Full wwPDB X-ray Structure Validation Report ⓘ

Aug 28, 2023 – 06:08 AM EDT

PDB ID	:	3KHS
Title	:	Crystal structure of grouper iridovirus purine nucleoside phosphorylase
Authors	:	Kang, Y.N.; Zhang, Y.; Allan, P.W.; Parker, W.B.; Ting, J.W.; Chang, C.Y.; Ealick, S.E.
Deposited on	:	2009-10-30
Resolution	:	2.38 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

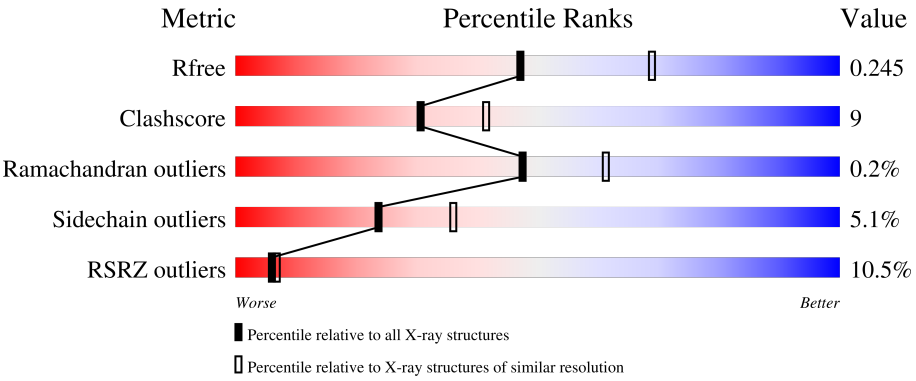
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.35
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA,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

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.38 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	5509 (2.40-2.36)
Clashscore	141614	6082 (2.40-2.36)
Ramachandran outliers	138981	5973 (2.40-2.36)
Sidechain outliers	138945	5975 (2.40-2.36)
RSRZ outliers	127900	5397 (2.40-2.36)

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	285	13% 73% 18% • 7%
1	B	285	5% 76% 17% • 5%
1	C	285	3% 77% 17% 5%
1	D	285	18% 72% 19% • 8%

2 Entry composition (i)

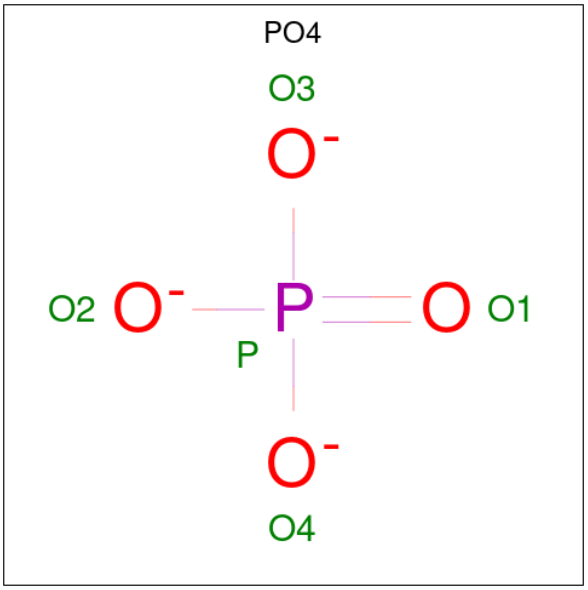
There are 4 unique types of molecules in this entry. The entry contains 8140 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Purine nucleoside phosphorylase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	264	Total	C	N	O	S	0	0	0
			1955	1230	339	368	18			
1	B	270	Total	C	N	O	S	0	0	0
			2001	1259	348	376	18			
1	C	270	Total	C	N	O	S	0	0	0
			1998	1255	348	377	18			
1	D	262	Total	C	N	O	S	0	0	0
			1940	1221	337	364	18			

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



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

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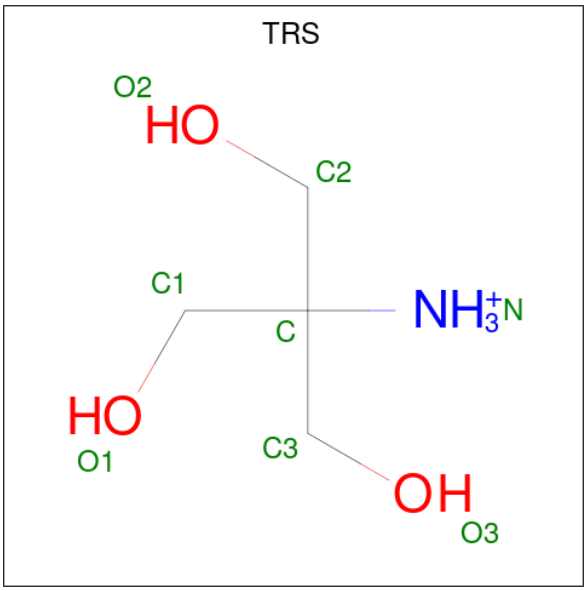
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	C	1	Total O P 5 4 1	0	0
2	D	1	Total O P 5 4 1	0	0

- Molecule 3 is 2-AMINO-2-HYDROXYMETHYL-PROPANE-1,3-DIOL (three-letter code: TRS) (formula: $C_4H_{12}NO_3$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C N O 8 4 1 3	0	0
3	B	1	Total C N O 8 4 1 3	0	0
3	C	1	Total C N O 8 4 1 3	0	0
3	D	1	Total C N O 8 4 1 3	0	0

- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	44	Total O 44 44	0	0
4	B	63	Total O 63 63	0	0
4	C	65	Total O 65 65	0	0

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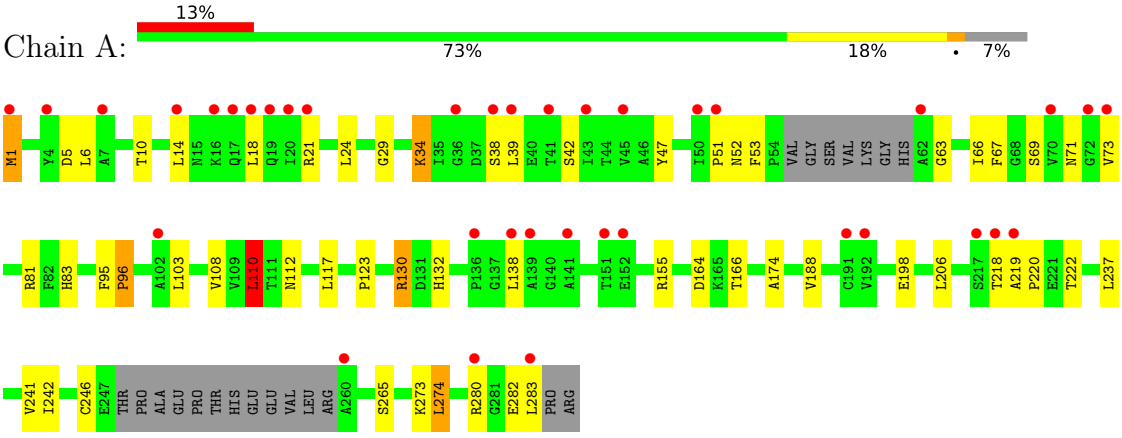
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	D	22	Total O 22 22	0	0

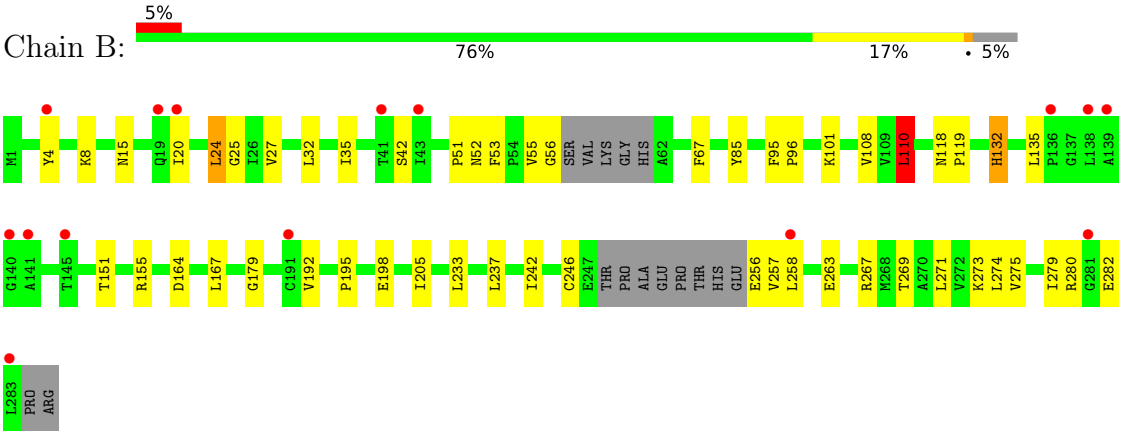
3 Residue-property plots (i)

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.

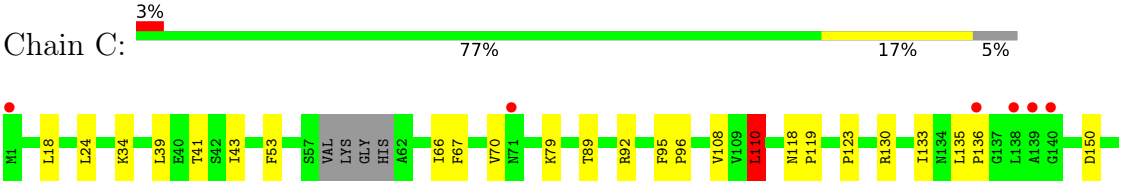
• Molecule 1: Purine nucleoside phosphorylase

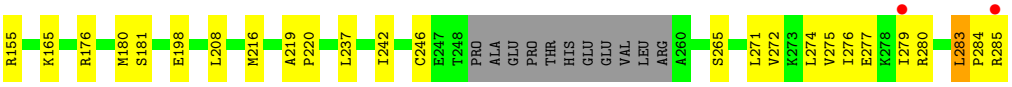


• Molecule 1: Purine nucleoside phosphorylase



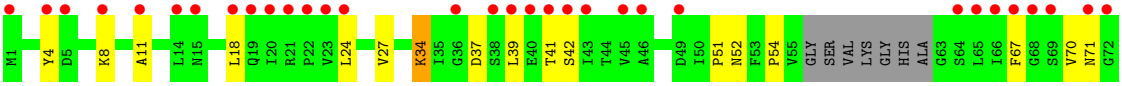
• Molecule 1: Purine nucleoside phosphorylase

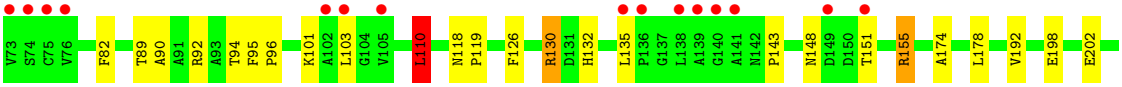


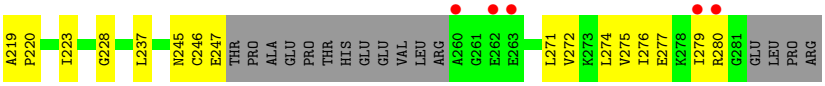


• Molecule 1: Purine nucleoside phosphorylase

Chain D:







4 Data and refinement statistics (i)

Property	Value	Source
Space group	H 3	Depositor
Cell constants a, b, c, α, β, γ	193.05Å 193.05Å 105.63Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	44.65 – 2.38 48.26 – 2.38	Depositor EDS
% Data completeness (in resolution range)	96.1 (44.65-2.38) 96.1 (48.26-2.38)	Depositor EDS
R_{merge}	0.05	Depositor
R_{sym}	0.05	Depositor
$< I/\sigma(I) >$ [1]	2.64 (at 2.37Å)	Xtriage
Refinement program	CNS	Depositor
R, R_{free}	0.214 , 0.255 0.206 , 0.245	Depositor DCC
R_{free} test set	5745 reflections (9.76%)	wwPDB-VP
Wilson B-factor (Å^2)	40.2	Xtriage
Anisotropy	0.344	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 53.4	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	0.018 for h,-h-k,-l	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	8140	wwPDB-VP
Average B, all atoms (Å^2)	47.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.99% of the height of the origin peak. No significant pseudotranslation is detected.*

[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: TRS, 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	0.49	0/1988	0.71	1/2689 (0.0%)
1	B	0.53	0/2034	0.73	1/2751 (0.0%)
1	C	0.51	0/2032	0.75	1/2748 (0.0%)
1	D	0.46	0/1973	0.71	1/2669 (0.0%)
All	All	0.50	0/8027	0.72	4/10857 (0.0%)

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	110	LEU	CA-CB-CG	6.86	131.07	115.30
1	C	110	LEU	CA-CB-CG	6.25	129.67	115.30
1	A	110	LEU	CA-CB-CG	6.10	129.32	115.30
1	D	110	LEU	CA-CB-CG	5.73	128.47	115.30

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	1955	0	1971	40	0
1	B	2001	0	2022	33	0
1	C	1998	0	2015	30	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	D	1940	0	1958	44	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	8	0	12	0	0
3	B	8	0	12	0	0
3	C	8	0	12	2	0
3	D	8	0	12	0	0
4	A	44	0	0	1	0
4	B	63	0	0	4	0
4	C	65	0	0	2	0
4	D	22	0	0	2	0
All	All	8140	0	8014	146	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 9.

All (146) 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:277:GLU:O	1:C:280:ARG:HG2	1.65	0.96
1:C:275:VAL:O	1:C:279:ILE:HG13	1.78	0.83
1:A:21:ARG:HB2	1:A:21:ARG:HH11	1.47	0.77
1:C:41:THR:O	1:C:41:THR:HG22	1.86	0.74
1:A:21:ARG:HB2	1:A:21:ARG:NH1	2.05	0.70
1:C:108:VAL:HG12	1:C:110:LEU:HD22	1.74	0.69
1:D:174:ALA:O	1:D:178:LEU:HD12	1.94	0.68
1:B:108:VAL:HG12	1:B:110:LEU:HD22	1.77	0.67
1:B:282:GLU:O	1:B:282:GLU:HG3	1.96	0.65
1:D:39:LEU:HD12	1:D:70:VAL:CG2	2.26	0.65
1:D:71:ASN:ND2	1:D:277:GLU:HB2	2.13	0.64
1:D:71:ASN:O	1:D:280:ARG:HD3	1.98	0.64
1:D:126:PHE:CE2	1:D:237:LEU:HD23	2.34	0.63
1:C:198:GLU:H	1:C:198:GLU:CD	2.01	0.63
1:A:47:TYR:CD2	1:A:63:GLY:HA3	2.34	0.62
1:A:18:LEU:HD11	1:A:67:PHE:CE2	2.35	0.61
1:D:126:PHE:HE2	1:D:237:LEU:HD23	1.66	0.61
1:C:272:VAL:O	1:C:276:ILE:HG13	2.00	0.60
1:B:275:VAL:O	1:B:279:ILE:HG13	2.01	0.60
1:D:272:VAL:O	1:D:276:ILE:HG13	2.01	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:135:LEU:HD12	1:D:192:VAL:HG12	1.84	0.59
1:A:282:GLU:HG2	1:A:283:LEU:N	2.18	0.59
1:D:27:VAL:HG21	1:D:110:LEU:HD13	1.84	0.59
1:C:89:THR:OG1	1:C:92:ARG:HB2	2.02	0.59
1:D:54:PRO:HB2	1:D:82:PHE:CE1	2.38	0.58
1:D:219:ALA:O	1:D:223:ILE:HG13	2.02	0.58
1:A:1:MET:HG3	1:A:5:ASP:CB	2.34	0.58
1:D:27:VAL:CG2	1:D:110:LEU:HD13	2.33	0.58
1:C:216:MET:HG3	3:C:296:TRS:H22	1.87	0.57
1:B:280:ARG:HH11	1:B:280:ARG:HG2	1.67	0.57
1:B:256:GLU:HG3	1:B:257:VAL:HG23	1.85	0.57
1:A:282:GLU:HG2	1:A:283:LEU:H	1.71	0.56
1:B:135:LEU:HD12	1:B:192:VAL:HG12	1.86	0.56
1:D:275:VAL:O	1:D:279:ILE:HG13	2.06	0.56
1:A:95:PHE:HB3	1:A:96:PRO:HD3	1.87	0.56
1:C:271:LEU:O	1:C:275:VAL:HG23	2.05	0.55
1:D:90:ALA:O	1:D:94:THR:HG23	2.06	0.55
1:D:271:LEU:O	1:D:275:VAL:HG23	2.07	0.55
1:A:39:LEU:HD22	1:A:66:ILE:HG22	1.89	0.54
1:A:1:MET:HG3	1:A:5:ASP:HB3	1.89	0.54
1:C:176:ARG:HG2	1:C:176:ARG:HH11	1.72	0.54
1:B:4:TYR:CE1	1:B:101:LYS:HD3	2.43	0.53
1:A:117:LEU:CD2	1:A:242:ILE:HD12	2.39	0.53
1:B:263:GLU:O	1:B:267:ARG:HG3	2.08	0.53
1:D:219:ALA:N	1:D:220:PRO:HD2	2.24	0.53
1:C:24:LEU:HD21	1:C:276:ILE:HG12	1.92	0.52
1:A:1:MET:HG2	1:A:6:LEU:HD23	1.91	0.52
1:B:233:LEU:HD12	4:B:403:HOH:O	2.08	0.51
1:A:24:LEU:C	1:A:24:LEU:HD23	2.31	0.51
1:B:85:TYR:HB2	1:B:195:PRO:HD3	1.93	0.51
1:D:51:PRO:O	1:D:52:ASN:HB2	2.10	0.51
1:D:18:LEU:HD21	1:D:67:PHE:CD2	2.45	0.51
1:B:51:PRO:O	1:B:52:ASN:HB2	2.11	0.51
1:D:198:GLU:HB2	1:D:202:GLU:HB2	1.93	0.51
1:D:101:LYS:HE2	1:D:228:GLY:CA	2.41	0.50
1:B:27:VAL:HG21	1:B:110:LEU:HD13	1.93	0.50
1:C:216:MET:HG3	3:C:296:TRS:C2	2.42	0.50
1:A:117:LEU:HD23	1:A:242:ILE:HD12	1.94	0.50
1:B:164:ASP:HB3	1:B:167:LEU:HD12	1.93	0.50
1:C:219:ALA:N	1:C:220:PRO:HD2	2.27	0.49
1:A:51:PRO:O	1:A:52:ASN:HB2	2.13	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:110:LEU:N	1:C:110:LEU:HD23	2.27	0.49
1:B:20:ILE:HG22	4:B:400:HOH:O	2.11	0.49
1:D:245:ASN:HD21	1:D:247:GLU:CD	2.16	0.49
1:A:71:ASN:O	1:A:280:ARG:HD3	2.12	0.49
1:A:198:GLU:CD	1:A:198:GLU:H	2.16	0.49
1:D:95:PHE:HB3	1:D:96:PRO:HD3	1.95	0.48
1:A:282:GLU:O	1:A:283:LEU:CB	2.60	0.48
1:D:101:LYS:HE2	1:D:228:GLY:HA2	1.96	0.48
1:C:18:LEU:HD23	1:C:43:ILE:HD11	1.95	0.48
1:B:4:TYR:OH	1:B:101:LYS:HD3	2.14	0.47
1:B:179:GLY:HA2	4:B:418:HOH:O	2.14	0.47
1:C:43:ILE:HG12	1:C:67:PHE:HB2	1.95	0.47
1:C:283:LEU:HB2	1:C:284:PRO:HD2	1.95	0.47
1:D:71:ASN:HD22	1:D:277:GLU:HB2	1.78	0.47
1:B:205:ILE:HD11	1:C:133:ILE:HD13	1.97	0.47
1:D:39:LEU:HD12	1:D:70:VAL:HG21	1.96	0.46
1:B:269:THR:O	1:B:273:LYS:HG3	2.15	0.46
1:A:1:MET:HG2	1:A:6:LEU:CD2	2.45	0.46
1:A:10:THR:O	1:A:14:LEU:HG	2.16	0.46
1:B:95:PHE:N	1:B:96:PRO:CD	2.79	0.46
1:C:280:ARG:HH11	1:C:280:ARG:HG3	1.81	0.46
1:D:151:THR:HG22	1:D:151:THR:O	2.16	0.46
1:A:174:ALA:HB1	1:A:274:LEU:HD13	1.98	0.46
1:C:39:LEU:HD12	1:C:70:VAL:CG2	2.46	0.45
1:D:4:TYR:CE2	1:D:8:LYS:HE3	2.51	0.45
1:B:4:TYR:HB2	4:B:486:HOH:O	2.16	0.45
1:C:92:ARG:HG2	4:C:386:HOH:O	2.15	0.45
1:A:219:ALA:N	1:A:220:PRO:HD2	2.32	0.45
1:A:138:LEU:HA	4:A:328:HOH:O	2.15	0.45
1:D:34:LYS:HD3	1:D:37:ASP:OD2	2.17	0.45
1:C:95:PHE:N	1:C:96:PRO:CD	2.80	0.45
1:D:89:THR:OG1	1:D:92:ARG:HB2	2.17	0.45
1:B:32:LEU:O	1:B:35:ILE:HG13	2.17	0.45
1:D:143:PRO:HD3	4:D:334:HOH:O	2.18	0.44
1:C:34:LYS:HG3	1:C:265:SER:OG	2.16	0.44
1:C:66:ILE:HD11	1:C:79:LYS:HE3	1.98	0.44
1:A:130:ARG:NH1	1:A:188:VAL:HG23	2.33	0.44
1:B:132:HIS:C	1:B:132:HIS:CD2	2.90	0.44
1:B:118:ASN:HA	1:B:119:PRO:HD3	1.86	0.44
1:B:271:LEU:O	1:B:275:VAL:HG23	2.17	0.44
1:A:1:MET:HG3	1:A:5:ASP:HB2	2.00	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:165:LYS:HG3	4:C:407:HOH:O	2.18	0.44
1:D:4:TYR:HE1	1:D:101:LYS:HD3	1.83	0.44
1:D:11:ALA:HB1	1:D:103:LEU:HD23	2.00	0.44
1:D:54:PRO:HB2	1:D:82:PHE:CD1	2.53	0.44
1:A:42:SER:HA	1:A:67:PHE:O	2.18	0.43
1:A:81:ARG:HG3	1:A:83:HIS:CE1	2.54	0.43
1:D:245:ASN:ND2	1:D:247:GLU:HG3	2.32	0.43
1:B:4:TYR:CE2	1:B:8:LYS:HE3	2.52	0.43
1:D:27:VAL:HG21	1:D:110:LEU:CD1	2.48	0.43
1:A:174:ALA:CB	1:A:274:LEU:HD13	2.48	0.43
1:B:4:TYR:CZ	1:B:101:LYS:HD3	2.53	0.43
1:C:242:ILE:N	1:C:242:ILE:HD12	2.34	0.43
1:B:24:LEU:HG	1:B:25:GLY:N	2.32	0.43
1:B:55:VAL:HG12	1:B:56:GLY:N	2.34	0.43
1:B:151:THR:HG22	1:B:151:THR:O	2.19	0.43
1:D:148:ASN:HB2	1:D:155:ARG:NH2	2.34	0.43
1:A:38:SER:OG	1:A:273:LYS:HD2	2.18	0.42
1:B:27:VAL:CG2	1:B:110:LEU:HD13	2.48	0.42
1:C:118:ASN:HA	1:C:119:PRO:HD3	1.82	0.42
1:C:66:ILE:CD1	1:C:79:LYS:HE3	2.48	0.42
1:D:24:LEU:C	1:D:24:LEU:HD23	2.40	0.42
1:A:273:LYS:HE2	1:A:273:LYS:HB3	1.86	0.42
1:A:14:LEU:HD12	1:A:103:LEU:HD21	2.02	0.42
1:A:108:VAL:HG12	1:A:110:LEU:HD22	2.02	0.42
1:B:256:GLU:HG3	1:B:257:VAL:N	2.34	0.42
1:C:41:THR:O	1:C:41:THR:CG2	2.57	0.42
1:A:218:THR:O	1:A:222:THR:HG23	2.20	0.42
1:A:123:PRO:HD3	1:A:241:VAL:HG23	2.01	0.42
1:A:164:ASP:OD2	1:A:166:THR:HB	2.19	0.42
1:D:118:ASN:HA	1:D:119:PRO:HD3	1.87	0.42
1:D:51:PRO:O	1:D:52:ASN:CB	2.68	0.42
1:C:135:LEU:HB2	1:C:136:PRO:HD3	2.01	0.41
1:D:18:LEU:HD21	1:D:67:PHE:CG	2.55	0.41
1:A:110:LEU:N	1:A:110:LEU:CD2	2.83	0.41
1:A:282:GLU:O	1:A:283:LEU:HB2	2.20	0.41
1:A:34:LYS:HB2	1:A:265:SER:OG	2.20	0.41
1:A:29:GLY:HA3	1:A:112:ASN:HA	2.03	0.41
1:B:242:ILE:HD12	1:B:242:ILE:N	2.36	0.41
1:D:34:LYS:HD3	1:D:34:LYS:HA	1.93	0.41
1:D:92:ARG:HD2	1:D:92:ARG:HA	1.68	0.41
1:B:42:SER:HA	1:B:67:PHE:O	2.21	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:130:ARG:NH2	4:D:443:HOH:O	2.51	0.40
1:A:69:SER:HA	1:A:73:VAL:O	2.22	0.40
1:D:42:SER:HA	1:D:67:PHE:O	2.21	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	
1	A	258/285 (90%)	247 (96%)	10 (4%)	1 (0%)	34	46
1	B	264/285 (93%)	251 (95%)	13 (5%)	0	100	100
1	C	264/285 (93%)	251 (95%)	13 (5%)	0	100	100
1	D	256/285 (90%)	245 (96%)	10 (4%)	1 (0%)	34	46
All	All	1042/1140 (91%)	994 (95%)	46 (4%)	2 (0%)	47	61

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	34	LYS
1	A	34	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	209/228 (92%)	198 (95%)	11 (5%)	22	34
1	B	214/228 (94%)	203 (95%)	11 (5%)	24	36
1	C	214/228 (94%)	200 (94%)	14 (6%)	17	24
1	D	208/228 (91%)	201 (97%)	7 (3%)	37	53
All	All	845/912 (93%)	802 (95%)	43 (5%)	24	36

All (43) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	1	MET
1	A	53	PHE
1	A	96	PRO
1	A	110	LEU
1	A	130	ARG
1	A	132	HIS
1	A	155	ARG
1	A	206	LEU
1	A	237	LEU
1	A	246	CYS
1	A	274	LEU
1	B	15	ASN
1	B	24	LEU
1	B	53	PHE
1	B	110	LEU
1	B	132	HIS
1	B	155	ARG
1	B	198	GLU
1	B	237	LEU
1	B	246	CYS
1	B	258	LEU
1	B	274	LEU
1	C	53	PHE
1	C	110	LEU
1	C	123	PRO
1	C	130	ARG
1	C	150	ASP
1	C	155	ARG
1	C	180	MET
1	C	181	SER
1	C	208	LEU
1	C	237	LEU
1	C	246	CYS

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Mol	Chain	Res	Type
1	C	274	LEU
1	C	283	LEU
1	C	285	ARG
1	D	41	THR
1	D	110	LEU
1	D	130	ARG
1	D	132	HIS
1	D	155	ARG
1	D	246	CYS
1	D	274	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	C	71	ASN
1	D	15	ASN
1	D	71	ASN
1	D	245	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

8 ligands 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	$\#\|Z\| > 2$
3	TRS	D	297	-	7,7,7	0.48	0	9,9,9	0.60	0
2	PO4	D	293	-	4,4,4	1.38	0	6,6,6	0.41	0
3	TRS	B	295	-	7,7,7	0.47	0	9,9,9	0.68	0
3	TRS	A	294	-	7,7,7	0.59	0	9,9,9	0.70	0
2	PO4	A	290	-	4,4,4	1.33	0	6,6,6	0.46	0
2	PO4	C	292	-	4,4,4	1.16	0	6,6,6	0.47	0
2	PO4	B	291	-	4,4,4	1.46	0	6,6,6	0.42	0
3	TRS	C	296	-	7,7,7	0.52	0	9,9,9	0.63	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. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	TRS	A	294	-	-	0/9/9/9	-
3	TRS	D	297	-	-	0/9/9/9	-
3	TRS	C	296	-	-	0/9/9/9	-
3	TRS	B	295	-	-	0/9/9/9	-

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.

1 monomer is involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	C	296	TRS	2	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

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, 95^{th} 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	264/285 (92%)	0.72	37 (14%) 2 3	27, 47, 75, 82	0
1	B	270/285 (94%)	0.29	15 (5%) 24 27	23, 40, 69, 83	0
1	C	270/285 (94%)	0.18	8 (2%) 50 53	24, 40, 69, 81	0
1	D	262/285 (91%)	0.92	52 (19%) 1 1	31, 52, 76, 88	0
All	All	1066/1140 (93%)	0.53	112 (10%) 6 7	23, 45, 74, 88	0

All (112) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	20	ILE	8.5
1	A	16	LYS	7.2
1	D	43	ILE	7.0
1	D	41	THR	6.9
1	D	72	GLY	6.7
1	D	45	VAL	6.3
1	D	18	LEU	6.2
1	D	21	ARG	6.1
1	A	18	LEU	5.7
1	D	280	ARG	5.3
1	D	1	MET	5.2
1	A	20	ILE	5.1
1	D	22	PRO	5.0
1	A	72	GLY	4.9
1	A	14	LEU	4.9
1	D	19	GLN	4.9
1	D	14	LEU	4.7
1	A	4	TYR	4.6
1	D	71	ASN	4.5
1	D	75	CYS	4.4
1	B	258	LEU	4.4

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Mol	Chain	Res	Type	RSRZ
1	A	43	ILE	4.4
1	D	39	LEU	4.4
1	D	74	SER	4.3
1	D	73	VAL	4.1
1	D	4	TYR	4.0
1	A	283	LEU	3.9
1	A	19	GLN	3.9
1	D	67	PHE	3.9
1	D	38	SER	3.7
1	D	102	ALA	3.6
1	A	45	VAL	3.6
1	A	51	PRO	3.6
1	A	191	CYS	3.4
1	D	140	GLY	3.4
1	B	20	ILE	3.3
1	C	285	ARG	3.3
1	D	40	GLU	3.2
1	A	62	ALA	3.1
1	D	263	GLU	3.1
1	D	76	VAL	3.1
1	D	69	SER	3.0
1	D	23	VAL	3.0
1	B	281	GLY	3.0
1	D	139	ALA	2.9
1	A	151	THR	2.9
1	D	65	LEU	2.9
1	D	36	GLY	2.9
1	A	136	PRO	2.8
1	B	191	CYS	2.8
1	D	66	ILE	2.8
1	A	70	VAL	2.8
1	A	260	ALA	2.8
1	C	1	MET	2.7
1	D	151	THR	2.7
1	A	217	SER	2.7
1	D	135	LEU	2.7
1	C	71	ASN	2.7
1	D	15	ASN	2.7
1	D	149	ASP	2.7
1	A	21	ARG	2.7
1	B	41	THR	2.7
1	A	219	ALA	2.7

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Mol	Chain	Res	Type	RSRZ
1	D	279	ILE	2.6
1	D	68	GLY	2.6
1	B	283	LEU	2.6
1	A	41	THR	2.6
1	D	138	LEU	2.6
1	D	11	ALA	2.6
1	B	141	ALA	2.6
1	A	138	LEU	2.5
1	B	138	LEU	2.5
1	A	50	ILE	2.5
1	A	141	ALA	2.5
1	D	141	ALA	2.5
1	C	139	ALA	2.5
1	B	4	TYR	2.5
1	A	192	VAL	2.4
1	A	280	ARG	2.4
1	D	42	SER	2.4
1	A	38	SER	2.4
1	C	279	ILE	2.4
1	D	46	ALA	2.4
1	A	7	ALA	2.4
1	A	1	MET	2.3
1	D	49	ASP	2.3
1	A	36	GLY	2.3
1	B	140	GLY	2.3
1	A	73	VAL	2.3
1	D	64	SER	2.2
1	D	103	LEU	2.2
1	D	136	PRO	2.2
1	A	139	ALA	2.2
1	B	145	THR	2.2
1	C	140	GLY	2.2
1	D	262	GLU	2.1
1	D	105	VAL	2.1
1	B	43	ILE	2.1
1	C	138	LEU	2.1
1	A	102	ALA	2.1
1	D	5	ASP	2.1
1	A	152	GLU	2.1
1	B	136	PRO	2.1
1	D	8	LYS	2.1
1	B	19	GLN	2.1

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Mol	Chain	Res	Type	RSRZ
1	A	17	GLN	2.1
1	A	39	LEU	2.1
1	D	24	LEU	2.1
1	B	139	ALA	2.1
1	D	260	ALA	2.1
1	C	136	PRO	2.1
1	A	218	THR	2.0

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

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, 95^{th} 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
3	TRS	D	297	8/8	0.86	0.20	54,59,63,68	0
3	TRS	A	294	8/8	0.88	0.18	40,45,52,62	0
3	TRS	C	296	8/8	0.91	0.20	48,54,59,59	0
3	TRS	B	295	8/8	0.93	0.21	33,45,49,52	0
2	PO4	C	292	5/5	0.95	0.14	37,41,49,51	0
2	PO4	A	290	5/5	0.99	0.12	35,38,42,44	0
2	PO4	D	293	5/5	0.99	0.10	47,50,53,58	0
2	PO4	B	291	5/5	0.99	0.14	35,36,37,39	0

6.5 Other polymers (i)

There are no such residues in this entry.