Full wwPDB X-ray Structure Validation Report (i)

Oct 9, 2023 – 05:10 AM EDT

PDB ID	:	6XJS
Title	:	Crystal Structure of KPT-330 bound to CRM1 (E582K, 537-DLTVK-541 to GLCEQ)
Authors	:	Baumhardt, J.M.; Chook, Y.M.
Deposited on	:	2020-06-24
Resolution	:	1.94 Å(reported)

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	:	2.35.1
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)	:	2.35.1
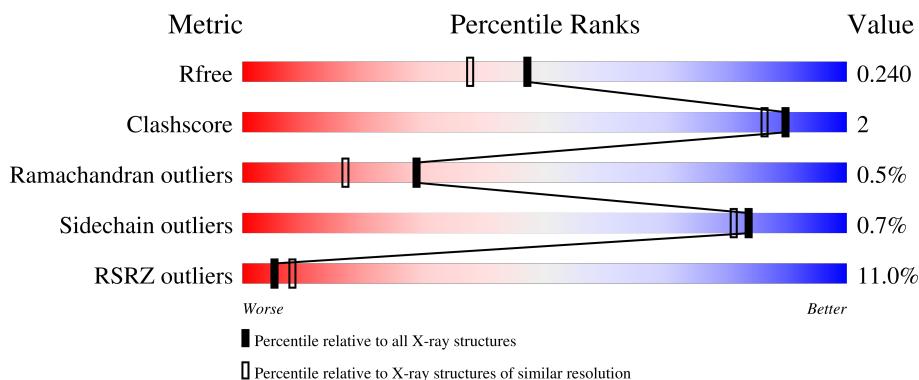
1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION
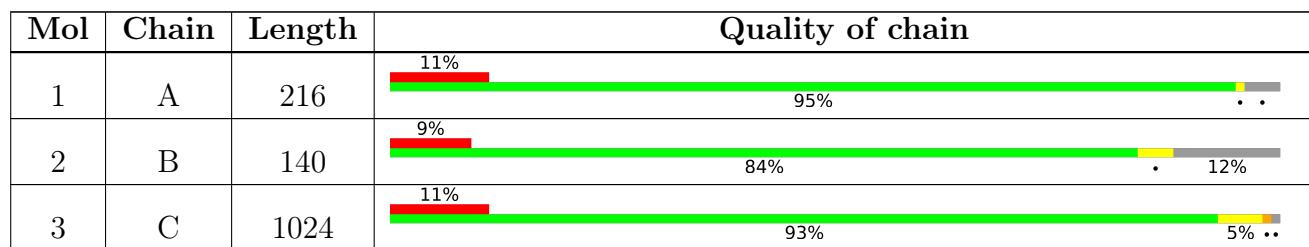
The reported resolution of this entry is 1.94 Å.

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	Percentile Ranks	Value
Rfree		0.240
Clashscore		2
Ramachandran outliers		0.5%
Sidechain outliers		0.7%
RSRZ outliers		11.0%

Worse ... *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	4310 (1.96-1.92)
Clashscore	141614	1023 (1.94-1.94)
Ramachandran outliers	138981	1007 (1.94-1.94)
Sidechain outliers	138945	1007 (1.94-1.94)
RSRZ outliers	127900	4250 (1.96-1.92)

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	216	11% / 95% · ·
2	B	140	9% / 84% · 12%
3	C	1024	11% / 93% 5% ··

2 Entry composition (i)

There are 8 unique types of molecules in this entry. The entry contains 22807 atoms, of which 11190 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 GTP-binding nuclear protein Ran.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	208	Total 3391	C 1093	H 1697	N 291	O 304	S 6	0	5	0

- Molecule 2 is a protein called Ran-specific GTPase-activating protein 1.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
2	B	123	Total 2060	C 652	H 1031	N 181	O 191	S 5	0	3	0

- Molecule 3 is a protein called Exportin-1.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
3	C	1011	Total 16744	C 5337	H 8434	N 1368	O 1560	S 45	0	42	0

There are 46 discrepancies between the modelled and reference sequences:
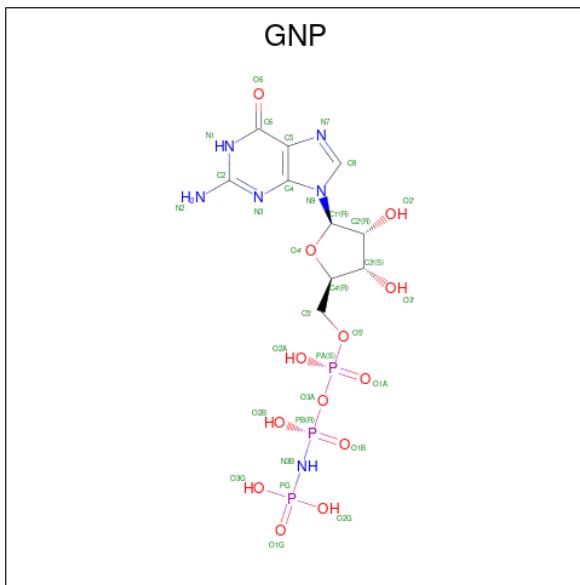
Chain	Residue	Modelled	Actual	Comment	Reference
C	-2	GLY	-	expression tag	UNP P30822
C	-1	GLY	-	expression tag	UNP P30822
C	0	SER	-	expression tag	UNP P30822
C	?	-	VAL	deletion	UNP P30822
C	?	-	GLN	deletion	UNP P30822
C	?	-	ARG	deletion	UNP P30822
C	?	-	LEU	deletion	UNP P30822
C	?	-	PRO	deletion	UNP P30822
C	?	-	ALA	deletion	UNP P30822
C	?	-	THR	deletion	UNP P30822
C	?	-	GLU	deletion	UNP P30822
C	?	-	MET	deletion	UNP P30822
C	?	-	SER	deletion	UNP P30822
C	?	-	PRO	deletion	UNP P30822

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Chain	Residue	Modelled	Actual	Comment	Reference
C	?	-	LEU	deletion	UNP P30822
C	?	-	ILE	deletion	UNP P30822
C	?	-	GLN	deletion	UNP P30822
C	?	-	LEU	deletion	UNP P30822
C	?	-	SER	deletion	UNP P30822
C	?	-	VAL	deletion	UNP P30822
C	?	-	GLY	deletion	UNP P30822
C	?	-	SER	deletion	UNP P30822
C	?	-	GLN	deletion	UNP P30822
C	?	-	ALA	deletion	UNP P30822
C	?	-	ILE	deletion	UNP P30822
C	?	-	SER	deletion	UNP P30822
C	?	-	THR	deletion	UNP P30822
C	?	-	GLY	deletion	UNP P30822
C	?	-	SER	deletion	UNP P30822
C	?	-	GLY	deletion	UNP P30822
C	?	-	ALA	deletion	UNP P30822
C	?	-	LEU	deletion	UNP P30822
C	?	-	ASN	deletion	UNP P30822
C	?	-	PRO	deletion	UNP P30822
C	?	-	GLU	deletion	UNP P30822
C	?	-	TYR	deletion	UNP P30822
C	?	-	MET	deletion	UNP P30822
C	?	-	LYS	deletion	UNP P30822
C	?	-	ARG	deletion	UNP P30822
C	?	-	PHE	deletion	UNP P30822
C	537	GLY	ASP	engineered mutation	UNP P30822
C	539	CYS	THR	engineered mutation	UNP P30822
C	540	GLU	VAL	engineered mutation	UNP P30822
C	541	GLN	LYS	engineered mutation	UNP P30822
C	582	LYS	GLU	engineered mutation	UNP P30822
C	1022	CYS	TYR	conflict	UNP P30822

- Molecule 4 is PHOSPHOAMINOPHOSPHONIC ACID-GUANYLATE ESTER (three-letter code: GNP) (formula: $C_{10}H_{17}N_6O_{13}P_3$).
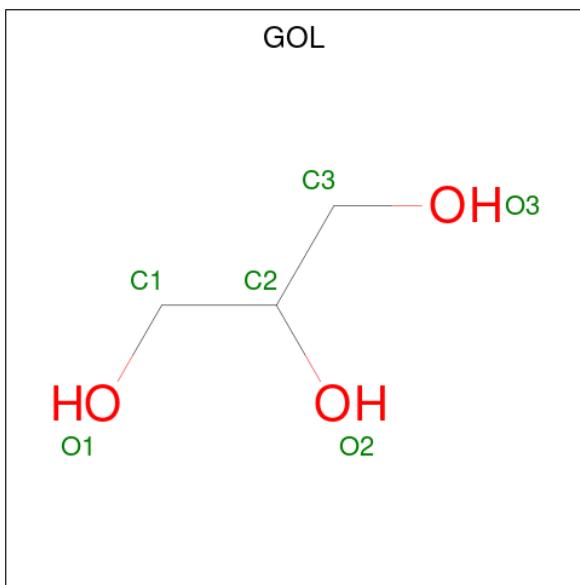
Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
			Total	C	H	N	O	P		
4	A	1	44	10	12	6	13	3	0	0

- Molecule 5 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	Mg		
5	A	1	1	1	0	0
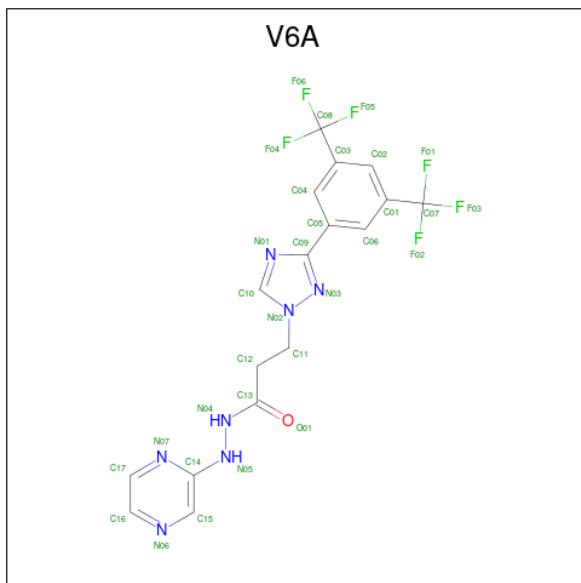
- Molecule 6 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
6	C	1	Total 14	C 3	H 8	O 3	14	0
6	C	1	Total 14	C 3	H 8	O 3	0	0

- Molecule 7 is selinexor, bound form (three-letter code: V6A) (formula: $C_{17}H_{13}F_6N_7O$) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
7	C	1	Total 31	C 17	F 6	N 7	O 1	0	0
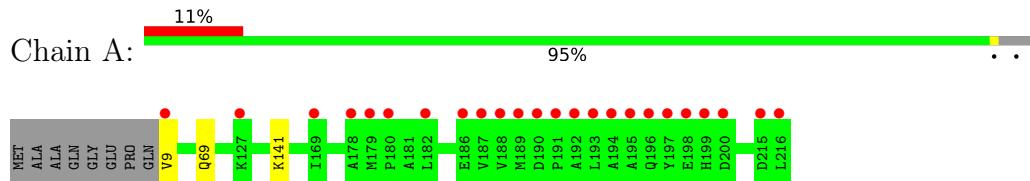
- Molecule 8 is water.

| Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	A	91	Total 91	O 91	0	0
8	B	27	Total 27	O 27	0	0
8	C	390	Total 390	O 390	0	0
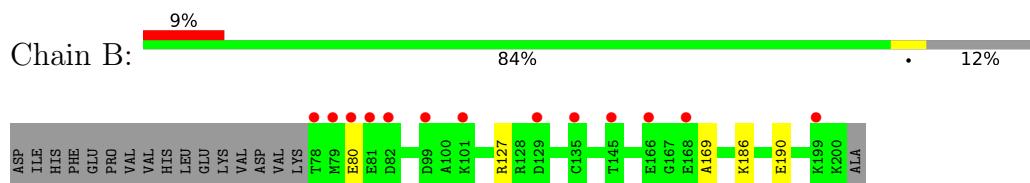
3 Residue-property plots ⓘ

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.
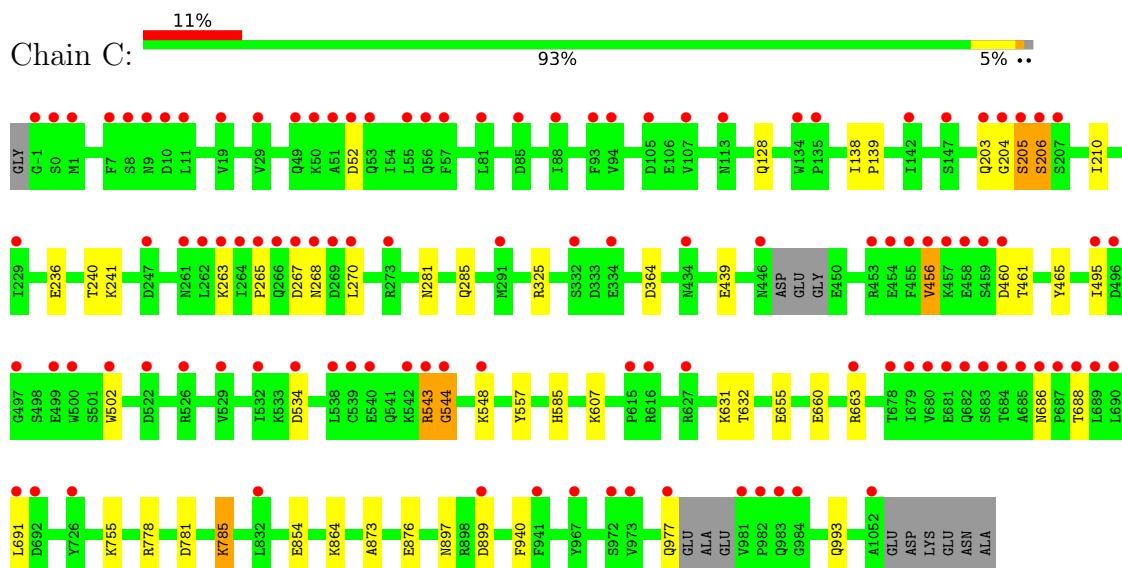
- Molecule 1: GTP-binding nuclear protein Ran

Chain A:

- Molecule 2: Ran-specific GTPase-activating protein 1

Chain B:

- Molecule 3: Exportin-1

Chain C:

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 43 21 2	Depositor
Cell constants a, b, c, α, β, γ	106.04Å 106.04Å 305.62Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	38.20 – 1.94 38.20 – 1.94	Depositor EDS
% Data completeness (in resolution range)	67.7 (38.20-1.94) 92.6 (38.20-1.94)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.69 (at 1.94Å)	Xtriage
Refinement program	PHENIX 1.11.1_2575	Depositor
R, R_{free}	0.202 , 0.240 0.211 , 0.240	Depositor DCC
R_{free} test set	2000 reflections (1.67%)	wwPDB-VP
Wilson B-factor (Å^2)	20.1	Xtriage
Anisotropy	0.019	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.38 , 62.0	EDS
L-test for twinning[2]	$< |L| > = 0.48, < L^2 > = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	22807	wwPDB-VP
Average B, all atoms (Å^2)	52.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.92% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1]Intensities estimated from amplitudes.

[2]Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: MG, GOL, V6A, GNP

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	0.26	0/1754	0.46	0/2379
2	B	0.25	0/1059	0.43	0/1413
3	C	0.26	0/8608	0.42	0/11658
All	All	0.26	0/11421	0.43	0/15450

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
3	C	0	1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
3	C	203	GLN	Peptide

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	1694	1697	1676	2	0
2	B	1029	1031	1021	2	0
3	C	8310	8434	8265	34	1
4	A	32	12	12	0	0
5	A	1	0	0	0	0
6	C	12	16	16	3	0
7	C	31	0	0	1	0
8	A	91	0	0	2	0
8	B	27	0	0	0	0
8	C	390	0	0	14	0
All	All	11617	11190	10990	39	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 2.

All (39) 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)
7:C:1103:V6A:N05	8:C:1201:HOH:O	1.69	1.25
3:C:977:GLN:O	8:C:1202:HOH:O	1.91	0.88
3:C:236:GLU:OE1	8:C:1203:HOH:O	1.94	0.85
3:C:778:ARG:NH2	8:C:1205:HOH:O	2.11	0.83
3:C:585:HIS:NE2	6:C:1102:GOL:O3	2.22	0.72
3:C:864:LYS:NZ	8:C:1206:HOH:O	2.19	0.66
3:C:607:LYS:NZ	8:C:1210:HOH:O	2.27	0.66
3:C:993:GLN:NE2	8:C:1204:HOH:O	2.10	0.65
3:C:897:ASN:ND2	8:C:1214:HOH:O	2.32	0.62
1:A:141:LYS:NZ	8:A:401:HOH:O	2.32	0.61
3:C:543:ARG:HA	3:C:548:LYS:HE2	1.86	0.58
1:A:9:VAL:N	8:A:402:HOH:O	2.37	0.56
2:B:80:GLU:OE1	2:B:127:ARG:NH2	2.35	0.55
3:C:204[B]:GLY:HA2	3:C:210:ILE:HD11	1.89	0.54
3:C:461:THR:HG22	8:C:1213:HOH:O	2.07	0.54
3:C:781:ASP:O	3:C:785:LYS:HE2	2.09	0.53
3:C:268:ASN:OD1	3:C:270:LEU:N	2.41	0.52
3:C:460:ASP:OD1	3:C:460:ASP:N	2.43	0.52
2:B:186:LYS:NZ	2:B:190:GLU:OE1	2.43	0.51
3:C:543:ARG:O	3:C:544:GLY:C	2.49	0.51
3:C:205[A]:SER:OG	3:C:206[A]:SER:N	2.44	0.51
3:C:465:TYR:OH	3:C:557:TYR:OH	2.22	0.49
3:C:899:ASP:HB3	8:C:1527:HOH:O	2.12	0.48
3:C:655:GLU:HG2	3:C:660:GLU:HG3	1.96	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:128:GLN:NE2	8:C:1217:HOH:O	2.35	0.46
3:C:632:THR:N	6:C:1102:GOL:O2	2.50	0.45
3:C:688:THR:O	3:C:691:LEU:HG	2.17	0.45
3:C:267:ASP:N	3:C:267:ASP:OD1	2.51	0.44
3:C:456:VAL:HA	8:C:1390:HOH:O	2.16	0.44
3:C:138:ILE:HB	3:C:139:PRO:HD3	2.00	0.43
3:C:364[B]:ASP:OD1	8:C:1207:HOH:O	2.22	0.42
3:C:873:ALA:O	3:C:876:GLU:HG3	2.19	0.41
3:C:240:THR:OG1	3:C:241:LYS:N	2.53	0.41
3:C:691:LEU:O	3:C:755:LYS:NZ	2.38	0.41
3:C:495:ILE:HD11	3:C:534:ASP:HB3	2.03	0.40
3:C:263:LYS:HD2	3:C:325:ARG:HD2	2.03	0.40
3:C:281:ASN:O	3:C:285:GLN:HG2	2.22	0.40
3:C:632:THR:HA	6:C:1102:GOL:O2	2.21	0.40
3:C:439:GLU:HG3	8:C:1331:HOH:O	2.21	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)
3:C:660:GLU:OE2	3:C:663:ARG:NH2[7_555]	2.19	0.01

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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	211/216 (98%)	206 (98%)	5 (2%)	0	100	100
2	B	124/140 (89%)	116 (94%)	7 (6%)	1 (1%)	19	9
3	C	1047/1024 (102%)	1016 (97%)	24 (2%)	7 (1%)	22	11
All	All	1382/1380 (100%)	1338 (97%)	36 (3%)	8 (1%)	29	13

All (8) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	C	205[A]	SER
3	C	205[B]	SER
3	C	206[A]	SER
3	C	206[B]	SER
2	B	169	ALA
3	C	544	GLY
3	C	265	PRO
3	C	686	ASN

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	185/185 (100%)	183 (99%)	2 (1%)	73	67
2	B	108/121 (89%)	108 (100%)	0	100	100
3	C	960/933 (103%)	952 (99%)	8 (1%)	81	78
All	All	1253/1239 (101%)	1243 (99%)	10 (1%)	84	78

All (10) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	69[A]	GLN
1	A	69[B]	GLN
3	C	52	ASP
3	C	456	VAL
3	C	502	TRP
3	C	543	ARG
3	C	631	LYS
3	C	785	LYS
3	C	854	GLU
3	C	940	PHE

Sometimes 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 monosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 5 ligands modelled in this entry, 1 is monoatomic - leaving 4 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	$\#|Z| > 2$
4	GNP	A	301	5	29,34,34	5.05	16 (55%)	33,54,54	1.78	8 (24%)
7	V6A	C	1103	3	32,33,33	2.56	9 (28%)	42,48,48	2.10	8 (19%)
6	GOL	C	1102	-	5,5,5	0.56	0	5,5,5	0.70	0
6	GOL	C	1101	-	5,5,5	0.42	0	5,5,5	0.43	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	GNP	A	301	5	-	7/14/38/38	0/3/3/3
7	V6A	C	1103	3	-	3/26/26/26	0/3/3/3
6	GOL	C	1102	-	-	2/4/4/4	-
6	GOL	C	1101	-	-	4/4/4/4	-

All (25) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	301	GNP	C2'-C1'	-14.78	1.31	1.53
4	A	301	GNP	O4'-C1'	14.75	1.61	1.41
4	A	301	GNP	C2-N2	10.34	1.54	1.33
7	C	1103	V6A	C13-N04	8.48	1.45	1.34
4	A	301	GNP	PB-O3A	6.99	1.67	1.59
7	C	1103	V6A	C10-N02	-6.63	1.27	1.33
4	A	301	GNP	PB-O1B	5.56	1.55	1.46
4	A	301	GNP	O4'-C4'	-5.37	1.33	1.45
7	C	1103	V6A	C14-N05	5.17	1.47	1.38
4	A	301	GNP	O2'-C2'	4.14	1.52	1.43
4	A	301	GNP	PG-O1G	3.92	1.52	1.46
7	C	1103	V6A	C09-N01	-3.54	1.30	1.35
4	A	301	GNP	O3'-C3'	-3.07	1.35	1.43
7	C	1103	V6A	C09-N03	-3.03	1.27	1.34
4	A	301	GNP	C5-C4	-2.81	1.33	1.40
4	A	301	GNP	PB-N3B	2.65	1.70	1.63
7	C	1103	V6A	O01-C13	-2.59	1.18	1.23
4	A	301	GNP	PA-O5'	2.41	1.69	1.59
4	A	301	GNP	PG-N3B	2.35	1.69	1.63
4	A	301	GNP	O6-C6	-2.31	1.18	1.24
4	A	301	GNP	C5-C6	-2.17	1.37	1.41
7	C	1103	V6A	C02-C03	-2.16	1.35	1.39
7	C	1103	V6A	C02-C01	-2.10	1.35	1.39
7	C	1103	V6A	C06-C01	-2.02	1.36	1.39
4	A	301	GNP	PB-O2B	-2.01	1.51	1.56

All (16) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	C	1103	V6A	N03-C09-N01	-9.30	107.01	114.72
4	A	301	GNP	N3-C2-N1	-5.01	120.54	127.22
7	C	1103	V6A	C15-C14-N07	-4.84	119.04	121.27
4	A	301	GNP	C2-N3-C4	3.91	119.83	115.36
4	A	301	GNP	C1'-N9-C4	-3.64	120.25	126.64
7	C	1103	V6A	N01-C10-N02	-3.61	107.05	112.21
4	A	301	GNP	PB-O3A-PA	-2.74	122.97	132.62
7	C	1103	V6A	C05-C09-N03	2.67	128.94	123.78
4	A	301	GNP	C5-C6-N1	-2.60	119.88	123.43
7	C	1103	V6A	C17-C16-N06	-2.47	118.87	121.95
4	A	301	GNP	C2-N1-C6	2.42	119.77	115.93
7	C	1103	V6A	O01-C13-N04	-2.36	119.95	122.81
4	A	301	GNP	N2-C2-N3	2.31	121.56	117.79

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
7	C	1103	V6A	F06-C08-F05	2.28	114.07	105.72
7	C	1103	V6A	F06-C08-C03	-2.14	108.22	112.93
4	A	301	GNP	C3'-C2'-C1'	2.06	104.08	100.98

There are no chirality outliers.

All (16) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	301	GNP	PG-N3B-PB-O1B
4	A	301	GNP	PG-N3B-PB-O3A
4	A	301	GNP	C5'-O5'-PA-O3A
6	C	1101	GOL	C1-C2-C3-O3
7	C	1103	V6A	N02-C11-C12-C13
7	C	1103	V6A	C12-C13-N04-N05
6	C	1101	GOL	O1-C1-C2-C3
6	C	1102	GOL	O1-C1-C2-C3
6	C	1101	GOL	O1-C1-C2-O2
7	C	1103	V6A	O01-C13-N04-N05
4	A	301	GNP	O4'-C4'-C5'-O5'
4	A	301	GNP	C3'-C4'-C5'-O5'
6	C	1101	GOL	O2-C2-C3-O3
4	A	301	GNP	C5'-O5'-PA-O1A
4	A	301	GNP	C5'-O5'-PA-O2A
6	C	1102	GOL	O1-C1-C2-O2
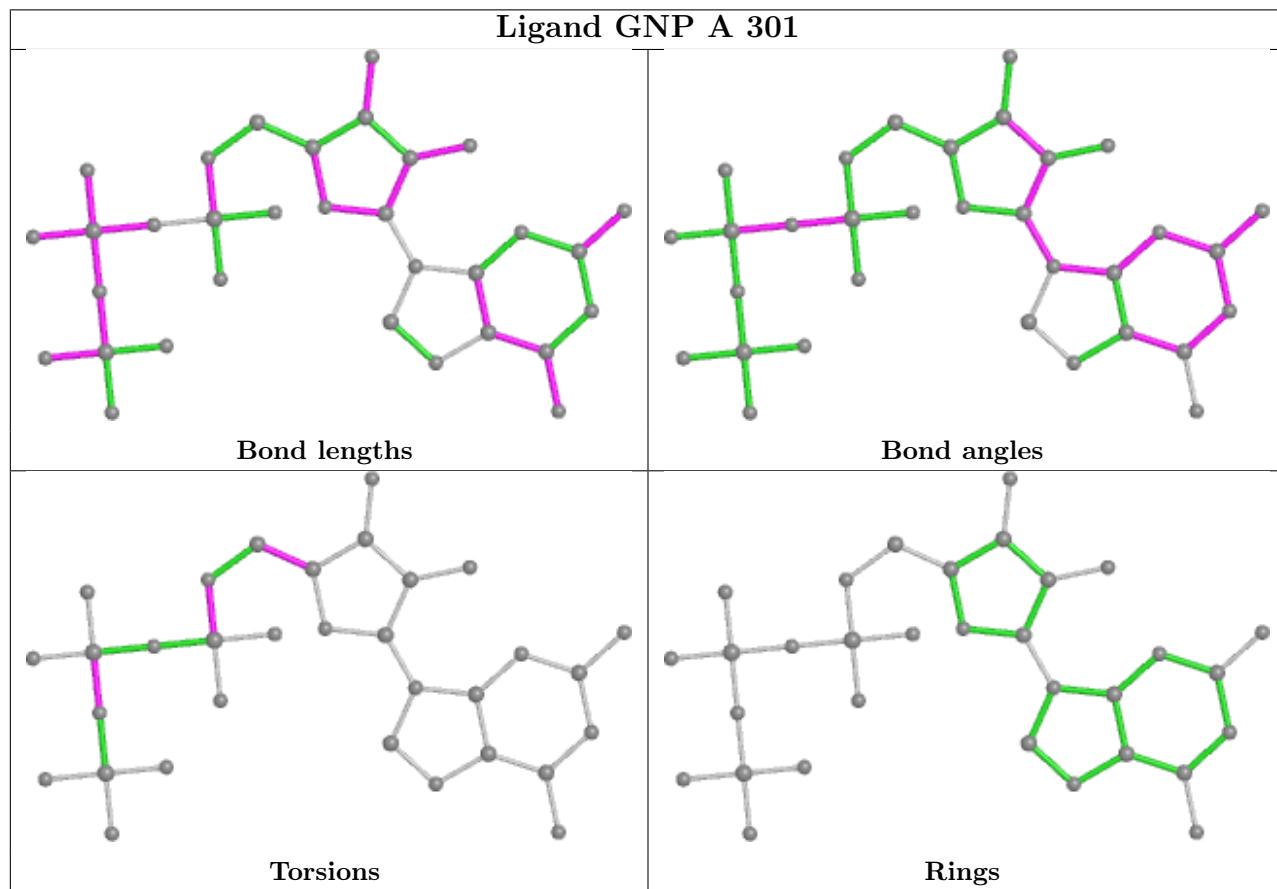
There are no ring outliers.
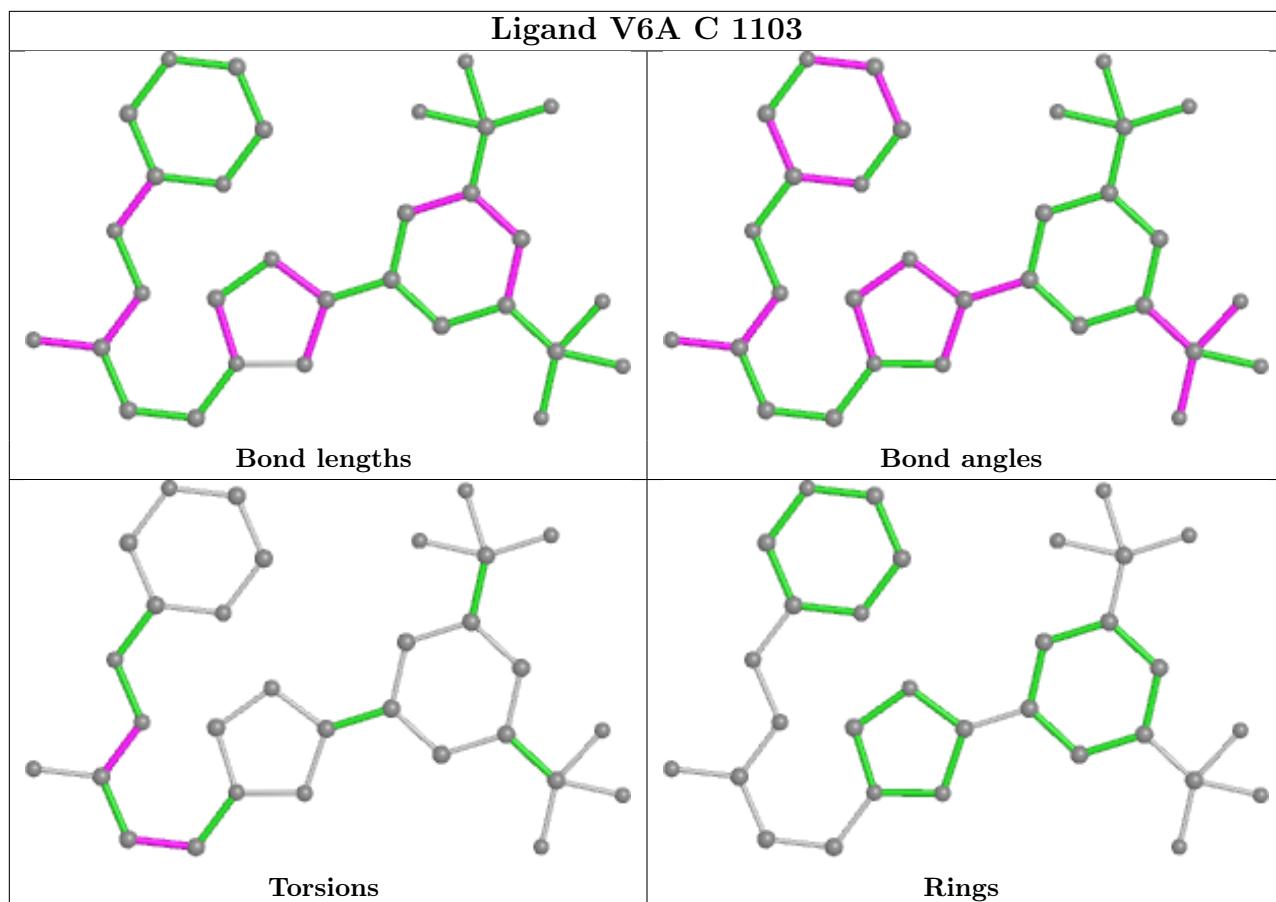
2 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	C	1103	V6A	1	0
6	C	1102	GOL	3	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 then 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.

Ligand GNP A 301

Bond lengths

Bond angles

Torsions

Rings

Ligand V6A C 1103

Bond lengths

Bond angles

Torsions

Rings

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 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(Å²)	Q<0.9
1	A	208/216 (96%)	0.91	24 (11%)	4	7	26, 37, 104, 159	0
2	B	123/140 (87%)	1.10	13 (10%)	6	9	38, 56, 94, 125	0
3	C	1011/1024 (98%)	0.90	111 (10%)	5	8	24, 41, 80, 131	0
All	All	1342/1380 (97%)	0.92	148 (11%)	5	8	24, 42, 84, 159	0

All (148) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	195	ALA	12.5
3	C	689	LEU	11.7
3	C	-1	GLY	11.6
2	B	79	MET	10.1
3	C	457	LYS	9.3
3	C	456	VAL	8.8
1	A	193	LEU	8.3
3	C	205[A]	SER	8.1
3	C	206[A]	SER	7.9
3	C	9	ASN	7.9
1	A	191	PRO	7.8
3	C	264	ILE	7.7
3	C	455	PHE	7.6
1	A	188	VAL	6.6
3	C	686	ASN	6.4
2	B	81	GLU	6.2
1	A	197	TYR	6.1
2	B	78	THR	6.1
3	C	460	ASP	5.4
3	C	691	LEU	5.4
3	C	683	SER	5.4
3	C	93	PHE	5.3
1	A	179	MET	5.3

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Mol	Chain	Res	Type	RSRZ
2	B	199	LYS	5.2
3	C	459	SER	5.2
3	C	544	GLY	5.0
3	C	684	THR	5.0
3	C	204[A]	GLY	4.9
3	C	983	GLN	4.8
1	A	194	ALA	4.8
3	C	262	LEU	4.8
3	C	685	ALA	4.6
3	C	616	ARG	4.5
3	C	270	LEU	4.4
3	C	690	LEU	4.4
3	C	679	ILE	4.4
3	C	266	GLN	4.4
3	C	687	PRO	4.4
3	C	977	GLN	4.3
3	C	502	TRP	4.2
1	A	180	PRO	4.1
3	C	203	GLN	4.0
3	C	497	GLY	4.0
3	C	10	ASP	4.0
1	A	189	MET	3.9
3	C	543	ARG	3.9
1	A	196	GLN	3.8
3	C	291[A]	MET	3.8
3	C	52	ASP	3.8
3	C	682	GLN	3.8
3	C	663	ARG	3.7
3	C	454	GLU	3.7
3	C	261	ASN	3.7
3	C	458	GLU	3.7
3	C	269	ASP	3.6
2	B	168	GLU	3.6
1	A	192	ALA	3.6
3	C	263	LYS	3.6
3	C	539	CYS	3.5
2	B	99	ASP	3.5
3	C	135	PRO	3.5
3	C	688	THR	3.5
3	C	1052	ALA	3.4
1	A	190	ASP	3.4
3	C	542	LYS	3.3

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Mol	Chain	Res	Type	RSRZ
3	C	615	PRO	3.3
3	C	972	SER	3.3
2	B	80	GLU	3.2
1	A	198	GLU	3.2
3	C	267	ASP	3.2
3	C	500	TRP	3.1
3	C	982	PRO	3.1
2	B	129	ASP	3.1
3	C	692	ASP	3.1
3	C	19	VAL	3.1
3	C	207[A]	SER	3.0
3	C	967	TYR	3.0
3	C	8	SER	3.0
1	A	187	VAL	3.0
3	C	268	ASN	3.0
3	C	332	SER	2.9
3	C	726	TYR	2.9
3	C	134	TRP	2.8
3	C	107	VAL	2.8
3	C	981	VAL	2.8
3	C	522	ASP	2.8
1	A	216	LEU	2.8
3	C	11	LEU	2.8
3	C	526	ARG	2.7
3	C	29	VAL	2.7
3	C	529	VAL	2.7
2	B	82	ASP	2.7
3	C	532	ILE	2.7
1	A	9	VAL	2.7
3	C	680	VAL	2.7
3	C	81	LEU	2.7
3	C	247	ASP	2.6
3	C	984	GLY	2.6
3	C	538	LEU	2.6
2	B	101	LYS	2.6
1	A	199	HIS	2.5
3	C	265	PRO	2.5
1	A	182	LEU	2.5
3	C	7	PHE	2.5
1	A	215	ASP	2.5
3	C	229	ILE	2.5
3	C	678	THR	2.5

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Mol	Chain	Res	Type	RSRZ
3	C	55	LEU	2.4
3	C	0	SER	2.4
3	C	49	GLN	2.4
3	C	56	GLN	2.4
3	C	832	LEU	2.4
3	C	85	ASP	2.4
3	C	534	ASP	2.4
3	C	51	ALA	2.3
3	C	434	ASN	2.3
3	C	495	ILE	2.3
3	C	94	VAL	2.3
3	C	334	GLU	2.3
3	C	499	GLU	2.3
3	C	681	GLU	2.3
2	B	145	THR	2.3
3	C	147[A]	SER	2.3
3	C	453	ARG	2.3
3	C	50	LYS	2.2
3	C	1	MET	2.2
1	A	178	ALA	2.2
3	C	142	ILE	2.2
2	B	166	GLU	2.2
1	A	127[A]	LYS	2.2
3	C	113[A]	ASN	2.2
1	A	186	GLU	2.2
3	C	57	PHE	2.2
3	C	899	ASP	2.2
3	C	53	GLN	2.2
3	C	105	ASP	2.1
3	C	496	ASP	2.1
3	C	273	ARG	2.1
3	C	88	ILE	2.1
3	C	446	ASN	2.1
3	C	941	PHE	2.1
3	C	973	VAL	2.1
1	A	200	ASP	2.1
3	C	548	LYS	2.1
3	C	540	GLU	2.0
3	C	627	ARG	2.0
1	A	169	ILE	2.0
2	B	135	CYS	2.0

6.2 Non-standard residues in protein, DNA, RNA chains ⓘ

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

6.3 Carbohydrates ⓘ

There are no monosaccharides in this entry.

6.4 Ligands ⓘ

LIGAND-RSR INFOmissingINFO

6.5 Other polymers ⓘ

There are no such residues in this entry.