wwPDB X-ray Structure Validation Summary Report (i)

Sep 5, 2023 – 05:00 PM EDT

PDB ID	:	4EV5
Title	:	Crystal structure of copper amine oxidase-1 from Hansenula polymorpha in complex with benzylamine
Authors	:	Klema, V.J.; Solheid, C.J.; Wilmot, C.M.
Deposited on	:	2012-04-25
Resolution	:	2.25 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 types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

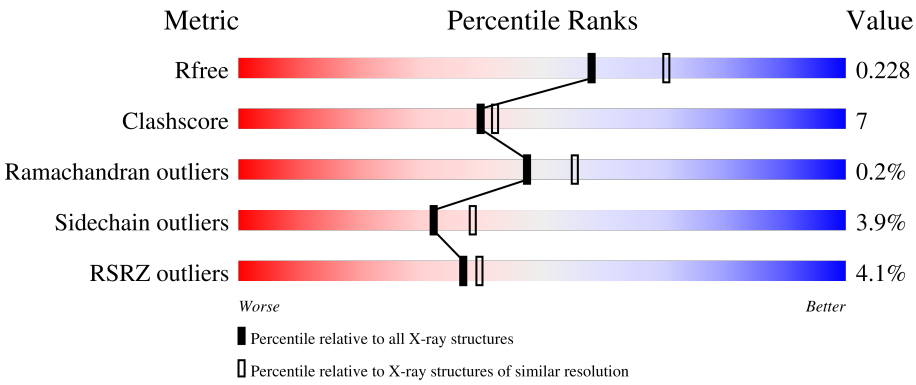
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.35
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, 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 2.25 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	1377 (2.26-2.26)
Clashscore	141614	1487 (2.26-2.26)
Ramachandran outliers	138981	1449 (2.26-2.26)
Sidechain outliers	138945	1450 (2.26-2.26)
RSRZ outliers	127900	1356 (2.26-2.26)

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	692	3% 81% 12% • 5%
1	B	692	% 80% 13% • 5%
1	C	692	4% 79% 14% • 5%
1	D	692	9% 79% 14% • 5%
1	E	692	4% 76% 16% • 5%

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Mol	Chain	Length	Quality of chain
1	F	692	3% 81% 12% 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	GOL	A	703	-	-	X	-
2	GOL	D	702	-	-	X	-
2	GOL	F	702	-	-	X	-
5	ABN	C	708	-	-	X	-

2 Entry composition (i)

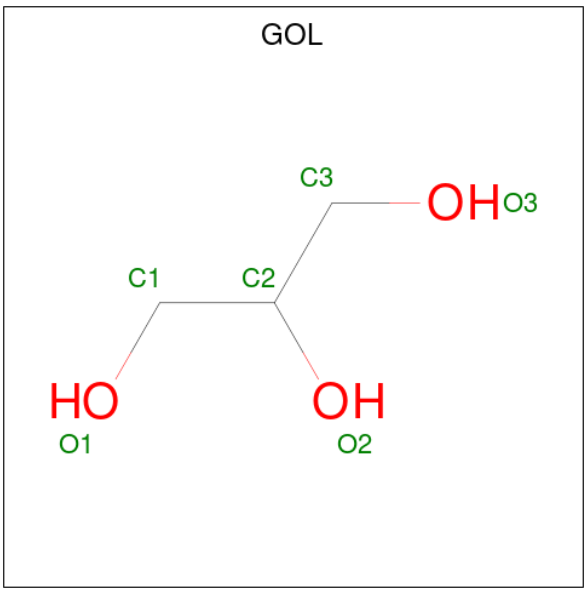
There are 6 unique types of molecules in this entry. The entry contains 34660 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 primary amine oxidase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	654	5227	3333	891	979	24	0	11	0
1	B	655	5227	3328	897	977	25	0	8	0
1	C	655	5228	3330	891	981	26	0	10	0
1	D	655	5223	3325	896	977	25	0	8	0
1	E	654	5245	3343	899	978	25	0	13	0
1	F	655	5227	3330	896	975	26	0	8	0

- Molecule 2 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	O		
2	A	1	6	3	3	0	0
2	A	1	6	3	3	0	0
2	A	1	6	3	3	0	0
2	A	1	6	3	3	0	0
2	A	1	6	3	3	0	0
2	B	1	6	3	3	0	0
2	B	1	6	3	3	0	0
2	B	1	6	3	3	0	0
2	B	1	6	3	3	0	0
2	B	1	6	3	3	0	0
2	B	1	6	3	3	0	0
2	C	1	6	3	3	0	0
2	C	1	6	3	3	0	0
2	C	1	6	3	3	0	0
2	C	1	6	3	3	0	0
2	C	1	6	3	3	0	0
2	C	1	6	3	3	0	0
2	D	1	6	3	3	0	0
2	D	1	6	3	3	0	0
2	D	1	6	3	3	0	0
2	D	1	6	3	3	0	0
2	E	1	6	3	3	0	0

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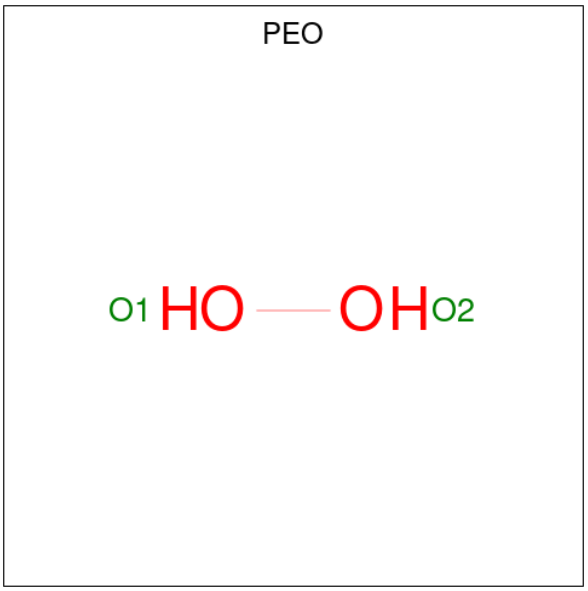
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	O		
2	E	1	6	3	3	0	0
			Total	C	O		
2	E	1	6	3	3	0	0
			Total	C	O		
2	E	1	6	3	3	0	0
			Total	C	O		
2	F	1	6	3	3	0	0
			Total	C	O		
2	F	1	6	3	3	0	0
			Total	C	O		
2	F	1	6	3	3	0	0
			Total	C	O		
2	F	1	6	3	3	0	0
			Total	C	O		
2	F	1	6	3	3	0	0

- Molecule 3 is COPPER (II) ION (three-letter code: CU) (formula: Cu).

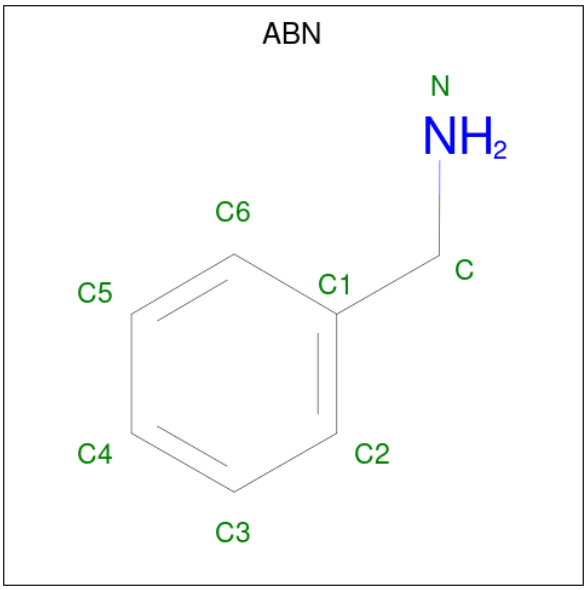
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	Cu		
3	A	1	1	1	0	0
			Total	Cu		
3	B	1	1	1	0	0
			Total	Cu		
3	C	1	1	1	0	0
			Total	Cu		
3	D	1	1	1	0	0
			Total	Cu		
3	E	1	1	1	0	0
			Total	Cu		
3	F	1	1	1	0	0

- Molecule 4 is HYDROGEN PEROXIDE (three-letter code: PEO) (formula: H_2O_2).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total O 2 2	0	0
4	B	1	Total O 2 2	0	0
4	E	1	Total O 2 2	0	0
4	F	1	Total O 2 2	0	0

- Molecule 5 is BENZYLAMINE (three-letter code: ABN) (formula: C_7H_9N).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	N		
5	A	1	8	7	1	0	0
5	B	1	8	7	1	0	0
5	C	1	8	7	1	0	0
5	D	1	8	7	1	0	0
5	E	1	8	7	1	0	0
5	F	1	8	7	1	0	0

- Molecule 6 is water.

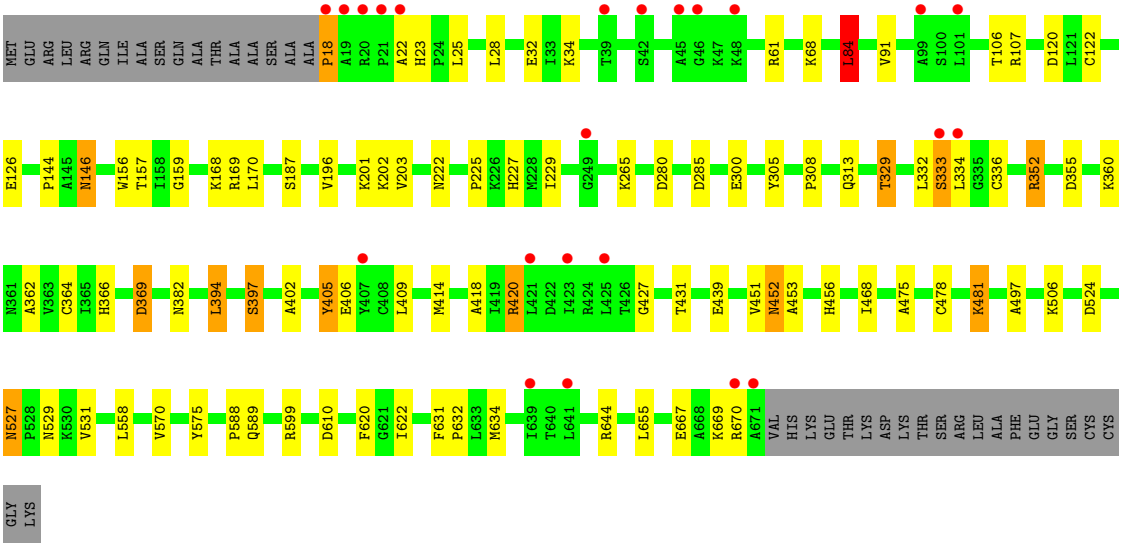
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
6	A	527	529	529	0	2
6	B	579	583	583	0	4
6	C	497	499	499	0	2
6	D	462	465	465	0	3
6	E	460	462	462	0	2
6	F	501	503	503	0	2

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.

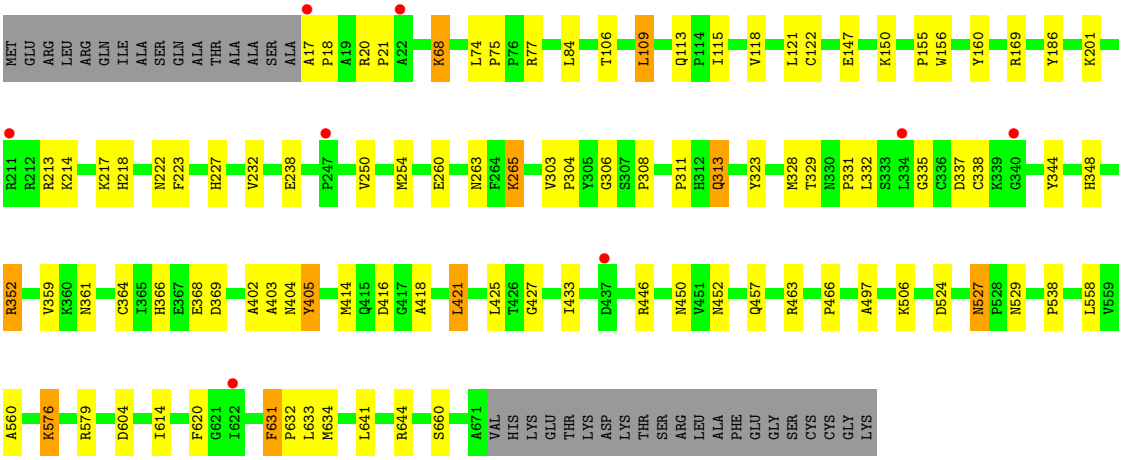
• Molecule 1: Peroxisomal primary amine oxidase

Chain A:



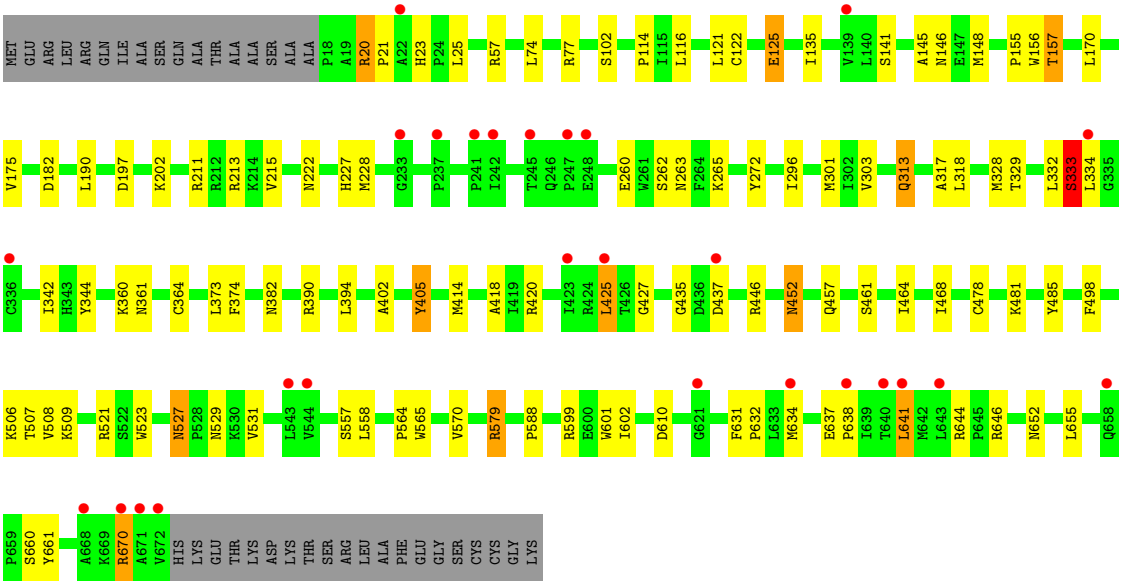
• Molecule 1: Peroxisomal primary amine oxidase

Chain B:



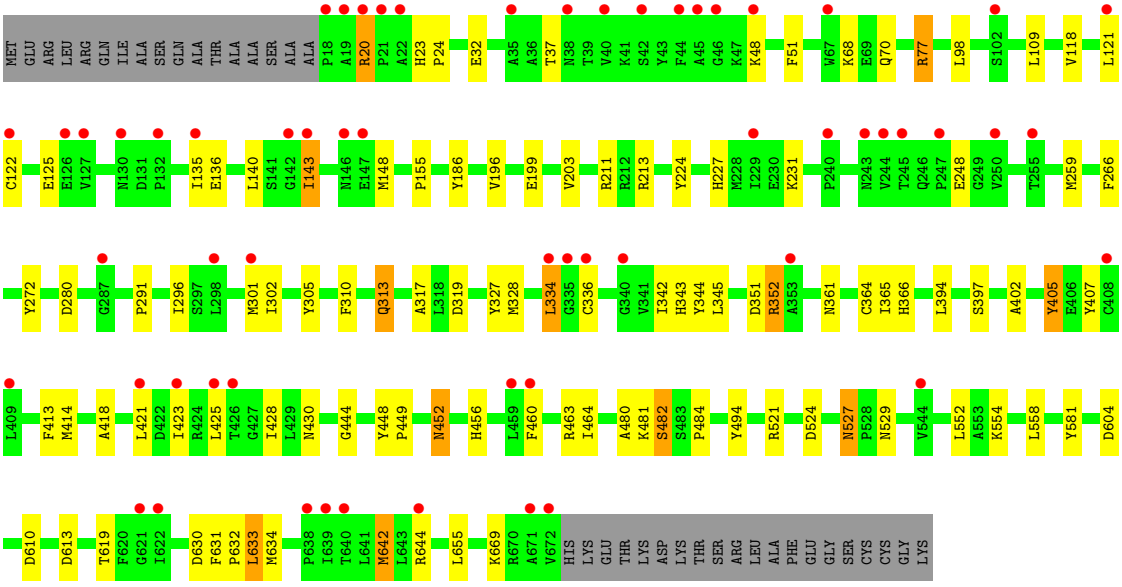
• Molecule 1: Peroxisomal primary amine oxidase

Chain C:



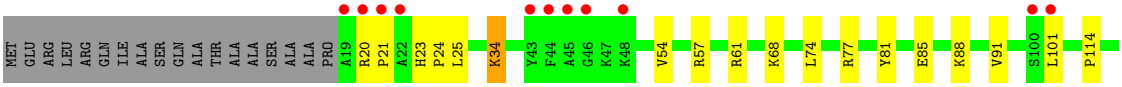
• Molecule 1: Peroxisomal primary amine oxidase

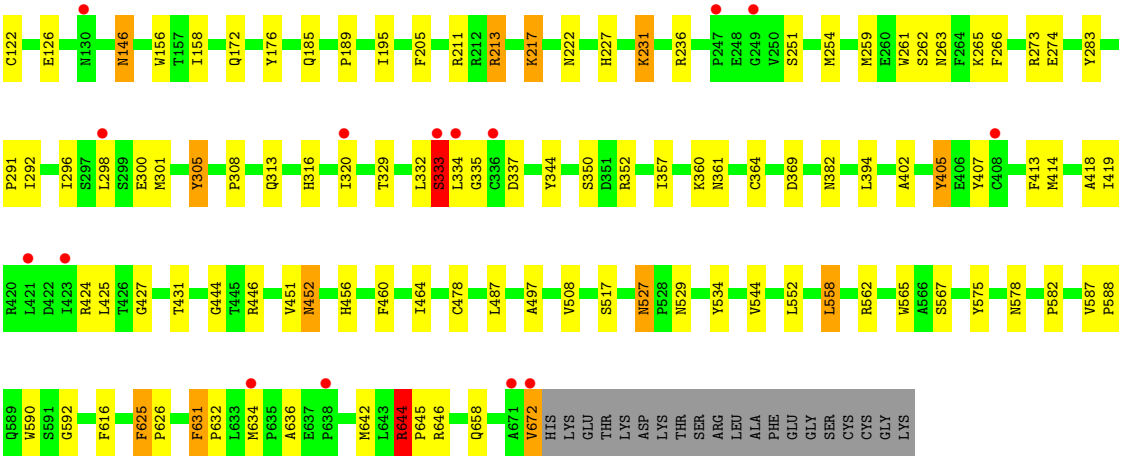
Chain D:



• Molecule 1: Peroxisomal primary amine oxidase

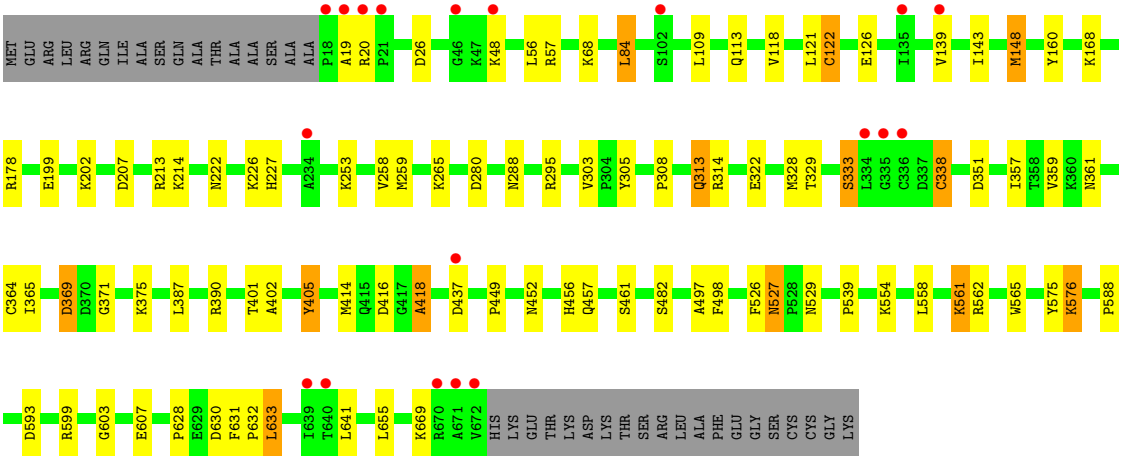
Chain E:





- Molecule 1: Peroxisomal primary amine oxidase

Chain F:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	104.24Å 233.71Å 105.05Å 90.00° 96.57° 90.00°	Depositor
Resolution (Å)	48.90 – 2.25 48.90 – 2.25	Depositor EDS
% Data completeness (in resolution range)	98.8 (48.90-2.25) 98.8 (48.90-2.25)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.40 (at 2.24Å)	Xtriage
Refinement program	REFMAC 5.5.0109	Depositor
R, R_{free}	0.169 , 0.230 0.168 , 0.228	Depositor DCC
R_{free} test set	11654 reflections (5.01%)	wwPDB-VP
Wilson B-factor (Å^2)	33.7	Xtriage
Anisotropy	0.193	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 43.8	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.34$	Xtriage
Estimated twinning fraction	0.007 for l,-k,h	Xtriage
F_o,F_c correlation	0.96	EDS
Total number of atoms	34660	wwPDB-VP
Average B, all atoms (Å^2)	34.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.39% 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 (i)

5.1 Standard geometry (i)

Bond lengths and bond angles in the following residue types are not validated in this section: ABN, GOL, TYQ, CU, PEO

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	1.09	6/5395 (0.1%)	0.95	10/7340 (0.1%)
1	B	1.21	8/5387 (0.1%)	1.01	11/7328 (0.2%)
1	C	1.05	2/5396 (0.0%)	0.95	9/7343 (0.1%)
1	D	0.98	1/5382 (0.0%)	0.90	11/7323 (0.2%)
1	E	1.13	11/5418 (0.2%)	0.98	9/7372 (0.1%)
1	F	1.10	7/5386 (0.1%)	0.98	18/7326 (0.2%)
All	All	1.10	35/32364 (0.1%)	0.96	68/44032 (0.2%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1
1	E	0	1
All	All	0	2

The worst 5 of 35 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	E	478	CYS	CB-SG	9.19	1.97	1.82
1	A	478	CYS	CB-SG	8.77	1.97	1.82
1	B	620	PHE	CE1-CZ	6.48	1.49	1.37
1	B	186	TYR	CD2-CE2	-6.45	1.29	1.39
1	B	560	ALA	CA-CB	6.38	1.65	1.52

The worst 5 of 68 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	F	295	ARG	NE-CZ-NH1	9.11	124.85	120.30
1	C	641	LEU	CA-CB-CG	8.63	135.16	115.30
1	E	446	ARG	NE-CZ-NH2	-8.41	116.10	120.30
1	B	463	ARG	NE-CZ-NH2	-8.10	116.25	120.30
1	E	446	ARG	NE-CZ-NH1	7.98	124.29	120.30

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	18	PRO	Peptide
1	E	333	SER	Peptide

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	5227	0	5096	79	0
1	B	5227	0	5086	73	0
1	C	5228	0	5084	84	0
1	D	5223	0	5075	79	0
1	E	5245	0	5127	96	0
1	F	5227	0	5094	56	0
2	A	30	0	40	6	0
2	B	36	0	48	5	0
2	C	36	0	48	4	0
2	D	24	0	32	9	0
2	E	24	0	32	6	0
2	F	30	0	40	6	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
3	C	1	0	0	0	0
3	D	1	0	0	0	0
3	E	1	0	0	0	0
3	F	1	0	0	0	0
4	A	2	0	0	1	0
4	B	2	0	0	0	0
4	E	2	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	F	2	0	0	1	0
5	A	8	0	9	2	0
5	B	8	0	9	2	0
5	C	8	0	9	5	0
5	D	8	0	9	3	0
5	E	8	0	9	2	0
5	F	8	0	9	3	0
6	A	529	0	0	12	0
6	B	583	0	0	16	0
6	C	499	0	0	13	0
6	D	465	0	0	12	0
6	E	462	0	0	11	0
6	F	503	0	0	8	0
All	All	34660	0	30856	453	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 7.

The worst 5 of 453 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:E:672:VAL:HG23	6:E:1198:HOH:O	1.40	1.20
6:E:1141:HOH:O	1:F:122[B]:CYS:SG	2.05	1.14
1:D:68:LYS:HE3	2:D:702:GOL:H2	1.38	1.05
1:D:23:HIS:HE2	2:D:702:GOL:H11	1.20	1.04
1:C:638:PRO:HD2	6:D:817[B]:HOH:O	1.59	1.02

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	662/692 (96%)	635 (96%)	25 (4%)	2 (0%)	41	46
1	B	660/692 (95%)	631 (96%)	29 (4%)	0	100	100
1	C	663/692 (96%)	634 (96%)	25 (4%)	4 (1%)	25	25
1	D	660/692 (95%)	633 (96%)	27 (4%)	0	100	100
1	E	664/692 (96%)	637 (96%)	26 (4%)	1 (0%)	47	55
1	F	660/692 (95%)	629 (95%)	30 (4%)	1 (0%)	47	55
All	All	3969/4152 (96%)	3799 (96%)	162 (4%)	8 (0%)	47	55

5 of 8 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	333	SER
1	E	333	SER
1	F	333	SER
1	A	22	ALA
1	C	333	SER

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	574/593 (97%)	550 (96%)	24 (4%)	30	34
1	B	572/593 (96%)	551 (96%)	21 (4%)	34	40
1	C	574/593 (97%)	550 (96%)	24 (4%)	30	34
1	D	572/593 (96%)	550 (96%)	22 (4%)	33	39
1	E	577/593 (97%)	552 (96%)	25 (4%)	29	33
1	F	573/593 (97%)	547 (96%)	26 (4%)	27	31
All	All	3442/3558 (97%)	3300 (96%)	142 (4%)	32	36

5 of 142 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	E	672	VAL

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Mol	Chain	Res	Type
1	F	109	LEU
1	F	329	THR
1	C	125	GLU
1	C	102[B]	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 53 such sidechains are listed below:

Mol	Chain	Res	Type
1	D	288	ASN
1	E	23	HIS
1	F	313	GLN
1	D	313	GLN
1	D	450	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)

6 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	TYQ	A	405	1	13,14,15	3.18	2 (15%)	15,19,21	2.16	3 (20%)
1	TYQ	F	405	1	13,14,15	3.41	2 (15%)	15,19,21	2.31	4 (26%)
1	TYQ	B	405	1	13,14,15	2.98	3 (23%)	15,19,21	3.47	10 (66%)
1	TYQ	D	405	1	13,14,15	2.67	2 (15%)	15,19,21	2.09	6 (40%)
1	TYQ	C	405	1	13,14,15	3.08	2 (15%)	15,19,21	2.40	5 (33%)
1	TYQ	E	405	1	13,14,15	2.32	3 (23%)	15,19,21	1.88	3 (20%)

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	TYQ	A	405	1	-	1/5/6/8	0/1/1/1
1	TYQ	F	405	1	-	2/5/6/8	0/1/1/1
1	TYQ	B	405	1	-	2/5/6/8	0/1/1/1
1	TYQ	D	405	1	-	2/5/6/8	0/1/1/1
1	TYQ	C	405	1	-	1/5/6/8	0/1/1/1
1	TYQ	E	405	1	-	1/5/6/8	0/1/1/1

The worst 5 of 14 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	F	405	TYQ	CE2-CZ	10.72	1.54	1.40
1	C	405	TYQ	CE2-CZ	8.54	1.51	1.40
1	A	405	TYQ	CE2-CZ	8.37	1.51	1.40
1	B	405	TYQ	CE2-CZ	7.12	1.49	1.40
1	A	405	TYQ	CD1-CG	7.02	1.50	1.40

The worst 5 of 31 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	405	TYQ	CB-CA-C	-7.47	97.47	111.47
1	C	405	TYQ	CB-CA-C	-7.04	98.27	111.47
1	A	405	TYQ	CB-CA-C	-6.54	99.20	111.47
1	B	405	TYQ	CB-CG-CD1	-6.17	114.49	120.95
1	B	405	TYQ	CD2-CG-CD1	5.22	124.45	118.17

There are no chirality outliers.

5 of 9 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	B	405	TYQ	O-C-CA-CB
1	D	405	TYQ	N-CA-CB-CG
1	E	405	TYQ	N-CA-CB-CG
1	F	405	TYQ	O-C-CA-CB
1	F	405	TYQ	N-CA-CB-CG

There are no ring outliers.

6 monomers are involved in 15 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	A	405	TYQ	3	0
1	F	405	TYQ	3	0
1	B	405	TYQ	2	0
1	D	405	TYQ	2	0
1	C	405	TYQ	3	0
1	E	405	TYQ	2	0

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

Of 46 ligands modelled in this entry, 6 are monoatomic - leaving 40 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	$\#\|Z\| > 2$
2	GOL	C	702	-	5,5,5	0.33	0	5,5,5	0.33	0
2	GOL	C	704	-	5,5,5	0.55	0	5,5,5	0.69	0
4	PEO	E	705	-	1,1,1	0.07	0	-		
2	GOL	F	703	-	5,5,5	0.64	0	5,5,5	0.69	0
2	GOL	A	701	-	5,5,5	0.45	0	5,5,5	0.42	0
5	ABN	E	707	-	8,8,8	0.55	0	9,9,9	0.47	0
2	GOL	A	705	-	5,5,5	0.44	0	5,5,5	0.42	0
2	GOL	D	704	-	5,5,5	0.34	0	5,5,5	0.49	0
2	GOL	B	705	-	5,5,5	0.53	0	5,5,5	1.08	0
2	GOL	A	704	-	5,5,5	0.46	0	5,5,5	0.25	0
5	ABN	D	706	-	8,8,8	1.16	0	9,9,9	1.07	1 (11%)
4	PEO	F	707	-	1,1,1	0.13	0	-		
2	GOL	C	705	-	5,5,5	0.62	0	5,5,5	0.66	0
2	GOL	B	707	-	5,5,5	0.37	0	5,5,5	1.00	0
2	GOL	C	707	-	5,5,5	0.52	0	5,5,5	1.50	1 (20%)
2	GOL	E	703	-	5,5,5	0.25	0	5,5,5	1.05	0
5	ABN	C	708	-	8,8,8	1.12	0	9,9,9	0.55	0
5	ABN	F	708	-	8,8,8	0.60	0	9,9,9	0.26	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
2	GOL	E	704	-	5,5,5	0.29	0	5,5,5	0.80	0
2	GOL	E	706	-	5,5,5	0.43	0	5,5,5	0.95	0
2	GOL	C	706	-	5,5,5	0.47	0	5,5,5	0.85	0
4	PEO	A	707	-	1,1,1	0.57	0	-		
2	GOL	B	704	-	5,5,5	0.55	0	5,5,5	1.07	0
2	GOL	E	702	-	5,5,5	0.44	0	5,5,5	0.66	0
4	PEO	B	708	3	1,1,1	0.21	0	-		
2	GOL	B	706	-	5,5,5	0.36	0	5,5,5	0.92	0
2	GOL	A	706	-	5,5,5	0.41	0	5,5,5	0.47	0
5	ABN	B	709	-	8,8,8	1.24	1 (12%)	9,9,9	1.70	2 (22%)
2	GOL	D	703	-	5,5,5	0.81	0	5,5,5	0.56	0
2	GOL	D	705	-	5,5,5	0.51	0	5,5,5	0.57	0
2	GOL	B	701	-	5,5,5	0.57	0	5,5,5	0.94	0
2	GOL	A	703	-	5,5,5	0.41	0	5,5,5	0.86	0
2	GOL	F	705	-	5,5,5	0.36	0	5,5,5	1.12	0
2	GOL	B	703	-	5,5,5	0.81	0	5,5,5	0.70	0
5	ABN	A	708	-	8,8,8	0.67	0	9,9,9	0.79	0
2	GOL	D	702	-	5,5,5	0.43	0	5,5,5	0.66	0
2	GOL	F	702	-	5,5,5	0.61	0	5,5,5	0.95	0
2	GOL	F	704	-	5,5,5	0.34	0	5,5,5	0.61	0
2	GOL	F	706	-	5,5,5	0.40	0	5,5,5	0.86	0
2	GOL	C	703	-	5,5,5	0.36	0	5,5,5	0.96	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	GOL	C	702	-	-	4/4/4/4	-
2	GOL	C	704	-	-	2/4/4/4	-
2	GOL	F	703	-	-	4/4/4/4	-
2	GOL	A	701	-	-	0/4/4/4	-
5	ABN	E	707	-	-	0/2/2/2	0/1/1/1
2	GOL	A	705	-	-	2/4/4/4	-
2	GOL	D	704	-	-	2/4/4/4	-
2	GOL	B	705	-	-	1/4/4/4	-
2	GOL	A	704	-	-	1/4/4/4	-
5	ABN	D	706	-	-	1/2/2/2	0/1/1/1
2	GOL	C	705	-	-	2/4/4/4	-
2	GOL	B	707	-	-	4/4/4/4	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	GOL	C	707	-	-	0/4/4/4	-
2	GOL	E	703	-	-	4/4/4/4	-
5	ABN	C	708	-	-	0/2/2/2	0/1/1/1
5	ABN	F	708	-	-	0/2/2/2	0/1/1/1
2	GOL	E	704	-	-	2/4/4/4	-
2	GOL	E	706	-	-	4/4/4/4	-
2	GOL	C	706	-	-	2/4/4/4	-
2	GOL	B	704	-	-	3/4/4/4	-
2	GOL	E	702	-	-	2/4/4/4	-
2	GOL	B	706	-	-	2/4/4/4	-
2	GOL	A	706	-	-	4/4/4/4	-
5	ABN	B	709	-	-	0/2/2/2	0/1/1/1
2	GOL	D	703	-	-	4/4/4/4	-
2	GOL	D	705	-	-	3/4/4/4	-
2	GOL	B	701	-	-	2/4/4/4	-
2	GOL	A	703	-	-	1/4/4/4	-
2	GOL	F	705	-	-	3/4/4/4	-
2	GOL	B	703	-	-	2/4/4/4	-
5	ABN	A	708	-	-	0/2/2/2	0/1/1/1
2	GOL	D	702	-	-	2/4/4/4	-
2	GOL	F	702	-	-	4/4/4/4	-
2	GOL	F	704	-	-	2/4/4/4	-
2	GOL	F	706	-	-	3/4/4/4	-
2	GOL	C	703	-	-	2/4/4/4	-

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	B	709	ABN	C3-C2	2.28	1.43	1.38

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	B	709	ABN	C3-C2-C1	3.01	125.25	120.63
5	B	709	ABN	C4-C5-C6	2.67	124.27	120.19
5	D	706	ABN	C4-C5-C6	-2.31	116.67	120.19
2	C	707	GOL	C3-C2-C1	-2.01	103.88	111.70

There are no chirality outliers.

5 of 74 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	705	GOL	O1-C1-C2-C3
2	A	706	GOL	C1-C2-C3-O3
2	B	701	GOL	O1-C1-C2-C3
2	B	704	GOL	O1-C1-C2-C3
2	B	704	GOL	O2-C2-C3-O3

There are no ring outliers.

24 monomers are involved in 55 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	702	GOL	2	0
5	E	707	ABN	2	0
2	D	704	GOL	1	0
5	D	706	ABN	3	0
4	F	707	PEO	1	0
2	B	707	GOL	1	0
2	C	707	GOL	1	0
5	C	708	ABN	5	0
5	F	708	ABN	3	0
2	E	704	GOL	3	0
2	E	706	GOL	3	0
4	A	707	PEO	1	0
2	B	704	GOL	1	0
2	B	706	GOL	2	0
5	B	709	ABN	2	0
2	D	705	GOL	1	0
2	A	703	GOL	6	0
2	F	705	GOL	1	0
2	B	703	GOL	1	0
5	A	708	ABN	2	0
2	D	702	GOL	7	0
2	F	702	GOL	4	0
2	F	704	GOL	1	0
2	C	703	GOL	1	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	653/692 (94%)	0.06	23 (3%)	44	46	15, 31, 53, 86	0
1	B	654/692 (94%)	-0.08	8 (1%)	79	81	15, 27, 45, 67	0
1	C	654/692 (94%)	0.02	27 (4%)	37	40	20, 32, 54, 84	0
1	D	654/692 (94%)	0.31	59 (9%)	9	10	22, 37, 60, 89	0
1	E	653/692 (94%)	0.18	26 (3%)	38	40	18, 33, 54, 83	0
1	F	654/692 (94%)	0.06	19 (2%)	51	55	15, 31, 54, 76	0
All	All	3922/4152 (94%)	0.09	162 (4%)	37	40	15, 32, 55, 89	0

The worst 5 of 162 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	18	PRO	6.9
1	A	19	ALA	6.6
1	D	18	PRO	6.6
1	E	672	VAL	6.3
1	F	672	VAL	5.9

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(Å^2)	Q<0.9
1	TYQ	D	405	14/15	0.91	0.21	38,42,46,47	0
1	TYQ	B	405	14/15	0.93	0.16	22,26,33,36	0
1	TYQ	C	405	14/15	0.93	0.20	28,35,42,43	0
1	TYQ	A	405	14/15	0.93	0.20	23,31,35,35	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
1	TYQ	E	405	14/15	0.94	0.20	23,29,40,42	0
1	TYQ	F	405	14/15	0.94	0.16	28,36,44,46	0

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, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	GOL	D	705	6/6	0.70	0.29	70,72,73,74	0
2	GOL	E	703	6/6	0.79	0.24	64,65,66,67	0
2	GOL	A	704	6/6	0.82	0.21	59,64,67,67	0
2	GOL	C	707	6/6	0.82	0.18	45,55,56,60	0
2	GOL	B	705	6/6	0.83	0.29	62,64,67,70	0
2	GOL	B	704	6/6	0.83	0.25	41,49,51,55	0
2	GOL	F	706	6/6	0.83	0.30	57,57,60,60	0
2	GOL	F	705	6/6	0.84	0.26	61,65,66,68	0
2	GOL	E	704	6/6	0.85	0.23	66,69,70,71	0
2	GOL	D	704	6/6	0.86	0.24	52,58,61,63	0
2	GOL	F	704	6/6	0.86	0.29	46,52,53,56	0
2	GOL	B	707	6/6	0.87	0.16	50,52,53,55	0
2	GOL	C	704	6/6	0.87	0.26	52,56,56,60	0
5	ABN	B	709	8/8	0.87	0.23	40,42,44,44	0
2	GOL	A	706	6/6	0.88	0.34	56,61,66,69	0
2	GOL	D	703	6/6	0.89	0.18	51,54,56,57	0
2	GOL	C	706	6/6	0.89	0.24	62,64,67,68	0
2	GOL	C	705	6/6	0.89	0.13	62,64,65,66	0
2	GOL	A	705	6/6	0.90	0.28	50,52,53,54	0
2	GOL	E	706	6/6	0.90	0.18	52,55,56,57	0
2	GOL	C	702	6/6	0.90	0.13	49,57,59,61	0
2	GOL	C	703	6/6	0.91	0.30	46,49,50,53	0
2	GOL	D	702	6/6	0.91	0.17	57,60,61,62	0
2	GOL	B	703	6/6	0.91	0.20	46,49,50,50	0
5	ABN	C	708	8/8	0.91	0.19	38,39,41,42	0
5	ABN	D	706	8/8	0.91	0.20	36,37,37,38	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	GOL	F	702	6/6	0.92	0.22	44,51,52,55	0
2	GOL	F	703	6/6	0.92	0.22	62,65,65,66	0
2	GOL	E	702	6/6	0.92	0.30	55,58,60,60	0
2	GOL	A	703	6/6	0.92	0.17	51,56,57,60	0
5	ABN	A	708	8/8	0.94	0.19	31,32,34,37	0
2	GOL	B	701	6/6	0.94	0.23	27,33,35,36	0
2	GOL	B	706	6/6	0.95	0.21	50,52,54,57	0
5	ABN	F	708	8/8	0.95	0.17	38,41,42,42	0
4	PEO	F	707	2/2	0.96	0.22	28,28,28,36	0
5	ABN	E	707	8/8	0.96	0.19	32,33,34,35	0
4	PEO	B	708	2/2	0.96	0.20	24,24,24,26	0
4	PEO	E	705	2/2	0.97	0.34	30,30,30,35	0
4	PEO	A	707	2/2	0.98	0.25	26,26,26,31	0
2	GOL	A	701	6/6	0.98	0.13	32,34,37,42	0
3	CU	E	701	1/1	0.99	0.14	28,28,28,28	0
3	CU	F	701	1/1	0.99	0.12	31,31,31,31	0
3	CU	C	701	1/1	0.99	0.12	33,33,33,33	0
3	CU	D	701	1/1	0.99	0.13	36,36,36,36	0
3	CU	A	702	1/1	1.00	0.14	28,28,28,28	0
3	CU	B	702	1/1	1.00	0.12	26,26,26,26	0

6.5 Other polymers (i)

There are no such residues in this entry.