



Full wwPDB X-ray Structure Validation Report ⓘ

Sep 24, 2023 – 08:06 AM EDT

PDB ID : 5U29
Title : Crystal structure of *Cryptococcus neoformans* H99 Acetyl-CoA Synthetase in complex with Ac-AMS
Authors : Seattle Structural Genomics Center for Infectious Disease (SSGCID); Fox III, D.; Edwards, T.E.; Potts, K.T.; Taylor, B.M.
Deposited on : 2016-11-30
Resolution : 2.50 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 : 1.8.5 (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

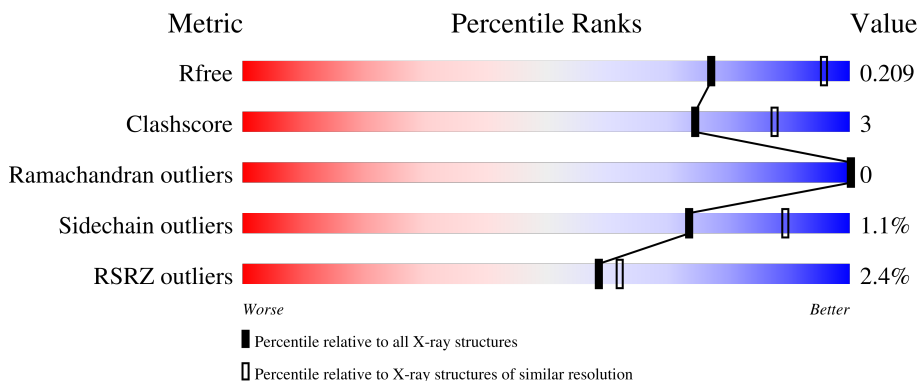
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.50 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	4661 (2.50-2.50)
Clashscore	141614	5346 (2.50-2.50)
Ramachandran outliers	138981	5231 (2.50-2.50)
Sidechain outliers	138945	5233 (2.50-2.50)
RSRZ outliers	127900	4559 (2.50-2.50)

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	694	 2% 89% 6% . .
1	B	694	 4% 88% 8% .
1	C	694	 1% 89% 7% .

2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 15741 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 Acetyl-coenzyme A synthetase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	668	5099	3253	867	952	27	0	1	0
1	B	667	5037	3210	860	940	27	0	2	0
1	C	668	5082	3242	865	948	27	0	2	0

There are 45 discrepancies between the modelled and reference sequences:

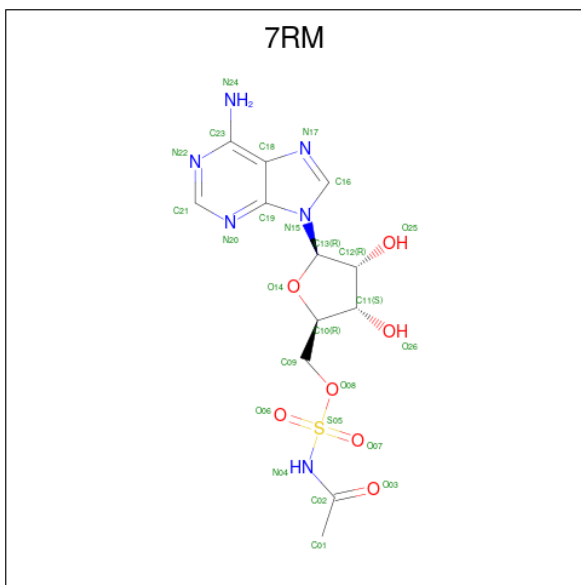
Chain	Residue	Modelled	Actual	Comment	Reference
A	-13	MET	-	initiating methionine	UNP J9VFT1
A	-12	HIS	-	expression tag	UNP J9VFT1
A	-11	HIS	-	expression tag	UNP J9VFT1
A	-10	HIS	-	expression tag	UNP J9VFT1
A	-9	HIS	-	expression tag	UNP J9VFT1
A	-8	HIS	-	expression tag	UNP J9VFT1
A	-7	HIS	-	expression tag	UNP J9VFT1
A	-6	HIS	-	expression tag	UNP J9VFT1
A	-5	HIS	-	expression tag	UNP J9VFT1
A	-4	GLU	-	expression tag	UNP J9VFT1
A	-3	ASN	-	expression tag	UNP J9VFT1
A	-2	LEU	-	expression tag	UNP J9VFT1
A	-1	TYR	-	expression tag	UNP J9VFT1
A	0	PHE	-	expression tag	UNP J9VFT1
A	1	GLN	-	expression tag	UNP J9VFT1
B	-13	MET	-	initiating methionine	UNP J9VFT1
B	-12	HIS	-	expression tag	UNP J9VFT1
B	-11	HIS	-	expression tag	UNP J9VFT1
B	-10	HIS	-	expression tag	UNP J9VFT1
B	-9	HIS	-	expression tag	UNP J9VFT1
B	-8	HIS	-	expression tag	UNP J9VFT1
B	-7	HIS	-	expression tag	UNP J9VFT1
B	-6	HIS	-	expression tag	UNP J9VFT1

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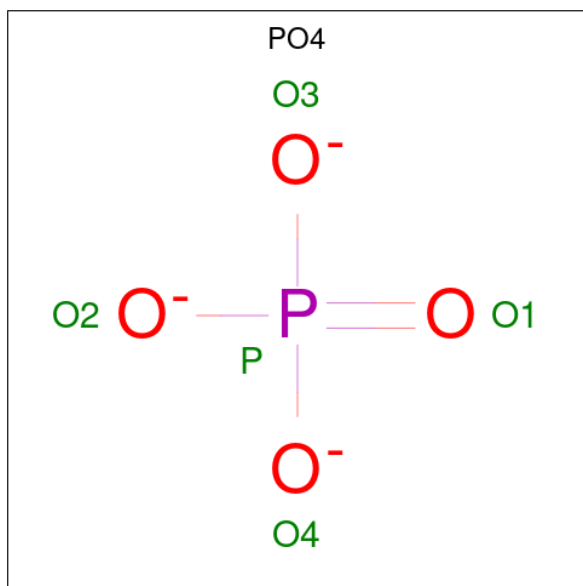
Chain	Residue	Modelled	Actual	Comment	Reference
B	-5	HIS	-	expression tag	UNP J9VFT1
B	-4	GLU	-	expression tag	UNP J9VFT1
B	-3	ASN	-	expression tag	UNP J9VFT1
B	-2	LEU	-	expression tag	UNP J9VFT1
B	-1	TYR	-	expression tag	UNP J9VFT1
B	0	PHE	-	expression tag	UNP J9VFT1
B	1	GLN	-	expression tag	UNP J9VFT1
C	-13	MET	-	initiating methionine	UNP J9VFT1
C	-12	HIS	-	expression tag	UNP J9VFT1
C	-11	HIS	-	expression tag	UNP J9VFT1
C	-10	HIS	-	expression tag	UNP J9VFT1
C	-9	HIS	-	expression tag	UNP J9VFT1
C	-8	HIS	-	expression tag	UNP J9VFT1
C	-7	HIS	-	expression tag	UNP J9VFT1
C	-6	HIS	-	expression tag	UNP J9VFT1
C	-5	HIS	-	expression tag	UNP J9VFT1
C	-4	GLU	-	expression tag	UNP J9VFT1
C	-3	ASN	-	expression tag	UNP J9VFT1
C	-2	LEU	-	expression tag	UNP J9VFT1
C	-1	TYR	-	expression tag	UNP J9VFT1
C	0	PHE	-	expression tag	UNP J9VFT1
C	1	GLN	-	expression tag	UNP J9VFT1

- Molecule 2 is 5'-O-(acetylsulfamoyl)adenosine (three-letter code: 7RM) (formula: C₁₂H₁₆N₆O₇S).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	S	0	0
			26	12	6	7	1		
2	B	1	Total	C	N	O	S	0	0
			26	12	6	7	1		
2	C	1	Total	C	N	O	S	0	0
			26	12	6	7	1		

- Molecule 3 is PHOSPHATE ION (three-letter code: PO4) (formula: O₄P).



Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	1	Total	O P	0	0
			5	4 1		
3	C	1	Total	O P	0	0
			5	4 1		
3	C	1	Total	O P	0	0
			5	4 1		

- Molecule 4 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: C₂H₆O₂).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C O 4 2 2	0	0
4	B	1	Total C O 4 2 2	0	0
4	B	1	Total C O 4 2 2	0	0
4	B	1	Total C O 4 2 2	0	0
4	B	1	Total C O 4 2 2	0	0
4	C	1	Total C O 4 2 2	0	0
4	C	1	Total C O 4 2 2	0	0

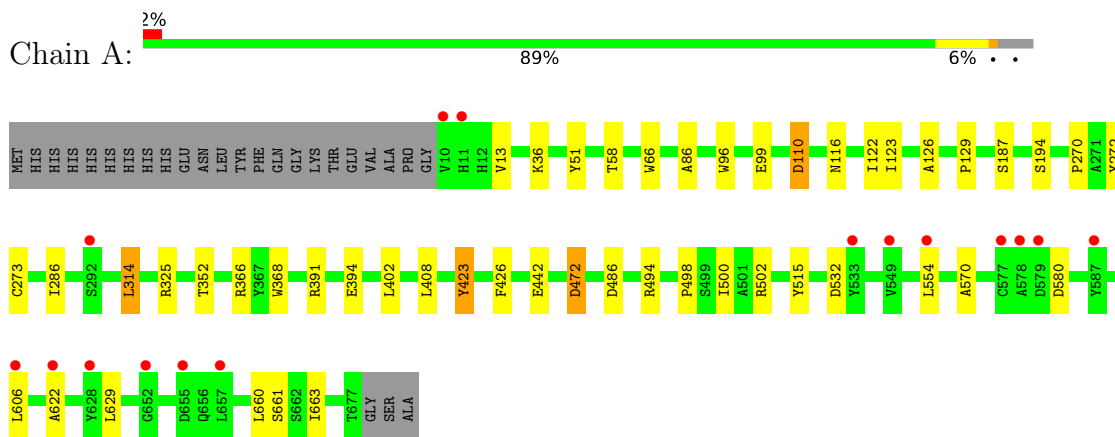
- Molecule 5 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	171	Total O 173 173	0	3
5	B	96	Total O 96 96	0	0
5	C	132	Total O 133 133	0	1

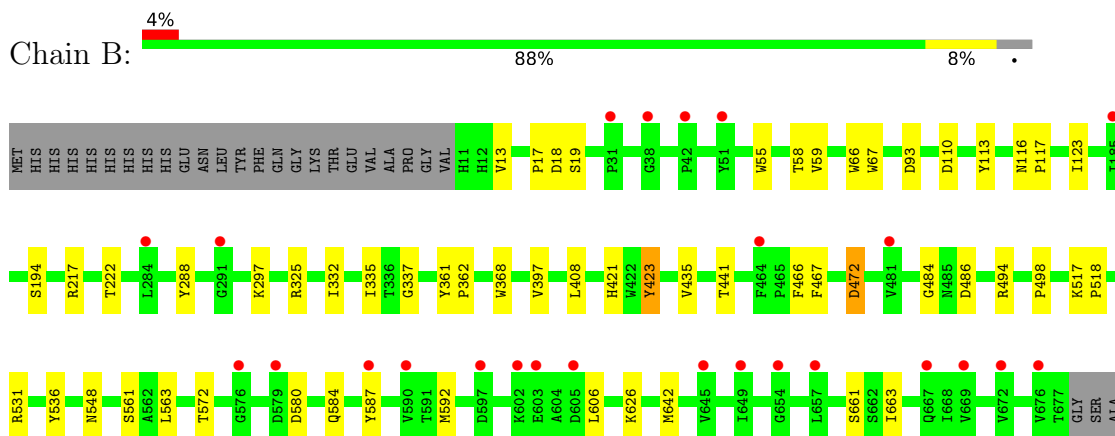
3 Residue-property plots [i](#)

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.

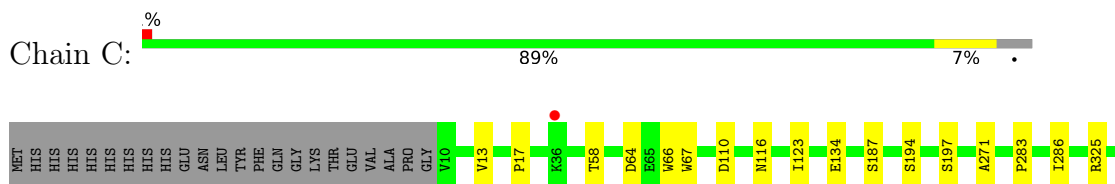
- Molecule 1: Acetyl-coenzyme A synthetase

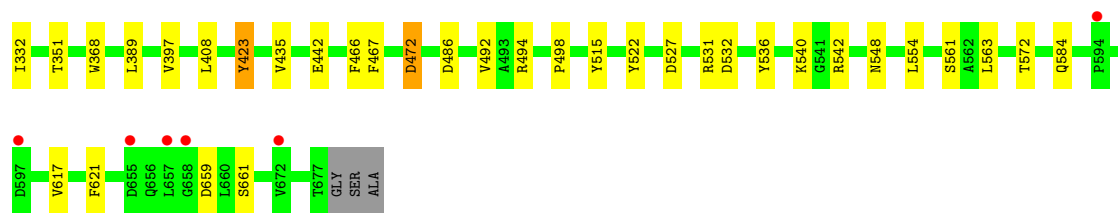


- Molecule 1: Acetyl-coenzyme A synthetase



- Molecule 1: Acetyl-coenzyme A synthetase





4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α , β , γ	71.28Å 83.78Å 101.60Å 110.33° 105.81° 87.75°	Depositor
Resolution (Å)	32.10 – 2.50 48.75 – 2.50	Depositor EDS
% Data completeness (in resolution range)	98.6 (32.10-2.50) 98.7 (48.75-2.50)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.80 (at 2.51Å)	Xtrriage
Refinement program	PHENIX (1.11.1_2575: 000)	Depositor
R, R_{free}	0.153 , 0.209 0.153 , 0.209	Depositor DCC
R_{free} test set	2000 reflections (2.77%)	wwPDB-VP
Wilson B-factor (Å ²)	42.5	Xtrriage
Anisotropy	0.278	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 67.2	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	15741	wwPDB-VP
Average B, all atoms (Å ²)	51.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.69% 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: PO4, EDO, 7RM

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	0.43	0/5243	0.59	1/7160 (0.0%)
1	B	0.38	0/5179	0.56	0/7082
1	C	0.39	0/5228	0.55	0/7140
All	All	0.40	0/15650	0.57	1/21382 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	314	LEU	CA-CB-CG	-5.35	103.00	115.30

There are no chirality outliers.

There are no planarity outliers.

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	5099	0	4825	29	0
1	B	5037	0	4707	31	0
1	C	5082	0	4815	36	0
2	A	26	0	0	0	0
2	B	26	0	0	0	0
2	C	26	0	0	2	0
3	A	5	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	C	10	0	0	0	0
4	A	4	0	6	0	0
4	B	16	0	24	2	0
4	C	8	0	12	2	0
5	A	173	0	0	0	0
5	B	96	0	0	0	0
5	C	133	0	0	2	0
All	All	15741	0	14389	95	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 (95) 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:283:PRO:HG3	4:C:705:EDO:H21	1.62	0.81
1:B:484:GLY:O	1:B:531:ARG:NH1	2.16	0.78
1:C:540:LYS:HG2	4:C:704:EDO:H21	1.66	0.77
1:B:592:MET:HE3	1:B:606:LEU:HD21	1.70	0.73
1:C:123:ILE:HD11	1:C:325:ARG:HD3	1.72	0.72
1:C:325:ARG:NH1	1:C:351:THR:HG21	2.05	0.70
1:A:99:GLU:HG2	4:B:702:EDO:H12	1.75	0.69
1:A:86:ALA:HA	4:B:703:EDO:H22	1.79	0.65
1:A:13:VAL:HG21	1:A:532:ASP:HA	1.80	0.62
1:C:472:ASP:OD2	1:C:494:ARG:NH1	2.32	0.62
1:B:472:ASP:OD2	1:B:494:ARG:NH1	2.31	0.60
1:C:194:SER:N	1:C:661:SER:OG	2.36	0.58
1:A:123:ILE:HD11	1:A:325:ARG:HH11	1.69	0.58
1:A:194:SER:N	1:A:661:SER:OG	2.37	0.56
1:B:194:SER:N	1:B:661:SER:OG	2.35	0.56
1:A:660:LEU:HB3	1:A:663:ILE:HD12	1.87	0.56
1:A:472:ASP:OD2	1:A:494:ARG:HD3	2.06	0.55
1:A:442:GLU:HG2	1:A:515:TYR:CZ	2.43	0.54
1:C:492:VAL:HB	1:C:522:TYR:HB3	1.90	0.54
1:B:58:THR:HG22	1:B:66:TRP:CD2	2.43	0.54
1:B:563:LEU:HB3	1:B:572:THR:HG21	1.90	0.54
1:A:394:GLU:HG2	1:A:426:PHE:CZ	2.42	0.53
1:A:13:VAL:CG2	1:A:532:ASP:HA	2.38	0.53
1:B:123:ILE:HD11	1:B:325:ARG:HD3	1.90	0.52
1:C:542:ARG:NH1	2:C:701:7RM:O26	2.42	0.52
1:C:13:VAL:CG2	1:C:532:ASP:HA	2.40	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:442:GLU:HG2	1:C:515:TYR:CZ	2.45	0.51
1:A:314:LEU:O	1:A:314:LEU:HG	2.08	0.51
1:B:13:VAL:HG22	1:B:486:ASP:OD1	2.11	0.51
1:A:58:THR:HG22	1:A:66:TRP:CD2	2.46	0.51
1:B:592:MET:CE	1:B:606:LEU:HD21	2.39	0.51
1:C:64:ASP:HB2	5:C:913:HOH:O	2.10	0.51
1:C:13:VAL:HG22	1:C:486:ASP:OD1	2.12	0.50
1:C:368:TRP:NE1	1:C:397:VAL:HG22	2.27	0.50
1:B:18:ASP:OD1	1:B:19:SER:N	2.45	0.49
1:B:217:ARG:NH1	1:B:222:THR:OG1	2.46	0.48
1:B:67:TRP:CZ3	1:B:498:PRO:HG2	2.47	0.48
1:B:548:ASN:O	1:B:584:GLN:HB2	2.14	0.48
1:C:442:GLU:OE2	1:C:515:TYR:OH	2.26	0.48
1:A:606:LEU:HD23	1:A:629:LEU:HD21	1.96	0.48
1:C:531:ARG:HA	1:C:536:TYR:O	2.15	0.47
1:B:531:ARG:HA	1:B:536:TYR:O	2.15	0.47
1:A:123:ILE:HD11	1:A:325:ARG:HD3	1.97	0.47
1:A:13:VAL:HG22	1:A:486:ASP:OD1	2.16	0.46
1:C:13:VAL:HG21	1:C:532:ASP:HA	1.96	0.46
1:B:335:ILE:HG12	1:B:441:THR:HA	1.98	0.46
1:B:93:ASP:HB3	1:C:271:ALA:HB3	1.97	0.45
1:B:642:MET:HG3	1:B:663:ILE:HG12	1.99	0.45
1:C:659:ASP:OD1	1:C:661:SER:HB2	2.17	0.45
1:C:17:PRO:HB3	1:C:617:VAL:HG11	1.99	0.45
1:B:113:TYR:CD1	1:B:117:PRO:HB3	2.52	0.45
1:B:18:ASP:OD2	1:B:421:HIS:NE2	2.49	0.45
1:A:126:ALA:O	1:A:366:ARG:NH2	2.50	0.45
1:C:408:LEU:HB3	1:C:423:TYR:CZ	2.53	0.44
1:B:332:ILE:HA	1:B:337:GLY:HA3	1.99	0.44
1:B:408:LEU:HB3	1:B:423:TYR:CE2	2.53	0.44
1:C:325:ARG:HH11	1:C:351:THR:HG21	1.81	0.44
1:A:110:ASP:N	1:A:110:ASP:OD1	2.50	0.44
1:C:197:SER:OG	1:C:659:ASP:OD2	2.35	0.44
1:A:368:TRP:HB3	1:A:402:LEU:HD21	2.00	0.43
1:A:391:ARG:HG3	1:A:570:ALA:CB	2.48	0.43
1:A:554:LEU:HD11	1:A:622:ALA:HA	2.00	0.43
1:C:527:ASP:OD2	2:C:701:7RM:O26	2.36	0.43
1:A:187:SER:HA	1:A:286:ILE:O	2.18	0.43
1:A:270:PRO:HD3	5:C:879:HOH:O	2.16	0.43
1:B:288:TYR:HA	1:B:297:LYS:O	2.18	0.43
1:C:67:TRP:CZ3	1:C:498:PRO:HG2	2.54	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:563:LEU:HB3	1:C:572:THR:HG21	2.00	0.43
1:B:587:TYR:CD2	1:B:626:LYS:HB2	2.54	0.43
1:C:17:PRO:HD2	1:C:561:SER:HB2	1.99	0.43
1:B:55:TRP:CH2	1:B:59:VAL:HG21	2.54	0.42
1:C:389:LEU:HD23	1:C:389:LEU:HA	1.87	0.42
1:A:391:ARG:HG3	1:A:570:ALA:HB1	2.01	0.42
1:A:272:TYR:CG	1:A:273:CYS:N	2.88	0.42
1:C:123:ILE:HD11	1:C:325:ARG:HH11	1.85	0.42
1:C:332:ILE:H	1:C:332:ILE:HG13	1.74	0.41
1:B:368:TRP:CD1	1:B:397:VAL:HG13	2.56	0.41
1:A:129:PRO:HG3	1:A:366:ARG:CZ	2.51	0.41
1:A:500:ILE:O	1:A:502:ARG:NH1	2.53	0.41
1:B:361:TYR:CD1	1:B:362:PRO:HA	2.56	0.41
1:C:134:GLU:OE2	1:C:325:ARG:NH2	2.54	0.41
1:C:435:VAL:O	1:C:435:VAL:HG23	2.20	0.41
1:A:122:ILE:HA	1:A:352:THR:O	2.21	0.41
1:B:17:PRO:HD2	1:B:561:SER:HB2	2.01	0.41
1:C:187:SER:HA	1:C:286:ILE:O	2.21	0.41
1:B:435:VAL:HG23	1:B:435:VAL:O	2.21	0.41
1:C:466:PHE:CG	1:C:467:PHE:N	2.89	0.41
1:C:554:LEU:HD13	1:C:621:PHE:HE2	1.85	0.41
1:B:466:PHE:CG	1:B:467:PHE:N	2.89	0.41
1:A:408:LEU:HB3	1:A:423:TYR:CZ	2.57	0.40
1:B:368:TRP:NE1	1:B:397:VAL:HG22	2.36	0.40
1:C:58:THR:HG22	1:C:66:TRP:CD2	2.57	0.40
1:A:96:TRP:CD1	1:A:498:PRO:HA	2.57	0.40
1:B:517:LYS:N	1:B:518:PRO:CD	2.84	0.40
1:C:548:ASN:O	1:C:584:GLN:HB2	2.22	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	667/694 (96%)	654 (98%)	13 (2%)	0	100	100
1	B	667/694 (96%)	653 (98%)	14 (2%)	0	100	100
1	C	668/694 (96%)	653 (98%)	15 (2%)	0	100	100
All	All	2002/2082 (96%)	1960 (98%)	42 (2%)	0	100	100

There are no Ramachandran outliers to report.

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	513/576 (89%)	506 (99%)	7 (1%)	67	86
1	B	497/576 (86%)	492 (99%)	5 (1%)	76	90
1	C	512/576 (89%)	508 (99%)	4 (1%)	81	93
All	All	1522/1728 (88%)	1506 (99%)	16 (1%)	73	89

All (16) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	36	LYS
1	A	51	TYR
1	A	110	ASP
1	A	116	ASN
1	A	423	TYR
1	A	472	ASP
1	A	580	ASP
1	B	110	ASP
1	B	116	ASN
1	B	423	TYR
1	B	472	ASP
1	B	580	ASP
1	C	110	ASP
1	C	116	ASN
1	C	423	TYR

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Mol	Chain	Res	Type
1	C	472	ASP

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

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

13 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	7RM	A	701	-	25,28,28	1.36	5 (20%)	27,42,42	2.19	4 (14%)
4	EDO	B	705	-	3,3,3	0.57	0	2,2,2	0.10	0
4	EDO	B	703	-	3,3,3	0.48	0	2,2,2	0.40	0
2	7RM	B	701	-	25,28,28	1.34	4 (16%)	27,42,42	1.98	5 (18%)
4	EDO	C	704	-	3,3,3	0.48	0	2,2,2	0.44	0
4	EDO	B	704	-	3,3,3	0.46	0	2,2,2	0.67	0
4	EDO	C	705	-	3,3,3	0.64	0	2,2,2	0.13	0
4	EDO	A	703	-	3,3,3	0.36	0	2,2,2	0.70	0
3	PO4	C	702	-	4,4,4	0.90	0	6,6,6	0.54	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	EDO	B	702	-	3,3,3	0.38	0	2,2,2	0.38	0
3	PO4	C	703	-	4,4,4	0.87	0	6,6,6	0.39	0
2	7RM	C	701	-	25,28,28	1.75	6 (24%)	27,42,42	2.21	5 (18%)
3	PO4	A	702	-	4,4,4	0.84	0	6,6,6	0.52	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	7RM	A	701	-	-	0/10/31/31	0/3/3/3
4	EDO	B	705	-	-	0/1/1/1	-
4	EDO	B	703	-	-	1/1/1/1	-
2	7RM	B	701	-	-	0/10/31/31	0/3/3/3
4	EDO	C	704	-	-	0/1/1/1	-
4	EDO	B	704	-	-	1/1/1/1	-
4	EDO	C	705	-	-	1/1/1/1	-
4	EDO	A	703	-	-	0/1/1/1	-
4	EDO	B	702	-	-	1/1/1/1	-
2	7RM	C	701	-	-	0/10/31/31	0/3/3/3

All (15) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	701	7RM	C02-N04	-4.96	1.33	1.38
2	B	701	7RM	C02-N04	-4.20	1.33	1.38
2	C	701	7RM	O06-S05	3.77	1.45	1.42
2	C	701	7RM	O07-S05	3.56	1.45	1.42
2	A	701	7RM	C02-N04	-3.13	1.34	1.38
2	A	701	7RM	O08-S05	-2.98	1.53	1.59
2	B	701	7RM	O08-S05	-2.91	1.53	1.59
2	C	701	7RM	O08-S05	-2.56	1.54	1.59
2	A	701	7RM	O14-C13	2.50	1.44	1.41
2	B	701	7RM	O07-S05	2.36	1.44	1.42
2	C	701	7RM	C12-C13	-2.14	1.50	1.53
2	C	701	7RM	O14-C13	2.10	1.44	1.41
2	A	701	7RM	O06-S05	2.10	1.44	1.42
2	A	701	7RM	O07-S05	2.05	1.44	1.42
2	B	701	7RM	O14-C13	2.03	1.43	1.41

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	701	7RM	C02-N04-S05	-8.15	117.40	124.31
2	C	701	7RM	C02-N04-S05	-7.47	117.97	124.31
2	B	701	7RM	O07-S05-O06	-6.00	111.41	120.76
2	C	701	7RM	O07-S05-O06	-5.07	112.86	120.76
2	B	701	7RM	C02-N04-S05	-4.93	120.13	124.31
2	C	701	7RM	N20-C21-N22	-4.92	120.99	128.68
2	A	701	7RM	O07-S05-O06	-4.68	113.46	120.76
2	B	701	7RM	N20-C21-N22	-4.58	121.52	128.68
2	A	701	7RM	N20-C21-N22	-4.24	122.05	128.68
2	B	701	7RM	C11-C12-C13	2.21	104.30	100.98
2	C	701	7RM	C13-N15-C19	-2.14	122.88	126.64
2	C	701	7RM	C19-C18-N17	-2.10	107.21	109.40
2	B	701	7RM	C19-C18-N17	-2.02	107.29	109.40
2	A	701	7RM	C11-C12-C13	2.02	104.02	100.98

There are no chirality outliers.

All (4) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	C	705	EDO	O1-C1-C2-O2
4	B	702	EDO	O1-C1-C2-O2
4	B	703	EDO	O1-C1-C2-O2
4	B	704	EDO	O1-C1-C2-O2

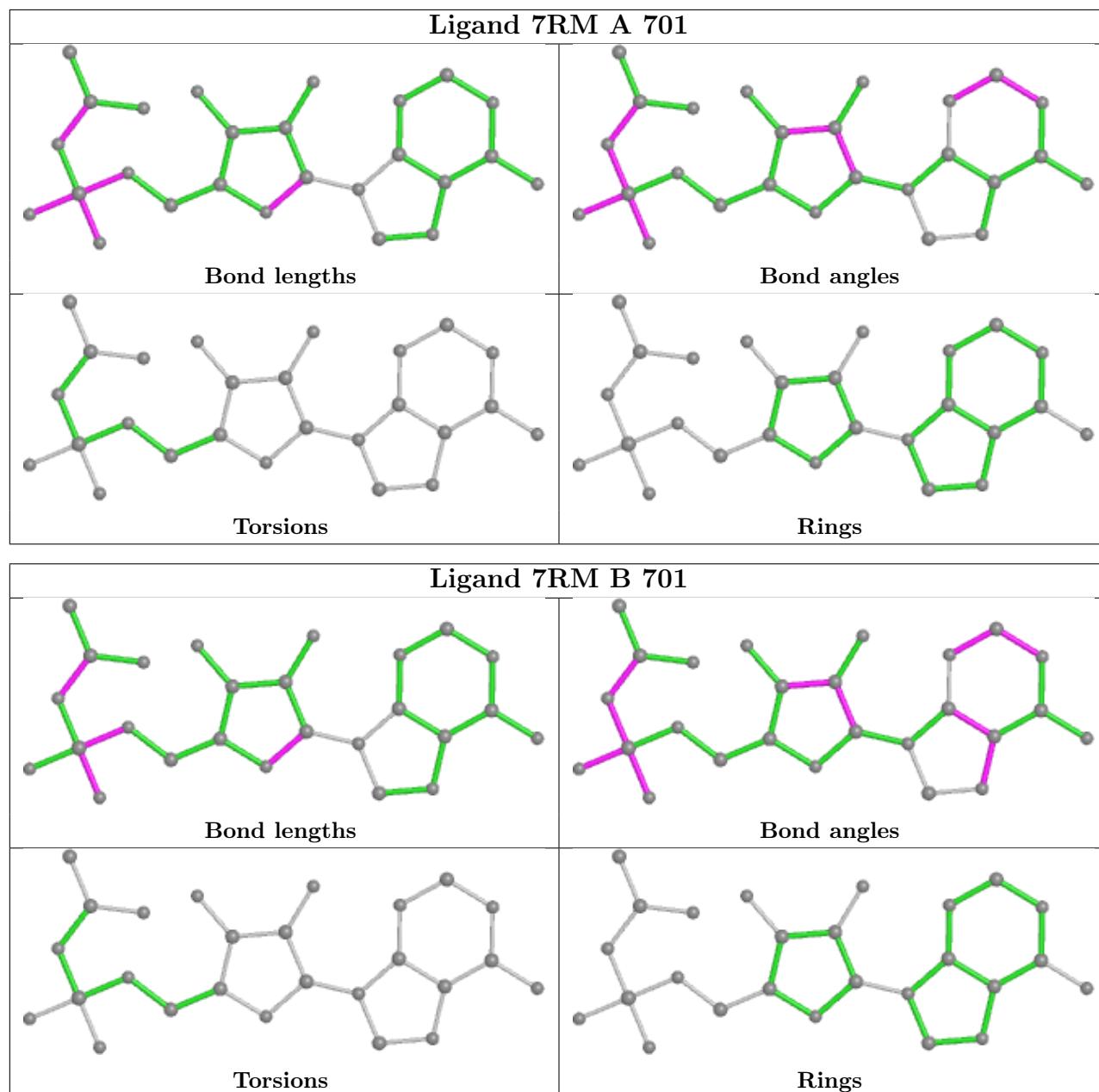
There are no ring outliers.

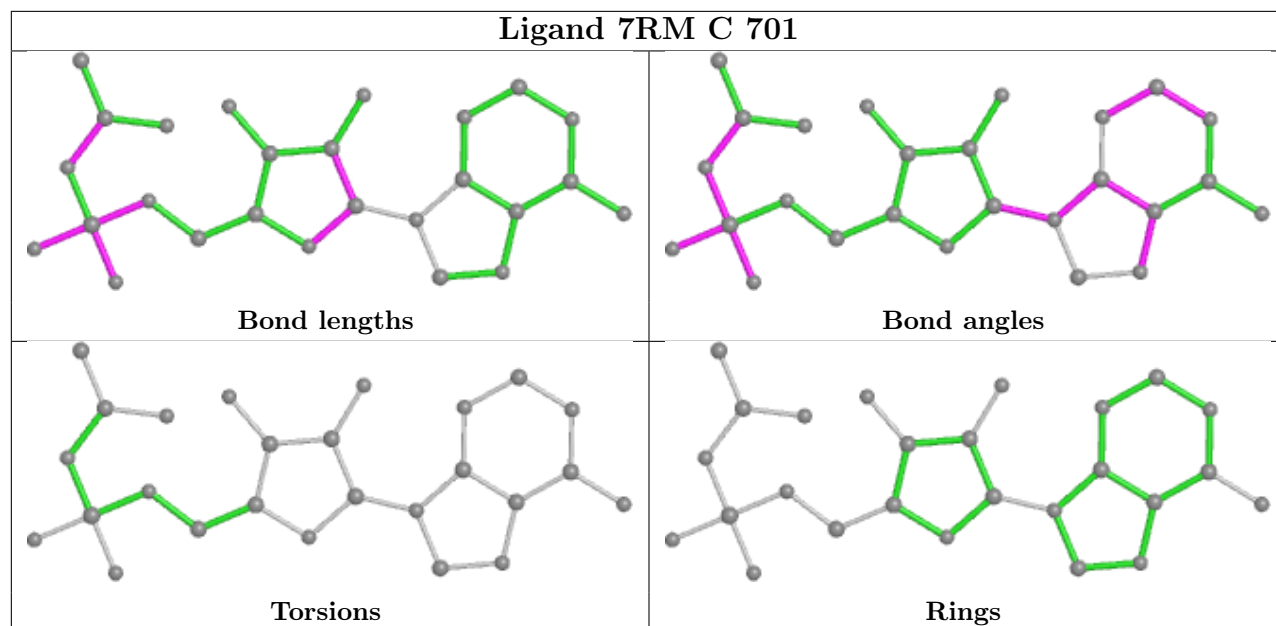
5 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	B	703	EDO	1	0
4	C	704	EDO	1	0
4	C	705	EDO	1	0
4	B	702	EDO	1	0
2	C	701	7RM	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 [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, 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	668/694 (96%)	-0.32	16 (2%) 59 62	25, 43, 83, 105	0
1	B	667/694 (96%)	-0.01	25 (3%) 41 45	28, 56, 91, 122	0
1	C	668/694 (96%)	-0.26	7 (1%) 82 84	26, 50, 85, 109	0
All	All	2003/2082 (96%)	-0.20	48 (2%) 59 62	25, 48, 86, 122	0

All (48) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	291	GLY	6.2
1	B	676	VAL	4.1
1	A	292	SER	3.3
1	A	533	TYR	3.3
1	A	606	LEU	3.1
1	A	657	LEU	3.1
1	B	672	VAL	3.0
1	A	10	VAL	2.9
1	A	655	ASP	2.9
1	A	577	CYS	2.8
1	A	578	ALA	2.8
1	B	669	VAL	2.7
1	B	649	ILE	2.7
1	B	481	VAL	2.7
1	C	597	ASP	2.7
1	B	42	PRO	2.6
1	C	658	GLY	2.6
1	A	549	VAL	2.6
1	B	590	VAL	2.6
1	A	622	ALA	2.5
1	A	11	HIS	2.5
1	C	655	ASP	2.5
1	C	657	LEU	2.5

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Mol	Chain	Res	Type	RSRZ
1	A	628	TYR	2.5
1	B	38	GLY	2.5
1	B	602	LYS	2.4
1	A	579	ASP	2.4
1	B	603	GLU	2.4
1	B	657	LEU	2.4
1	C	672	VAL	2.4
1	B	185	ILE	2.4
1	B	576	GLY	2.4
1	B	51	TYR	2.4
1	B	579	ASP	2.3
1	B	645	VAL	2.3
1	A	587	TYR	2.3
1	A	652	GLY	2.2
1	A	554	LEU	2.1
1	C	36	LYS	2.1
1	B	31	PRO	2.1
1	B	654	GLY	2.1
1	B	284	LEU	2.1
1	B	597	ASP	2.1
1	B	605	ASP	2.0
1	B	587	TYR	2.0
1	B	464	PHE	2.0
1	B	667	GLN	2.0
1	C	594	PRO	2.0

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

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

6.3 Carbohydrates [i](#)

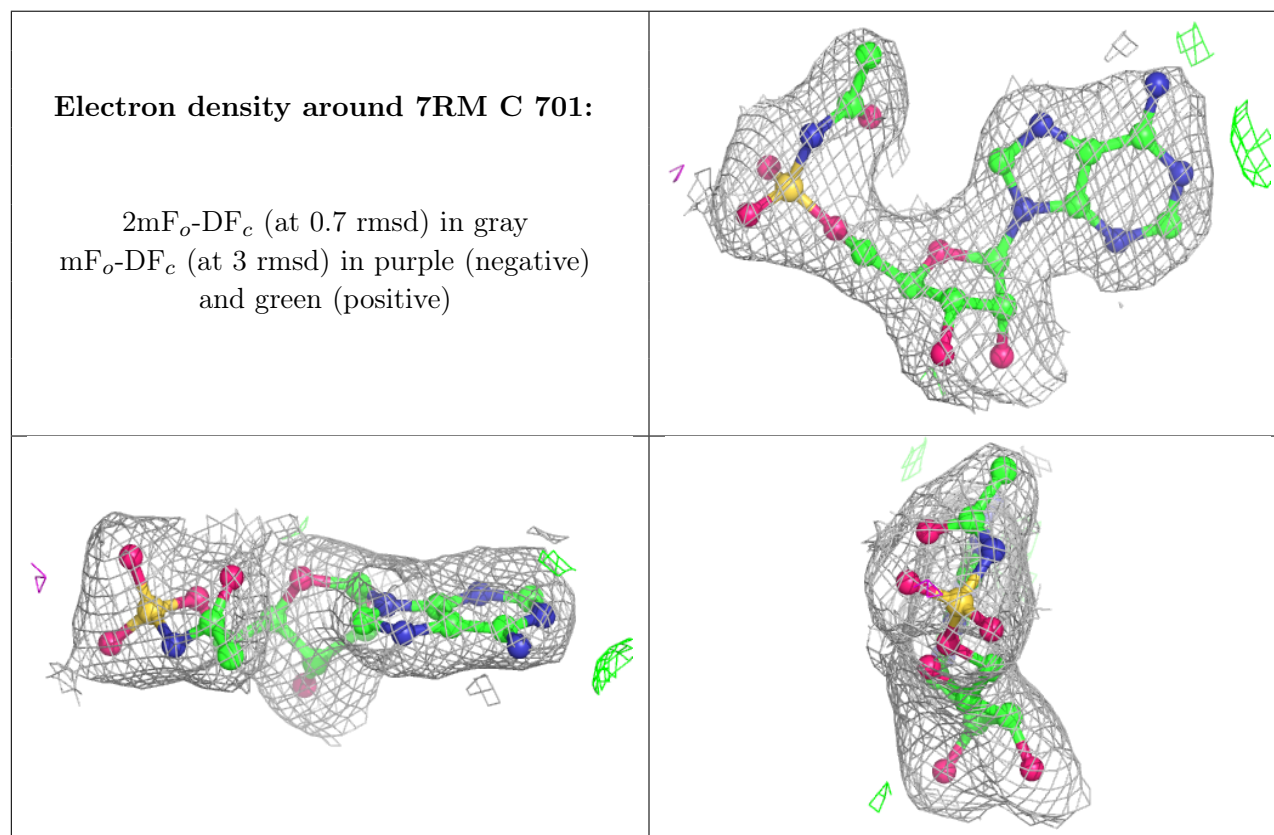
There are no monosaccharides in this entry.

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.

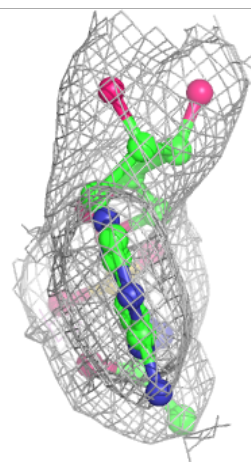
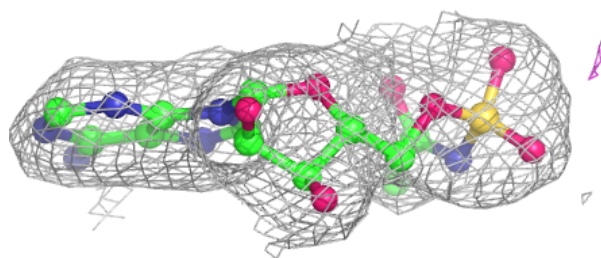
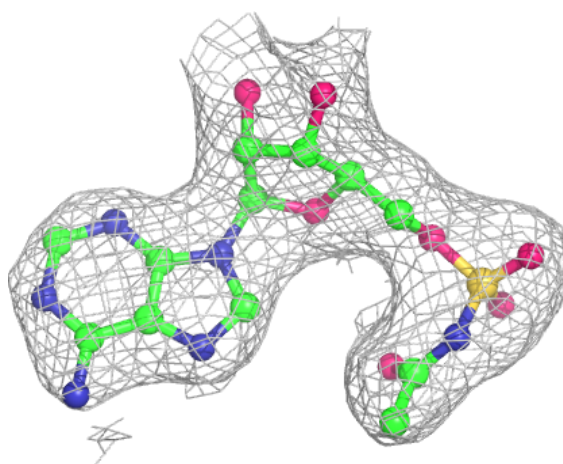
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
4	EDO	B	705	4/4	0.86	0.16	64,73,75,77	0
4	EDO	C	705	4/4	0.87	0.26	58,63,63,63	0
3	PO4	C	702	5/5	0.90	0.38	111,115,118,120	0
4	EDO	B	704	4/4	0.92	0.17	67,69,70,73	0
3	PO4	A	702	5/5	0.93	0.30	118,119,121,123	0
4	EDO	B	703	4/4	0.94	0.13	49,50,52,54	0
3	PO4	C	703	5/5	0.95	0.09	76,78,81,87	0
4	EDO	C	704	4/4	0.97	0.10	59,59,63,65	0
4	EDO	B	702	4/4	0.98	0.11	45,46,51,56	0
2	7RM	C	701	26/26	0.98	0.15	28,40,46,49	0
4	EDO	A	703	4/4	0.98	0.18	42,42,52,52	0
2	7RM	B	701	26/26	0.99	0.13	36,54,62,64	0
2	7RM	A	701	26/26	0.99	0.13	27,34,42,42	0

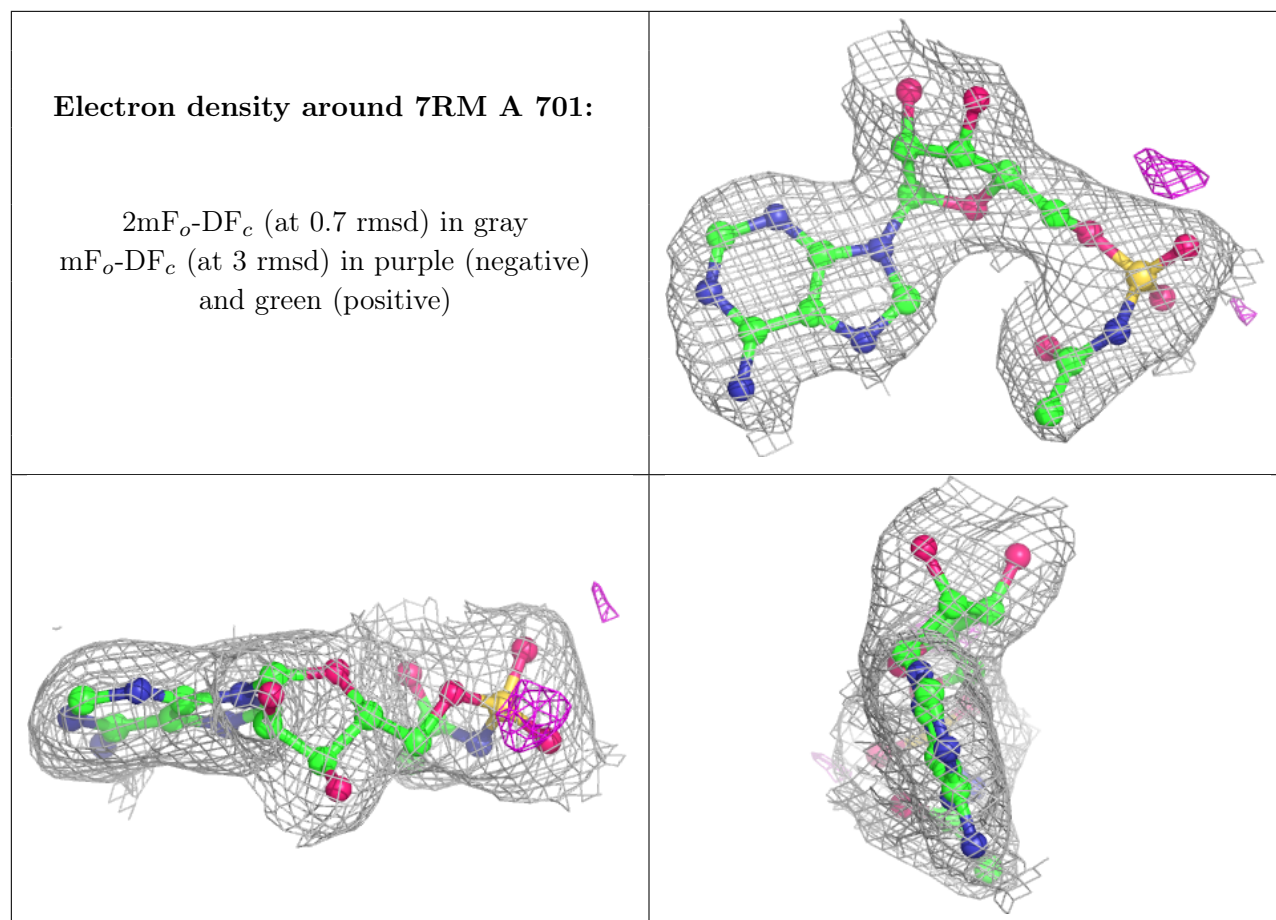
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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



Electron density around 7RM B 701:

$2mF_o-DF_c$ (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.