



Full wwPDB X-ray Structure Validation Report ⓘ

Jul 17, 2024 – 03:49 pm BST

PDB ID : 8PRY
Title : Crystal structure of Trypanosoma cruzi glycerol kinase
Authors : Lipinski, O.; Sonani, R.R.; Dubin, G.
Deposited on : 2023-07-12
Resolution : 2.07 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<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 : 1.8.4, CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.37.1
buster-report : 1.1.7 (2018)
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) : 2.37.1

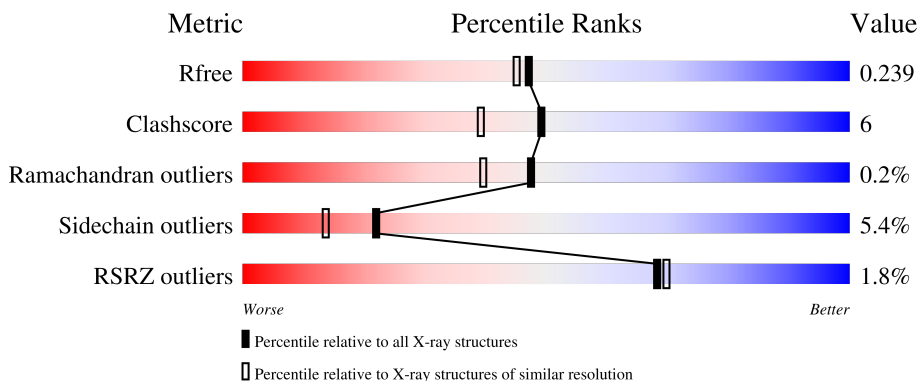
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.07 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	2684 (2.08-2.04)
Clashscore	141614	2801 (2.08-2.04)
Ramachandran outliers	138981	2768 (2.08-2.04)
Sidechain outliers	138945	2768 (2.08-2.04)
RSRZ outliers	127900	2646 (2.08-2.04)

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	523	
1	B	523	
1	C	523	
1	D	523	

2 Entry composition i

There are 3 unique types of molecules in this entry. The entry contains 16378 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 glycerol kinase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	512	3992	2538	694	732	28	0	0	0
1	B	511	3984	2532	693	731	28	0	0	0
1	C	512	3992	2538	694	732	28	0	0	0
1	D	511	3983	2532	693	730	28	0	0	0

There are 32 discrepancies between the modelled and reference sequences:

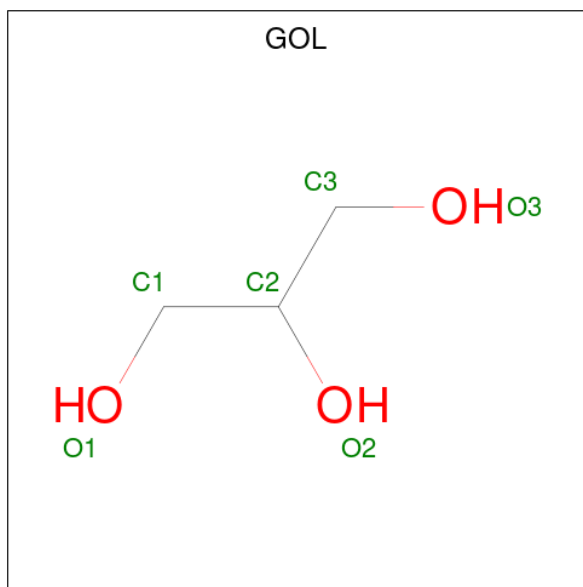
Chain	Residue	Modelled	Actual	Comment	Reference
A	-10	MET	-	initiating methionine	UNP A0A2V2W444
A	-9	ALA	-	expression tag	UNP A0A2V2W444
A	-8	HIS	-	expression tag	UNP A0A2V2W444
A	-7	HIS	-	expression tag	UNP A0A2V2W444
A	-6	HIS	-	expression tag	UNP A0A2V2W444
A	-5	HIS	-	expression tag	UNP A0A2V2W444
A	-4	HIS	-	expression tag	UNP A0A2V2W444
A	-3	HIS	-	expression tag	UNP A0A2V2W444
B	-10	MET	-	initiating methionine	UNP A0A2V2W444
B	-9	ALA	-	expression tag	UNP A0A2V2W444
B	-8	HIS	-	expression tag	UNP A0A2V2W444
B	-7	HIS	-	expression tag	UNP A0A2V2W444
B	-6	HIS	-	expression tag	UNP A0A2V2W444
B	-5	HIS	-	expression tag	UNP A0A2V2W444
B	-4	HIS	-	expression tag	UNP A0A2V2W444
B	-3	HIS	-	expression tag	UNP A0A2V2W444
C	-10	MET	-	initiating methionine	UNP A0A2V2W444
C	-9	ALA	-	expression tag	UNP A0A2V2W444
C	-8	HIS	-	expression tag	UNP A0A2V2W444
C	-7	HIS	-	expression tag	UNP A0A2V2W444
C	-6	HIS	-	expression tag	UNP A0A2V2W444

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Chain	Residue	Modelled	Actual	Comment	Reference
C	-5	HIS	-	expression tag	UNP A0A2V2W444
C	-4	HIS	-	expression tag	UNP A0A2V2W444
C	-3	HIS	-	expression tag	UNP A0A2V2W444
D	-10	MET	-	initiating methionine	UNP A0A2V2W444
D	-9	ALA	-	expression tag	UNP A0A2V2W444
D	-8	HIS	-	expression tag	UNP A0A2V2W444
D	-7	HIS	-	expression tag	UNP A0A2V2W444
D	-6	HIS	-	expression tag	UNP A0A2V2W444
D	-5	HIS	-	expression tag	UNP A0A2V2W444
D	-4	HIS	-	expression tag	UNP A0A2V2W444
D	-3	HIS	-	expression tag	UNP A0A2V2W444

- Molecule 2 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$) (labeled as "Ligand of Interest" by depositor).



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

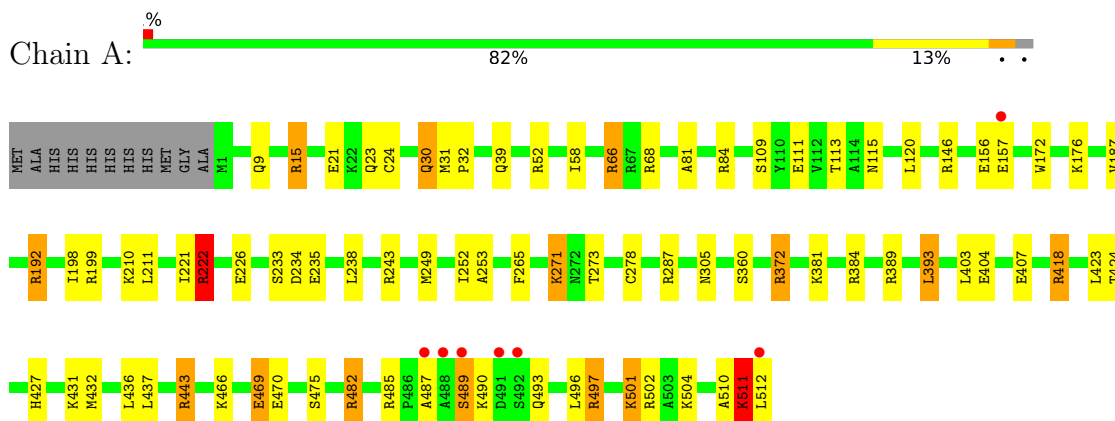
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	112	Total 112	O 112	0	0
3	B	156	Total 156	O 156	0	0
3	C	95	Total 95	O 95	0	0
3	D	40	Total 40	O 40	0	0

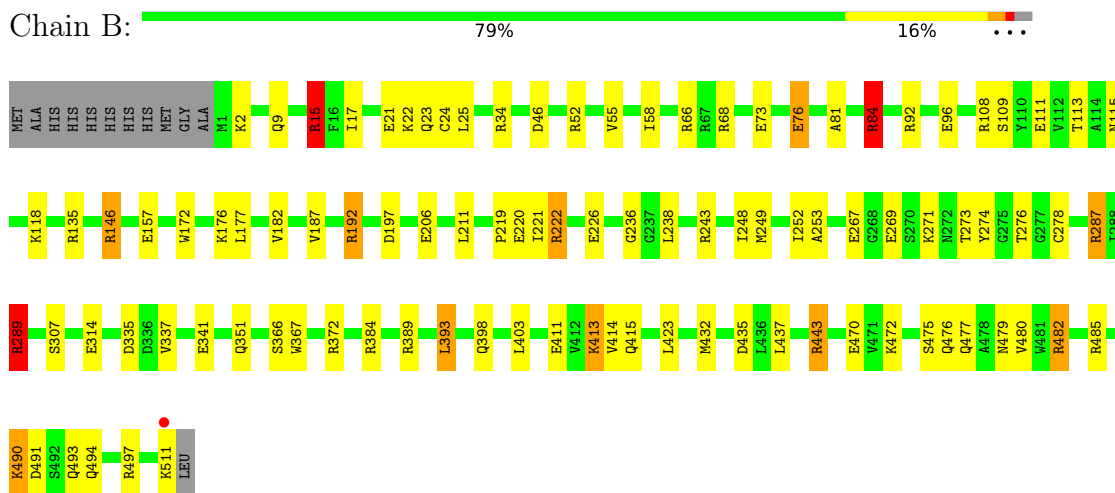
3 Residue-property plots [i](#)

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.

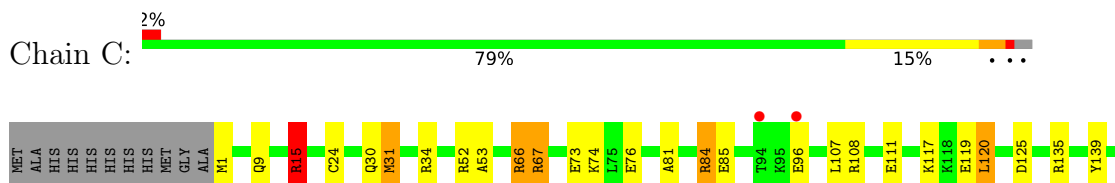
- Molecule 1: glycerol kinase

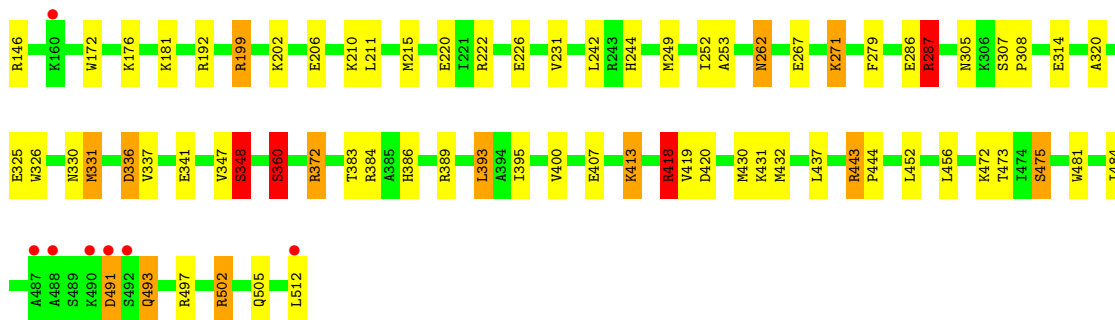


- Molecule 1: glycerol kinase

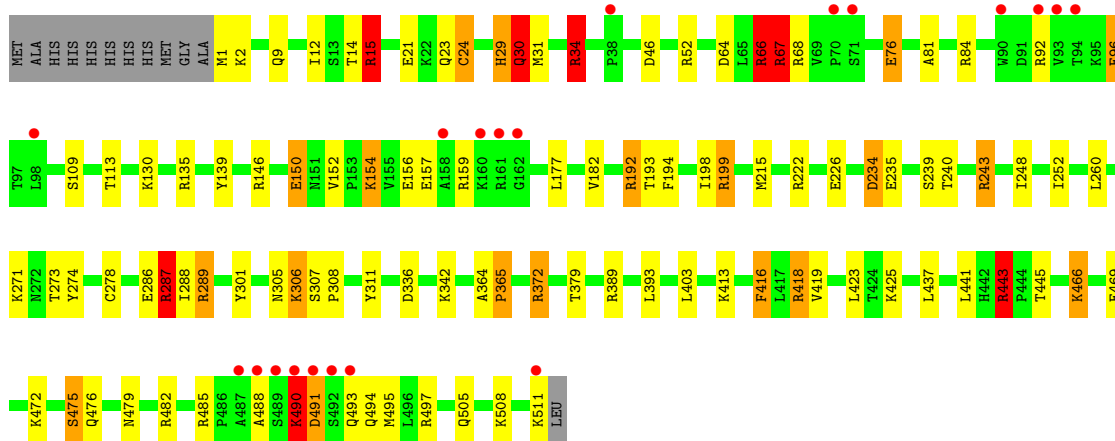
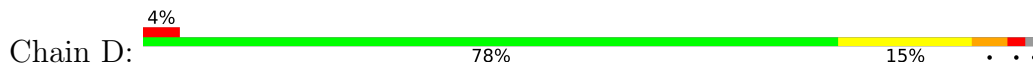


- Molecule 1: glycerol kinase





● Molecule 1: glycerol kinase



4 Data and refinement statistics i

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α , β , γ	68.78Å 89.32Å 97.16Å 117.35° 88.99° 93.68°	Depositor
Resolution (Å)	44.61 – 2.07 44.57 – 2.07	Depositor EDS
% Data completeness (in resolution range)	93.8 (44.61-2.07) 93.8 (44.57-2.07)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.40 (at 2.07Å)	Xtrriage
Refinement program	REFMAC 5.8.0352	Depositor
R, R_{free}	0.176 , 0.238 0.184 , 0.239	Depositor DCC
R_{free} test set	5822 reflections (4.97%)	wwPDB-VP
Wilson B-factor (Å ²)	34.5	Xtrriage
Anisotropy	0.122	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 36.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	0.009 for -h,-k,k+1	Xtrriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	16378	wwPDB-VP
Average B, all atoms (Å ²)	46.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.32% 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 [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: GOL, CSD

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	0.90	12/4064 (0.3%)	1.18	16/5496 (0.3%)
1	B	0.96	18/4056 (0.4%)	1.25	32/5485 (0.6%)
1	C	0.88	8/4064 (0.2%)	1.27	34/5496 (0.6%)
1	D	0.77	5/4055 (0.1%)	1.18	26/5483 (0.5%)
All	All	0.88	43/16239 (0.3%)	1.22	108/21960 (0.5%)

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	10
1	B	0	7
1	C	0	11
1	D	0	16
All	All	0	44

All (43) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	111	GLU	CD-OE2	12.52	1.39	1.25
1	B	470	GLU	CD-OE1	11.16	1.38	1.25
1	A	21	GLU	CD-OE2	-9.78	1.14	1.25
1	B	76	GLU	CD-OE1	9.27	1.35	1.25
1	C	314	GLU	CD-OE1	9.24	1.35	1.25
1	B	24	CSD	C-N	8.73	1.54	1.34
1	C	286	GLU	CD-OE1	-8.34	1.16	1.25
1	C	76	GLU	CD-OE2	-8.26	1.16	1.25
1	D	24	CSD	C-N	8.23	1.52	1.34
1	A	24	CSD	C-N	8.16	1.52	1.34

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	470	GLU	CD-OE2	-8.16	1.16	1.25
1	B	314	GLU	CD-OE1	-7.97	1.16	1.25
1	A	157	GLU	CD-OE2	7.94	1.34	1.25
1	B	470	GLU	CD-OE2	7.46	1.33	1.25
1	A	470	GLU	CD-OE1	-7.33	1.17	1.25
1	C	24	CSD	C-N	7.31	1.50	1.34
1	B	267	GLU	CD-OE1	-6.76	1.18	1.25
1	B	341	GLU	CD-OE2	6.62	1.32	1.25
1	D	286	GLU	CD-OE2	-6.62	1.18	1.25
1	B	111	GLU	CD-OE1	6.62	1.32	1.25
1	D	469	GLU	CD-OE2	6.53	1.32	1.25
1	B	73	GLU	CD-OE2	6.48	1.32	1.25
1	B	307	SER	CB-OG	-6.33	1.34	1.42
1	A	31	MET	CG-SD	-6.31	1.64	1.81
1	A	407	GLU	CD-OE2	-6.17	1.18	1.25
1	C	341	GLU	CD-OE1	-6.13	1.19	1.25
1	A	404	GLU	CD-OE2	-5.92	1.19	1.25
1	B	269	GLU	CD-OE2	-5.89	1.19	1.25
1	C	85	GLU	CD-OE2	5.73	1.31	1.25
1	B	269	GLU	CD-OE1	-5.69	1.19	1.25
1	A	156	GLU	CD-OE1	-5.68	1.19	1.25
1	A	157	GLU	CB-CG	5.68	1.62	1.52
1	B	21	GLU	CD-OE2	5.53	1.31	1.25
1	B	267	GLU	CD-OE2	-5.45	1.19	1.25
1	B	76	GLU	CB-CG	-5.41	1.41	1.52
1	C	360	SER	CB-OG	5.39	1.49	1.42
1	B	206	GLU	CD-OE2	-5.37	1.19	1.25
1	A	469	GLU	CD-OE2	5.29	1.31	1.25
1	D	76	GLU	CD-OE2	5.26	1.31	1.25
1	B	411	GLU	CD-OE2	-5.18	1.20	1.25
1	D	150	GLU	CD-OE2	5.11	1.31	1.25
1	C	267	GLU	CD-OE2	-5.05	1.20	1.25
1	B	157	GLU	CD-OE1	5.00	1.31	1.25

All (108) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	372	ARG	NE-CZ-NH2	-15.66	112.47	120.30
1	A	482	ARG	NE-CZ-NH1	13.27	126.94	120.30
1	B	372	ARG	NE-CZ-NH1	13.18	126.89	120.30
1	C	443	ARG	NE-CZ-NH2	-11.47	114.56	120.30
1	B	52	ARG	NE-CZ-NH2	-10.33	115.13	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	34	ARG	NE-CZ-NH2	-10.01	115.30	120.30
1	C	287	ARG	CG-CD-NE	9.89	132.57	111.80
1	D	372	ARG	NE-CZ-NH2	-9.86	115.37	120.30
1	D	372	ARG	NE-CZ-NH1	9.53	125.06	120.30
1	A	418	ARG	NE-CZ-NH2	-9.20	115.70	120.30
1	C	52	ARG	NE-CZ-NH2	-8.57	116.01	120.30
1	D	287	ARG	NE-CZ-NH1	8.49	124.55	120.30
1	D	497	ARG	NE-CZ-NH2	-8.40	116.10	120.30
1	C	199	ARG	NE-CZ-NH1	-8.27	116.16	120.30
1	A	497	ARG	CG-CD-NE	-8.11	94.76	111.80
1	C	135	ARG	NE-CZ-NH2	-8.03	116.29	120.30
1	A	389	ARG	NE-CZ-NH2	-7.84	116.38	120.30
1	D	491	ASP	CB-CA-C	-7.74	94.91	110.40
1	B	84	ARG	NE-CZ-NH2	-7.71	116.44	120.30
1	B	443	ARG	NE-CZ-NH1	7.67	124.14	120.30
1	C	66	ARG	NE-CZ-NH2	-7.64	116.48	120.30
1	B	389	ARG	NE-CZ-NH1	7.58	124.09	120.30
1	C	497	ARG	NE-CZ-NH1	-7.56	116.52	120.30
1	B	276	THR	CA-CB-OG1	-7.55	93.14	109.00
1	C	67	ARG	NE-CZ-NH2	-7.50	116.55	120.30
1	B	289	ARG	NE-CZ-NH1	7.47	124.04	120.30
1	B	222	ARG	NE-CZ-NH1	7.36	123.98	120.30
1	D	192	ARG	NE-CZ-NH1	7.33	123.97	120.30
1	A	66	ARG	CG-CD-NE	-7.29	96.50	111.80
1	A	265	PHE	CB-CA-C	-7.09	96.22	110.40
1	A	372	ARG	NE-CZ-NH1	7.08	123.84	120.30
1	C	418	ARG	NE-CZ-NH2	-7.07	116.76	120.30
1	C	389	ARG	NE-CZ-NH1	6.95	123.78	120.30
1	B	222	ARG	NE-CZ-NH2	-6.95	116.83	120.30
1	C	108	ARG	NE-CZ-NH2	-6.87	116.86	120.30
1	C	139	TYR	CB-CG-CD1	6.86	125.12	121.00
1	B	135	ARG	NE-CZ-NH1	-6.84	116.88	120.30
1	B	34	ARG	NE-CZ-NH1	6.76	123.68	120.30
1	C	348	SER	N-CA-CB	6.69	120.53	110.50
1	B	443	ARG	NE-CZ-NH2	-6.68	116.96	120.30
1	C	15	ARG	CB-CA-C	6.67	123.74	110.40
1	C	389	ARG	NE-CZ-NH2	-6.63	116.98	120.30
1	D	139	TYR	CB-CG-CD1	6.60	124.96	121.00
1	B	384	ARG	NE-CZ-NH2	-6.56	117.02	120.30
1	D	29	HIS	CB-CA-C	6.55	123.50	110.40
1	C	331	MET	CG-SD-CE	-6.50	89.81	100.20
1	B	96	GLU	CB-CA-C	-6.48	97.44	110.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	482	ARG	NE-CZ-NH2	-6.32	117.14	120.30
1	D	389	ARG	NE-CZ-NH2	-6.32	117.14	120.30
1	B	66	ARG	NE-CZ-NH2	-6.31	117.14	120.30
1	C	199	ARG	NE-CZ-NH2	6.30	123.45	120.30
1	C	491	ASP	CB-CA-C	-6.30	97.80	110.40
1	C	336	ASP	CB-CG-OD1	-6.26	112.66	118.30
1	C	336	ASP	CB-CA-C	-6.24	97.92	110.40
1	A	39	GLN	CB-CA-C	-6.24	97.93	110.40
1	D	192	ARG	NE-CZ-NH2	-6.23	117.19	120.30
1	D	472	LYS	CB-CG-CD	6.22	127.78	111.60
1	B	222	ARG	CB-CG-CD	6.19	127.69	111.60
1	C	139	TYR	CB-CG-CD2	-6.15	117.31	121.00
1	B	435	ASP	CB-CG-OD1	-6.13	112.78	118.30
1	C	135	ARG	NE-CZ-NH1	6.10	123.35	120.30
1	C	52	ARG	NE-CZ-NH1	6.09	123.34	120.30
1	B	389	ARG	NE-CZ-NH2	-6.06	117.27	120.30
1	B	52	ARG	NE-CZ-NH1	6.04	123.32	120.30
1	D	139	TYR	CA-CB-CG	6.01	124.82	113.40
1	C	262	ASN	CB-CA-C	-6.00	98.39	110.40
1	B	76	GLU	CB-CA-C	-5.88	98.64	110.40
1	D	66	ARG	CG-CD-NE	-5.86	99.48	111.80
1	D	68	ARG	NE-CZ-NH1	-5.84	117.38	120.30
1	A	389	ARG	NE-CZ-NH1	5.84	123.22	120.30
1	C	372	ARG	NE-CZ-NH2	5.83	123.21	120.30
1	A	485	ARG	CG-CD-NE	-5.80	99.63	111.80
1	D	182	VAL	CA-CB-CG2	5.79	119.58	110.90
1	A	222	ARG	NE-CZ-NH2	-5.73	117.43	120.30
1	D	67	ARG	NE-CZ-NH1	5.73	123.17	120.30
1	C	502	ARG	CG-CD-NE	-5.73	99.77	111.80
1	D	135	ARG	NE-CZ-NH1	5.70	123.15	120.30
1	A	502	ARG	NE-CZ-NH1	-5.66	117.47	120.30
1	B	243	ARG	NE-CZ-NH2	-5.66	117.47	120.30
1	A	427	HIS	CA-CB-CG	-5.65	104.00	113.60
1	B	46	ASP	CB-CG-OD2	-5.60	113.26	118.30
1	D	466	LYS	CB-CA-C	5.59	121.59	110.40
1	D	68	ARG	NE-CZ-NH2	5.58	123.09	120.30
1	B	384	ARG	CG-CD-NE	-5.53	100.20	111.80
1	C	418	ARG	NE-CZ-NH1	5.49	123.04	120.30
1	A	192	ARG	NE-CZ-NH1	5.48	123.04	120.30
1	D	135	ARG	NE-CZ-NH2	-5.47	117.56	120.30
1	A	199	ARG	CG-CD-NE	5.45	123.24	111.80
1	D	418	ARG	NE-CZ-NH2	-5.43	117.58	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	325	GLU	N-CA-CB	-5.42	100.84	110.60
1	B	192	ARG	NE-CZ-NH2	-5.41	117.59	120.30
1	C	15	ARG	CA-CB-CG	5.35	125.17	113.40
1	C	15	ARG	NE-CZ-NH2	5.34	122.97	120.30
1	D	389	ARG	NE-CZ-NH1	5.30	122.95	120.30
1	C	96	GLU	CB-CA-C	-5.29	99.83	110.40
1	B	335	ASP	CB-CA-C	-5.28	99.84	110.40
1	D	287	ARG	NE-CZ-NH2	-5.28	117.66	120.30
1	B	197	ASP	CB-CG-OD2	-5.25	113.58	118.30
1	C	360	SER	CB-CA-C	5.25	120.07	110.10
1	D	156	GLU	CB-CA-C	5.25	120.89	110.40
1	B	76	GLU	OE1-CD-OE2	5.24	129.59	123.30
1	B	108	ARG	NE-CZ-NH2	-5.21	117.70	120.30
1	C	336	ASP	N-CA-CB	5.15	119.86	110.60
1	B	197	ASP	CB-CG-OD1	5.12	122.91	118.30
1	D	96	GLU	N-CA-CB	5.11	119.79	110.60
1	B	15	ARG	NE-CZ-NH2	5.04	122.82	120.30
1	C	84	ARG	NE-CZ-NH2	-5.02	117.79	120.30
1	D	443	ARG	NE-CZ-NH1	5.00	122.80	120.30

There are no chirality outliers.

All (44) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	15	ARG	Sidechain
1	A	192	ARG	Sidechain
1	A	222	ARG	Sidechain
1	A	234	ASP	Peptide
1	A	287	ARG	Sidechain
1	A	372	ARG	Sidechain
1	A	384	ARG	Sidechain
1	A	418	ARG	Sidechain
1	A	443	ARG	Sidechain
1	A	489	SER	Peptide
1	B	146	ARG	Sidechain
1	B	15	ARG	Sidechain
1	B	192	ARG	Sidechain
1	B	287	ARG	Sidechain
1	B	289	ARG	Sidechain
1	B	497	ARG	Sidechain
1	B	84	ARG	Sidechain
1	C	15	ARG	Sidechain

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Mol	Chain	Res	Type	Group
1	C	192	ARG	Sidechain
1	C	287	ARG	Sidechain
1	C	34	ARG	Sidechain
1	C	372	ARG	Sidechain
1	C	384	ARG	Sidechain
1	C	418	ARG	Sidechain
1	C	443	ARG	Sidechain
1	C	502	ARG	Sidechain
1	C	66	ARG	Sidechain
1	C	67	ARG	Sidechain
1	D	15	ARG	Sidechain
1	D	150	GLU	Mainchain
1	D	159	ARG	Sidechain
1	D	192	ARG	Sidechain
1	D	199	ARG	Sidechain
1	D	287	ARG	Sidechain
1	D	289	ARG	Sidechain
1	D	34	ARG	Sidechain
1	D	364	ALA	Mainchain,Peptide
1	D	443	ARG	Sidechain
1	D	485	ARG	Sidechain
1	D	488	ALA	Peptide
1	D	490	LYS	Peptide
1	D	67	ARG	Sidechain
1	D	92	ARG	Sidechain

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	3992	0	4040	37	0
1	B	3984	0	4029	45	0
1	C	3992	0	4040	57	0
1	D	3983	0	4029	56	0
2	A	6	0	8	0	0
2	B	6	0	8	0	0
2	C	6	0	8	1	0
2	D	6	0	8	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	A	112	0	0	4	0
3	B	156	0	0	4	0
3	C	95	0	0	9	0
3	D	40	0	0	7	0
All	All	16378	0	16170	188	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 6.

All (188) 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:C:331:MET:N	3:C:701:HOH:O	1.70	1.13
1:A:52:ARG:NH1	3:A:701:HOH:O	1.86	1.07
1:D:493:GLN:NE2	3:D:702:HOH:O	1.90	1.04
1:D:24:CSD:OD2	3:D:701:HOH:O	1.84	0.96
1:C:119:GLU:HB2	1:C:120:LEU:HD13	1.47	0.93
1:A:30:GLN:NE2	3:A:702:HOH:O	2.03	0.89
1:B:68:ARG:NH1	3:B:701:HOH:O	2.02	0.88
1:A:23:GLN:HE22	1:A:475:SER:HB2	1.36	0.88
1:D:84:ARG:HH21	2:D:601:GOL:H12	1.39	0.87
1:D:29:HIS:O	1:D:30:GLN:HB3	1.76	0.84
1:D:66:ARG:HG3	1:D:66:ARG:NH1	1.94	0.82
1:A:493:GLN:O	1:A:497:ARG:HG3	1.80	0.81
1:A:436:LEU:HD23	1:A:493:GLN:OE1	1.81	0.79
1:A:115:ASN:HD22	1:A:146:ARG:HH22	1.31	0.79
1:A:482:ARG:HH11	1:A:482:ARG:HA	1.47	0.78
1:C:220:GLU:OE2	1:C:222:ARG:NH1	2.17	0.76
1:C:330:ASN:CA	3:C:701:HOH:O	2.33	0.76
1:B:92:ARG:HG3	1:B:92:ARG:NH1	2.00	0.75
1:D:306:LYS:H	1:D:306:LYS:HD2	1.51	0.73
1:D:222:ARG:HD2	1:D:226:GLU:OE2	1.89	0.73
1:C:326:TRP:O	1:C:330:ASN:O	2.07	0.72
1:D:152:VAL:HG12	1:D:154:LYS:HG3	1.72	0.72
1:C:74:LYS:CE	1:C:244:HIS:HB2	2.20	0.72
1:A:68:ARG:NH1	3:A:703:HOH:O	2.14	0.70
1:D:66:ARG:HG3	1:D:66:ARG:HH11	1.57	0.70
1:B:287:ARG:HH12	1:B:289:ARG:NE	1.89	0.69
1:C:330:ASN:HA	3:C:701:HOH:O	1.93	0.69
1:C:119:GLU:HB2	1:C:120:LEU:CD1	2.21	0.69
1:B:92:ARG:HG3	1:B:92:ARG:HH11	1.58	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:23:GLN:HE22	1:D:475:SER:HB2	1.59	0.67
1:D:287:ARG:HG2	1:D:289:ARG:HH11	1.60	0.66
1:C:74:LYS:HE2	1:C:244:HIS:HB2	1.77	0.65
1:C:305:ASN:ND2	1:C:305:ASN:H	1.95	0.65
1:D:416:PHE:CZ	1:D:418:ARG:NH1	2.64	0.65
1:A:233:SER:OG	1:A:235:GLU:HB2	1.98	0.63
1:B:287:ARG:NH1	1:B:289:ARG:NE	2.46	0.63
1:D:1:MET:N	3:D:704:HOH:O	2.32	0.63
1:C:262:ASN:OD1	3:C:703:HOH:O	2.16	0.63
1:C:305:ASN:H	1:C:305:ASN:HD22	1.46	0.62
1:D:443:ARG:HG2	1:D:482:ARG:HH11	1.64	0.62
1:B:477:GLN:HE21	1:C:472:LYS:NZ	1.96	0.62
1:B:443:ARG:HH12	1:B:482:ARG:NH1	1.97	0.62
1:B:15:ARG:CZ	1:B:15:ARG:HB2	2.30	0.61
1:D:15:ARG:HG2	1:D:15:ARG:HH21	1.65	0.61
1:C:475:SER:HB2	3:C:756:HOH:O	2.01	0.61
1:B:403:LEU:HD11	1:B:414:VAL:HG21	1.84	0.60
1:C:107:LEU:HD21	1:C:360:SER:O	2.02	0.60
1:D:84:ARG:HH21	2:D:601:GOL:C1	2.13	0.59
1:C:320:ALA:HA	1:C:395:ILE:HG12	1.83	0.59
1:B:477:GLN:HE21	1:C:472:LYS:HZ1	1.50	0.58
1:C:206:GLU:O	1:C:210:LYS:HG3	2.03	0.58
1:D:235:GLU:CD	3:D:713:HOH:O	2.41	0.58
1:B:115:ASN:HD22	1:B:146:ARG:HH22	1.51	0.58
1:D:491:ASP:HB3	1:D:494:GLN:HG2	1.86	0.58
1:A:120:LEU:HD22	1:A:210:LYS:HG2	1.86	0.58
1:C:1:MET:N	3:C:704:HOH:O	2.36	0.58
1:C:220:GLU:CD	1:C:222:ARG:NH1	2.58	0.57
1:C:419:VAL:O	1:C:444:PRO:HD2	2.05	0.56
1:B:477:GLN:NE2	1:C:472:LYS:NZ	2.53	0.56
1:D:445:THR:HG22	1:D:482:ARG:NH2	2.20	0.56
1:D:2:LYS:HB3	1:D:76:GLU:HG3	1.88	0.56
1:D:52:ARG:HG2	3:D:713:HOH:O	2.06	0.56
1:D:234:ASP:HB3	1:D:239:SER:HB2	1.88	0.55
1:C:347:VAL:O	1:C:348:SER:CB	2.52	0.55
1:C:393:LEU:HD13	1:C:432:MET:SD	2.47	0.55
1:C:73:GLU:HG3	1:C:74:LYS:HG3	1.89	0.55
1:D:34:ARG:HH12	1:D:46:ASP:HB3	1.73	0.54
1:D:403:LEU:HD23	1:D:437:LEU:HD22	1.89	0.54
1:C:383:THR:H	1:C:386:HIS:HD2	1.55	0.54
1:C:279:PHE:CZ	2:C:601:GOL:H32	2.43	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:23:GLN:NE2	1:A:475:SER:HB2	2.17	0.53
1:C:407:GLU:OE1	1:C:413:LYS:HE2	2.09	0.53
1:D:505:GLN:NE2	1:D:508:LYS:HE2	2.23	0.53
1:B:23:GLN:NE2	1:B:475:SER:HB3	2.24	0.53
1:B:22:LYS:HD3	1:C:481:TRP:O	2.09	0.52
1:B:177:LEU:HD13	1:B:248:ILE:HD13	1.89	0.52
1:D:419:VAL:HG11	1:D:441:LEU:HD13	1.91	0.52
1:B:480:VAL:HG11	1:C:473:THR:HG23	1.91	0.52
1:B:403:LEU:HD23	1:B:437:LEU:HD22	1.91	0.52
1:A:115:ASN:ND2	1:A:146:ARG:HH22	2.05	0.52
1:B:393:LEU:HD13	1:B:432:MET:SD	2.51	0.51
1:B:398:GLN:NE2	3:B:703:HOH:O	2.34	0.51
1:C:31:MET:HG2	1:C:53:ALA:HB1	1.91	0.51
1:A:510:ALA:O	1:A:511:LYS:O	2.28	0.51
1:B:23:GLN:HE22	1:B:475:SER:HB3	1.75	0.51
1:C:117:LYS:HD2	1:C:125:ASP:OD1	2.10	0.51
1:D:288:ILE:HG12	1:D:311:TYR:CZ	2.46	0.51
1:D:490:LYS:HD2	1:D:491:ASP:OD1	2.11	0.51
1:D:307:SER:HB3	1:D:308:PRO:HD2	1.92	0.51
1:B:58:ILE:HG21	1:B:238:LEU:HD11	1.93	0.50
1:C:418:ARG:HH11	1:C:418:ARG:HG3	1.76	0.50
1:B:92:ARG:HH11	1:B:92:ARG:CG	2.23	0.50
1:C:307:SER:HB3	1:C:308:PRO:HD2	1.94	0.50
1:D:274:TYR:HB3	1:D:423:LEU:HB3	1.92	0.50
1:D:64:ASP:HA	1:D:67:ARG:NH2	2.26	0.49
1:D:289:ARG:NE	3:D:703:HOH:O	2.21	0.49
1:C:119:GLU:CB	1:C:120:LEU:HD13	2.33	0.49
1:C:119:GLU:CB	1:C:120:LEU:CD1	2.89	0.49
1:B:220:GLU:OE1	1:B:222:ARG:HD3	2.12	0.48
1:B:480:VAL:HG21	1:C:473:THR:HA	1.95	0.48
1:C:81:ALA:HA	1:C:252:ILE:O	2.14	0.48
1:D:1:MET:SD	1:D:21:GLU:HG2	2.53	0.48
1:D:12:ILE:O	1:D:12:ILE:HG22	2.13	0.48
1:A:403:LEU:HD23	1:A:437:LEU:HD22	1.96	0.48
1:A:109:SER:O	1:A:113:THR:HG23	2.13	0.47
1:B:109:SER:O	1:B:113:THR:HG23	2.14	0.47
1:A:501:LYS:HE2	1:A:504:LYS:CE	2.45	0.47
1:A:469:GLU:OE1	1:A:469:GLU:N	2.47	0.47
1:D:14:THR:O	1:D:30:GLN:HA	2.15	0.47
1:A:66:ARG:HH22	1:A:243:ARG:HG3	1.79	0.47
1:A:424:THR:HB	1:A:443:ARG:HD3	1.95	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:274:TYR:HB3	1:B:423:LEU:HB3	1.95	0.47
1:D:52:ARG:CG	3:D:713:HOH:O	2.61	0.47
1:C:172:TRP:CH2	1:C:176:LYS:HD3	2.50	0.46
1:C:262:ASN:ND2	1:C:420:ASP:OD2	2.42	0.46
1:B:172:TRP:CH2	1:B:176:LYS:HD3	2.51	0.46
1:B:177:LEU:HD13	1:B:248:ILE:CD1	2.45	0.46
1:D:416:PHE:C	1:D:416:PHE:CD1	2.87	0.46
1:C:430:MET:HB3	1:C:484:ILE:HD13	1.97	0.46
1:D:288:ILE:HG12	1:D:311:TYR:CE2	2.51	0.45
1:C:347:VAL:O	1:C:348:SER:HB3	2.15	0.45
1:C:493:GLN:HB2	3:C:719:HOH:O	2.16	0.45
1:A:172:TRP:CH2	1:A:176:LYS:HD3	2.51	0.45
1:D:416:PHE:CD1	1:D:416:PHE:N	2.84	0.45
1:B:413:LYS:O	1:B:415:GLN:NE2	2.49	0.45
1:A:52:ARG:NH2	3:A:712:HOH:O	2.49	0.45
1:C:231:VAL:HG11	1:C:242:LEU:HD12	1.99	0.45
1:A:273:THR:O	1:A:278:CYS:HA	2.17	0.45
1:D:109:SER:O	1:D:113:THR:HG23	2.17	0.44
1:D:81:ALA:HA	1:D:252:ILE:O	2.18	0.44
1:A:403:LEU:HD23	1:A:437:LEU:CD2	2.48	0.44
1:A:431:LYS:HE2	1:A:487:ALA:HB3	1.99	0.44
1:B:187:VAL:HG13	1:B:222:ARG:O	2.16	0.44
1:A:187:VAL:HG12	1:A:221:ILE:CG2	2.47	0.44
1:D:152:VAL:CG1	1:D:154:LYS:HG3	2.46	0.44
1:B:273:THR:O	1:B:278:CYS:HA	2.18	0.44
1:B:485:ARG:HG2	1:B:485:ARG:HH11	1.83	0.44
1:A:84:ARG:CD	1:A:253:ALA:HB1	2.48	0.43
1:C:181:LYS:HA	1:C:181:LYS:HD3	1.65	0.43
1:C:452:LEU:O	1:C:456:LEU:HG	2.17	0.43
1:D:416:PHE:CE1	1:D:418:ARG:NH1	2.86	0.43
1:C:493:GLN:CB	3:C:719:HOH:O	2.66	0.43
1:B:81:ALA:HA	1:B:252:ILE:O	2.18	0.43
1:D:29:HIS:O	1:D:30:GLN:CB	2.56	0.43
1:B:68:ARG:HD2	3:B:701:HOH:O	2.17	0.43
1:C:400:VAL:HG22	1:C:437:LEU:HD23	2.00	0.43
1:B:226:GLU:O	1:B:249:MET:HA	2.19	0.43
1:B:366:SER:O	1:B:367:TRP:C	2.56	0.43
1:A:511:LYS:HB3	1:A:511:LYS:HE2	1.70	0.43
1:D:146:ARG:HA	1:D:146:ARG:HD2	1.76	0.43
1:C:226:GLU:O	1:C:249:MET:HA	2.19	0.43
1:D:177:LEU:HD13	1:D:248:ILE:CD1	2.49	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:81:ALA:HA	1:A:252:ILE:O	2.18	0.43
1:C:84:ARG:CD	1:C:253:ALA:HB1	2.49	0.43
1:C:305:ASN:ND2	1:C:305:ASN:N	2.66	0.43
1:A:466:LYS:HD3	1:A:466:LYS:HA	1.75	0.42
1:D:287:ARG:HG2	1:D:289:ARG:NH1	2.32	0.42
1:B:17:ILE:HG23	1:B:25:LEU:HG	2.01	0.42
1:B:475:SER:O	1:B:476:GLN:C	2.56	0.42
1:A:226:GLU:O	1:A:249:MET:HA	2.19	0.42
1:B:479:ASN:HB2	3:B:847:HOH:O	2.19	0.42
1:C:271:LYS:HD2	1:C:271:LYS:C	2.40	0.42
1:B:55:VAL:HG11	1:B:236:GLY:HA3	2.01	0.42
1:B:477:GLN:NE2	1:C:472:LYS:HZ2	2.17	0.42
1:D:198:ILE:HA	1:D:198:ILE:HD12	1.87	0.42
1:A:501:LYS:HE3	1:A:504:LYS:NZ	2.35	0.42
1:B:2:LYS:HD3	1:B:76:GLU:HG3	2.01	0.42
1:C:287:ARG:HG2	3:C:761:HOH:O	2.19	0.42
1:B:84:ARG:CD	1:B:253:ALA:HB1	2.50	0.41
1:B:187:VAL:HG12	1:B:221:ILE:CG2	2.50	0.41
1:A:501:LYS:CE	1:A:504:LYS:NZ	2.83	0.41
1:A:436:LEU:HA	1:A:493:GLN:OE1	2.20	0.41
1:B:287:ARG:NH1	1:B:287:ARG:HG2	2.36	0.41
1:D:372:ARG:HA	1:D:372:ARG:HD3	1.88	0.41
1:A:187:VAL:HG13	1:A:222:ARG:O	2.21	0.41
1:D:193:THR:O	1:D:194:PHE:CB	2.68	0.41
1:D:260:LEU:HD11	1:D:301:TYR:CD2	2.56	0.41
1:D:273:THR:O	1:D:278:CYS:HA	2.21	0.41
1:D:416:PHE:HD1	1:D:416:PHE:O	2.03	0.41
1:A:271:LYS:HD2	1:A:271:LYS:C	2.40	0.41
1:D:505:GLN:HE21	1:D:508:LYS:HE2	1.86	0.41
1:C:119:GLU:C	1:C:120:LEU:HD12	2.41	0.41
1:A:58:ILE:HG21	1:A:238:LEU:HD11	2.03	0.41
1:A:393:LEU:HD13	1:A:432:MET:SD	2.61	0.41
1:C:120:LEU:CD1	1:C:120:LEU:N	2.84	0.40
1:D:96:GLU:HA	1:D:96:GLU:OE1	2.22	0.40
1:D:240:THR:O	1:D:243:ARG:HG2	2.21	0.40
1:C:418:ARG:HG3	1:C:418:ARG:NH1	2.37	0.40

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	509/523 (97%)	492 (97%)	16 (3%)	1 (0%)	47	39
1	B	508/523 (97%)	489 (96%)	18 (4%)	1 (0%)	47	39
1	C	509/523 (97%)	489 (96%)	19 (4%)	1 (0%)	47	39
1	D	508/523 (97%)	487 (96%)	19 (4%)	2 (0%)	34	25
All	All	2034/2092 (97%)	1957 (96%)	72 (4%)	5 (0%)	47	39

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	511	LYS
1	B	490	LYS
1	D	30	GLN
1	C	348	SER
1	D	365	PRO

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	424/432 (98%)	406 (96%)	18 (4%)	30	23
1	B	423/432 (98%)	405 (96%)	18 (4%)	29	22
1	C	424/432 (98%)	399 (94%)	25 (6%)	19	11
1	D	423/432 (98%)	392 (93%)	31 (7%)	14	6
All	All	1694/1728 (98%)	1602 (95%)	92 (5%)	22	14

All (92) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	9	GLN
1	A	15	ARG
1	A	30	GLN
1	A	32	PRO
1	A	198	ILE
1	A	211	LEU
1	A	271	LYS
1	A	305	ASN
1	A	360	SER
1	A	381	LYS
1	A	393	LEU
1	A	423	LEU
1	A	489	SER
1	A	490	LYS
1	A	496	LEU
1	A	501	LYS
1	A	511	LYS
1	A	512	LEU
1	B	9	GLN
1	B	15	ARG
1	B	118	LYS
1	B	182	VAL
1	B	211	LEU
1	B	219	PRO
1	B	271	LYS
1	B	337	VAL
1	B	351	GLN
1	B	393	LEU
1	B	413	LYS
1	B	472	LYS
1	B	482	ARG
1	B	490	LYS
1	B	491	ASP
1	B	493	GLN
1	B	494	GLN
1	B	511	LYS
1	C	9	GLN
1	C	15	ARG
1	C	30	GLN
1	C	31	MET
1	C	111	GLU
1	C	120	LEU

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Mol	Chain	Res	Type
1	C	146	ARG
1	C	199	ARG
1	C	202	LYS
1	C	211	LEU
1	C	215	MET
1	C	271	LYS
1	C	287	ARG
1	C	336	ASP
1	C	337	VAL
1	C	348	SER
1	C	360	SER
1	C	393	LEU
1	C	413	LYS
1	C	431	LYS
1	C	475	SER
1	C	491	ASP
1	C	493	GLN
1	C	505	GLN
1	C	512	LEU
1	D	9	GLN
1	D	15	ARG
1	D	30	GLN
1	D	31	MET
1	D	34	ARG
1	D	66	ARG
1	D	130	LYS
1	D	154	LYS
1	D	157	GLU
1	D	199	ARG
1	D	215	MET
1	D	234	ASP
1	D	243	ARG
1	D	271	LYS
1	D	305	ASN
1	D	306	LYS
1	D	336	ASP
1	D	342	LYS
1	D	365	PRO
1	D	379	THR
1	D	393	LEU
1	D	413	LYS
1	D	416	PHE

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Mol	Chain	Res	Type
1	D	425	LYS
1	D	466	LYS
1	D	475	SER
1	D	476	GLN
1	D	479	ASN
1	D	490	LYS
1	D	495	MET
1	D	511	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (19) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	23	GLN
1	A	115	ASN
1	A	244	HIS
1	A	505	GLN
1	B	23	GLN
1	B	115	ASN
1	B	476	GLN
1	B	477	GLN
1	C	23	GLN
1	C	30	GLN
1	C	305	ASN
1	C	330	ASN
1	C	386	HIS
1	C	477	GLN
1	C	494	GLN
1	D	23	GLN
1	D	442	HIS
1	D	479	ASN
1	D	505	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](#)

4 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	CSD	B	24	1	3,6,8	1.07	0	0,6,10	-	-
1	CSD	A	24	1	3,6,8	0.79	0	0,6,10	-	-
1	CSD	C	24	1	3,6,8	0.60	0	0,6,10	-	-
1	CSD	D	24	1	3,6,8	0.72	0	0,6,10	-	-

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	CSD	B	24	1	-	0/1/5/8	-
1	CSD	A	24	1	-	0/1/5/8	-
1	CSD	C	24	1	-	0/1/5/8	-
1	CSD	D	24	1	-	0/1/5/8	-

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.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	D	24	CSD	1	0

5.5 Carbohydrates

There are no monosaccharides 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	GOL	C	601	-	5,5,5	0.52	0	5,5,5	1.56	1 (20%)
2	GOL	D	601	-	5,5,5	0.39	0	5,5,5	0.70	0
2	GOL	B	601	-	5,5,5	0.38	0	5,5,5	1.56	1 (20%)
2	GOL	A	601	-	5,5,5	0.30	0	5,5,5	0.73	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	601	-	-	4/4/4/4	-
2	GOL	D	601	-	-	2/4/4/4	-
2	GOL	B	601	-	-	4/4/4/4	-
2	GOL	A	601	-	-	1/4/4/4	-

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	601	GOL	O2-C2-C1	2.53	120.25	109.12
2	C	601	GOL	O1-C1-C2	2.46	121.98	110.20

There are no chirality outliers.

All (11) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	B	601	GOL	O1-C1-C2-C3
2	B	601	GOL	C1-C2-C3-O3

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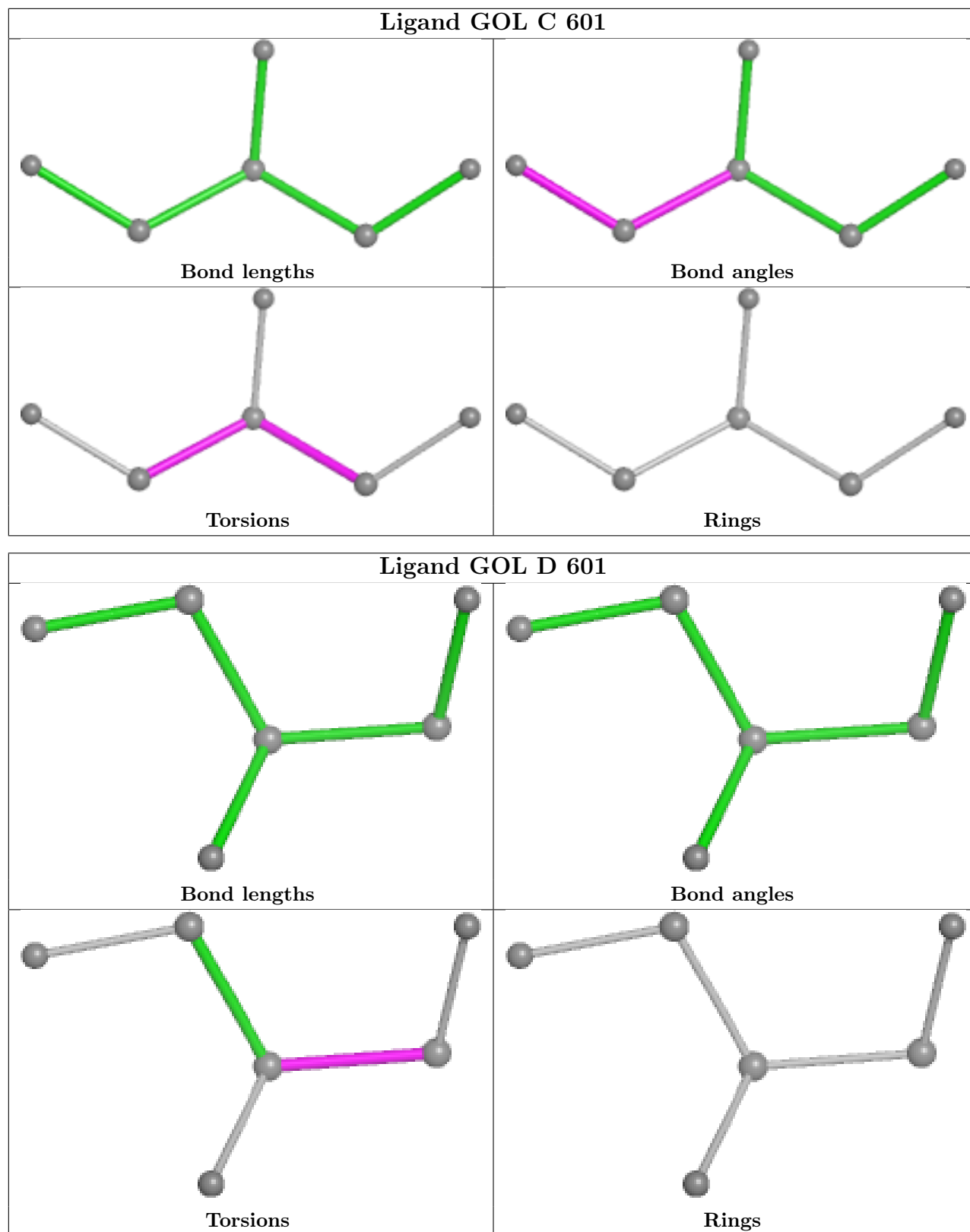
Mol	Chain	Res	Type	Atoms
2	C	601	GOL	C1-C2-C3-O3
2	D	601	GOL	O1-C1-C2-O2
2	D	601	GOL	O1-C1-C2-C3
2	B	601	GOL	O1-C1-C2-O2
2	B	601	GOL	O2-C2-C3-O3
2	C	601	GOL	O1-C1-C2-O2
2	C	601	GOL	O2-C2-C3-O3
2	A	601	GOL	C1-C2-C3-O3
2	C	601	GOL	O1-C1-C2-C3

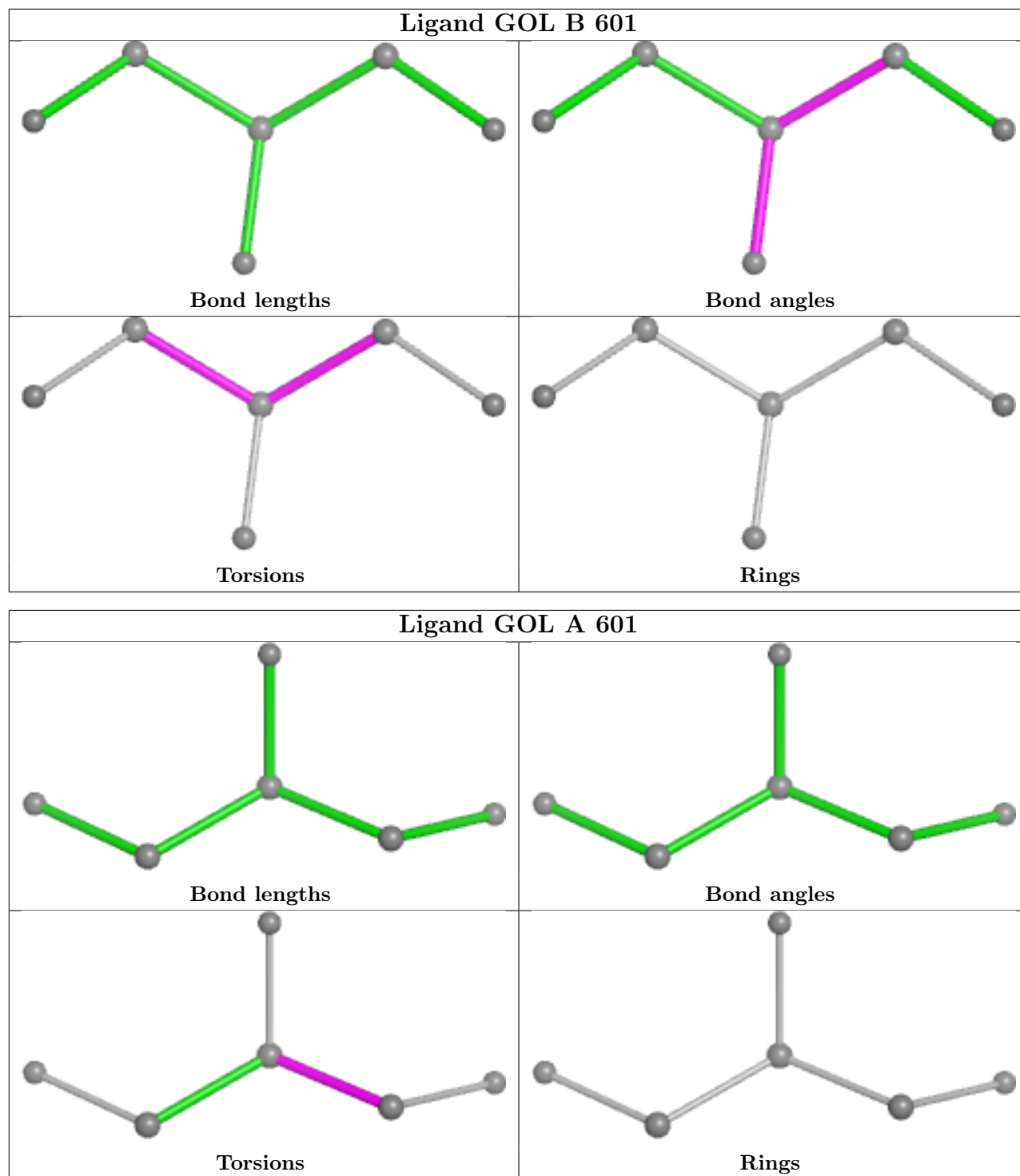
There are no ring outliers.

2 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	601	GOL	1	0
2	D	601	GOL	2	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.





5.7 Other polymers [\(i\)](#)

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, 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	511/523 (97%)	-0.36	7 (1%) 75 76	26, 41, 62, 123	0
1	B	510/523 (97%)	-0.40	1 (0%) 95 95	26, 37, 58, 92	0
1	C	511/523 (97%)	-0.35	9 (1%) 68 70	29, 41, 67, 105	0
1	D	510/523 (97%)	-0.13	20 (3%) 39 41	34, 52, 81, 114	0
All	All	2042/2092 (97%)	-0.31	37 (1%) 68 70	26, 43, 71, 123	0

All (37) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	488	ALA	8.7
1	D	489	SER	7.8
1	D	488	ALA	6.4
1	A	512	LEU	5.2
1	D	487	ALA	5.0
1	A	492	SER	4.2
1	C	488	ALA	4.1
1	C	491	ASP	4.1
1	D	492	SER	3.9
1	A	491	ASP	3.8
1	C	490	LYS	3.6
1	D	490	LYS	3.4
1	C	160	LYS	3.2
1	D	93	VAL	3.1
1	A	487	ALA	3.0
1	D	162	GLY	3.0
1	D	98	LEU	2.8
1	D	70	PRO	2.7
1	C	492	SER	2.7
1	A	489	SER	2.6
1	D	493	GLN	2.5

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Mol	Chain	Res	Type	RSRZ
1	D	491	ASP	2.5
1	D	160	LYS	2.4
1	D	161	ARG	2.4
1	D	158	ALA	2.4
1	C	94	THR	2.3
1	C	487	ALA	2.3
1	D	90	TRP	2.3
1	D	94	THR	2.2
1	C	512	LEU	2.1
1	C	96	GLU	2.1
1	D	71	SER	2.1
1	A	157	GLU	2.1
1	B	511	LYS	2.1
1	D	38	PRO	2.0
1	D	511	LYS	2.0
1	D	92	ARG	2.0

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

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. 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	CSD	C	24	7/9	0.91	0.09	36,38,50,62	0
1	CSD	B	24	7/9	0.95	0.07	29,36,43,53	0
1	CSD	A	24	7/9	0.96	0.07	36,41,43,46	0
1	CSD	D	24	7/9	0.96	0.05	44,53,60,61	0

6.3 Carbohydrates [i](#)

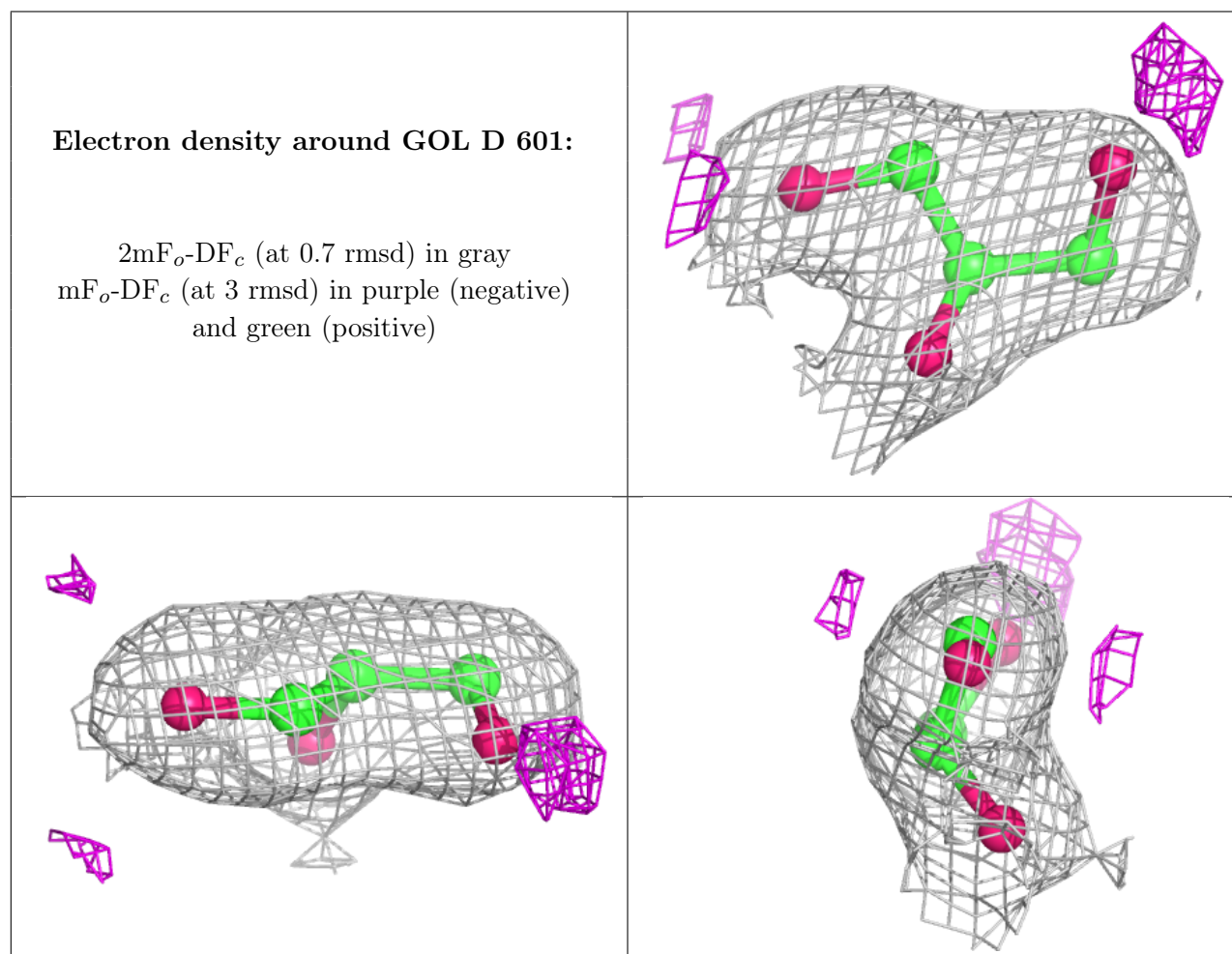
There are no monosaccharides in this entry.

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.

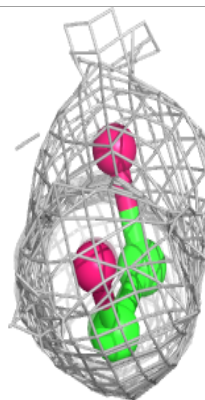
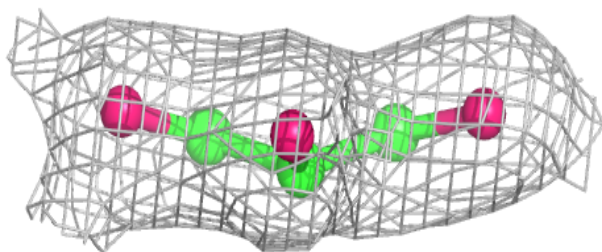
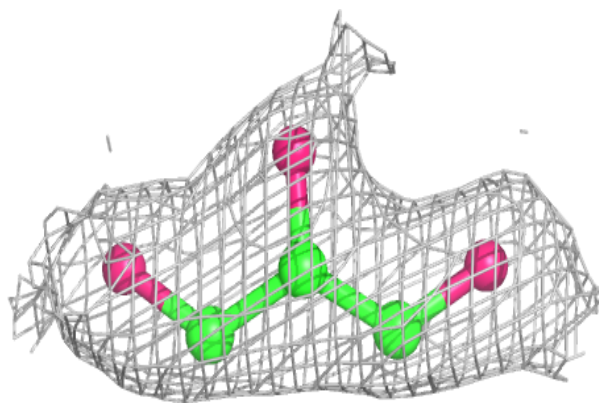
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
2	GOL	D	601	6/6	0.90	0.14	35,39,41,43	0
2	GOL	C	601	6/6	0.97	0.15	27,35,37,39	0
2	GOL	A	601	6/6	0.98	0.13	26,27,28,29	0
2	GOL	B	601	6/6	0.98	0.12	25,30,33,36	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

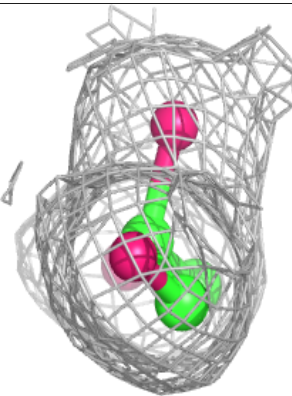
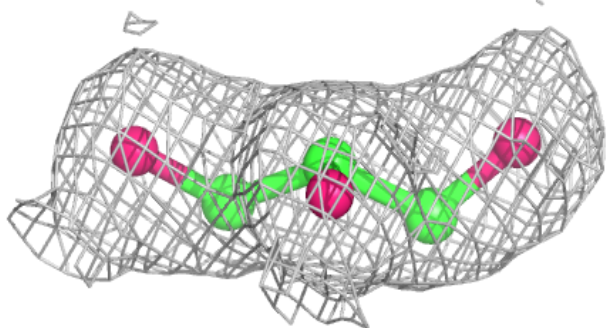
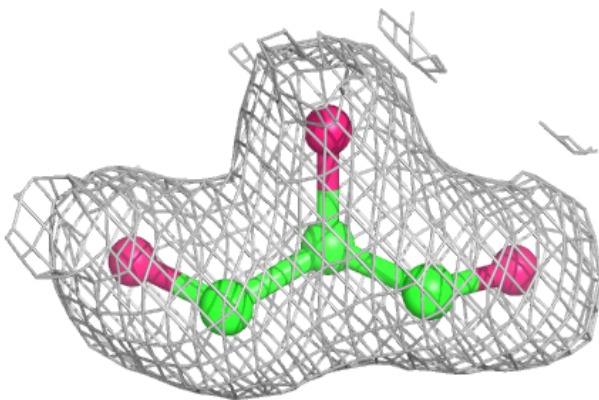


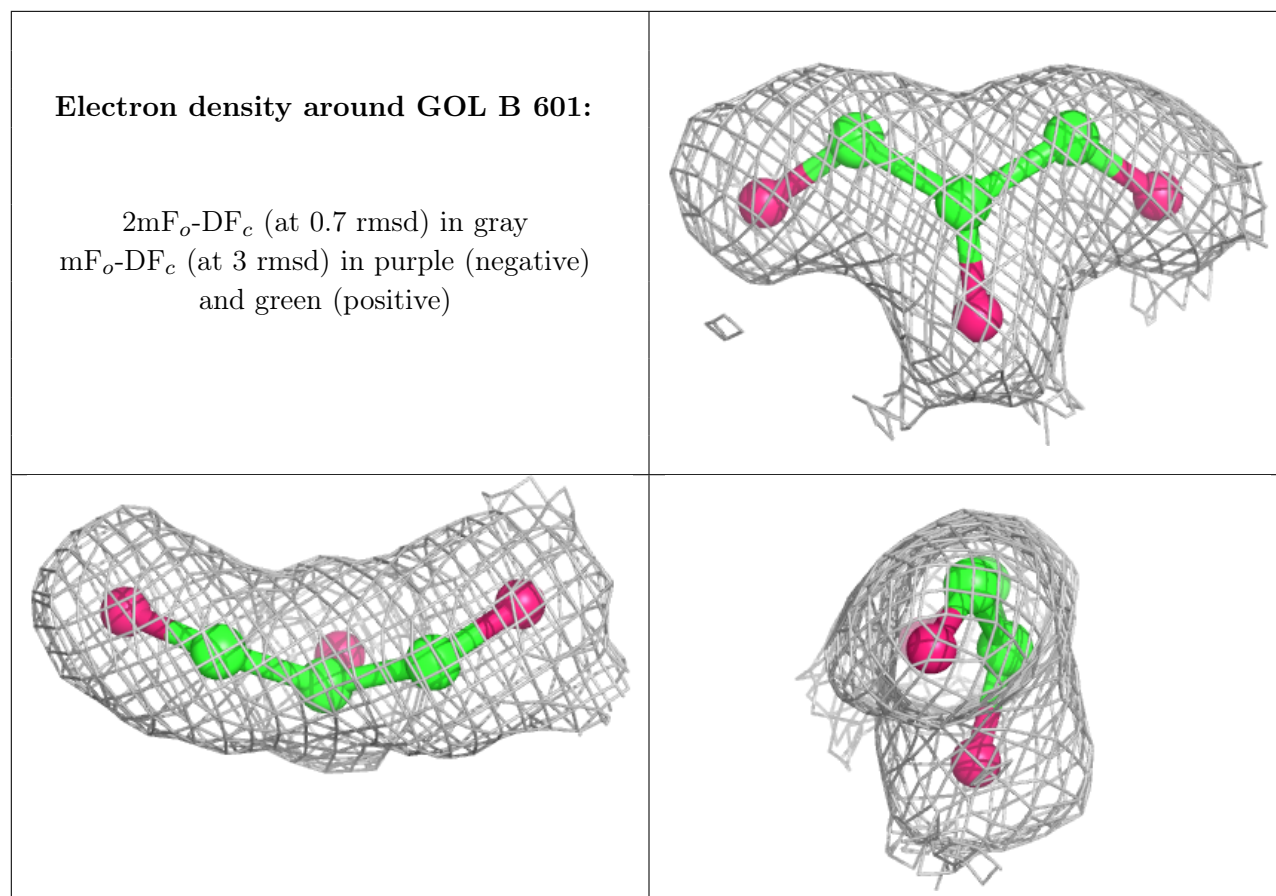
Electron density around GOL C 601:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

**Electron density around GOL A 601:**

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)





6.5 Other polymers [i](#)

There are no such residues in this entry.