



# Full wwPDB X-ray Structure Validation Report ⓘ

Jan 31, 2016 – 07:42 PM GMT

PDB ID : 1GUH  
Title : Structure determination and refinement of human alpha class glutathione transferase A1-1, and a comparison with the MU and PI class enzymes  
Authors : Sinning, I.; Kleywegt, G.J.; Jones, T.A.  
Deposited on : 1993-02-24  
Resolution : 2.60 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](mailto:validation@mail.wwpdb.org)  
A user guide is available at  
<http://wwpdb.org/validation/2016/XrayValidationReportHelp>  
with specific help available everywhere you see the ⓘ symbol.

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The following versions of software and data (see [references ⓘ](#)) 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

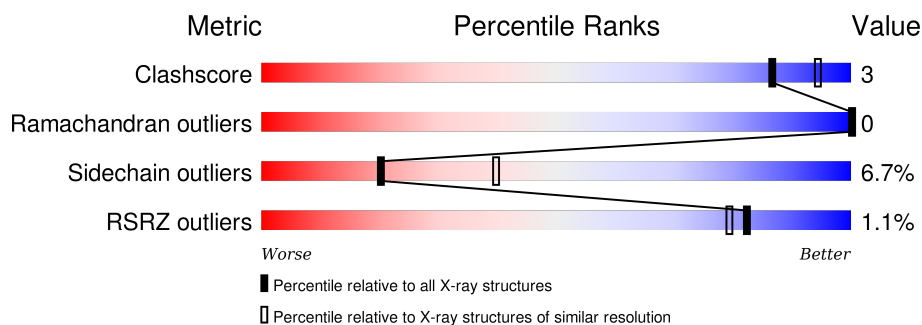
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.60 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))
Clashscore	102246	2679 (2.60-2.60)
Ramachandran outliers	100387	2635 (2.60-2.60)
Sidechain outliers	100360	2635 (2.60-2.60)
RSRZ outliers	91569	2334 (2.60-2.60)

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  $\geq 3$ , 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  $\leq 5\%$ . 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	221	<div> <div>%</div> <div> <div></div> <div>86%</div> <div>10%</div> <div>..</div> </div> </div>
1	B	221	<div> <div></div> <div>86%</div> <div>10%</div> <div>..</div> </div>
1	C	221	<div> <div>%</div> <div> <div></div> <div>86%</div> <div>10%</div> <div>..</div> </div> </div>
1	D	221	<div> <div>%</div> <div> <div></div> <div>85%</div> <div>11%</div> <div>..</div> </div> </div>

## 2 Entry composition [i](#)

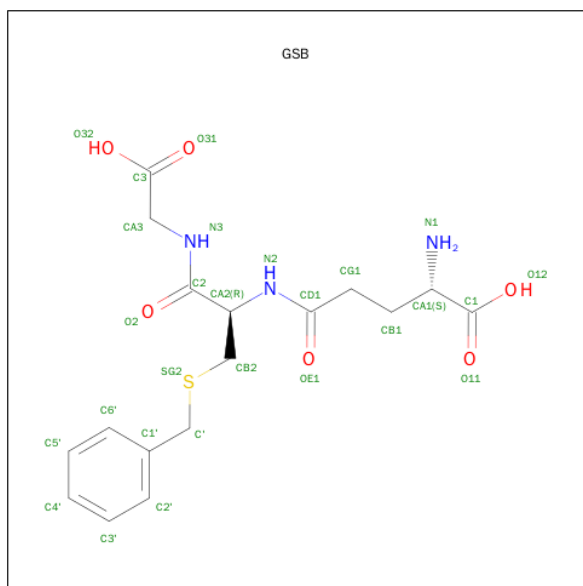
There are 2 unique types of molecules in this entry. The entry contains 7292 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 GLUTATHIONE S-TRANSFERASE A1-1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	221	Total	C	N	O	S	0	0	0
			1796	1164	300	324	8			
1	B	221	Total	C	N	O	S	0	0	0
			1796	1164	300	324	8			
1	C	221	Total	C	N	O	S	0	0	0
			1796	1164	300	324	8			
1	D	221	Total	C	N	O	S	0	0	0
			1796	1164	300	324	8			

- Molecule 2 is S-BENZYL-GLUTATHIONE (three-letter code: GSB) (formula: C<sub>17</sub>H<sub>23</sub>N<sub>3</sub>O<sub>6</sub>S).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	S	0	0
			27	17	3	6	1		
2	B	1	Total	C	N	O	S	0	0
			27	17	3	6	1		

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	C	1	Total	C	N	O	S	0	0
			27	17	3	6	1		
2	D	1	Total	C	N	O	S	0	0
			27	17	3	6	1		



- Molecule 1: GLUTATHIONE S-TRANSFERASE A1-1





## 4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	100.80 Å 95.40 Å 105.20 Å 90.00° 92.40° 90.00°	Depositor
Resolution (Å)	(Not available) – 2.60 30.91 – 2.56	Depositor EDS
% Data completeness (in resolution range)	(Not available) ((Not available)-2.60) 77.6 (30.91-2.56)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.38 (at 2.57 Å)	Xtriage
Refinement program	X-PLOR	Depositor
R, $R_{free}$	0.229 , (Not available) 0.223 , (Not available)	Depositor DCC
$R_{free}$ test set	No test flags present.	DCC
Wilson B-factor (Å <sup>2</sup> )	36.6	Xtriage
Anisotropy	0.301	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.27 , 34.0	EDS
Estimated twinning fraction	0.000 for -h,-k,l	Xtriage
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.51$ , $\langle L^2 \rangle = 0.34$	Xtriage
Outliers	3 of 25135 reflections (0.012%)	Xtriage
$F_o, F_c$ correlation	0.93	EDS
Total number of atoms	7292	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	35.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 38.93 % of the origin peak, indicating pseudo translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo translational symmetry is equal to 3.4225e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  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: GSB

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	0/1832	1.39	24/2461 (1.0%)
1	B	0.74	0/1832	1.39	23/2461 (0.9%)
1	C	0.74	0/1832	1.39	24/2461 (1.0%)
1	D	0.74	0/1832	1.39	24/2461 (1.0%)
All	All	0.74	0/7328	1.39	95/9844 (1.0%)

There are no bond length outliers.

All (95) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	204	ARG	NE-CZ-NH2	-11.68	114.46	120.30
1	D	204	ARG	NE-CZ-NH2	-11.67	114.46	120.30
1	A	204	ARG	NE-CZ-NH2	-11.58	114.51	120.30
1	C	204	ARG	NE-CZ-NH2	-11.56	114.52	120.30
1	A	13	ARG	NE-CZ-NH1	9.47	125.03	120.30
1	C	13	ARG	NE-CZ-NH1	9.46	125.03	120.30
1	B	13	ARG	NE-CZ-NH1	9.43	125.02	120.30
1	D	13	ARG	NE-CZ-NH1	9.42	125.01	120.30
1	C	21	TRP	CD1-CG-CD2	8.84	113.37	106.30
1	A	21	TRP	CD1-CG-CD2	8.84	113.37	106.30
1	B	21	TRP	CD1-CG-CD2	8.81	113.34	106.30
1	D	21	TRP	CD1-CG-CD2	8.77	113.31	106.30
1	D	16	MET	CG-SD-CE	-8.06	87.30	100.20
1	B	16	MET	CG-SD-CE	-8.05	87.32	100.20
1	A	16	MET	CG-SD-CE	-8.05	87.32	100.20
1	C	16	MET	CG-SD-CE	-8.05	87.33	100.20
1	D	204	ARG	NE-CZ-NH1	7.96	124.28	120.30
1	B	204	ARG	NE-CZ-NH1	7.95	124.28	120.30
1	A	204	ARG	NE-CZ-NH1	7.92	124.26	120.30
1	C	204	ARG	NE-CZ-NH1	7.87	124.23	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	89	ARG	NE-CZ-NH1	7.32	123.96	120.30
1	A	89	ARG	NE-CZ-NH1	7.29	123.94	120.30
1	B	89	ARG	NE-CZ-NH1	7.27	123.94	120.30
1	D	89	ARG	NE-CZ-NH1	7.25	123.92	120.30
1	C	21	TRP	CE2-CD2-CG	-6.90	101.78	107.30
1	A	21	TRP	CE2-CD2-CG	-6.89	101.79	107.30
1	D	21	TRP	CE2-CD2-CG	-6.88	101.80	107.30
1	B	21	TRP	CE2-CD2-CG	-6.87	101.80	107.30
1	A	204	ARG	CB-CG-CD	-6.84	93.82	111.60
1	C	204	ARG	CB-CG-CD	-6.84	93.82	111.60
1	B	204	ARG	CB-CG-CD	-6.83	93.84	111.60
1	D	204	ARG	CB-CG-CD	-6.83	93.84	111.60
1	C	149	VAL	CA-C-N	6.47	129.13	116.20
1	A	149	VAL	CA-C-N	6.43	129.07	116.20
1	D	21	TRP	CG-CD1-NE1	-6.43	103.67	110.10
1	B	21	TRP	CG-CD1-NE1	-6.42	103.67	110.10
1	D	149	VAL	CA-C-N	6.42	129.04	116.20
1	B	149	VAL	CA-C-N	6.41	129.02	116.20
1	A	21	TRP	CG-CD1-NE1	-6.39	103.71	110.10
1	C	21	TRP	CG-CD1-NE1	-6.37	103.73	110.10
1	C	221	ARG	NE-CZ-NH2	-6.18	117.21	120.30
1	B	149	VAL	CG1-CB-CG2	-6.18	101.01	110.90
1	D	149	VAL	CG1-CB-CG2	-6.18	101.01	110.90
1	A	149	VAL	CG1-CB-CG2	-6.17	101.02	110.90
1	C	149	VAL	CG1-CB-CG2	-6.17	101.03	110.90
1	A	66	VAL	CA-C-N	6.15	130.72	117.20
1	C	66	VAL	CA-C-N	6.13	130.69	117.20
1	B	66	VAL	CA-C-N	6.12	130.66	117.20
1	A	221	ARG	NE-CZ-NH2	-6.10	117.25	120.30
1	D	66	VAL	CA-C-N	6.10	130.61	117.20
1	B	221	ARG	NE-CZ-NH2	-6.09	117.26	120.30
1	D	221	ARG	NE-CZ-NH2	-6.08	117.26	120.30
1	A	13	ARG	NE-CZ-NH2	-5.84	117.38	120.30
1	B	13	ARG	NE-CZ-NH2	-5.84	117.38	120.30
1	C	13	ARG	NE-CZ-NH2	-5.84	117.38	120.30
1	A	67	GLN	CA-C-N	5.83	130.01	117.20
1	C	67	GLN	CA-C-N	5.82	130.01	117.20
1	B	67	GLN	CA-C-N	5.80	129.97	117.20
1	D	13	ARG	NE-CZ-NH2	-5.80	117.40	120.30
1	D	67	GLN	CA-C-N	5.80	129.97	117.20
1	D	147	TYR	CB-CG-CD1	-5.76	117.54	121.00
1	C	200	PRO	CA-C-N	5.75	127.69	116.20

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	200	PRO	CA-C-N	5.74	127.67	116.20
1	D	200	PRO	CA-C-N	5.73	127.66	116.20
1	B	200	PRO	CA-C-N	5.72	127.65	116.20
1	D	221	ARG	NE-CZ-NH1	5.66	123.13	120.30
1	A	147	TYR	CB-CG-CD1	-5.66	117.61	121.00
1	B	221	ARG	NE-CZ-NH1	5.65	123.12	120.30
1	B	147	TYR	CB-CG-CD1	-5.65	117.61	121.00
1	A	221	ARG	NE-CZ-NH1	5.64	123.12	120.30
1	C	221	ARG	NE-CZ-NH1	5.63	123.11	120.30
1	C	147	TYR	CB-CG-CD1	-5.58	117.65	121.00
1	A	131	ARG	NE-CZ-NH1	5.55	123.08	120.30
1	B	187	ARG	NE-CZ-NH1	5.55	123.08	120.30
1	C	49	TYR	CB-CG-CD2	-5.55	117.67	121.00
1	D	187	ARG	NE-CZ-NH1	5.54	123.07	120.30
1	A	49	TYR	CB-CG-CD2	-5.54	117.68	121.00
1	C	131	ARG	NE-CZ-NH1	5.54	123.07	120.30
1	A	187	ARG	NE-CZ-NH1	5.52	123.06	120.30
1	B	131	ARG	NE-CZ-NH1	5.52	123.06	120.30
1	C	187	ARG	NE-CZ-NH1	5.50	123.05	120.30
1	B	49	TYR	CB-CG-CD2	-5.48	117.71	121.00
1	D	131	ARG	NE-CZ-NH1	5.43	123.02	120.30
1	D	49	TYR	CB-CG-CD2	-5.42	117.75	121.00
1	A	66	VAL	CA-CB-CG2	-5.41	102.79	110.90
1	B	66	VAL	CA-CB-CG2	-5.41	102.79	110.90
1	C	66	VAL	CA-CB-CG2	-5.38	102.83	110.90
1	D	66	VAL	CA-CB-CG2	-5.37	102.84	110.90
1	A	82	TYR	CB-CG-CD2	-5.36	117.78	121.00
1	C	82	TYR	CB-CG-CD2	-5.32	117.81	121.00
1	B	82	TYR	CB-CG-CD2	-5.31	117.81	121.00
1	D	82	TYR	CB-CG-CD2	-5.26	117.85	121.00
1	A	20	ARG	NE-CZ-NH1	5.04	122.82	120.30
1	D	20	ARG	NE-CZ-NH1	5.04	122.82	120.30
1	C	20	ARG	NE-CZ-NH1	5.02	122.81	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	1796	0	1863	16	1
1	B	1796	0	1863	16	0
1	C	1796	0	1863	16	0
1	D	1796	0	1863	16	1
2	A	27	0	21	0	0
2	B	27	0	21	0	0
2	C	27	0	21	0	0
2	D	27	0	21	0	0
All	All	7292	0	7536	40	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 (40) 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:67:GLN:HG2	1:B:97:GLU:HB3	1.73	0.70
1:A:97:GLU:HB3	1:B:67:GLN:HG2	1.75	0.68
1:C:67:GLN:HG2	1:D:97:GLU:HB3	1.73	0.68
1:C:97:GLU:HB3	1:D:67:GLN:HG2	1.75	0.68
1:A:73:ASN:HB3	1:B:89:ARG:HH21	1.59	0.66
1:C:73:ASN:HB3	1:D:89:ARG:HH21	1.59	0.66
1:C:89:ARG:HH21	1:D:73:ASN:HB3	1.68	0.59
1:D:129:LYS:HE3	1:D:174:LEU:HD23	1.86	0.58
1:A:129:LYS:HE3	1:A:174:LEU:HD23	1.86	0.58
1:A:89:ARG:HH21	1:B:73:ASN:HB3	1.68	0.58
1:C:129:LYS:HE3	1:C:174:LEU:HD23	1.86	0.58
1:B:129:LYS:HE3	1:B:174:LEU:HD23	1.86	0.57
1:A:67:GLN:HG2	1:B:97:GLU:CB	2.35	0.56
1:D:102:LEU:HD23	1:D:163:LEU:HD21	1.88	0.56
1:C:67:GLN:HG2	1:D:97:GLU:CB	2.35	0.56
1:A:102:LEU:HD23	1:A:163:LEU:HD21	1.88	0.55
1:C:102:LEU:HD23	1:C:163:LEU:HD21	1.88	0.55
1:B:102:LEU:HD23	1:B:163:LEU:HD21	1.88	0.55
1:C:131:ARG:HD2	1:D:52:PHE:O	2.08	0.53
1:A:131:ARG:HD2	1:B:52:PHE:O	2.08	0.53
1:C:89:ARG:NH1	1:D:89:ARG:NH1	2.60	0.50
1:B:137:GLU:HG3	1:B:178:PHE:HD1	1.77	0.50
1:A:89:ARG:NH1	1:B:89:ARG:NH1	2.60	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:137:GLU:HG3	1:A:178:PHE:HD1	1.77	0.49
1:C:97:GLU:CB	1:D:67:GLN:HG2	2.42	0.49
1:D:137:GLU:HG3	1:D:178:PHE:HD1	1.77	0.49
1:C:52:PHE:O	1:D:131:ARG:HD2	2.13	0.49
1:C:137:GLU:HG3	1:C:178:PHE:HD1	1.77	0.48
1:A:52:PHE:O	1:B:131:ARG:HD2	2.13	0.48
1:A:97:GLU:CB	1:B:67:GLN:HG2	2.42	0.47
1:C:131:ARG:NH1	1:D:53:GLN:HB2	2.31	0.46
1:A:131:ARG:NH1	1:B:53:GLN:HB2	2.31	0.46
1:A:89:ARG:HH12	1:B:89:ARG:NH1	2.14	0.46
1:D:129:LYS:HE3	1:D:174:LEU:CD2	2.46	0.46
1:C:89:ARG:HH12	1:D:89:ARG:NH1	2.14	0.45
1:B:129:LYS:HE3	1:B:174:LEU:CD2	2.46	0.45
1:C:129:LYS:HE3	1:C:174:LEU:CD2	2.46	0.45
1:A:129:LYS:HE3	1:A:174:LEU:CD2	2.46	0.44
1:C:89:ARG:NH1	1:D:89:ARG:HH12	2.18	0.42
1:A:89:ARG:NH1	1:B:89:ARG:HH12	2.18	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:210:GLU:OE2	1:D:115:GLU:OE2[2_756]	1.91	0.29

## 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	219/221 (99%)	211 (96%)	8 (4%)	0	100	100
1	B	219/221 (99%)	211 (96%)	8 (4%)	0	100	100
1	C	219/221 (99%)	211 (96%)	8 (4%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	D	219/221 (99%)	211 (96%)	8 (4%)	0	100	100
All	All	876/884 (99%)	844 (96%)	32 (4%)	0	100	100

There are no Ramachandran outliers to report.

### 5.3.2 Protein sidechains ⓘ

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	195/195 (100%)	182 (93%)	13 (7%)	20	40
1	B	195/195 (100%)	182 (93%)	13 (7%)	20	40
1	C	195/195 (100%)	182 (93%)	13 (7%)	20	40
1	D	195/195 (100%)	182 (93%)	13 (7%)	20	40
All	All	780/780 (100%)	728 (93%)	52 (7%)	20	40

All (52) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	13	ARG
1	A	16	MET
1	A	66	VAL
1	A	67	GLN
1	A	82	TYR
1	A	112	CYS
1	A	118	ASP
1	A	120	LYS
1	A	131	ARG
1	A	143	HIS
1	A	146	ASP
1	A	200	PRO
1	A	210	GLU
1	B	13	ARG
1	B	16	MET
1	B	66	VAL

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Mol	Chain	Res	Type
1	B	67	GLN
1	B	82	TYR
1	B	112	CYS
1	B	118	ASP
1	B	120	LYS
1	B	131	ARG
1	B	143	HIS
1	B	146	ASP
1	B	200	PRO
1	B	210	GLU
1	C	13	ARG
1	C	16	MET
1	C	66	VAL
1	C	67	GLN
1	C	82	TYR
1	C	112	CYS
1	C	118	ASP
1	C	120	LYS
1	C	131	ARG
1	C	143	HIS
1	C	146	ASP
1	C	200	PRO
1	C	210	GLU
1	D	13	ARG
1	D	16	MET
1	D	66	VAL
1	D	67	GLN
1	D	82	TYR
1	D	112	CYS
1	D	118	ASP
1	D	120	LYS
1	D	131	ARG
1	D	143	HIS
1	D	146	ASP
1	D	200	PRO
1	D	210	GLU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

### 5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates ⓘ

There are no carbohydrates in this entry.

## 5.6 Ligand geometry ⓘ

4 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	GSB	A	223	-	21,27,27	0.49	0	25,34,34	0.72	0
2	GSB	B	223	-	21,27,27	0.49	0	25,34,34	0.71	0
2	GSB	C	223	-	21,27,27	0.49	0	25,34,34	0.71	0
2	GSB	D	223	-	21,27,27	0.49	0	25,34,34	0.71	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	GSB	A	223	-	-	0/22/28/28	0/1/1/1
2	GSB	B	223	-	-	0/22/28/28	0/1/1/1
2	GSB	C	223	-	-	0/22/28/28	0/1/1/1
2	GSB	D	223	-	-	0/22/28/28	0/1/1/1

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 [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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	221/221 (100%)	-0.29	3 (1%) 78 74	2, 27, 76, 132	0
1	B	221/221 (100%)	-0.34	1 (0%) 91 90	2, 27, 76, 132	0
1	C	221/221 (100%)	-0.21	3 (1%) 78 74	2, 27, 76, 132	0
1	D	221/221 (100%)	-0.14	3 (1%) 78 74	2, 27, 76, 132	0
All	All	884/884 (100%)	-0.25	10 (1%) 82 79	2, 28, 76, 132	0

All (10) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	113	PRO	4.2
1	A	113	PRO	4.0
1	B	2	ALA	3.7
1	A	2	ALA	3.6
1	C	2	ALA	3.0
1	D	113	PRO	2.9
1	A	115	GLU	2.4
1	C	222	PHE	2.3
1	D	2	ALA	2.2
1	D	211	LYS	2.0

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

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

### 6.3 Carbohydrates [i](#)

There are no 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<sup>th</sup> 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( $\text{\AA}^2$ )	Q<0.9
2	GSB	B	223	27/27	0.92	0.17	0.24	21,21,25,25	0
2	GSB	D	223	27/27	0.92	0.18	-0.01	21,21,25,25	0
2	GSB	A	223	27/27	0.91	0.16	-0.27	21,21,25,25	0
2	GSB	C	223	27/27	0.93	0.15	-0.42	21,21,25,25	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.