Full wwPDB X-ray Structure Validation Report (i)

Sep 7, 2023 – 07:23 AM EDT

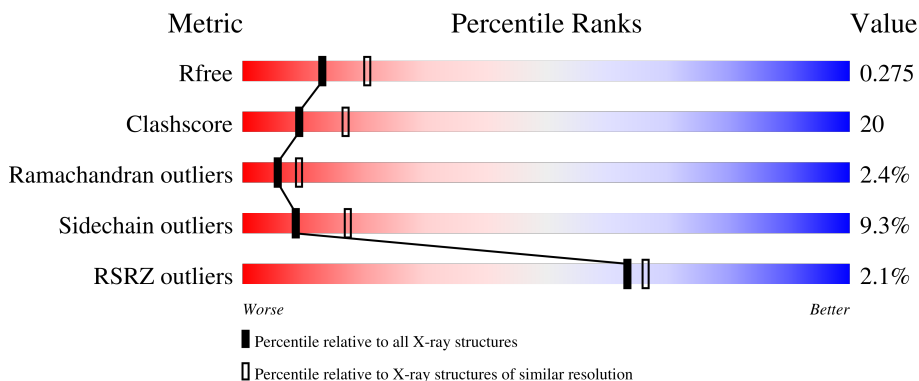|		
PDB ID	:	4G3I
Title	:	Crystal structure of Dpo4 in complex with DNA duplex
Authors	:	Yan, Y.Y.; Gan, J.H.; Huang, Z.
Deposited on	:	2012-07-14
Resolution	:	2.50 Å(reported)

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 2.50 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.
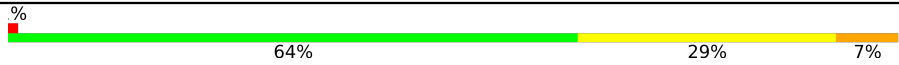
Metric	Percentile Ranks	Value
Rfree		0.275
Clashscore		20
Ramachandran outliers		2.4%
Sidechain outliers		9.3%
RSRZ outliers		2.1%

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	4661 (2.50-2.50)
Clashscore	141614	5346 (2.50-2.50)
Ramachandran outliers	138981	5231 (2.50-2.50)
Sidechain outliers	138945	5233 (2.50-2.50)
RSRZ outliers	127900	4559 (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 <=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	C	16	19% 25% 19% 38%
1	E	16	6% 38% 19% 38%
2	D	13	8% 31% 23% 38%
2	F	13	46% 15% 38%
3	A	342	3% 61% 32% 6% ·

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Mol	Chain	Length	Quality of chain
3	B	342	

2 Entry composition ⓘ

There are 5 unique types of molecules in this entry. The entry contains 6238 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 DNA chain called DNA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	C	10	Total	C	N	O	P	0	0	0
			198	96	33	60	9			
1	E	10	Total	C	N	O	P	0	0	0
			198	96	33	60	9			

- Molecule 2 is a DNA chain called DNA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	D	8	Total	C	N	O	P	0	0	0
			163	78	33	45	7			
2	F	8	Total	C	N	O	P	0	0	0
			163	78	33	45	7			

- Molecule 3 is a protein called DNA polymerase IV.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	A	342	Total	C	N	O	S	0	0	0
			2750	1763	473	507	7			
3	B	341	Total	C	N	O	S	0	0	0
			2744	1760	472	505	7			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	0	SER	-	expression tag	UNP Q97W02
B	0	SER	-	expression tag	UNP Q97W02

- Molecule 4 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	1	Total	Ca	0	0
			1	1		

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W O R L D W I D E
wwPDB
PROTEIN DATA BANK

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	B	1	Total 1	Ca 1	0	0

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	C	1	Total 1	O 1	0	0
5	A	16	Total 16	O 16	0	0
5	B	3	Total 3	O 3	0	0

3 Residue-property plots (i)

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: DNA

Chain C:

• Molecule 1: DNA

Chain E:

• Molecule 2: DNA

Chain D:

• Molecule 2: DNA

Chain F:

• Molecule 3: DNA polymerase IV

Chain A:

G215 M216 I217 G218 E219 Y224 L228 Y233 N234 E235 P236 I237 V241 R242 K243 S244 I245 I248 M251 K252 R253 N254 L258 I261 Y264 L265 F266 R267 A268 I269 E270 E271 S272 Y273 Y274 K275 L276 I280 P281 I284 V289 T290 E291 D292 L293 D294 I295

R298 G299 R300 T301 F302 P303 H304 G305 K308 E309 T310 A311 Y312 S313 E314 L319 Q320 K321 I322 L323 R328 K329 I330 R331 R332 I333 G334 V335 R336 F337 F340 I341

• Molecule 3: DNA polymerase IV

%

Chain B: 64%   29%   7%

SER M1 V6 D7 F8 D9 Y10 F11 Y12 A13 Q14 L19 P27 R36 F37 E38 D39 S40 T45 Y48 E49 A50 R51 K52 L68 P69 N70 A71 E79 V80 Y81 Q82 Q83 V84 S85 I88 M89 E97 I101 A102 S103 E106 A107 Y108 R116 Y122

N123 L124 G125 L126 K131 E134 I138 T139 V140 T141 K146 N147 F150 A151 K152 G162 I166 E170 V171 L174 I175 R176 E177 L178 D179 I180 A181 D182 V183 I186 G187 N188 I189 T190 A191 E192 I199 N200 K201 L202 V203 D204 T205 I208 E209 K212

M216 K221 Y224 S227 D231 P236 I237 R238 I245 G246 R247 I248 V249 T250 M251 K252 R253 N254 S255 R256 N257 L258 E259 E260 I261 K262 P263 Y264 I269 E270 E271 S272 K275 L276 D277 K278 R279 V289 T290 E291 D292 L293 D294 R300 K308 E314 S315 V316

Q320 L323 R328 K329 I330 R331 R332 I333 G334 V335 R336 F337 I341

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	52.47Å 52.63Å 99.44Å 75.40° 80.35° 70.97°	Depositor
Resolution (Å)	95.81 – 2.50 28.39 – 2.50	Depositor EDS
% Data completeness (in resolution range)	97.1 (95.81-2.50) 97.1 (28.39-2.50)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.08	Depositor
$< I/\sigma(I) >$ [1]	4.78 (at 2.51Å)	Xtriage
Refinement program	REFMAC 5.5.0109	Depositor
R, R_{free}	0.241 , 0.294 0.251 , 0.275	Depositor DCC
R_{free} test set	1650 reflections (5.07%)	wwPDB-VP
Wilson B-factor (Å^2)	53.7	Xtriage
Anisotropy	0.168	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 11.7	EDS
L-test for twinning[2]	$< \|L\| > = 0.45, < L^2 > = 0.28$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.90	EDS
Total number of atoms	6238	wwPDB-VP
Average B, all atoms (Å^2)	33.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 15.57% 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 (i)

5.1 Standard geometry (i)

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

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	C	1.38	1/220 (0.5%)	2.10	7/337 (2.1%)
1	E	1.30	0/220	2.32	16/337 (4.7%)
2	D	1.35	0/183	2.15	10/281 (3.6%)
2	F	1.32	1/183 (0.5%)	2.28	16/281 (5.7%)
3	A	0.84	2/2789 (0.1%)	0.85	1/3744 (0.0%)
3	B	0.86	0/2783	0.86	1/3736 (0.0%)
All	All	0.93	4/6378 (0.1%)	1.15	51/8716 (0.6%)

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	F	8	DT	C5-C7	5.34	1.53	1.50
3	A	106	GLU	CB-CG	5.24	1.62	1.52
3	A	79	GLU	CG-CD	5.09	1.59	1.51
1	C	11	DG	C3'-O3'	-5.01	1.37	1.44

All (51) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	12	DC	O4'-C4'-C3'	-10.35	99.79	106.00
2	D	7	DC	N3-C2-O2	-10.15	114.79	121.90
1	E	7	DC	O4'-C1'-N1	9.74	114.82	108.00
2	D	7	DC	N1-C2-O2	9.47	124.58	118.90
1	C	12	DC	N1-C2-O2	9.30	124.48	118.90
1	E	8	DT	O4'-C1'-N1	9.15	114.40	108.00
1	C	9	DT	O4'-C1'-N1	8.90	114.23	108.00
1	E	8	DT	C3'-C2'-C1'	-8.28	92.56	102.50
2	F	10	DC	C1'-O4'-C4'	-8.23	101.87	110.10
1	E	6	DC	P-O3'-C3'	8.02	129.33	119.70
1	E	6	DC	N1-C2-O2	8.00	123.70	118.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	4	DG	C3'-C2'-C1'	-7.98	92.92	102.50
1	E	8	DT	C1'-O4'-C4'	-7.92	102.18	110.10
2	F	6	DG	C5-C6-N1	7.79	115.40	111.50
1	E	12	DC	N3-C4-C5	7.55	124.92	121.90
1	C	13	DC	O4'-C1'-N1	-7.51	102.74	108.00
2	D	11	DA	P-O3'-C3'	7.10	128.22	119.70
2	F	6	DG	N1-C6-O6	-6.74	115.86	119.90
1	E	13	DC	O4'-C1'-C2'	6.67	111.24	105.90
1	E	6	DC	N3-C2-O2	-6.48	117.36	121.90
2	F	8	DT	N3-C4-O4	6.47	123.78	119.90
1	C	12	DC	N3-C2-O2	-6.29	117.50	121.90
1	E	5	DT	C4-C5-C7	6.25	122.75	119.00
2	F	8	DT	C5-C4-O4	-6.21	120.56	124.90
2	F	7	DC	O5'-P-OP2	-6.16	100.16	105.70
2	D	6	DG	C1'-O4'-C4'	-6.13	103.97	110.10
2	F	12	DG	C8-N9-C4	-6.06	103.98	106.40
2	D	8	DT	P-O3'-C3'	6.00	126.90	119.70
2	F	8	DT	C1'-O4'-C4'	-5.67	104.43	110.10
2	D	10	DC	P-O3'-C3'	5.67	126.50	119.70
3	B	7	ASP	CB-CG-OD1	5.63	123.37	118.30
2	F	7	DC	P-O3'-C3'	5.62	126.44	119.70
2	F	6	DG	C6-C5-N7	5.54	133.73	130.40
1	E	10	DA	N1-C6-N6	5.53	121.92	118.60
2	D	5	DG	N9-C1'-C2'	5.50	123.06	112.60
1	E	10	DA	P-O5'-C5'	-5.44	112.19	120.90
1	E	9	DT	O4'-C1'-N1	-5.42	104.20	108.00
2	D	7	DC	C2-N1-C1'	5.42	124.76	118.80
2	D	9	DA	P-O3'-C3'	5.41	126.19	119.70
2	F	10	DC	O4'-C1'-N1	5.38	111.77	108.00
1	E	10	DA	N9-C4-C5	-5.36	103.66	105.80
1	E	10	DA	C5-C6-N6	-5.32	119.45	123.70
2	F	12	DG	C5-C6-O6	-5.30	125.42	128.60
2	D	6	DG	P-O3'-C3'	5.22	125.97	119.70
2	F	5	DG	O4'-C4'-C3'	-5.22	102.41	104.50
1	C	12	DC	C2-N1-C1'	5.21	124.53	118.80
3	A	202	LEU	CA-CB-CG	5.19	127.23	115.30
2	F	7	DC	C2-N3-C4	-5.16	117.32	119.90
2	F	6	DG	C6-N1-C2	-5.12	122.03	125.10
2	F	6	DG	C1'-O4'-C4'	-5.01	105.09	110.10
1	E	5	DT	C6-C5-C7	-5.01	119.90	122.90

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	C	198	0	115	6	0
1	E	198	0	115	2	0
2	D	163	0	91	6	0
2	F	163	0	91	5	0
3	A	2750	0	2894	121	0
3	B	2744	0	2889	117	0
4	A	1	0	0	0	0
4	B	1	0	0	0	0
5	A	16	0	0	0	0
5	B	3	0	0	1	0
5	C	1	0	0	0	0
All	All	6238	0	6195	246	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 20.

All (246) 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:B:254:ASN:HB3	3:B:330:ILE:O	1.43	1.18
3:B:256:ARG:O	3:B:323:LEU:HD21	1.46	1.15
3:B:12:TYR:HB2	3:B:45:THR:HG21	1.18	1.13
3:B:116:ARG:HB3	3:B:116:ARG:NH1	1.77	0.99
3:A:294:ASP:CB	3:A:328:ARG:HH12	1.75	0.98
3:A:242:ARG:HG3	3:A:242:ARG:HH11	1.30	0.95
3:B:12:TYR:HB2	3:B:45:THR:CG2	1.98	0.91
3:B:116:ARG:HB3	3:B:116:ARG:HH11	1.36	0.91
3:A:199:ILE:HG23	3:A:204:ASP:HB2	1.55	0.89
3:A:14:GLN:NE2	3:A:139:THR:H	1.71	0.89
3:A:294:ASP:HB3	3:A:328:ARG:NH1	1.87	0.88
3:A:14:GLN:HE22	3:A:139:THR:H	0.93	0.88
3:A:149:VAL:O	3:A:153:ILE:HG13	1.74	0.88

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:254:ASN:CB	3:B:330:ILE:O	2.22	0.87
3:A:294:ASP:HB3	3:A:328:ARG:HH12	1.37	0.85
3:B:48:TYR:HA	3:B:51:ARG:HG3	1.59	0.85
3:B:248:ILE:HD11	3:B:332:ARG:HB3	1.58	0.84
3:B:12:TYR:CB	3:B:45:THR:HG21	2.06	0.84
3:B:38:GLU:O	3:B:39:ASP:HB2	1.79	0.83
3:B:251:MET:CE	3:B:330:ILE:HG22	2.09	0.83
3:A:37:PHE:CE1	3:A:40:SER:HB3	2.13	0.81
3:B:278:LYS:HA	3:B:278:LYS:HE2	1.63	0.79
3:A:0:SER:O	3:A:1:MET:HB3	1.83	0.79
3:B:166:ILE:HG23	3:B:170:GLU:HG3	1.63	0.79
3:A:14:GLN:HE22	3:A:139:THR:N	1.77	0.78
3:A:200:ASN:H	3:A:200:ASN:HD22	1.32	0.77
3:A:194:LEU:HD22	3:A:199:ILE:HD12	1.67	0.76
3:B:254:ASN:ND2	3:B:331:ARG:HD3	2.01	0.76
1:C:9:DT:H2"	1:C:10:DA:OP2	1.85	0.75
2:F:10:DC:H2'	2:F:11:DA:C8	2.22	0.74
3:B:14:GLN:NE2	3:B:139:THR:H	1.87	0.73
2:D:8:DT:O3'	3:A:242:ARG:NH1	2.21	0.72
3:A:46:ALA:HB1	3:A:50:ALA:HB3	1.70	0.72
2:D:9:DA:P	3:A:242:ARG:HH12	2.13	0.71
3:B:277:ASP:O	3:B:278:LYS:HB2	1.89	0.71
3:B:146:LYS:HD3	3:B:171:VAL:HG21	1.72	0.71
3:A:48:TYR:OH	3:A:159:LYS:HD3	1.91	0.71
3:B:254:ASN:OD1	3:B:254:ASN:N	2.22	0.71
3:A:304:HIS:HD2	3:A:305:GLY:O	1.75	0.70
3:B:254:ASN:HB3	3:B:330:ILE:C	2.13	0.69
3:A:242:ARG:HG3	3:A:242:ARG:NH1	2.04	0.69
3:B:256:ARG:O	3:B:323:LEU:CD2	2.36	0.68
2:D:8:DT:OP2	3:A:336:ARG:NH2	2.25	0.67
3:A:37:PHE:CZ	3:A:40:SER:HB3	2.30	0.66
3:B:166:ILE:HG23	3:B:170:GLU:CG	2.25	0.66
3:B:14:GLN:HE22	3:B:139:THR:H	1.41	0.65
3:A:37:PHE:CD1	3:A:40:SER:HB3	2.31	0.65
3:B:147:ASN:HD21	3:B:150:PHE:HD2	1.44	0.64
3:A:271:GLU:O	3:A:274:TYR:HB3	1.98	0.64
3:B:116:ARG:NH1	3:B:116:ARG:CB	2.60	0.64
3:B:14:GLN:HG2	3:B:138:ILE:HD13	1.80	0.63
3:B:175:ILE:HG22	3:B:203:VAL:HG23	1.80	0.63
3:B:36:ARG:NH1	3:B:331:ARG:HD2	2.13	0.63
3:A:294:ASP:HB3	3:A:328:ARG:CZ	2.29	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:8:DT:OP2	3:B:336:ARG:NH2	2.33	0.62
3:A:190:THR:HG23	3:A:217:ILE:HG21	1.80	0.62
3:A:251:MET:HG2	3:A:264:TYR:CD2	2.35	0.62
3:B:253:ARG:O	3:B:253:ARG:HG2	2.00	0.61
3:B:8:PHE:CZ	3:B:88:ILE:HG21	2.36	0.61
3:A:253:ARG:O	3:A:253:ARG:HG3	1.99	0.61
3:B:122:TYR:CE2	3:B:126:LEU:HD11	2.35	0.61
2:D:9:DA:OP1	3:A:242:ARG:NH1	2.33	0.61
3:A:6:VAL:O	3:A:106:GLU:HA	2.00	0.61
3:A:294:ASP:HB2	3:A:328:ARG:HH12	1.65	0.61
3:A:200:ASN:H	3:A:200:ASN:ND2	1.96	0.61
3:A:292:ASP:O	3:A:293:LEU:HB2	2.00	0.61
3:A:200:ASN:HD22	3:A:200:ASN:N	1.99	0.60
3:A:309:GLU:O	3:A:312:TYR:HB2	2.00	0.60
3:A:149:VAL:HG11	3:A:228:LEU:HD11	1.84	0.60
3:A:200:ASN:ND2	3:A:200:ASN:N	2.47	0.60
3:B:333:ILE:O	3:B:333:ILE:HG23	2.00	0.60
3:A:121:ALA:HB1	3:A:144:ILE:HD13	1.82	0.60
3:B:101:ILE:HD12	3:B:101:ILE:H	1.67	0.60
3:B:236:PRO:HG2	3:B:238:ARG:NH1	2.16	0.60
3:A:26:LYS:HB3	3:A:27:PRO:HD2	1.84	0.59
3:A:251:MET:HG2	3:A:264:TYR:CG	2.38	0.59
1:E:9:DT:H2"	1:E:10:DA:OP2	2.01	0.59
3:B:27:PRO:HB2	3:B:71:ALA:HB2	1.85	0.58
3:A:258:LEU:HG	3:A:323:LEU:HD22	1.86	0.58
3:B:258:LEU:HG	3:B:262:LYS:HD2	1.85	0.57
3:A:237:ILE:HG22	3:A:237:ILE:O	2.02	0.57
3:A:273:TYR:HA	3:A:276:LEU:HD12	1.85	0.57
3:A:275:LYS:O	3:A:276:LEU:C	2.43	0.57
3:B:27:PRO:HB2	3:B:71:ALA:CB	2.35	0.56
3:A:228:LEU:HD23	3:A:233:TYR:HB2	1.87	0.56
3:A:269:ILE:HG13	3:A:335:VAL:HG11	1.87	0.56
3:B:255:SER:CB	3:B:260:GLU:OE1	2.54	0.56
3:A:258:LEU:HD11	3:A:320:GLN:HG2	1.88	0.55
3:B:180:ILE:CG2	3:B:181:ALA:N	2.68	0.55
3:A:1:MET:HG2	3:A:146:LYS:O	2.07	0.55
3:B:116:ARG:CB	3:B:116:ARG:CZ	2.85	0.55
2:F:10:DC:C2'	2:F:11:DA:C8	2.89	0.55
3:A:309:GLU:OE1	3:A:309:GLU:N	2.35	0.55
3:B:36:ARG:HH12	3:B:331:ARG:NE	2.04	0.55
3:A:233:TYR:CZ	3:A:235:GLU:HB2	2.43	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:294:ASP:OD2	3:A:328:ARG:NH2	2.41	0.54
3:B:289:VAL:HA	3:B:294:ASP:O	2.07	0.54
3:B:1:MET:HE3	3:B:146:LYS:O	2.08	0.54
3:B:146:LYS:HE2	3:B:231:ASP:OD1	2.07	0.54
3:A:300:ARG:HD3	3:A:314:GLU:OE1	2.08	0.54
1:C:10:DA:H3'	3:A:189:ILE:HB	1.90	0.53
3:A:9:ASP:O	3:A:10:TYR:C	2.47	0.53
3:B:36:ARG:HH12	3:B:331:ARG:HD2	1.72	0.53
3:B:180:ILE:O	3:B:183:VAL:HG23	2.09	0.53
2:D:9:DA:P	3:A:242:ARG:NH1	2.81	0.53
3:A:291:GLU:HB3	3:A:329:LYS:HB2	1.91	0.52
3:B:257:ASN:ND2	3:B:259:GLU:H	2.07	0.52
3:A:322:ILE:HG22	3:A:323:LEU:N	2.24	0.52
3:B:316:VAL:O	3:B:320:GLN:HG3	2.10	0.52
3:A:160:PRO:O	3:A:161:ASN:O	2.28	0.52
3:A:199:ILE:HD11	3:A:208:ILE:HG21	1.91	0.51
3:A:294:ASP:HB3	3:A:328:ARG:NH2	2.26	0.51
3:B:254:ASN:HD21	3:B:331:ARG:HD3	1.73	0.51
3:B:36:ARG:HH12	3:B:331:ARG:CD	2.24	0.51
3:B:146:LYS:HE2	3:B:171:VAL:HG11	1.93	0.51
3:B:9:ASP:O	3:B:10:TYR:C	2.48	0.51
3:B:246:GLY:HA3	3:B:336:ARG:NH1	2.25	0.51
3:B:186:ILE:HD12	3:B:190:THR:HG21	1.92	0.51
3:A:147:ASN:HD21	3:A:150:PHE:HD2	1.60	0.50
3:A:280:ILE:HB	3:A:341:ILE:HG13	1.91	0.50
3:B:180:ILE:HG23	3:B:181:ALA:N	2.25	0.50
3:B:256:ARG:HB2	3:B:256:ARG:CZ	2.42	0.50
3:B:278:LYS:HE2	3:B:278:LYS:CA	2.36	0.50
3:A:178:LEU:O	3:A:201:LYS:HD2	2.12	0.50
3:B:251:MET:HE2	3:B:330:ILE:HG22	1.89	0.50
3:A:310:THR:O	3:A:314:GLU:HB2	2.12	0.50
3:B:278:LYS:HA	3:B:278:LYS:CE	2.29	0.49
3:A:10:TYR:O	3:A:10:TYR:CD1	2.65	0.49
3:A:12:TYR:HB2	3:A:45:THR:CG2	2.41	0.49
2:D:5:DG:H2'	3:A:332:ARG:NH2	2.28	0.49
3:A:289:VAL:HB	3:A:332:ARG:HB2	1.95	0.49
3:B:248:ILE:CD1	3:B:332:ARG:HE	2.25	0.49
3:A:294:ASP:CB	3:A:328:ARG:NH1	2.50	0.49
3:A:200:ASN:O	3:A:201:LYS:HD3	2.13	0.49
3:B:291:GLU:C	3:B:293:LEU:H	2.16	0.49
3:B:254:ASN:CA	3:B:330:ILE:O	2.61	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:169:GLU:O	3:A:172:LYS:HB2	2.13	0.48
3:B:108:TYR:OH	3:B:152:LYS:HD2	2.14	0.48
3:B:300:ARG:HD3	3:B:314:GLU:OE1	2.14	0.48
3:A:264:TYR:HB2	3:A:333:ILE:HG21	1.96	0.48
1:C:7:DC:OP1	3:A:298:ARG:HD3	2.13	0.48
3:B:256:ARG:HB2	3:B:256:ARG:NH1	2.28	0.48
3:A:245:ILE:HG21	3:A:275:LYS:HB3	1.96	0.48
3:A:10:TYR:CE1	3:A:14:GLN:HG3	2.48	0.48
3:A:266:PHE:HA	3:A:269:ILE:HD12	1.95	0.47
3:B:68:LEU:HD13	3:B:71:ALA:HB2	1.96	0.47
3:A:190:THR:HA	3:A:193:LYS:HB2	1.96	0.47
3:B:122:TYR:CD2	3:B:126:LEU:HD11	2.49	0.47
3:B:36:ARG:HA	3:B:252:LYS:HE3	1.97	0.47
3:B:101:ILE:HD12	3:B:101:ILE:N	2.29	0.47
1:C:10:DA:H5"	3:A:189:ILE:HG21	1.96	0.47
3:A:26:LYS:CB	3:A:27:PRO:HD2	2.45	0.47
2:F:11:DA:H2'	2:F:11:DA:OP2	2.15	0.47
3:B:251:MET:HA	3:B:264:TYR:CE1	2.49	0.47
3:A:16:GLU:OE2	3:A:81:TYR:OH	2.29	0.46
3:B:289:VAL:HB	3:B:332:ARG:HB2	1.98	0.46
3:B:221:LYS:O	3:B:224:TYR:HB3	2.15	0.46
3:B:116:ARG:HB3	3:B:116:ARG:CZ	2.40	0.46
3:B:122:TYR:O	3:B:125:GLY:N	2.49	0.46
3:A:319:LEU:HD12	3:A:319:LEU:O	2.16	0.46
3:B:85:SER:O	3:B:89:MET:HG2	2.15	0.46
3:A:254:ASN:HB3	3:A:331:ARG:HA	1.98	0.46
3:B:49:GLU:HA	3:B:52:LYS:HE2	1.98	0.46
1:E:4:DG:H1'	1:E:5:DT:C2	2.51	0.45
3:A:304:HIS:C	3:A:304:HIS:CD2	2.90	0.45
3:B:209:GLU:OE1	3:B:212:LYS:HG2	2.16	0.45
3:A:85:SER:O	3:A:89:MET:HG2	2.17	0.45
3:B:79:GLU:HB2	5:B:501:HOH:O	2.15	0.45
3:B:289:VAL:HG13	3:B:294:ASP:O	2.17	0.45
3:B:1:MET:CE	3:B:146:LYS:O	2.65	0.45
3:A:172:LYS:HB3	3:A:176:ARG:HH21	1.81	0.45
3:A:252:LYS:HD2	3:A:252:LYS:HA	1.64	0.45
3:A:254:ASN:N	3:A:254:ASN:HD22	2.14	0.45
3:B:253:ARG:O	3:B:254:ASN:C	2.55	0.45
3:A:258:LEU:CD1	3:A:320:GLN:HG2	2.47	0.44
3:B:8:PHE:CZ	3:B:88:ILE:CG2	3.00	0.44
3:B:292:ASP:OD1	3:B:292:ASP:N	2.51	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:290:THR:HG21	3:B:328:ARG:HE	1.82	0.44
3:A:10:TYR:O	3:A:10:TYR:CG	2.69	0.44
3:A:194:LEU:HA	3:A:197:LEU:HB2	2.00	0.44
3:B:19:LEU:HD12	3:B:19:LEU:HA	1.80	0.44
3:B:178:LEU:O	3:B:201:LYS:HD3	2.18	0.44
3:A:321:LYS:HB2	3:A:321:LYS:HE3	1.64	0.44
3:B:9:ASP:HB3	3:B:10:TYR:CD2	2.53	0.44
3:B:124:LEU:HA	3:B:124:LEU:HD12	1.58	0.43
3:B:269:ILE:HG13	3:B:335:VAL:HG11	2.01	0.43
3:A:129:LYS:NZ	3:A:162:GLY:H	2.16	0.43
3:A:160:PRO:O	3:A:161:ASN:C	2.55	0.43
3:A:281:PRO:HA	3:A:340:PHE:HA	2.00	0.43
3:A:300:ARG:HG2	3:A:302:PHE:CE1	2.53	0.43
3:B:236:PRO:HG2	3:B:238:ARG:HH11	1.83	0.43
3:B:278:LYS:CA	3:B:278:LYS:CE	2.96	0.43
3:A:273:TYR:CD1	3:A:276:LEU:HD12	2.53	0.43
1:C:9:DT:C2'	1:C:10:DA:OP2	2.61	0.43
2:F:8:DT:H2''	2:F:9:DA:C8	2.54	0.43
3:B:179:ASP:O	3:B:180:ILE:C	2.57	0.43
3:A:29:VAL:HG22	3:A:55:VAL:HG11	2.00	0.43
3:A:10:TYR:CZ	3:A:14:GLN:HG3	2.54	0.42
3:A:261:ILE:HG21	3:A:319:LEU:HD21	2.01	0.42
3:A:300:ARG:NH1	3:A:314:GLU:OE1	2.48	0.42
3:A:242:ARG:NH1	3:A:242:ARG:CG	2.71	0.42
3:A:194:LEU:HD23	3:A:197:LEU:HD12	2.00	0.42
3:A:214:LYS:HD2	3:A:219:GLU:OE2	2.18	0.42
3:B:12:TYR:N	3:B:12:TYR:CD1	2.88	0.42
3:B:275:LYS:O	3:B:279:ARG:NH2	2.51	0.42
3:B:36:ARG:HB2	3:B:37:PHE:H	1.60	0.42
3:B:291:GLU:HG3	3:B:292:ASP:OD1	2.19	0.42
3:A:241:VAL:HB	3:A:243:LYS:NZ	2.35	0.42
3:A:292:ASP:O	3:A:293:LEU:CB	2.68	0.42
3:B:81:TYR:CD1	3:B:81:TYR:N	2.86	0.42
3:A:252:LYS:HE3	3:B:83:GLN:NE2	2.35	0.42
3:B:199:ILE:HG21	3:B:205:THR:HG22	2.01	0.42
3:B:272:SER:HB2	3:B:337:PHE:CE2	2.55	0.42
3:A:190:THR:HG23	3:A:217:ILE:CG2	2.49	0.42
3:A:294:ASP:CG	3:A:328:ARG:HH22	2.23	0.42
3:B:254:ASN:HA	3:B:330:ILE:O	2.20	0.42
3:A:0:SER:O	3:A:1:MET:CB	2.59	0.41
3:A:197:LEU:HD23	3:A:197:LEU:HA	1.92	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:103:SER:OG	3:B:106:GLU:HG2	2.20	0.41
3:B:70:ASN:O	3:B:70:ASN:ND2	2.53	0.41
3:B:270:GLU:OE1	3:B:308:LYS:NZ	2.50	0.41
3:B:245:ILE:CD1	3:B:279:ARG:HH21	2.34	0.41
3:A:234:ASN:O	3:A:234:ASN:CG	2.58	0.41
3:A:122:TYR:HD1	3:A:165:VAL:HG23	1.85	0.41
3:A:36:ARG:HH22	3:A:254:ASN:HB3	1.86	0.41
3:A:81:TYR:CD1	3:A:81:TYR:N	2.85	0.41
3:A:97:GLU:H	3:A:97:GLU:CD	2.24	0.41
3:A:270:GLU:OE2	3:A:308:LYS:HD2	2.21	0.41
3:B:183:VAL:O	3:B:186:ILE:HB	2.21	0.41
3:B:199:ILE:HG23	3:B:204:ASP:HB2	2.03	0.41
3:A:292:ASP:OD1	3:A:328:ARG:HD2	2.21	0.41
3:B:180:ILE:HD13	3:B:202:LEU:HA	2.02	0.41
3:A:183:VAL:O	3:A:186:ILE:HB	2.20	0.40
3:A:281:PRO:HG3	3:A:337:PHE:HB3	2.03	0.40
3:A:292:ASP:CG	3:A:328:ARG:HH11	2.24	0.40
3:B:251:MET:CE	3:B:330:ILE:CG2	2.91	0.40
3:B:293:LEU:HD23	3:B:293:LEU:HA	1.85	0.40
3:B:38:GLU:O	3:B:39:ASP:CB	2.56	0.40
3:B:141:THR:HA	3:B:162:GLY:O	2.22	0.40
3:A:20:ASN:HB3	3:A:23:LEU:HG	2.04	0.40
3:A:70:ASN:C	3:A:71:ALA:O	2.60	0.40
3:B:36:ARG:HG3	3:B:40:SER:OG	2.20	0.40
3:B:97:GLU:CD	3:B:97:GLU:H	2.24	0.40
3:B:276:LEU:O	3:B:277:ASP:C	2.60	0.40
1:C:12:DC:H2"	1:C:13:DC:H5'	2.03	0.40
3:B:6:VAL:O	3:B:106:GLU:HA	2.22	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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	
3	A	340/342 (99%)	302 (89%)	26 (8%)	12 (4%)	3	4
3	B	339/342 (99%)	304 (90%)	31 (9%)	4 (1%)	13	24
All	All	679/684 (99%)	606 (89%)	57 (8%)	16 (2%)	6	9

All (16) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	A	161	ASN
3	A	295	ILE
3	A	26	LYS
3	A	216	MET
3	B	71	ALA
3	B	277	ASP
3	A	36	ARG
3	A	1	MET
3	A	10	TYR
3	A	293	LEU
3	B	292	ASP
3	A	71	ALA
3	A	252	LYS
3	A	274	TYR
3	A	276	LEU
3	B	180	ILE

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	
3	A	301/301 (100%)	275 (91%)	26 (9%)	10	20
3	B	300/301 (100%)	270 (90%)	30 (10%)	7	15
All	All	601/602 (100%)	545 (91%)	56 (9%)	9	17

All (56) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	A	1	MET
3	A	19	LEU
3	A	24	LYS
3	A	26	LYS
3	A	38	GLU
3	A	45	THR
3	A	81	TYR
3	A	94	GLU
3	A	106	GLU
3	A	178	LEU
3	A	180	ILE
3	A	196	LYS
3	A	200	ASN
3	A	207	SER
3	A	224	TYR
3	A	241	VAL
3	A	242	ARG
3	A	243	LYS
3	A	248	ILE
3	A	253	ARG
3	A	254	ASN
3	A	258	LEU
3	A	267	ARG
3	A	271	GLU
3	A	284	ILE
3	A	335	VAL
3	B	19	LEU
3	B	36	ARG
3	B	40	SER
3	B	45	THR
3	B	51	ARG
3	B	68	LEU
3	B	70	ASN
3	B	131	LYS
3	B	134	GLU
3	B	146	LYS
3	B	177	GLU
3	B	192	GLU
3	B	203	VAL
3	B	208	ILE
3	B	216	MET
3	B	221	LYS
3	B	227	SER

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Mol	Chain	Res	Type
3	B	248	ILE
3	B	249	VAL
3	B	253	ARG
3	B	254	ASN
3	B	255	SER
3	B	257	ASN
3	B	278	LYS
3	B	292	ASP
3	B	294	ASP
3	B	308	LYS
3	B	331	ARG
3	B	336	ARG
3	B	341	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (10) such sidechains are listed below:

Mol	Chain	Res	Type
3	A	14	GLN
3	A	123	ASN
3	A	200	ASN
3	A	254	ASN
3	A	304	HIS
3	B	14	GLN
3	B	70	ASN
3	B	83	GLN
3	B	257	ASN
3	B	304	HIS

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 ⓘ

Of 2 ligands modelled in this entry, 2 are monoatomic - leaving 0 for Mogul analysis.

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 ⓘ

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	C	10/16 (62%)	-0.25	0	100	100	22, 46, 60, 62	0
1	E	10/16 (62%)	-0.13	0	100	100	21, 46, 61, 62	0
2	D	8/13 (61%)	0.10	0	100	100	26, 29, 50, 51	0
2	F	8/13 (61%)	0.01	0	100	100	25, 28, 50, 51	0
3	A	342/342 (100%)	0.41	11 (3%)	47	51	10, 30, 52, 72	1 (0%)
3	B	341/342 (99%)	0.31	4 (1%)	79	80	11, 30, 51, 62	0
All	All	719/742 (96%)	0.34	15 (2%)	63	66	10, 30, 54, 72	1 (0%)

All (15) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	B	341	ILE	4.0
3	B	216	MET	3.5
3	A	341	ILE	3.5
3	A	293	LEU	3.4
3	A	193	LYS	3.0
3	B	188	ASN	2.7
3	A	10	TYR	2.6
3	A	63	GLU	2.5
3	A	190	THR	2.4
3	A	178	LEU	2.3
3	B	174	LEU	2.3
3	A	212	LYS	2.1
3	A	187	GLY	2.0
3	A	36	ARG	2.0
3	A	195	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 monosaccharides in this entry.

6.4 Ligands ⓘ

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
4	CA	B	401	1/1	0.72	0.26	99,99,99,99	0
4	CA	A	401	1/1	0.84	0.16	126,126,126,126	0

6.5 Other polymers ⓘ

There are no such residues in this entry.