Full wwPDB X-ray Structure Validation Report ⓘ

May 22, 2020 – 04:25 am BST

PDB ID	:	5Z69
Title	:	Structure of the recombination mediator protein RecF-ATPrS in RecFOR pathway
Authors	:	Tang, Q.; Liu, Y.-P.; Yan, X.-X.
Deposited on	:	2018-01-22
Resolution	:	2.10 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 following versions of software and data (see references ⓘ) were used in the production of this report:

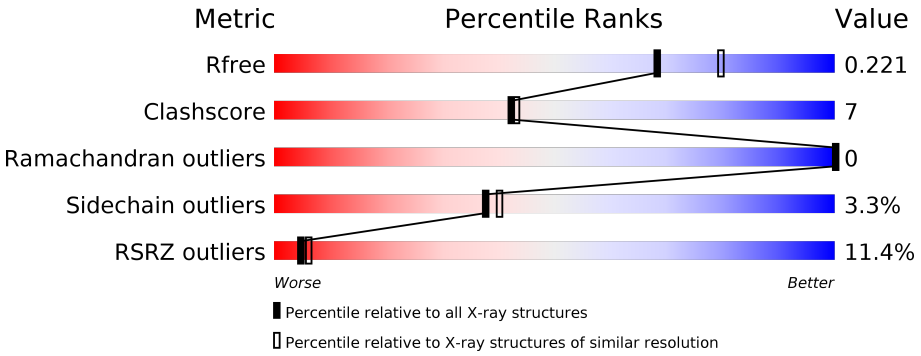
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.11
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.11

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 2.10 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	5197 (2.10-2.10)
Clashscore	141614	5710 (2.10-2.10)
Ramachandran outliers	138981	5647 (2.10-2.10)
Sidechain outliers	138945	5648 (2.10-2.10)
RSRZ outliers	127900	5083 (2.10-2.10)

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 >=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	372	10% 80% 19%
1	B	372	13% 83% 16%

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 6494 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.

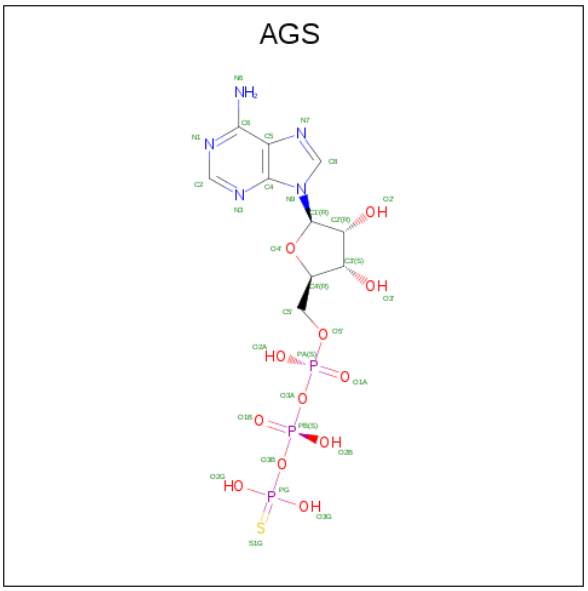
- Molecule 1 is a protein called DNA replication and repair protein RecF.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	372	Total	C	N	O	S	4	8	0
			3044	1949	511	573	11			
1	B	371	Total	C	N	O	S	1	4	0
			3038	1944	509	574	11			

There are 22 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-6	HIS	-	expression tag	UNP Q8RDL3
A	-5	HIS	-	expression tag	UNP Q8RDL3
A	-4	HIS	-	expression tag	UNP Q8RDL3
A	-3	SER	-	expression tag	UNP Q8RDL3
A	-2	GLN	-	expression tag	UNP Q8RDL3
A	-1	ASP	-	expression tag	UNP Q8RDL3
A	0	PRO	-	expression tag	UNP Q8RDL3
A	362	ASP	-	expression tag	UNP Q8RDL3
A	363	LYS	-	expression tag	UNP Q8RDL3
A	364	LEU	-	expression tag	UNP Q8RDL3
A	365	ALA	-	expression tag	UNP Q8RDL3
B	-6	HIS	-	expression tag	UNP Q8RDL3
B	-5	HIS	-	expression tag	UNP Q8RDL3
B	-4	HIS	-	expression tag	UNP Q8RDL3
B	-3	SER	-	expression tag	UNP Q8RDL3
B	-2	GLN	-	expression tag	UNP Q8RDL3
B	-1	ASP	-	expression tag	UNP Q8RDL3
B	0	PRO	-	expression tag	UNP Q8RDL3
B	362	ASP	-	expression tag	UNP Q8RDL3
B	363	LYS	-	expression tag	UNP Q8RDL3
B	364	LEU	-	expression tag	UNP Q8RDL3
B	365	ALA	-	expression tag	UNP Q8RDL3

- Molecule 2 is PHOSPHOTHIOPHOSPHORIC ACID-ADENYLATE ESTER (three-letter code: AGS) (formula: $C_{10}H_{16}N_5O_{12}P_3S$).



Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
2	A	1	Total	C	N	O	P	S	0	0
			31	10	5	12	3	1		

- Molecule 3 is water.

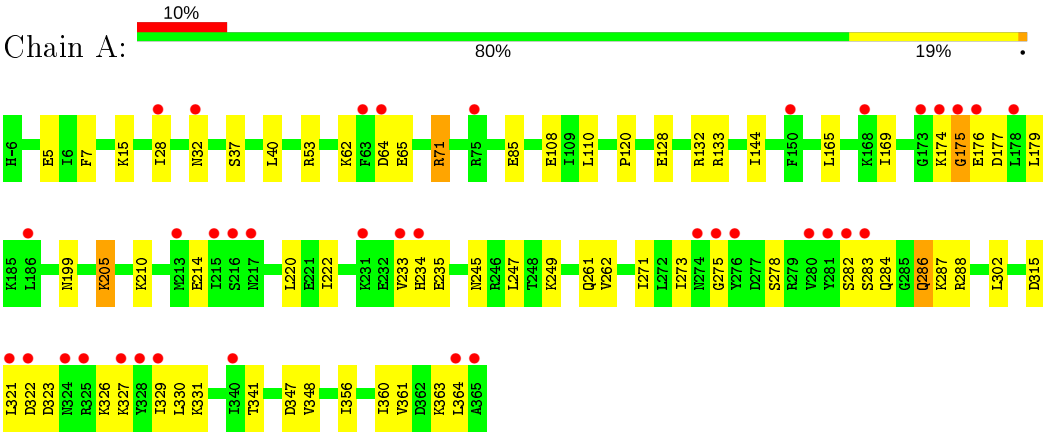
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	230	Total	O	0	0
			230	230		
3	B	151	Total	O	0	0
			151	151		

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 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.

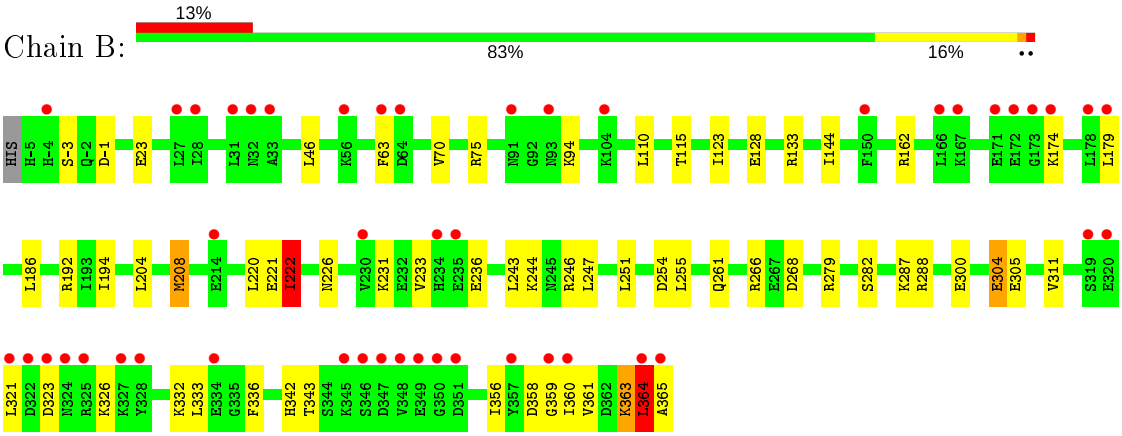
• Molecule 1: DNA replication and repair protein RecF

Chain A:



• Molecule 1: DNA replication and repair protein RecF

Chain B:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	166.73Å 48.11Å 116.86Å 90.00° 100.06° 90.00°	Depositor
Resolution (Å)	19.84 – 2.10 19.84 – 2.10	Depositor EDS
% Data completeness (in resolution range)	99.5 (19.84-2.10) 99.5 (19.84-2.10)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	3.56 (at 2.11Å)	Xtriage
Refinement program	PHENIX 1.9_1692	Depositor
R, R_{free}	0.188 , 0.221 0.192 , 0.221	Depositor DCC
R_{free} test set	2551 reflections (4.78%)	wwPDB-VP
Wilson B-factor (Å^2)	36.0	Xtriage
Anisotropy	0.085	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 65.1	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.96	EDS
Total number of atoms	6494	wwPDB-VP
Average B, all atoms (Å^2)	51.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.06% of the height of the origin peak. No significant pseudotranslation is detected.*

[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: AGS

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	0.51	0/3114	0.81	12/4172 (0.3%)
1	B	0.46	0/3093	0.67	5/4140 (0.1%)
All	All	0.48	0/6207	0.74	17/8312 (0.2%)

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	2
1	B	0	1
All	All	0	3

There are no bond length outliers.

All (17) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	177	ASP	N-CA-CB	-15.95	81.90	110.60
1	A	176	GLU	CB-CA-C	14.26	138.92	110.40
1	A	175	GLY	N-CA-C	14.05	148.23	113.10
1	A	176	GLU	N-CA-CB	-10.60	91.52	110.60
1	B	364	LEU	CB-CA-C	-10.38	90.48	110.20
1	A	174	LYS	CB-CA-C	-8.51	93.38	110.40
1	B	363	LYS	CB-CA-C	7.74	125.88	110.40
1	A	71[A]	ARG	NE-CZ-NH2	-7.58	116.51	120.30
1	A	71[B]	ARG	NE-CZ-NH2	-7.58	116.51	120.30
1	B	363	LYS	N-CA-C	-6.42	93.68	111.00
1	A	323	ASP	CB-CG-OD1	-6.15	112.77	118.30
1	A	323	ASP	CB-CG-OD2	6.09	123.78	118.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	71[A]	ARG	NE-CZ-NH1	5.84	123.22	120.30
1	A	71[B]	ARG	NE-CZ-NH1	5.84	123.22	120.30
1	B	364	LEU	N-CA-C	5.46	125.75	111.00
1	B	222	ILE	CG1-CB-CG2	-5.37	99.59	111.40
1	A	177	ASP	CB-CA-C	5.22	120.83	110.40

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	110	LEU	Peptide
1	A	322	ASP	Peptide
1	B	110	LEU	Peptide

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	3044	0	3079	47	0
1	B	3038	0	3085	39	0
2	A	31	0	12	2	0
3	A	230	0	0	9	0
3	B	151	0	0	3	0
All	All	6494	0	6176	85	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 7.

All (85) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:128:GLU:O	1:A:133:ARG:NH2	2.15	0.79
1:A:282:SER:HB2	1:A:286:GLN:HG3	1.65	0.77
1:B:128:GLU:O	1:B:133:ARG:NH2	2.17	0.77
1:A:363:LYS:HG2	1:A:364:LEU:HG	1.72	0.72

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:221:GLU:OE2	3:B:401:HOH:O	2.09	0.70
1:B:333:LEU:O	1:B:336:PHE:HD2	1.75	0.69
1:B:358:ASP:O	1:B:360:ILE:CD1	2.41	0.68
1:B:360:ILE:N	1:B:360:ILE:HD12	2.09	0.67
1:A:169:ILE:HG12	1:A:175:GLY:C	2.16	0.66
1:A:347:ASP:O	3:A:502:HOH:O	2.14	0.66
1:A:5:GLU:OE2	1:A:71[B]:ARG:NH2	2.30	0.65
1:A:282:SER:O	1:A:287:LYS:NZ	2.33	0.62
1:A:326:LYS:HZ1	1:A:348:VAL:HG22	1.63	0.60
1:A:210:LYS:O	1:A:214:GLU:HG2	2.03	0.59
1:A:37:SER:OG	1:A:53:ARG:NH2	2.35	0.59
1:B:323:ASP:HA	1:B:326:LYS:HB2	1.84	0.59
1:B:363:LYS:HG3	1:B:364:LEU:HD23	1.83	0.59
1:B:94:LYS:NZ	3:B:405:HOH:O	2.36	0.59
1:A:283:SER:OG	1:A:284:GLN:N	2.38	0.57
1:A:181:ILE:HD12	1:A:181:ILE:H	1.70	0.56
1:B:358:ASP:O	1:B:360:ILE:HD12	2.04	0.56
1:B:144:ILE:HG21	1:B:305:GLU:HG2	1.86	0.56
1:A:199[A]:ASN:ND2	3:A:513:HOH:O	2.40	0.55
1:A:330:LEU:N	3:A:501:HOH:O	2.41	0.54
1:A:326:LYS:HE3	1:A:330:LEU:HD22	1.89	0.54
1:B:243:LEU:O	1:B:247:LEU:HG	2.07	0.54
1:B:-1:ASP:OD2	1:B:75:ARG:NH2	2.40	0.54
1:B:332:LYS:NZ	3:B:409:HOH:O	2.41	0.53
1:A:199[A]:ASN:ND2	3:A:518:HOH:O	2.42	0.53
1:A:165:LEU:HD23	1:A:179:LEU:HD23	1.91	0.51
1:A:15:LYS:HG3	1:A:360:ILE:HG12	1.92	0.51
1:A:205:LYS:HB3	1:A:205:LYS:NZ	2.27	0.50
1:B:363:LYS:HG3	1:B:364:LEU:CD2	2.42	0.50
1:A:356:ILE:HG12	1:A:361:VAL:HG22	1.94	0.50
1:A:273:ILE:HG12	1:A:278:SER:HB3	1.93	0.49
1:B:364:LEU:O	1:B:365:ALA:CB	2.61	0.49
1:B:356:ILE:HG12	1:B:361:VAL:HG22	1.95	0.48
1:A:220:LEU:HD11	1:A:222:ILE:HG13	1.94	0.48
1:A:180:GLU:O	1:A:184:GLU:HG3	2.14	0.48
1:A:71[B]:ARG:HG3	1:A:85:GLU:HG2	1.96	0.47
1:A:249:LYS:HG2	1:B:231:LYS:HB2	1.95	0.47
1:B:360:ILE:N	1:B:360:ILE:CD1	2.74	0.47
1:A:331:LYS:N	3:A:501:HOH:O	2.13	0.47
1:B:359:GLY:C	1:B:360:ILE:HD12	2.36	0.46
1:B:226:ASN:HD21	1:B:231:LYS:H	1.63	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:300:GLU:O	1:B:304[B]:GLU:HG3	2.16	0.46
1:B:133:ARG:NH1	1:B:268:ASP:OD2	2.49	0.45
1:B:115:THR:HG22	1:B:311:VAL:HB	1.99	0.45
1:A:120:PRO:HD3	1:A:315:ASP:O	2.16	0.45
1:A:28:ILE:O	1:A:341:THR:HA	2.16	0.45
1:A:205:LYS:HB3	1:A:205:LYS:HZ2	1.82	0.45
1:A:62:LYS:HD3	1:A:65:GLU:HG3	1.99	0.45
1:B:220:LEU:HD11	1:B:222:ILE:HD12	1.99	0.45
1:B:179:LEU:HD21	1:B:251:LEU:HD13	1.98	0.44
1:A:319:SER:O	1:A:321:LEU:HG	2.18	0.44
1:B:342:HIS:CG	1:B:343:THR:H	2.36	0.44
1:A:108:GLU:OE1	3:A:503:HOH:O	2.21	0.44
1:A:7:PHE:HB2	1:A:71[B]:ARG:NH2	2.33	0.43
1:B:46:LEU:HD21	1:B:70:VAL:CG1	2.48	0.43
1:A:283:SER:O	1:A:287:LYS:HG3	2.19	0.43
1:B:254:ASP:OD1	1:B:261:GLN:HG2	2.19	0.43
1:B:194:ILE:HG22	1:B:233:VAL:HG11	2.00	0.43
1:A:247:LEU:HD23	1:A:262:VAL:HB	2.01	0.43
1:A:53:ARG:NH2	2:A:401:AGS:O2A	2.52	0.43
1:B:162:ARG:HD2	1:B:186:LEU:HD11	2.01	0.43
1:B:282:SER:O	1:B:287:LYS:NZ	2.51	0.43
1:A:245:ASN:OD1	1:B:246:ARG:NH2	2.52	0.42
1:B:192:ARG:HG2	1:B:236:GLU:OE2	2.20	0.42
1:B:321:LEU:O	1:B:326:LYS:NZ	2.53	0.42
1:B:244:LYS:HA	1:B:247:LEU:HD12	2.02	0.42
1:A:220:LEU:HD21	1:A:271:ILE:HG23	2.01	0.42
1:B:204:LEU:O	1:B:208:MET:HB2	2.19	0.42
2:A:401:AGS:O2G	2:A:401:AGS:O2B	2.39	0.41
1:B:333:LEU:HA	1:B:333:LEU:HD23	1.91	0.41
1:B:123:ILE:HD12	1:B:288[B]:ARG:HG2	2.03	0.41
1:A:144:ILE:HG22	1:A:302:LEU:HD13	2.03	0.41
1:A:273:ILE:C	1:A:275:GLY:H	2.24	0.41
1:A:132:ARG:NH1	3:A:508:HOH:O	2.34	0.41
1:A:326:LYS:HE2	3:A:502:HOH:O	2.21	0.41
1:B:255:LEU:HD23	1:B:255:LEU:HA	1.94	0.41
1:A:144:ILE:HG21	1:A:144:ILE:HD13	1.86	0.41
1:A:169:ILE:HG12	1:A:175:GLY:CA	2.52	0.40
1:A:40:LEU:HD23	1:A:315:ASP:HB2	2.04	0.40
1:A:327:LYS:O	3:A:501:HOH:O	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	379/372 (102%)	358 (94%)	21 (6%)	0	100	100
1	B	373/372 (100%)	364 (98%)	9 (2%)	0	100	100
All	All	752/744 (101%)	722 (96%)	30 (4%)	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	335/339 (99%)	322 (96%)	13 (4%)	32	33
1	B	336/339 (99%)	325 (97%)	11 (3%)	38	40
All	All	671/678 (99%)	647 (96%)	24 (4%)	38	36

All (24) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	32	ASN
1	A	205	LYS
1	A	233	VAL
1	A	234	HIS
1	A	235[A]	GLU
1	A	235[B]	GLU
1	A	261	GLN
1	A	286	GLN

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Mol	Chain	Res	Type
1	A	288	ARG
1	A	318	MET
1	A	319	SER
1	A	320	GLU
1	A	329	ILE
1	B	-3	SER
1	B	23	GLU
1	B	63	PHE
1	B	174	LYS
1	B	208	MET
1	B	222	ILE
1	B	266	ARG
1	B	279	ARG
1	B	304[A]	GLU
1	B	304[B]	GLU
1	B	364	LEU

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

5.3.3 RNA

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates

There are no carbohydrates in this entry.

5.6 Ligand geometry

1 ligand is 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	AGS	A	401	-	26,33,33	0.83	1 (3%)	26,52,52	1.01	2 (7%)

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	AGS	A	401	-	-	8/17/38/38	0/3/3/3

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	401	AGS	PG-S1G	2.40	1.95	1.90

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	401	AGS	PA-O3A-PB	-2.61	123.87	132.83
2	A	401	AGS	C5-C6-N6	2.01	123.40	120.35

There are no chirality outliers.

All (8) torsion outliers are listed below:

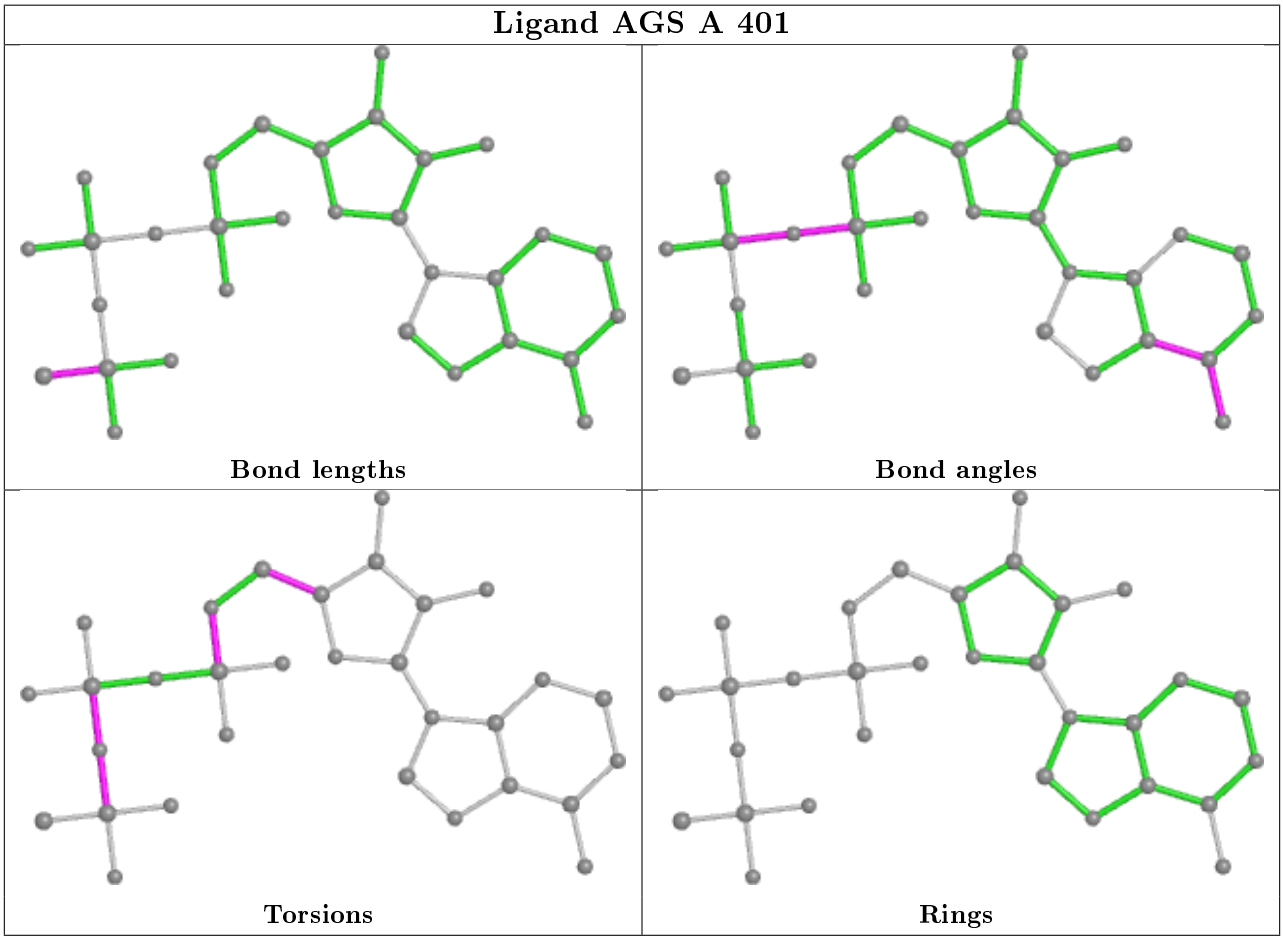
Mol	Chain	Res	Type	Atoms
2	A	401	AGS	PB-O3B-PG-O2G
2	A	401	AGS	PB-O3B-PG-O3G
2	A	401	AGS	C5'-O5'-PA-O1A
2	A	401	AGS	C5'-O5'-PA-O2A
2	A	401	AGS	C3'-C4'-C5'-O5'
2	A	401	AGS	O4'-C4'-C5'-O5'
2	A	401	AGS	C5'-O5'-PA-O3A
2	A	401	AGS	PG-O3B-PB-O2B

There are no ring outliers.

1 monomer is involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	401	AGS	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 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.



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, 95^{th} 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	372/372 (100%)	0.40	38 (10%)	6 8	20, 42, 88, 111	1 (0%)
1	B	371/372 (99%)	0.58	47 (12%)	3 5	24, 50, 96, 127	0
All	All	743/744 (99%)	0.49	85 (11%)	5 6	20, 47, 93, 127	1 (0%)

All (85) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	365	ALA	9.5
1	B	364	LEU	9.3
1	A	281	TYR	7.3
1	B	348	VAL	6.7
1	A	174	LYS	6.6
1	A	175	GLY	6.3
1	B	63	PHE	5.9
1	B	347	ASP	5.4
1	B	323	ASP	5.2
1	B	31	LEU	4.9
1	B	64	ASP	4.9
1	A	322	ASP	4.8
1	A	283	SER	4.6
1	B	174	LYS	4.4
1	B	334	GLU	4.0
1	B	325	ARG	3.9
1	A	64	ASP	3.9
1	A	324	ASN	3.9
1	A	215	ILE	3.9
1	B	349	GLU	3.8
1	B	-4	HIS	3.8
1	A	231	LYS	3.7
1	B	32	ASN	3.7
1	A	327	LYS	3.6

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Mol	Chain	Res	Type	RSRZ
1	B	346	SER	3.5
1	A	328	TYR	3.5
1	A	176	GLU	3.5
1	B	357	TYR	3.4
1	A	216[A]	SER	3.3
1	B	322	ASP	3.3
1	A	325	ARG	3.2
1	B	234	HIS	3.2
1	B	33	ALA	3.1
1	A	32	ASN	3.1
1	A	321	LEU	3.1
1	B	28	ILE	3.1
1	B	93	ASN	3.1
1	B	359	GLY	3.0
1	B	327	LYS	2.9
1	A	280	VAL	2.9
1	A	150	PHE	2.9
1	A	340	ILE	2.9
1	B	319	SER	2.9
1	B	345	LYS	2.9
1	B	214	GLU	2.8
1	B	351	ASP	2.8
1	A	186	LEU	2.8
1	B	320	GLU	2.7
1	A	28	ILE	2.6
1	B	91	ASN	2.6
1	A	282	SER	2.6
1	B	178	LEU	2.6
1	B	328	TYR	2.6
1	B	235	GLU	2.6
1	A	276	TYR	2.5
1	A	217	ASN	2.5
1	B	166	LEU	2.5
1	A	75[A]	ARG	2.5
1	A	233	VAL	2.4
1	B	324	ASN	2.4
1	B	27	LEU	2.4
1	A	234	HIS	2.4
1	A	329	ILE	2.4
1	A	213	MET	2.4
1	A	275	GLY	2.4
1	B	104	LYS	2.3

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Mol	Chain	Res	Type	RSRZ
1	A	320	GLU	2.3
1	A	365	ALA	2.3
1	A	168	LYS	2.3
1	B	230	VAL	2.3
1	B	179	LEU	2.2
1	B	171	GLU	2.2
1	B	350	GLY	2.2
1	A	178	LEU	2.2
1	B	150[A]	PHE	2.2
1	B	56	LYS	2.2
1	B	172	GLU	2.2
1	B	360	ILE	2.1
1	A	364	LEU	2.1
1	B	167	LYS	2.1
1	A	63[A]	PHE	2.1
1	A	173	GLY	2.0
1	A	274	ASN	2.0
1	B	321	LEU	2.0
1	B	173	GLY	2.0

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

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

6.3 Carbohydrates (i)

There are no carbohydrates in this entry.

6.4 Ligands (i)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} 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.

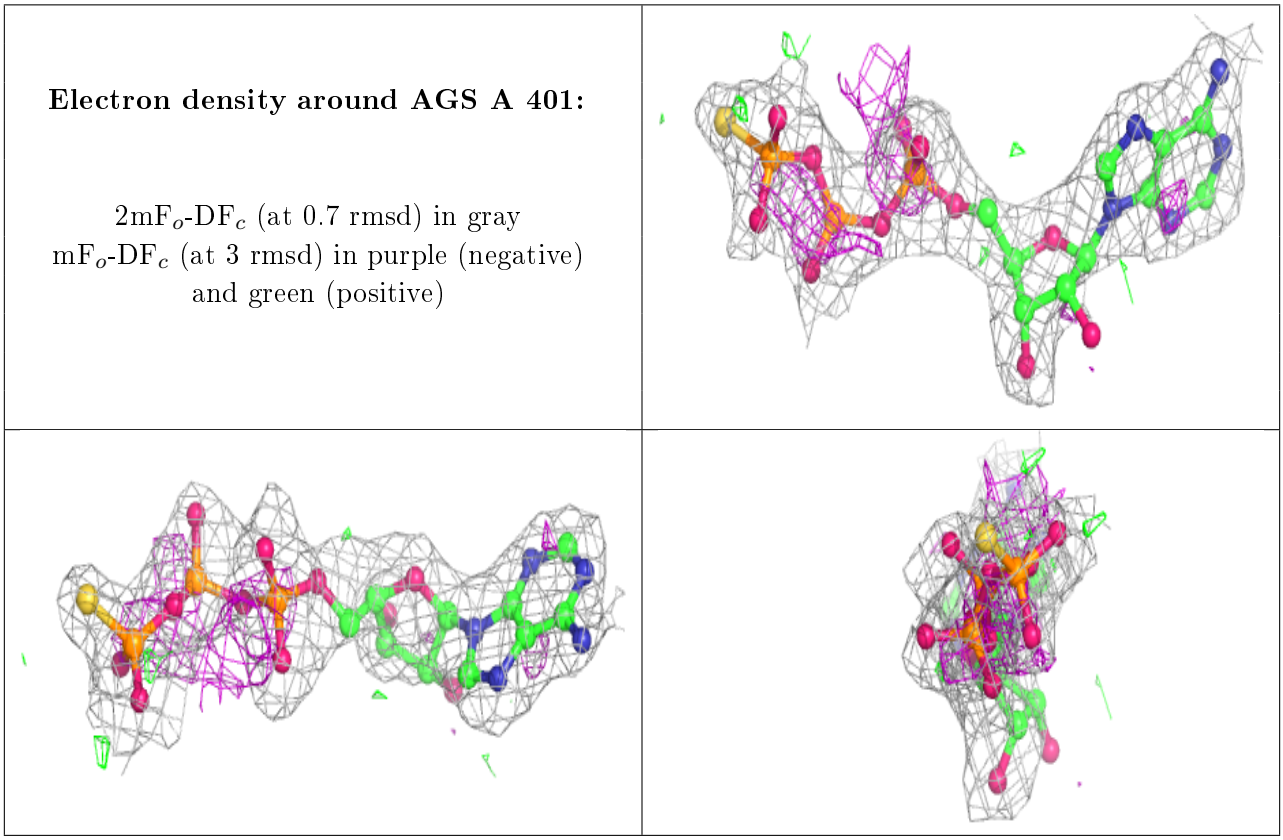
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	AGS	A	401	31/31	0.87	0.20	35,61,86,103	0

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 AGS A 401:

$2mF_o$-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

There are no such residues in this entry.