Full wwPDB X-ray Structure Validation Report (i)

Feb 1, 2016 – 06:44 AM GMT

PDB ID	:	2Y6V
Title	:	Peroxisomal alpha-beta hydrolase Lpx1 (Yor084w) from Saccharomyces cerevisiae (crystal form I)
Authors	:	Thoms, S.; Niemann, H.H.
Deposited on	:	2011-01-26
Resolution	:	2.83 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
http://wwpdb.org/validation/2016/XrayValidationReportHelp
with specific help available everywhere you see the (i) symbol.

The following versions of software and data (see references (1)) were used in the production of this report:

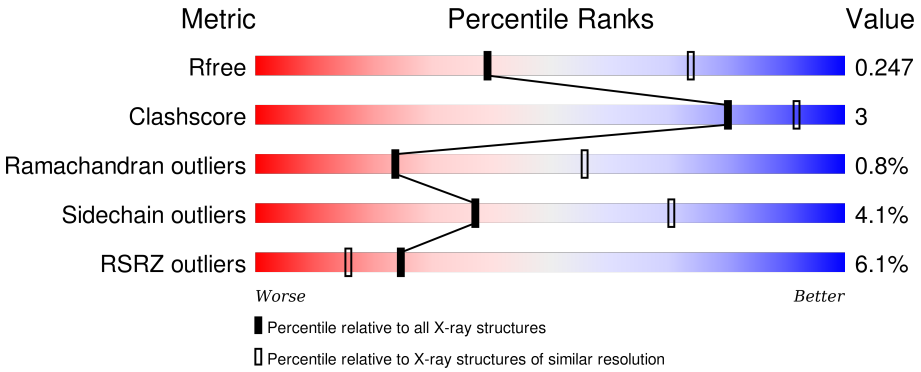
MolProbity	:	4.02b-467
Mogul	:	1.7 (RC4), CSD as536be (2015)
Xtriage (Phenix)	:	1.9-1692
EDS	:	rb-20026688
Percentile statistics	:	20151230.v01 (using entries in the PDB archive December 30th 2015)
Refmac	:	5.8.0135
CCP4	:	6.5.0
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	trunk26865

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 2.83 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}	91344	3170 (2.88-2.80)
Clashscore	102246	3658 (2.88-2.80)
Ramachandran outliers	100387	3591 (2.88-2.80)
Sidechain outliers	100360	3594 (2.88-2.80)
RSRZ outliers	91569	3184 (2.88-2.80)

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 <=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	398	6% 81% 8% • 11%
1	B	398	7% 82% 7% • 9%
1	C	398	4% 85% 8% • 5%

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 criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	PO4	B	1382	-	-	-	X
2	PO4	C	1388	-	-	-	X

2 Entry composition (i)

There are 3 unique types of molecules in this entry. The entry contains 8879 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 PEROXISOMAL MEMBRANE PROTEIN LPX1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	356	Total	C	N	O	S	0	0	0
			2855	1809	511	520	15			
1	B	363	Total	C	N	O	S	0	0	0
			2915	1844	524	532	15			
1	C	377	Total	C	N	O	S	0	1	0
			3023	1909	546	552	16			

There are 33 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	388	ALA	-	EXPRESSION TAG	UNP Q12405
A	389	ALA	-	EXPRESSION TAG	UNP Q12405
A	390	ALA	-	EXPRESSION TAG	UNP Q12405
A	391	LEU	-	EXPRESSION TAG	UNP Q12405
A	392	GLU	-	EXPRESSION TAG	UNP Q12405
A	393	HIS	-	EXPRESSION TAG	UNP Q12405
A	394	HIS	-	EXPRESSION TAG	UNP Q12405
A	395	HIS	-	EXPRESSION TAG	UNP Q12405
A	396	HIS	-	EXPRESSION TAG	UNP Q12405
A	397	HIS	-	EXPRESSION TAG	UNP Q12405
A	398	HIS	-	EXPRESSION TAG	UNP Q12405
B	388	ALA	-	EXPRESSION TAG	UNP Q12405
B	389	ALA	-	EXPRESSION TAG	UNP Q12405
B	390	ALA	-	EXPRESSION TAG	UNP Q12405
B	391	LEU	-	EXPRESSION TAG	UNP Q12405
B	392	GLU	-	EXPRESSION TAG	UNP Q12405
B	393	HIS	-	EXPRESSION TAG	UNP Q12405
B	394	HIS	-	EXPRESSION TAG	UNP Q12405
B	395	HIS	-	EXPRESSION TAG	UNP Q12405
B	396	HIS	-	EXPRESSION TAG	UNP Q12405
B	397	HIS	-	EXPRESSION TAG	UNP Q12405
B	398	HIS	-	EXPRESSION TAG	UNP Q12405
C	388	ALA	-	EXPRESSION TAG	UNP Q12405

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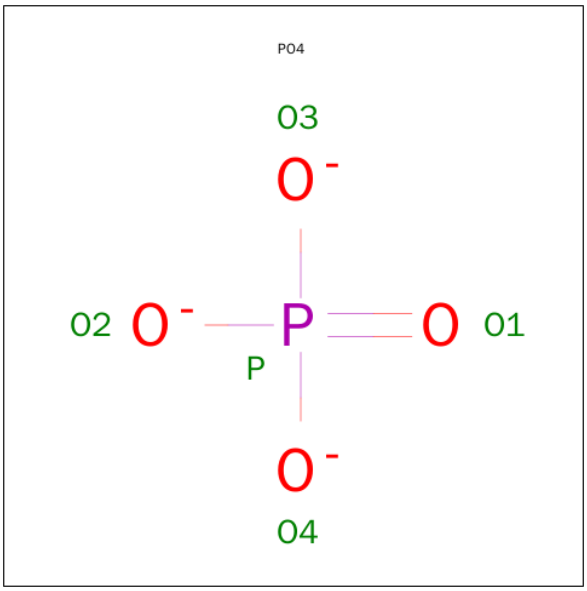
Chain	Residue	Modelled	Actual	Comment	Reference
C	389	ALA	-	EXPRESSION TAG	UNP Q12405
C	390	ALA	-	EXPRESSION TAG	UNP Q12405
C	391	LEU	-	EXPRESSION TAG	UNP Q12405
C	392	GLU	-	EXPRESSION TAG	UNP Q12405
C	393	HIS	-	EXPRESSION TAG	UNP Q12405
C	394	HIS	-	EXPRESSION TAG	UNP Q12405
C	395	HIS	-	EXPRESSION TAG	UNP Q12405
C	396	HIS	-	EXPRESSION TAG	UNP Q12405
C	397	HIS	-	EXPRESSION TAG	UNP Q12405
C	398	HIS	-	EXPRESSION TAG	UNP Q12405

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



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

- Molecule 3 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	16	Total O 16 16	0	0

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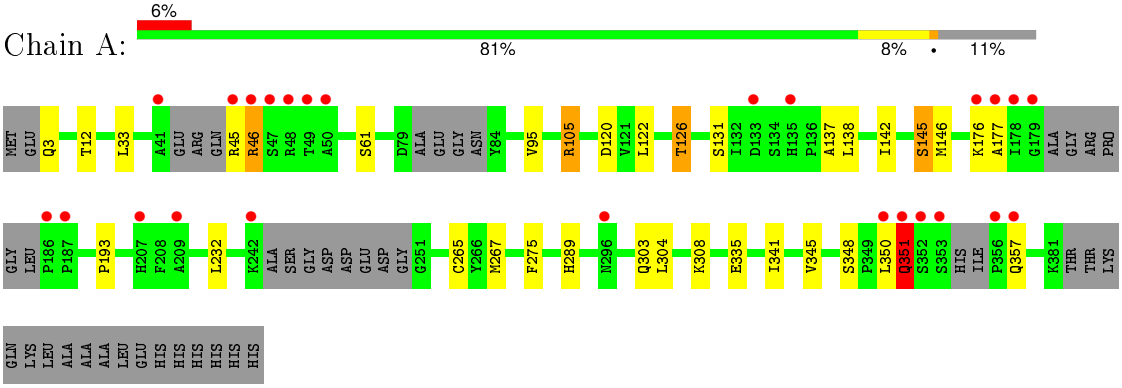
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	B	22	Total O 22 22	0	0
3	C	33	Total O 33 33	0	0

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 errors 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.

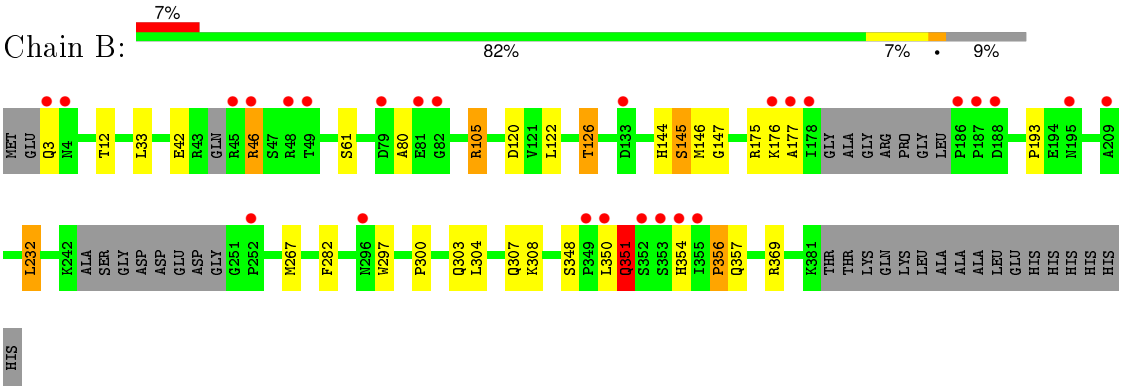
- Molecule 1: PEROXISOMAL MEMBRANE PROTEIN LPX1

Chain A:



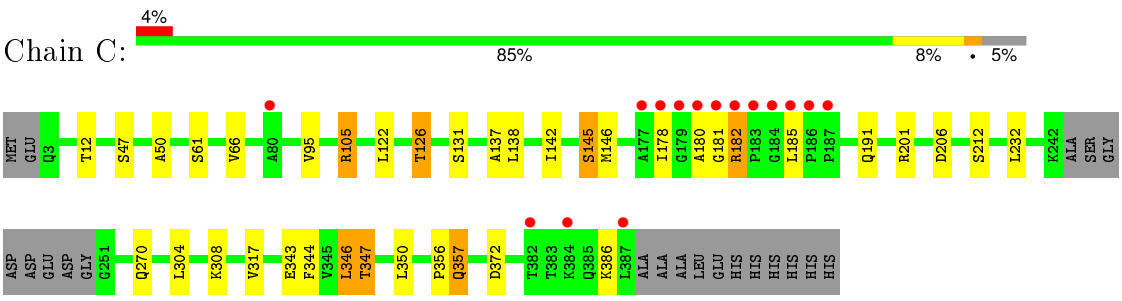
- Molecule 1: PEROXISOMAL MEMBRANE PROTEIN LPX1

Chain B:



- Molecule 1: PEROXISOMAL MEMBRANE PROTEIN LPX1

Chain C:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	140.48Å 87.77Å 125.04Å 90.00° 95.10° 90.00°	Depositor
Resolution (Å)	19.75 – 2.83 19.75 – 2.83	Depositor EDS
% Data completeness (in resolution range)	100.0 (19.75-2.83) 96.0 (19.75-2.83)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.52 (at 2.83Å)	Xtriage
Refinement program	REFMAC 5.5.0109	Depositor
R, R_{free}	0.207 , 0.254 0.206 , 0.247	Depositor DCC
R_{free} test set	1744 reflections (5.26%)	DCC
Wilson B-factor (Å^2)	36.3	Xtriage
Anisotropy	0.136	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 39.5	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Outliers	0 of 34876 reflections	Xtriage
F_o,F_c correlation	0.92	EDS
Total number of atoms	8879	wwPDB-VP
Average B, all atoms (Å^2)	38.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.17% 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, 0.375 respectively for untwinned datasets, and 0.333, 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: PO4, CSO, CME

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	0.74	2/2872 (0.1%)	0.73	0/3880
1	B	0.76	0/2935	0.74	1/3969 (0.0%)
1	C	0.76	1/3039 (0.0%)	0.79	4/4112 (0.1%)
All	All	0.75	3/8846 (0.0%)	0.76	5/11961 (0.0%)

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	343	GLU	CG-CD	5.31	1.59	1.51
1	A	265	CYS	CB-SG	-5.25	1.73	1.81
1	A	335	GLU	CG-CD	5.07	1.59	1.51

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	105	ARG	NE-CZ-NH1	5.66	123.13	120.30
1	C	356	PRO	N-CA-C	5.52	126.45	112.10
1	C	206	ASP	CB-CG-OD1	5.38	123.15	118.30
1	B	105	ARG	NE-CZ-NH1	5.38	122.99	120.30
1	C	201	ARG	NE-CZ-NH1	5.36	122.98	120.30

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	2855	0	2847	19	1
1	B	2915	0	2902	28	1
1	C	3023	0	3019	23	0
2	A	5	0	0	0	0
2	B	5	0	0	0	0
2	C	5	0	0	0	0
3	A	16	0	0	1	0
3	B	22	0	0	1	0
3	C	33	0	0	1	0
All	All	8879	0	8768	59	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 3.

All (59) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:307:GLN:HG3	1:C:317:VAL:HG21	1.51	0.89
1:B:350:LEU:HA	1:B:351:GLN:HB2	1.58	0.85
1:A:350:LEU:HA	1:A:351:GLN:HB2	1.58	0.84
1:B:300:PRO:HG3	1:C:304:LEU:HD12	1.62	0.80
1:C:346:LEU:O	1:C:347:THR:HG23	1.82	0.80
1:B:350:LEU:HA	1:B:351:GLN:CB	2.16	0.75
1:A:350:LEU:HA	1:A:351:GLN:CB	2.17	0.74
1:B:46:ARG:O	1:B:46:ARG:HD3	1.95	0.67
1:A:145:SER:OG	1:A:146:MET:N	2.29	0.66
1:C:122:LEU:O	1:C:126:THR:HB	1.99	0.63
1:A:122:LEU:O	1:A:126:THR:HB	1.98	0.63
1:C:137:ALA:O	1:C:138:LEU:HD23	1.99	0.62
1:A:46:ARG:O	1:A:46:ARG:HD3	2.00	0.62
1:C:95:VAL:HG13	3:C:2011:HOH:O	1.99	0.61
1:B:354:HIS:NE2	1:B:356:PRO:HB3	2.16	0.60
1:B:300:PRO:HB3	1:C:304:LEU:CD1	2.33	0.59
1:B:177:ALA:HB2	1:B:193:PRO:HG3	1.84	0.58
1:B:354:HIS:CE1	1:B:356:PRO:HB3	2.39	0.58
1:B:300:PRO:HG3	1:C:304:LEU:CD1	2.34	0.58
1:B:145:SER:OG	1:B:146:MET:N	2.37	0.58
1:C:145:SER:OG	1:C:146:MET:N	2.38	0.56
1:A:177:ALA:HB2	1:A:193:PRO:HG3	1.87	0.55
1:B:122:LEU:O	1:B:126:THR:HB	2.07	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:300:PRO:HA	1:C:304:LEU:HD11	1.91	0.52
1:B:300:PRO:CB	1:C:304:LEU:HD11	2.39	0.52
1:C:304:LEU:O	1:C:308:LYS:HG2	2.10	0.52
1:B:33:LEU:HD11	1:B:120:ASP:HB3	1.90	0.51
1:A:350:LEU:CA	1:A:351:GLN:CB	2.89	0.50
1:B:304:LEU:O	1:B:308:LYS:HG2	2.11	0.49
1:A:304:LEU:O	1:A:308:LYS:HG2	2.13	0.49
1:B:300:PRO:CG	1:C:304:LEU:HD12	2.40	0.49
1:B:300:PRO:CB	1:C:304:LEU:CD1	2.91	0.48
1:B:300:PRO:CA	1:C:304:LEU:HD11	2.44	0.48
1:B:350:LEU:CA	1:B:351:GLN:CB	2.88	0.48
1:C:182:ARG:HB2	1:C:185:LEU:HD12	1.96	0.47
1:A:33:LEU:HD11	1:A:120:ASP:HB3	1.97	0.47
1:C:344:PHE:O	1:C:347:THR:OG1	2.32	0.47
1:B:300:PRO:HB3	1:C:304:LEU:HD11	1.96	0.46
1:C:182:ARG:HB2	1:C:185:LEU:CD1	2.45	0.46
1:A:137:ALA:O	1:A:138:LEU:HD23	2.16	0.46
1:A:341:ILE:O	1:A:345:VAL:HG23	2.16	0.46
1:C:142:ILE:HD12	1:C:142:ILE:N	2.31	0.46
1:B:46:ARG:HD3	1:B:46:ARG:C	2.36	0.45
1:A:46:ARG:HD3	1:A:46:ARG:C	2.36	0.45
1:C:191:GLN:HB2	1:C:270:GLN:NE2	2.32	0.45
1:B:303:GLN:NE2	3:B:2021:HOH:O	2.42	0.44
1:C:47:SER:H	1:C:50:ALA:HB2	1.81	0.44
1:C:180:ALA:HA	1:C:181:GLY:HA3	1.76	0.44
1:B:144:HIS:O	1:B:147:GLY:N	2.50	0.43
1:A:45:ARG:O	1:A:46:ARG:C	2.56	0.43
1:A:142:ILE:N	1:A:142:ILE:HD12	2.34	0.42
1:A:289:HIS:CE1	1:A:303:GLN:HG3	2.55	0.42
1:A:95:VAL:HG13	3:A:2008:HOH:O	2.19	0.42
1:B:175:ARG:NH1	1:B:297:TRP:O	2.53	0.42
1:A:275:PHE:HA	1:B:282:PHE:CZ	2.55	0.42
1:A:267:MET:HB3	1:A:267:MET:HE2	2.01	0.41
1:B:232:LEU:O	1:B:232:LEU:HD22	2.21	0.41
1:A:105:ARG:HG2	1:A:105:ARG:HH11	1.86	0.40
1:B:267:MET:HB3	1:B:267:MET:HE2	1.99	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:3:GLN:O	1:B:369:ARG:NH2[4_645]	2.15	0.05

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	339/398 (85%)	326 (96%)	11 (3%)	2 (1%)	30	63
1	B	350/398 (88%)	330 (94%)	16 (5%)	4 (1%)	17	47
1	C	368/398 (92%)	350 (95%)	16 (4%)	2 (0%)	34	67
All	All	1057/1194 (88%)	1006 (95%)	43 (4%)	8 (1%)	24	56

All (8) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	351	GLN
1	B	351	GLN
1	C	347	THR
1	A	357	GLN
1	B	356	PRO
1	B	357	GLN
1	C	357	GLN
1	B	80	ALA

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	311/342 (91%)	300 (96%)	11 (4%)	43 76
1	B	317/342 (93%)	305 (96%)	12 (4%)	40 73
1	C	327/342 (96%)	311 (95%)	16 (5%)	31 63
All	All	955/1026 (93%)	916 (96%)	39 (4%)	37 70

All (39) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	12	THR
1	A	46	ARG
1	A	61	SER
1	A	105	ARG
1	A	126	THR
1	A	131	SER
1	A	145	SER
1	A	176	LYS
1	A	232	LEU
1	A	348	SER
1	A	351	GLN
1	B	3	GLN
1	B	12	THR
1	B	42	GLU
1	B	46	ARG
1	B	61	SER
1	B	105	ARG
1	B	126	THR
1	B	145	SER
1	B	176	LYS
1	B	232	LEU
1	B	348	SER
1	B	351	GLN
1	C	12	THR
1	C	61	SER
1	C	66	VAL
1	C	105	ARG
1	C	126	THR
1	C	131	SER
1	C	145	SER
1	C	178	ILE
1	C	182	ARG
1	C	212	SER
1	C	232	LEU

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Mol	Chain	Res	Type
1	C	346	LEU
1	C	350	LEU
1	C	357	GLN
1	C	372	ASP
1	C	386	LYS

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (7) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	4	ASN
1	A	314	HIS
1	B	4	ASN
1	C	4	ASN
1	C	230	GLN
1	C	314	HIS
1	C	357	GLN

5.3.3 RNA

There are no RNA molecules in this entry.

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

16 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	CSO	A	127	1	3,6,7	0.85	0	1,6,8	1.84	0
1	CME	A	13	1	8,9,10	0.78	0	6,9,11	2.45	2 (33%)
1	CSO	A	205	1	3,6,7	0.71	0	1,6,8	1.95	0
1	CSO	A	26	1	3,6,7	0.61	0	1,6,8	1.72	0
1	CSO	A	298	1	3,6,7	0.20	0	1,6,8	2.49	1 (100%)
1	CSO	B	127	1	3,6,7	0.82	0	1,6,8	2.10	1 (100%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
1	CME	B	13	1	8,9,10	0.82	0	6,9,11	2.37	2 (33%)
1	CSO	B	205	1	3,6,7	0.77	0	1,6,8	2.17	1 (100%)
1	CSO	B	26	1	3,6,7	0.30	0	1,6,8	1.43	0
1	CSO	B	298	1	3,6,7	0.54	0	1,6,8	1.70	0
1	CSO	C	127	1	3,6,7	0.95	0	1,6,8	2.07	1 (100%)
1	CME	C	13	1	8,9,10	0.90	1 (12%)	6,9,11	1.96	2 (33%)
1	CSO	C	205	1	3,6,7	0.59	0	1,6,8	1.81	0
1	CSO	C	26	1	3,6,7	0.46	0	1,6,8	1.82	0
1	CSO	C	298[A]	1	3,6,7	0.61	0	1,6,8	2.34	1 (100%)
1	CSO	C	298[B]	1	3,6,7	0.60	0	1,6,8	2.31	1 (100%)

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	CSO	A	127	1	-	0/1/5/7	0/0/0/0
1	CME	A	13	1	-	0/5/8/10	0/0/0/0
1	CSO	A	205	1	-	0/1/5/7	0/0/0/0
1	CSO	A	26	1	-	0/1/5/7	0/0/0/0
1	CSO	A	298	1	-	0/1/5/7	0/0/0/0
1	CSO	B	127	1	-	0/1/5/7	0/0/0/0
1	CME	B	13	1	-	0/5/8/10	0/0/0/0
1	CSO	B	205	1	-	0/1/5/7	0/0/0/0
1	CSO	B	26	1	-	0/1/5/7	0/0/0/0
1	CSO	B	298	1	-	0/1/5/7	0/0/0/0
1	CSO	C	127	1	-	0/1/5/7	0/0/0/0
1	CME	C	13	1	-	0/5/8/10	0/0/0/0
1	CSO	C	205	1	-	0/1/5/7	0/0/0/0
1	CSO	C	26	1	-	0/1/5/7	0/0/0/0
1	CSO	C	298[A]	1	-	0/1/5/7	0/0/0/0
1	CSO	C	298[B]	1	-	0/1/5/7	0/0/0/0

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	13	CME	CB-SG	-2.18	1.73	1.81

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	13	CME	CB-SG-SD	-4.91	94.39	103.95
1	B	13	CME	CB-SG-SD	-4.65	94.89	103.95
1	C	13	CME	CA-CB-SG	-3.35	102.09	114.23
1	C	13	CME	CB-SG-SD	-2.96	98.18	103.95
1	A	298	CSO	O-C-CA	-2.49	119.00	125.49
1	B	13	CME	CA-CB-SG	-2.42	105.46	114.23
1	C	298[A]	CSO	O-C-CA	-2.34	119.39	125.49
1	C	298[B]	CSO	O-C-CA	-2.31	119.46	125.49
1	A	13	CME	CZ-CE-SD	-2.27	107.62	113.16
1	B	205	CSO	O-C-CA	-2.17	119.83	125.49
1	B	127	CSO	O-C-CA	-2.10	120.02	125.49
1	C	127	CSO	O-C-CA	-2.07	120.09	125.49

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)

3 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	$\#\|Z\| > 2$
2	PO4	A	1382	-	4,4,4	0.13	0	6,6,6	0.29	0
2	PO4	B	1382	-	4,4,4	0.33	0	6,6,6	0.29	0
2	PO4	C	1388	-	4,4,4	0.42	0	6,6,6	0.28	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
2	PO4	A	1382	-	-	0/0/0/0	0/0/0/0
2	PO4	B	1382	-	-	0/0/0/0	0/0/0/0
2	PO4	C	1388	-	-	0/0/0/0	0/0/0/0

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 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	351/398 (88%)	-0.22	25 (7%)	19	11	21, 37, 60, 81	0
1	B	358/398 (89%)	-0.16	26 (7%)	18	10	22, 38, 65, 79	0
1	C	372/398 (93%)	-0.27	15 (4%)	42	31	21, 34, 62, 95	0
All	All	1081/1194 (90%)	-0.22	66 (6%)	25	16	21, 36, 63, 95	0

All (66) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	49	THR	6.3
1	B	4	ASN	6.2
1	C	177	ALA	5.8
1	B	186	PRO	5.8
1	A	351	GLN	5.8
1	A	178	ILE	5.4
1	C	181	GLY	5.3
1	A	45	ARG	5.0
1	A	46	ARG	5.0
1	A	350	LEU	4.7
1	C	178	ILE	4.7
1	B	3	GLN	4.6
1	A	48	ARG	4.6
1	B	187	PRO	4.5
1	A	177	ALA	4.5
1	B	49	THR	4.4
1	B	81	GLU	4.4
1	B	177	ALA	4.3
1	A	179	GLY	4.1
1	A	187	PRO	4.1
1	B	178	ILE	4.0
1	C	183	PRO	3.9
1	B	46	ARG	3.9

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Mol	Chain	Res	Type	RSRZ
1	B	45	ARG	3.7
1	C	180	ALA	3.7
1	B	209	ALA	3.7
1	A	41	ALA	3.6
1	A	47	SER	3.5
1	A	209	ALA	3.3
1	C	187	PRO	3.3
1	A	207	HIS	3.2
1	A	352	SER	3.1
1	C	184	GLY	3.1
1	C	384	LYS	3.1
1	C	179	GLY	3.1
1	B	48	ARG	3.0
1	C	80	ALA	2.9
1	A	50	ALA	2.9
1	B	79	ASP	2.8
1	C	185	LEU	2.8
1	B	352	SER	2.8
1	C	387	LEU	2.7
1	A	356	PRO	2.7
1	B	296	ASN	2.6
1	A	353	SER	2.6
1	B	176	LYS	2.6
1	A	357	GLN	2.6
1	B	353	SER	2.6
1	A	242	LYS	2.6
1	B	355	ILE	2.6
1	C	382	THR	2.5
1	C	182	ARG	2.5
1	A	296	ASN	2.5
1	C	186	PRO	2.5
1	B	133	ASP	2.4
1	A	176	LYS	2.4
1	B	195	ASN	2.3
1	A	186	PRO	2.3
1	B	82	GLY	2.2
1	A	133	ASP	2.2
1	B	188	ASP	2.1
1	B	350	LEU	2.1
1	B	252	PRO	2.1
1	B	349	PRO	2.1
1	B	354	HIS	2.1

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Mol	Chain	Res	Type	RSRZ
1	A	135	HIS	2.0

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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	LLDF	B-factors(Å^2)	Q<0.9
1	CSO	C	26	7/8	0.95	0.11	-	31,32,36,37	0
1	CSO	B	298	7/8	0.90	0.26	-	41,43,45,46	0
1	CSO	A	26	7/8	0.95	0.11	-	33,34,39,40	0
1	CSO	A	127	7/8	0.96	0.13	-	28,30,34,35	0
1	CSO	B	127	7/8	0.97	0.13	-	29,31,36,36	0
1	CSO	C	298[B]	7/8	0.94	0.16	-	35,37,38,39	7
1	CSO	C	127	7/8	0.95	0.11	-	27,28,33,34	0
1	CSO	A	205	7/8	0.84	0.17	-	42,43,49,51	0
1	CME	B	13	10/11	0.91	0.17	-	28,31,35,36	0
1	CSO	C	205	7/8	0.97	0.11	-	35,36,42,44	0
1	CSO	A	298	7/8	0.87	0.19	-	38,40,41,44	0
1	CSO	B	26	7/8	0.96	0.10	-	35,36,42,42	0
1	CSO	C	298[A]	7/8	0.94	0.16	-	31,35,39,39	7
1	CME	C	13	10/11	0.94	0.17	-	26,27,32,33	0
1	CME	A	13	10/11	0.94	0.14	-	27,28,33,33	0
1	CSO	B	205	7/8	0.91	0.14	-	41,42,48,49	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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	LLDF	B-factors(Å^2)	Q<0.9
2	PO4	C	1388	5/5	0.93	0.45	3.10	60,61,62,63	0
2	PO4	B	1382	5/5	0.88	0.42	1.60	60,60,63,64	0
2	PO4	A	1382	5/5	0.94	0.33	1.44	49,51,53,54	0

6.5 Other polymers (i)

There are no such residues in this entry.