



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 8, 2018 – 10:31 pm GMT

PDB ID : 4NST
Title : Crystal structure of human Cdk12/Cyclin K in complex with ADP-aluminum fluoride
Authors : Boesken, C.A.; Farnung, L.; Anand, K.; Geyer, M.
Deposited on : 2013-11-29
Resolution : 2.20 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 following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467
Mogul : 1.7.3 (157068), CSD as539be (2018)
Xtriage (Phenix) : 1.13
EDS : trunk30967
Percentile statistics : 20171227.v01 (using entries in the PDB archive December 27th 2017)
Refmac : 5.8.0158
CCP4 : 7.0 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : trunk30967

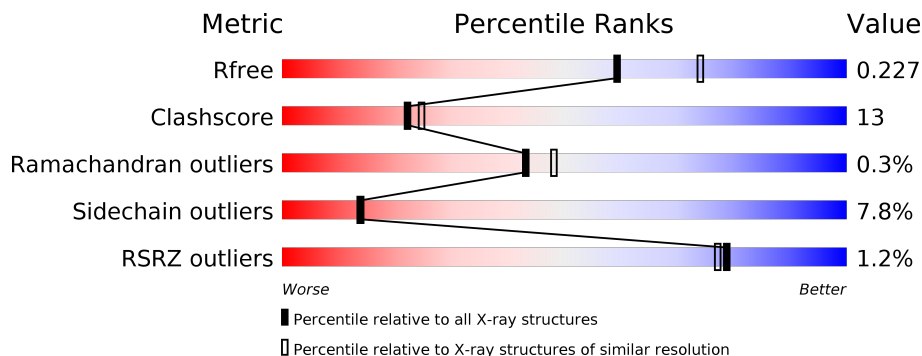
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.20 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}	111664	4343 (2.20-2.20)
Clashscore	122126	5027 (2.20-2.20)
Ramachandran outliers	120053	4952 (2.20-2.20)
Sidechain outliers	120020	4953 (2.20-2.20)
RSRZ outliers	108989	4245 (2.20-2.20)

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 on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. 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 $\leq 5\%$. 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	351	<p>64% 25% 8%</p>
1	C	351	<p>64% 24% 9%</p>
2	B	268	<p>77% 12% 8%</p>
2	D	268	<p>73% 15% 10%</p>

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit crite-

ria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
6	EDO	C	1105	-	-	X	-

2 Entry composition [i](#)

There are 7 unique types of molecules in this entry. The entry contains 9618 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 Cyclin-dependent kinase 12.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace	
			Total	C	N	O	P				S
1	A	323	Total	C	N	O	P	S	0	0	0
			2588	1660	438	472	1	17			
1	C	318	Total	C	N	O	P	S	0	0	0
			2541	1631	426	466	1	17			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	713	GLY	-	EXPRESSION TAG	UNP Q9NYV4
C	713	GLY	-	EXPRESSION TAG	UNP Q9NYV4

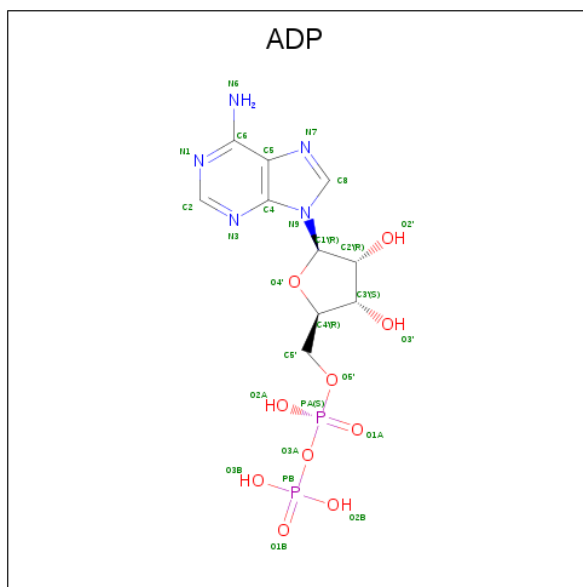
- Molecule 2 is a protein called Cyclin-K.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	246	Total	C	N	O	S	0	0	0
			2023	1313	337	361	12			
2	D	241	Total	C	N	O	S	0	0	0
			1988	1293	330	353	12			

There are 2 discrepancies between the modelled and reference sequences:

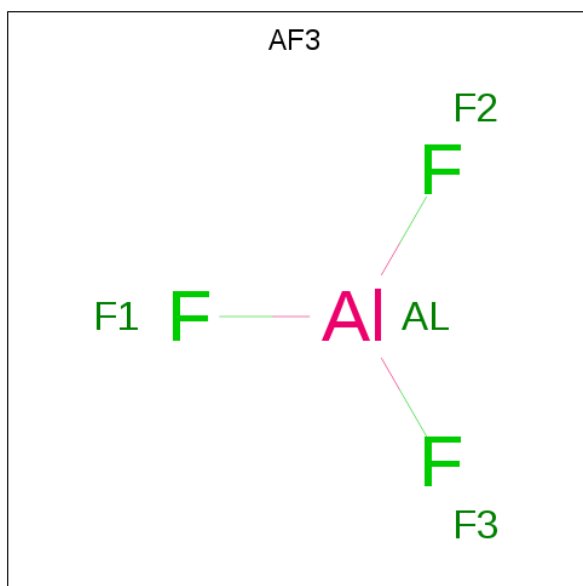
Chain	Residue	Modelled	Actual	Comment	Reference
B	0	GLY	-	EXPRESSION TAG	UNP O75909
D	0	GLY	-	EXPRESSION TAG	UNP O75909

- Molecule 3 is ADENOSINE-5'-DIPHOSPHATE (three-letter code: ADP) (formula: $C_{10}H_{15}N_5O_{10}P_2$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
3	A	1	Total	C	N	O	P	0	0
			27	10	5	10	2		
3	C	1	Total	C	N	O	P	0	0
			27	10	5	10	2		

- Molecule 4 is ALUMINUM FLUORIDE (three-letter code: AF3) (formula: AlF_3).

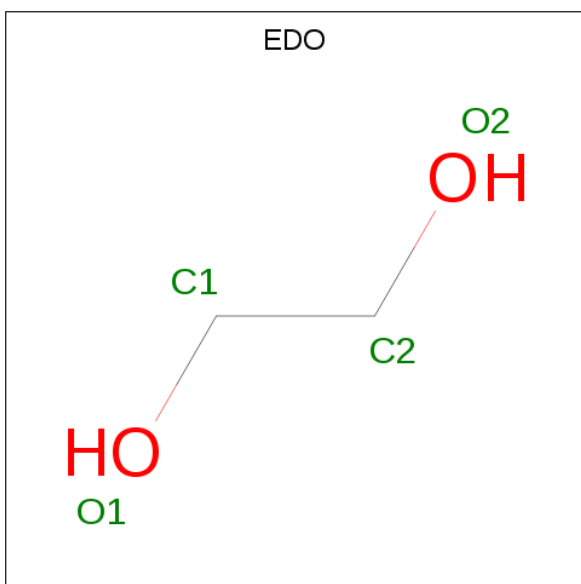


Mol	Chain	Residues	Atoms		ZeroOcc	AltConf	
4	A	1	Total	Al	F	0	0
			4	1	3		
4	C	1	Total	Al	F	0	0
			4	1	3		

- Molecule 5 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	3	Total Mg 3 3	0	0
5	D	2	Total Mg 2 2	0	0
5	C	2	Total Mg 2 2	0	0

- Molecule 6 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: C₂H₆O₂).



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

- Molecule 7 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	107	Total O 107 107	0	0
7	B	92	Total O 92 92	0	0

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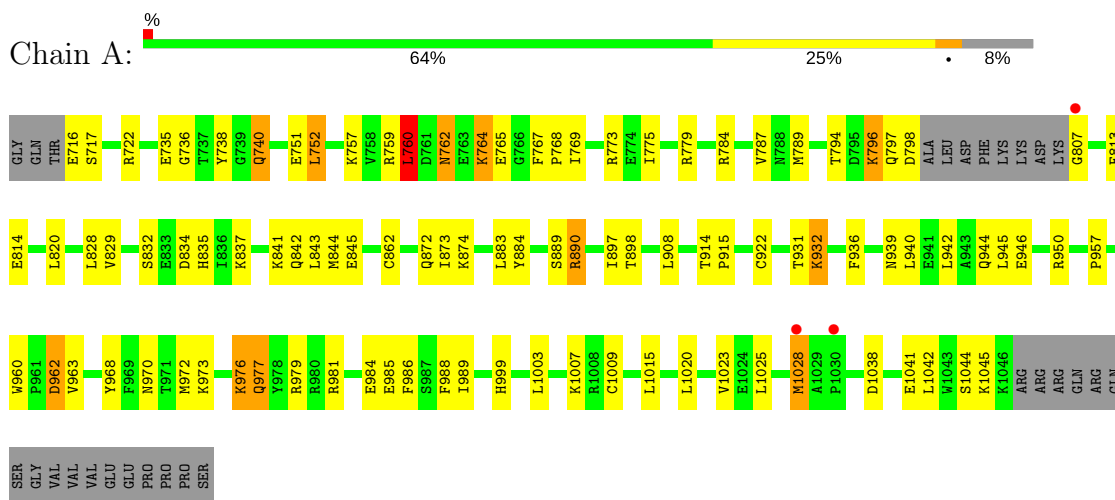
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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	C	96	Total O 96 96	0	0
7	D	98	Total O 98 98	0	0

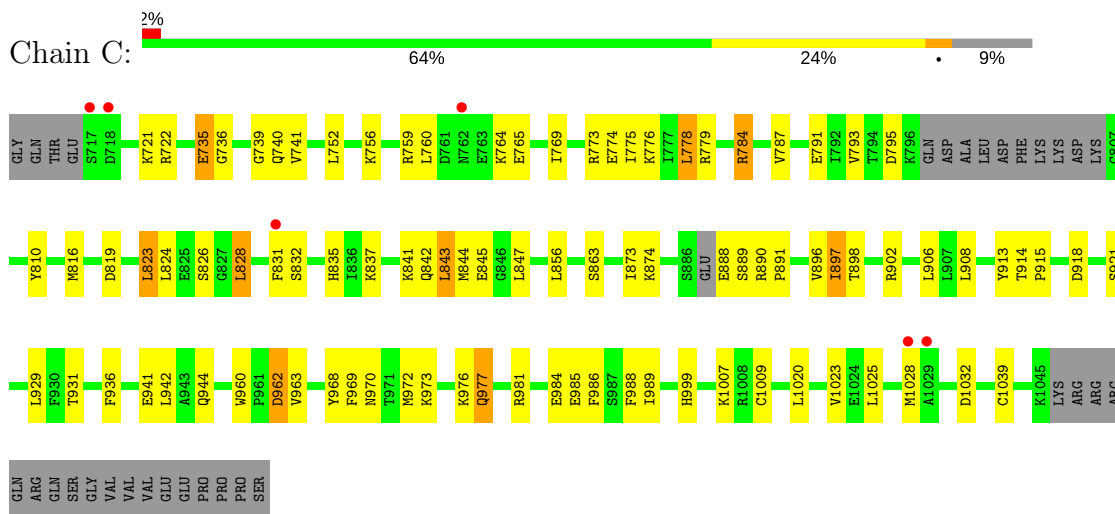
3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA 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.

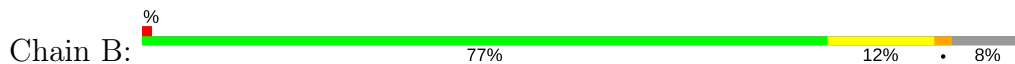
- Molecule 1: Cyclin-dependent kinase 12

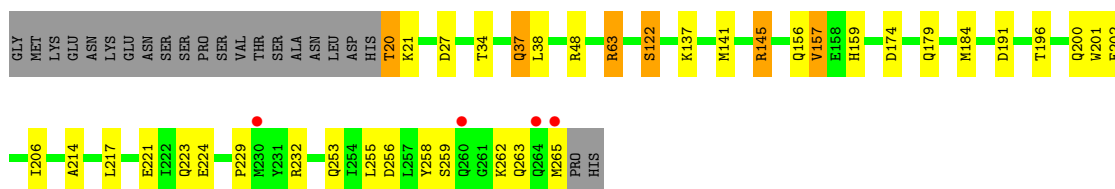


- Molecule 1: Cyclin-dependent kinase 12



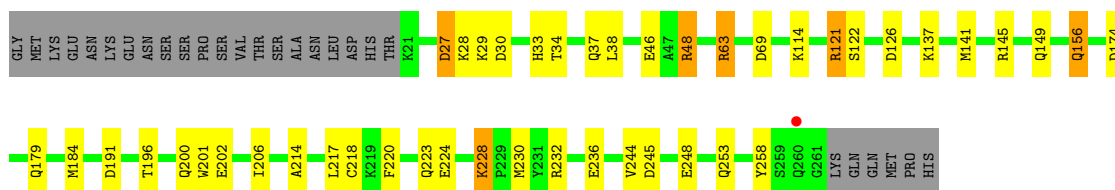
- Molecule 2: Cyclin-K





• Molecule 2: Cyclin-K

Chain D: 73% 15% 10%



4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α , β , γ	49.72Å 78.85Å 91.49Å 104.04° 85.76° 101.46°	Depositor
Resolution (Å)	48.71 – 2.20 48.71 – 2.20	Depositor EDS
% Data completeness (in resolution range)	97.2 (48.71-2.20) 97.3 (48.71-2.20)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.91 (at 2.20Å)	Xtrriage
Refinement program	PHENIX (phenix.refine: 1.5_2)	Depositor
R, R_{free}	0.195 , 0.240 0.191 , 0.227	Depositor DCC
R_{free} test set	3264 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å ²)	35.6	Xtrriage
Anisotropy	0.337	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 49.1	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	9618	wwPDB-VP
Average B, all atoms (Å ²)	42.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 10.26% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ 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: TPO, MG, EDO, ADP, AF3

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	1.08	0/2636	0.84	4/3562 (0.1%)
1	C	1.00	0/2588	0.83	2/3502 (0.1%)
2	B	0.92	1/2078 (0.0%)	0.74	1/2818 (0.0%)
2	D	0.92	0/2043	0.72	0/2770
All	All	0.99	1/9345 (0.0%)	0.79	7/12652 (0.1%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	157	VAL	CB-CG1	-5.42	1.41	1.52

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	976	LYS	CB-CA-C	-8.37	93.67	110.40
1	C	891	PRO	O-C-N	6.36	132.88	122.70
1	A	760	LEU	CA-CB-CG	6.34	129.89	115.30
1	A	1038	ASP	CB-CG-OD1	5.60	123.34	118.30
1	C	856	LEU	CA-CB-CG	5.38	127.66	115.30
1	A	1003	LEU	CA-CB-CG	5.27	127.41	115.30
2	B	27	ASP	CB-CA-C	-5.22	99.96	110.40

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	2588	0	2555	76	1
1	C	2541	0	2492	90	0
2	B	2023	0	1972	39	0
2	D	1988	0	1945	39	0
3	A	27	0	12	1	0
3	C	27	0	9	2	0
4	A	4	0	0	0	0
4	C	4	0	0	0	0
5	A	3	0	0	0	0
5	C	2	0	0	0	0
5	D	2	0	0	0	0
6	A	4	0	6	2	0
6	B	4	0	6	0	0
6	C	4	0	6	7	0
6	D	4	0	6	0	0
7	A	107	0	0	8	0
7	B	92	0	0	4	0
7	C	96	0	0	6	0
7	D	98	0	0	4	0
All	All	9618	0	9009	230	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 13.

All (230) 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:C:739:GLY:HA2	1:C:759:ARG:NH1	1.46	1.30
1:A:939:ASN:ND2	1:A:940:LEU:HD12	1.55	1.22
1:A:796:LYS:HD3	1:A:796:LYS:N	1.48	1.21
1:A:740:GLN:OE1	1:A:759:ARG:NH2	1.74	1.19
1:C:888:GLU:HG3	1:C:890:ARG:NH1	1.58	1.18
1:C:739:GLY:CA	1:C:759:ARG:NH1	2.11	1.13
2:B:191:ASP:OD2	2:B:258:TYR:OH	1.71	1.08
1:C:843:LEU:HD13	1:C:844:MET:CE	1.91	1.01
1:A:794:THR:OG1	7:A:1271:HOH:O	1.77	1.01
2:D:228:LYS:NZ	7:D:476:HOH:O	1.87	1.01
1:A:796:LYS:HD3	1:A:796:LYS:H	0.87	1.00
1:A:796:LYS:CD	1:A:796:LYS:H	1.77	0.98

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:888:GLU:HG3	1:C:890:ARG:HH12	1.21	0.97
1:C:888:GLU:CG	1:C:890:ARG:HH12	1.78	0.97
1:C:739:GLY:HA2	1:C:759:ARG:HH11	1.15	0.97
1:A:999:HIS:CE1	1:A:1009:CYS:HB3	1.99	0.96
2:B:259:SER:O	2:B:262:LYS:HE3	1.66	0.95
1:C:739:GLY:CA	1:C:759:ARG:HH11	1.77	0.95
1:A:939:ASN:HD22	1:A:940:LEU:CD1	1.81	0.93
1:A:939:ASN:HD22	1:A:940:LEU:HD12	1.11	0.93
1:A:765:GLU:OE1	7:A:1241:HOH:O	1.84	0.93
1:A:960:TRP:O	1:A:963:VAL:HG12	1.70	0.92
1:C:740:GLN:H	1:C:759:ARG:HH12	1.17	0.91
2:D:232:ARG:HD2	2:D:236:GLU:OE1	1.73	0.88
1:C:999:HIS:CE1	1:C:1009:CYS:HB3	2.10	0.86
2:B:63:ARG:NH2	2:B:122:SER:OG	2.09	0.86
1:C:823:LEU:HD13	1:C:1039:CYS:HB2	1.57	0.86
1:C:740:GLN:N	1:C:759:ARG:HH12	1.73	0.86
1:C:843:LEU:HD13	1:C:844:MET:HE1	1.57	0.86
1:C:960:TRP:O	1:C:963:VAL:HG12	1.77	0.84
2:D:63:ARG:NH2	2:D:122:SER:OG	2.10	0.84
1:C:981:ARG:NH1	1:C:985:GLU:OE1	2.10	0.84
2:B:179:GLN:HE22	1:C:1007:LYS:NZ	1.77	0.82
1:A:807:GLY:HA3	2:B:145:ARG:NH2	1.96	0.80
1:C:765:GLU:OE1	7:C:1273:HOH:O	1.98	0.80
2:B:259:SER:O	2:B:262:LYS:CE	2.30	0.79
2:D:121:ARG:HD3	2:D:121:ARG:O	1.83	0.79
1:C:776:LYS:HA	6:C:1105:EDO:H21	1.64	0.77
1:C:739:GLY:CA	1:C:759:ARG:HH12	1.93	0.77
1:A:862:CYS:HB2	6:A:1106:EDO:H22	1.65	0.76
1:C:776:LYS:CA	6:C:1105:EDO:H21	2.16	0.76
1:A:757:LYS:HD3	1:A:759:ARG:HE	1.51	0.75
1:C:843:LEU:HD13	1:C:844:MET:HE3	1.67	0.75
1:A:986:PHE:HB3	1:A:989:ILE:HD12	1.69	0.74
2:D:232:ARG:CD	2:D:236:GLU:OE1	2.35	0.74
1:A:814:GLU:OE2	7:A:1236:HOH:O	2.07	0.73
1:A:976:LYS:HG2	1:A:977:GLN:N	2.02	0.72
1:C:824:LEU:HD11	1:C:831:PHE:HE2	1.55	0.72
2:B:256:ASP:OD2	7:B:492:HOH:O	2.07	0.71
2:B:179:GLN:HE22	1:C:1007:LYS:HZ3	1.39	0.71
1:A:1007:LYS:NZ	2:D:179:GLN:HE22	1.88	0.71
1:C:986:PHE:HB3	1:C:989:ILE:HD12	1.73	0.69
1:C:970:ASN:HA	1:C:973:LYS:HE3	1.75	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:259:SER:N	2:B:262:LYS:HZ2	1.91	0.68
1:C:888:GLU:CD	1:C:890:ARG:HH12	1.97	0.68
1:A:769:ILE:O	1:A:773:ARG:HG3	1.94	0.67
2:D:27:ASP:HB3	2:D:30:ASP:H	1.60	0.67
1:A:976:LYS:CG	1:A:977:GLN:N	2.57	0.67
1:A:931:THR:C	1:A:932:LYS:HG2	2.14	0.66
2:D:184:MET:CE	2:D:214:ALA:HA	2.26	0.66
1:C:774:GLU:HG2	1:C:778:LEU:HD22	1.77	0.66
2:B:184:MET:HE2	2:B:214:ALA:HA	1.78	0.65
1:A:950:ARG:HD2	7:A:1247:HOH:O	1.97	0.65
2:B:259:SER:O	2:B:262:LYS:NZ	2.29	0.65
1:C:960:TRP:O	1:C:963:VAL:CG1	2.45	0.65
1:A:796:LYS:CD	1:A:796:LYS:N	2.37	0.65
1:A:999:HIS:ND1	1:A:1009:CYS:HB3	2.12	0.64
2:D:223:GLN:HB2	2:D:228:LYS:HE3	1.80	0.64
1:C:888:GLU:CG	1:C:890:ARG:NH1	2.42	0.64
2:B:184:MET:CE	2:B:214:ALA:HA	2.28	0.63
1:A:832:SER:H	1:A:835:HIS:CD2	2.16	0.63
2:B:179:GLN:NE2	1:C:1007:LYS:HZ3	1.97	0.63
1:A:843:LEU:HG	1:A:844:MET:HE1	1.81	0.62
1:C:832:SER:H	1:C:835:HIS:CD2	2.17	0.62
1:C:962:ASP:N	1:C:962:ASP:OD2	2.30	0.62
1:A:775:ILE:O	1:A:779:ARG:HG3	2.00	0.62
1:C:842:GLN:NE2	7:C:1212:HOH:O	2.26	0.61
2:D:200:GLN:HE22	2:D:253:GLN:HE22	1.47	0.61
2:B:20:THR:OG1	2:B:21:LYS:N	2.32	0.61
1:A:1007:LYS:HZ3	2:D:179:GLN:HE22	1.46	0.61
1:C:897:ILE:HG21	1:C:902:ARG:HA	1.83	0.60
1:C:999:HIS:ND1	1:C:1009:CYS:HB3	2.16	0.60
1:C:776:LYS:O	6:C:1105:EDO:H21	2.01	0.60
1:C:791:GLU:OE2	7:C:1274:HOH:O	2.17	0.60
1:A:862:CYS:HB2	6:A:1106:EDO:C2	2.32	0.60
1:A:807:GLY:HA3	2:B:145:ARG:HH21	1.64	0.59
2:B:200:GLN:HE22	2:B:253:GLN:HE22	1.50	0.59
1:C:735:GLU:OE1	1:C:735:GLU:HA	2.04	0.58
1:A:898:THR:HG23	7:A:1222:HOH:O	2.03	0.58
1:C:739:GLY:HA3	1:C:759:ARG:NH1	2.13	0.58
1:A:981:ARG:NH1	1:A:985:GLU:OE1	2.36	0.58
2:D:34:THR:OG1	2:D:37:GLN:HG2	2.04	0.58
1:A:976:LYS:CG	1:A:977:GLN:H	2.17	0.57
1:C:936:PHE:CB	1:C:944:GLN:HE22	2.18	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:807:GLY:CA	2:B:145:ARG:NH2	2.66	0.57
6:C:1105:EDO:H22	2:D:156:GLN:HB2	1.87	0.57
2:D:184:MET:HE1	2:D:217:LEU:HB2	1.85	0.57
1:A:760:LEU:HG	1:A:807:GLY:O	2.05	0.56
1:A:736:GLY:HA2	3:A:1101:ADP:O1B	2.05	0.56
1:A:841:LYS:HE3	1:A:845:GLU:OE2	2.06	0.56
1:A:842:GLN:NE2	1:A:873:ILE:H	2.04	0.56
1:A:970:ASN:HA	1:A:973:LYS:HE3	1.88	0.55
1:C:775:ILE:O	1:C:779:ARG:HG3	2.06	0.55
2:B:184:MET:HE1	2:B:217:LEU:HB2	1.89	0.55
1:C:769:ILE:O	1:C:773:ARG:HG3	2.07	0.55
1:C:843:LEU:HB3	1:C:844:MET:CE	2.37	0.55
1:A:797:GLN:O	1:A:798:ASP:CB	2.54	0.55
2:B:157:VAL:HG12	2:B:159:HIS:CE1	2.41	0.55
2:D:184:MET:HE3	2:D:214:ALA:HA	1.89	0.55
1:A:834:ASP:O	1:A:1028:MET:CE	2.55	0.55
1:A:936:PHE:CB	1:A:944:GLN:HE22	2.20	0.55
2:B:37:GLN:HB2	7:B:453:HOH:O	2.07	0.55
1:C:736:GLY:HA2	3:C:1101:ADP:O1B	2.07	0.54
1:C:776:LYS:HA	6:C:1105:EDO:C2	2.38	0.54
1:C:784:ARG:NH1	1:C:845:GLU:OE1	2.40	0.54
2:D:27:ASP:HB2	2:D:30:ASP:OD2	2.08	0.54
1:A:889:SER:O	1:A:890:ARG:HD3	2.09	0.53
1:C:843:LEU:CD1	1:C:844:MET:CE	2.78	0.53
1:C:969:PHE:O	1:C:973:LYS:HE3	2.08	0.53
1:C:936:PHE:HB3	1:C:944:GLN:NE2	2.23	0.53
1:A:1007:LYS:HZ3	2:D:179:GLN:NE2	2.06	0.53
2:B:184:MET:HE2	2:B:214:ALA:CA	2.38	0.53
1:C:896:VAL:O	1:C:897:ILE:HB	2.07	0.53
1:C:914:THR:HB	1:C:915:PRO:HD2	1.90	0.53
2:D:137:LYS:O	2:D:141:MET:HG2	2.09	0.52
1:C:739:GLY:C	1:C:759:ARG:HH12	2.12	0.52
1:A:936:PHE:HB3	1:A:944:GLN:NE2	2.25	0.52
1:A:936:PHE:HB2	1:A:944:GLN:HE22	1.75	0.52
1:A:751:GLU:HG3	1:A:752:LEU:N	2.24	0.52
1:A:986:PHE:HD1	1:A:989:ILE:HD11	1.74	0.52
1:C:936:PHE:HB2	1:C:944:GLN:HE22	1.75	0.51
1:C:898:THR:HG23	7:C:1209:HOH:O	2.08	0.51
2:B:179:GLN:NE2	1:C:1007:LYS:NZ	2.52	0.51
1:C:976:LYS:CG	1:C:977:GLN:N	2.74	0.51
1:A:789:MET:HB2	1:A:813:PHE:CE1	2.46	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:156:GLN:HG3	7:D:420:HOH:O	2.11	0.50
2:B:259:SER:OG	2:B:262:LYS:NZ	2.30	0.50
2:B:184:MET:CE	2:B:217:LEU:HB2	2.42	0.49
1:A:716:GLU:OE1	1:A:716:GLU:HA	2.11	0.49
1:A:962:ASP:OD2	1:A:962:ASP:N	2.42	0.49
1:C:793:VAL:HG23	1:C:810:TYR:HB2	1.95	0.49
1:C:824:LEU:CD1	1:C:831:PHE:HE2	2.24	0.49
1:C:986:PHE:HD1	1:C:989:ILE:HD11	1.78	0.48
1:A:784:ARG:HG3	7:A:1229:HOH:O	2.12	0.48
2:D:191:ASP:OD2	2:D:258:TYR:OH	2.20	0.48
1:C:931:THR:HG22	1:C:988:PHE:HZ	1.78	0.48
2:B:34:THR:OG1	2:B:37:GLN:HG2	2.14	0.48
1:C:841:LYS:HG2	1:C:1025:LEU:HD11	1.96	0.48
1:A:976:LYS:HG2	1:A:977:GLN:H	1.71	0.47
1:A:874:LYS:NZ	7:A:1274:HOH:O	2.44	0.47
2:B:137:LYS:O	2:B:141:MET:HG2	2.14	0.47
2:D:184:MET:CE	2:D:217:LEU:HB2	2.44	0.47
2:D:218:CYS:HB3	2:D:220:PHE:CE2	2.49	0.47
1:A:986:PHE:HD1	1:A:989:ILE:CD1	2.27	0.47
1:A:834:ASP:O	1:A:1028:MET:HE1	2.14	0.47
2:D:121:ARG:HD3	2:D:121:ARG:C	2.28	0.47
2:D:196:THR:O	2:D:200:GLN:HG3	2.14	0.47
1:A:844:MET:HE3	1:A:922:CYS:HB3	1.97	0.47
1:C:874:LYS:NZ	7:C:1277:HOH:O	2.46	0.47
1:A:936:PHE:CB	1:A:944:GLN:NE2	2.78	0.47
2:B:201:TRP:HB2	2:B:206:ILE:HD11	1.97	0.47
2:D:121:ARG:HH22	2:D:126:ASP:HA	1.79	0.47
2:B:179:GLN:HE22	1:C:1007:LYS:HZ2	1.60	0.46
1:C:784:ARG:HG3	7:C:1276:HOH:O	2.14	0.46
1:A:890:ARG:HA	1:A:890:ARG:HD2	1.58	0.46
1:A:914:THR:HB	1:A:915:PRO:HD2	1.96	0.46
1:C:721:LYS:HD3	2:D:149:GLN:HB3	1.97	0.46
2:D:184:MET:HE2	2:D:214:ALA:HB1	1.96	0.46
1:C:776:LYS:C	6:C:1105:EDO:H21	2.36	0.46
1:C:936:PHE:CB	1:C:944:GLN:NE2	2.78	0.46
1:A:767:PHE:HA	1:A:768:PRO:HD3	1.76	0.46
1:A:842:GLN:HE22	1:A:873:ILE:H	1.63	0.46
2:D:174:ASP:C	2:D:174:ASP:OD1	2.54	0.46
1:C:843:LEU:HB3	1:C:844:MET:HE2	1.97	0.45
2:D:244:VAL:O	2:D:248:GLU:HG2	2.17	0.45
1:A:945:LEU:HD22	1:A:972:MET:HE1	1.99	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:986:PHE:HD1	1:C:989:ILE:CD1	2.28	0.45
2:D:184:MET:HE2	2:D:214:ALA:CA	2.47	0.45
2:D:37:GLN:NE2	2:D:46:GLU:OE1	2.39	0.45
1:C:776:LYS:HA	6:C:1105:EDO:C1	2.46	0.45
2:D:184:MET:HE2	2:D:214:ALA:CB	2.47	0.45
2:D:184:MET:HE2	2:D:214:ALA:HA	1.96	0.45
1:C:841:LYS:HG2	1:C:1025:LEU:HD21	1.98	0.45
2:B:174:ASP:OD1	2:B:174:ASP:C	2.56	0.44
1:A:764:LYS:HB2	1:A:764:LYS:HE2	1.75	0.44
2:B:48:ARG:NH2	7:B:456:HOH:O	2.49	0.44
2:B:258:TYR:CD2	2:B:263:GLN:HB3	2.52	0.44
2:D:29:LYS:O	2:D:33:HIS:HD2	2.01	0.44
1:C:795:ASP:OD1	1:C:810:TYR:HE2	2.00	0.44
1:A:946:GLU:O	1:A:950:ARG:HG3	2.18	0.43
1:A:931:THR:HG22	1:A:988:PHE:HZ	1.83	0.43
1:C:735:GLU:CA	1:C:735:GLU:OE1	2.64	0.43
1:C:816:MET:O	3:C:1101:ADP:H2	2.00	0.43
1:C:842:GLN:NE2	1:C:873:ILE:H	2.16	0.43
1:A:769:ILE:HG22	7:A:1240:HOH:O	2.17	0.43
2:B:223:GLN:O	2:B:229:PRO:HA	2.19	0.43
1:C:741:VAL:HG22	1:C:756:LYS:HG2	2.00	0.43
2:D:201:TRP:HB2	2:D:206:ILE:HD11	2.00	0.43
2:D:34:THR:O	2:D:38:LEU:HG	2.19	0.43
1:A:968:TYR:HB3	1:A:972:MET:HG3	1.99	0.43
1:C:837:LYS:HB3	1:C:1023:VAL:HG21	2.00	0.43
1:C:936:PHE:HB3	1:C:944:GLN:HE22	1.82	0.43
1:C:960:TRP:CG	1:C:963:VAL:HB	2.54	0.42
1:C:843:LEU:HB3	1:C:844:MET:HE1	2.01	0.42
1:C:906:LEU:HD21	1:C:913:TYR:CD2	2.54	0.42
1:C:826:SER:OG	1:C:828:LEU:HB2	2.19	0.42
2:D:48:ARG:NH2	7:D:462:HOH:O	2.52	0.42
1:A:1041:GLU:HG2	1:A:1045:LYS:HE3	2.00	0.42
1:C:968:TYR:HB3	1:C:972:MET:HG3	2.00	0.42
1:A:807:GLY:N	2:B:145:ARG:NH2	2.67	0.42
1:A:842:GLN:HE22	1:A:872:GLN:HA	1.84	0.42
2:B:256:ASP:O	2:B:262:LYS:NZ	2.44	0.42
2:B:157:VAL:CG1	2:B:159:HIS:CE1	3.03	0.41
1:A:972:MET:HB3	1:A:972:MET:HE2	1.87	0.41
2:B:38:LEU:HD23	2:B:38:LEU:HA	1.82	0.41
1:A:837:LYS:HB3	1:A:1023:VAL:HG21	2.02	0.41
1:C:739:GLY:HA3	1:C:759:ARG:HH11	1.70	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1007:LYS:NZ	2:D:179:GLN:NE2	2.62	0.41
1:C:819:ASP:C	1:C:819:ASP:OD2	2.59	0.41
2:D:69:ASP:HB2	7:D:491:HOH:O	2.20	0.41
1:C:784:ARG:H	1:C:784:ARG:HG3	1.68	0.41
1:C:889:SER:O	1:C:890:ARG:HD3	2.21	0.41
2:B:48:ARG:NH1	7:B:455:HOH:O	2.54	0.41
1:A:764:LYS:HB3	1:A:764:LYS:HE3	1.68	0.41
1:C:918:ASP:O	1:C:921:SER:HB2	2.22	0.40
2:B:196:THR:O	2:B:200:GLN:HG3	2.21	0.40
1:C:776:LYS:HB3	1:C:776:LYS:HE2	1.90	0.40
1:A:986:PHE:CD1	1:A:989:ILE:CD1	3.05	0.40
2:B:255:LEU:HA	2:B:255:LEU:HD23	1.94	0.40
1:C:896:VAL:O	1:C:897:ILE:CB	2.69	0.40

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

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:762:ASN:ND2	1:A:1015:LEU:O[1_455]	1.37	0.83

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	
1	A	318/351 (91%)	313 (98%)	4 (1%)	1 (0%)	43	48
1	C	311/351 (89%)	304 (98%)	5 (2%)	2 (1%)	27	28
2	B	244/268 (91%)	244 (100%)	0	0	100	100
2	D	239/268 (89%)	239 (100%)	0	0	100	100
All	All	1112/1238 (90%)	1100 (99%)	9 (1%)	3 (0%)	43	48

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	897	ILE
1	C	897	ILE
1	C	764	LYS

5.3.2 Protein sidechains [i](#)

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	279/316 (88%)	249 (89%)	30 (11%)	7 6
1	C	274/316 (87%)	252 (92%)	22 (8%)	13 13
2	B	215/241 (89%)	204 (95%)	11 (5%)	26 31
2	D	212/241 (88%)	199 (94%)	13 (6%)	20 23
All	All	980/1114 (88%)	904 (92%)	76 (8%)	14 14

All (76) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	717	SER
1	A	722	ARG
1	A	735	GLU
1	A	738	TYR
1	A	740	GLN
1	A	752	LEU
1	A	760	LEU
1	A	762	ASN
1	A	764	LYS
1	A	787	VAL
1	A	796	LYS
1	A	820	LEU
1	A	828	LEU
1	A	829	VAL
1	A	883	LEU
1	A	884	TYR
1	A	890	ARG
1	A	908	LEU
1	A	932	LYS

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Mol	Chain	Res	Type
1	A	942	LEU
1	A	957	PRO
1	A	962	ASP
1	A	977	GLN
1	A	979	ARG
1	A	984	GLU
1	A	1020	LEU
1	A	1025	LEU
1	A	1028	MET
1	A	1042	LEU
1	A	1044	SER
2	B	20	THR
2	B	37	GLN
2	B	63	ARG
2	B	122	SER
2	B	145	ARG
2	B	156	GLN
2	B	202	GLU
2	B	221	GLU
2	B	224	GLU
2	B	232	ARG
2	B	265	MET
1	C	722	ARG
1	C	735	GLU
1	C	752	LEU
1	C	760	LEU
1	C	778	LEU
1	C	784	ARG
1	C	787	VAL
1	C	823	LEU
1	C	828	LEU
1	C	843	LEU
1	C	847	LEU
1	C	863	SER
1	C	908	LEU
1	C	929	LEU
1	C	941	GLU
1	C	942	LEU
1	C	962	ASP
1	C	977	GLN
1	C	984	GLU
1	C	1020	LEU

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Mol	Chain	Res	Type
1	C	1028	MET
1	C	1032	ASP
2	D	27	ASP
2	D	28	LYS
2	D	48	ARG
2	D	63	ARG
2	D	114	LYS
2	D	121	ARG
2	D	145	ARG
2	D	156	GLN
2	D	202	GLU
2	D	224	GLU
2	D	228	LYS
2	D	230	MET
2	D	245	ASP

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (16) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	835	HIS
1	A	842	GLN
1	A	944	GLN
1	A	977	GLN
1	A	1035	HIS
1	A	1037	GLN
2	B	179	GLN
2	B	253	GLN
1	C	835	HIS
1	C	842	GLN
1	C	944	GLN
1	C	1035	HIS
2	D	33	HIS
2	D	67	HIS
2	D	179	GLN
2	D	200	GLN

5.3.3 RNA

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains

2 non-standard protein/DNA/RNA residues are modelled in this entry.

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
1	TPO	A	893	1	9,10,11	1.86	3 (33%)	11,14,16	1.46	2 (18%)
1	TPO	C	893	1	9,10,11	1.54	1 (11%)	11,14,16	1.90	2 (18%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
1	TPO	A	893	1	-	0/8/11/13	0/0/0/0
1	TPO	C	893	1	-	0/8/11/13	0/0/0/0

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	893	TPO	CB-CA	2.31	1.58	1.53
1	A	893	TPO	P-OG1	2.67	1.64	1.59
1	A	893	TPO	CA-C	3.31	1.54	1.50
1	C	893	TPO	CA-C	3.79	1.55	1.50

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	893	TPO	CG2-CB-CA	-4.79	103.26	113.07
1	A	893	TPO	CG2-CB-CA	-3.34	106.24	113.07
1	C	893	TPO	O3P-P-OG1	2.07	115.28	105.99
1	A	893	TPO	O3P-P-OG1	2.33	116.43	105.99

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

5.6 Ligand geometry [i](#)

Of 15 ligands modelled in this entry, 7 are monoatomic - leaving 8 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
3	ADP	A	1101	5	25,29,29	1.14	2 (8%)	25,45,45	1.75	3 (12%)
4	AF3	A	1102	-	0,3,3	0.00	-	0,3,3	0.00	-
6	EDO	A	1106	-	3,3,3	0.35	0	2,2,2	1.21	0
6	EDO	B	301	-	3,3,3	0.65	0	2,2,2	0.08	0
3	ADP	C	1101	5	25,29,29	1.62	6 (24%)	25,45,45	3.07	7 (28%)
4	AF3	C	1102	-	0,3,3	0.00	-	0,3,3	0.00	-
6	EDO	C	1105	-	3,3,3	0.65	0	2,2,2	0.78	0
6	EDO	D	303	-	3,3,3	0.32	0	2,2,2	1.20	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '2' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	ADP	A	1101	5	-	0/12/32/32	0/3/3/3
4	AF3	A	1102	-	-	0/0/0/0	0/0/0/0
6	EDO	A	1106	-	-	0/1/1/1	0/0/0/0
6	EDO	B	301	-	-	0/1/1/1	0/0/0/0
3	ADP	C	1101	5	-	0/12/32/32	0/3/3/3
4	AF3	C	1102	-	-	0/0/0/0	0/0/0/0
6	EDO	C	1105	-	-	0/1/1/1	0/0/0/0

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	EDO	D	303	-	-	0/1/1/1	0/0/0/0

All (8) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	1101	ADP	C5-C4	-3.44	1.32	1.40
3	C	1101	ADP	O2'-C2'	-2.48	1.36	1.43
3	C	1101	ADP	O3'-C3'	-2.26	1.37	1.43
3	C	1101	ADP	O4'-C4'	2.18	1.49	1.45
3	A	1101	ADP	PA-O5'	2.43	1.69	1.59
3	C	1101	ADP	C2-N1	2.64	1.38	1.33
3	C	1101	ADP	C2-N3	2.97	1.37	1.32
3	A	1101	ADP	C5-C4	3.03	1.47	1.40

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	1101	ADP	N3-C2-N1	-9.31	120.89	128.86
3	A	1101	ADP	N3-C2-N1	-6.72	123.11	128.86
3	C	1101	ADP	C4'-O4'-C1'	-6.18	103.39	109.83
3	A	1101	ADP	O5'-PA-O1A	-3.36	95.92	109.07
3	A	1101	ADP	C4-C5-N7	-2.35	107.14	109.41
3	C	1101	ADP	C2'-C3'-C4'	-2.20	98.39	102.62
3	C	1101	ADP	C5'-C4'-C3'	2.02	122.90	115.29
3	C	1101	ADP	O3'-C3'-C2'	3.88	124.25	111.83
3	C	1101	ADP	O4'-C4'-C5'	5.14	126.51	109.39
3	C	1101	ADP	O3'-C3'-C4'	6.64	130.30	111.06

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

4 monomers are involved in 12 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	1101	ADP	1	0
6	A	1106	EDO	2	0
3	C	1101	ADP	2	0
6	C	1105	EDO	7	0

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 [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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	322/351 (91%)	0.02	3 (0%) 84 83	23, 41, 74, 98	0
1	C	317/351 (90%)	0.01	6 (1%) 66 65	24, 42, 74, 99	0
2	B	246/268 (91%)	-0.05	4 (1%) 72 70	19, 36, 72, 88	0
2	D	241/268 (89%)	-0.07	1 (0%) 92 91	21, 37, 65, 87	0
All	All	1126/1238 (90%)	-0.02	14 (1%) 79 77	19, 40, 72, 99	0

All (14) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	1029	ALA	5.2
2	B	264	GLN	4.9
1	A	1028	MET	4.1
1	C	1028	MET	3.1
1	C	762	ASN	3.0
2	B	230	MET	2.9
2	B	265	MET	2.9
1	C	718	ASP	2.8
1	A	807	GLY	2.5
2	D	260	GLN	2.3
1	A	1030	PRO	2.2
2	B	260	GLN	2.1
1	C	717	SER	2.1
1	C	831	PHE	2.1

6.2 Non-standard residues in protein, DNA, RNA chains [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(\AA^2)	Q<0.9
1	TPO	A	893	11/12	0.92	0.15	24,35,43,44	0
1	TPO	C	893	11/12	0.96	0.10	27,34,41,48	0

6.3 Carbohydrates [i](#)

There are no carbohydrates 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(\AA^2)	Q<0.9
6	EDO	A	1106	4/4	0.65	0.27	48,53,59,65	0
6	EDO	B	301	4/4	0.79	0.28	64,71,73,77	0
6	EDO	C	1105	4/4	0.81	0.24	39,43,45,52	0
6	EDO	D	303	4/4	0.83	0.19	44,46,57,60	0
5	MG	A	1105	1/1	0.83	0.28	70,70,70,70	0
5	MG	D	302	1/1	0.86	0.26	74,74,74,74	0
4	AF3	C	1102	4/4	0.87	0.14	45,69,86,132	0
5	MG	C	1103	1/1	0.89	0.13	32,32,32,32	0
3	ADP	A	1101	27/27	0.92	0.17	26,56,63,65	0
5	MG	D	301	1/1	0.93	0.26	49,49,49,49	0
5	MG	A	1104	1/1	0.94	0.07	51,51,51,51	0
4	AF3	A	1102	4/4	0.94	0.12	41,68,89,97	0
5	MG	A	1103	1/1	0.96	0.08	27,27,27,27	0
3	ADP	C	1101	27/27	0.97	0.12	23,32,40,42	0
5	MG	C	1104	1/1	0.97	0.07	56,56,56,56	0

6.5 Other polymers [i](#)

There are no such residues in this entry.