 (9%)	12 (3%)	3	5

All (12) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	F	130	GLU
1	A	192	ASP
1	B	190	VAL
1	E	187	ASN
1	E	208	PRO
1	F	208	PRO
1	E	155	MET
1	E	209	GLY
1	A	128	VAL
1	F	155	MET
1	F	213	ARG
1	E	188	VAL

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	92/95 (97%)	87 (95%)	5 (5%)	20	41
1	B	91/95 (96%)	85 (93%)	6 (7%)	15	32
1	E	92/95 (97%)	88 (96%)	4 (4%)	26	51
1	F	92/95 (97%)	85 (92%)	7 (8%)	12	26
All	All	367/380 (97%)	345 (94%)	22 (6%)	17	36

All (22) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	133	GLU
1	A	135	GLN
1	A	162	LEU
1	A	187	ASN
1	A	208	PRO
1	B	135	GLN
1	B	162	LEU
1	B	168	THR
1	B	172	ARG
1	B	189	TYR

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Mol	Chain	Res	Type
1	B	212	ASP
1	E	159	GLU
1	E	162	LEU
1	E	187	ASN
1	E	212	ASP
1	F	131	VAL
1	F	133	GLU
1	F	135	GLN
1	F	162	LEU
1	F	172	ARG
1	F	208	PRO
1	F	212	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (11) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	164	HIS
1	A	178	GLN
1	B	135	GLN
1	B	144	HIS
1	B	164	HIS
1	E	181	ASN
1	F	135	GLN
1	F	144	HIS
1	F	178	GLN
1	F	181	ASN
1	F	211	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

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 ⓘ

EDS was not executed - this section is therefore empty.

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

EDS was not executed - this section is therefore empty.

6.3 Carbohydrates ⓘ

EDS was not executed - this section is therefore empty.

6.4 Ligands ⓘ

EDS was not executed - this section is therefore empty.

6.5 Other polymers ⓘ

EDS was not executed - this section is therefore empty.