wwPDB X-ray Structure Validation Summary Report (i)

Aug 9, 2020 – 11:17 PM BST

PDB ID	:	1XSK
Title	:	Structure of a Family 31 alpha glycosidase glycosyl-enzyme intermediate
Authors	:	Lovering, A.L.; Lee, S.S.; Kim, Y.W.; Withers, S.G.; Strynadka, N.C.
Deposited on	:	2004-10-19
Resolution	:	2.20 Å(reported)

This is a wwPDB X-ray Structure Validation Summary 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 (i) symbol.

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

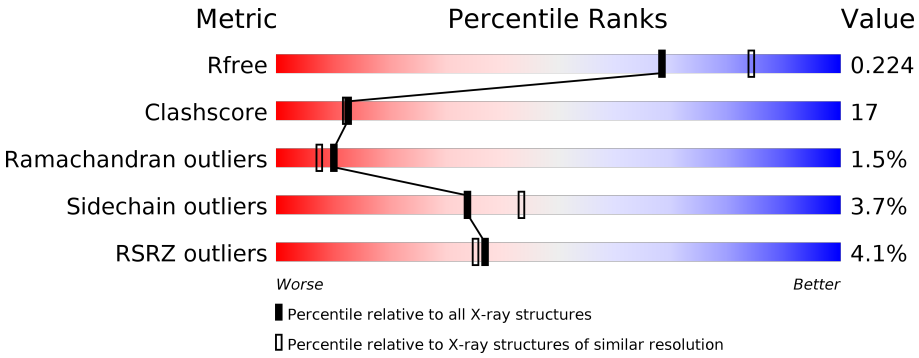
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.13.1
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.13.1

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 2.20 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}	130704	4898 (2.20-2.20)
Clashscore	141614	5594 (2.20-2.20)
Ramachandran outliers	138981	5503 (2.20-2.20)
Sidechain outliers	138945	5504 (2.20-2.20)
RSRZ outliers	127900	4800 (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 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	778	2% 70% 26%
1	B	778	6% 67% 30%
1	C	778	2% 68% 29%
1	D	778	7% 66% 30%
1	E	778	4% 66% 30%
1	F	778	4% 70% 27%

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	SO4	F	3005	-	-	X	-

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 38360 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 Putative family 31 glucosidase yicI.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	773	Total	C	N	O	S	0	0	0
			6226	3978	1069	1147	32			
1	B	773	Total	C	N	O	S	0	0	0
			6226	3978	1069	1147	32			
1	C	773	Total	C	N	O	S	0	0	0
			6226	3978	1069	1147	32			
1	D	773	Total	C	N	O	S	0	0	0
			6226	3978	1069	1147	32			
1	E	773	Total	C	N	O	S	0	0	0
			6226	3978	1069	1147	32			
1	F	773	Total	C	N	O	S	0	0	0
			6226	3978	1069	1147	32			

There are 36 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	773	HIS	-	expression tag	UNP P31434
A	774	HIS	-	expression tag	UNP P31434
A	775	HIS	-	expression tag	UNP P31434
A	776	HIS	-	expression tag	UNP P31434
A	777	HIS	-	expression tag	UNP P31434
A	778	HIS	-	expression tag	UNP P31434
B	773	HIS	-	expression tag	UNP P31434
B	774	HIS	-	expression tag	UNP P31434
B	775	HIS	-	expression tag	UNP P31434
B	776	HIS	-	expression tag	UNP P31434
B	777	HIS	-	expression tag	UNP P31434
B	778	HIS	-	expression tag	UNP P31434
C	773	HIS	-	expression tag	UNP P31434
C	774	HIS	-	expression tag	UNP P31434
C	775	HIS	-	expression tag	UNP P31434
C	776	HIS	-	expression tag	UNP P31434
C	777	HIS	-	expression tag	UNP P31434

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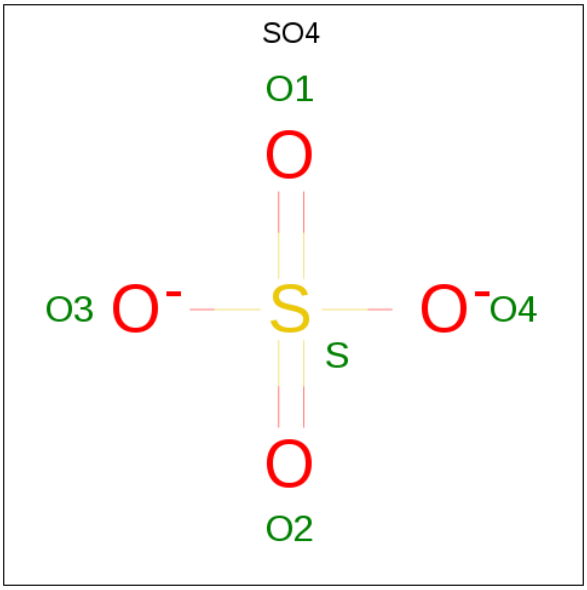
Chain	Residue	Modelled	Actual	Comment	Reference
C	778	HIS	-	expression tag	UNP P31434
D	773	HIS	-	expression tag	UNP P31434
D	774	HIS	-	expression tag	UNP P31434
D	775	HIS	-	expression tag	UNP P31434
D	776	HIS	-	expression tag	UNP P31434
D	777	HIS	-	expression tag	UNP P31434
D	778	HIS	-	expression tag	UNP P31434
E	773	HIS	-	expression tag	UNP P31434
E	774	HIS	-	expression tag	UNP P31434
E	775	HIS	-	expression tag	UNP P31434
E	776	HIS	-	expression tag	UNP P31434
E	777	HIS	-	expression tag	UNP P31434
E	778	HIS	-	expression tag	UNP P31434
F	773	HIS	-	expression tag	UNP P31434
F	774	HIS	-	expression tag	UNP P31434
F	775	HIS	-	expression tag	UNP P31434
F	776	HIS	-	expression tag	UNP P31434
F	777	HIS	-	expression tag	UNP P31434
F	778	HIS	-	expression tag	UNP P31434

- Molecule 2 is SULFATE ION (three-letter code: SO4) (formula: O_4S).



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

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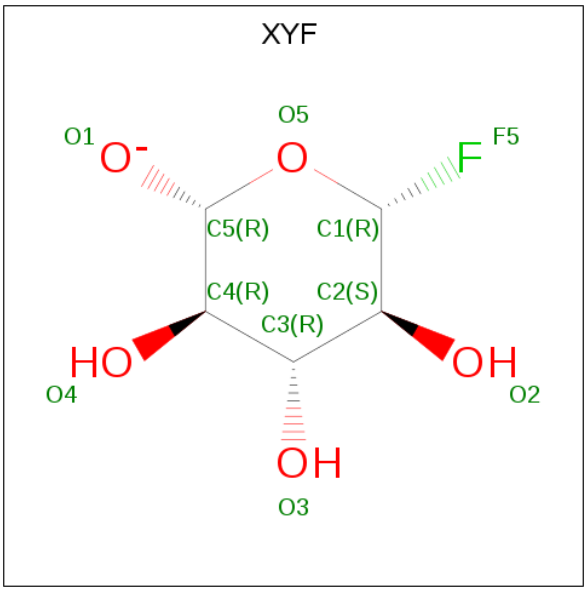
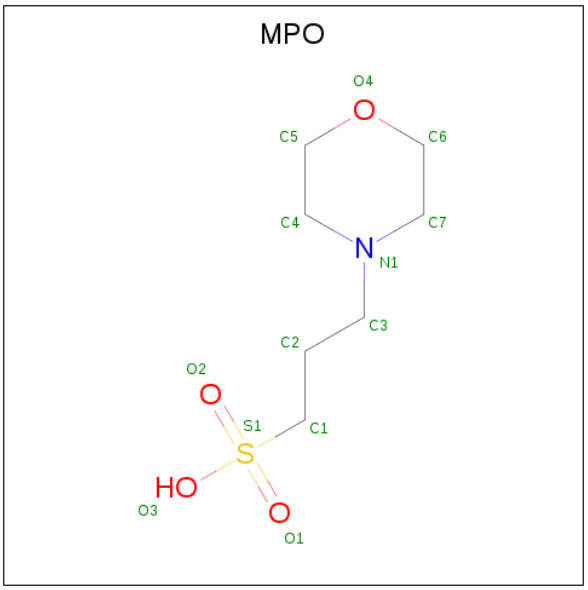
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	B	1	Total O S 5 4 1	0	0
2	B	1	Total O S 5 4 1	0	0
2	C	1	Total O S 5 4 1	0	0
2	C	1	Total O S 5 4 1	0	0
2	D	1	Total O S 5 4 1	0	0
2	E	1	Total O S 5 4 1	0	0
2	F	1	Total O S 5 4 1	0	0
2	F	1	Total O S 5 4 1	0	0
2	F	1	Total O S 5 4 1	0	0
2	F	1	Total O S 5 4 1	0	0
2	F	1	Total O S 5 4 1	0	0

- Molecule 3 is 5(R)-fluoro-beta-D-xylopyranose (three-letter code: XYF) (formula: $C_5H_8FO_5$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C F O 10 5 1 4	0	0
3	B	1	Total C F O 10 5 1 4	0	0
3	C	1	Total C F O 10 5 1 4	0	0
3	E	1	Total C F O 10 5 1 4	0	0

- Molecule 4 is 3[N-MORPHOLINO]PROPANE SULFONIC ACID (three-letter code: MPO) (formula: $C_7H_{15}NO_4S$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	B	1	Total C N O S 13 7 1 4 1	0	0
4	C	1	Total C N O S 13 7 1 4 1	0	0
4	D	1	Total C N O S 13 7 1 4 1	0	0
4	E	1	Total C N O S 13 7 1 4 1	0	0

- Molecule 5 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	168	Total O 168 168	0	0

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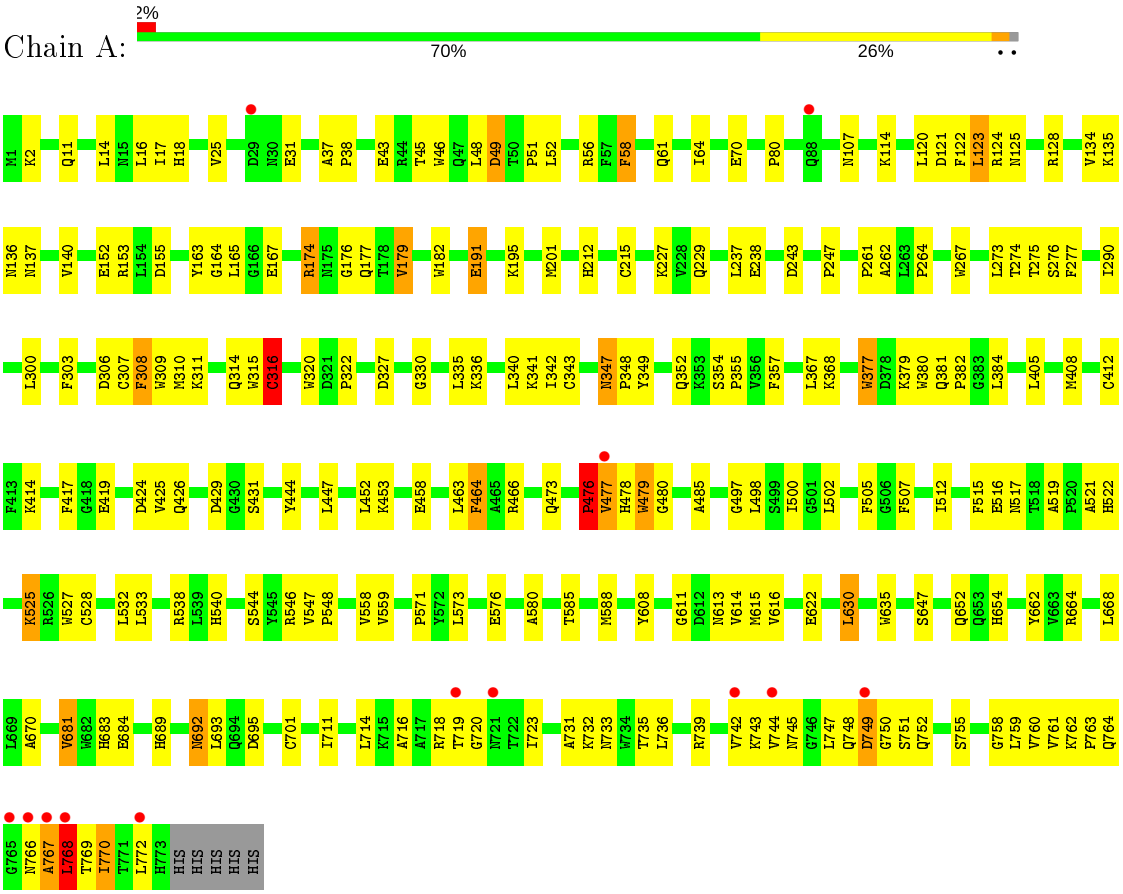
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	B	114	Total O 114 114	0	0
5	C	167	Total O 167 167	0	0
5	D	145	Total O 145 145	0	0
5	E	122	Total O 122 122	0	0
5	F	131	Total O 131 131	0	0

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.

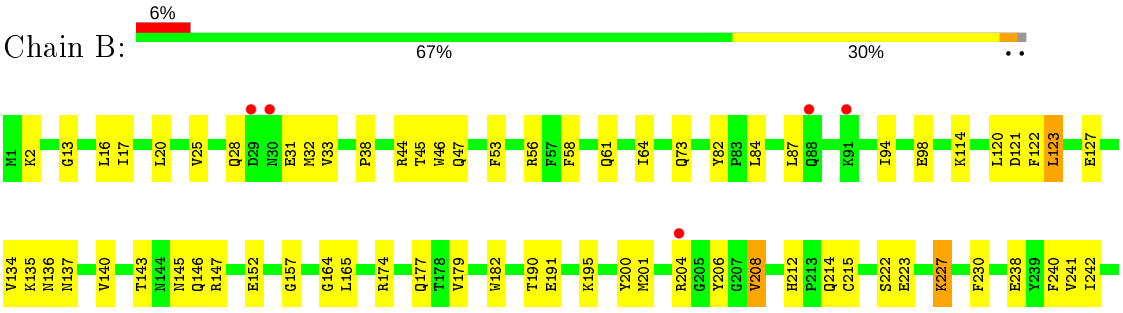
- Molecule 1: Putative family 31 glucosidase yicI

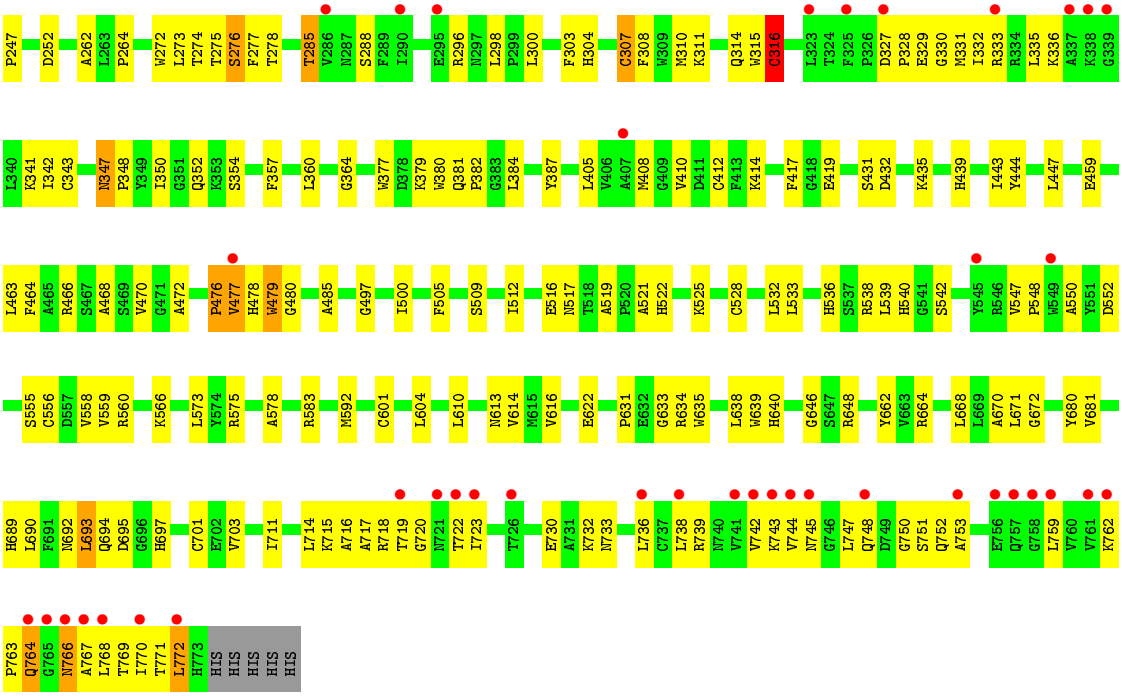
Chain A:



- Molecule 1: Putative family 31 glucosidase yicI

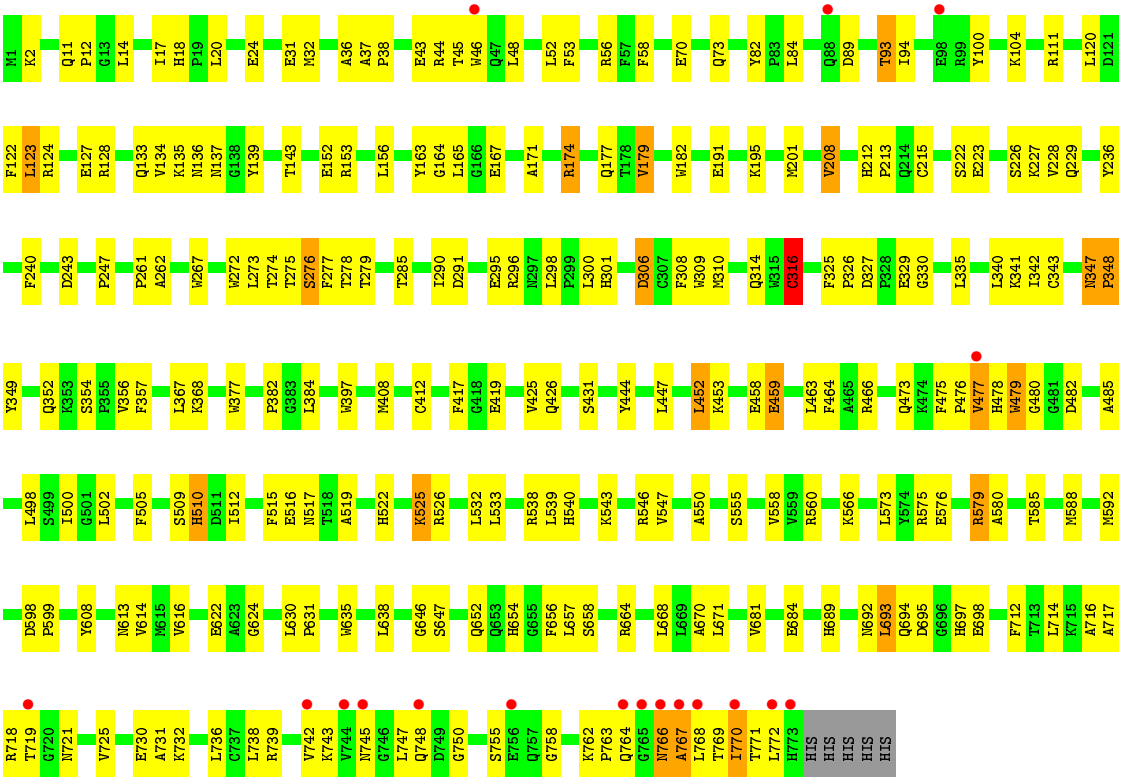
Chain B:





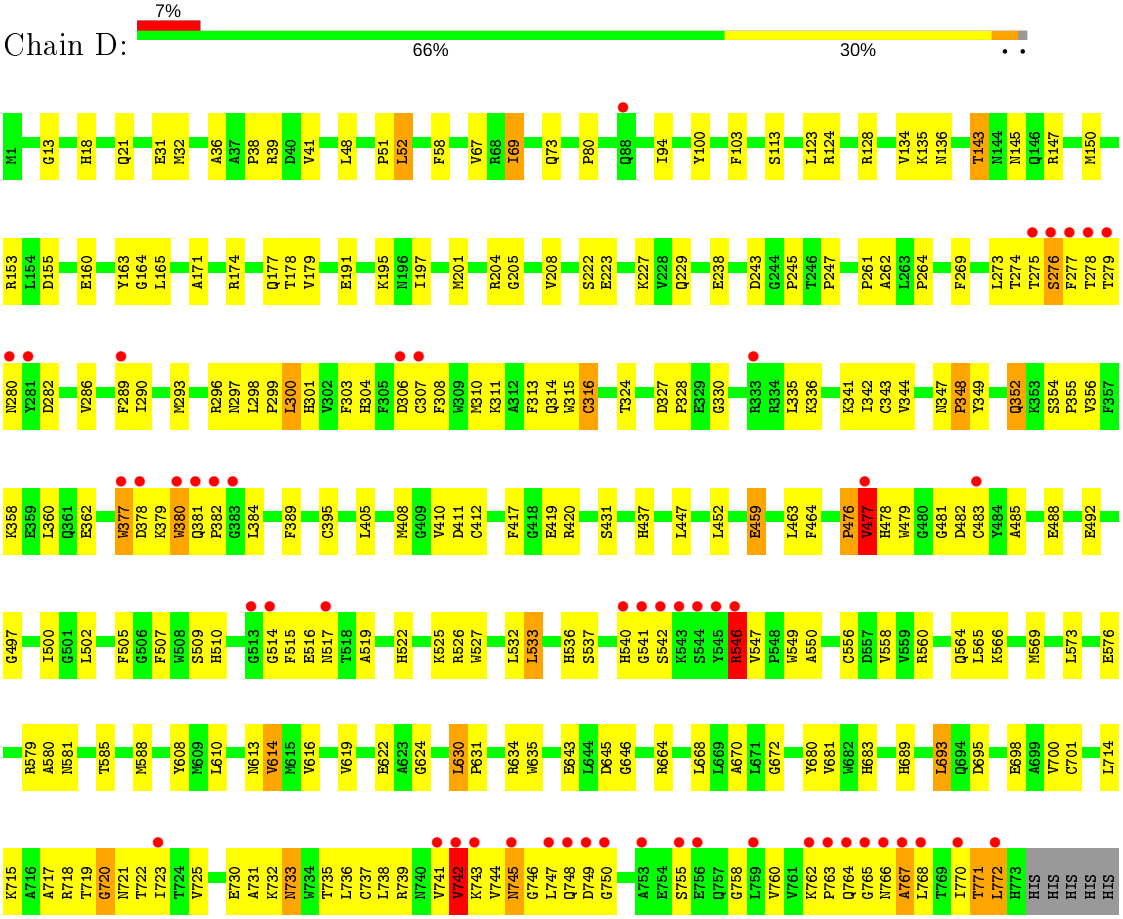
• Molecule 1: Putative family 31 glucosidase yicI

Chain C:



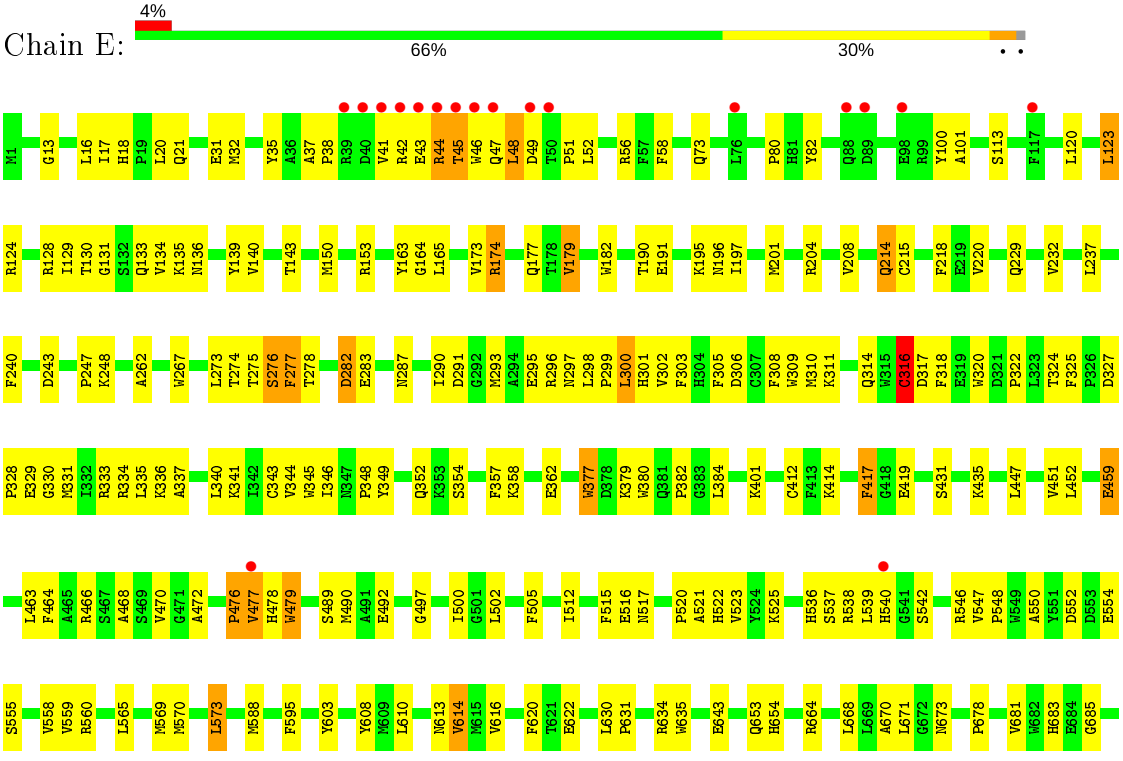
• Molecule 1: Putative family 31 glucosidase yicI

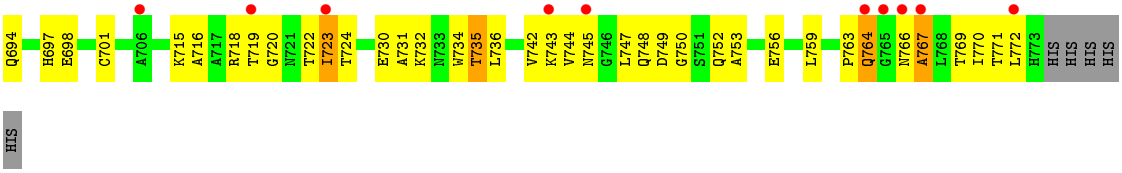
Chain D:



- Molecule 1: Putative family 31 glucosidase yicI

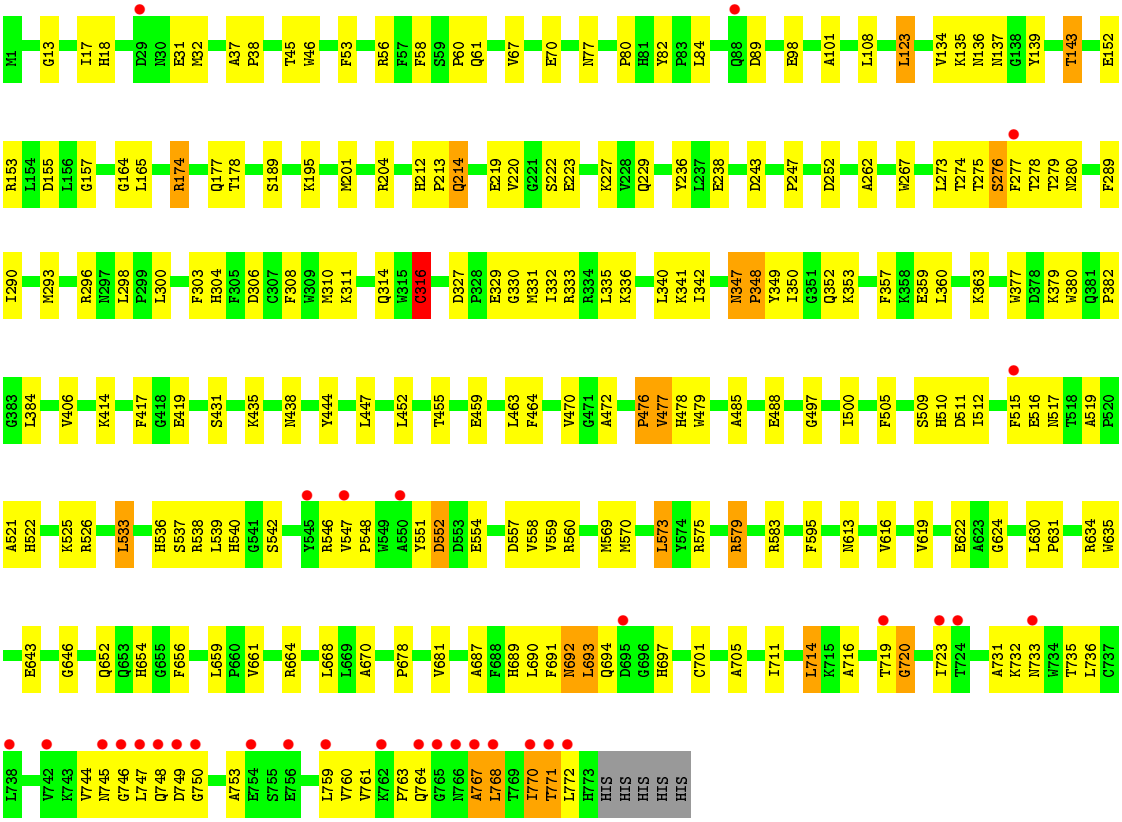
Chain E:





- Molecule 1: Putative family 31 glucosidase yicI

Chain F:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	162.14Å 175.47Å 210.85Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	29.88 – 2.20 69.48 – 2.20	Depositor EDS
% Data completeness (in resolution range)	97.9 (29.88-2.20) 97.6 (69.48-2.20)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	0.10	Depositor
$< I/\sigma(I) >$ [1]	2.21 (at 2.20Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.235 , 0.272 0.227 , 0.224	Depositor DCC
R_{free} test set	15006 reflections (5.05%)	wwPDB-VP
Wilson B-factor (Å^2)	29.5	Xtriage
Anisotropy	0.633	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 37.3	EDS
L-test for twinning[2]	$< \|L\| > = 0.51$, $< L^2 > = 0.35$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	38360	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 2.42% 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: MPO, SO4, XYF

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	0.41	0/6409	0.67	4/8711 (0.0%)
1	B	0.36	0/6409	0.62	1/8711 (0.0%)
1	C	0.41	0/6409	0.67	2/8711 (0.0%)
1	D	0.40	0/6409	0.65	1/8711 (0.0%)
1	E	0.40	0/6409	0.64	1/8711 (0.0%)
1	F	0.40	0/6409	0.65	2/8711 (0.0%)
All	All	0.40	0/38454	0.65	11/52266 (0.0%)

There are no bond length outliers.

The worst 5 of 11 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	F	316	CYS	CA-CB-SG	-6.24	102.77	114.00
1	C	316	CYS	CA-CB-SG	-6.16	102.92	114.00
1	E	613	ASN	N-CA-C	5.82	126.70	111.00
1	A	613	ASN	N-CA-C	5.81	126.67	111.00
1	D	613	ASN	N-CA-C	5.66	126.28	111.00

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	6226	0	5934	195	0
1	B	6226	0	5934	199	0
1	C	6226	0	5934	213	0
1	D	6226	0	5934	214	0
1	E	6226	0	5934	224	0
1	F	6226	0	5934	191	0
2	A	10	0	0	0	0
2	B	10	0	0	0	0
2	C	10	0	0	1	0
2	D	5	0	0	0	0
2	E	5	0	0	1	0
2	F	25	0	0	2	0
3	A	10	0	6	2	0
3	B	10	0	6	1	0
3	C	10	0	6	2	0
3	E	10	0	6	2	0
4	B	13	0	15	0	0
4	C	13	0	15	0	0
4	D	13	0	15	0	0
4	E	13	0	15	0	0
5	A	168	0	0	3	0
5	B	114	0	0	6	0
5	C	167	0	0	5	0
5	D	145	0	0	5	0
5	E	122	0	0	4	0
5	F	131	0	0	6	0
All	All	38360	0	35688	1212	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 17.

The worst 5 of 1212 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:A:274:THR:HG22	1:A:276:SER:H	1.14	1.11
1:E:274:THR:HG22	1:E:276:SER:H	1.00	1.09
1:A:668:LEU:HD21	1:A:714:LEU:HD12	1.39	1.04
1:C:579:ARG:HB2	1:C:579:ARG:HH11	1.21	1.04
1:C:32:MET:HE2	1:C:94:ILE:HG23	1.39	1.04

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	771/778 (99%)	716 (93%)	45 (6%)	10 (1%)	12 9
1	B	771/778 (99%)	712 (92%)	44 (6%)	15 (2%)	8 5
1	C	771/778 (99%)	716 (93%)	47 (6%)	8 (1%)	15 14
1	D	771/778 (99%)	709 (92%)	47 (6%)	15 (2%)	8 5
1	E	771/778 (99%)	709 (92%)	52 (7%)	10 (1%)	12 9
1	F	771/778 (99%)	709 (92%)	51 (7%)	11 (1%)	11 8
All	All	4626/4668 (99%)	4271 (92%)	286 (6%)	69 (2%)	10 8

5 of 69 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	767	ALA
1	B	764	GLN
1	B	766	ASN
1	C	766	ASN
1	C	767	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	659/665 (99%)	634 (96%)	25 (4%)	33 42
1	B	659/665 (99%)	643 (98%)	16 (2%)	49 62
1	C	659/665 (99%)	630 (96%)	29 (4%)	28 35

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	D	659/665 (99%)	630 (96%)	29 (4%)	28 35
1	E	659/665 (99%)	634 (96%)	25 (4%)	33 42
1	F	659/665 (99%)	635 (96%)	24 (4%)	35 45
All	All	3954/3990 (99%)	3806 (96%)	148 (4%)	34 43

5 of 148 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	657	LEU
1	D	352	GLN
1	F	459	GLU
1	C	721	ASN
1	D	208	VAL

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 83 such sidechains are listed below:

Mol	Chain	Res	Type
1	C	347	ASN
1	D	7	ASN
1	F	280	ASN
1	C	361	GLN
1	C	692	ASN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

21 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	SO4	B	3010	-	4,4,4	1.89	2 (50%)	6,6,6	0.91	0
2	SO4	F	3005	-	4,4,4	1.87	2 (50%)	6,6,6	0.89	0
2	SO4	F	3001	-	4,4,4	1.87	2 (50%)	6,6,6	0.88	0
4	MPO	C	2002	-	13,13,13	2.09	2 (15%)	17,17,17	2.23	6 (35%)
4	MPO	D	2003	-	13,13,13	1.93	2 (15%)	17,17,17	2.29	6 (35%)
2	SO4	C	3007	-	4,4,4	1.86	2 (50%)	6,6,6	0.92	0
3	XYF	C	803	1	10,10,11	1.68	3 (30%)	14,14,16	0.72	0
2	SO4	A	3013	-	4,4,4	1.89	2 (50%)	6,6,6	0.88	0
2	SO4	F	3009	-	4,4,4	1.89	2 (50%)	6,6,6	0.91	0
2	SO4	E	3006	-	4,4,4	1.89	2 (50%)	6,6,6	0.89	0
3	XYF	E	804	1	10,10,11	1.67	3 (30%)	14,14,16	0.64	0
2	SO4	D	3004	-	4,4,4	1.92	2 (50%)	6,6,6	0.90	0
4	MPO	E	2004	-	13,13,13	1.92	2 (15%)	17,17,17	2.26	6 (35%)
2	SO4	F	3002	-	4,4,4	1.87	2 (50%)	6,6,6	0.91	0
3	XYF	A	801	1	10,10,11	1.70	3 (30%)	14,14,16	0.67	0
2	SO4	C	3011	-	4,4,4	1.83	2 (50%)	6,6,6	0.91	0
4	MPO	B	2001	-	13,13,13	1.99	2 (15%)	17,17,17	2.28	6 (35%)
3	XYF	B	802	1	10,10,11	1.66	3 (30%)	14,14,16	0.69	0
2	SO4	B	3008	-	4,4,4	1.87	2 (50%)	6,6,6	0.91	0
2	SO4	F	3003	-	4,4,4	1.90	2 (50%)	6,6,6	0.93	0
2	SO4	A	3012	-	4,4,4	1.88	2 (50%)	6,6,6	0.88	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
4	MPO	C	2002	-	-	5/7/15/15	0/1/1/1
4	MPO	D	2003	-	-	3/7/15/15	0/1/1/1
3	XYF	C	803	1	-	-	0/1/1/1
3	XYF	B	802	1	-	-	0/1/1/1
4	MPO	E	2004	-	-	2/7/15/15	0/1/1/1
3	XYF	A	801	1	-	-	0/1/1/1
4	MPO	B	2001	-	-	3/7/15/15	0/1/1/1
3	XYF	E	804	1	-	-	0/1/1/1

The worst 5 of 46 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	C	2002	MPO	C1-S1	6.24	1.86	1.77
4	B	2001	MPO	C1-S1	5.85	1.85	1.77
4	D	2003	MPO	C1-S1	5.61	1.85	1.77
4	E	2004	MPO	C1-S1	5.49	1.85	1.77
3	B	802	XYF	O5-C1	3.38	1.44	1.39

The worst 5 of 24 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	D	2003	MPO	C2-C1-S1	-6.57	103.17	113.25
4	E	2004	MPO	C2-C1-S1	-6.42	103.41	113.25
4	B	2001	MPO	C2-C1-S1	-6.32	103.56	113.25
4	C	2002	MPO	C2-C1-S1	-6.06	103.95	113.25
4	B	2001	MPO	O1-S1-C1	3.55	111.19	106.92

There are no chirality outliers.

5 of 13 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	C	2002	MPO	C1-C2-C3-N1
4	B	2001	MPO	C1-C2-C3-N1
4	D	2003	MPO	C2-C3-N1-C7
4	C	2002	MPO	C2-C3-N1-C4
4	C	2002	MPO	C2-C3-N1-C7

There are no ring outliers.

7 monomers are involved in 11 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	F	3005	SO4	2	0
3	C	803	XYF	2	0
2	E	3006	SO4	1	0
3	E	804	XYF	2	0
3	A	801	XYF	2	0
2	C	3011	SO4	1	0
3	B	802	XYF	1	0

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, 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	773/778 (99%)	-0.09	13 (1%)	70	68	16, 28, 48, 76	0
1	B	773/778 (99%)	0.19	46 (5%)	21	20	20, 36, 61, 82	0
1	C	773/778 (99%)	-0.06	18 (2%)	60	58	17, 29, 50, 72	0
1	D	773/778 (99%)	0.15	52 (6%)	17	16	17, 31, 63, 84	0
1	E	773/778 (99%)	-0.02	28 (3%)	42	41	18, 32, 55, 90	0
1	F	773/778 (99%)	0.11	32 (4%)	37	35	19, 30, 55, 77	0
All	All	4638/4668 (99%)	0.05	189 (4%)	37	35	16, 31, 56, 90	0

The worst 5 of 189 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	F	719	THR	8.8
1	B	767	ALA	8.7
1	E	46	TRP	7.8
1	B	766	ASN	7.6
1	D	382	PRO	7.3

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 (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
2	SO4	A	3012	5/5	0.76	0.17	87,87,88,88	0
2	SO4	F	3001	5/5	0.77	0.20	91,91,91,92	0
2	SO4	C	3011	5/5	0.78	0.29	105,106,106,106	0
2	SO4	F	3009	5/5	0.84	0.23	91,91,92,92	0
3	XYF	B	802	10/11	0.85	0.15	37,41,43,45	0
3	XYF	C	803	10/11	0.85	0.19	33,36,38,40	0
2	SO4	B	3010	5/5	0.87	0.20	88,89,89,90	0
3	XYF	E	804	10/11	0.88	0.25	25,26,27,29	10
4	MPO	B	2001	13/13	0.88	0.17	68,68,69,69	0
4	MPO	E	2004	13/13	0.91	0.16	53,55,57,58	0
2	SO4	F	3005	5/5	0.92	0.15	58,58,59,59	0
4	MPO	C	2002	13/13	0.92	0.15	52,57,61,62	0
2	SO4	E	3006	5/5	0.93	0.17	84,84,85,85	0
3	XYF	A	801	10/11	0.93	0.10	35,36,38,39	0
2	SO4	F	3003	5/5	0.93	0.19	67,68,69,69	0
2	SO4	D	3004	5/5	0.94	0.18	75,75,75,75	0
2	SO4	A	3013	5/5	0.94	0.12	77,77,78,78	0
2	SO4	F	3002	5/5	0.94	0.16	76,77,77,78	0
4	MPO	D	2003	13/13	0.95	0.20	53,57,63,63	0
2	SO4	B	3008	5/5	0.95	0.15	72,72,72,73	0
2	SO4	C	3007	5/5	0.96	0.21	75,76,76,77	0

6.5 Other polymers (i)

There are no such residues in this entry.