



wwPDB X-ray Structure Validation Summary Report

Aug 26, 2023 – 09:55 PM EDT

PDB ID : 3ET0
Title : Structure of PPARgamma with 3-(5-Methoxy-1H-indol-3-yl)-propionic acid
Authors : Zhang, K.Y.J.; Wang, W.
Deposited on : 2008-10-06
Resolution : 2.40 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  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)
Xtrriage (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

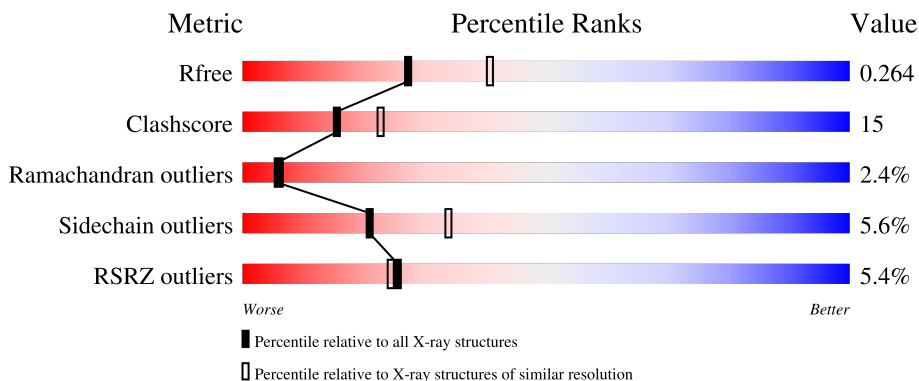
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.40 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	3907 (2.40-2.40)
Clashscore	141614	4398 (2.40-2.40)
Ramachandran outliers	138981	4318 (2.40-2.40)
Sidechain outliers	138945	4319 (2.40-2.40)
RSRZ outliers	127900	3811 (2.40-2.40)

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 $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	292	 3% 64% 22% 11%
1	B	292	 6% 62% 22% 11%

2 Entry composition i

There are 4 unique types of molecules in this entry. The entry contains 4289 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 Peroxisome proliferator-activated receptor gamma.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	260	2088	1347	338	391	12	0	0	0
1	B	259	2075	1338	337	388	12	0	0	0

There are 42 discrepancies between the modelled and reference sequences:

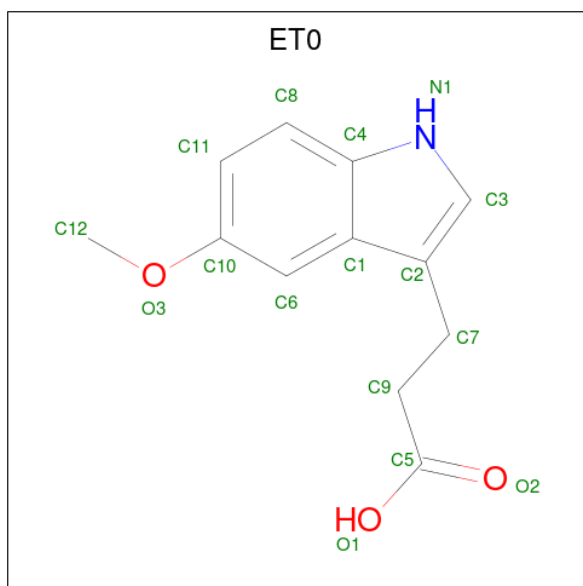
Chain	Residue	Modelled	Actual	Comment	Reference
A	186	MET	-	expression tag	UNP P37231
A	187	GLY	-	expression tag	UNP P37231
A	188	SER	-	expression tag	UNP P37231
A	189	SER	-	expression tag	UNP P37231
A	190	HIS	-	expression tag	UNP P37231
A	191	HIS	-	expression tag	UNP P37231
A	192	HIS	-	expression tag	UNP P37231
A	193	HIS	-	expression tag	UNP P37231
A	194	HIS	-	expression tag	UNP P37231
A	195	HIS	-	expression tag	UNP P37231
A	196	SER	-	expression tag	UNP P37231
A	197	SER	-	expression tag	UNP P37231
A	198	GLY	-	expression tag	UNP P37231
A	199	LEU	-	expression tag	UNP P37231
A	200	VAL	-	expression tag	UNP P37231
A	201	PRO	-	expression tag	UNP P37231
A	202	ARG	-	expression tag	UNP P37231
A	203	GLY	-	expression tag	UNP P37231
A	204	SER	-	expression tag	UNP P37231
A	205	HIS	-	expression tag	UNP P37231
A	206	MET	-	expression tag	UNP P37231
B	186	MET	-	expression tag	UNP P37231
B	187	GLY	-	expression tag	UNP P37231
B	188	SER	-	expression tag	UNP P37231
B	189	SER	-	expression tag	UNP P37231

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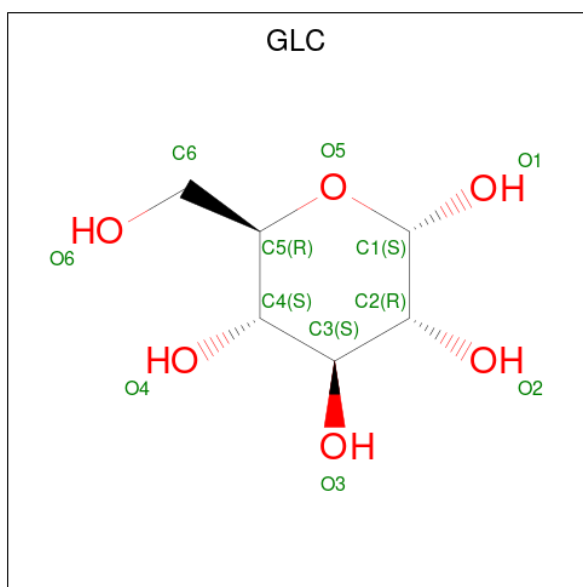
Chain	Residue	Modelled	Actual	Comment	Reference
B	190	HIS	-	expression tag	UNP P37231
B	191	HIS	-	expression tag	UNP P37231
B	192	HIS	-	expression tag	UNP P37231
B	193	HIS	-	expression tag	UNP P37231
B	194	HIS	-	expression tag	UNP P37231
B	195	HIS	-	expression tag	UNP P37231
B	196	SER	-	expression tag	UNP P37231
B	197	SER	-	expression tag	UNP P37231
B	198	GLY	-	expression tag	UNP P37231
B	199	LEU	-	expression tag	UNP P37231
B	200	VAL	-	expression tag	UNP P37231
B	201	PRO	-	expression tag	UNP P37231
B	202	ARG	-	expression tag	UNP P37231
B	203	GLY	-	expression tag	UNP P37231
B	204	SER	-	expression tag	UNP P37231
B	205	HIS	-	expression tag	UNP P37231
B	206	MET	-	expression tag	UNP P37231

- Molecule 2 is 3-(5-methoxy-1H-indol-3-yl)propanoic acid (three-letter code: ET0) (formula: $C_{12}H_{13}NO_3$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	
			Total	C	N			O
2	A	1	16	12	1	3	0	0

- Molecule 3 is alpha-D-glucopyranose (three-letter code: GLC) (formula: $C_6H_{12}O_6$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	B	1	Total C O 12 6 6	0	0

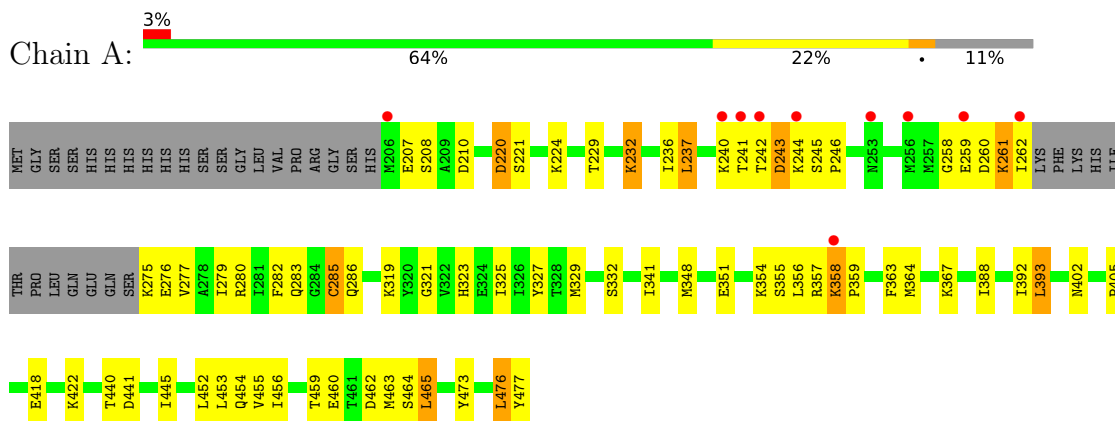
- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	52	Total O 52 52	0	0
4	B	46	Total O 46 46	0	0

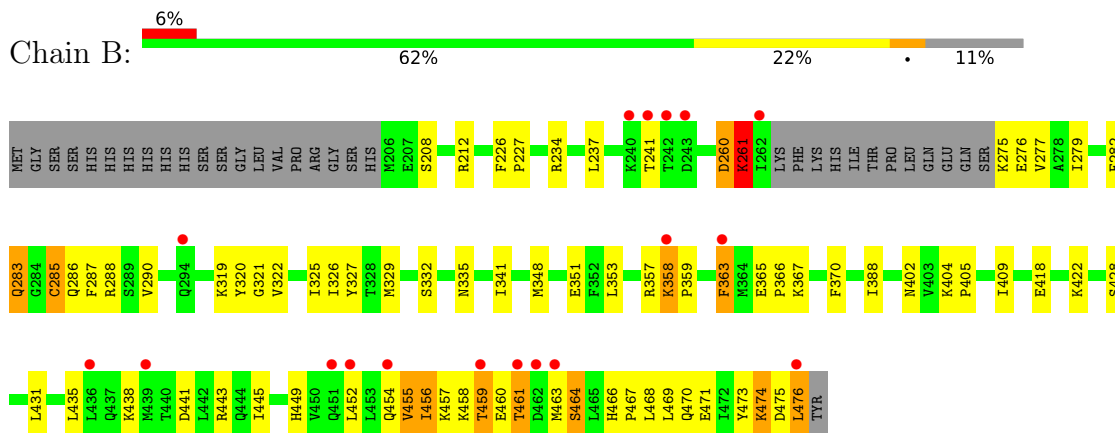
3 Residue-property plots [i](#)

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: Peroxisome proliferator-activated receptor gamma



- Molecule 1: Peroxisome proliferator-activated receptor gamma



4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	93.35Å 62.45Å 119.24Å 90.00° 101.73° 90.00°	Depositor
Resolution (Å)	29.19 – 2.40 29.48 – 2.20	Depositor EDS
% Data completeness (in resolution range)	96.3 (29.19-2.40) 94.4 (29.48-2.20)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.05	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.17 (at 2.20Å)	Xtrriage
Refinement program	PHENIX	Depositor
R, R_{free}	0.200 , 0.255 0.214 , 0.264	Depositor DCC
R_{free} test set	1622 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å ²)	47.3	Xtrriage
Anisotropy	0.513	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 53.3	EDS
L-test for twinning ²	$\langle L \rangle = 0.51$, $\langle L^2 \rangle = 0.34$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	4289	wwPDB-VP
Average B, all atoms (Å ²)	68.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.26% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: ET0, CME, GLC

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	0.36	0/2111	0.53	0/2840
1	B	0.36	0/2097	0.52	0/2822
All	All	0.36	0/4208	0.53	0/5662

There are no bond length outliers.

There are no bond angle outliers.

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	2088	0	2148	51	0
1	B	2075	0	2139	76	0
2	A	16	0	12	1	0
3	B	12	0	12	2	0
4	A	52	0	0	3	0
4	B	46	0	0	1	0
All	All	4289	0	4311	126	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 15.

The worst 5 of 126 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:285:CME:SD	1:B:285:CME:SG	2.33	1.25
1:A:285:CME:SD	1:A:285:CME:SG	2.34	1.24
1:A:319:LYS:HE3	1:A:476:LEU:HD23	1.45	0.97
1:B:460:GLU:HB2	1:B:463:MET:HA	1.49	0.95
1:B:459:THR:HG22	1:B:460:GLU:H	1.33	0.93

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	255/292 (87%)	240 (94%)	10 (4%)	5 (2%)	7	9
1	B	254/292 (87%)	236 (93%)	11 (4%)	7 (3%)	5	4
All	All	509/584 (87%)	476 (94%)	21 (4%)	12 (2%)	6	6

5 of 12 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	243	ASP
1	A	261	LYS
1	A	358	LYS
1	B	261	LYS
1	B	358	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	232/261 (89%)	218 (94%)	14 (6%)	19	31
1	B	231/261 (88%)	219 (95%)	12 (5%)	23	38
All	All	463/522 (89%)	437 (94%)	26 (6%)	21	34

5 of 26 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	234	ARG
1	B	260	ASP
1	B	474	LYS
1	B	241	THR
1	B	261	LYS

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

Mol	Chain	Res	Type
1	A	437	GLN
1	B	283	GLN
1	B	308	ASN
1	B	437	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
1	CME	B	285	1	8,9,10	1.44	1 (12%)	5,9,11	1.41	1 (20%)
1	CME	A	285	1	8,9,10	1.46	1 (12%)	5,9,11	1.12	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
1	CME	B	285	1	-	3/5/8/10	-
1	CME	A	285	1	-	3/5/8/10	-

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	285	CME	SD-SG	4.02	2.34	2.03
1	B	285	CME	SD-SG	3.94	2.33	2.03

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	285	CME	CB-SG-SD	2.81	111.09	103.82

There are no chirality outliers.

5 of 6 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	285	CME	CE-SD-SG-CB
1	A	285	CME	SD-CE-CZ-OH
1	B	285	CME	SD-CE-CZ-OH
1	B	285	CME	N-CA-CB-SG
1	B	285	CME	CZ-CE-SD-SG

There are no ring outliers.

2 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	B	285	CME	3	0
1	A	285	CME	1	0

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

2 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	ET0	A	1	-	16,17,17	1.20	1 (6%)	17,23,23	1.71	3 (17%)
3	GLC	B	2	-	12,12,12	1.20	1 (8%)	17,17,17	1.78	4 (23%)

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	ET0	A	1	-	-	4/7/7/7	0/2/2/2
3	GLC	B	2	-	-	0/2/22/22	0/1/1/1

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	1	ET0	C1-C4	-2.45	1.36	1.42
3	B	2	GLC	C1-C2	2.08	1.57	1.52

The worst 5 of 7 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	1	ET0	C6-C1-C4	4.34	124.19	118.26
3	B	2	GLC	O5-C1-C2	4.18	117.74	110.28
3	B	2	GLC	C4-C3-C2	-3.86	104.08	110.82
3	B	2	GLC	C1-O5-C5	3.31	119.90	113.66
2	A	1	ET0	C7-C2-C3	3.23	134.01	127.19

There are no chirality outliers.

All (4) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	1	ET0	C1-C2-C7-C9
2	A	1	ET0	C3-C2-C7-C9
2	A	1	ET0	O2-C5-C9-C7
2	A	1	ET0	O1-C5-C9-C7

There are no ring outliers.

2 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	1	ET0	1	0
3	B	2	GLC	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 [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	259/292 (88%)	-0.14	10 (3%) 39 38	40, 60, 104, 158	0
1	B	258/292 (88%)	-0.04	18 (6%) 16 15	39, 61, 125, 178	0
All	All	517/584 (88%)	-0.09	28 (5%) 25 24	39, 61, 119, 178	0

The worst 5 of 28 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	242	THR	8.5
1	B	461	THR	7.1
1	B	242	THR	6.1
1	B	243	ASP	4.0
1	B	241	THR	4.0

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. 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	CME	B	285	10/11	0.89	0.18	58,70,99,136	0
1	CME	A	285	10/11	0.94	0.20	60,67,137,138	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
3	GLC	B	2	12/12	0.81	0.26	68,79,106,107	0
2	ET0	A	1	16/16	0.86	0.21	66,84,93,93	0

6.5 Other polymers [i](#)

There are no such residues in this entry.