



# Full wwPDB X-ray Structure Validation Report ⓘ

Feb 1, 2016 – 01:16 AM GMT

PDB ID : 2CFG  
Title : AGAO IN COMPLEX WITH WC4D3 (RU-WIRE INHIBITOR, 4-CARBON LINKER, DELTA ENANTIOMER, DATA SET 3)  
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Deposited on : 2006-02-21  
Resolution : 1.55 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

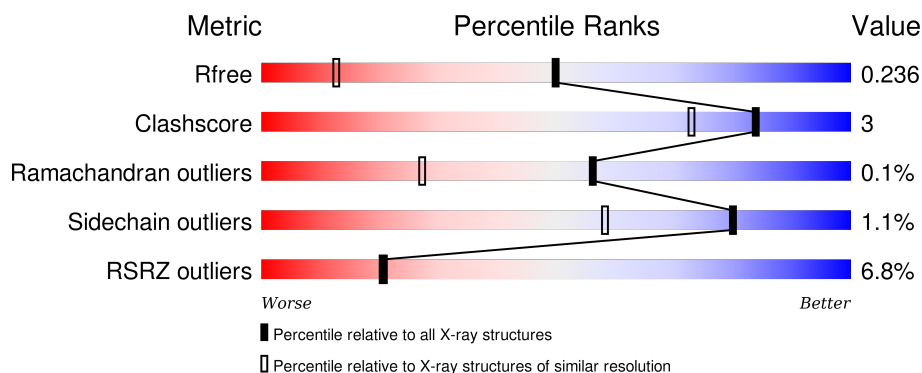
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 1.55 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))
$R_{free}$	91344	1665 (1.58-1.54)
Clashscore	102246	1014 (1.56-1.56)
Ramachandran outliers	100387	1704 (1.58-1.54)
Sidechain outliers	100360	1702 (1.58-1.54)
RSRZ outliers	91569	1668 (1.58-1.54)

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	646	<div> <div>8%</div> <div>91%</div> <div>5%</div> <div>.</div> </div>
1	B	646	<div> <div>5%</div> <div>89%</div> <div>6%</div> <div>.</div> </div>

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	CU	A	1628	-	-	-	X
2	CU	B	1630	-	-	-	X
3	NA	A	1629	-	-	-	X
4	R4A	A	1630	X	-	-	X
4	R4A	B	1632	X	-	-	X
5	GOL	A	1631	-	-	-	X
5	GOL	A	1632	-	-	-	X
5	GOL	A	1634	-	-	-	X
5	GOL	B	1629	-	-	-	X
5	GOL	B	1634	-	-	-	X
5	GOL	B	1635	-	-	-	X
5	GOL	B	1636	-	-	-	X
5	GOL	B	1637	-	-	-	X
5	GOL	B	1638	-	-	-	X
5	GOL	B	1639	-	-	-	X
6	SO4	B	1633	-	-	-	X

## 2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 19843 atoms, of which 9102 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 PHENYLETHYLAMINE OXIDASE.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	619	Total	C	H	N	O	S	0	4	0
			9355	3080	4480	853	931	11			
1	B	619	Total	C	H	N	O	S	0	5	0
			9362	3082	4485	853	931	11			

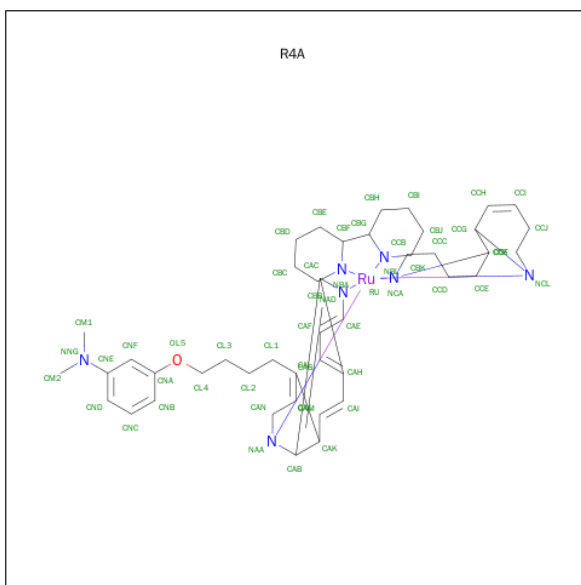
- Molecule 2 is COPPER (II) ION (three-letter code: CU) (formula: Cu).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	B	1	Total	Cu	0	0
			1	1		
2	A	1	Total	Cu	0	0
			1	1		

- Molecule 3 is SODIUM ION (three-letter code: NA) (formula: Na).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	B	1	Total	Na	0	0
			1	1		
3	A	1	Total	Na	0	0
			1	1		

- Molecule 4 is BIS[1H,1'H-2,2'-BIPYRIDINATO(2-)-KAPPA 2 N 1 ,N 1' ]{3-[4-(1,10-DIHYDRO-1,10-PHENANTHROLIN-4-YL-KAPPA 2 N 1 ,N 10 )BUTOXY]-N,N-DIMETHYLANILINATO(2-)}RUTHENIUM (three-letter code: R4A) (formula: C<sub>44</sub>H<sub>61</sub>N<sub>7</sub>ORu).



Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
4	A	1	Total 94	C 44	H 41	N 7	O 1	Ru 1	0	0
4	B	1	Total 94	C 44	H 41	N 7	O 1	Ru 1	0	0

- Molecule 5 is GLYCEROL (three-letter code: GOL) (formula:  $\text{C}_3\text{H}_8\text{O}_3$ ).



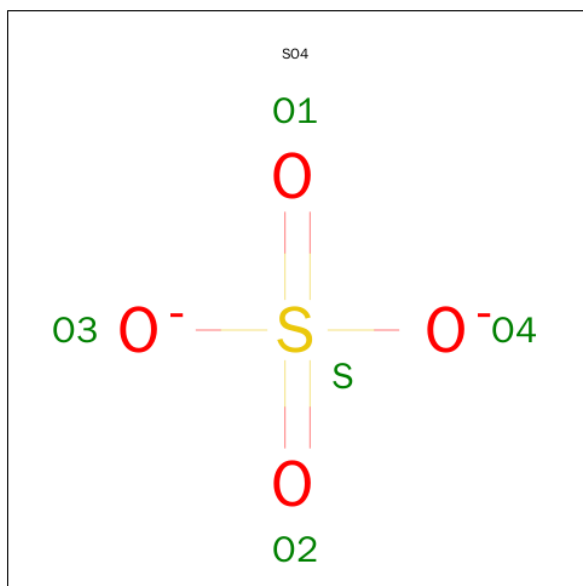
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	A	1	Total 11	C 3	H 5	O 3	0	0
5	A	1	Total 11	C 3	H 5	O 3	0	0

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	A	1	Total	C	H	O	0	0
			11	3	5	3		
5	A	1	Total	C	H	O	0	0
			11	3	5	3		
5	B	1	Total	C	H	O	0	0
			11	3	5	3		
5	B	1	Total	C	H	O	0	0
			11	3	5	3		
5	B	1	Total	C	H	O	0	0
			11	3	5	3		
5	B	1	Total	C	H	O	0	0
			11	3	5	3		
5	B	1	Total	C	H	O	0	0
			11	3	5	3		
5	B	1	Total	C	H	O	0	0
			11	3	5	3		

- Molecule 6 is SULFATE ION (three-letter code: SO<sub>4</sub>) (formula: O<sub>4</sub>S).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	B	1	Total	O	S	0	0
			5	4	1		
6	B	1	Total	O	S	0	0
			5	4	1		

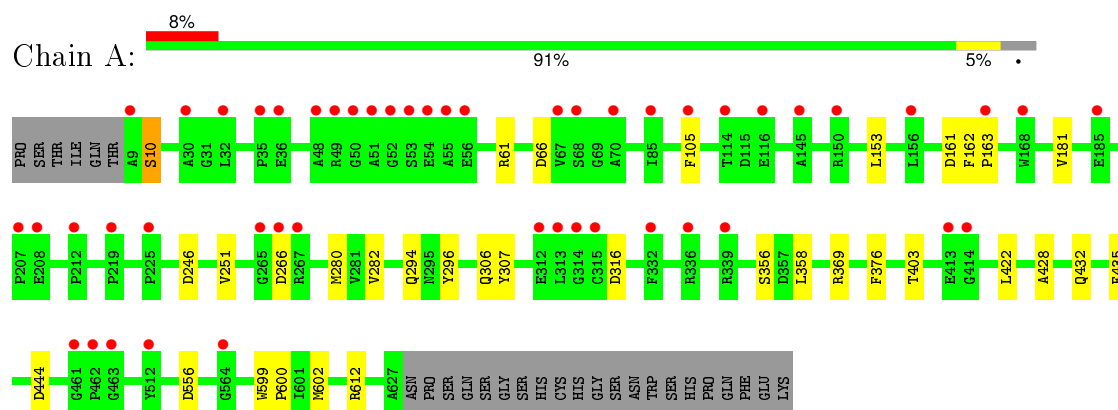
- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	365	Total 365	O 365	0	0
7	B	438	Total 438	O 438	0	0

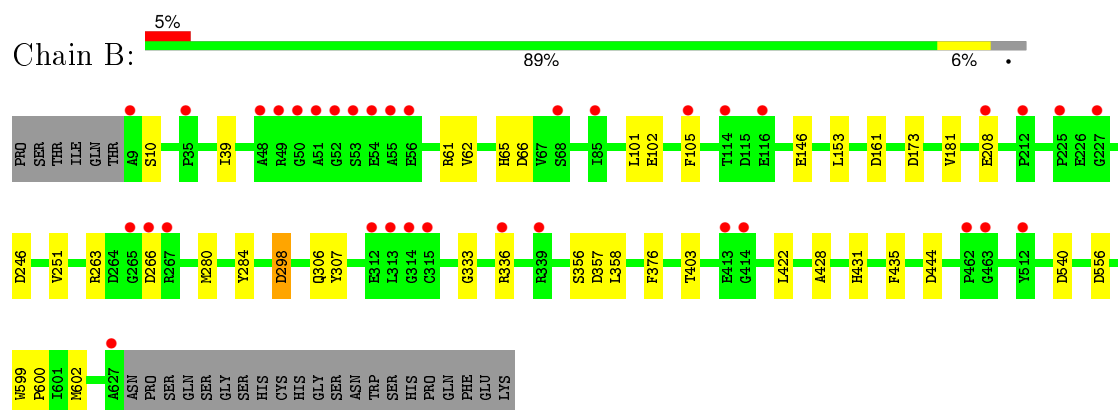
### 3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors 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: PHENYLETHYLAMINE OXIDASE



#### • Molecule 1: PHENYLETHYLAMINE OXIDASE





## 4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	192.37Å 62.95Å 158.13Å 90.00° 117.46° 90.00°	Depositor
Resolution (Å)	30.01 – 1.55 30.01 – 1.55	Depositor EDS
% Data completeness (in resolution range)	92.6 (30.01-1.55) 92.5 (30.01-1.55)	Depositor EDS
$R_{merge}$	0.04	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.48 (at 1.55Å)	Xtriage
Refinement program	REFMAC 5.1.24	Depositor
R, $R_{free}$	0.203 , 0.224 0.220 , 0.236	Depositor DCC
$R_{free}$ test set	11299 reflections (5.28%)	DCC
Wilson B-factor (Å <sup>2</sup> )	25.8	Xtriage
Anisotropy	0.385	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.46 , 52.1	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.33$	Xtriage
Outliers	0 of 225428 reflections	Xtriage
$F_o, F_c$ correlation	0.97	EDS
Total number of atoms	19843	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	27.0	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 93.62 % 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 4.8182e-09. 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: GOL, R4A, NA, SO4, TPQ, CU

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	0.50	0/4998	0.79	6/6804 (0.1%)
1	B	0.57	0/5006	0.83	8/6815 (0.1%)
All	All	0.54	0/10004	0.81	14/13619 (0.1%)

There are no bond length outliers.

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	246	ASP	CB-CG-OD2	6.62	124.26	118.30
1	B	540	ASP	CB-CG-OD2	6.58	124.23	118.30
1	A	246	ASP	CB-CG-OD2	6.38	124.04	118.30
1	B	298	ASP	CB-CG-OD2	6.26	123.93	118.30
1	A	66	ASP	CB-CG-OD2	5.51	123.26	118.30
1	B	66	ASP	CB-CG-OD2	5.51	123.26	118.30
1	A	266	ASP	CB-CG-OD2	5.47	123.22	118.30
1	B	161	ASP	CB-CG-OD2	5.41	123.17	118.30
1	B	173	ASP	CB-CG-OD2	5.40	123.16	118.30
1	B	266	ASP	CB-CG-OD2	5.29	123.06	118.30
1	B	357	ASP	CB-CG-OD2	5.18	122.97	118.30
1	A	612	ARG	NE-CZ-NH1	5.08	122.84	120.30
1	A	161	ASP	CB-CG-OD2	5.07	122.86	118.30
1	A	316	ASP	CB-CG-OD2	5.02	122.81	118.30

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	4875	4480	4692	19	0
1	B	4877	4485	4693	36	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
4	A	53	41	47	7	0
4	B	53	41	50	19	0
5	A	24	20	32	1	0
5	B	42	35	56	1	0
6	B	10	0	0	1	0
7	A	365	0	0	1	0
7	B	438	0	0	2	0
All	All	10741	9102	9570	58	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 3.

All (58) 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:105:PHE:CZ	4:B:1632:R4A:HL12	1.38	1.58
1:B:105:PHE:CE2	4:B:1632:R4A:CAL	2.20	1.24
1:B:105:PHE:CZ	4:B:1632:R4A:CL1	2.21	1.22
1:B:105:PHE:CE2	4:B:1632:R4A:CL1	2.33	1.09
1:B:105:PHE:CE2	4:B:1632:R4A:HL12	1.87	1.06
1:B:105:PHE:CD2	4:B:1632:R4A:CAK	2.56	0.88
1:A:307:TYR:CE1	4:A:1630:R4A:HAM	2.12	0.85
1:B:105:PHE:CD2	4:B:1632:R4A:CAL	2.66	0.79
1:B:105:PHE:HZ	4:B:1632:R4A:HL12	1.38	0.79
1:B:105:PHE:CE2	4:B:1632:R4A:CAM	2.65	0.78
1:B:105:PHE:HE2	4:B:1632:R4A:CAM	2.02	0.71
1:B:307:TYR:CE1	4:B:1632:R4A:HAM	2.27	0.70
1:B:599:TRP:CD2	1:B:600:PRO:HA	2.34	0.63
1:B:102:GLU:HB3	4:B:1632:R4A:HBI1	1.82	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:251:VAL:HG22	1:A:306:GLN:HB3	1.83	0.61
1:A:599:TRP:CD2	1:A:600:PRO:HA	2.37	0.59
1:B:61:ARG:NH2	1:B:556:ASP:OD2	2.38	0.56
1:A:307:TYR:CE1	4:A:1630:R4A:CAM	2.87	0.55
1:B:251:VAL:HG22	1:B:306:GLN:HB3	1.90	0.54
4:A:1630:R4A:HCD1	1:B:356[B]:SER:OG	2.08	0.54
1:B:280[B]:MET:HG3	1:B:435:PHE:CE2	2.43	0.54
1:B:105:PHE:CD2	4:B:1632:R4A:CAJ	2.91	0.53
5:A:1634:GOL:H11	7:A:2205:HOH:O	2.08	0.52
1:A:422:LEU:HD11	1:A:428:ALA:HB2	1.93	0.51
1:A:307:TYR:CZ	4:A:1630:R4A:HAM	2.45	0.50
1:A:358:LEU:HD12	4:B:1632:R4A:CAI	2.41	0.50
1:B:307:TYR:CE1	4:B:1632:R4A:CAM	2.95	0.50
1:B:105:PHE:CE1	4:B:1632:R4A:CL1	2.89	0.49
1:B:422:LEU:HD11	1:B:428:ALA:HB2	1.94	0.49
1:B:307:TYR:CZ	4:B:1632:R4A:HAM	2.48	0.47
1:A:105:PHE:HB3	4:A:1630:R4A:CAI	2.44	0.47
1:B:251:VAL:CG2	1:B:306:GLN:HB3	2.46	0.46
1:B:105:PHE:CZ	4:B:1632:R4A:HL11	2.41	0.46
1:B:39[B]:ILE:HD12	1:B:333:GLY:HA2	1.98	0.46
1:B:39[B]:ILE:HD12	1:B:333:GLY:CA	2.46	0.45
1:B:280[B]:MET:HG3	1:B:435:PHE:CD2	2.52	0.45
1:A:403:THR:HA	1:A:602[A]:MET:HG3	1.99	0.45
1:B:403:THR:HA	1:B:602[A]:MET:HG3	1.99	0.45
1:B:403:THR:HA	1:B:602[A]:MET:CG	2.47	0.44
5:B:1639:GOL:H32	7:B:2260:HOH:O	2.16	0.44
1:A:162:PHE:HB2	1:A:163:PRO:CD	2.47	0.44
1:A:307:TYR:CD1	4:A:1630:R4A:HAM	2.52	0.44
1:A:61:ARG:HH22	1:A:556:ASP:CG	2.22	0.43
1:B:39[A]:ILE:HD12	1:B:62:VAL:CG1	2.49	0.43
6:B:1633:SO4:O2	7:B:2428:HOH:O	2.19	0.43
1:A:153:LEU:HD12	1:A:181:VAL:HG11	2.00	0.43
1:A:280[B]:MET:HG3	1:A:435:PHE:CD2	2.54	0.42
4:A:1630:R4A:CAI	1:B:358:LEU:HD12	2.49	0.42
1:B:284:TYR:CD2	1:B:431:HIS:HB3	2.54	0.42
1:A:280[B]:MET:HG3	1:A:435:PHE:CE2	2.54	0.42
1:A:282:VAL:HA	1:A:432:GLN:O	2.20	0.42
1:B:280[B]:MET:HE1	1:B:298:ASP:OD1	2.20	0.41
1:A:403:THR:HA	1:A:602[A]:MET:CG	2.49	0.41
1:A:294:GLN:HB2	1:A:296:TYR:CZ	2.55	0.41
1:B:61:ARG:HH22	1:B:556:ASP:CG	2.24	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:153:LEU:HD12	1:B:181:VAL:HG11	2.02	0.40
1:A:356[B]:SER:OG	4:B:1632:R4A:HCD1	2.21	0.40
1:B:65:HIS:CD2	1:B:101:LEU:HD11	2.56	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	620/646 (96%)	598 (96%)	21 (3%)	1 (0%)	52	25
1	B	621/646 (96%)	597 (96%)	24 (4%)	0	100	100
All	All	1241/1292 (96%)	1195 (96%)	45 (4%)	1 (0%)	56	27

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	10	SER

### 5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	516/537 (96%)	512 (99%)	4 (1%)	86	71
1	B	517/537 (96%)	510 (99%)	7 (1%)	74	48

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
All	All	1033/1074 (96%)	1022 (99%)	11 (1%)	80	58

All (11) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	10	SER
1	A	369	ARG
1	A	376	PHE
1	A	444	ASP
1	B	10	SER
1	B	146	GLU
1	B	208	GLU
1	B	263	ARG
1	B	336	ARG
1	B	376	PHE
1	B	444	ASP

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

Mol	Chain	Res	Type
1	A	421	GLN
1	B	306	GLN
1	B	421	GLN
1	B	507	ASN

### 5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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	TPQ	A	382	1	13,14,15	1.36	2 (15%)	15,19,21	1.72	4 (26%)
1	TPQ	B	382	1	13,14,15	1.32	2 (15%)	15,19,21	1.63	3 (20%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
1	TPQ	A	382	1	-	0/4/22/24	0/1/1/1
1	TPQ	B	382	1	-	0/4/22/24	0/1/1/1

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	382	TPQ	O4-C4	-2.78	1.26	1.34
1	B	382	TPQ	O4-C4	-2.73	1.27	1.34
1	B	382	TPQ	C3-C4	2.54	1.39	1.35
1	A	382	TPQ	C3-C4	2.89	1.40	1.35

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	382	TPQ	C1-C6-C5	-4.08	120.48	122.97
1	A	382	TPQ	C1-C6-C5	-3.93	120.57	122.97
1	B	382	TPQ	O-C-CA	-2.73	118.37	125.49
1	A	382	TPQ	O2-C2-C1	-2.24	118.90	120.85
1	A	382	TPQ	C3-C2-C1	2.08	119.86	118.30
1	A	382	TPQ	C6-C1-C2	2.35	120.10	118.44
1	B	382	TPQ	C6-C1-C2	2.91	120.49	118.44

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

## 5.5 Carbohydrates ⓘ

There are no carbohydrates in this entry.

## 5.6 Ligand geometry

Of 19 ligands modelled in this entry, 4 are monoatomic - leaving 15 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	R4A	A	1630	-	53,63,63	4.16	23 (43%)	48,101,101	3.42	25 (52%)
5	GOL	A	1631	-	5,5,5	0.36	0	5,5,5	0.23	0
5	GOL	A	1632	-	5,5,5	0.30	0	5,5,5	0.31	0
5	GOL	A	1633	-	5,5,5	0.36	0	5,5,5	0.29	0
5	GOL	A	1634	-	5,5,5	0.29	0	5,5,5	0.78	0
6	SO4	B	1628	-	4,4,4	0.24	0	6,6,6	0.55	0
5	GOL	B	1629	-	5,5,5	0.29	0	5,5,5	0.20	0
4	R4A	B	1632	-	53,63,63	4.17	24 (45%)	48,101,101	3.43	24 (50%)
6	SO4	B	1633	-	4,4,4	0.25	0	6,6,6	0.45	0
5	GOL	B	1634	-	5,5,5	0.22	0	5,5,5	0.43	0
5	GOL	B	1635	-	5,5,5	0.34	0	5,5,5	0.21	0
5	GOL	B	1636	-	5,5,5	0.27	0	5,5,5	0.46	0
5	GOL	B	1637	-	5,5,5	0.29	0	5,5,5	0.34	0
5	GOL	B	1638	-	5,5,5	0.32	0	5,5,5	0.17	0
5	GOL	B	1639	-	5,5,5	0.24	0	5,5,5	0.64	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	R4A	A	1630	-	5/5/19/19	0/12/150/150	0/10/11/11
5	GOL	A	1631	-	-	0/4/4/4	0/0/0/0
5	GOL	A	1632	-	-	0/4/4/4	0/0/0/0
5	GOL	A	1633	-	-	0/4/4/4	0/0/0/0
5	GOL	A	1634	-	-	0/4/4/4	0/0/0/0
6	SO4	B	1628	-	-	0/0/0/0	0/0/0/0
5	GOL	B	1629	-	-	0/4/4/4	0/0/0/0
4	R4A	B	1632	-	5/5/19/19	0/12/150/150	0/10/11/11
6	SO4	B	1633	-	-	0/0/0/0	0/0/0/0

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	GOL	B	1634	-	-	0/4/4/4	0/0/0/0
5	GOL	B	1635	-	-	0/4/4/4	0/0/0/0
5	GOL	B	1636	-	-	0/4/4/4	0/0/0/0
5	GOL	B	1637	-	-	0/4/4/4	0/0/0/0
5	GOL	B	1638	-	-	0/4/4/4	0/0/0/0
5	GOL	B	1639	-	-	0/4/4/4	0/0/0/0

All (47) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	1630	R4A	CBB-NBA	-13.58	1.27	1.49
4	B	1632	R4A	CBB-NBA	-13.51	1.28	1.49
4	A	1630	R4A	CCB-NCA	-13.39	1.28	1.49
4	B	1632	R4A	CCB-NCA	-13.22	1.28	1.49
4	B	1632	R4A	CBK-NBL	-9.56	1.34	1.49
4	B	1632	R4A	CCK-NCL	-9.49	1.34	1.49
4	A	1630	R4A	CCK-NCL	-9.41	1.34	1.49
4	A	1630	R4A	CBK-NBL	-9.35	1.34	1.49
4	B	1632	R4A	CBD-CBE	-7.64	1.32	1.53
4	A	1630	R4A	CBD-CBE	-7.56	1.32	1.53
4	A	1630	R4A	CCD-CCE	-7.53	1.32	1.53
4	B	1632	R4A	CCD-CCE	-7.40	1.33	1.53
4	B	1632	R4A	CBH-CBG	-5.92	1.39	1.53
4	A	1630	R4A	CBH-CBG	-5.88	1.40	1.53
4	B	1632	R4A	CBI-CBH	-5.01	1.39	1.53
4	A	1630	R4A	CBI-CBH	-4.87	1.40	1.53
4	A	1630	R4A	CBB-CBC	-4.47	1.34	1.51
4	B	1632	R4A	CCB-CCC	-4.45	1.34	1.51
4	A	1630	R4A	CCB-CCC	-4.44	1.34	1.51
4	B	1632	R4A	CBB-CBC	-4.41	1.34	1.51
4	A	1630	R4A	CCK-CCJ	-3.96	1.39	1.51
4	B	1632	R4A	CCK-CCJ	-3.84	1.40	1.51
4	A	1630	R4A	CAK-CAB	-3.14	1.46	1.52
4	B	1632	R4A	CBK-CBJ	-2.97	1.39	1.51
4	B	1632	R4A	CAK-CAB	-2.97	1.46	1.52
4	A	1630	R4A	CBK-CBJ	-2.88	1.40	1.51
4	B	1632	R4A	CBI-CBJ	-2.87	1.39	1.51
4	A	1630	R4A	CBI-CBJ	-2.79	1.39	1.51
4	A	1630	R4A	CCG-CCF	-2.41	1.50	1.54
4	B	1632	R4A	CCJ-CCI	-2.39	1.40	1.48
4	A	1630	R4A	CCJ-CCI	-2.34	1.40	1.48
4	B	1632	R4A	CCG-CCF	-2.33	1.50	1.54

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	1632	R4A	CCE-CCF	-2.31	1.47	1.53
4	A	1630	R4A	CAN-CAM	-2.28	1.39	1.48
4	B	1632	R4A	CAN-CAM	-2.20	1.40	1.48
4	A	1630	R4A	CCE-CCF	-2.14	1.48	1.53
4	B	1632	R4A	CBE-CBF	-2.01	1.48	1.53
4	B	1632	R4A	CCH-CCI	2.61	1.39	1.32
4	A	1630	R4A	CCH-CCI	2.65	1.39	1.32
4	B	1632	R4A	CAM-CAL	2.76	1.39	1.33
4	A	1630	R4A	CAM-CAL	2.79	1.39	1.33
4	A	1630	R4A	CAC-CAH	3.88	1.47	1.42
4	B	1632	R4A	CAC-CAH	3.95	1.47	1.42
4	A	1630	R4A	CAC-CAB	4.11	1.44	1.38
4	B	1632	R4A	CAC-CAB	4.37	1.45	1.38
4	B	1632	R4A	CAI-CAJ	5.30	1.41	1.32
4	A	1630	R4A	CAI-CAJ	5.47	1.41	1.32

All (49) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	B	1632	R4A	CNF-CNE-NNG	-3.03	117.03	121.22
4	A	1630	R4A	CAC-CAH-CAI	-2.81	118.57	123.91
4	B	1632	R4A	CAC-CAH-CAI	-2.75	118.68	123.91
4	A	1630	R4A	CNF-CNE-NNG	-2.71	117.47	121.22
4	B	1632	R4A	CL1-CAL-CAM	-2.17	117.15	123.84
4	A	1630	R4A	CL1-CAL-CAM	-2.13	117.29	123.84
4	A	1630	R4A	CAG-CAH-CAI	2.05	125.87	121.19
4	A	1630	R4A	CAE-CAF-CAG	2.26	122.85	119.44
4	B	1632	R4A	CAE-CAF-CAG	2.38	123.03	119.44
4	A	1630	R4A	CBC-CBD-CBE	2.66	117.01	111.44
4	B	1632	R4A	CBC-CBD-CBE	2.72	117.15	111.44
4	A	1630	R4A	CAL-CAK-CAB	2.93	112.40	108.40
4	A	1630	R4A	CCC-CCD-CCE	3.00	117.74	111.44
4	B	1632	R4A	CCC-CCD-CCE	3.07	117.87	111.44
4	B	1632	R4A	CAL-CAK-CAB	3.11	112.65	108.40
4	A	1630	R4A	CCD-CCE-CCF	3.33	117.69	111.23
4	B	1632	R4A	CCD-CCE-CCF	3.40	117.83	111.23
4	A	1630	R4A	CBF-CBG-NBL	3.43	114.17	109.21
4	B	1632	R4A	CBD-CBE-CBF	3.43	117.87	111.23
4	B	1632	R4A	CBF-CBG-NBL	3.49	114.26	109.21
4	A	1630	R4A	CBD-CBE-CBF	3.51	118.03	111.23
4	B	1632	R4A	CBI-CBH-CBG	3.64	118.28	111.23
4	A	1630	R4A	CBI-CBH-CBG	3.74	118.47	111.23

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	B	1632	R4A	CBJ-CBK-NBL	3.87	119.38	112.92
4	A	1630	R4A	CBJ-CBK-NBL	3.98	119.56	112.92
4	A	1630	R4A	CBJ-CBI-CBH	4.12	120.07	111.44
4	B	1632	R4A	CBJ-CBI-CBH	4.17	120.17	111.44
4	B	1632	R4A	CCB-CCC-CCD	4.87	119.05	111.43
4	A	1630	R4A	CCB-CCC-CCD	5.05	119.33	111.43
4	B	1632	R4A	CBG-CBF-NBA	5.18	116.71	109.21
4	B	1632	R4A	CCC-CCB-NCA	5.18	121.57	112.92
4	B	1632	R4A	CBB-CBC-CBD	5.21	119.58	111.43
4	A	1630	R4A	CBB-CBC-CBD	5.22	119.60	111.43
4	A	1630	R4A	CCG-CCF-NCA	5.23	116.77	109.21
4	A	1630	R4A	CCC-CCB-NCA	5.28	121.73	112.92
4	A	1630	R4A	CBG-CBF-NBA	5.28	116.85	109.21
4	B	1632	R4A	CCG-CCF-NCA	5.37	116.98	109.21
4	B	1632	R4A	CAJ-CAK-CAB	5.49	118.94	107.96
4	A	1630	R4A	CAJ-CAK-CAB	5.51	118.97	107.96
4	A	1630	R4A	CBK-CBJ-CBI	5.69	120.33	111.43
4	A	1630	R4A	CBC-CBB-NBA	5.78	122.56	112.92
4	B	1632	R4A	CBK-CBJ-CBI	5.81	120.52	111.43
4	B	1632	R4A	CBC-CBB-NBA	5.82	122.64	112.92
4	A	1630	R4A	CBK-NBL-CBG	6.90	121.43	109.89
4	B	1632	R4A	CBK-NBL-CBG	6.94	121.50	109.89
4	B	1632	R4A	CBB-NBA-CBF	7.27	122.05	109.89
4	A	1630	R4A	CBB-NBA-CBF	7.55	122.53	109.89
4	A	1630	R4A	CCB-NCA-CCF	8.19	123.59	109.89
4	B	1632	R4A	CCB-NCA-CCF	8.51	124.13	109.89

All (10) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
4	B	1632	R4A	CAK
4	B	1632	R4A	CBG
4	B	1632	R4A	CCF
4	B	1632	R4A	CBF
4	B	1632	R4A	CCG
4	A	1630	R4A	CAK
4	A	1630	R4A	CBG
4	A	1630	R4A	CCF
4	A	1630	R4A	CBF
4	A	1630	R4A	CCG

There are no torsion outliers.

There are no ring outliers.

5 monomers are involved in 29 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	1630	R4A	7	0
5	A	1634	GOL	1	0
4	B	1632	R4A	19	0
6	B	1633	SO4	1	0
5	B	1639	GOL	1	0

## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

## 6 Fit of model and data ⓘ

### 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, 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	618/646 (95%)	0.41	49 (7%) 15 15	18, 27, 40, 60	1 (0%)
1	B	618/646 (95%)	0.23	35 (5%) 27 28	16, 24, 35, 58	1 (0%)
All	All	1236/1292 (95%)	0.32	84 (6%) 20 21	16, 25, 38, 60	2 (0%)

All (84) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	52	GLY	11.9
1	A	53	SER	10.8
1	B	53	SER	10.4
1	A	51	ALA	9.3
1	A	9	ALA	8.8
1	A	52	GLY	8.6
1	B	55	ALA	7.5
1	A	54	GLU	7.4
1	B	54	GLU	7.1
1	B	51	ALA	6.5
1	A	55	ALA	6.5
1	A	50	GLY	6.3
1	A	266	ASP	6.1
1	B	50	GLY	5.8
1	B	9	ALA	5.5
1	B	266	ASP	4.9
1	B	462	PRO	4.4
1	B	313	LEU	4.3
1	B	225	PRO	4.2
1	A	313	LEU	4.0
1	B	312	GLU	4.0
1	A	48	ALA	3.9
1	A	462	PRO	3.9
1	B	212	PRO	3.8

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Mol	Chain	Res	Type	RSRZ
1	B	314	GLY	3.8
1	A	163	PRO	3.4
1	B	105	PHE	3.4
1	A	314	GLY	3.4
1	A	267	ARG	3.3
1	A	68	SER	3.3
1	B	315	CYS	3.2
1	A	116	GLU	3.1
1	A	312	GLU	3.1
1	A	336	ARG	3.1
1	A	225	PRO	3.1
1	B	85	ILE	3.1
1	A	56	GLU	3.1
1	A	32	LEU	3.1
1	A	145	ALA	3.1
1	B	48	ALA	3.0
1	A	512	TYR	3.0
1	B	265	GLY	3.0
1	B	267	ARG	3.0
1	A	105	PHE	3.0
1	B	339	ARG	2.9
1	A	49	ARG	2.9
1	B	49	ARG	2.8
1	B	627	ALA	2.8
1	A	70	ALA	2.7
1	A	332	PHE	2.6
1	B	336	ARG	2.6
1	A	67	VAL	2.6
1	B	116	GLU	2.6
1	A	339	ARG	2.6
1	A	36	GLU	2.6
1	B	56	GLU	2.6
1	A	463	GLY	2.6
1	A	564	GLY	2.6
1	A	185	GLU	2.5
1	A	30	ALA	2.5
1	B	414	GLY	2.5
1	B	114	THR	2.4
1	B	208	GLU	2.4
1	A	413	GLU	2.4
1	A	414	GLY	2.4
1	B	463	GLY	2.4

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Mol	Chain	Res	Type	RSRZ
1	B	68	SER	2.3
1	A	265	GLY	2.3
1	A	85	ILE	2.3
1	A	212	PRO	2.2
1	B	35	PRO	2.2
1	B	512	TYR	2.2
1	A	168	TRP	2.2
1	B	413	GLU	2.2
1	A	35	PRO	2.2
1	A	150	ARG	2.1
1	A	156	LEU	2.1
1	A	315	CYS	2.1
1	A	208	GLU	2.1
1	A	219	PRO	2.1
1	A	461	GLY	2.1
1	B	227	GLY	2.1
1	A	207	PRO	2.0
1	A	114	THR	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. 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(Å <sup>2</sup> )	Q<0.9
1	TPQ	A	382	14/15	0.94	0.11	-	22,28,35,39	0
1	TPQ	B	382	14/15	0.94	0.12	-	19,26,33,38	0

## 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(Å <sup>2</sup> )	Q<0.9
5	GOL	B	1638	6/6	0.65	0.21	13.50	53,54,55,56	0
5	GOL	A	1632	6/6	0.73	0.23	10.57	66,66,67,67	0
2	CU	A	1628	1/1	1.00	0.16	9.00	32,32,32,32	0
5	GOL	B	1636	6/6	0.74	0.21	7.91	62,63,63,64	0
5	GOL	B	1629	6/6	0.73	0.20	7.82	54,55,55,57	0
5	GOL	B	1639	6/6	0.79	0.20	6.42	46,51,52,54	0
5	GOL	B	1635	6/6	0.73	0.14	4.11	42,46,47,49	0
5	GOL	A	1634	6/6	0.79	0.18	3.53	43,51,52,54	0
5	GOL	B	1634	6/6	0.78	0.16	3.04	33,33,34,35	0
5	GOL	A	1631	6/6	0.71	0.13	2.67	43,49,51,52	0
4	R4A	A	1630	53/53	0.87	0.25	2.62	46,52,53,53	71
3	NA	A	1629	1/1	0.98	0.25	2.42	34,34,34,34	0
2	CU	B	1630	1/1	0.99	0.14	2.39	30,30,30,30	0
5	GOL	B	1637	6/6	0.67	0.23	2.31	56,59,59,60	0
6	SO4	B	1633	5/5	0.93	0.13	2.15	56,56,57,58	0
4	R4A	B	1632	53/53	0.90	0.21	2.14	37,41,43,43	71
5	GOL	A	1633	6/6	0.73	0.20	1.91	59,60,61,61	0
3	NA	B	1631	1/1	0.99	0.17	1.06	30,30,30,30	0
6	SO4	B	1628	5/5	0.96	0.09	0.44	50,50,53,54	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.